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P-2022/11246

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
DIRECCIÓN DE NUEVAS CREACIONES

Expediente No. **NC2022/0004984**
Solicitud de patente a nombre de **MAYO FOUNDATION FOR MEDICAL EDUCATION AND RESEARCH**

Yo, CAROLINA DAZA MONTALVO identificada como aparece al pie de mi firma, domiciliada en la Carrera 11 No. 86-53, actuando como apoderada de la sociedad **MAYO FOUNDATION FOR MEDICAL EDUCATION AND RESEARCH**, domiciliada en Rochester, Estados Unidos de América, solicitante de la patente de la referencia, en respuesta al oficio No. 19656 notificado electrónicamente el 12 de noviembre de 2024 y para el cual solicité prórroga el 3 de febrero de 2025, en relación con los méritos de la solicitud, respetuosamente presento la siguiente información:

1. Titulo

En primer lugar, respecto a la observación sobre la falta de relación entre el título y la materia contenida en la descripción y las reivindicaciones, se resalta que el título ha sido modificado siguiendo la sugerencia del Examinador de la siguiente manera:

"VIRUS DE LA ESTOMATITIS VESICULAR (VSV) RECOMBINANTE QUE NO EXPRESA LA PROTEÍNA G Y QUE EXPRESA LAS PROTEÍNAS F Y H (Y539A) DEL VIRUS DEL MOQUILLO CANINO (CDV)"

En vista de lo anterior, solicito amablemente que se considere superada la objeción a este respecto.

2. Modificaciones del capítulo reivindicatorio y del listado de secuencias

Con fundamento en la facultad conferida por el artículo 34 de la Decisión 486 al solicitante para modificar la solicitud de patente en cualquier momento del trámite, presento junto con este escrito un nuevo capítulo reivindicatorio que consta de veinte (20) reivindicaciones y un nuevo listado de secuencias, los cuales reemplazan en su totalidad las versiones anteriormente presentadas.

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A continuación, se describen las modificaciones introducidas en el capítulo reivindicatorio:

- Se modificó la reivindicación 1 para especificar que VSV corresponde al virus de la estomatitis vesicular y que CDV corresponde al virus del moquillo canino.
- Se modificó la reivindicación 12 para sustituir la referencia a la Figura 11 por las SEQ ID NOS 5, 31 a 145, 227 y 228. Esta modificación encuentra sustento en la figura 12 y en las páginas 16 y 25 de la descripción.
- Se modificó la reivindicación 20 para especificar que NIS corresponde a simportador de yoduro de sodio.

Se ha modificado el listado de secuencias para incluir más información técnica relevante en el identificador <223> para los SEQ ID NOS: 8 a 20 y 22 a 30. Estas modificaciones encuentran sustento en las páginas 23, 36, 54 y 56 de la descripción.

Estas modificaciones no amplían en modo alguno el objeto de la presente solicitud, ya que se basan en la descripción originalmente presentada, por lo que se ajustan a lo dispuesto en el artículo 34 de la Decisión 486/00.

3. Pago de tasas

Teniendo en cuenta que este escrito se presenta junto con modificaciones a las reivindicaciones, se adjunta recibo de pago de la tasa de modificación, según lo establecido en la Resolución 59669 de 2020.

Se señala que no se paga tasa por reivindicaciones adicionales, dado que el nuevo capítulo reivindicatorio comprende el mismo número de reivindicaciones que el anteriormente presentado y estudiado por ese despacho.

Por otra parte, es deseo del solicitante requerir que, si el examinador considera que aún existen motivos que impidan la concesión de la solicitud, proceda a emitir un nuevo examen de patentabilidad, para lo cual se anexa el respectivo pago de la tasa de acuerdo con lo establecido en la Resolución 59669 de 2020.

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4. Claridad y concisión del capítulo reivindicatorio

El solicitante afirma que con la presentación del nuevo pliego de reivindicaciones se superan todas las objeciones planteadas por el examinador en su concepto técnico, por lo que las nuevas reivindicaciones definen de forma clara y concisa la invención.

Específicamente, el Examinador argumenta que las reivindicaciones 1 a 4 y 6 a 20 carecen de claridad y sustento en la descripción ya que no se incluyen todas las características esenciales de la invención, el lenguaje y las mutaciones mencionadas no son claras, y cubren un número innumerable de polipéptidos no explorados por el solicitante. Además, el Examinador considera que las reivindicaciones 1 y 5 se refieren a resultados a alcanzar que no definen el polipéptido y que la reivindicación 12 no es clara porque se refiere a la Figura 11 pero las reivindicaciones deben ser autosuficientes. Por último, el Examinador señala que las reivindicaciones 1 y 20 no especifican a qué corresponden CDV y NIS.

El solicitante no está de acuerdo con la observación del Examinador. En primer lugar, se resalta que la Guía de Examen de la Superintendencia de Industria y Comercio (versión 2023) establece específicamente que:

> *La invención puede estar suficientemente descrita si se aporta: - Un sólo ejemplo o un número razonable de ejemplos, modos de realización alternativos o variaciones que habilitan a la persona del oficio normalmente versada en la materia para que, junto con sus conocimientos generales, pueda poner en práctica la invención en toda el área reivindicada y no sólo algunas especies particulares reivindicadas, sin que requiera de un esfuerzo inventivo. En tal caso, la presentación de ejemplos relativos a todas las especies particulares de la invención o a cada alternativa reivindicada no será condición necesaria para la suficiencia, siempre y cuando dichas especies se mencionen en la descripción (página 124, énfasis añadido)*

Por lo tanto, el Solicitante no está obligado a limitar la materia reivindicada a lo que se ha ejemplificado. En este sentido, se enfatiza que la materia reivindicada corresponde a una generalización razonable de las realizaciones exploradas por la solicitud. Además, se resalta que el lenguaje empleado en las reivindicaciones sería claro para una persona versada en la materia que combinaría las enseñanzas de la descripción y sus conocimientos.

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Por otro lado, se aclara que la reivindicación 1 no se refiere a un resultado a alcanzar sino a las características técnicas de la invención y que la inclusión de resultados en la reivindicación 5 es aceptable. En este sentido, se recuerda al Examinador que, según la Guía de Examen, los resultados a alcanzar pueden incluirse en una reivindicación cuando también se definen las características esenciales de la invención, como ocurre en el presente caso.

Finalmente, se resalta que las reivindicaciones 1 y 20 han sido modificadas para incluir el significado de las siglas VSV, CDV y NIS, y la reivindicación 12 ha sido modificada para sustituir la referencia a la Figura 11 por las SEQ ID NOS 5, 31 a 145, 227 y 228.

En vista de lo anterior, se solicita considerar superadas las objeciones al respecto.

5. Descripción

El Examinador indica que la descripción no revela la materia reivindicada de manera suficiente para que una persona normalmente versada en la materia pueda ejecutarla o reproducirla y por lo tanto no cumpliría con lo dispuesto en el Art. 28 de la Decisión Andina 486.

El solicitante no está de acuerdo con la observación del Examinador ya que la descripción sí proporciona suficiente información para reproducir la invención. En este sentido, se reitera que, de acuerdo con la Guía de Examen, limitar la materia reivindicada a las realizaciones ejemplificadas no es una condición necesaria para reconocer la suficiencia de la descripción.

Teniendo en cuenta lo anterior, se señala que la descripción cumple con los requisitos legales establecidos en la Decisión Andina 486.

6. Figuras

El examinador considera que las figuras 2F y 13B no son claras porque los tratamientos no pueden distinguirse en el gráfico. Por otro lado, el Examinador considera que las Figuras 4B y 25A no son claras porque no hay ninguna leyenda que permita distinguir a qué tratamiento corresponde cada curva.

El solicitante no está de acuerdo con las observaciones del examinador por las siguientes razones:

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- La figura 2F es un gráfico de barras que utiliza colores (blanco, negro y gris) y patrones (líneas en diferentes orientaciones) para diferenciar claramente los tratamientos.
- No hay Figura 13B.
- La Figura 4B proporciona leyendas en la parte superior para PBS, MeV o Stealth 2.0.
- La Figura 25A proporciona leyendas en la parte superior para PBS, Stealth o MeV.

Por lo tanto, las figuras cumplen con los requisitos establecidos en la Decisión Andina 486.

7. Listado de secuencias.

El Examinador considera que el listado de secuencias no es claro porque hace referencia a *"secuencia sintética", "polipéptido sintético" o "morbillivirus canino"* pero en ningún momento menciona qué es cada secuencia, a qué polipéptido corresponde o si se trata de un ácido nucleico que codifica un polipéptido.

En primer lugar, se aclara que las referencias a *"morbillivirus canino"* se incluyen en el identificador <213>, que según la norma ST.25 debe completarse sólo con el nombre científico del organismo.

Dicha norma sólo exige la inclusión de información adicional en casos específicos como que el organismo sea una secuencia artificial. En consecuencia, hemos modificado el identificador <223> para las SEQ ID NOS: 8 a 20 y 22 a 30 para incluir información técnica adicional. Por ejemplo, para las SEQ ID NOS 8 a 20, se especificó que corresponden a péptidos señal de un polipéptido F del virus del moquillo canino.

En vista de lo anterior, se solicita que se consideren superadas las objeciones al respecto.

8. Unidad de la invención

El examinador afirma que la solicitud carece de unidad de invención porque, en su opinión, hace referencia a los siguientes grupos inventivos que no tienen elementos técnicos nuevos e inventivos comunes:

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- Grupo inventivo 1: virus de estomatitis vesicular con capacidad de replicación que comprende una molécula de ARN que codifica un polipéptido VSV N, una secuencia de ácido nucleico q que codifica un polipéptido VSV P, una secuencia de ácido nucleico codifica un polipéptido VSV M, una secuencia de ácido nucleico que codifica un polipéptido CDV F, una secuencia de ácido nucleico que codifica un polipéptido CDV H, y una secuencia de ácido nucleico que codifica un polipéptido VSV L, donde CDV H comprende la mutación Y539A en relación a la SEQ ID NO: 2 (reivindicaciones 1 a 10, 12 a 16 y 18 a 20 parcialmente).

- Grupo inventivo 2: virus de estomatitis vesicular con capacidad de replicación que comprende una molécula de ARN que codifica un polipéptido VSV N, una secuencia de ácido nucleico q que codifica un polipéptido VSV P, una secuencia de ácido nucleico codifica un polipéptido VSV M, una secuencia de ácido nucleico que codifica un polipéptido CDV F, una secuencia de ácido nucleico que codifica un polipéptido CDV H, y una secuencia de ácido nucleico que codifica un polipéptido VSV L, donde CDV H comprende la mutación M437L en relación a la SEQ ID NO: 5 (reivindicaciones 11 y 17 completamente, reivindicaciones 1 a 5 y 18 a 20 parcialmente).

El Solicitante no está de acuerdo con lo anterior. Contrario a lo afirmado por del examinador, el documento D1 no divulga un virus de estomatitis vesicular con capacidad de replicación que incluya una molécula de ARN que comprenda (a) una secuencia de ácido nucleico que sea un molde para un transcrito de sentido positivo que codifique un polipéptido F del CDV y (b) una secuencia de ácido nucleico que sea un molde para un transcrito de sentido positivo que codifique un polipéptido H del CDV.

En este sentido, se resalta que D1 divulga pseudotipos de VSV que tienen proteínas F y H provistas *en trans* (página 815, columna izquierda, único párrafo completo).

De esta manera, D1 no divulga el concepto inventivo común a las reivindicaciones 1 a 20. Considerando que la solicitud cumple con los requisitos establecidos en el artículo 25 de la Decisión 486, las objeciones a este respecto pueden considerarse superadas.

9. Novedad y Nivel inventivo.

El examinador afirma que la reivindicación 1 carecería de novedad a la luz del documento Logan, N., *et al. Vaccine*. (**D1**). Además, el examinador considera que las reivindicaciones 2 a 10, 12 a 16 y 18 a 20 carecerían de nivel inventivo a la luz de los

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documentos **D1**, von Messling, V., & Cattaneo, R. *Journal of virology* (**D2**) y Langedijk, J. P., et al. *Journal of virology* (**D3**).

En este sentido, es pertinente destacar que, para considerar que el objeto de la solicitud carece de novedad, deben tenerse en cuenta, como mínimo, los siguientes aspectos:

- El objeto de la invención objeto de estudio debe estar contenido de manera TOTAL y ABSOLUTA en el documento mencionado como estado de la técnica; y
- La comparación del objeto de la invención en cuestión y el estado de la técnica no debe centrarse o limitarse a los elementos de la invención previamente conocidos, sino a la novedad que la caracteriza. Esto significa que debe analizarse el valor añadido que la invención aporta con sus nuevas características al campo técnico al que pertenece la aplicación objeto de estudio.

Lo anterior significa que para que un documento del estado de la técnica pueda afectar a la novedad de una solicitud, debe revelar todas y cada una de las características técnicas que la definen.

Aplicando lo anterior al caso concreto, por las razones expuestas por esta Oficina para refutar que la novedad sea cierta, sería necesario demostrar que la invención está totalmente incluida en el estado de la técnica, es decir, individualmente en el documento D1, lo que no ocurre en este caso.

Por otro lado, quisiera resaltar lo dispuesto en el artículo 18 de la Decisión 486 de la Comisión de la Comunidad Andina, el cual establece que *"Se considerará que una invención tiene nivel inventivo, si para una persona del oficio normalmente versada en la materia técnica correspondiente, esa invención no hubiese resultado obvia ni se hubiese derivado de manera evidente del estado de la técnica.".*

Esto significa que el análisis del nivel inventivo **NO** es una comparación entre los objetos de la precedencia y la solicitud objeto de estudio. Por el contrario, el análisis del nivel inventivo **debe** demostrar la obviedad de la invención y establecer que no contiene un salto cualitativo que demuestre su altura inventiva, teniendo en cuenta que **es necesario demostrar** que la invención analizada carece de nivel inventivo y hubiera sido obvia para una persona versada en la materia.

Sin embargo, estas condiciones no se cumplen en el caso que nos ocupa, ya que, como se verá más adelante, las características técnicas mencionadas en el capítulo

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reivindicatorio no pueden derivarse de manera obvia o evidente de las enseñanzas del estado de la técnica, y, por tanto, el objeto reivindicado es inventivo a la luz del estado de la técnica anterior.

En primer lugar, se resalta que la reivindicación 1 requiere un virus de la estomatitis vesicular con capacidad de replicación que incluya una molécula de ARN que comprenda (a) una secuencia de ácido nucleico que sea un molde para transcrito de sentido positivo que codifique un polipéptido F del CDV y (b) una secuencia de ácido nucleico que sea un molde para transcrito de sentido positivo que codifique un polipéptido H del CDV.

Ahora bien, el documento D1 revela que los pseudotipos de VSV tienen proteínas F y H provistas *en trans* (página 815, columna izquierda, único párrafo completo). Además, el documento D1 revela específicamente que proporcionar las proteínas F y H en trans es importante, ya que evita que las proteínas F y H estén sujetas a la deriva antigénica (es decir, congelando el virus en el tiempo), *"garantizando así que la respuesta neutralizante [sic] siempre se mida contra viriones con hemaglutininas idénticas, facilitando las comparaciones entre animales, virus y fechas de muestreo".*

Los documentos D2 y D3 citados por el examinador no resuelven las deficiencias de D1. Por lo tanto, la técnica citada no proporciona suficientes enseñanzas o indicaciones para llegar al virus reivindicado.

En vista de lo anterior, las características técnicas del objeto definido en el pliego de reivindicaciones cumplen con el requisito de novedad y actividad inventiva establecido en los Art. 16 y 18 de la Decisión 486.

10. Conclusión

Con las modificaciones introducidas y los argumentos presentados, se puede concluir que:

- El nuevo título de la solicitud es claro y guarda relación con el objeto reivindicado, cumpliendo así con el literal d) del artículo 27 de la Decisión 486 de 2000.;

- El nuevo capítulo reivindicatorio se ajusta a lo dispuesto en el artículo 34 de la Decisión 486/00;

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- La invención de la presente solicitud es clara y está debidamente sustentada en el capítulo reivindicatorio, y se divulga de manera suficientemente completa, cumpliendo así con los requisitos de los artículos 30 y 28 de la Decisión 486.;

- La presente invención se refiere a un solo concepto inventivo, cumpliendo así con los requisitos del artículo 25 de la Decisión 486;

- La invención de esta solicitud no había sido divulgada previamente en el estado de la técnica, cumpliendo así con los requisitos del artículo 16 de la Decisión 486, y

- La invención de la presente solicitud no es obvia ni se desprende del estado de la técnica, por lo que cumple con los requisitos del artículo 18 de la Decisión 486.

Por lo anterior, respetuosamente solicito a esta Oficina conceder el privilegio de patente solicitado a la solicitud bajo estudio, por cuanto cumple a cabalidad con los requisitos exigidos en la Decisión 486 de 2000.

Asimismo, solicito respetuosamente al Despacho que se pronuncie sobre todos los argumentos expuestos en el presente escrito, aplicando estrictamente el principio del debido proceso consagrado en el artículo 29 de la Constitución Política de la República.

11. Anexos

- Capítulo de reivindicaciones modificado compuesto por veinte (20) reivindicaciones.
- Listado de secuencias modificada.
- Recibo de pago por concepto de modificación.
- Recibo de pago por concepto de nuevo examen de patentabilidad.

Director,



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REIVINDICACIONES

1. Un virus de estomatitis vesicular con capacidad de replicación que comprende una molécula de ARN, en el que dicha molécula de ARN comprende una secuencia de ácido nucleico que es un molde para un transcrito de sentido positivo que codifica un polipéptido N del virus de estomatitis vesicular (VSV), una secuencia de ácido nucleico que es un molde para un transcrito de sentido positivo que codifica un polipéptido VSV P, una secuencia de ácido nucleico que es un molde para un transcrito de sentido positivo que codifica un polipéptido VSV M, una secuencia de ácido nucleico que es un molde para un transcrito de sentido positivo que codifica un polipéptido F del virus del moquillo canino (CDV), una secuencia de ácido nucleico que es un molde para un transcrito de sentido positivo que codifica un polipéptido CDV H, y una secuencia de ácido nucleico que es un molde para un transcrito de sentido positivo que codifica un polipéptido VSV L, en el que dicha molécula de ARN carece de una secuencia de ácido nucleico que es un molde para un transcrito de sentido positivo que codifica un polipéptido G de VSV funcional.

2. El virus de la reivindicación 1, en el que dicho polipéptido CDV F es un polipéptido CDV F que tiene una secuencia de péptido señal que tiene menos de 75 residuos de aminoácidos de longitud.

3. El virus de la reivindicación 2, en el que dicha secuencia de péptido señal comprende no más de 75 residuos de aminoácidos de la SEQ ID NO:6.

4. El virus de la reivindicación 1, en el que dicho polipéptido CDV F comprende la SEQ ID NO:4 con la condición de que dicho polipéptido CDV F carezca de al menos los residuos de aminoácidos 1 a 60 o carezca de al menos residuos de aminoácidos 1 a 105 de la SEQ ID NO:4.

5. El virus de cualquiera de las reivindicaciones 1-4, en el que dicho virus muestra una actividad fusogénica aumentada en comparación con un virus recombinante de control comparable que comprende un polipéptido CDV F de tipo salvaje de longitud completa y dicho polipéptido CDV H.

6. El virus de cualquiera de las reivindicaciones 1-5, en el que dicho polipéptido CDV H es un polipéptido CDV H que comprende 454A, 464A, 479A, 494A, 510A, 520A, 525A, 526A, 527S, 528A, 529A, 537A, 539A, 547A, 548A, o una combinación de los mismos según la numeración de aminoácidos de SEQ ID NO:2.

7. El virus de cualquiera de las reivindicaciones 1-5, en el que dicho polipéptido CDV H es un polipéptido CDV H que comprende una combinación de dos, tres, cuatro, cinco o seis de 454A, 464A, 479A, 494A, 510A, 520A, 525A, 526A, 527S, 528A, 529A, 537A, 539A, 547A y 548A.

8. El virus de cualquiera de las reivindicaciones 1-5, en el que dicho polipéptido CDV H es un polipéptido CDV H que comprende una combinación de siete, ocho, nueve, diez u once de 454A, 464A, 479A, 494A, 510A, 520A, 525A, 526A, 527S, 528A, 529A, 537A, 539A, 547A y 548A.

9. El virus de cualquiera de las reivindicaciones 1-5, en el que dicho polipéptido CDV H es un polipéptido CDV H que comprende una combinación de 12, 13 o 14 de 454A, 464A, 479A, 494A, 510A, 520A, 525A, 526A, 527S, 528A, 529A, 537A, 539A, 547A y 548A.

10. El virus de cualquiera de las reivindicaciones 1-5, en el que dicho polipéptido CDV H es un polipéptido CDV H que comprende 454A, 464A, 479A, 494A, 510A, 520A, 525A, 526A, 527S, 528A, 529A, 537A, 539A, 547A y 548A.

11. El virus de cualquiera de las reivindicaciones 1-10, en el que dicho polipéptido CDV H es un polipéptido CDV H que comprende M437 según la numeración de aminoácidos de la SEQ ID NO:5.

12. El virus de cualquiera de las reivindicaciones 1-5, en el que dicho polipéptido CDV H es un polipéptido CDV H que comprende la secuencia expuesta en las SEQ ID NOS 5, 31 a 145, 227 y 228excepto que dicha secuencia comprende una mutación de un residuo de aminoácido presentado seleccionado del grupo que consiste en P454, V/L/F460, L/F/W479, I494, I /L/V510, Y520, Y/N525, D/G526, I/V527, S/T528, R529, Y/D537, Y539, Y/F547 y T/M548 según la numeración de aminoácidos de la SEQ ID NO:5.

13. El virus de la reivindicación 12, en el que dicho polipéptido CDV H comprende una mutación de dos, tres, cuatro, cinco o seis residuos de aminoácidos seleccionados de dicho grupo.

14. El virus de la reivindicación 12, en el que dicho polipéptido CDV H comprende una mutación de siete, ocho, nueve, diez u once residuos de aminoácidos seleccionados de dicho grupo.

15. El virus de la reivindicación 12, en el que dicho polipéptido CDV H comprende una mutación de 12, 13 o 14 residuos de aminoácidos presentados seleccionados de dicho grupo.

16. El virus de la reivindicación 12, en el que dicho polipéptido CDV H comprende una mutación de los residuos de aminoácidos presentados de dicho grupo.

17. El virus de la reivindicación 12, en el que dicho polipéptido CDV H comprende M437 según la numeración de aminoácidos de la SEQ ID NO:5.

18. El virus de cualquiera de las reivindicaciones 1-17, en el que dicho polipéptido CDV H comprende una secuencia de aminoácidos de un anticuerpo monocatenario.

19. El virus de la reivindicación 18, en el que dicho anticuerpo monocatenario es un anticuerpo monocatenario dirigido contra CD19, CD20, CD38, CD46, EGFR, αFR, HER2/neu o PSMA.

20. El virus de cualquiera de las reivindicaciones 1-19, en el que dicha molécula de ARN comprende una secuencia de ácido nucleico que es un molde para un transcrito de sentido positivo que codifica un polipéptido simportador de yoduro de sodio (NIS).

LISTA DE SECUENCIAS

<110> MAYO FOUNDATION FOR MEDICAL EDUCATION AND RESEARCH

<120> VIRUS DEL MOQUILLO CANINO HEMAGLUTININA Y POLIPÉPTIDOS DE FUSIÓN

<130> 07039-1936WO1

<140> PCT/US2020/055100
<141> 2020-10-09

<150> 62/913,111
<151> 2019-10-09

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<170> PatentIn version 3.5

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Lys Ser Ile Ala Leu Ala Ala Asn Pro Ile Leu Phe Ser Ala Leu Ser
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Phe Ile Lys Asp Ser Val Ala Thr Trp Met Val Pro Ala Leu Val Ser
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Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
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Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu His Leu Asp Ala Ser
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Thr Asp Arg Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
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Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
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Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
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Arg Asn Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
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    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
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Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
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Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
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225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
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Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
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Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
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Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Thr Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Arg Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Phe Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
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Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
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Asn Ile Ile Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
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530 535 540

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Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
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Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
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Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Val Lys Val Asn Phe Thr Asn Tyr Cys Glu Ser Ile Gly Ile Arg
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Lys Ala Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
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Gly Gly Arg Ser Asp Ile Phe Pro Pro His Arg Cys Ser Gly Ala Thr
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Thr Ser Val Gly Lys Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
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Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Asp Ile Glu
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Arg Glu Phe Asp Thr Gln Glu Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
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Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
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Gly Ile Phe Trp Ala Thr Pro Met Asp His Ile Glu Glu Val Ile Pro
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Val Ala His Pro Ser Met Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Ala Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Gly Cys Leu Glu Ser Ala Cys Gln Arg
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Lys Thr Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
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Val Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
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Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asn Ser Gly
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Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Val Gly Leu Ile Asn
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Lys Ala Gly Arg Gly Asp Gln Phe Thr Val Leu Pro His Val Leu Thr
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Gly Pro Arg Thr Leu Asp Arg Leu Val Cys Tyr Ile Met Asn Arg Ala
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Met Ser Cys Lys Gln Ala Ser Tyr Arg Ser Asp Asn Ile Pro Ala His
65 70 75 80

Gly Asp His Glu Gly Val Val His His Thr Pro Glu Ser Val Ser Gln
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Gly Ala Arg Ser Gln Leu Lys Arg Arg Thr Ser Asn Ala Ile Asn Ser
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Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145 150 155 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
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Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
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Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Leu Gly Ser Gly Arg Arg Gln Arg Arg
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Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285

Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Arg Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Gly Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Phe Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
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<210> 9
<211> 31
<212> PRT
<213> Secuencia artificial

<220>
<223> Descripción de la secuencia artificial: Péptido señal de un polipéptido F del virus del moquillo canino

<400> 9
Met Thr Ser Asn Ala Ile Asn Ser Gly Phe Gln Tyr Ile Trp Leu Val
1 5 10 15

Leu Trp Cys Ile Gly Ile Ala Ser Leu Phe Leu Cys Ser Lys Ala
20 25 30

<210> 10
<211> 26

<212> PRT
<213> Secuencia artificial

<220>
<223> Descripción de la secuencia artificial: Péptido señal
de un polipéptido F del virus del moquillo canino

<400> 10
Met Ser Ile Met Gly Leu Lys Val Asn Val Ser Ala Ile Phe Met Ala
1 5 10 15

Val Leu Leu Thr Leu Gln Thr Pro Thr Gly
20 25

<210> 11
<211> 28
<212> PRT
<213> Secuencia artificial

<220>
<223> Descripción de la secuencia artificial: Péptido señal
de un polipéptido F del virus del moquillo canino

<400> 11
Met Ala Ile Asn Ser Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys
1 5 10 15

Leu Gly Ile Ala Ser Leu Phe Leu Cys Ser Lys Ala
20 25

<210> 12
<211> 28
<212> PRT
<213> Secuencia artificial

<220>
<223> Descripción de la secuencia artificial: Péptido señal
de un polipéptido F del virus del moquillo canino

<400> 12
Met Ala Ile Asn Ser Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys
1 5 10 15

Leu Gly Met Ala Ser Leu Phe Leu Cys Ser Lys Ala
20 25

<210> 13
<211> 28
<212> PRT
<213> Secuencia artificial

<220>

<223> Descripción de la secuencia artificial: Péptido señal
de un polipéptido F del virus del moquillo canino

<400> 13
Met Ala Ile Asn Ser Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys
1 5 10 15

Phe Gly Thr Ala Ser Leu Phe Leu Cys Ser Lys Ala
20 25

<210> 14
<211> 28
<212> PRT
<213> Secuencia artificial

<220>
<223> Descripción de la secuencia artificial: Péptido señal
de un polipéptido F del virus del moquillo canino

<400> 14
Met Ala Thr Ser Pro Gly Pro Gln Cys Thr Trp Leu Val Leu Trp Cys
1 5 10 15

Ile Gly Ile Ala Ser Leu Phe Leu Cys Ser Glu Ala
20 25

<210> 15
<211> 28
<212> PRT
<213> Secuencia artificial

<220>
<223> Descripción de la secuencia artificial: Péptido señal
de un polipéptido F del virus del moquillo canino

<400> 15
Met Ala Val Lys Ser Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys
1 5 10 15

Ile Gly Val Ala Ser Leu Phe Leu Cys Ser Lys Ala
20 25

<210> 16
<211> 28
<212> PRT
<213> Secuencia artificial

<220>
<223> Descripción de la secuencia artificial: Péptido señal
de un polipéptido F del virus del moquillo canino

<400> 16

Met Ala Ser Asn Pro Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys
1 5 10 15

Ile Gly Ile Ala Ser Leu Phe Leu Cys Ser Lys Ala
20 25

<210> 17
<211> 28
<212> PRT
<213> Secuencia artificial

<220>
<223> Descripción de la secuencia artificial: Péptido señal de un polipéptido F del virus del moquillo canino

<400> 17
Met Ala Thr Asn Ala Gly Ser Gln Tyr Thr Trp Leu Val Leu Trp Cys
1 5 10 15

Ile Gly Ile Ala Ser Leu Phe Leu Cys Ser Lys Ala
20 25

<210> 18
<211> 28
<212> PRT
<213> Secuencia artificial

<220>
<223> Descripción de la secuencia artificial: Péptido señal de un polipéptido F del virus del moquillo canino

<400> 18
Met Ala Thr Ser Ser Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys
1 5 10 15

Ile Gly Val Ala Ser Leu Phe Leu Cys Ser Lys Ala
20 25

<210> 19
<211> 28
<212> PRT
<213> Secuencia artificial

<220>
<223> Descripción de la secuencia artificial: Péptido señal de un polipéptido F del virus del moquillo canino

<400> 19
Met Ala Ile Asn Ser Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys
1 5 10 15

Ile Gly Val Ala Ser Leu Phe Leu Cys Ser Lys Ala
20 25

<210> 20
<211> 28
<212> PRT
<213> Secuencia artificial

<220>
<223> Descripción de la secuencia artificial: Péptido señal de un polipéptido F del virus del moquillo canino

<400> 20
Met Ala Ile Asn Ser Gly Phe Gln Tyr Ile Trp Leu Val Leu Trp Cys
1 5 10 15

Ile Gly Ile Ala Ser Leu Phe Leu Cys Ser Lys Ala
20 25

<210> 21
<211> 6
<212> PRT
<213> Secuencia artificial

<220>
<223> Descripción de la secuencia artificial: Etiqueta 6xHis sintética

<400> 21
His His His His His His
1 5

<210> 22
<211> 25
<212> ADN
<213> Secuencia artificial

<220>
<223> Descripción de la secuencia artificial: Iniciador sintético para la amplificación por PCR del gen CDV-H

<400> 22
agaaaactta gggctcaggt agtcc
25

<210> 23
<211> 23
<212> ADN
<213> Artificial Sequence

<220>
<223> Descripción de la secuencia artificial: Iniciador sintético para la amplificación por PCR del gen CDV-H

<400> 23
tcgtctgtaa gggatttctc acc
23

<210> 24
<211> 21
<212> ADN
<213> Secuencia artificial

<220>
<223> Descripción de la secuencia artificial: Iniciador
sintético para la amplificación por PCR del gen CDV-F

<400> 24
aggacatagc aagccaacag g
21

<210> 25
<211> 25
<212> ADN
<213> Secuencia artificial

<220>
<223> Descripción de la secuencia artificial: Iniciador
sintético para la amplificación por PCR del gen CDV-H

<400> 25
ggactacctg agccctaagt tttct
25

<210> 26
<211> 64
<212> ADN
<213> Secuencia artificial

<220>
<223> Descripción de la secuencia artificial: Iniciador
sintético para la amplificación por PCR del marco
de lectura abierto de CDV H

<400> 26
ccggtagtta attaaaactt agggtgcaag atcatcgata atgctctcct accaagataa
60

ggtg
64

<210> 27
<211> 90
<212> ADN
<213> Secuencia artificial

<220>

<223> Descripción de la secuencia artificial: Iniciador sintético para la amplificación por PCR del marco de lectura abierto de CDV H

<400> 27
ctatttcaca ctagtgggta tgcctgatgt ctgggtgaca tcatgtgatt ggttcactag
60

cagcctcaag gttttgaacg gttacaggag
90

<210> 28
<211> 7
<212> PRT
<213> Secuencia artificial

<220>
<223> Descripción de la secuencia artificial: Etiqueta FLAG sintética

<400> 28
Asp Tyr Lys Asp Asp Asp Asp
1 5

<210> 29
<211> 9
<212> PRT
<213> Secuencia artificial

<220>
<223> Descripción de la secuencia artificial: Enlazador peptídico sintético

<400> 29
Gly Ser Ser Gly Gly Ser Ser Ser Gly
1 5

<210> 30
<211> 7
<212> PRT
<213> Secuencia artificial

<220>
<223> Descripción de la secuencia artificial: Enlazador peptídico sintético

<400> 30
Ser Ser Gly Gly Gly Gly Ser
1 5

<210> 31
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 31

```
Met Leu Ser Tyr Gln Asp Lys Ala Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                  10                  15

Arg Ala Asn Ser Thr Lys Leu Ser Leu Val Thr Glu Glu His Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Val Leu Leu Val Gly
        35                  40                  45

Ile Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Ser Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Val Lys Val Asn Phe Thr Asn Tyr Cys Glu Ser Ile Gly Ile Arg
145                 150                 155                 160

Lys Ala Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Pro
                165                 170                 175

Gly Gly Arg Ser Asp Ile Phe Pro Pro His Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Lys Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220
```

```
Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Ala Pro Asp Asp Ile Glu
225                 230                 235                 240

Arg Glu Phe Asp Thr Gln Glu Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Ser Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Glu Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Ser Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Thr Thr Pro Met Asp His Ile Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Met Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Ala Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Gly Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Pro Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Arg Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Ala Ser
                405                 410                 415

Val Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asn Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
    450                 455                 460
```

```
Lys Ala Gly Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Met Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Ile Asp Arg Asp Val Leu Ile Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Ser Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Ser Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr His Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asn Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asn Ile Ala Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Asn Pro
        595                 600                 605
```

<210> 32
<211> 607
<212> PRT
<213> Morbillivirus canino

```
<400> 32
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Pro Ser Lys Leu Ser Leu Val Thr Glu Glu His Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Leu Ala Leu Leu Ser Ile Thr Gly Val Arg Phe His Lys Val Ser
    50                  55                  60
```

```
Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Val Lys Val Asn Phe Thr Asn Tyr Cys Glu Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Ser Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Lys Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Val Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Asp Ile Glu
225                 230                 235                 240

Arg Glu Phe Asp Thr Gln Glu Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285
```

```
Glu Leu Thr Leu Ala Ser Leu Cys Val Glu Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Arg Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Ser Met Asp His Ile Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Met Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Ala Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Gly Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Thr Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Ala Ser
                405                 410                 415

Val Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Val Tyr Tyr Glu Ser Pro Leu Leu Asn Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Gly Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Ile Asp Arg Asp Val Leu Ile Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Ser Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525
```

```
Arg Asn Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Phe Arg Thr
    530                 535                 540

Ile Phe Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asn Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Tyr Glu Ala Asn Ile Ala Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Asn Pro
        595                 600                 605
```

<210> 33
<211> 604
<212> PRT
<213> Morbillivirus canino

<400> 33

```
Met Leu Pro Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Thr Lys Leu Ser Leu Val Thr Glu Gly His Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Ile Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125
```

```
Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Val Lys Val Asn Phe Thr Asn Tyr Cys Glu Ser Ile Gly Ile Arg
145                 150                 155                 160

Lys Ala Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Ser Asp Ile Phe Pro Pro His Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Lys Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Val Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Asp Ile Glu
225                 230                 235                 240

Arg Glu Phe Asp Thr Gln Glu Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Glu Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Ser Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Trp Ala Thr Pro Met Asp His Ile Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Met Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350
```

```
Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Ala Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Gly Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Thr Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Arg Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Ala Ser
                405                 410                 415

Val Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asn Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Phe Gly Leu Ile Asn
    450                 455                 460

Lys Ala Gly Arg Gly Asp Gln Phe Thr Val Leu Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Ile Asp Arg Asp Val Leu Ile Glu Ser Asn Ile Val Val
            500                 505                 510

Leu Pro Thr Gln Ser Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Ser Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr His Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asn Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Ile Ala Asn Ser Thr Thr Ser Val
            580                 585                 590
```

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg
595 600

<210> 34
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 34
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

Arg Ala Asn Pro Ser Lys Leu Ser Leu Val Thr Glu Glu His Gly Gly
20 25 30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
35 40 45

Ile Leu Ala Leu Leu Ser Ile Thr Gly Val Arg Phe His Lys Val Ser
50 55 60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65 70 75 80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
85 90 95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
100 105 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
115 120 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
130 135 140

Lys Val Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145 150 155 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
165 170 175

Gly Ser Arg Ser Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
180 185 190

```
Thr Ser Val Gly Lys Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Val Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Asp Ile Glu
225                 230                 235                 240

Arg Glu Phe Asp Thr Gln Glu Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Arg Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp His Ile Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Met Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Ala Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Gly Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Thr Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Ala Ser
                405                 410                 415
```

Val Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
420 425 430

Asn Gly Asp Gly Met Val Tyr Tyr Glu Ser Pro Leu Leu Asn Ser Gly
435 440 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
450 455 460

Lys Ala Gly Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465 470 475 480

Phe Ala Pro Arg Glu Ser Gly Gly Asn Cys Tyr Leu Pro Ile Gln Thr
485 490 495

Ser Gln Ile Ile Asp Arg Asp Val Leu Ile Glu Ser Asn Leu Val Val
500 505 510

Leu Pro Thr Gln Ser Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
515 520 525

Arg Asn Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Phe Arg Thr
530 535 540

Ile Phe Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545 550 555 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asn Leu Trp Cys His
565 570 575

Gln Phe Tyr Arg Tyr Glu Ala Asn Ile Ala Asn Ser Thr Thr Ser Val
580 585 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Asn Pro
595 600 605

<210> 35
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 35
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

```
Arg Ala Asn Ser Ser Lys Leu Ser Pro Val Thr Glu Glu His Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Val Lys Val Asn Phe Thr Asn Tyr Cys Glu Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Ser Asp Ile Phe Pro Pro Tyr Arg Cys Arg Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Lys Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Thr Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Asp Ile Glu
225                 230                 235                 240

Arg Glu Phe Asp Thr Gln Glu Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255
```

```
Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Glu Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Arg Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp His Ile Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Met Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Ala Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Gly Arg Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Thr Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Ala Ser
                405                 410                 415

Val Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asn Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro Gln Val Leu Thr
465                 470                 475                 480
```

Phe Ala Pro Arg Glu Ser Cys Gly Asn Cys Tyr Leu Pro Ile Gln Thr
485 490 495

Ser Gln Ile Ile Asp Arg Asp Val Leu Ile Glu Ser Asn Val Val Val
500 505 510

Leu Pro Thr Gln Ser Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
515 520 525

Arg Asn Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
530 535 540

Ile Ser Tyr Thr His Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545 550 555 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asn Leu Trp Cys His
565 570 575

Gln Phe Tyr Arg Tyr Glu Ala Asn Ile Ala Asn Ser Thr Thr Ser Val
580 585 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Asn Pro
595 600 605

<210> 36
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 36
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

Arg Ala Asn Pro Ser Lys Leu Ser Leu Val Thr Glu Glu His Gly Gly
20 25 30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
35 40 45

Ile Leu Ala Leu Leu Ser Ile Thr Gly Val Arg Phe His Lys Val Ser
50 55 60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65 70 75 80

```
Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Val Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Ser Arg Ser Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Lys Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Val Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Asp Ile Glu
225                 230                 235                 240

Arg Glu Phe Asp Thr Gln Glu Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Arg Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320
```

```
Gly Ile Phe Gly Ala Thr Pro Met Asp His Ile Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Met Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Ala Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Gly Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Thr Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Ala Ser
                405                 410                 415

Val Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Val Tyr Tyr Glu Ser Pro Leu Leu Asn Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Gly Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Gly Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Ile Asp Arg Asp Val Leu Ile Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Ser Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Asn Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Phe Arg Thr
    530                 535                 540
```

Ile Phe Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545 550 555 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asn Leu Trp Cys His
565 570 575

Gln Phe Tyr Arg Tyr Glu Ala Asn Ile Ala Asn Ser Thr Thr Ser Val
580 585 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Asn Pro
595 600 605

<210> 37
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 37
Met Leu Ser Tyr Gln Asp Lys Val Ser Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
20 25 30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
35 40 45

Ile Met Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
50 55 60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65 70 75 80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
85 90 95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
100 105 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
115 120 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
130 135 140

```
Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val His Asp Tyr Ile Glu
225                 230                 235                 240

Gly Gly Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asp Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380
```

```
Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Ala Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Ser Thr Val Ile Pro His Val Phe Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Gly Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Ala
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Ser Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 38
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 38
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Asp Gln Gly Gly
20 25 30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
35 40 45

Ile Met Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
50 55 60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65 70 75 80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
85 90 95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
100 105 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
115 120 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
130 135 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145 150 155 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
165 170 175

Gly Gly Arg Ser Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
180 185 190

Thr Ser Val Gly Arg Val Phe Ser Leu Ser Val Ser Leu Ser Met Ser
195 200 205

```
Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Gly Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Trp Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445
```

```
Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Ile Ile Pro His Val Trp Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Ile Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Gly Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Met Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Thr Asp Ser Thr Asn Ser Thr Thr Ser Ile
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 39
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 39

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Ser Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45
```

```
Ile Met Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Tyr Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Ser Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Ile Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Met Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asn Gly Met Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270
```

```
Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Ala Pro Ser
                405                 410                 415

Ile Asp Leu Arg Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Glu Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510
```

Leu Pro Thr Gln Asn Phe Arg Tyr Val Thr Ala Thr Tyr Asp Ile Ser
515 520 525

Arg Gly Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
530 535 540

Ile Ser Tyr Thr His Pro Phe Arg Leu Thr Thr Gln Gly Arg Pro Asp
545 550 555 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
565 570 575

Gln Phe Tyr Arg Phe Glu Thr Asp Ser Thr Asn Ser Thr Thr Ser Val
580 585 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Ser Arg Ser Lys Pro
595 600 605

<210> 40
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 40
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
20 25 30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
35 40 45

Ile Met Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
50 55 60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65 70 75 80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
85 90 95

Lys Ile Ile Gly Asp Glu Val Gly Leu Arg Leu Pro Gln Lys Leu Asn
100 105 110

```
Glu Ile Lys Gln Phe Ile Leu Gln Lys Pro Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Ser Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Val Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Ile Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335
```

```
Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Ser Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asn Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Gly Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Gly Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr His Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575
```

Gln Phe Tyr Arg Phe Glu Ala Asp Ser Thr Asn Ser Thr Thr Ser Val
580 585 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys His Arg Ser Lys Pro
595 600 605

<210> 41
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 41
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
20 25 30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
35 40 45

Ile Met Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
50 55 60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65 70 75 80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
85 90 95

Lys Ile Ile Gly Asp Glu Val Gly Leu Arg Leu Pro Gln Lys Leu Asn
100 105 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
115 120 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
130 135 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145 150 155 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala His Thr
165 170 175

```
Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Ile Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Ser Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400
```

```
Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asn Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Gly Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Gly Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Gly Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr His Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Thr Asp Ser Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Ser Arg Ser Lys Pro
        595                 600                 605
```

<210> 42
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 42

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                  10                  15

Arg Ala Asn Ser Ser Arg Leu Ser Leu Val Thr Glu Asp Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Met Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Arg Ser Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Ser Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Leu Glu
225                 230                 235                 240
```

```
Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asn Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Gly Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Pro His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460
```

```
Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Ile Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Gly Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr His Ala Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Ser Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605


<210> 43
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 43
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Arg
        35                  40                  45

Ile Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60
```

```
Thr Ser Asn Val Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Arg Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Val Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Ala
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Lys Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asn Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Leu Asp Tyr Ile Glu
225                 230                 235                 240

Glu Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Val Cys Val Gly Glu Ser Thr Val Leu Leu
    290                 295                 300
```

```
Tyr His Asp Ser Asn Gly Ser Gln Asp Ser Ile Leu Ala Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Ser Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Thr Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Arg
                405                 410                 415

Thr Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Ser Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Ile Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Thr
        515                 520                 525
```

```
Arg Asp Asn His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Ile Thr Asn Ser Thr Ile Ser Val
            580                 585                 590

Glu Thr Leu Asp Pro Ile Arg Ser Ser Cys Lys Arg Ser Gly Pro
        595                 600                 605
```

<210> 44
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 44

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Val Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125
```

```
Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Ala
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Lys Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asn Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Glu Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Val Cys Val Gly Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Ser Ile Leu Ala Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Ser Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365
```

```
Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Thr Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Ser Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Ile Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Asp Asn His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590
```

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Ser Arg Ser Arg Pro
595 600 605

<210> 45
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 45
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
20 25 30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
35 40 45

Ile Leu Ala Leu Leu Thr Ile Thr Gly Val Arg Phe His Gln Val Ser
50 55 60

Thr Ser Asn Val Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65 70 75 80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
85 90 95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
100 105 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
115 120 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
130 135 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145 150 155 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
165 170 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Ala
180 185 190

```
Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Thr Ser Arg Lys Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asn Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Glu Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Gly Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Ser Ile Leu Ala Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Ser Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Arg Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Thr Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430
```

```
Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Ser Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Ile Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Asp Asn His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr His Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Ile Thr Asn Ala Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Arg Pro
        595                 600                 605
```

<210> 46
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 46

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Lys Leu Tyr Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30
```

```
Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Leu Ala Leu Leu Thr Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Val Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Ala
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Thr Ser Arg Lys Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asn Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Glu Lys Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255
```

```
Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Gly Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Ser Ile Leu Ala Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Ser Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Met Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Thr Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Ser Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Ile Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495
```

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
500 505 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
515 520 525

Arg Asp Asn His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
530 535 540

Ile Ser Tyr Met Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545 550 555 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
565 570 575

Gln Phe Tyr Arg Phe Glu Ala Asp Ile Thr Asn Ala Thr Thr Ser Val
580 585 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Arg Pro
595 600 605

<210> 47
<211> 601
<212> PRT
<213> Morbillivirus canino

<400> 47
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
20 25 30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
35 40 45

Ile Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
50 55 60

Thr Ser Asn Val Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65 70 75 80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
85 90 95

```
Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Ala
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Lys Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asn Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Glu Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Gly Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Ser Ile Leu Ala Val Thr Leu
305                 310                 315                 320
```

```
Gly Ile Phe Gly Ala Thr Ser Ile Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Thr Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Ser Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Ile Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Asp Asn His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560
```

```
Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser
        595                 600
```

<210> 48
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 48

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Leu Ala Leu Leu Thr Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Val Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160
```

```
Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Ala
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Thr Ser Arg Lys Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asn Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Glu Lys Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Gly Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Ser Ile Leu Ala Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Ser Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380
```

```
Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Thr Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Ser Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Ile Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Asp Asn His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Met Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Ile Thr Asn Ala Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Arg Pro
        595                 600                 605
```

<210> 49
<211> 607

<212> PRT
<213> Morbillivirus canino

<400> 49

```
Met Leu Ser Tyr Arg Asp Lys Val Asp Ala Phe Tyr Lys Asp Asn Ala
1               5                  10                  15

Arg Ala Asn Leu Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Met Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Leu Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Asn Gly Ala Thr
            180                 185                 190

Ile Ser Val Gly Lys Ile Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220
```

```
Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Met Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Val Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Ser Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala Asp Pro Leu Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Ile Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Ile Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445
```

```
Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Ser Thr Gln Asn Phe Arg Tyr Val Val Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Asp Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Met Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 50
<211> 80
<212> PRT
<213> Morbillivirus canino

<400> 50

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Arg Leu Ser Leu Val Thr Glu Asp Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45
```

Ile Met Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
50 55 60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65 70 75 80

<210> 51
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 51
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

Arg Ala Asn Ser Ser Arg Leu Ser Leu Val Thr Glu Asp Gln Gly Gly
20 25 30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
35 40 45

Ile Met Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
50 55 60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65 70 75 80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
85 90 95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
100 105 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
115 120 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
130 135 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145 150 155 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
165 170 175

```
Arg Ser Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Ser Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Leu Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asn Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Gly Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Pro His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415
```

```
Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Ile Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Gly Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr His Ala Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Ser Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 52
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 52

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15
```

```
Arg Ala Asn Ser Ser Arg Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Lys Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Met Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Lys
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Val Phe Pro Ser Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Leu Glu
225                 230                 235                 240
```

```
Gly Glu Phe Asp Met Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asn Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asp Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Ser Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Ala Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Arg Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asn Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480
```

```
Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Met Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Gly Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Thr Asp Ser Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 53
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 53

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Arg Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Met Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80
```

```
Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Lys
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Val Phe Pro Ser Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Leu Glu
225                 230                 235                 240

Gly Glu Phe Asp Met Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asn Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asp Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300
```

```
Tyr His Asp Ser Asn Gly Ser Gln Asp Ser Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Ala Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Arg Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asn Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Met Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Gly Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540
```

```
Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560


Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575


Gln Phe Tyr Arg Phe Glu Thr Asp Ser Thr Asn Ser Thr Thr Ser Val
            580                 585                 590


Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 54
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 54

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15


Arg Ala Asn Ser Ser Arg Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30


Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45


Ile Met Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60


Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80


Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95


Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110


Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125


Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140
```

```
Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Lys
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Val Phe Pro Ser Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Leu Glu
225                 230                 235                 240

Gly Glu Phe Asp Met Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asn Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asp Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Ser Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Ala Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365
```

```
Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Arg Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asn Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Arg Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Met Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Gly Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Thr Asp Ser Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 55
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 55
Met Leu Ser Tyr Gln Asp Lys Val Ser Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
20 25 30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
35 40 45

Ile Met Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
50 55 60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65 70 75 80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
85 90 95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
100 105 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
115 120 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
130 135 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145 150 155 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
165 170 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
180 185 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
195 200 205

```
Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Gly Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asp Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430
```

```
Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Gly Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Ala
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Ser Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 56
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 56

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Asp Gln Gly Gly
            20                  25                  30
```

```
Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Met Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Ser Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Ser Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270
```

```
Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Gly Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Trp Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Ile Ile Pro His Val Trp Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495
```

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
500 505 510

Leu Pro Thr Gln Asn Phe Ile Tyr Val Ile Ala Thr Tyr Asp Ile Ser
515 520 525

Arg Gly Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
530 535 540

Ile Ser Tyr Met Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545 550 555 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
565 570 575

Gln Phe Tyr Arg Phe Glu Thr Asp Ser Thr Asn Ser Thr Thr Ser Ile
580 585 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
595 600 605

<210> 57
<211> 607
<212> PRT
<213> Morbillivirus canino

<220>
<221> MOD_RES
<222> (295)..(295)
<223> cualquier amino ácido

<400> 57
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

Arg Ala Asn Leu Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
20 25 30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
35 40 45

Val Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
50 55 60

Ile Asn Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65 70 75 80

```
Ser Asp Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Ser Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Leu Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Ile Gly Lys Ser Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ser Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Phe Gln Thr Thr Asn Tyr Met
            260                 265                 270

Thr Leu Pro Glu Asn Ser Lys Thr Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Xaa Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300
```

```
Tyr His Asp Ser Asn Asp Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Val Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Asn Leu Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu His Leu Asp Ala Ser
                405                 410                 415

Thr Asp Arg Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asn Gly Met Asp Tyr Tyr Glu Ser Pro Leu Met Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Ser
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Asn Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540
```

```
Ile Ser Tyr Thr His Pro Phe Arg Leu Thr Thr Lys Gly Arg Ser Asp
545                 550                 555                 560


Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575


Gln Phe Tyr Arg Phe Glu Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590


Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605


<210> 58
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 58
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15


Arg Ala Asn Leu Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30


Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45


Ile Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60


Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80


Ser Asp Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95


Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110


Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125


Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140
```

```
Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Leu Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Ser Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Lys Ser Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ala Glu Ile Ile Asn Met Leu Thr Ser Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Phe Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Ala Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Gly Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Val Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365
```

```
Glu Asn Leu Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Ala Ser
                405                 410                 415

Ile Asp Arg Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Ser
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Asn Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 59
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 59
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

Arg Ala Asn Leu Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
20 25 30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
35 40 45

Ile Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
50 55 60

Ile Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65 70 75 80

Ser Asp Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
85 90 95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
100 105 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
115 120 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
130 135 140

Lys Ile Lys Val Asn Phe Thr Ser Tyr Cys Asp Thr Ile Gly Ile Arg
145 150 155 160

Lys Ser Ile Ala Leu Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
165 170 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
180 185 190

Thr Ser Ile Gly Lys Ser Phe Pro Leu Ser Val Ser Leu Ser Met Ser
195 200 205

```
Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ser Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Phe Gln Thr Thr Asn Tyr Met
            260                 265                 270

Ile Leu Pro Glu Asn Ser Lys Thr Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Asp Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Val Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Asn Leu Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu His Leu Asp Ala Ser
                405                 410                 415

Thr Asp Arg Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430
```

```
Asn Gly Asn Gly Met Asp Tyr Tyr Glu Ser Pro Leu Met Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Ser
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Asn Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Ser Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 60
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 60

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Leu Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30
```

```
Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Ile Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Asp Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Ser Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Lys Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Val Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Leu Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Ser Asp Ile Phe Pro Pro His Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Lys Ser Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ser Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Phe Gln Thr Thr Asn Tyr Met
            260                 265                 270
```

```
Ile Leu Pro Glu Asn Ser Lys Thr Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Ile Leu Ala Ser Leu Cys Val Glu Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Gly Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Lys Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Val Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Asn Leu Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Ala Ser
                405                 410                 415

Ile Asp Arg Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Ser
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495
```

```
Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Gly Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 61
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 61

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Leu Ser Lys Leu Ser Leu Val Thr Glu Gly Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Ile Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Asp Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95
```

```
Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Ser Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Leu Ala Ala Asn Pro Val Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Lys Ser Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ser Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Phe Gln Thr Thr Asn Tyr Met
            260                 265                 270

Ile Leu Pro Glu Asn Ser Lys Thr Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335
```

```
Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Val Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Asn Leu Glu Glu Gln Glu Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu His Leu Asp Ala Ser
                405                 410                 415

Ile Asp Arg Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Ser
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Asn Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560
```

```
Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Ile Asn Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 62
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 62

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Leu Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Ile Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Asp Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Ser Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160
```

```
Lys Ser Ile Ala Leu Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Lys Ser Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ser Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Phe Gln Thr Thr Asn Tyr Met
            260                 265                 270

Ile Leu Pro Glu Asn Ser Lys Thr Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Val Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Asn Leu Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Glu Gly
385                 390                 395                 400
```

```
Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu His Leu Asp Ala Ser
                405                 410                 415

Ile Asp Arg Gln Ile Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Ser
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Arg Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Asn Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 63
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 63

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                  10                  15

Arg Ala Asn Leu Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Asp Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Glu Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Leu Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Val Thr
            180                 185                 190

Thr Ser Val Gly Glu Ser Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ser Ile Ser
    210                 215                 220
```

```
Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Phe Gln Thr Thr Asn Tyr Met
            260                 265                 270

Ile Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Val Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Asn Leu Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Val Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
    450                 455                 460
```

```
Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Asn Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Gly Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Lys Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 64
<211> 607
<212> PRT
<213> Morbillivirus canino

```
<400> 64
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Leu Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60
```

```
Ile Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Asp Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Ser Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Leu Ala Ala Asn Pro Ile Leu Phe Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Lys Ser Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ser Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Phe Gln Thr Thr Asn Tyr Met
            260                 265                 270

Ile Leu Pro Glu Asn Ser Lys Thr Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285
```

```
Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Asp Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Val Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Asn Leu Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu His Leu Asp Ala Ser
                405                 410                 415

Thr Asp Arg Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asn Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Ser
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525
```

```
Arg Asn Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Ser Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 65
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 65

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Met Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125
```

```
Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Leu Thr Asn Tyr Cys Asp Thr Ile Gly Leu Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Arg Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Phe Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350
```

```
Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Phe Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Asp Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Phe Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Ile Thr Asn Phe Thr Thr Ser Val
            580                 585                 590
```

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
595 600 605

<210> 66
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 66
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
20 25 30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
35 40 45

Ile Met Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
50 55 60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65 70 75 80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
85 90 95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
100 105 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
115 120 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
130 135 140

Lys Ile Lys Val Asn Leu Thr Asn Tyr Cys Asp Thr Ile Gly Leu Arg
145 150 155 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
165 170 175

Arg Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
180 185 190

```
Thr Ser Val Gly Arg Phe Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415
```

```
Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Phe Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Lys Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Asp Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Lys
    530                 535                 540

Ile Ser Phe Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Ile Thr Asp Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 67
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 67

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15
```

```
Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Met Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Leu Thr Asn Tyr Cys Asp Thr Ile Gly Leu Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Arg Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Phe Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255
```

```
Lys Arg Trp Leu Asn Asp Met Pro Leu Phe Gln Thr Thr Asn Tyr Met
            260                 265                 270

Leu Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Val Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Asn Leu Glu Glu Gln Glu Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu His Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480
```

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
485 490 495

Phe Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
500 505 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
515 520 525

Arg Asp Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Lys
530 535 540

Ile Ser Phe Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545 550 555 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
565 570 575

Gln Phe Tyr Arg Phe Glu Ala Asp Ile Thr Asn Phe Pro Thr Ser Val
580 585 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
595 600 605

<210> 68
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 68
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
20 25 30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
35 40 45

Ile Met Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
50 55 60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65 70 75 80

```
Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Leu Thr Asn Tyr Cys Asp Thr Ile Gly Leu Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Arg Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Phe Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320
```

```
Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Phe Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Asp Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Lys
    530                 535                 540
```

```
Ile Ser Phe Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Ile Thr Asn Phe Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 69
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 69

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Ser Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Met Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140
```

```
Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Ser Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Ala
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Pro Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Gly Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Val Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380
```

```
Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Gly
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Arg Phe Thr Val Thr Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Arg Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Asn Asp Ile Ser
        515                 520                 525

Arg Asp Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 70
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 70
Met Leu Ser Tyr His Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
20 25 30

Arg Arg Pro Pro Phe Leu Leu Phe Val Leu Leu Val Leu Leu Val Gly
35 40 45

Ile Met Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
50 55 60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65 70 75 80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
85 90 95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Ser
100 105 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
115 120 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
130 135 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145 150 155 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
165 170 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Asn Gly Ala Ala
180 185 190

Thr Ser Ala Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
195 200 205

```
Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asp Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asp Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Ile Ser
        355                 360                 365

Gly Glu Gln Glu Glu Gln Lys Asn Cys Leu Glu Leu Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Asp
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Phe Gly
        435                 440                 445
```

```
Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Gly Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Asp Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr His Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Gly Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys His
        595                 600                 605
```

<210> 71
<211> 607
<212> PRT
<213> Morbillivirus canino

```
<400> 71
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Phe Leu Leu Phe Val Leu Leu Val Leu Leu Val Gly
        35                  40                  45
```

```
Ile Met Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Asp Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Asn Gly Ala Ala
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asn Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270
```

```
Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Gly Gly Ile Ile Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Ile Ser
        355                 360                 365

Gly Glu Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Gly
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ser Pro Arg Glu Ser Arg Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510
```

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
515 520 525

Arg Asp Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
530 535 540

Ile Ser Tyr Thr His Pro Phe Arg Leu Thr Ile Lys Gly Arg Pro Asp
545 550 555 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
565 570 575

Gln Phe Tyr Arg Phe Glu Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
580 585 590

Glu Asn Leu Val His Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
595 600 605

<210> 72
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 72
Met Leu Ser Tyr Gln Asp Lys Val Ser Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu His Gly Ser
20 25 30

Arg Arg Pro Pro Tyr Leu Leu Phe Ile Leu Leu Ile Leu Leu Val Gly
35 40 45

Ile Met Ala Leu Leu Ala Ile Thr Gly Ala Arg Phe His Gln Val Ser
50 55 60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65 70 75 80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
85 90 95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
100 105 110

```
Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Lys
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Leu Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Arg Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Ala
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335
```

```
Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Val Leu Val Ser
        355                 360                 365

Glu Asn Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Gly
                405                 410                 415

Ile Asp Leu Gln Leu Asn Leu Ser Phe Thr Tyr Gly Pro Ile Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asn Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Thr Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Asp Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Tyr Asp Leu Trp Cys His
                565                 570                 575
```

Gln Phe Tyr Arg Phe Glu Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
580 585 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
595 600 605

<210> 73
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 73
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
20 25 30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
35 40 45

Ile Met Thr Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
50 55 60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65 70 75 80

Ser Glu Ala Val His His Gln Val Met Asp Val Leu Thr Pro Leu Phe
85 90 95

Lys Ile Ile Gly Asp Glu Val Gly Leu Arg Leu Pro Gln Lys Leu Asn
100 105 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
115 120 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
130 135 140

Lys Ile Lys Val Asn Phe Ser Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145 150 155 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
165 170 175

```
Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Asn Gly Ala Ala
            180                 185                 190

Thr Ser Ile Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ala Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Asp Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Glu Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Ser Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Trp Gly Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Lys Ala Ile Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Thr Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400
```

```
Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Met Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Gly Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Ala Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Asp Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 74
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 74

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                  10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu His Gly Ser
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Ile Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Met Ala Leu Leu Ala Ile Thr Gly Ala Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Lys
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Leu Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Arg Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Ala
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240
```

```
Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Val Leu Val Ser
        355                 360                 365

Glu Asn Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Gly
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Ile Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asn Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
    450                 455                 460
```

```
Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Thr Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Asp Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Tyr Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605


<210> 75
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 75
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Phe Leu Leu Phe Val Leu Leu Val Leu Leu Val Gly
        35                  40                  45

Ile Met Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60
```

```
Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Asp Ala Val His Tyr Gln Val Arg Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Asn Gly Ala Ala
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asn Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300
```

```
Tyr His Asp Ser Asn Gly Ser Gln Gly Gly Ile Ile Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Ile Ser
        355                 360                 365

Gly Glu Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Gly
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ser Pro Arg Glu Ser Arg Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525
```

Arg Asp Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
530 535 540

Ile Ser Tyr Thr His Pro Phe Arg Leu Thr Ile Lys Gly Arg Pro Asp
545 550 555 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
565 570 575

Gln Phe Tyr Arg Phe Glu Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
580 585 590

Glu Asn Leu Val His Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
595 600 605

<210> 76
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 76
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
20 25 30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
35 40 45

Ile Met Thr Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
50 55 60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65 70 75 80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
85 90 95

Lys Ile Ile Gly Asp Glu Val Gly Leu Gln Leu Pro Gln Lys Leu Asn
100 105 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
115 120 125

```
Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Lys
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Lys Thr Ser Glu Ile Thr Ser Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asn Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365
```

```
Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Thr Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Ser Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Arg Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Gly Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr His Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590
```

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
595 600 605

<210> 77
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 77
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
20 25 30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
35 40 45

Ile Met Thr Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
50 55 60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65 70 75 80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
85 90 95

Lys Ile Ile Gly Asp Glu Val Gly Leu Arg Leu Pro Gln Lys Leu Asn
100 105 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
115 120 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
130 135 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Lys
145 150 155 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
165 170 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
180 185 190

```
Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Lys Thr Ser Glu Ile Thr Ser Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asn Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Thr Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430
```

```
Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Ser Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Arg Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Gly Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 78
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 78

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30
```

```
Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Met Thr Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Val Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Lys Thr Ser Gly Ile Thr Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255
```

```
Lys Arg Trp Leu Asn Asn Met Pro Leu Phe Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Pro Gln Gly Gly Val Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Met Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Val Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Thr Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495
```

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
500 505 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
515 520 525

Arg Gly Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
530 535 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Glu
545 550 555 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
565 570 575

Gln Phe Tyr Arg Phe Glu Ala Asp Ile Thr Asn Ser Thr Ile Ser Val
580 585 590

Glu Asn Leu Val His Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
595 600 605

<210> 79
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 79
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
20 25 30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
35 40 45

Ile Met Thr Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
50 55 60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65 70 75 80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
85 90 95

```
Lys Ile Ile Gly Asp Glu Val Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Lys Thr Ser Gly Ile Thr Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asn Met Pro Leu Phe Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Gly Gly Val Leu Val Val Thr Leu
305                 310                 315                 320
```

```
Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Met Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Thr Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Val Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Leu Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Gly Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr His Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Glu
545                 550                 555                 560
```

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
565 570 575

Gln Phe Tyr Gln Phe Glu Ala Asp Ile Thr Asn Ser Thr Ile Ser Val
580 585 590

Glu Asn Leu Val His Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
595 600 605

<210> 80
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 80
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
20 25 30

Arg Arg Pro Leu Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
35 40 45

Ile Met Thr Leu Leu Ala Ile Thr Gly Val Arg Phe His His Val Ser
50 55 60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65 70 75 80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
85 90 95

Lys Ile Ile Gly Asp Glu Val Gly Leu Arg Leu Pro Gln Lys Leu Asn
100 105 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
115 120 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
130 135 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145 150 155 160

```
Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Ser Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Lys Thr Ser Lys Ile Thr Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Val Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asn Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Asp Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Leu Met Asp Gln Val Glu Lys Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asn Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380
```

```
Lys Thr Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Met Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Pro Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Ile Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Gly Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Val Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Lys Phe Ser Cys Asp Arg Ser Lys Pro
        595                 600                 605
```

<210> 81
<211> 607

<212> PRT
<213> Morbillivirus canino

<400> 81
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
20 25 30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
35 40 45

Ile Met Thr Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
50 55 60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65 70 75 80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
85 90 95

Lys Ile Ile Gly Asp Glu Val Gly Leu Arg Leu Pro Gln Lys Leu Asn
100 105 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
115 120 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
130 135 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145 150 155 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
165 170 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
180 185 190

Thr Ser Met Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
195 200 205

Leu Ile Ser Lys Thr Ser Gly Ile Thr Asn Met Leu Thr Ala Ile Ser
210 215 220

```
Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asn Met Pro Leu Phe Gln Thr Thr Asn Tyr Met
            260                 265                 270

Ile Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Gly Gly Val Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Met Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Thr Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Val Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445
```

```
Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Gly Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr His Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Glu
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Ile Thr Asn Ser Thr Ile Ser Val
            580                 585                 590

Glu Asn Leu Val His Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 82
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 82

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45
```

```
Ile Met Thr Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Val Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Lys
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Lys Thr Ser Glu Ile Thr Ser Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asn Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285
```

```
Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Thr Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Ser Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Arg Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510
```

```
Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Gly Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 83
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 83

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Met Thr Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Val Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110
```

```
Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Val Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asn Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Met Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Ser Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350
```

```
Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Phe
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Thr Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Thr Leu Ser Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Gly Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575
```

Gln Phe Tyr Arg Phe Glu Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
580 585 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
595 600 605

<210> 84
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 84
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
20 25 30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
35 40 45

Ile Met Thr Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
50 55 60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65 70 75 80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
85 90 95

Lys Ile Ile Gly Asp Glu Val Gly Leu Arg Leu Pro Gln Lys Leu Asn
100 105 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
115 120 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
130 135 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Glu Ile Arg
145 150 155 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
165 170 175

```
Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Thr Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Phe Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Phe Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Ser Leu
    290                 295                 300

Tyr His Asp Gly Ser Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Thr Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Trp Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415
```

```
Ile Asp Leu Gln Leu Asn Ile Ser Val Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Ser Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Gly Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Val
545                 550                 555                 560

Ser Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Gln Phe Glu Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 85
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 85

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15
```

```
Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Met Thr Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Val Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Val Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Thr Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240
```

```
Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asn Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Ile Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Val Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Thr Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Asn
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Ser Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480
```

```
Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ser Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Gly Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Gln Phe Glu Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 86
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 86

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Met Thr Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80
```

```
Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Val Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Val Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Val Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Thr Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asn Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Ile Leu Leu
    290                 295                 300
```

```
Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Val Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Thr Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Asn
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Ser Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ser Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Gly Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540
```

```
Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560


Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575


Gln Phe Tyr Gln Phe Glu Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590


Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605


<210> 87
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 87
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15


Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30


Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45


Ile Met Thr Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60


Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80


Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95


Lys Ile Ile Gly Asp Glu Val Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110


Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125


Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140
```

```
Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Met Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Thr Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Glu Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asn Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Ala Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Ser Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Ala Pro Ala Leu Ala Ser
        355                 360                 365
```

```
Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Thr Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Thr Phe Gly Arg
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Ser Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Asn Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Leu Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Gly Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Gln Phe Glu Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 88
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 88
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
20 25 30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
35 40 45

Ile Met Thr Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
50 55 60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65 70 75 80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
85 90 95

Lys Ile Ile Gly Asp Glu Val Gly Leu Arg Leu Pro Gln Lys Leu Asn
100 105 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
115 120 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
130 135 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145 150 155 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
165 170 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
180 185 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
195 200 205

```
Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Val Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asn Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Met Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Ser Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Phe
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Thr Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430
```

```
Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Thr Leu Ser Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Gly Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 89
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 89

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30
```

```
Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Met Thr Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Val Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Val Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Thr Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asn Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270
```

```
Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Ile Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Val Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Thr Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Asn
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Ser Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Gly Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495
```

```
Ser Gln Ile Met Asp Lys Asp Val Leu Thr Gly Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ser Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Gly Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Gln Phe Glu Ala Asp Ile Ala Asn Ser Thr Thr Gly Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 90
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 90

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Arg Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Ile Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Met Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95
```

```
Lys Ile Ile Gly Asp Glu Val Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Ser
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Ala Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Ser Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Arg Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Ser Val Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335
```

```
Ile Ala His Pro Ser Val Glu Lys Val His Ile Thr Asn His Arg Gly
            340                 345                 350

Leu Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr His Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Ser Leu Ser Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Ser Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Arg Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Ile Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Thr Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Asn Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Ser
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560
```

```
Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Lys Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 91
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 91

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Arg Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Ile Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Met Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Val Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Ser
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160
```

```
Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Ala Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Ser Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Arg Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Ser Val Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Ile Ala His Pro Ser Val Glu Lys Val His Ile Thr Asn His Arg Gly
            340                 345                 350

Leu Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400
```

```
Glu Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr His Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Ser Leu Ser Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Arg Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Ile Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Thr Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Asn Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Ser
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Lys Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 92
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 92
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

Arg Ala Asn Ser Ser Arg Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
20 25 30

Arg Arg Pro Pro Tyr Leu Leu Phe Ile Leu Leu Ile Leu Leu Val Gly
35 40 45

Ile Met Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
50 55 60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65 70 75 80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
85 90 95

Lys Ile Ile Gly Asp Glu Val Gly Leu Arg Leu Pro Gln Lys Leu Asn
100 105 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Ser
115 120 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
130 135 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145 150 155 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
165 170 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
180 185 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
195 200 205

Leu Ile Ser Arg Ala Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
210 215 220

```
Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Ser Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Arg Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Ser Val Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Ile Ala His Pro Ser Val Glu Lys Val His Ile Thr Asn His Arg Gly
            340                 345                 350

Leu Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Lys Pro Phe Gly Gly
385                 390                 395                 400

Glu Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr His Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Ser Leu Ser Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460
```

```
Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Arg Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Ile Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Thr Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Asn Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Ser
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Lys Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 93
<211> 607
<212> PRT
<213> Morbillivirus canino

```
<400> 93
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Ile Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Met Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60
```

```
Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Ser
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Ala Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Ser Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Arg Val Cys Thr Ile Ala Val Gly
        275                 280                 285
```

```
Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Ser Val Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Ile Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Leu Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Glu Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr His Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Ser Leu Ser Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Arg Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Ile Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525
```

```
Arg Asn Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 94
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 94

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Val
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Ile Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Met Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Ser
        115                 120                 125
```

```
Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Val Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Ala Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Ser Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Gly Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Ser Val Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350
```

```
Leu Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr His Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Ser Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Arg Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Ile Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Asn Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590
```

```
Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605


<210> 95
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 95
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Arg Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Ile Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Met Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Val Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Ser
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190
```

```
Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Ala Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Ser Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Arg Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Ser Val Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Ile Ala His Pro Ser Val Glu Lys Val His Ile Thr Asn His Arg Gly
            340                 345                 350

Leu Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415
```

```
Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr His Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Ser Leu Ser Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Arg Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Ile Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Thr Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Asn Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Ser
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Lys Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 96
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 96

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15
```

```
Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Ile
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Val Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Ser
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Ser Tyr Cys Asp Thr Ile Gly Ile Lys
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Lys Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Met Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255
```

```
Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Asp Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Ile Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Arg Gln Glu Glu Gln Lys Ile Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Ala Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480
```

Phe Ser Pro Arg Glu Ser Ser Gly Ser Cys Tyr Leu Pro Ile Gln Thr
485 490 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
500 505 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Val Ala Thr Tyr Asp Ile Ser
515 520 525

Arg Asn Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
530 535 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545 550 555 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
565 570 575

Gln Phe Tyr Arg Phe Glu Thr Asp Ile Thr Asn Ser Thr Thr Ser Val
580 585 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
595 600 605

<210> 97
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 97
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Ile
20 25 30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
35 40 45

Val Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
50 55 60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65 70 75 80

```
Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Ser
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Ser Tyr Cys Asp Thr Ile Gly Ile Lys
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Lys Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Met Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Asp Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320
```

```
Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Ile Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Arg Gln Glu Glu Gln Lys Ile Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Ala Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ser Pro Arg Glu Ser Ser Gly Ser Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Val Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Asn Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540
```

```
Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Thr Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 98
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 98

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Ile
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Val Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Ser
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140
```

```
Lys Ile Lys Val Asn Phe Thr Ser Tyr Cys Asp Thr Ile Gly Ile Lys
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Lys Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Met Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Asp Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Gly Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Ile Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Arg Gln Glu Glu Gln Lys Ile Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380
```

```
Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Ala Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ser Pro Arg Glu Ser Ser Gly Ser Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Val Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Asn Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Thr Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 99
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 99
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Ile
20 25 30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
35 40 45

Val Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
50 55 60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65 70 75 80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
85 90 95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
100 105 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Ser
115 120 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
130 135 140

Lys Ile Lys Val Asn Phe Thr Ser Tyr Cys Asp Thr Ile Gly Ile Lys
145 150 155 160

Lys Ser Ile Ala Ser Ala Ala Lys Pro Ile Leu Leu Ser Ala Leu Ser
165 170 175

Gly Gly Arg Arg Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
180 185 190

Thr Ser Met Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
195 200 205

```
Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Arg Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Ile Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Asp Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Ile Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Arg Gln Glu Glu Gln Lys Ile Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Ala Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445
```

```
Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ser Pro Arg Glu Ser Ser Gly Ser Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Val Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Asn Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Thr Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 100
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 100

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Ile
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45
```

```
Val Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Asn Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Ser
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Ser Tyr Cys Asp Thr Ile Gly Ile Lys
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Lys Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Met Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270
```

```
Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Asp Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Ser Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Ile Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Arg Gln Glu Glu Gln Lys Ile Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Ser Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ser Pro Arg Glu Ser Ser Gly Ser Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510
```

Leu Pro Thr Gln Asn Phe Arg Tyr Val Val Ala Thr Tyr Asp Ile Ser
515 520 525

Arg Asn Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
530 535 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545 550 555 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
565 570 575

Gln Phe Tyr Arg Phe Glu Thr Asp Ile Thr Asn Ser Thr Thr Ser Val
580 585 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
595 600 605

<210> 101
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 101
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Ile
20 25 30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
35 40 45

Val Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
50 55 60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65 70 75 80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
85 90 95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
100 105 110

```
Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Ser
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Ser Tyr Cys Asp Thr Ile Gly Ile Lys
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Lys Pro Ile Leu Phe Leu Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Met Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Asp Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335
```

```
Ile Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Arg Gln Glu Glu Gln Lys Ile Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Ala Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ser Pro Arg Glu Ser Ser Gly Ser Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Val Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Asn Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Thr Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575
```

```
Gln Phe Tyr Arg Phe Glu Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Arg Pro
        595                 600                 605
```

<210> 102
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 102

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Ile
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Val Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Ser
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Ser Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Leu Ala Ala Lys Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175
```

```
Gly Gly Lys Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Ile Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Val Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Gly Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Arg Gln Glu Glu Gln Lys Ile Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400
```

```
Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Ala Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Ser Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Val Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Asn Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Lys Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 103
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 103

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                  10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Ile
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Val Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Lys Phe Phe Asn Pro Ser
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Val Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Ser Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Lys Pro Ile Leu Ser Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Ile Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240
```

```
Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Arg Gln Glu Glu Gln Lys Ile Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Ala Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Phe Leu Asp Pro Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
    450                 455                 460
```

```
Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Ser Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Val Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Ser Phe Ile Tyr Val Val Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Asn Asp His Ala Ile Val Tyr Tyr Ile Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr His Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Thr Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 104
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 104

```
Met Leu Ser His Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Met Thr Glu Glu Arg Gly Asp
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60
```

```
Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Asp Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ala Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asn Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300
```

```
Ser His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Leu Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Ala Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Gln Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Arg Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Ile Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Asp Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Lys Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Gly Val Ser
        515                 520                 525
```

```
Arg Asp Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Ala
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Val Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Cys Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 105
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 105

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Met Thr Glu Glu Gln Gly Asp
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125
```

```
Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Lys
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Lys Thr Ala Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Glu Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asn Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Ile Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Ser His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Leu Val Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Arg Ala Leu Ala Ser
        355                 360                 365
```

```
Glu Lys Gln Glu Glu Gln Gln Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Arg Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Arg Gln Leu Pro Ser Tyr Gly Arg Leu Ala Leu Pro Ile Asp Pro Ser
                405                 410                 415

Ile His Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Asp Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Val Ser
        515                 520                 525

Arg Asp Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Val Thr Asn Ser Thr Thr Ser Val
            580                 585                 590
```

Glu Asn Leu Val Cys Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
595 600 605

<210> 106
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 106
Met Leu Ser His Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Met Thr Glu Glu Arg Gly Asp
20 25 30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
35 40 45

Ile Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
50 55 60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65 70 75 80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
85 90 95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
100 105 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
115 120 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
130 135 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145 150 155 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
165 170 175

Gly Asp Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
180 185 190

```
Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ala Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asn Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Lys Ser Thr Val Leu Leu
    290                 295                 300

Ser His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Leu Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Ala Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Gln Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Arg Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Ile Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430
```

```
Asn Gly Asp Gly Met Asp Tyr Tyr Asp Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Val Ser
        515                 520                 525

Arg Asp Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr His Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Val Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Cys Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 107
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 107

```
Met Leu Ser His Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Met Thr Glu Glu Arg Gly Asp
            20                  25                  30
```

```
Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Lys
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ala Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255
```

```
Lys Arg Trp Leu Asn Asn Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Ser His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Leu Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Ala Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Gln Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Arg Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Ile Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Asp Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495
```

```
Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Ile Tyr Val Ile Ala Thr Tyr Asp Val Ser
        515                 520                 525

Arg Asp Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr His Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Val Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Cys Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 108
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 108

```
Met Leu Ser His Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Met Thr Glu Glu Arg Gly Asp
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95
```

```
Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu Tyr Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Lys
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ala Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asn Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Ala Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Ser His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320
```

```
Gly Ile Phe Gly Ala Thr Leu Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Ala Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Gln Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Arg Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Ile Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr His Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Asp Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Ile Tyr Val Ile Ala Thr Tyr Asp Val Ser
        515                 520                 525

Arg Asp Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr His Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560
```

```
Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Val Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Cys Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 109
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 109

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Met Thr Glu Glu Gln Gly Asp
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Lys
145                 150                 155                 160
```

```
Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Lys Thr Ala Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Glu Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asn Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Ile Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Ser His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Leu Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Ala Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Gln Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380
```

```
Arg Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Arg Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Ile Asp Pro Ser
                405                 410                 415

Ile His Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Asp Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Val Ser
        515                 520                 525

Arg Asp Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Val Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Cys Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 110
<211> 607

<212> PRT
<213> Morbillivirus canino

<400> 110
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Met Thr Glu Glu Gln Gly Asp
20 25 30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
35 40 45

Ile Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
50 55 60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65 70 75 80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
85 90 95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
100 105 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
115 120 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
130 135 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Lys
145 150 155 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
165 170 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
180 185 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
195 200 205

Leu Ile Ser Lys Thr Ala Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
210 215 220

```
Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Glu Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asn Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Ile Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Ser His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Leu Val Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Arg Ala Leu Ala Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Gln Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Arg Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Arg Gln Leu Pro Ser Tyr Gly Arg Leu Ala Leu Pro Ile Asp Pro Ser
                405                 410                 415

Ile His Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Asp Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445
```

```
Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Val Ser
        515                 520                 525

Arg Asp Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Val Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Cys Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 111
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 111

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Pro Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Ile Gly
        35                  40                  45
```

```
Ile Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Val Gly Val Lys
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Ile Leu Ser Ala Leu Ser
                165                 170                 175

Gly Ala Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Ser Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Thr Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285
```

```
Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Trp Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asn Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Arg Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Val Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Ser Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Thr Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510
```

```
Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Gly Asp His Ala Ile Val Tyr Tyr Val Tyr Gly Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asn Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 112
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 112

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Ile Gly
        35                  40                  45

Ile Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110
```

```
Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Val Gly Val Lys
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Ile Leu Ser Ala Leu Ser
                165                 170                 175

Gly Ala Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Ser Gln Glu Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Thr Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asn Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Arg Ile His Ile Thr Asn His Arg Gly
            340                 345                 350
```

```
Phe Ile Lys Asp Ser Ile Val Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Leu Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Val Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Thr Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Gly Asp His Ala Ile Val Tyr Tyr Val Tyr Gly Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Met Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575
```

```
Gln Phe Tyr Arg Phe Glu Ala Asn Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 113
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 113

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Lys Leu Phe Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Ile Gly
        35                  40                  45

Ile Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Val Gly Val Lys
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Ile Leu Ser Ala Leu Ser
                165                 170                 175
```

```
Gly Ala Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Ser Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Val Thr Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asn Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Arg Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Val Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Arg Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415
```

```
Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Tyr Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Thr Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Gly Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Phe Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asn Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val His Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 114
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 114

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15
```

```
Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Ile Gly
        35                  40                  45

Ile Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Asn Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Val Gly Val Lys
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Ile Leu Ser Ala Leu Ser
                165                 170                 175

Gly Ala Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Gly
225                 230                 235                 240
```

```
Gly Glu Phe Asp Ser Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Thr Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Ile Ala His Pro Ser Val Glu Arg Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Val Thr Trp Met Val Pro Val Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys His Ile
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Thr Pro His Val Leu Thr
465                 470                 475                 480
```

```
Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Gly Asp His Ala Ile Val Tyr Asp Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asn Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 115
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 115

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Ile Gly
        35                  40                  45

Ile Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80
```

```
Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Val Gly Val Lys
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Ile Ser Ser Ala Leu Ser
                165                 170                 175

Gly Ala Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Glu Glu Phe Asp Ser Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Thr Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Ser
    290                 295                 300
```

```
Tyr His Asp Ser Asn Gly Ser Gln Asn Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Ile Ala His Pro Ser Val Glu Arg Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Val Val Thr Trp Met Val Pro Val Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Val Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Glu Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp His Phe Thr Val Thr Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Gly Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540
```

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545 550 555 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
565 570 575

Gln Phe Tyr Arg Phe Glu Ala Asn Val Thr Asn Ser Thr Thr Ser Val
580 585 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
595 600 605

<210> 116
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 116
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
20 25 30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Ile Gly
35 40 45

Ile Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
50 55 60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65 70 75 80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
85 90 95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
100 105 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
115 120 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
130 135 140

```
Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Val Gly Val Lys
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Ile Leu Ser Ala Leu Ser
                165                 170                 175

Gly Ala Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Met Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Gly Ser Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Thr Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Ser Met Ser Gln Asn Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Ile Ala His Pro Ser Val Glu Gly Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Val Thr Trp Met Val Pro Val Leu Val Ser
        355                 360                 365
```

```
Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Gly Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Ala Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Thr Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Gly Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asn Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 117
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 117
Met Leu Pro Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
20 25 30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Ile Gly
35 40 45

Ile Leu Thr Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
50 55 60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65 70 75 80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
85 90 95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
100 105 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
115 120 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
130 135 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Val Gly Val Lys
145 150 155 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Ile Leu Ser Ala Leu Ser
165 170 175

Gly Ala Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
180 185 190

Thr Ser Val Gly Arg Val Phe Ser Leu Ser Val Ser Leu Ser Met Ser
195 200 205

```
Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Ser Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asn Ile Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Thr Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asn Ser Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Ile Ala His Pro Ser Val Glu Arg Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Val Val Thr Trp Met Val Pro Val Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Cys Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Val Asn Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430
```

```
Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Glu Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Ser Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Thr Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Gly Asn His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Asn Arg Thr
    530                 535                 540

Ile Ser Tyr Thr His Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asn Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 118
<211> 607
<212> PRT
<213> Morbillivirus canino

```
<400> 118
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30
```

```
Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Ile Gly
        35                  40                  45

Ile Leu Thr Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Val Gly Val Lys
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Ile Leu Ser Ala Leu Ser
                165                 170                 175

Gly Ala Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Ser Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Ser Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asn Ile Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270
```

```
Val Leu Pro Glu Thr Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asn Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Ile Ala His Pro Ser Val Glu Arg Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Val Val Thr Trp Met Val Pro Val Leu Val Ser
        355                 360                 365

Gly Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Val Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Glu Ser Gly
        435                 440                 445

Trp Leu Thr Val Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Thr Pro Tyr Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495
```

```
Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Gly Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Asn Arg Thr
    530                 535                 540

Ile Ser Tyr Thr His Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asn Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 119
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 119

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Leu Ala Leu Leu Ala Ile Ala Gly Val Arg Phe Arg Gln Val Ser
    50                  55                  60

Thr Ser Asn Val Glu Phe Gly Arg Leu Leu Lys Asp Asp Leu Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Met Asp Val Leu Thr Pro Leu Phe
                85                  90                  95
```

```
Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Val Lys
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Ile Leu Ser Ala Leu Ser
                165                 170                 175

Gly Val Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Lys Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Arg Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Ser Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asn Gln Val Glu Glu Val Ile Pro
                325                 330                 335
```

```
Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Val Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Gln Gln Glu Gly Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Val Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Ala Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Thr Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Glu Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Glu Asn His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560
```

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
565 570 575

Gln Phe Tyr Arg Phe Glu Ser Asp Ile Thr Ser Ser Thr Thr Ser Val
580 585 590

Glu Asp Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
595 600 605

<210> 120
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 120
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
20 25 30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
35 40 45

Ile Leu Ala Leu Leu Ala Ile Ala Gly Val Arg Phe Arg Gln Val Ser
50 55 60

Thr Ser Asn Val Glu Phe Gly Arg Leu Leu Lys Asp Asp Leu Glu Lys
65 70 75 80

Ser Glu Ala Val His His Gln Val Met Asp Val Leu Thr Pro Leu Phe
85 90 95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
100 105 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
115 120 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
130 135 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Ala Ile Gly Val Arg
145 150 155 160

```
Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Lys Thr Ser Glu Ile Ile Ser Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Arg Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Ser Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asn Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Arg Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Val Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Gln Gln Glu Gly Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400
```

```
Val Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Ala Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Asn Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Lys Phe Thr Val Thr Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Val Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Glu Asn His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ser Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asp Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 121
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 121

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                  10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Leu Ala Leu Leu Ala Ile Ala Gly Val Arg Phe Arg Gln Val Ser
    50                  55                  60

Thr Ser Asn Val Glu Phe Gly Arg Leu Leu Lys Asp Asp Leu Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Met Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Val Gly Val Lys
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Ile Leu Ser Ala Leu Ser
                165                 170                 175

Gly Ala Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220
```

```
Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Ser Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Glu Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Pro His Asp Ser Val Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asn Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Val Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Gln Gln Glu Gly Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Val Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu His Leu Asp Ala Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Asn Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
    450                 455                 460
```

```
Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Thr Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Val Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Gly Asn His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Met Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ser Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asp Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 122
<211> 607
<212> PRT
<213> Morbillivirus canino

```
<400> 122
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60
```

```
Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Lys Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285
```

```
Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Ser Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Val Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Val Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Ala Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Val Ala Thr Tyr Asp Ile Ser
        515                 520                 525
```

```
Arg Asp Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 123
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 123

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Leu Ala Leu Leu Ala Ile Ala Gly Val Arg Phe Arg Gln Val Ser
    50                  55                  60

Thr Ser Asn Val Glu Phe Gly Arg Leu Leu Lys Asp Asp Leu Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Met Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125
```

```
Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Ala Ile Gly Val Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Lys Thr Ser Glu Ile Ile Ser Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Arg Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Ser Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asn Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Arg Ile His Ile Thr Asn His Arg Gly
            340                 345                 350
```

```
Phe Ile Lys Asp Ser Val Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Gln Gln Glu Gly Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Val Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Ala Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Asn Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Thr Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Val Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Lys Asn His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Met Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ser Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590
```

Glu Asp Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
595 600 605

<210> 124
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 124
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
20 25 30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
35 40 45

Ile Leu Ala Leu Leu Ala Ile Ala Gly Val Arg Phe Arg Gln Val Ser
50 55 60

Thr Ser Asn Val Glu Phe Gly Arg Leu Leu Lys Asp Asp Leu Glu Lys
65 70 75 80

Ser Glu Ala Val His His Gln Val Met Asp Val Leu Thr Pro Leu Phe
85 90 95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
100 105 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
115 120 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
130 135 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Ala Ile Gly Val Arg
145 150 155 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
165 170 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
180 185 190

```
Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Lys Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Arg Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Ser Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asn Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Arg Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Val Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Gln Gln Glu Gly Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Val Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Ala Ser
                405                 410                 415
```

```
Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Asn Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Thr Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Gly Tyr Val Val Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Glu Asn His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ser Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asp Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 125
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 125

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15
```

```
Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Leu Ala Leu Leu Ala Ile Ala Gly Val Arg Phe Arg Gln Val Ser
    50                  55                  60

Thr Ser Asn Val Glu Phe Gly Arg Leu Leu Lys Asp Asp Leu Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Met Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Ala Ile Gly Val Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Lys Thr Ser Glu Ile Ile Ser Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Arg Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255
```

```
Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Ser Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asn Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Arg Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Val Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Gln Gln Glu Gly Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Val Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Ala Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Asn Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Thr Pro His Val Leu Thr
465                 470                 475                 480
```

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
485 490 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
500 505 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Val Ala Thr Tyr Asp Ile Ser
515 520 525

Arg Glu Asn His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
530 535 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545 550 555 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
565 570 575

Gln Phe Tyr Arg Phe Glu Ser Asp Ile Thr Asn Ser Thr Thr Ser Val
580 585 590

Glu Asp Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
595 600 605

<210> 126
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 126
Met Leu Ser Tyr Gln Asp Glu Val Gly Ala Phe Tyr Met Asp Asn Ala
1 5 10 15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Arg Ser
20 25 30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
35 40 45

Ile Leu Ala Leu Leu Ala Ile Ala Gly Val Arg Phe Arg Gln Val Ser
50 55 60

Thr Ser Asn Val Glu Phe Gly Arg Leu Leu Lys Asp Asp Leu Glu Lys
65 70 75 80

```
Ser Glu Ala Val His His Gln Val Met Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Gln Gln Lys Leu Asn
            100                 105                 110

Gly Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Ser Glu Phe Asp Phe Arg Asn Phe His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Ala Ile Gly Val Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ile Leu Phe
                165                 170                 175

Gly Cys Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Ile
            180                 185                 190

Thr Ser Val Gly Arg Val Ile Pro Leu Ser Val Ser Leu Ser Thr Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Ser Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Leu Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Lys Glu Phe Asp Thr Arg Glu Ile Arg Val Phe Glu Ile Lys Phe Ile
                245                 250                 255

Glu Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Ile Thr Asn Tyr Met
            260                 265                 270

Ile Leu Gly Glu Asn Ser Glu Ala Lys Val Cys Thr Ile Ala Val Asp
        275                 280                 285

Gln Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr Tyr Asp Ser Asn Gly Ser Arg Asp Ser Ile Leu Val Val Thr Leu
305                 310                 315                 320
```

```
Gly Ile Phe Glu Ala Ser Pro Met Asn Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala Asn Pro Ser Val Glu Arg Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Tyr Ile Ile Asp Ser Val Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Arg Leu Glu Gly Gln Glu Asn Cys Leu Glu Ser Ala Cys Arg Arg
    370                 375                 380

Glu Ser Tyr Pro Met Cys Lys Gln Thr Ser Cys Glu Pro Phe Gly Gly
385                 390                 395                 400

Val Gln Val Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Glu Arg
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Asn Pro Leu Leu Asp Ser Arg
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Glu Asp Gln Phe Thr Val Thr Ser His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Phe Pro Thr Gln Asn Phe Arg Tyr Val Val Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Arg Tyr His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540
```

```
Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ser Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asp Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Glu Pro
        595                 600                 605
```

<210> 127
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 127

```
Met Leu Ser Tyr Gln Asp Glu Val Gly Ala Phe Tyr Met Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Arg Ser
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Leu Ala Leu Leu Ala Ile Ala Gly Val Arg Phe Arg Gln Val Ser
    50                  55                  60

Thr Ser Asn Val Glu Phe Gly Arg Leu Leu Lys Asp Asp Leu Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Met Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Gln Gln Lys Leu Tyr
            100                 105                 110

Gly Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Ser Glu Phe Asp Phe Arg Asn Phe His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140
```

```
Lys Ile Lys Val Asn Asn Thr Asn Tyr Cys Asp Ala Ile Gly Val Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn His Ile Leu Leu Ser Ile Leu Phe
                165                 170                 175

Gly Cys Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Ile
            180                 185                 190

Thr Ser Val Gly Arg Val Ile Pro Leu Ser Val Ser Leu Ser Thr Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Ser Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Leu Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Lys Glu Phe Asp Thr Arg Glu Ile Arg Val Phe Glu Ile Lys Phe Ile
                245                 250                 255

Glu Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Ile Thr Asn Tyr Met
            260                 265                 270

Ile Leu Gly Glu Asn Ser Glu Ala Lys Val Cys Thr Ile Ala Val Asp
        275                 280                 285

Gln Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr Tyr Asp Ser Asn Gly Ser Arg Asp Ser Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Glu Ala Ser Pro Met Asn Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala Asn Pro Ser Val Glu Arg Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Tyr Ile Ile Asp Ser Val Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Arg Leu Glu Gly Gln Glu Asn Cys Leu Glu Ser Ala Cys Arg Arg
    370                 375                 380
```

```
Glu Ser Tyr Pro Met Cys Lys Gln Thr Ser Cys Glu Pro Phe Gly Gly
385                 390                 395                 400

Val Gln Val Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Glu Arg
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Asn Pro Leu Leu Asp Ser Arg
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Glu Asp Gln Phe Thr Val Thr Ser His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Phe Pro Thr Gln Asn Phe Arg Tyr Val Val Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Arg Tyr His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ser Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asp Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Glu Pro
        595                 600                 605
```

<210> 128
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 128
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
20 25 30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
35 40 45

Ile Leu Ala Leu Leu Ala Ile Ala Gly Val Arg Phe Arg Gln Val Ser
50 55 60

Thr Ser Asn Val Glu Phe Gly Arg Leu Leu Lys Asp Asp Leu Glu Lys
65 70 75 80

Ser Glu Ala Val His His Gln Val Met Asp Val Leu Thr Pro Leu Phe
85 90 95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
100 105 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
115 120 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
130 135 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Ala Ile Gly Val Arg
145 150 155 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
165 170 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
180 185 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
195 200 205

```
Leu Ile Ser Lys Thr Ser Glu Ile Ile Ser Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Arg Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Ser Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asn Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Arg Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Val Ala Thr Trp Met Val Pro Ala Leu Val Ser
        355                 360                 365

Glu Gln Gln Glu Gly Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Val Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Ala Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Asn Pro Leu Leu Asp Ser Gly
        435                 440                 445
```

```
Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Thr Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Val Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Glu Asn His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ser Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asp Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 129
<211> 607
<212> PRT
<213> Morbillivirus canino

```
<400> 129
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Lys Leu Pro Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45
```

```
Ile Met Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Ile Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Lys Ser Glu Ile Ile Ser Met Ile Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Val Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Leu
            260                 265                 270
```

```
Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Val Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Met His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Val Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Asn Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Ile Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Val Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Ile Glu Ser Asn Leu Val Val
            500                 505                 510
```

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
515 520 525

Arg Asp Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
530 535 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545 550 555 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
565 570 575

Gln Phe Tyr Arg Phe Glu Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
580 585 590

Glu Asn Ser Val Arg Met Arg Phe Ser Cys Asn Arg Ser Lys Pro
595 600 605

<210> 130
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 130
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

Lys Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
20 25 30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
35 40 45

Ile Met Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
50 55 60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65 70 75 80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
85 90 95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
100 105 110

```
Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Lys Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Met Pro Asp Tyr Ile Asp
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Val Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Leu
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Ala Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335
```

```
Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Val Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Thr Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Asn Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Arg Ala Ser Arg Gly Asp Gln Phe Thr Val Val Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Ile Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Asp Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575
```

Gln Phe Tyr Arg Phe Glu Ala Asp Ile Thr Asn Ala Thr Thr Ser Val
580 585 590

Glu Asn Ser Val Arg Met Arg Phe Ser Cys Asn Arg Ser Lys Pro
595 600 605

<210> 131
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 131
Met Phe Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
20 25 30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
35 40 45

Ile Met Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
50 55 60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65 70 75 80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
85 90 95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
100 105 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
115 120 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
130 135 140

Lys Ile Arg Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145 150 155 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
165 170 175

```
Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Ile Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Lys Ser Glu Ile Ile Ser Met Ile Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Val Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Leu
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Val Val Ile Pro
                325                 330                 335

Val Ala His Ser Ser Val Glu Lys Met His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Val Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400
```

```
Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Asn Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Ile Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Val Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Asp Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Asp Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 132
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 132

```
Met Phe Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                  10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Met Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Ile Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Lys Ser Glu Ile Ile Ser Met Ile Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240
```

```
Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Val Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Leu
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Val Val Ile Pro
                325                 330                 335

Val Ala His Ser Ser Val Glu Lys Met His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Val Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Asn Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Ile Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460
```

```
Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Val Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Asp Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Asp Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605


<210> 133
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 133
Met Phe Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Met Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60
```

```
Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ser Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Ser Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Ile Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Lys Ser Glu Ile Ile Ser Met Ile Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Val Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Leu
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300
```

```
Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Val Val Ile Pro
                325                 330                 335

Val Ala His Ser Ser Val Glu Lys Met His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Val Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Asn Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Ile Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Val Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525
```

```
Arg Asp Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Asp Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 134
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 134

```
Met Phe Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Met Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125
```

```
Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145                 150                 155                 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Asp Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Ile Gly Arg Ile Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Lys Ser Glu Ile Ile Ser Met Ile Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Val Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Leu
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Ser Ser Val Glu Lys Met His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Val Leu Val Ser
        355                 360                 365
```

```
Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Asn Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Ile Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Val Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Asp Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Asp Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
            580                 585                 590
```

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
595 600 605

<210> 135
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 135
Met Phe Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
20 25 30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
35 40 45

Ile Met Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
50 55 60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65 70 75 80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
85 90 95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
100 105 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
115 120 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
130 135 140

Lys Ile Lys Val Thr Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
145 150 155 160

Lys Ser Ile Ala Ser Ala Ala Ser Pro Ile Leu Leu Ser Ala Leu Ser
165 170 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
180 185 190

```
Thr Ser Val Gly Arg Ile Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Lys Ser Glu Ile Ile Ser Met Ile Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Leu
            260                 265                 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    290                 295                 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
                325                 330                 335

Val Ala His Ser Ser Val Glu Lys Met His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Val Leu Val Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Asn Gly Pro Val Ile Leu
            420                 425                 430
```

```
Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Ile Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Val Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Ile Ser
        515                 520                 525

Arg Asp Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Asp Ala Asp Val Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 136
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 136

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30
```

```
Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Val Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Ile Ile Gly Ile Lys
145                 150                 155                 160

Glu Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Glu Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Lys Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Val Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asn Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Glu Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255
```

```
Lys Arg Trp Leu Asn Asn Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Ser Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Val Leu
    290                 295                 300

Tyr His Asp Ser Ser Gly Pro Gln Asp Ser Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Leu Met Asp Gln Val Glu Lys Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Ala Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Gln Thr Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Thr Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Arg Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Gly Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Tyr Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Glu Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Pro Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495
```

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
500 505 510

Leu Leu Thr His Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Val Ser
515 520 525

Arg Asp Asp His Ala Ile Val Tyr Asp Val Tyr Asp Pro Ile Arg Lys
530 535 540

Ile Tyr Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545 550 555 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
565 570 575

Gln Phe Tyr Arg Phe Glu Ala Asp Val Thr Asn Ser Thr Thr Ser Val
580 585 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
595 600 605

<210> 137
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 137
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
20 25 30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
35 40 45

Ile Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
50 55 60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65 70 75 80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
85 90 95

```
Lys Ile Ile Gly Asp Glu Val Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Ile Ile Gly Ile Lys
145                 150                 155                 160

Glu Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Lys Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Val Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Glu Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asn Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Ser Ser Asn Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Val Leu
    290                 295                 300

Tyr His Asp Ser Ser Gly Pro Gln Asp Ser Ile Leu Val Val Thr Leu
305                 310                 315                 320
```

```
Gly Ile Phe Gly Ala Thr Leu Met Asp Gln Val Glu Lys Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Ile Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Ala Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Gln Thr Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Thr Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Arg Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Gly Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Tyr Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Leu Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Val Ser
        515                 520                 525

Arg Asp Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560
```

```
Phe Leu Arg Ile Glu Cys Phe Val Trp Gly Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Val Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Lys Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 138
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 138

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Val Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Lys Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Val Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Ile Ile Gly Ile Lys
145                 150                 155                 160
```

```
Glu Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Glu Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Lys Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Val Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asn Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Glu Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asn Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Ser Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Val Leu
    290                 295                 300

Tyr His Asp Ser Ser Gly Pro Gln Asp Ser Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Ala Ala Thr Leu Met Asp Gln Val Glu Lys Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Ala Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Gln Thr Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380
```

```
Lys Thr Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Arg Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Gly Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Tyr Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Glu Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Leu Thr His Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Val Ser
        515                 520                 525

Arg Asp Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Val Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 139
<211> 607

<212> PRT
<213> Morbillivirus canino

<400> 139

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Thr
1               5                  10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Val Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Ile Ile Gly Ile Lys
145                 150                 155                 160

Glu Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Lys Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Val Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220
```

```
Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Glu Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asn Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Ser Ser Asn Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Val Leu
    290                 295                 300

Tyr His Asp Ser Ser Gly Pro Gln Asp Ser Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Leu Met Asp Gln Val Glu Lys Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Ile Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Ala Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Gln Thr Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Thr Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Arg Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Gly Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Tyr Gly
        435                 440                 445
```

```
Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Leu Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Val Ser
        515                 520                 525

Arg Asp Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr His Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Val Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 140
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 140

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Ile Gly
        35                  40                  45
```

```
Ile Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Val Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn His Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Ile Ile Gly Ile Lys
145                 150                 155                 160

Glu Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Glu Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Lys Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Val Ile Asn Met Ile Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Glu Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asn Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Ser Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285
```

```
Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Val Leu
    290                 295                 300

Tyr His Asp Ser Ser Gly Pro Gln Asp Ser Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Leu Met Asp Gln Val Glu Lys Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Ile Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Ala Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Gln Thr Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Thr Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Arg Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Gly Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Tyr Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510
```

```
Leu Leu Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Val Ser
        515                 520                 525

Arg Gly Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Val Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 141
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 141

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Val Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110
```

```
Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Ile Ile Gly Ile Lys
145                 150                 155                 160

Glu Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Lys Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Val Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Glu Lys Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asn Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Ser Ser Asn Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Val Leu
    290                 295                 300

Tyr His Asp Ser Ser Gly Pro Gln Asp Ser Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Leu Met Asp Gln Val Glu Lys Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Ile Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350
```

```
Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Ala Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Gln Thr Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Thr Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Arg Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Gly Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Gly Tyr Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Leu Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Val Ser
        515                 520                 525

Arg Asp Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575
```

Gln Phe Tyr Arg Phe Glu Ala Asp Val Thr Asn Ser Thr Thr Ser Val
580 585 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
595 600 605

<210> 142
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 142
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
20 25 30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
35 40 45

Ile Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
50 55 60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65 70 75 80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
85 90 95

Lys Ile Ile Gly Asp Glu Val Gly Leu Arg Leu Pro Gln Lys Leu Asn
100 105 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
115 120 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
130 135 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Ile Ile Gly Ile Lys
145 150 155 160

Glu Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
165 170 175

```
Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Lys Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Val Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Glu Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asn Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Ser Ser Asn Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Val Leu
    290                 295                 300

Tyr His Asp Ser Ser Gly Pro Gln Asp Ser Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Leu Met Asp Gln Val Glu Lys Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Ile Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Ala Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Gln Thr Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Thr Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Arg Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415
```

```
Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Gly Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Tyr Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Leu Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Val Ser
        515                 520                 525

Arg Asp Asp His Ala Ile Val Cys Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Val Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 143
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 143

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15
```

```
Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Arg
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80

Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Met Ile Gly Ile Lys
145                 150                 155                 160

Glu Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ser Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240
```

```
Glu Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asn Met Ser Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Ser Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Val Leu
    290                 295                 300

Ser His Asp Asp Ser Gly Pro Gln Asp Ser Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Ile Phe Gly Ala Thr Leu Met Asp Gln Val Glu Lys Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Ala Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Gln Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Thr Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Gly Arg Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Ile Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Gly Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480
```

```
Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Arg Thr Gln Asn Phe Arg Tyr Val Ile Ala Thr Tyr Asp Val Ser
        515                 520                 525

Arg Asn Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545                 550                 555                 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                565                 570                 575

Gln Phe Tyr Arg Phe Glu Ala Asp Val Thr Asn Ser Thr Thr Ser Val
            580                 585                 590

Glu Asn Leu Val His Ile Arg Phe Ser Phe Asn Arg Ser Lys Pro
        595                 600                 605
```

<210> 144
<211> 607
<212> PRT
<213> Morbillivirus canino

<400> 144

```
Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1               5                   10                  15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Glu Glu Gln Gly Gly
            20                  25                  30

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
        35                  40                  45

Ile Leu Ala Leu Leu Ala Ile Thr Gly Val Arg Phe His Gln Val Ser
    50                  55                  60

Thr Ser Asn Met Glu Phe Ser Arg Leu Leu Lys Glu Asp Met Glu Lys
65                  70                  75                  80
```

```
Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
                85                  90                  95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
            100                 105                 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
        115                 120                 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
    130                 135                 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Ile Ile Gly Ile Lys
145                 150                 155                 160

Glu Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
                165                 170                 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Asn Gly Ala Thr
            180                 185                 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        195                 200                 205

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    210                 215                 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225                 230                 235                 240

Glu Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                245                 250                 255

Lys Arg Trp Leu Asn Asn Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            260                 265                 270

Val Leu Pro Glu Ser Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
        275                 280                 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Val Leu
    290                 295                 300
```

```
Tyr His Asp Ser Ser Gly Pro Gln Asp Ser Ile Leu Val Val Thr Leu
305                 310                 315                 320

Gly Met Phe Gly Ala Thr Leu Met Asp Gln Val Glu Lys Val Ile Pro
                325                 330                 335

Val Ala His Pro Ser Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            340                 345                 350

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Ala Ser
        355                 360                 365

Glu Lys Gln Glu Glu Gln Gln Asn Cys Leu Glu Ser Ala Cys Gln Arg
    370                 375                 380

Lys Thr Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385                 390                 395                 400

Arg Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Ser Leu Asp Pro Ser
                405                 410                 415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
            420                 425                 430

Asn Gly Gly Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        435                 440                 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    450                 455                 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
465                 470                 475                 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                485                 490                 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            500                 505                 510

Leu Leu Thr Gln Asn Phe Arg Tyr Val Val Ala Thr Tyr Asp Val Ser
        515                 520                 525

Arg Asp Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    530                 535                 540
```

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
545 550 555 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
565 570 575

Gln Phe Tyr Arg Phe Glu Ala Asp Val Thr Asn Ser Thr Thr Ser Val
580 585 590

Glu Asn Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
595 600 605

<210> 145
<211> 527
<212> PRT
<213> Morbillivirus canino

<400> 145
Ser Glu Ala Val His His Gln Val Ile Asp Val Leu Thr Pro Leu Phe
1 5 10 15

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
20 25 30

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
35 40 45

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
50 55 60

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Thr Ile Gly Ile Arg
65 70 75 80

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
85 90 95

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Asn Gly Ala Thr
100 105 110

Ile Ser Val Gly Lys Ile Phe Pro Leu Ser Val Ser Leu Ser Met Ser
115 120 125

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
130 135 140

```
Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Met Pro Asp Tyr Ile Glu
145                 150                 155                 160

Gly Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
                165                 170                 175

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
            180                 185                 190

Val Leu Pro Glu Asn Ser Arg Ala Lys Val Cys Thr Ile Ala Val Gly
        195                 200                 205

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
    210                 215                 220

Tyr His Asp Ser Asn Gly Ser Gln Asp Gly Val Leu Val Val Thr Leu
225                 230                 235                 240

Gly Ile Phe Gly Ala Thr Ser Met Asp Gln Val Glu Glu Val Ile Pro
                245                 250                 255

Val Ala Asp Pro Leu Val Glu Lys Ile His Ile Thr Asn His Arg Gly
            260                 265                 270

Ile Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
        275                 280                 285

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
    290                 295                 300

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
305                 310                 315                 320

Gly Gln Leu Pro Ser Tyr Gly Arg Leu Thr Leu Pro Leu Asp Pro Ser
                325                 330                 335

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Ile Ile Leu
            340                 345                 350

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Ser Pro Leu Leu Asp Ser Gly
        355                 360                 365
```

```
Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Val Leu Gly Leu Ile Asn
    370                 375                 380

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Ile Pro His Val Leu Thr
385                 390                 395                 400

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
                405                 410                 415

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
            420                 425                 430

Leu Ser Thr Gln Asn Phe Arg Tyr Val Val Ala Thr Tyr Asp Ile Ser
        435                 440                 445

Arg Asp Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
    450                 455                 460

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
465                 470                 475                 480

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
                485                 490                 495

Gln Phe Tyr Arg Phe Glu Ala Asp Ile Thr Asn Ser Thr Thr Ser Val
            500                 505                 510

Glu Asn Leu Val Arg Met Arg Phe Ser Cys Asn Arg Ser Lys Pro
        515                 520                 525
```

<210> 146
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 146

```
Met His Lys Gly Ile Pro Lys Ser Ser Lys Pro Gln Thr His Thr Gln
1               5                   10                  15

Gln Asp Arg Pro Pro Gln Pro Ser Thr Glu Pro Glu Glu Thr Arg Thr
            20                  25                  30

Ser Arg Ala Arg His Ser Ile Thr Ser Ala Gln Arg Ser Thr His Ser
        35                  40                  45
```

```
Asp Pro Arg Thr Ser Asp Arg Pro Val Ser Tyr Thr Met Asn Arg Ile
    50                  55                  60

Arg Ser Arg Lys Gln Thr Ser His Arg Leu Lys Asn Ile Pro Val His
65                  70                  75                  80

Gly Asn His Glu Ala Ile Ile Gln His Met Pro Glu Ser Val Ser Lys
                85                  90                  95

Gly Ala Arg Ser Gln Ile Glu Arg Arg Gln Pro Asn Ala Ile Asn Ser
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Leu Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Leu Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Val Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Arg Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Gly Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Phe Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Ile Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Lys Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

```
Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
        515                 520                 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
    530                 535                 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Gly Lys Val Ala Leu
545                 550                 555                 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
                565                 570                 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
            580                 585                 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
        595                 600                 605

Leu Leu Ser Val Pro Ile Leu Ser Cys Thr Ala Leu Ala Leu Leu Leu
    610                 615                 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Lys Gln His
625                 630                 635                 640

Thr Lys Val Asp Pro Ala Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
                645                 650                 655

Ser Tyr Val Arg Ser Leu
            660
```

<210> 147
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 147

```
Met His Lys Gly Ile Pro Lys Ser Ser Lys Pro Gln Thr His Thr Gln
1               5                   10                  15

Gln Asp Arg Pro Pro Gln Pro Ser Thr Glu Pro Glu Glu Thr Arg Thr
            20                  25                  30

Ser Arg Ala Arg His Ser Ile Thr Ser Ala Gln Arg Ser Thr His Ser
        35                  40                  45
```

```
Asp Pro Arg Thr Ser Asp Arg Pro Val Ser Tyr Thr Met Asn Arg Ile
    50                  55                  60

Arg Ser Arg Lys Gln Thr Ser His Arg Leu Lys Asn Ile Pro Val His
65                  70                  75                  80

Gly Asn His Glu Ala Ile Ile Gln His Met Pro Glu Ser Val Ser Lys
                85                  90                  95

Gly Ala Arg Ser Gln Ile Glu Arg Arg Gln Pro Asn Ala Ile Asn Ser
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Leu Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Leu Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Val Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Arg Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Gly Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Phe Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Ile Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Lys Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Gly Lys Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
595 600 605

Leu Leu Ser Val Pro Ile Leu Ser Cys Thr Ala Leu Ala Leu Leu Leu
610 615 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Lys Gln His
625 630 635 640

Thr Lys Val Asp Pro Ala Phe Lys Arg Asp Leu Thr Gly Thr Ser Lys
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 148
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 148
Met His Arg Gly Ile Pro Lys Ser Ser Lys Thr Gln Thr His Thr Gln
1 5 10 15

Gln Asp Arg Pro Pro Gln Pro Ser Thr Glu Leu Glu Glu Thr Arg Thr
20 25 30

Ser Arg Ala Arg His Ser Thr Thr Ser Ala Gln Arg Ser Thr His Tyr
35 40 45

```
Asp Pro Arg Thr Ser Asp Arg Pro Val Ser Tyr Thr Met Asn Arg Thr
    50                  55                  60

Arg Ser Arg Lys Gln Thr Ser His Arg Leu Lys Asn Ile Pro Val His
65                  70                  75                  80

Gly Asn His Glu Ala Thr Ile Gln His Ile Pro Glu Ser Val Ser Lys
                85                  90                  95

Gly Ala Arg Ser Gln Ile Glu Arg Arg Gln Pro Asn Ala Ile Asn Ser
            100                 105                 110

Gly Ser His Cys Thr Trp Leu Val Leu Trp Cys Leu Gly Met Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Glu Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Leu Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Val Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Arg Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ile Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Ser Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Phe Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Ile Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Ala Thr Ile Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Gly Lys Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Asp Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
595 600 605

Leu Leu Ser Val Pro Ile Leu Ser Cys Thr Ala Leu Ala Leu Leu Leu
610 615 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Lys Gln His
625 630 635 640

Thr Lys Val Asp Pro Ala Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 149
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 149
Met His Lys Gly Ile Pro Lys Ser Ser Lys Thr Gln Thr His Thr Gln
1 5 10 15

Gln Asp Arg Pro Pro Gln Pro Ser Thr Glu Leu Glu Glu Thr Arg Thr
20 25 30

Ser Arg Ala Arg His Ser Thr Thr Ser Ala Gln Arg Ser Thr His Tyr
35 40 45

```
Asp Pro Arg Thr Ser Asp Arg Pro Val Ser Tyr Thr Met Asn Arg Thr
    50                  55                  60

Arg Ser Arg Lys Gln Thr Ser His Arg Leu Lys Asn Ile Pro Val His
65                  70                  75                  80

Gly Asn His Glu Ala Thr Ile Gln His Ile Pro Glu Ser Val Ser Lys
                85                  90                  95

Gly Ala Arg Ser Gln Ile Glu Arg Arg Gln Pro Asn Ala Ile Asn Ser
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Leu Gly Met Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Glu Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Leu Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Val Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Arg Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ile Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Ser Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Phe Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Ile Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

```
Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
        515                 520                 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Ala Thr Ile Gln Val
    530                 535                 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Gly Lys Val Ala Leu
545                 550                 555                 560

Gly Pro Ala Ile Ser Leu Asp Arg Leu Asp Val Gly Thr Asn Leu Gly
                565                 570                 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
            580                 585                 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
        595                 600                 605

Leu Leu Ser Val Pro Ile Leu Ser Cys Thr Ala Leu Ala Leu Leu Leu
    610                 615                 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Lys Gln His
625                 630                 635                 640

Thr Lys Val Asp Pro Ala Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
                645                 650                 655

Ser Tyr Val Arg Ser Leu
            660
```

<210> 150
<211> 662
<212> PRT
<213> Morbillivirus canino

```
<400> 150
Met His Lys Gly Ile Pro Lys Ser Ser Lys Thr Gln Thr His Thr Gln
1               5                   10                  15

Gln Asp Arg Pro Pro Gln Pro Ser Thr Glu Leu Glu Glu Thr Arg Thr
            20                  25                  30

Ser Arg Ala Arg His Ser Thr Thr Ser Ala Gln Arg Ser Thr His Tyr
        35                  40                  45
```

```
Asp Pro Arg Thr Ser Asp Arg Pro Val Ser Tyr Thr Met Asn Arg Thr
    50                  55                  60

Arg Ser Arg Lys Gln Thr Ser His Arg Leu Lys Asn Ile Pro Val His
65                  70                  75                  80

Gly Asn His Glu Ala Thr Ile Gln His Ile Pro Glu Ser Val Ser Lys
                85                  90                  95

Gly Ala Arg Ser Gln Ile Glu Arg Arg Gln Pro Asn Ala Ile Asn Ser
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Leu Gly Met Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Glu Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Leu Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Val Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Arg Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ile Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Ser Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Phe Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Ile Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asn Gly Ala Thr Ile Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Gly Lys Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Asp Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Ile Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
595 600 605

Leu Leu Ser Val Pro Ile Leu Ser Cys Thr Ala Leu Ala Leu Leu Leu
610 615 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Lys Gln His
625 630 635 640

Thr Lys Val Asp Pro Ala Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 151
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 151
Met His Lys Ala Ile Pro Lys Ser Ser Lys Thr His Thr His Thr Gln
1 5 10 15

Gln Asn Arg Pro Ser Gln Pro Ser Thr Gly Pro Asp Glu Thr Arg Thr
20 25 30

Ser Arg Ala Arg His Ser Ile Thr Ser Ala Gln Arg Ser Thr His Tyr
35 40 45

```
Asp Pro Arg Thr Leu Asp Arg Pro Val Ser Tyr Thr Met Asn Arg Thr
    50                  55                  60

Arg Ser Arg Lys Gln Thr Ser Tyr Arg Leu Glu Asn Ile Ser Val His
65                  70                  75                  80

Gly Asn His Glu Ala Ile Ile Gln His Met Pro Glu Ser Val Ser Lys
                85                  90                  95

Gly Ala Arg Ser Gln Ile Glu Arg Arg Arg Pro Asn Ala Ile Asn Ser
            100                 105                 110

Gly Ser Gln Cys Ser Trp Leu Val Leu Trp Cys Leu Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Ala Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Val Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Leu Gly Ser Ala Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Gly Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Ile Pro Gly Lys Phe Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Ile Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
595 600 605

Leu Leu Ser Val Pro Ile Leu Ser Gly Thr Ala Leu Ala Leu Leu Leu
610 615 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Lys Arg Asn
625 630 635 640

Thr Lys Val Asp Pro Ala Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 152
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 152
Met His Lys Glu Ile Pro Lys Ser Ser Lys Thr His Thr His Thr Gln
1 5 10 15

Gln Asn Arg Pro Pro Gln Pro Ser Thr Gly Pro Asp Glu Thr Arg Thr
20 25 30

Ser Arg Ala Arg His Ser Ile Thr Ser Ala Gln Arg Ser Thr Asn Tyr
35 40 45

```
Asp Pro Arg Thr Leu Asp Arg Pro Val Ser Tyr Thr Met Asn Arg Thr
    50                  55                  60

Arg Ser Arg Lys Gln Thr Ser Tyr Arg Leu Glu Asn Ile Ser Val His
65                  70                  75                  80

Gly Asn His Glu Ala Ile Ile Gln His Met Pro Glu Ser Val Ser Lys
                85                  90                  95

Gly Ala Arg Ser Gln Ile Glu Arg Arg Gln Pro Asn Ala Ile Asn Ser
            100                 105                 110

Gly Ser Gln Cys Ser Trp Leu Val Leu Trp Cys Leu Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Ala Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Leu Gly Ser Ala Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Gly Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Ile Pro Gly Lys Phe Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Ile Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
595 600 605

Leu Leu Ser Val Pro Ile Leu Ser Gly Thr Ala Leu Ala Leu Leu Leu
610 615 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Lys Arg Asn
625 630 635 640

Thr Lys Val Asp Pro Ala Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 153
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 153
Met His Lys Glu Ile Pro Lys Ser Ser Lys Thr His Thr His Thr Gln
1 5 10 15

Gln Asn Arg Pro Pro Gln Pro Ser Thr Gly Pro Asp Glu Thr Arg Thr
20 25 30

Ser Arg Ala Arg His Ser Ile Thr Ser Ala Gln Arg Ser Thr Asn Tyr
35 40 45

```
Asp Pro Arg Thr Leu Asp Arg Pro Val Ser Tyr Thr Met Asn Arg Thr
    50                  55                  60

Arg Ser Arg Lys Gln Thr Ser Tyr Arg Leu Glu Asn Ile Ser Val His
65                  70                  75                  80

Gly Asn His Glu Ala Ile Ile Gln His Met Pro Glu Ser Val Ser Lys
                85                  90                  95

Gly Ala Arg Ser Gln Ile Glu Arg Arg Gln Pro Asn Ala Ile Asn Ser
            100                 105                 110

Gly Ser Gln Cys Ser Trp Leu Val Leu Trp Cys Leu Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Ala Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Leu Gly Ser Ala Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Gly Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Ile Pro Gly Lys Phe Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Ile Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
595 600 605

Leu Leu Ser Val Pro Ile Leu Ser Gly Thr Ala Leu Ala Leu Leu Leu
610 615 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Lys Arg Asn
625 630 635 640

Thr Lys Val Asp Pro Ala Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 154
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 154
Met His Lys Glu Ile Pro Lys Ser Ser Lys Thr His Thr His Thr Gln
1 5 10 15

Gln Asn Arg Pro Pro Gln Pro Ser Thr Gly Pro Asp Glu Thr Arg Thr
20 25 30

Ser Arg Ala Arg His Ser Ile Thr Ser Ala Gln Arg Ser Thr Asn Tyr
35 40 45

```
Asp Pro Arg Thr Leu Asp Arg Pro Val Ser Tyr Thr Met Asn Arg Thr
    50                  55                  60

Arg Ser Arg Lys Gln Thr Ser Tyr Arg Leu Glu Asn Ile Ser Val His
65                  70                  75                  80

Gly Asn His Glu Ala Ile Ile Gln His Met Pro Glu Ser Val Ser Lys
                85                  90                  95

Gly Ala Arg Ser Gln Ile Glu Arg Arg Gln Pro Asn Ala Ile Asn Ser
            100                 105                 110

Gly Ser Gln Cys Ser Trp Leu Val Leu Trp Cys Leu Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Ala Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Glu Ser Leu Gly Ser Ala Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Gly Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Ile Pro Gly Lys Phe Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Ile Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
595 600 605

Leu Leu Ser Val Pro Ile Leu Ser Gly Thr Ala Leu Ala Leu Leu Leu
610 615 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Lys Arg Asn
625 630 635 640

Thr Lys Val Asp Pro Ala Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 155
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 155
Met His Asn Lys Ile Pro Lys Gly Ser Lys Thr Ser Thr Pro Thr Gln
1 5 10 15

Gln Asp Pro Pro Pro Gln His Ser Ile Lys Ser Ala Gly Ala Lys Val
20 25 30

Ser Gln Ala Arg His Asn Thr Thr Ser Ala His Gln Ser Thr Arg His
35 40 45

```
Gly Pro Arg Ile Ser Asp Arg Pro Thr His Tyr Ile Met Asn Arg Thr
    50                  55                  60

Arg Ser Cys Lys Gln Ala Ser Tyr Arg Ser Asp Asn Ile Pro Ala His
65                  70                  75                  80

Gly Asp His Glu Cys Ile Ile His His Thr Pro Glu Ser Val Ser Gln
                85                  90                  95

Gly Val Arg Ser Arg Phe Lys Arg Arg Gln Ser Asn Ala Thr Ser Ser
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Val Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Ser Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Ala Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Ile Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Ile Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

```
Ser Thr Met Ile Ser Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
        515                 520                 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
    530                 535                 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545                 550                 555                 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
                565                 570                 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Ile Leu Ile Asp Ser Ser
            580                 585                 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
        595                 600                 605

Leu Leu Ser Val Leu Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Phe
    610                 615                 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Lys Gln His
625                 630                 635                 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
                645                 650                 655

Ser Tyr Val Arg Ser Leu
            660


<210> 156
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 156
Met His Asn Lys Ile Pro Lys Gly Ser Lys Thr Ser Thr Pro Thr Gln
1               5                   10                  15

Pro Glu Pro Pro Pro Gln His Ser Ile Lys Ser Ala Gly Ala Lys Val
            20                  25                  30

Ser Gln Ala Arg His Asn Thr Thr Ser Ala His Gln Ser Thr Arg His
        35                  40                  45
```

```
Gly Pro Arg Ile Ser Asp Arg Pro Thr His Tyr Ile Met Asn Arg Thr
    50                  55                  60

Arg Ser Cys Lys Gln Ala Ser Tyr Arg Ser Asp Asn Ile Pro Ala His
65                  70                  75                  80

Gly Asp His Glu Cys Ile Ile His His Thr Pro Glu Ser Val Ser Gln
                85                  90                  95

Gly Val Arg Ser Arg Phe Lys Arg Arg Gln Ser Asn Ala Thr Ser Ser
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Val Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Arg Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Ser Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Ala Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Ile Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Ile Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Ser Thr Met Ile Ser Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Ile Leu Ile Asp Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
595 600 605

Leu Leu Ser Val Leu Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Phe
610 615 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Lys Gln His
625 630 635 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 157
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 157
Met His Asn Lys Thr Pro Lys Gly Ser Lys Thr Pro Thr Pro Thr Gln
1 5 10 15

Gln Asp Pro Pro Pro Gln His Ser Ile Lys Ser Ala Gly Ala Lys Ala
20 25 30

Ser Gln Ala Arg His Asn Thr Thr Ser Ala His Gln Ser Thr Arg His
35 40 45

```
Gly Pro Arg Ile Ser Asp Arg Pro Thr His Tyr Ile Met Asn Arg Thr
    50                  55                  60

Arg Cys Cys Lys Gln Ala Ser Tyr Arg Ser Asp Asn Ile Pro Ala His
65                  70                  75                  80

Gly Asp His Glu Cys Ile Ile His His Thr Pro Glu Ser Val Ser Gln
                85                  90                  95

Gly Val Arg Ser Arg Phe Lys Arg Arg Gln Ser Asn Ala Thr Ser Ser
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Val Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Ser Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Ala Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Ile Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Ile Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Ser Thr Met Ile Ser Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Ile Leu Ile Asp Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
595 600 605

Leu Leu Ser Val Leu Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Phe
610 615 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Lys Gln His
625 630 635 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 158
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 158
Met His Asn Lys Ile Pro Lys Gly Ser Lys Thr Pro Thr Pro Thr Gln
1 5 10 15

Gln Asp Pro Pro Pro Gln His Ser Ile Lys Ser Ala Glu Thr Lys Thr
20 25 30

Ser Gln Ala Arg Tyr Asn Ile Thr Ser Ala Gln Gln Ser Thr Arg His
35 40 45

```
Gly Pro Arg Thr Ser Asp Arg Pro Val His Tyr Ile Met Asn Arg Thr
    50                  55                  60

Arg Ser Cys Lys Gln Ala Ser Tyr Arg Ser Asp Asn Ile Pro Ala His
65                  70                  75                  80

Gly Asp His Glu Gly Ile Ile His His Thr Pro Glu Ser Val Ser Gln
                85                  90                  95

Gly Val Arg Ser Arg Phe Lys Arg Arg Gln Ser Asn Ala Thr Ser Ser
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Val Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Ser Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Ile Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Ile Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

```
Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
        515                 520                 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
    530                 535                 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545                 550                 555                 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
                565                 570                 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Ile Leu Ile Asp Ser Ser
            580                 585                 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
        595                 600                 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Phe
    610                 615                 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Lys Gln His
625                 630                 635                 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
                645                 650                 655

Ser Tyr Val Arg Ser Leu
            660


<210> 159
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 159
Met His Asn Lys Ile Pro Lys Gly Ser Lys Ile Pro Thr Pro Thr Gln
1               5                   10                  15

Gln Asp Pro Ser Pro Gln His Ser Ile Lys Ser Ala Glu Thr Lys Thr
            20                  25                  30

Ser Gln Ala Arg His Asn Thr Thr Ser Ala Gln Arg Pro Thr Arg His
        35                  40                  45
```

```
Gly Pro Arg Thr Ser Asp Arg Pro Val His Tyr Ile Met Asn Arg Thr
    50                  55                  60

Arg Pro Cys Lys Gln Ala Ser Tyr Arg Ser Asp Asn Ile Pro Ala His
65                  70                  75                  80

Glu Asp His Glu Gly Ile Ile His His Thr Pro Glu Ser Val Ser Gln
                85                  90                  95

Gly Val Arg Ser Arg Phe Lys Arg Arg Gln Ser Asn Ala Thr Ile Ser
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Ser Ser Val Leu Glu Pro Ile Ser Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Ile Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Ile Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Ile Leu Ile Asp Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Lys Arg Ser Ser Phe Asn Phe Gly Ser
595 600 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Val Leu Leu Phe
610 615 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Lys Gln His
625 630 635 640

Thr Arg Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 160
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 160
Met His Asn Lys Ile Pro Lys Gly Ser Lys Ile Leu Thr Pro Thr Gln
1 5 10 15

Gln Asp Leu Pro Gln Arg His Asn Ile Lys Ser Ala Glu Thr Arg Thr
20 25 30

Ser Pro Ala Arg His Ser Ile Thr Ser Ala Arg Arg Ser Thr Arg His
35 40 45

```
Gly Pro Arg Thr Ser Asp Arg Pro Val His Tyr Ile Met Asn Arg Thr
    50                  55                  60

Arg Ser Cys Lys Gln Ala Ser His Arg Ser Asp Asn Ile Pro Ala His
65                  70                  75                  80

Gly Asp His Glu Gly Ile Val His His Thr Pro Glu Ser Val Ser Gln
                85                  90                  95

Gly Met Arg Ser Arg Phe Lys Arg Arg Gln Ser Ser Ala Thr Ser Ser
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Ser Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile Gln Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

```
Gly Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
        515                 520                 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
    530                 535                 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545                 550                 555                 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
                565                 570                 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Ile Leu Ile Asp Ser Ser
            580                 585                 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
        595                 600                 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Val Leu Leu Phe
    610                 615                 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Lys Gln His
625                 630                 635                 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
                645                 650                 655

Ser Tyr Val Arg Ser Leu
            660


<210> 161
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 161
Met His Asn Lys Ile Pro Lys Gly Ser Lys Thr Leu Thr Thr Thr Gln
1               5                   10                  15

Gln Asp Phe Pro Gln Arg His Ser Ile Lys Ser Ala Glu Thr Gln Thr
            20                  25                  30

Ser Gln Ala Arg His Ser Ile Thr Ser Ala Gln Arg Ser Ala Arg His
        35                  40                  45
```

```
Gly Pro Arg Thr Ser Asp Arg Pro Val His Tyr Ile Met Asn Arg Thr
    50                  55                  60

Arg Ser Cys Lys Gln Ala Ser Tyr Arg Ser Asp Asn Ile Pro Ala His
65                  70                  75                  80

Lys Asp His Glu Gly Ile Ile His His Thr Pro Glu Arg Val Ser Gln
                85                  90                  95

Gly Met Arg Phe Arg Phe Lys Arg Arg Gln Ser Ser Ala Thr Ser Ser
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Ser Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Ile Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

```
Gly Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
        515                 520                 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
    530                 535                 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545                 550                 555                 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
                565                 570                 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Ile Leu Ile Asp Ser Ser
            580                 585                 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
        595                 600                 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Ile Ala Leu Val Leu Leu Phe
    610                 615                 620

Leu Ile Cys Cys Cys Lys Arg Arg Tyr Leu Gln Thr Leu Lys Gln His
625                 630                 635                 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
                645                 650                 655

Ser Tyr Val Arg Ser Leu
            660
```

<210> 162
<211> 661
<212> PRT
<213> Morbillivirus canino

<400> 162

```
Met His Asn Lys Ile Pro Lys Gly Ser Lys Thr Leu Thr Thr Thr Gln
1               5                   10                  15

Gln Asp Phe Pro Gln Arg His Ser Ile Lys Ser Ala Glu Thr Gln Thr
            20                  25                  30

Ser Gln Ala Arg His Ser Ile Thr Ser Ala Gln Arg Ser Ala Arg His
        35                  40                  45
```

```
Gly Pro Arg Thr Ser Asp Arg Pro Val His Tyr Ile Met Asn Arg Thr
    50                  55                  60

Arg Ser Cys Lys Gln Ala Ser Tyr Arg Ser Asp Asn Ile Pro Ala His
65                  70                  75                  80

Lys Asp His Glu Gly Ile Ile His His Thr Pro Glu Arg Val Ser Gln
                85                  90                  95

Gly Met Arg Phe Arg Phe Lys Arg Arg Gln Ser Ser Ala Thr Ser Ser
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Lys Leu Met Pro Asn Val Ser Leu Ile
                165                 170                 175

Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu Ser
            180                 185                 190

Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys Asn
        195                 200                 205

Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg Phe
    210                 215                 220

Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala Ala
225                 230                 235                 240

Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala Gln
                245                 250                 255

Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala Ile
            260                 265                 270

Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Ile Ile Ala Val Gln Gly
        275                 280                 285
```

```
Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His Met
    290                 295                 300

Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg Tyr
305                 310                 315                 320

Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro Ile
                325                 330                 335

Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly Glu
            340                 345                 350

Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met Ile
        355                 360                 365

Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val Asp
    370                 375                 380

Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu Ser
385                 390                 395                 400

Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr Asn
                405                 410                 415

Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala Thr
            420                 425                 430

Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe Val
        435                 440                 445

Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser Pro
    450                 455                 460

Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg Thr
465                 470                 475                 480

Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly Asn
                485                 490                 495

Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr Gly
            500                 505                 510
```

Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala Ser
515 520 525

Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val Gly
530 535 540

Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu Gly
545 550 555 560

Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly Asn
565 570 575

Ala Leu Lys Lys Leu Asp Asp Ala Lys Ile Leu Ile Asp Ser Ser Asn
580 585 590

Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser Leu
595 600 605

Leu Ser Val Pro Ile Leu Ile Cys Ile Ala Leu Val Leu Leu Phe Leu
610 615 620

Ile Cys Cys Cys Lys Arg Arg Tyr Leu Gln Thr Leu Lys Gln His Thr
625 630 635 640

Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys Ser
645 650 655

Tyr Val Arg Ser Leu
660

<210> 163
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 163
Met His Asn Lys Ile Pro Lys Gly Ser Lys Thr Leu Thr Thr Thr Gln
1 5 10 15

Gln Asp Phe Pro Lys Arg His Ser Ile Lys Ser Ala Glu Thr Gln Thr
20 25 30

Ser Gln Ala Arg His Ser Ile Thr Ser Ala Gln Arg Ser Thr Arg His
35 40 45

```
Gly Pro Arg Thr Ser Asp Arg Pro Val His Tyr Ile Met Asn Arg Thr
    50                  55                  60

Arg Ser Cys Lys Gln Ala Ser Tyr Arg Ser Asp Asn Ile Pro Ala His
65                  70                  75                  80

Gly Asp His Glu Gly Ile Ile His His Thr Pro Glu Arg Val Ser Gln
                85                  90                  95

Gly Met Arg Phe Arg Phe Lys Arg Arg Gln Ser Ser Ala Thr Ser Ser
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser Asn Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Thr Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Ser Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Ile Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Ile Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Gly Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
595 600 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Val Leu Leu Phe
610 615 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Leu Gln Thr Leu Lys Gln His
625 630 635 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 164
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 164
Met His Asn Lys Ile Pro Lys Gly Ser Lys Thr Leu Thr Pro Thr Gln
1 5 10 15

Gln Asp Leu Pro Gln Arg His Ser Ile Lys Ser Ala Glu Thr Gln Thr
20 25 30

Ser Gln Ala Arg His Ser Ile Thr Ser Ala His Arg Ser Ala Arg His
35 40 45

```
Gly Pro Arg Thr Ser Asp Arg Pro Val His Tyr Ile Met Asn Arg Thr
    50                  55                  60

Arg Pro Cys Lys Gln Ala Gly Tyr Arg Ser Asp Asn Ile Pro Ala His
65                  70                  75                  80

Gly Asp His Glu Gly Ile Ile His His Thr Pro Glu Arg Val Ser Gln
                85                  90                  95

Gly Met Arg Ser Arg Phe Lys Arg Arg Gln Ser Ser Ala Thr Ser Ser
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser Arg Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Ser Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Ile Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln Gln
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

```
Gly Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
        515                 520                 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
    530                 535                 540

Gly Gly Arg Gln Tyr Pro Asp Ile Val Tyr Glu Ser Lys Val Ala Leu
545                 550                 555                 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
                565                 570                 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Ile Leu Ile Asp Ser Ser
            580                 585                 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
        595                 600                 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Val Leu Leu Phe
    610                 615                 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Lys Gln His
625                 630                 635                 640

Thr Lys Ile Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
                645                 650                 655

Ser Tyr Val Arg Ser Leu
            660
```

<210> 165
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 165

```
Met His Asn Lys Ile Pro Lys Arg Ser Lys Thr Gln Thr His Thr Gln
1               5                   10                  15

Gln Asp Leu Pro Pro Gln His Ser Thr Glu Leu Ala Glu Thr Lys Thr
            20                  25                  30

Ser Arg Ala Arg His Ser Thr Thr Ser Ala Gln Arg Ser Thr His Tyr
        35                  40                  45
```

```
Gly Pro Leu Thr Ser Asp Arg Pro Ile His Tyr Thr Met Asn Arg Ile
    50                  55                  60

Arg Ser Arg Lys Gln Ala Ser His Arg Ser Glu Asn Ile Pro Val His
65                  70                  75                  80

Gly Asn His Glu Gly Thr Ile His His Thr Pro Gly Ser Val Ser Gln
                85                  90                  95

Gly Ala Gly Ser Arg Leu Lys Arg Arg Gln Ser Asn Ala Ile Asn Ser
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Leu Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Ala Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Glu Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Leu Gly Ser Ala Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Val Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Ile Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Ile Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Pro Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Ser Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

```
Gly Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
        515                 520                 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
    530                 535                 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545                 550                 555                 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
                565                 570                 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
            580                 585                 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
        595                 600                 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Phe
    610                 615                 620

Met Ile Tyr Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Lys Gln Asn
625                 630                 635                 640

Ala Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
                645                 650                 655

Ser Tyr Val Arg Ser Leu
            660
```

<210> 166
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 166

```
Met His Asn Lys Ile Pro Lys Arg Ser Asn Thr Arg Thr His Thr Gln
1               5                   10                  15

Gln Asp Leu Pro Pro Gln Pro Ser Thr Lys Ser Ala Glu Thr Lys Thr
            20                  25                  30

Ser Gln Ala Arg His Ser Ile Thr Ser Ala Arg Arg Ser Thr His His
        35                  40                  45
```

```
Asp Pro Leu Thr Ser Asp Arg Pro Ile His Tyr Ile Met Asn Arg Ile
    50                  55                  60

Arg Ser Cys Lys Gln Thr Ser Tyr Arg Ser Asp Asn Ile Pro Ala His
65                  70                  75                  80

Gly Asp His Glu Gly Ile Ile His His Thr Pro Gly Ser Val Pro Gln
                85                  90                  95

Gly Ser Gly Ser Gln Ile Lys Arg Arg Gln Ser Asn Ala Ile Asn Ser
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Val Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Ala Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Glu Asn Cys Thr Lys Ala Lys Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Leu Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Ser Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Pro Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Gly Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
595 600 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
610 615 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Lys Gln Asn
625 630 635 640

Ala Lys Val Asp Pro Ala Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 167
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 167
Met His Asn Lys Ile Pro Lys Arg Ser Asn Thr Arg Lys His Thr Gln
1 5 10 15

Gln Asp Leu Pro Pro Gln His Ser Thr Lys Ser Ala Glu Thr Lys Thr
20 25 30

Ser Gln Ala Arg His Ser Thr Thr Ser Ala Arg Arg Ser Thr His His
35 40 45

```
Gly Pro Leu Thr Ser Asp Arg Pro Ile His Tyr Ile Met Asn Arg Ile
    50                  55                  60

Arg Ser Cys Lys Gln Ala Ser His Arg Ser Asp Asn Ile Pro Ala His
65                  70                  75                  80

Gly Asp His Glu Gly Thr Ile His His Thr Pro Gly Ser Val Ser Gln
                85                  90                  95

Gly Ala Gly Ser Arg Leu Lys Arg Arg Gln Ser Asn Ala Thr Asn Ser
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Val Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Pro Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

```
Gly Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
        515                 520                 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
    530                 535                 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545                 550                 555                 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
                565                 570                 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
            580                 585                 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
        595                 600                 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
    610                 615                 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Lys Gln Asn
625                 630                 635                 640

Ala Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
                645                 650                 655

Ser Tyr Val Arg Ser Leu
            660
```

<210> 168
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 168

```
Met His Asn Lys Ile Pro Lys Arg Ser Asn Thr Arg Lys His Thr Gln
1               5                   10                  15

Gln Asp Leu Pro Pro Gln His Ser Thr Lys Ser Ala Glu Thr Lys Thr
            20                  25                  30

Ser Gln Ala Arg His Ser Thr Thr Ser Ala Arg Arg Ser Thr His His
        35                  40                  45
```

```
Gly Pro Leu Thr Ser Asp Arg Pro Ile His Tyr Ile Met Asn Arg Ile
    50                  55                  60

Arg Ser Cys Lys Gln Ala Ser His Arg Ser Asp Asn Ile Pro Ala His
65                  70                  75                  80

Gly Asp His Glu Gly Thr Ile His His Thr Pro Gly Ser Val Ser Gln
                85                  90                  95

Gly Ala Gly Ser Arg Leu Lys Arg Arg Gln Ser Asn Ala Thr Asn Ser
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Val Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Pro Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

```
Gly Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
        515                 520                 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
    530                 535                 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545                 550                 555                 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
                565                 570                 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
            580                 585                 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
        595                 600                 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
    610                 615                 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Lys Gln Asn
625                 630                 635                 640

Ala Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
                645                 650                 655

Ser Tyr Val Arg Ser Leu
            660
```

<210> 169
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 169

```
Met His Asn Lys Ile Pro Lys Arg Ser Asn Thr Arg Lys His Thr Gln
1               5                   10                  15

Gln Asp Leu Pro Pro Gln His Ser Thr Lys Ser Ala Glu Thr Lys Thr
            20                  25                  30

Ser Gln Ala Arg His Ser Thr Thr Ser Ala Arg Arg Ser Thr His His
        35                  40                  45
```

```
Gly Pro Leu Thr Ser Asp Arg Pro Ile His Tyr Ile Met Asn Arg Ile
    50                  55                  60

Arg Ser Cys Lys Gln Ala Ser His Arg Ser Asp Asn Ile Pro Ala His
65                  70                  75                  80

Gly Asp His Glu Gly Thr Ile His His Thr Pro Gly Ser Val Ser Gln
                85                  90                  95

Gly Ala Gly Ser Arg Leu Lys Arg Arg Gln Ser Asn Ala Thr Asn Ser
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Pro Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Gly Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
595 600 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
610 615 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Lys Gln Asn
625 630 635 640

Ala Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 170
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 170
Met His Asn Lys Ile Pro Lys Arg Ser Asn Thr Arg Lys His Thr Gln
1 5 10 15

Gln Asp Leu Pro Pro Gln His Ser Thr Lys Ser Ala Glu Thr Lys Thr
20 25 30

Ser Gln Ala Arg His Ser Thr Thr Ser Ala Arg Arg Ser Thr His His
35 40 45

```
Gly Pro Leu Thr Ser Asp Arg Pro Ile His Tyr Ile Met Asn Arg Ile
    50                  55                  60

Arg Ser Cys Lys Gln Ala Ser His Arg Ser Asp Asn Ile Pro Ala His
65                  70                  75                  80

Gly Asp His Glu Gly Thr Ile His His Thr Pro Gly Ser Val Ser Gln
                85                  90                  95

Gly Ala Gly Ser Arg Leu Lys Arg Arg Gln Ser Asn Ala Thr Asn Ser
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Ala Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

```
Gly Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
        515                 520                 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
    530                 535                 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545                 550                 555                 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
                565                 570                 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
            580                 585                 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
        595                 600                 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
    610                 615                 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Lys Gln Asn
625                 630                 635                 640

Thr Lys Val Ala Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
                645                 650                 655

Ser Tyr Val Lys Ser Leu
            660
```

<210> 171
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 171

```
Met His Asn Lys Ile Pro Lys Arg Ser Lys Thr Arg Lys His Thr Gln
1               5                   10                  15

Gln Asp Leu Pro Gln Gln His Ser Thr Lys Ser Ala Glu Thr Lys Thr
            20                  25                  30

Ser Gln Ala Arg His Ser Thr Thr Ser Ala Gln Arg Ser Ala His His
        35                  40                  45
```

```
Gly Ser Leu Thr Ser Asp Arg Pro Val His Tyr Ile Met Asn Arg Val
    50                  55                  60

Arg Ser Cys Lys Gln Ala Gly His Lys Ser Asp Asn Ile Pro Ala His
65                  70                  75                  80

Gly Asp His Glu Gly Thr Ile His His Thr Pro Gly Ser Val Ser Gln
                85                  90                  95

Gly Ala Gly Ser Arg Leu Lys Arg Arg Gln Ser Asn Ala Thr Asn Ser
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Thr Thr Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Ser Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Ser Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Lys Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Pro Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

```
Gly Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
        515                 520                 525

Ser Asp Ile Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
    530                 535                 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545                 550                 555                 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
                565                 570                 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
            580                 585                 590

Asn Gln Ile Leu Asp Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
        595                 600                 605

Leu Leu Ser Val Pro Leu Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
    610                 615                 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Lys Gln Asn
625                 630                 635                 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
                645                 650                 655

Ser Tyr Val Arg Ser Leu
            660
```

<210> 172
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 172

```
Met His Asn Lys Ile Pro Lys Arg Ser Arg Thr Gln Thr His Thr Gln
1               5                   10                  15

Gln Asp Leu Pro Pro Gln His Ser Thr Lys Ser Ala Glu Thr Lys Thr
            20                  25                  30

Ser Gln Thr Arg His Ser Ile Thr Pro Ala Gln Arg Ser Thr His His
        35                  40                  45
```

```
Gly Pro Arg Thr Ser Asp Arg Pro Val His Tyr Ile Met Asn Arg Thr
    50                  55                  60

Arg Ser Cys Lys Gln Ala Ser Tyr Arg Ser Asp Asn Ile Pro Ala His
65                  70                  75                  80

Gly Asp His Glu Gly Ile Ile His His Thr Pro Glu Ser Val Ser Gln
                85                  90                  95

Gly Ala Arg Ser Arg Phe Lys Arg Arg Gln Ser Asn Ala Thr Asn Ser
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Ile Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Ile Thr Val Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
580 585 590

Asn His Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
595 600 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
610 615 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Lys Gln Asn
625 630 635 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 173
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 173
Met His Asn Lys Ile Pro Glu Arg Ser Arg Ile Gln Thr His Thr Gln
1 5 10 15

Gln Asp Leu Pro Gln Gln Tyr Ser Thr Lys Ser Val Glu Thr Glu Thr
20 25 30

Ser Gln Ala Arg His Ser Thr Thr Ser Ala Gln Arg Ser Met His His
35 40 45

```
Gly Pro Leu Thr Leu Glu Arg Pro Val His Tyr Ile Met Asn Arg Thr
    50                  55                  60

Arg Ser Arg Lys Gln Ala Ser Tyr Arg Ser Asp Asn Ile Pro Ala His
65                  70                  75                  80

Gly Asp His Glu Gly Ile Ile His His Lys Pro Glu Ser Val Ser Gln
                85                  90                  95

Gly Thr Arg Ser Gln Phe Lys Arg Arg Arg Ser Asp Ala Thr Asn Ser
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Ile Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ser Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Ile Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Ala Leu Ile Glu Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Leu Asn Phe Gly Ser
595 600 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
610 615 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Lys Gln Asn
625 630 635 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 174
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 174
Met His Asn Lys Ile Pro Glu Arg Ser Arg Ile Gln Thr His Thr Gln
1 5 10 15

Gln Asp Leu Pro Gln Gln Tyr Ser Thr Lys Ser Val Glu Thr Glu Thr
20 25 30

Ser Gln Ala Arg His Ser Thr Thr Ser Ala Gln Arg Ser Met His His
35 40 45

```
Gly Pro Leu Thr Leu Asp Arg Pro Val His Tyr Ile Met Asn Arg Thr
    50                  55                  60

Arg Ser Arg Lys Gln Ala Ser Tyr Arg Ser Asp Asn Ile Pro Ala His
65                  70                  75                  80

Gly Asp His Glu Gly Ile Ile His His Lys Pro Glu Ser Val Ser Gln
                85                  90                  95

Gly Thr Arg Ser Gln Phe Lys Arg Arg Arg Ser Asp Ala Thr Asn Ser
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Ile Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ser Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Ile Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Gln Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Ala Leu Ile Glu Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Leu Asn Phe Gly Ser
595 600 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
610 615 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Lys Gln Asn
625 630 635 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 175
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 175
Met His Asn Lys Ile Pro Glu Arg Ser Arg Ile Gln Thr His Thr Gln
1 5 10 15

Gln Asp Leu Pro Gln Gln Tyr Ser Thr Lys Ser Val Glu Thr Glu Thr
20 25 30

Ser Gln Ala Arg His Ser Thr Thr Ser Ala Gln Arg Ser Met His His
35 40 45

```
Gly Pro Leu Thr Leu Asp Arg Pro Val His Tyr Ile Met Asn Arg Thr
    50                  55                  60

Arg Ser Arg Lys Gln Ala Ser Tyr Arg Ser Asp Asn Ile Pro Ala His
65                  70                  75                  80

Gly Asp His Glu Gly Ile Ile His His Lys Pro Glu Ser Val Ser Gln
                85                  90                  95

Gly Thr Arg Ser Gln Phe Lys Arg Arg Arg Ser Asp Ala Thr Asn Ser
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Ile Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ser Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Ile Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Gln Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Ala Leu Ile Glu Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Leu Asn Phe Gly Ser
595 600 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
610 615 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Lys Gln Asn
625 630 635 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 176
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 176
Met His Asn Lys Ile Pro Glu Arg Ser Arg Ile Gln Thr His Thr Gln
1 5 10 15

Gln Asp Leu Pro Gln Gln His Ser Thr Lys Ser Val Glu Thr Asp Thr
20 25 30

Ser Gln Ala Arg His Ser Thr Thr Ser Ala Gln Arg Ser Met His His
35 40 45

```
Gly Pro Leu Thr Leu Asp Arg Pro Val His Tyr Ile Met Ser Arg Thr
    50                  55                  60

Arg Ser Arg Lys Gln Ala Ser Asp Arg Ser His Asn Ile Pro Ala His
65                  70                  75                  80

Gly Asp His Lys Gly Ile Ile His His Lys Pro Glu Ser Val Ser Gln
                85                  90                  95

Gly Ala Gly Ser Gln Phe Lys Lys Arg Arg Tyr Asp Thr Thr Asn Ser
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Ile Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ser Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Ile Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Ile Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

```
Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
        515                 520                 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
    530                 535                 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545                 550                 555                 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
                565                 570                 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Glu Ser Ser
            580                 585                 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Pro Ser Leu Ser Phe Ser Ser
        595                 600                 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
    610                 615                 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Lys Gln Asn
625                 630                 635                 640

Thr Lys Val Asp Leu Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
                645                 650                 655

Ser Tyr Val Arg Ser Leu
            660
```

<210> 177
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 177

```
Met His Asn Lys Ile Pro Glu Arg Ser Arg Ile Gln Thr His Thr Gln
1               5                   10                  15

Gln Asp Leu Pro Gln Gln His Ser Thr Lys Ser Val Glu Thr Asp Thr
            20                  25                  30

Ser Gln Ala Arg His Ser Thr Thr Ser Ala Gln Arg Ser Met His His
        35                  40                  45
```

```
Gly Pro Leu Thr Leu Asp Arg Pro Val His Tyr Ile Met Ser Arg Thr
    50                  55                  60

Arg Ser Arg Lys Gln Ala Ser Tyr Arg Ser His Asn Ile Pro Ala His
65                  70                  75                  80

Gly Asp His Lys Gly Ile Ile His His Lys Pro Glu Ser Val Ser Gln
                85                  90                  95

Gly Ala Gly Ser Gln Phe Lys Lys Arg Arg Tyr Asp Thr Thr Asn Ser
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Ile Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ser Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Ile Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Glu Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Pro Ser Leu Ser Phe Ser Ser
595 600 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
610 615 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Lys Gln Asn
625 630 635 640

Thr Lys Val Asp Leu Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 178
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 178
Met His Glu Lys Ile Pro Lys Arg Ser Lys Thr Gln Thr His Thr Gln
1 5 10 15

Gln Asp Leu Pro Gln Gln His Ser Thr Lys Ser Ala Glu Ser Lys Thr
20 25 30

Ser Arg Ala Arg His Ser Ile Thr Ser Ala Gln Arg Ser Thr His Tyr
35 40 45

```
Asp Pro Arg Thr Ala Asp Trp Pro Asp Tyr Tyr Ile Met Lys Arg Thr
    50                  55                  60

Arg Ser Cys Lys Gln Ala Ser Tyr Arg Ser Asp Asn Ile Pro Ala His
65                  70                  75                  80

Gly Asp His Asp Gly Ile Ile His His Thr Pro Glu Ser Val Ser Gln
                85                  90                  95

Gly Ala Lys Ser Arg Leu Lys Met Gly Gln Ser Asn Ala Val Lys Ser
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Val Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Asp Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Ser Ser Ile Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Phe Ile Ile Leu Ser Val Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
595 600 605

Leu Leu Ser Val Pro Ile Leu Ser Cys Thr Ala Leu Ala Leu Leu Leu
610 615 620

Leu Ile Cys Cys Cys Lys Arg Arg Tyr Gln Gln Thr His Lys Gln Asn
625 630 635 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Arg
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 179
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 179
Met His Glu Lys Ile Pro Lys Arg Ser Lys Thr Gln Thr His Thr Gln
1 5 10 15

Gln Asp Leu Pro Gln Gln His Ser Thr Lys Ser Ala Glu Ser Lys Thr
20 25 30

Ser Arg Ala Arg His Ser Ile Thr Ser Ala Gln Arg Ser Thr His Tyr
35 40 45

```
Asp Pro Arg Thr Ala Asp Trp Pro Asp Tyr Tyr Ile Met Lys Arg Thr
    50                  55                  60

Arg Ser Cys Lys Gln Ala Ser Tyr Arg Ser Asp Asn Ile Pro Ala His
65                  70                  75                  80

Gly Asp His Asp Gly Ile Ile His His Thr Pro Glu Ser Val Ser Gln
                85                  90                  95

Gly Ala Lys Ser Arg Leu Lys Met Gly Gln Ser Asn Ala Val Lys Ser
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Val Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Asp Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Ser Ser Ile Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Phe Ile Ile Leu Ser Val Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
595 600 605

Leu Leu Ser Val Pro Ile Leu Ser Cys Thr Ala Leu Ala Leu Leu Leu
610 615 620

Leu Ile Cys Cys Cys Lys Arg Arg Tyr Gln Gln Thr His Lys Gln Asn
625 630 635 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Arg
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 180
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 180
Met His Glu Lys Ile Pro Lys Arg Ser Lys Thr Gln Thr His Thr Gln
1 5 10 15

Gln Asp Leu Pro Gln Gln His Ser Thr Lys Ser Ala Glu Ser Lys Thr
20 25 30

Ser Arg Ala Arg His Ser Ile Thr Ser Ala Gln Arg Ser Thr His Tyr
35 40 45

```
Asp Pro Arg Thr Ala Asp Trp Pro Asp Tyr Tyr Ile Met Lys Arg Thr
    50                  55                  60

Arg Ser Cys Lys Gln Ala Ser Tyr Arg Ser Asp Asn Ile Pro Ala His
65                  70                  75                  80

Gly Asp His Asp Gly Ile Ile His His Thr Pro Glu Ser Val Ser Gln
                85                  90                  95

Gly Ala Lys Ser Arg Leu Lys Met Gly Gln Ser Asn Ala Val Lys Ser
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Val Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Asp Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Ser Ser Ile Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Phe Ile Ile Leu Ser Val Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
530 535 540

Gly Ser Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
595 600 605

Leu Leu Ser Val Pro Ile Leu Ser Cys Thr Ala Leu Ala Leu Leu Leu
610 615 620

Leu Ile Cys Cys Cys Lys Arg Arg Tyr Gln Gln Thr His Lys Gln Asn
625 630 635 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Arg
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 181
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 181
Met His Glu Lys Ile Pro Lys Arg Ser Lys Thr Gln Thr His Thr Gln
1 5 10 15

Gln Asp Leu Pro Gln Gln His Ser Thr Lys Ser Ala Glu Ser Lys Thr
20 25 30

Ser Arg Ala Arg His Ser Ile Thr Ser Ala Gln Arg Ser Thr His Tyr
35 40 45

```
Asp Pro Arg Thr Ala Asp Trp Pro Asp Tyr Tyr Ile Met Lys Arg Thr
    50                  55                  60

Arg Ser Cys Lys Gln Ala Ser Tyr Arg Ser Asp Asn Ile Pro Ala His
65                  70                  75                  80

Gly Asp His Asp Gly Ile Ile His His Thr Pro Glu Ser Val Ser Gln
                85                  90                  95

Gly Ala Lys Ser Arg Leu Lys Met Gly Gln Ser Asn Ala Val Lys Ser
            100                 105                 110

Gly Ser Gln Tyr Thr Trp Leu Val Leu Trp Cys Ile Gly Val Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Asp Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Ser Ser Ile Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Phe Ile Ile Leu Ser Val Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

```
Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
        515                 520                 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
    530                 535                 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545                 550                 555                 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
                565                 570                 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
            580                 585                 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
        595                 600                 605

Leu Leu Ser Val Pro Ile Leu Ser Cys Thr Ala Leu Ala Leu Leu Leu
    610                 615                 620

Leu Ile Cys Cys Cys Lys Arg Arg Tyr Gln Gln Thr His Lys Gln Asn
625                 630                 635                 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Ala Ser Arg
                645                 650                 655

Ser Tyr Val Arg Ser Leu
            660
```

<210> 182
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 182

```
Met His Lys Lys Ile Pro Lys Arg Ser Lys Thr Gln Thr His Thr Gln
1               5                   10                  15

Gln Asp Leu Pro Gln Gln His Ser Thr Lys Ser Ala Glu Ser Lys Thr
            20                  25                  30

Ser Arg Ala Arg His Ser Ile Thr Ser Ala Gln Arg Ser Thr His Tyr
        35                  40                  45
```

```
Asp Pro Arg Thr Ala Asp Trp Pro Asp Tyr Tyr Ile Met Lys Arg Thr
    50                  55                  60

Arg Ser Cys Lys Gln Ala Ser Tyr Arg Ser Asp Asn Ile Pro Ala His
65                  70                  75                  80

Gly Asp His Asp Gly Ile Ile His His Thr Pro Glu Ser Val Ser Gln
                85                  90                  95

Gly Ala Lys Ser Arg Leu Lys Met Gly Gln Ser Asn Ala Val Lys Ser
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Val Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Asp Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Phe Ile Ile Leu Ser Val Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

```
Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
        515                 520                 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
    530                 535                 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545                 550                 555                 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
                565                 570                 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
            580                 585                 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
        595                 600                 605

Leu Leu Ser Val Pro Ile Leu Ser Cys Thr Ala Leu Ala Leu Leu Leu
    610                 615                 620

Leu Ile Cys Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Lys Gln Asn
625                 630                 635                 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
                645                 650                 655

Ser Tyr Val Arg Ser Leu
            660


<210> 183
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 183
Met His Lys Glu Ile Pro Glu Arg Ser Arg Thr Gln Thr His Thr Gln
1               5                   10                  15

Gln Asp Leu Pro Gln Gln Lys Ser Thr Glu Tyr Thr Glu Ile Lys Thr
            20                  25                  30

Ser Arg Ala Arg His Gly Ile Thr Pro Ala Gln Arg Ser Thr His Tyr
        35                  40                  45
```

```
Gly Pro Arg Thr Leu Asp Arg Leu Val Cys Tyr Ile Met Asn Arg Ala
    50                  55                  60

Met Ser Cys Lys Gln Ala Ser Tyr Arg Ser Asp Asn Ile Pro Ala His
65                  70                  75                  80

Gly Asp His Glu Gly Val Val His His Thr Leu Glu Ser Val Ser Gln
                85                  90                  95

Gly Ala Arg Ser Gln Leu Lys Arg Arg Pro Ser Asn Ala Ile Asn Ser
            100                 105                 110

Gly Phe Gln Tyr Ile Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Val Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Arg Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Phe Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

```
Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
        515                 520                 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
    530                 535                 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545                 550                 555                 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
                565                 570                 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
            580                 585                 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
        595                 600                 605

Leu Leu Ser Val Pro Ile Leu Ser Cys Ala Val Leu Ala Leu Leu Leu
    610                 615                 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Lys Arg Asn
625                 630                 635                 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ala Lys
                645                 650                 655

Ser Tyr Val Arg Ser Leu
            660
```

<210> 184
<211> 662
<212> PRT
<213> Morbillivirus canino

```
<400> 184
Met His Lys Glu Ile Pro Glu Arg Ser Arg Thr Gln Thr His Thr Gln
1               5                   10                  15

Gln Asp Leu Pro Gln Gln Lys Ser Thr Glu Tyr Thr Glu Ile Lys Thr
            20                  25                  30

Ser Arg Ala Arg His Gly Ile Thr Pro Ala Gln Arg Ser Thr His Tyr
        35                  40                  45
```

```
Gly Pro Arg Thr Leu Asp Arg Leu Val Cys Tyr Ile Met Asn Arg Ala
    50                  55                  60

Met Ser Cys Lys Gln Ala Ser Tyr Arg Ser Asp Asn Ile Pro Ala His
65                  70                  75                  80

Gly Asp His Glu Gly Val Val His His Thr Leu Glu Ser Val Ser Gln
                85                  90                  95

Gly Ala Arg Ser Gln Leu Lys Arg Arg Pro Ser Asn Ala Ile Asn Ser
            100                 105                 110

Gly Phe Gln Tyr Ile Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Ile Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Arg Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Phe Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

```
Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
        515                 520                 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
    530                 535                 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545                 550                 555                 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
                565                 570                 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
            580                 585                 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
        595                 600                 605

Leu Leu Ser Val Pro Ile Leu Ser Cys Ala Val Leu Ala Leu Leu Leu
    610                 615                 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Lys Arg Asn
625                 630                 635                 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
                645                 650                 655

Ser Tyr Val Arg Ser Leu
            660
```

<210> 185
<211> 662
<212> PRT
<213> Morbillivirus canino

```
<400> 185
Met His Lys Glu Ile Pro Glu Lys Ser Arg Thr Arg Thr His Thr Gln
1               5                   10                  15

Gln Asp Leu Pro Gln Gln Lys Ser Thr Glu Tyr Thr Glu Ile Lys Thr
            20                  25                  30

Ser Arg Ala Arg His Gly Ile Thr Pro Ala Gln Arg Ser Thr His Tyr
        35                  40                  45
```

```
Gly Pro Arg Thr Leu Asp Arg Leu Val Cys Tyr Ile Met Asn Arg Ala
    50                  55                  60

Met Ser Cys Lys Gln Ala Ser Tyr Arg Ser Asp Asn Ile Pro Ala His
65                  70                  75                  80

Gly Asp His Glu Gly Val Val His His Thr Pro Glu Ser Val Ser Gln
                85                  90                  95

Gly Ala Arg Ser Gln Leu Lys Arg Arg Thr Ser Asn Ala Ile Asn Ser
            100                 105                 110

Gly Phe Gln Tyr Ile Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Ile Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Thr Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Arg Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Phe Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Ile Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

```
Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
        515                 520                 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
    530                 535                 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545                 550                 555                 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
                565                 570                 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
            580                 585                 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
        595                 600                 605

Leu Leu Ser Val Pro Ile Leu Ser Cys Ala Ala Leu Ala Leu Leu Leu
    610                 615                 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Lys Arg Asn
625                 630                 635                 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
                645                 650                 655

Ser Tyr Val Arg Ser Leu
            660


<210> 186
<211> 659
<212> PRT
<213> Morbillivirus canino

<400> 186
Met His Lys Lys Ile Pro Glu Arg Ser Arg Thr Tyr Thr His Thr Gln
1               5                   10                  15

Gln Asp Leu Pro Gln Gln Asp Asn Thr Lys Tyr Thr Glu Ile Lys Thr
            20                  25                  30

Ser Arg Ala Arg His Gly Ile Thr Ser Ala Gln Arg Ser Thr His Tyr
        35                  40                  45
```

```
Gly Pro Arg Thr Leu Asp Arg Leu Val Tyr Tyr Ile Met Asn Arg Ser
    50                  55                  60

Met Ser Cys Lys Gln Ala Ser Tyr Arg Ser Asp Asn Ile Leu Ala His
65                  70                  75                  80

Gly Asp His Glu Gly Val Val His His Thr Pro Lys Ser Val Ser Gln
                85                  90                  95

Gly Ala Arg Ser Gln Leu Lys Arg Arg Gln Ser Asn Ala Ile Asn Ser
            100                 105                 110

Gly Phe Gln Tyr Val Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Thr Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Ser Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asp Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Arg Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Phe Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

```
Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Ile Ala Ser Asp Thr
        515                 520                 525

Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val Gly Gly Arg
    530                 535                 540

Gln Tyr Pro Asp Leu Val Tyr Glu Ser Lys Val Ala Leu Gly Pro Ala
545                 550                 555                 560

Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly Asn Ala Leu
                565                 570                 575

Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser Asn Gln Ile
            580                 585                 590

Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser Leu Leu Ser
        595                 600                 605

Val Pro Ile Leu Ser Cys Ala Val Leu Ala Leu Leu Leu Leu Ile Tyr
    610                 615                 620

Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Lys Gln Asn Thr Lys Val
625                 630                 635                 640

Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys Ser Tyr Val
                645                 650                 655

Arg Ser Leu
```

<210> 187
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 187

```
Met His Lys Lys Ile Pro Glu Arg Ser Lys Thr Gln Thr His Thr Gln
1               5                   10                  15

Gln Asp Leu Pro Arg Gln Tyr Ser Thr Lys Tyr Thr Glu Ile Lys Ile
            20                  25                  30

Ser Arg Ala Arg His Gly Ile Thr Ser Ala Gln Arg Ser Thr His Tyr
        35                  40                  45
```

```
Gly Pro Arg Thr Ser Asp Arg Leu Val His Tyr Ile Met Asn Arg Thr
    50                  55                  60

Ile Ser Cys Lys Gln Ala Ser His Arg Ser Asp Asn Ile Pro Ala His
65                  70                  75                  80

Gly Asp His Glu Gly Val Val His His Thr Pro Glu Ser Val Pro Gln
                85                  90                  95

Gly Ser Gly Ser Gln Leu Lys Arg Arg Gln Ser Asn Ala Phe Asn Ser
            100                 105                 110

Gly Ser Gln Tyr Ile Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Arg Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Phe Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
595 600 605

Leu Leu Ser Val Pro Ile Leu Ser Cys Thr Val Leu Ala Leu Leu Leu
610 615 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Lys Gln Asn
625 630 635 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 188
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 188
Met His Asn Lys Ile Pro Lys Arg Ser Arg Thr Arg Thr His Thr Arg
1 5 10 15

Gln Asp Leu Ser Pro Gln His Ser Thr Lys Ser Ile Gly Thr Lys Thr
20 25 30

Ser Arg Ala Arg His Ser Ile Thr Ser Val Leu Gln Ser Thr His Leu
35 40 45

```
Gly Pro Gln Thr Ser Asp Arg Pro Val His Tyr Ile Lys Asn Arg Thr
    50                  55                  60

Arg Ser Cys Lys Gln Ala Ser Tyr Arg Ser Gly Asn Ile Ser Ala His
65                  70                  75                  80

Arg Asp His Asp Gly Ile Val His His Ala Pro Glu Ser Val Ser Gln
                85                  90                  95

Glu Ala Arg Ser Leu Phe Lys Arg Arg Gln Ser Asn Ala Thr Asp Ser
            100                 105                 110

Gly Phe Gln Cys Thr Trp Leu Ile Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Arg Thr Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Asn Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Ile Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Ile Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
595 600 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
610 615 620

Leu Ile Cys Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Lys Gln Asn
625 630 635 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Ala Ser Lys
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 189
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 189
Met His Asn Lys Ile Pro Lys Arg Ser Arg Thr Arg Thr His Thr Arg
1 5 10 15

Gln Asp Leu Ser Pro Gln His Ser Thr Lys Ser Ile Gly Thr Lys Thr
20 25 30

Ser Arg Ala Arg His Ser Ile Thr Ser Val Leu Gln Ser Thr His Leu
35 40 45

```
Gly Pro Gln Thr Ser Asp Arg Pro Val His Tyr Ile Lys Asn Arg Thr
    50                  55                  60

Arg Ser Cys Lys Gln Ala Ser Tyr Arg Ser Gly Asn Ile Ser Ala His
65                  70                  75                  80

Arg Asp His Asp Gly Ile Val His His Ala Pro Glu Ser Val Ser Gln
                85                  90                  95

Glu Ala Arg Ser Leu Phe Lys Arg Arg Gln Ser Asn Ala Thr Asp Ser
            100                 105                 110

Gly Phe Gln Cys Thr Trp Leu Ile Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Arg Thr Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Asn Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Ile Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Ile Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
595 600 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
610 615 620

Leu Ile Cys Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Lys Gln Asn
625 630 635 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 190
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 190
Met His Asn Lys Ile Pro Lys Arg Ser Arg Thr Arg Thr His Thr Arg
1 5 10 15

Gln Asp Leu Ser Pro Gln His Ser Thr Lys Ser Ile Gly Thr Lys Thr
20 25 30

Ser Arg Ala Arg His Ser Ile Thr Ser Val Leu Gln Ser Thr His Leu
35 40 45

```
Gly Pro Gln Thr Ser Asp Arg Pro Val His Tyr Ile Lys Asn Arg Thr
    50                  55                  60

Arg Ser Cys Lys Gln Ala Ser Tyr Arg Ser Gly Asn Ile Ser Ala His
65                  70                  75                  80

Arg Asp His Asp Gly Ile Val His His Ala Pro Glu Ser Val Ser Gln
                85                  90                  95

Glu Ala Arg Ser Leu Phe Lys Arg Arg Gln Ser Asn Ala Thr Asp Ser
            100                 105                 110

Gly Phe Gln Cys Thr Trp Leu Ile Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Arg Thr Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Asn Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Ile Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Ile Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
595 600 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
610 615 620

Leu Ile Cys Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Lys Gln Asn
625 630 635 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 191
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 191
Met His Asn Lys Ile Pro Lys Arg Ser Arg Thr Arg Thr His Thr Arg
1 5 10 15

Gln Gly Leu Ser Pro Gln His Ser Thr Lys Ser Ile Gly Thr Lys Thr
20 25 30

Ser Arg Ala Arg His Ser Ile Thr Ser Ala Leu Gln Ser Thr His Leu
35 40 45

```
Gly Pro Gln Thr Ser Asp Arg Pro Val His Tyr Ile Lys Asn Arg Thr
    50                  55                  60

Arg Ser Cys Lys Gln Ala Ser Tyr Arg Ser Gly Asn Ile Ser Ala His
65                  70                  75                  80

Arg Asp His Asp Gly Ile Ile His His Ala Pro Glu Ser Val Ser Gln
                85                  90                  95

Glu Ala Arg Ser Leu Ser Lys Arg Arg Gln Ser Asn Ala Thr Asp Ser
            100                 105                 110

Gly Phe Gln Cys Thr Trp Leu Ile Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Arg Thr Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Asn Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
595 600 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
610 615 620

Leu Ile Cys Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Lys Gln Asn
625 630 635 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 192
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 192
Met His Asn Lys Ile Pro Lys Arg Ser Arg Thr Arg Thr His Thr Arg
1 5 10 15

Gln Asp Leu Ser Pro Gln His Ser Thr Glu Ser Ile Gly Thr Lys Thr
20 25 30

Ser Arg Gly Arg His Ile Ile Thr Ser Ala Leu Gln Ser Thr His Leu
35 40 45

```
Gly Pro Gln Thr Ser Asp Arg Pro Val His Tyr Ile Lys Asn Arg Thr
    50                  55                  60

Arg Ser Cys Lys Gln Ala Ser Tyr Arg Ser Gly Asn Ile Ser Ala His
65                  70                  75                  80

Arg Asp His Asp Gly Ile Ile His His Ala Pro Glu Ser Val Ser Gln
                85                  90                  95

Glu Ala Arg Ser Leu Phe Lys Arg Arg Gln Ser Asn Ala Thr Asp Ser
            100                 105                 110

Gly Phe Gln Cys Thr Trp Leu Ile Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Arg Thr Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Asn Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Ile Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Leu Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Val Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
595 600 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
610 615 620

Leu Ile Cys Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Lys Gln Asn
625 630 635 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 193
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 193
Met His Asn Lys Ile Leu Glu Gly Ser Lys Thr Gln Met His Thr Gln
1 5 10 15

Gln Asn Pro Pro Ser Gln His Ser Thr Lys Ser Ser Gly Thr Lys Thr
20 25 30

Ser Gln Thr Arg His Ser Thr Thr Ser Ala Gln Arg Ser Thr His His
35 40 45

```
Gly Pro Arg Thr Ala Asp Arg Pro Val His Tyr Thr Met Asp Arg Thr
    50                  55                  60

Arg Ser Cys Lys Gln Ala Gly His Arg Ser Asp Ser Ile Pro Val Arg
65                  70                  75                  80

Gly Asp His Glu Gly Ile Ile His His Thr Leu Glu Gly Ile Ser Gln
                85                  90                  95

Gly Ala Arg Ser Arg Phe Lys Arg Arg Gln Ser Thr Ala Thr Ser Pro
            100                 105                 110

Gly Pro Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Glu Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

```
Ser Thr Ile Ile Asn Gln Ser Ser Asp Lys Leu Leu Thr Phe Ile Ala
        515                 520                 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
    530                 535                 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Arg Val Ala Leu
545                 550                 555                 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
                565                 570                 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
            580                 585                 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Leu Asn Phe Gly Ser
        595                 600                 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
    610                 615                 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Arg Gln Asn
625                 630                 635                 640

Pro Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
                645                 650                 655

Ser Tyr Val Arg Ser Leu
            660
```

<210> 194
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 194

```
Met His Asn Lys Ile Leu Glu Gly Ser Lys Thr Gln Met His Thr Gln
1               5                   10                  15

Gln Asn Pro Pro Ser Gln His Ser Thr Lys Ser Ser Gly Thr Lys Thr
            20                  25                  30

Ser Gln Thr Arg His Ser Thr Thr Ser Ala Gln Arg Ser Thr His His
        35                  40                  45
```

```
Gly Pro Arg Thr Ser Asp Arg Pro Val His Tyr Thr Met Asp Arg Thr
    50                  55                  60

Arg Ser Cys Lys Gln Ala Gly His Arg Ser Asp Ser Ile Pro Val Arg
65                  70                  75                  80

Gly Asp His Glu Gly Ile Ile His His Thr Leu Glu Ser Ile Ser Gln
                85                  90                  95

Gly Ala Arg Ser Arg Phe Lys Arg Arg Gln Ser Thr Ala Thr Ser Pro
            100                 105                 110

Gly Pro Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Glu Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Ala Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Ile Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Arg Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Leu Asn Phe Gly Ser
595 600 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Pro Leu Leu Leu
610 615 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Gln Gln Thr Leu Arg Gln Asn
625 630 635 640

Pro Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 195
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 195
Met His Asn Lys Ile Pro Lys Lys Ser Lys Pro Leu Pro His Thr Arg
1 5 10 15

Gln Asp Pro Leu Gln Gln His Ser Thr Arg Ser Thr Glu Thr Lys Thr
20 25 30

Ser Gln Gly Arg Tyr Ser Ile Thr Ser Ala Gln Arg Ser Thr Tyr Tyr
35 40 45

```
Ser Pro Gln Ala Leu Asp Arg Ser Ile His Tyr Ile Met Asn Arg Thr
    50                  55                  60

Arg Ser Cys Lys Gln Thr Ser His Arg Ser Asn Asn Ile Pro Pro His
65                  70                  75                  80

Arg Asp His Glu Gly Ile Ile His His Thr Pro Glu Ser Val Thr Gln
                85                  90                  95

Gly Ala Ser Ser Trp Phe Lys Arg Trp Gln Ser Asn Ala Thr Asn Ala
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Asn
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Ala Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Lys Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Ile Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

```
Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
        515                 520                 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
    530                 535                 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545                 550                 555                 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
                565                 570                 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
            580                 585                 590

Asn Gln Ile Leu Glu Thr Val Lys Arg Ser Ser Phe Asn Phe Gly Ser
        595                 600                 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
    610                 615                 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Arg Gln Thr Phe Lys His Asn
625                 630                 635                 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
                645                 650                 655

Ser Tyr Val Arg Ser Leu
            660


<210> 196
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 196
Met His Asn Lys Ile Pro Lys Lys Ser Lys Pro Leu Pro His Thr Arg
1               5                   10                  15

Gln Asp Pro Leu Gln Gln His Ser Thr Arg Ser Thr Glu Thr Lys Thr
            20                  25                  30

Ser Gln Gly Arg Tyr Ser Ile Thr Ser Ala Gln Arg Ser Thr Tyr Tyr
        35                  40                  45
```

```
Ser Pro Gln Thr Leu Asp Arg Ser Val His Tyr Ile Met Asn Arg Thr
    50                  55                  60

Arg Ser Cys Lys Gln Thr Ser His Arg Ser Asn Asn Ile Pro Pro His
65                  70                  75                  80

Arg Asp His Glu Gly Ile Ile His Tyr Thr Pro Glu Ser Val Thr Gln
                85                  90                  95

Gly Ala Ser Ser Trp Phe Lys Arg Trp Gln Ser Asn Ala Thr Asn Ala
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Asn
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Ala Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Lys Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Ile Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

```
Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
        515                 520                 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
    530                 535                 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545                 550                 555                 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
                565                 570                 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
            580                 585                 590

Asn Gln Ile Leu Glu Thr Val Lys Arg Ser Ser Phe Asn Phe Gly Ser
        595                 600                 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
    610                 615                 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Arg Gln Thr Phe Lys His Asn
625                 630                 635                 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
                645                 650                 655

Ser Tyr Val Arg Ser Leu
            660
```

<210> 197
<211> 661
<212> PRT
<213> Morbillivirus canino

<400> 197

```
Met His Asn Lys Ile Pro Lys Lys Ser Lys Pro Leu Pro His Thr Arg
1               5                   10                  15

Gln Asp Pro Leu Gln Gln His Ser Thr Arg Ser Ala Glu Thr Lys Thr
            20                  25                  30

Ser Gln Gly Arg Tyr Ser Ile Thr Ser Ala Arg Ser Thr Tyr His Gly
        35                  40                  45
```

```
Pro Arg Thr Ser Asp Arg Ser Val His Tyr Ile Met Asn Arg Thr Arg
    50                  55                  60

Ser Cys Lys Gln Thr Ser His Arg Ser Asp Asn Ile Pro Pro His Arg
65                  70                  75                  80

Asp His Glu Gly Ile Ile His His Thr Pro Glu Ser Val Thr Gln Gly
                85                  90                  95

Ala Ser Ser Trp Phe Lys Arg Arg Gln Ser Asn Ala Thr Asn Ala Gly
            100                 105                 110

Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser Leu
        115                 120                 125

Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr Ile
    130                 135                 140

Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg Pro
145                 150                 155                 160

Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu Ile
                165                 170                 175

Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu Asn
            180                 185                 190

Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Asn Asn
        195                 200                 205

Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg Phe
    210                 215                 220

Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala Ala
225                 230                 235                 240

Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala Gln
                245                 250                 255

Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala Ile
            260                 265                 270

Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln Gly
        275                 280                 285
```

```
Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His Met
    290                 295                 300

Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg Tyr
305                 310                 315                 320

Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro Ile
                325                 330                 335

Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly Glu
            340                 345                 350

Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met Ile
        355                 360                 365

Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val Asp
    370                 375                 380

Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu Ser
385                 390                 395                 400

Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr Asn
                405                 410                 415

Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Lys Tyr Val Ala Thr
            420                 425                 430

Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe Val
        435                 440                 445

Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser Pro
    450                 455                 460

Ile Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg Thr
465                 470                 475                 480

Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly Asn
                485                 490                 495

Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr Ser
            500                 505                 510
```

```
Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala Ser
        515                 520                 525

Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val Gly
    530                 535                 540

Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu Gly
545                 550                 555                 560

Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly Asn
                565                 570                 575

Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser Asn
            580                 585                 590

Gln Ile Leu Glu Thr Val Lys Arg Ser Ser Phe Asn Phe Gly Ser Leu
        595                 600                 605

Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu Leu
    610                 615                 620

Ile Tyr Cys Cys Lys Arg Arg Tyr Arg Gln Thr Phe Lys His Asn Thr
625                 630                 635                 640

Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys Ser
                645                 650                 655

Tyr Val Arg Ser Leu
            660
```

<210> 198
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 198

```
Met His Asn Lys Ile Pro Lys Lys Ser Lys Pro Leu Pro His Thr Arg
1               5                   10                  15

Gln Asp Pro Leu Gln Gln His Ser Thr Lys Ser Ala Glu Thr Lys Thr
            20                  25                  30

Ser Gln Gly Arg Tyr Ser Ile Thr Ser Ala Gln Arg Ser Thr Tyr His
        35                  40                  45
```

```
Gly Pro Arg Thr Ser Asp Arg Ser Val His Tyr Ile Met Asn Arg Thr
    50                  55                  60

Arg Ser Cys Lys Gln Thr Ser His Arg Ser Asp Asn Ile Pro Pro His
65                  70                  75                  80

Arg Asp His Glu Gly Ile Ile His His Thr Pro Glu Ser Val Thr Gln
                85                  90                  95

Gly Ala Ser Ser Trp Phe Lys Arg Arg Gln Ser Asn Ala Thr Asn Ala
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Asn
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Lys Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Ile Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Lys Arg Ser Ser Phe Asn Phe Gly Ser
595 600 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
610 615 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Arg Gln Thr Phe Lys His Asn
625 630 635 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 199
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 199
Met His Asn Lys Ile Pro Lys Lys Ser Lys Pro Leu Pro His Thr Arg
1 5 10 15

Gln Asp Pro Leu Gln Gln His Ser Thr Lys Ser Ala Glu Thr Lys Thr
20 25 30

Ser Gln Gly Arg Tyr Ser Ile Thr Ser Ala Gln Arg Ser Thr Tyr His
35 40 45

```
Gly Pro Arg Thr Ser Asp Arg Ser Val His Tyr Ile Met Asn Arg Thr
    50                  55                  60

Arg Ser Cys Lys Gln Thr Ser His Arg Ser Asp Asn Ile Pro Pro His
65                  70                  75                  80

Arg Asp His Glu Gly Ile Ile His His Thr Pro Glu Ser Val Thr Gln
                85                  90                  95

Gly Ala Ser Ser Trp Phe Lys Arg Arg Gln Ser Asn Ala Thr Asn Ala
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Asn
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Lys Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Ile Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

```
Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
        515                 520                 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
    530                 535                 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545                 550                 555                 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
                565                 570                 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
            580                 585                 590

Asn Gln Ile Leu Glu Thr Val Lys Arg Ser Ser Phe Asn Phe Ser Ser
        595                 600                 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
    610                 615                 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Arg Gln Thr Phe Lys His Asn
625                 630                 635                 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
                645                 650                 655

Ser Tyr Val Arg Ser Leu
            660
```

<210> 200
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 200

```
Met His Asn Lys Ile Pro Lys Lys Ser Lys Pro Leu Pro His Thr Arg
1               5                   10                  15

Gln Asp Pro Leu Gln Gln His Ser Thr Arg Ser Thr Glu Thr Lys Thr
            20                  25                  30

Ser Gln Gly Arg Tyr Ser Ile Thr Ser Ala Gln Arg Ser Thr Tyr His
        35                  40                  45
```

```
Ser Pro Arg Thr Ser Asp Arg Pro Val His Tyr Ile Met Asn Arg Thr
    50                  55                  60

Arg Ser Cys Lys Gln Thr Ser His Arg Ser Asp Asn Ile Pro Pro His
65                  70                  75                  80

Arg Asp His Glu Gly Ile Ile His His Thr Pro Glu Ser Val Thr Gln
                85                  90                  95

Gly Ala Ser Ser Trp Phe Lys Arg Trp Gln Ser Asn Ala Thr Asn Ala
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Asn
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Lys Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Ile Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

```
Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
        515                 520                 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
    530                 535                 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545                 550                 555                 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
                565                 570                 575

Asn Ala Leu Lys Lys Leu Asn Asp Ala Lys Val Leu Ile Asp Ser Ser
            580                 585                 590

Asn Gln Ile Leu Glu Thr Val Lys Arg Ser Ser Phe Asn Phe Gly Ser
        595                 600                 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
    610                 615                 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Arg Gln Thr Phe Lys His Asn
625                 630                 635                 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Val Leu Thr Gly Thr Ser Lys
                645                 650                 655

Ser Tyr Val Arg Ser Leu
            660


<210> 201
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 201
Met His Asn Lys Ile Pro Lys Lys Ser Lys Pro Leu Pro His Thr Arg
1               5                   10                  15

Gln Asp Pro Leu Gln Gln His Ser Thr Arg Ser Thr Glu Thr Lys Thr
            20                  25                  30

Ser Gln Gly Arg Tyr Ser Ile Thr Ser Ala Gln Arg Ser Thr Tyr His
        35                  40                  45
```

```
Ser Pro Arg Thr Ser Asp Arg Ser Val His Tyr Ile Met Asn Arg Thr
    50                  55                  60

Arg Ser Cys Asn Gln Thr Ser His Arg Ser Asp Asn Ile Pro Pro His
65                  70                  75                  80

Arg Asp His Glu Gly Ile Ile His His Thr Pro Glu Ser Val Thr Gln
                85                  90                  95

Gly Ala Ser Ser Trp Phe Lys Arg Trp Gln Ser Asn Ala Thr Asn Ala
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Asn
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Lys Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Ile Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Lys Arg Ser Ser Phe Asn Phe Gly Ser
595 600 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
610 615 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Arg Gln Thr Phe Lys His Asn
625 630 635 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 202
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 202
Met His Asn Lys Ile Pro Lys Lys Ser Lys Pro Leu Pro His Thr Arg
1 5 10 15

Gln Asp Pro Leu Gln Gln His Ser Thr Arg Ser Ala Glu Thr Lys Thr
20 25 30

Ser Gln Gly Arg Tyr Ser Ile Thr Ser Val Gln Arg Ser Thr Tyr His
35 40 45

```
Gly Pro Arg Thr Ser Asp Arg Ser Val His Tyr Ile Met Asn Arg Thr
    50                  55                  60

Arg Ser Cys Lys Gln Thr Ser His Arg Ser Asp Asn Ile Pro Pro His
65                  70                  75                  80

Arg Asp His Glu Gly Ile Ile His His Thr Pro Glu Ser Val Thr Arg
                85                  90                  95

Gly Ala Ser Ser Trp Phe Lys Arg Arg Gln Ser Asn Ala Thr Asn Ala
            100                 105                 110

Gly Pro Gln Tyr Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Asn
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Lys Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Ile Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Lys Arg Ser Ser Phe Asn Phe Gly Ser
595 600 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
610 615 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Arg Gln Thr Phe Lys His Asn
625 630 635 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 203
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 203
Met His Asn Lys Ile Pro Lys Lys Ser Lys Pro Leu Pro His Thr Arg
1 5 10 15

Gln Asp Pro Pro Gln Gln His Ser Thr Arg Ser Ala Glu Thr Lys Thr
20 25 30

Ser Gln Gly Arg Tyr Ser Ile Thr Ser Val Gln Arg Ser Thr Tyr His
35 40 45

```
Gly Pro Arg Thr Ser Asp Arg Ser Val His Tyr Met Met Asn Arg Thr
    50                  55                  60

Arg Ser Cys Lys Gln Thr Ser His Arg Ser Asp Asn Ile Pro Pro His
65                  70                  75                  80

Arg Asp His Lys Gly Ile Ile His His Thr Pro Glu Ser Val Thr Arg
                85                  90                  95

Gly Ala Ser Ser Trp Phe Lys Arg Arg Gln Ser Asn Ala Thr Asn Ala
            100                 105                 110

Gly Pro Gln Tyr Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Asn
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Lys Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Ile Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

```
Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
        515                 520                 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
    530                 535                 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545                 550                 555                 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
                565                 570                 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
            580                 585                 590

Asn Gln Ile Leu Glu Thr Val Lys Arg Ser Ser Phe Asn Phe Gly Ser
        595                 600                 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
    610                 615                 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Arg Gln Thr Phe Lys His Asn
625                 630                 635                 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
                645                 650                 655

Ser Tyr Val Arg Ser Leu
            660
```

<210> 204
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 204

```
Met His Asn Lys Ile Pro Lys Lys Ser Lys Pro Leu Pro His Thr Arg
1               5                   10                  15

Gln Asp Pro Leu Gln Gln His Ser Thr Arg Ser Thr Glu Thr Lys Thr
            20                  25                  30

Ser Gln Gly Arg Tyr Ser Ile Thr Ser Ala Gln Arg Ser Thr Tyr His
        35                  40                  45
```

```
Ser Pro Arg Thr Ser Asp Arg Ser Val His Cys Ile Met Asn Arg Thr
    50                  55                  60

Arg Ser Cys Lys Gln Thr Ser His Arg Ser Asp Asn Ile Pro Pro His
65                  70                  75                  80

Arg Asp His Glu Gly Ile Ile His His Thr Pro Glu Ser Val Thr Gln
                85                  90                  95

Gly Ala Ser Ser Trp Phe Lys Arg Trp Gln Ser Asn Ala Thr Asn Ala
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile His Gln Ala Leu Thr Leu Met Thr Asn
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Lys Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Lys Tyr Val Ala
            420                 425                 430

Thr Asn Ser Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Ile Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Arg Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Lys Arg Ser Ser Phe Asn Phe Gly Ser
595 600 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
610 615 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Arg Gln Thr Phe Lys His Asn
625 630 635 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 205
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 205
Met His Asn Lys Ile Ser Lys Lys Ser Lys Pro Leu Pro His Thr Arg
1 5 10 15

Gln Asp Pro Leu Gln Gln His Ser Asn Arg Ser Thr Glu Thr Lys Thr
20 25 30

Ser Gln Gly Arg Tyr Ser Ile Thr Ser Ala Gln Arg Ser Thr Tyr His
35 40 45

```
Ser Pro Arg Thr Ser Asp Arg Ser Val His Tyr Ile Met Asn Arg Thr
    50                  55                  60

Arg Ser Cys Lys Gln Thr Ser His Arg Ser Asp Asn Val Pro Pro His
65                  70                  75                  80

Arg Asp His Glu Asp Ile Ile His His Thr Pro Glu Ser Val Thr Gln
                85                  90                  95

Gly Ala Ser Ser Trp Phe Lys Arg Trp Gln Ser Asn Ala Thr Asn Ala
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Ile Leu Met Thr Asn
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Ala Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Lys Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Ile Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

```
Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
        515                 520                 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
    530                 535                 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545                 550                 555                 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
                565                 570                 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
            580                 585                 590

Asn Gln Ile Leu Glu Thr Val Lys Arg Ser Ser Phe Asn Phe Gly Ser
        595                 600                 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
    610                 615                 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Arg Gln Thr Phe Lys His Asn
625                 630                 635                 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
                645                 650                 655

Ser Tyr Val Arg Ser Leu
            660
```

<210> 206
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 206

```
Met His Asn Lys Ile Pro Lys Lys Ser Lys Pro Leu Pro His Thr Arg
1               5                   10                  15

Gln Asp Pro Leu Gln Gln His Ser Thr Arg Ser Ala Glu Thr Lys Thr
            20                  25                  30

Ser Gln Gly Arg His Ser Ile Thr Ser Ala Gln Arg Ser Thr His His
        35                  40                  45
```

```
Gly Pro Arg Thr Ser Asp Arg Ser Val His Tyr Ile Met Asn Arg Thr
    50                  55                  60

Arg Ser Cys Lys Gln Thr Ser His Arg Ser Asp Asn Ile Pro Pro His
65                  70                  75                  80

Arg Asp His Glu Gly Ile Ile His His Thr Pro Glu Ser Val Thr Gln
                85                  90                  95

Gly Ala Ser Ser Trp Phe Lys Arg Arg Gln Ser Asn Ala Thr Asn Ala
            100                 105                 110

Gly Ser Gln Tyr Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Thr Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Ser
        195                 200                 205

Asn Val Lys Pro Leu Gln Ala Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Lys Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Ile Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Lys Arg Ser Ser Phe Asn Phe Gly Ser
595 600 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
610 615 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Arg Gln Thr Phe Lys His Asn
625 630 635 640

Thr Lys Ala Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 207
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 207
Met His Asn Lys Ile Pro Lys Lys Ser Lys Pro Leu Pro His Thr Arg
1 5 10 15

Gln Asp Pro Leu Gln Gln His Ser Thr Arg Ser Ala Glu Thr Lys Thr
20 25 30

Ser Gln Gly Arg His Ser Ile Thr Ser Ala Gln Arg Ser Thr His His
35 40 45

```
Gly Pro Arg Thr Ser Asp Arg Ser Val His Tyr Ile Met Asn Arg Thr
    50                  55                  60

Arg Ser Cys Lys Gln Thr Ser His Arg Ser Asp Asn Ile Pro Pro His
65                  70                  75                  80

Arg Asp His Glu Gly Ile Ile His His Thr Pro Glu Ser Val Thr Gln
                85                  90                  95

Gly Ala Ser Ser Trp Phe Lys Arg Arg Gln Ser Asn Ala Thr Asn Ala
            100                 105                 110

Gly Ser Gln Tyr Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Thr Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Ser
        195                 200                 205

Asn Val Lys Pro Leu Gln Ala Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Lys Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Ile Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

```
Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
        515                 520                 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
    530                 535                 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545                 550                 555                 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
                565                 570                 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
            580                 585                 590

Asn Gln Ile Leu Glu Thr Val Lys Arg Ser Ser Phe Asn Phe Gly Ser
        595                 600                 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
    610                 615                 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Arg Gln Thr Phe Lys His Asn
625                 630                 635                 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
                645                 650                 655

Ser Tyr Val Arg Ser Leu
            660
```

<210> 208
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 208

```
Met His Ser Thr Thr Pro Lys Asn Ser Lys Pro Leu Pro His Ile Arg
1               5                   10                  15

Gln Asp Pro Leu Gln Gln His Ser Thr Arg Ser Ala Glu Thr Lys Thr
            20                  25                  30

Ser Gln Gly Arg Tyr Ser Ile Thr Ser Ala Gln Arg Ser Thr Tyr His
        35                  40                  45
```

```
Gly Pro Arg Thr Ser Asp Arg Ser Val His Tyr Ile Met Asn Arg Thr
    50                  55                  60

Arg Ser Cys Lys Gln Thr Ser His Ser Ser Asp Asn Ile Pro Pro His
65                  70                  75                  80

Arg Asp His Glu Gly Ile Ile His His Thr Pro Glu Ser Val Thr Arg
                85                  90                  95

Gly Ala Ser Ser Trp Phe Lys Arg Arg Gln Ser Asn Ala Thr Asn Ala
            100                 105                 110

Gly Ser Gln His Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Asn
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Lys Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Lys His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Lys Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Ile Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Ser Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Thr Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Lys Arg Ser Ser Phe Asn Phe Gly Ser
595 600 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
610 615 620

Leu Ile Tyr Cys Cys Lys Gly Arg Tyr Arg Gln Thr Phe Lys His Asn
625 630 635 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 209
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 209
Met His Ser Thr Thr Pro Lys Asn Ser Lys Pro Leu Pro His Thr Arg
1 5 10 15

Gln Asp Pro Leu Gln Gln His Ser Thr Arg Ser Ala Glu Thr Lys Thr
20 25 30

Ser Gln Gly Arg Tyr Ser Ile Thr Ser Ala Gln Arg Ser Thr Tyr His
35 40 45

```
Gly Pro Arg Thr Ser Asp Arg Ser Val His Tyr Ile Met Asn Arg Thr
    50                  55                  60

Arg Ser Cys Lys Gln Thr Ser His Arg Ser Asp Asn Ile Pro Pro His
65                  70                  75                  80

Arg Asp His Glu Gly Ile Ile His His Thr Pro Glu Ser Val Thr Arg
                85                  90                  95

Gly Ala Ser Ser Trp Phe Lys Arg Arg Gln Ser Asn Ala Thr Asn Ala
            100                 105                 110

Gly Ser Gln Tyr Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Asn
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Lys Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Lys His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Lys Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Ile Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Ser Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

```
Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
        515                 520                 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
    530                 535                 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545                 550                 555                 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
                565                 570                 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
            580                 585                 590

Asn Gln Ile Leu Glu Thr Val Lys Arg Ser Ser Phe Asn Phe Gly Ser
        595                 600                 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
    610                 615                 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Arg Gln Thr Phe Lys His Asn
625                 630                 635                 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
                645                 650                 655

Ser Tyr Val Arg Ser Leu
            660
```

<210> 210
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 210

```
Met His Ser Lys Thr Leu Lys Asn Ser Lys Pro Leu Pro His Thr Arg
1               5                   10                  15

Gln Asp Pro Leu Gln Gln His Ser Thr Arg Ser Ala Glu Thr Lys Thr
            20                  25                  30

Ser Gln Gly Arg Tyr Ser Ile Thr Ser Ala Gln Arg Ser Thr Tyr His
        35                  40                  45
```

```
Gly Pro Arg Thr Ser Asp Arg Ser Val His Tyr Ile Met Asn Arg Thr
    50                  55                  60

Arg Ser Cys Lys Gln Thr Ser His Arg Ser Asp Asn Ile Pro Pro His
65                  70                  75                  80

Arg Asp His Glu Gly Ile Ile His His Thr Pro Glu Ser Val Thr Arg
                85                  90                  95

Gly Ala Ser Ser Trp Phe Lys Arg Arg Gln Ser Asn Ala Thr Asn Ala
            100                 105                 110

Gly Ser Gln Tyr Thr Trp Leu Val Leu Trp Cys Ile Gly Thr Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Asn
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Lys Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Lys Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Ile Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

```
Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
        515                 520                 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
    530                 535                 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545                 550                 555                 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
                565                 570                 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
            580                 585                 590

Asn Gln Ile Leu Glu Thr Val Lys Arg Ser Ser Phe Asn Phe Gly Ser
        595                 600                 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
    610                 615                 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Arg Gln Thr Phe Lys His Asn
625                 630                 635                 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
                645                 650                 655

Ser Tyr Val Arg Ser Leu
            660
```

<210> 211
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 211

```
Met His Ser Lys Ile Pro Lys Lys Ser Lys Pro Leu Pro His Thr Arg
1               5                   10                  15

Gln Asp Leu Leu Gln Gln His Ser Thr Arg Ser Thr Glu Thr Lys Thr
            20                  25                  30

Ser Gln Gly Gln Tyr Ser Leu Thr Ser Asp Gln Arg Ser Thr Tyr His
        35                  40                  45
```

```
Ser Pro Arg Thr Ser Asp Gly Ser Val His Cys Ile Met Asn Arg Thr
    50                  55                  60

Arg Ser Cys Lys Gln Thr Ser His Arg Ser Asp Asn Ile Pro Pro His
65                  70                  75                  80

Arg Asp His Glu Gly Ile Ile His His Thr Pro Glu Ser Val Thr Gln
                85                  90                  95

Gly Ala Ser Ser Trp Phe Lys Arg Trp Gln Ser Asn Ala Thr Asn Ala
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Asn
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Lys Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Lys Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Ile Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Arg Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Lys Arg Ser Ser Phe Asn Phe Gly Ser
595 600 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
610 615 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Arg Gln Thr Phe Lys His Asn
625 630 635 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 212
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 212
Met His Asn Lys Ile Pro Lys Lys Ser Lys Pro Leu Pro Asn Pro Arg
1 5 10 15

Gln Asp Pro Leu Gln Gln His Ser Thr Arg Ser Thr Glu Thr Lys Thr
20 25 30

Ser Gln Gly Arg Tyr Ser Ile Thr Ser Ala Gln Arg Ser Thr Tyr His
35 40 45

```
Ser Pro Arg Thr Ser Asp Arg Ser Val His His Thr Met Asn Arg Thr
    50                  55                  60

Arg Ser Arg Lys Gln Thr Ser His Arg Ser Asp Asn Ile Pro Pro His
65                  70                  75                  80

Arg Asp His Glu Gly Ile Ile His His Thr Pro Glu Asn Val Thr Gln
                85                  90                  95

Gly Ala Ser Ser Trp Phe Lys Arg Trp Gln Ser Asn Ala Thr Asn Ala
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Asn
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Lys Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Ile Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

```
Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
        515                 520                 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
    530                 535                 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545                 550                 555                 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
                565                 570                 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
            580                 585                 590

Asn Gln Ile Leu Glu Thr Val Lys Arg Ser Ser Phe Asn Phe Gly Ser
        595                 600                 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
    610                 615                 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Arg Gln Thr Phe Lys His Asn
625                 630                 635                 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
                645                 650                 655

Ser Tyr Val Arg Ser Leu
            660
```

<210> 213
<211> 662
<212> PRT
<213> Morbillivirus canino

```
<400> 213
Met His Asn Lys Ile Pro Lys Lys Ser Lys Pro Leu Pro His Thr Arg
1               5                   10                  15

Gln Asp Pro Leu Gln Gln His Ser Thr Arg Ser Ala Glu Thr Lys Thr
            20                  25                  30

Ser Gln Gly Arg Tyr Ser Ile Thr Ser Ala Pro Arg Ser Thr Tyr His
        35                  40                  45
```

```
Gly Pro Arg Thr Ser Asp Arg Ser Val His Tyr Ile Met Asn Lys Thr
    50                  55                  60

Arg Ser Cys Lys Gln Thr Ser His Arg Ser Asp Asn Ile Pro Pro His
65                  70                  75                  80

Arg Asp His Glu Gly Ile Phe His His Thr Pro Glu Ser Val Thr Arg
                85                  90                  95

Gly Ala Ser Ser Trp Phe Lys Arg Arg Gln Tyr Asn Ala Thr Asn Ala
            100                 105                 110

Gly Ser Gln Tyr Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Asn
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Thr Gly Lys Phe Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Lys Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Ile Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Lys Arg Ser Ser Phe Asn Phe Gly Ser
595 600 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
610 615 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Arg Gln Thr Phe Lys His Asn
625 630 635 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 214
<211> 660
<212> PRT
<213> Morbillivirus canino

<400> 214
Met His Asn Lys Ile Pro Lys Lys Ser Lys Pro Leu Pro His Thr Arg
1 5 10 15

Gln Asp Pro Leu Gln Gln His Ser Ile Arg Ser Ala Glu Thr Lys Thr
20 25 30

Ser Gln Gly Arg Tyr Ser Ile Thr Ser Ala Gln Arg Ser Thr Tyr His
35 40 45

```
Gly Pro Arg Thr Ser Asp Arg Ser Val His Tyr Ile Met Asn Lys Thr
    50                  55                  60

Arg Ser Cys Lys Gln Thr Ser His Arg Ser Asp Asn Ile Pro Pro His
65                  70                  75                  80

Arg Asp His Glu Gly Ile Ile His His Thr Pro Glu Ser Val Thr Arg
                85                  90                  95

Gly Ala Ser Ser Trp Phe Lys Arg Arg Gln Ser Asn Ala Thr Asn Ala
            100                 105                 110

Gly Ser Gln Tyr Thr Trp Leu Val Leu Trp Cys Gly Ile Ala Ser Leu
        115                 120                 125

Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr Ile
    130                 135                 140

Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg Pro
145                 150                 155                 160

Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu Ile
                165                 170                 175

Asp Asn Cys Thr Lys Glu Leu Gly Glu Tyr Glu Lys Leu Leu Asn Ser
            180                 185                 190

Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Asn Asn Val
        195                 200                 205

Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg Phe Ala
    210                 215                 220

Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala Ala Gln
225                 230                 235                 240

Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala Gln Ala
                245                 250                 255

Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala Ile Glu
            260                 265                 270

Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln Gly Val
        275                 280                 285
```

```
Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His Met Ser
    290                 295                 300

Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg Tyr Tyr
305                 310                 315                 320

Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro Ile Ser
                325                 330                 335

Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly Glu Ile
            340                 345                 350

His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met Ile Ala
        355                 360                 365

Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val Asp Leu
    370                 375                 380

Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu Ser Glu
385                 390                 395                 400

Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr Asn Ile
                405                 410                 415

Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Lys Tyr Val Ala Thr Asn
            420                 425                 430

Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe Val Ser
        435                 440                 445

Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser Pro Ile
    450                 455                 460

Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg Thr Leu
465                 470                 475                 480

Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly Asn Ile
                485                 490                 495

Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr Ser Thr
            500                 505                 510
```

```
Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala Ser Asp
        515                 520                 525

Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val Gly Gly
    530                 535                 540

Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu Gly Pro
545                 550                 555                 560

Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly Asn Ala
                565                 570                 575

Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser Asn Gln
            580                 585                 590

Ile Leu Glu Thr Val Lys Arg Ser Ser Phe Asn Phe Gly Ser Leu Leu
        595                 600                 605

Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu Leu Ile
    610                 615                 620

Tyr Cys Cys Lys Arg Arg Tyr Gln Gln Thr Phe Lys His Asn Thr Lys
625                 630                 635                 640

Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys Ser Tyr
                645                 650                 655

Val Arg Ser Leu
            660
```

<210> 215
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 215

```
Met His Asn Lys Ile Pro Lys Lys Ser Lys Pro Leu Pro His Thr Arg
1               5                   10                  15

Gln Asp Pro Leu Gln Gln His Ser Thr Arg Ser Thr Glu Thr Lys Thr
            20                  25                  30

Ser Gln Gly Arg His Ser Thr Thr Ser Ala Gln Gln Ser Thr His His
        35                  40                  45
```

```
Ser Pro Arg Thr Ser Asp Arg Ser Val His Tyr Ile Met Asn Arg Thr
    50                  55                  60

Arg Ser Cys Lys Gln Thr Ser His Arg Ser Asp Asn Ile Pro Pro His
65                  70                  75                  80

Arg Asp His Glu Gly Ile Ile His His Thr Pro Glu Ser Val Thr Gln
                85                  90                  95

Gly Ser Ser Ser Trp Cys Lys Arg Trp Gln Ser Asn Ala Thr Asn Ala
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Asn
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Lys Arg
    210                 215                 220

Leu Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Phe Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Val Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Lys Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Ile Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Arg Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Lys Arg Ser Ser Phe Asn Phe Gly Ser
595 600 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
610 615 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Arg Gln Thr Phe Lys His Asn
625 630 635 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 216
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 216
Met His Asn Lys Thr Pro Lys Lys Ser Lys Pro Leu Pro His Thr Arg
1 5 10 15

Gln Asn Pro Leu Gln Gln His Ser Thr Lys Ser Ala Glu Thr Lys Thr
20 25 30

Ser Gln Gly Arg Tyr Ser Ile Thr Ser Ala Gln Arg Ser Thr His His
35 40 45

```
Gly Pro Arg Thr Ser Asn Arg Pro Val His Tyr Ile Met Asn Arg Thr
    50                  55                  60

Arg Ser Cys Met Gln Thr Ser His Arg Ser Asp Asn Ile Pro Asp His
65                  70                  75                  80

Arg Asp His Glu Gly Ile Ile His His Thr Pro Glu Ser Val Thr Gln
                85                  90                  95

Gly Val Gly Phe Trp Phe Lys Arg Arg Arg Ser Asn Ala Thr Asn Ala
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Asn
        195                 200                 205

Asn Val Lys Leu Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Lys Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Ile Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Ile Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Gly Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Lys Arg Ser Ser Phe Asn Phe Gly Ser
595 600 605

Met Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
610 615 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Arg Gln Thr Phe Lys His Asn
625 630 635 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 217
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 217
Met His Asn Lys Thr Pro Lys Lys Ser Lys Pro Leu Pro His Thr Arg
1 5 10 15

Gln Asn Pro Leu Gln Gln His Ser Thr Lys Ser Ala Glu Thr Lys Thr
20 25 30

Ser Gln Gly Arg Tyr Ser Ile Thr Ser Ala Gln Arg Ser Thr His His
35 40 45

```
Gly Pro Arg Thr Ser Asn Arg Pro Val His Tyr Ile Met Asn Arg Thr
    50                  55                  60

Arg Ser Cys Met Gln Thr Ser His Arg Ser Asp Asn Ile Pro Asp His
65                  70                  75                  80

Arg Asp His Glu Gly Ile Ile His His Thr Pro Glu Ser Val Thr Gln
                85                  90                  95

Gly Val Gly Phe Trp Phe Lys Arg Arg Arg Ser Asn Ala Thr Asn Ala
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Asn
        195                 200                 205

Asn Val Lys Leu Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Lys Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Ile Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Ile Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Gly Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Lys Arg Ser Ser Phe Asn Phe Gly Ser
595 600 605

Met Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
610 615 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Arg Gln Thr Phe Lys His Asn
625 630 635 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 218
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 218
Met His Asn Lys Thr Pro Lys Lys Ser Lys Pro Leu Pro His Thr Arg
1 5 10 15

Gln Asn Pro Leu Gln Gln His Ser Thr Lys Ser Ala Glu Thr Lys Thr
20 25 30

Ser Gln Gly Arg Tyr Ser Ile Thr Ser Ala Gln Arg Ser Thr His His
35 40 45

```
Gly Pro Arg Thr Ser Asn Arg Pro Val His Tyr Ile Met Asn Arg Thr
    50                  55                  60

Arg Ser Cys Met Gln Thr Ser His Arg Ser Asp Asn Ile Leu Asp His
65                  70                  75                  80

Arg Asp His Glu Gly Ile Ile His His Thr Pro Glu Ser Val Thr Gln
                85                  90                  95

Gly Val Gly Phe Trp Phe Lys Arg Arg Arg Ser Asn Ala Thr Asn Ala
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Asn
        195                 200                 205

Asn Val Lys Leu Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Lys Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Ile Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Ile Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

```
Gly Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
        515                 520                 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
    530                 535                 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545                 550                 555                 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
                565                 570                 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
            580                 585                 590

Asn Gln Ile Leu Glu Thr Val Lys Arg Ser Ser Phe Asn Phe Gly Ser
        595                 600                 605

Met Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
    610                 615                 620

Leu Ile Tyr Cys Cys Lys Arg Arg Tyr Arg Gln Thr Phe Lys His Asn
625                 630                 635                 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
                645                 650                 655

Ser Tyr Val Arg Ser Leu
            660
```

<210> 219
<211> 662
<212> PRT
<213> Morbillivirus canino

```
<400> 219
Met His Asn Lys Ile Pro Lys Arg Ser Lys Thr Leu Pro His Thr Arg
1               5                   10                  15

Gln Asp Leu Leu Gln Gln His Ser Thr Lys Ser Ala Glu Thr Lys Thr
            20                  25                  30

Ser Gln Gly Arg Tyr Ser Ile Ser Ser Ala Gln Arg Ser Ala His His
        35                  40                  45
```

```
Gly Pro Leu Thr Ser Asn Arg Pro Val His Tyr Ile Met Asn Arg Thr
    50                  55                  60

Arg Ser Cys Lys Gln Thr Ser His Arg Ser Asp Asn Ile Pro Ala His
65                  70                  75                  80

Arg Asp His Glu Gly Ile Ile His His Thr Pro Glu Gly Val Thr Gln
                85                  90                  95

Gly Ala Ser Ser Trp Phe Lys Arg Arg Gln Ser Asn Ala Ser Asn Pro
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Asn
        195                 200                 205

Asn Met Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Asn Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Phe Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Ala Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Lys Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Ile Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Ile Thr Ile Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
595 600 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
610 615 620

Leu Val Tyr Cys Cys Lys Arg Arg Tyr Arg Gln Thr Phe Lys His Asn
625 630 635 640

Pro Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 220
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 220
Met His Asn Lys Ile Pro Lys Lys Ser Asn Pro Arg Gln His Thr Arg
1 5 10 15

Gln Asp Leu Leu Gln Gln His Ser Thr Arg Ser Thr Glu Thr Lys Thr
20 25 30

Ser Gln Gly Arg Tyr Ser Ile Thr Ser Ala Gln Arg Ser Thr Tyr His
35 40 45

```
Ser Pro Leu Ala Leu Asp Arg Ser Ile His Tyr Ile Met Asn Arg Thr
    50                  55                  60

Arg Ser Cys Lys Gln Ala Ser His Arg Ser Asp Asn Ile Pro Pro His
65                  70                  75                  80

Arg Asp His Glu Gly Ile Ile His His Thr Pro Glu Ser Val Thr Gln
                85                  90                  95

Gly Ala Gly Ser Trp Leu Lys Arg Trp Gln Ser Asn Ala Thr Asn Ala
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Val Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Asn
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Lys Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Leu Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Ile
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Glu Tyr Val Ala
            420                 425                 430

Thr Ile Gly Tyr Leu Ile Ser Asn Leu Asp Glu Ser Pro Cys Val Ser
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Phe Leu Tyr Pro Met Ser
    450                 455                 460

Arg Ser Thr Gln Gln Cys Ile Arg Arg Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Leu Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

```
Gly Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
        515                 520                 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Asp Val Thr Ile Gln Val
    530                 535                 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545                 550                 555                 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
                565                 570                 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
            580                 585                 590

Asn Gln Ile Leu Glu Thr Asp Lys Arg Ser Ser Phe Asn Phe Gly Ser
        595                 600                 605

Leu Leu Ser Val Pro Ile Leu Ile Cys Thr Ala Leu Ala Leu Leu Leu
    610                 615                 620

Leu Ile Tyr Cys Cys Arg Arg Arg Tyr Arg Gln Thr Phe Lys His Asn
625                 630                 635                 640

Ala Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
                645                 650                 655

Ser Tyr Val Arg Ser Leu
            660
```

<210> 221
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 221

```
Met His Lys Lys Phe Phe Lys Asn Ser Thr Thr Gln Thr His Thr Gln
1               5                   10                  15

Gln Asp Leu Leu Pro Gln His Ser Thr Lys Ser Ala Glu Thr Lys Thr
            20                  25                  30

Ser Arg Ala Arg His Ser Ile Thr Ser Val Gln Arg Ser Thr His Tyr
        35                  40                  45
```

```
Gly Pro Arg Thr Ser Asp Arg Pro Val Tyr Tyr Thr Val Asn Arg Thr
    50                  55                  60

Gly Ser Cys Lys Gln Ala Ser Tyr Arg Ser Asp Asn Ile Pro Pro His
65                  70                  75                  80

Gly Asp His Glu Gly Thr Val Leu His Thr Pro Glu Ser Val Ser Gln
                85                  90                  95

Gly Met Arg Ser Trp Pro Lys Gly Arg Gln Ser Asn Ala Ile Asn Thr
            100                 105                 110

Asp Ser His Cys Ala Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Val
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Val Gly Ser Gly Arg Arg Gln Lys Arg
    210                 215                 220

Phe Ala Gly Val Val Ile Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Phe Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Val Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Leu
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Thr Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

```
Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
        515                 520                 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
    530                 535                 540

Gly Ala Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545                 550                 555                 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
                565                 570                 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
            580                 585                 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
        595                 600                 605

Leu Leu Ser Val Pro Ile Leu Ser Cys Thr Ala Leu Ala Leu Leu Leu
    610                 615                 620

Leu Ile Tyr Cys Cys Arg Arg Arg Tyr Gln Gln Thr Ile Lys Gln Asn
625                 630                 635                 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
                645                 650                 655

Ser Tyr Val Arg Ser Leu
            660
```

<210> 222
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 222

```
Met His Arg Lys Pro Pro Lys Lys Ser Lys Thr Gln Thr His Thr Gln
1               5                   10                  15

Arg Asp Pro Pro Pro Gln His Ser Thr Lys Ser Ala Glu Thr Lys Thr
            20                  25                  30

Pro Arg Ala Arg His Ser Ile Thr Ser Ala Gln Arg Ser Thr His Tyr
        35                  40                  45
```

```
Gly Pro Arg Thr Ser Asp Arg Pro Ile His Tyr Thr Val Asn Arg Thr
    50                  55                  60

Gly Ser Cys Lys Gln Ala Ser Tyr Arg Leu Asp Asn Ile Pro Pro His
65                  70                  75                  80

Gly Asp His Glu Gly Thr Val Leu His Thr Pro Glu Ser Val Ser Gln
                85                  90                  95

Gly Val Arg Ser Lys Pro Lys Gly Arg Gln Ser Asn Ala Ile Asn Ile
            100                 105                 110

Ala Ser His Cys Ala Trp Leu Ile Leu Trp Cys Ile Gly Ile Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Pro Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Lys Pro Leu Gln Ser Ile Gly Ser Gly Arg Arg Gln Lys Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Ala Gln Glu Thr Val Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Pro Gly Lys Phe Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Val Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Thr Ser Cys Ala Arg
465                 470                 475                 480

Thr Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Val Leu Ile Asp Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Ser Asn Phe Gly Ser
595 600 605

Leu Leu Ser Val Pro Ile Leu Ser Cys Thr Ala Leu Ala Leu Leu Leu
610 615 620

Leu Ile Tyr Cys Cys Arg Arg Arg Tyr Gln Gln Thr Ile Lys Gln Asn
625 630 635 640

Thr Lys Val Asp Pro Thr Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 223
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 223
Met His Gly Glu Ile Pro Thr Gly Ser Thr Thr Arg Thr His Thr Gln
1 5 10 15

Gln Asp Arg Pro Ser His Pro Ser Thr Lys Pro Asp Glu Thr Arg Ile
20 25 30

Ser Arg Thr Gln His Gly Thr Thr Ser Ala Lys Arg Ser Thr Asp His
35 40 45

```
Asp Pro Arg Lys Ser Asp Arg Pro Val His Tyr Thr Met Asn Arg Ala
    50                  55                  60

Arg Ser His Lys His Ile Gly His Gly Pro Glu Asn Ile Pro Ala His
65                  70                  75                  80

Gly Asp His Glu Ala Thr Thr Gln His Ile Pro Glu Ser Ala Ser Lys
                85                  90                  95

Gly Ala Lys Ser Gln Leu Glu Arg Arg Gln Ser Asp Ala Ile Asn Ser
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Phe Gly Met Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Ser Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Arg Ser Leu Gln Ser Leu Gly Ser Gly Arg Arg Gln Lys Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Ile Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Gly Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Leu Gly Lys Phe Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Ile Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Ser Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

```
Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
        515                 520                 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
    530                 535                 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545                 550                 555                 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
                565                 570                 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Ile Leu Ile Asp Ser Ser
            580                 585                 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
        595                 600                 605

Leu Leu Ser Val Pro Ile Leu Ser Cys Thr Ala Leu Ala Leu Leu Leu
    610                 615                 620

Leu Ile Tyr Cys Cys Arg Arg Arg Tyr Gln Gln Thr Leu Lys Gln Asn
625                 630                 635                 640

Ala Lys Val Asn Pro Ala Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
                645                 650                 655

Ser Tyr Val Arg Ser Leu
            660


<210> 224
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 224
Met His Gly Glu Ile Pro Thr Gly Ser Thr Thr Arg Thr His Thr Gln
1               5                   10                  15

Gln Asp Arg Pro Ser His Pro Ser Thr Lys Pro Asp Glu Thr Arg Ile
            20                  25                  30

Ser Arg Thr Gln His Gly Thr Thr Ser Ala Lys Arg Ser Thr Asp His
        35                  40                  45
```

```
Asp Pro Arg Lys Ser Asp Arg Pro Val His Tyr Thr Met Asn Arg Ala
    50                  55                  60

Arg Ser His Lys His Ile Gly His Gly Pro Glu Asn Ile Pro Ala His
65                  70                  75                  80

Gly Asp His Glu Ala Thr Thr Gln His Ile Pro Glu Ser Ala Ser Lys
                85                  90                  95

Gly Ala Lys Ser Gln Leu Glu Arg Arg Gln Ser Asp Ala Ile Asn Ser
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Phe Gly Thr Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Ser Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Arg Ser Leu Gln Ser Leu Gly Ser Gly Arg Arg Gln Lys Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Ile Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Gly Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Leu Gly Lys Phe Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Ile Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Ser Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

```
Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
        515                 520                 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
    530                 535                 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545                 550                 555                 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
                565                 570                 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Ile Leu Ile Asp Ser Ser
            580                 585                 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
        595                 600                 605

Leu Leu Ser Val Pro Ile Leu Ser Cys Thr Ala Leu Ala Leu Leu Leu
    610                 615                 620

Leu Ile Tyr Cys Cys Arg Arg Arg Tyr Gln Gln Thr Leu Lys Gln Asn
625                 630                 635                 640

Ala Lys Val Asn Pro Ala Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
                645                 650                 655

Ser Tyr Val Arg Ser Leu
            660


<210> 225
<211> 662
<212> PRT
<213> Morbillivirus canino

<400> 225
Met His Gly Glu Ile Pro Thr Gly Ser Thr Thr Arg Thr His Thr Gln
1               5                   10                  15

Gln Asp Arg Pro Ser His Pro Ser Thr Lys Pro Asp Glu Thr Arg Ile
            20                  25                  30

Ser Arg Thr Gln His Gly Thr Thr Ser Ala Lys Arg Ser Thr Asp His
        35                  40                  45
```

```
Asp Pro Arg Lys Ser Asp Arg Pro Val His Tyr Thr Met Asn Arg Ala
    50                  55                  60

Arg Ser His Lys His Ile Gly His Gly Pro Glu Asn Ile Pro Ala His
65                  70                  75                  80

Gly Asp His Glu Ala Thr Thr Gln His Ile Pro Glu Ser Ala Ser Lys
                85                  90                  95

Gly Ala Lys Ser Gln Leu Glu Arg Arg Gln Ser Asp Ala Ile Asn Ser
            100                 105                 110

Gly Ser Gln Cys Thr Trp Leu Val Leu Trp Cys Phe Gly Thr Ala Ser
        115                 120                 125

Leu Phe Leu Cys Ser Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr
    130                 135                 140

Ile Gly Ile Ile Gly Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg
145                 150                 155                 160

Ser Ser His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val Ser Leu
                165                 170                 175

Ile Asp Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu
            180                 185                 190

Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys
        195                 200                 205

Asn Val Arg Ser Leu Gln Ser Leu Gly Ser Gly Arg Arg Gln Lys Arg
    210                 215                 220

Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val Ala Thr Ala
225                 230                 235                 240

Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala
                245                 250                 255

Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala
            260                 265                 270

Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu Thr Ile Ile Ala Val Gln
        275                 280                 285
```

```
Gly Val Gln Asp Tyr Val Asn Asn Glu Leu Val Pro Ala Met Gln His
    290                 295                 300

Met Ser Cys Glu Leu Val Gly Gln Arg Leu Gly Leu Lys Leu Leu Arg
305                 310                 315                 320

Tyr Tyr Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro
                325                 330                 335

Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly
            340                 345                 350

Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Gly Asp Met
        355                 360                 365

Ile Ala Ile Leu Glu Ser Arg Gly Ile Lys Thr Lys Ile Thr His Val
    370                 375                 380

Asp Leu Leu Gly Lys Phe Ile Ile Leu Ser Ile Ser Tyr Pro Thr Leu
385                 390                 395                 400

Ser Glu Val Lys Gly Val Ile Val His Arg Leu Glu Ala Val Ser Tyr
                405                 410                 415

Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Ile Ala
            420                 425                 430

Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val Phe
        435                 440                 445

Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met Ser
    450                 455                 460

Pro Leu Leu Gln Gln Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg
465                 470                 475                 480

Ser Leu Val Ser Gly Thr Met Gly Asn Lys Phe Ile Leu Ser Lys Gly
                485                 490                 495

Asn Ile Val Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Ser Thr
            500                 505                 510
```

Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala
515 520 525

Ser Asp Thr Cys Pro Leu Val Glu Ile Asp Gly Val Thr Ile Gln Val
530 535 540

Gly Gly Arg Gln Tyr Pro Asp Met Val Tyr Glu Ser Lys Val Ala Leu
545 550 555 560

Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu Gly
565 570 575

Asn Ala Leu Lys Lys Leu Asp Asp Ala Lys Ile Leu Ile Asp Ser Ser
580 585 590

Asn Gln Ile Leu Glu Thr Val Arg Arg Ser Ser Phe Asn Phe Gly Ser
595 600 605

Leu Leu Ser Val Pro Ile Leu Ser Cys Thr Ala Leu Ala Leu Leu Leu
610 615 620

Leu Ile Tyr Cys Cys Arg Arg Arg Tyr Gln Gln Thr Leu Lys Gln Asn
625 630 635 640

Ala Lys Val Asn Pro Ala Phe Lys Pro Asp Leu Thr Gly Thr Ser Lys
645 650 655

Ser Tyr Val Arg Ser Leu
660

<210> 226
<211> 653
<212> PRT
<213> Morbillivirus canino

<400> 226
Met His Asn Lys Ile Pro Lys Arg Ser Lys Thr Arg Thr His Gln Gln
1 5 10 15

Asp Leu Pro Gln Arg Ser Thr Lys Ser Ala Glu Val Arg Thr Phe Gln
20 25 30

Ala Arg His Ser Thr Thr Ser Ala Leu Arg Ser Thr His His Gly Arg
35 40 45

```
Ile Ser Asp Ile His His Ile Met Asn Arg Thr Arg Ser Cys Arg Gln
    50                  55                  60

Ala Ser His Arg Ser Asp Asn Ile Pro Ala His Gly Asp His Glu Gly
65                  70                  75                  80

Ile Ile His His Thr Pro Glu Ser Val Ser Gln Gly Ala Gly Pro Arg
                85                  90                  95

Leu Lys Gly Gln Arg Tyr Asn Ala Thr Asn Ser Gly Ser Gln Cys Thr
            100                 105                 110

Trp Leu Val Leu Trp Cys Ile Gly Ile Ala Gly Leu Phe Leu Cys Ser
        115                 120                 125

Lys Ala Gln Ile His Trp Asn Asn Leu Ser Thr Ile Gly Ile Ile Gly
    130                 135                 140

Thr Asp Ser Val His Tyr Lys Ile Met Thr Arg Pro Ser His Gln Tyr
145                 150                 155                 160

Leu Val Ile Lys Leu Met Pro Asn Val Ser Ile Ile Asp Asn Cys Thr
                165                 170                 175

Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu Asn Ser Val Leu Glu
            180                 185                 190

Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys Asn Val Lys Pro Leu
        195                 200                 205

Gln Ser Val Gly Ser Gly Arg Arg Gln Arg Arg Phe Ala Gly Val Val
    210                 215                 220

Ala Gly Ala Ala Leu Gly Val Ala Thr Ala Ala Gln Ile Thr Ala Gly
225                 230                 235                 240

Ile Ala Leu His Gln Ser Ser Leu Asn Ala Gln Ala Ile Gln Ser Leu
                245                 250                 255

Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala Ile Glu Glu Ile Arg Glu
            260                 265                 270

Ala Thr Gln Glu Thr Val Ile Ala Val Gln Gly Val Gln Asp Tyr Val
        275                 280                 285
```

```
Asn Asn Glu Leu Val Ala Met Gln His Met Ser Cys Glu Leu Gly Gln
    290                 295                 300

Arg Leu Gly Leu Lys Leu Leu Arg Tyr Tyr Thr Glu Leu Leu Ser Ile
305                 310                 315                 320

Phe Gly Pro Ser Leu Arg Asp Pro Ile Ser Ala Glu Ile Ser Ile Gln
                325                 330                 335

Ala Leu Ser Tyr Ala Leu Gly Gly Glu Ile His Lys Ile Leu Glu Lys
            340                 345                 350

Leu Gly Tyr Ser Gly Asn Asp Met Ile Ala Ile Leu Glu Ser Arg Gly
        355                 360                 365

Ile Lys Thr Lys Ile Thr His Val Asp Leu Pro Gly Lys Leu Ile Ile
    370                 375                 380

Leu Ser Ile Ser Tyr Pro Thr Leu Ser Glu Val Lys Gly Val Ile Val
385                 390                 395                 400

His Arg Leu Glu Ala Val Ser Tyr Asn Ile Gly Ser Gln Trp Tyr Thr
                405                 410                 415

Thr Val Pro Arg Tyr Val Ala Thr Asn Gly Tyr Leu Ile Ser Asn Phe
            420                 425                 430

Asp Glu Ser Ser Cys Val Phe Val Ser Glu Ser Ala Ile Cys Ser Gln
        435                 440                 445

Asn Ser Leu Tyr Pro Met Ser Pro Leu Leu Gln Gln Cys Ile Arg Gly
    450                 455                 460

Asp Thr Ser Ser Cys Ala Arg Thr Leu Val Ser Gly Thr Met Gly Asn
465                 470                 475                 480

Lys Phe Ile Leu Ser Lys Gly Asn Ile Val Ala Asn Cys Ala Ser Ile
                485                 490                 495

Leu Cys Lys Cys Tyr Ser Thr Ser Thr Ile Ile Asn Gln Gly Pro Asp
            500                 505                 510
```

```
Lys Leu Leu Thr Phe Ile Ala Ser Asp Thr Cys Pro Leu Val Glu Ile
        515                 520                 525

Asp Gly Val Thr Ile Gln Val Gly Gly Arg Gln Tyr Pro Asp Met Val
    530                 535                 540

Tyr Glu Ser Lys Val Ala Leu Gly Pro Ala Ile Ser Leu Glu Arg Leu
545                 550                 555                 560

Asp Val Gly Thr Asn Leu Gly Asn Ala Leu Lys Lys Leu Asp Asp Ala
                565                 570                 575

Lys Val Leu Ile Asp Ser Ser Asn Gln Ile Leu Glu Thr Val Arg Arg
            580                 585                 590

Ser Ser Phe Asn Phe Gly Ser Leu Leu Ser Val Pro Ile Leu Ile Cys
        595                 600                 605

Thr Ala Leu Ala Leu Leu Phe Leu Ile Tyr Cys Cys Lys Arg Arg Tyr
    610                 615                 620

Gln Gln Thr Leu Lys Gln Ser Thr Lys Val Asp Pro Thr Phe Lys Pro
625                 630                 635                 640

Asp Leu Thr Gly Thr Ser Lys Ser Tyr Val Arg Ser Leu
                645                 650
```

<210> 227
<211> 80
<212> PRT
<213> Morbillivirus canino

<400> 227

```
Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
1               5                   10                  15

Gly Gly Arg Gly Asp Ile Phe Pro Ser Tyr Arg Cys Ser Gly Ala Thr
            20                  25                  30

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
        35                  40                  45

Leu Ile Ser Arg Thr Ser Glu Ile Ile Asn Met Leu Thr Ala Ile Ser
    50                  55                  60
```

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Phe Leu Glu
65 70 75 80

<210> 228
<211> 80
<212> PRT
<213> Morbillivirus canino

<400> 228
Gly Ile Phe Gly Ala Thr Pro Met Asp Gln Val Glu Glu Val Ile Pro
1 5 10 15

Val Ala His Pro Ser Val Glu Lys Ile His Ile Ala Asn His Arg Gly
20 25 30

Phe Ile Lys Asp Ser Ile Ala Thr Trp Met Val Pro Ala Leu Val Ser
35 40 45

Glu Lys Gln Glu Glu Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
50 55 60

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
65 70 75 80

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

NIT: 800.176.089-2

COMPROBANTE DE RECAUDO SISTEMA SIPI

Radicado: NC2022/0004984
Recibo: 25-127917
Fecha: 21/03/2025

CAROLINA MERCEDES DAZA MONTALVO
CC: 66.783.790
Pago PSE No: 1088258
CUS: 1353867439

Patente PCT
VIRUS DEL MOQUILLO CANINO HEMAGLUTININA Y POLIPÉPTIDOS DE FUSIÓN

Detalle del pago

Id.	Rentístico	Concepto y Servicio	Cant.	Val. Unit.	Subtotal
1	50005-01-03	Modificaciones / Correcciones al registro Patente PCT (DESCUENTO INTERNET)	1	$ 225,000	$ 225,000
2	50005-01-01	Solicitud examen de patentabilidad Patente PCT (DESCUENTO INTERNET)	1	$ 1,522,000	$ 1,522,000
		TOTAL			$ 1,747,000

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