Clarke, Modet & Cº

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SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
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P-703

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
DIVISION DE NUEVAS CREACIONES
E. S. D.

Re: Expediente No. **05-116231**
Solicitud de patente a nombre de **WYETH HOLDINGS CORPORATION**

Yo, DILIA MARIA RODRIGUEZ D'ALEMAN, identificada como aparece al pie de mi firma, domiciliada en la Carrera 11 No. 86-53, piso 6, obrando como apoderada de la sociedad WYETH HOLDINGS CORPORATION, domiciliada en Madison, Estados Unidos, solicitante de la patente de la referencia, en respuesta al oficio No. 15329 notificado por fijación en lista el 26 de noviembre de 2010, relacionado con el concepto técnico de fondo No. 4085, me permito manifestar:

1. Modificación del capítulo reivindicatorio de la solicitud

1. Con fundamento en la facultad que confiere el artículo 34 de la Decisión 486 al solicitante para modificar la solicitud de patente en cualquier momento del trámite, presento junto con este memorial nuevo capítulo reivindicatorio que consta de 23 reivindicaciones, en las cuales se realizaron las siguientes modificaciones:

1.1. Se eliminaron las reivindicaciones 6 a 10, 13 a 17, 19, 25 y 26.

1.2. Se realizaron algunos ajustes a la reivindicación 1 en procura de precisar aún más el alcance de la invención. Siendo así se establecieron claramente las secuencias de las porciones inmunogénicas definidas en el literal c) de dicha reivindicación y se limitó el alcance de los equivalentes biológicos a las proteínas que tienen al menos 90% de homología con las proteínas definidas en los literales (a) y (b) de dicha reivindicación 1.

En cuanto a estas modificaciones, me permito decir que las mismas no amplían de ninguna manera la materia objeto de la presente solicitud y se realizaron con el ánimo de superar las objeciones de claridad planteadas por el examinador en su concepto técnico.

Adicionalmente, de acuerdo con lo establecido en la respuesta emitida por esa Superintendencia el 4 de marzo de 2009 para el expediente No. 09-012.566, dado que la modificación que se presenta en este caso no supera las quince reivindicaciones, no se hace necesario presentar la respectiva tasa de modificación ni ninguna otra tasa adicional con relación al exceso de reivindicaciones para el presente caso, siguiendo lo establecido por el Superintendente Delegado para la Propiedad Industrial, el Doctor Giancarlo Marcenaro Jiménez.

1409

2. Claridad de la solicitud

Respecto a este punto, el solicitante manifiesta que mediante las modificaciones realizadas en el capítulo reivindicatorio, quedan subsanadas la totalidad de las objeciones, de modo tal que las nuevas reivindicaciones proporcionan claridad a la invención descrita.

En primer lugar, la Superintendencia cuestiona la claridad de la reivindicación 1 por considerar que no existe soporte en la descripción para las secuencias impares SEQ ID N° 331 – 443 y las secuencias pares SEQ ID N° 330 - 442.

Respetuosamente el solicitante hace un llamado a ese despacho para que corrobore si en las páginas 48 a 62 no se hace mención de dichas secuencias y para que establezca si dichas secuencias no se encuentra perfectamente definidas en el listado de secuencias presentado junto con la solicitud. No obstante, en procura de facilitar la comprensión de la invención y demostrar que existe soporte para la materia reclamada, el solicitante presenta la totalidad del listado de secuencias que hacen parte de la descripción de la solicitud bajo análisis, en donde claramente se definen cada una de las secuencias mencionadas en las reivindicaciones.

En cuanto a la afirmación que establece que no existe claridad en las características técnicas esenciales de la invención de las reivindicaciones 1 y sus dependientes, respetuosamente manifestamos nuestra inconformidad con tal afirmación pues cualquier persona versada en la materia puede determinar el alcance de la reivindicación 1 pues puede establecer si una composición comprende o no la proteína de las secuencias SEQ ID N° 330 - 442 pares, puede identificar claramente cuáles son las proteínas codificadas por el polinucleótido que hibridiza con SEQ ID N° 330 - 442 pares, igualmente está en la capacidad de reconocer si una porción inmunogénica presenta o no las secuencias SEQ ID N° 444 – 452 y pude determinar si una proteína tiene una homología mayor al 90% con las secuencias antes mencionadas y si ella conserva las mismas propiedades inmunológicas. Así las cosas, respetuosamente no se entiende que no es claro para ese Despacho. Si ustedes nos precisan el por qué de su afirmación, nosotros procuraremos realizar las correcciones pertinentes.

En cuanto a las porciones inmunogénicas, se modificó la reivindicación 1 para precisar sus secuencias. Respecto a los equivalentes biológicos, el solicitante dirige la atención del examinador al contenido de las páginas 82 y 83 donde se indica *"Los equivalentes biológicos adecuados tienen al menos aproximadamente 60%, preferiblemente al menos aproximadamente 70%, más preferiblemente al menos aproximadamente 75%, aún más preferiblemente aproximadamente 80%, aún más preferiblemente aproximadamente 85%, aún más preferiblemente aproximadamente 90%, aún más preferiblemente 95% o aún más preferiblemente 98%, o aún más preferiblemente 99% de similitud con uno de los polipéptidos 2086 especificados aquí (es decir, las ID DE SEC NOS: 2-252 numeradas pares y las ID DE SEC NOS: 331-443 numeradas impares), siempre y cuando el equivalente sea capaz de elicitar sustancialmente las mismas propiedades inmunogénicas que una de las proteínas 2086 de esta invención."* Para una persona versada en la materia es evidente que una secuencia de aminoácidos

puede ser 90% similar a otra y mantener sus propiedades inmunogénicas.

Las reivindicaciones 6 a 10, 13 a 17, 19, 25 y 26 fueron eliminadas por lo que se considera que las objeciones sobre ellas han sido superadas.

Finalmente, las reivindicaciones 18 y 20 han sido modificadas para que en ellas ahora se defina el método para preparar la composición, ya se partiendo de células aisladas y purificadas o de células recombinantes que expresan las proteínas definidas en la reivindicación 1 de la presente solicitud.

3. Unidad de invención

El nuevo capítulo reivindicatorio cumple con el requisito de unidad toda vez que limita el alcance de la invención a las composiciones que comprenden polipéptidos que comprenden una secuencia de aminoácidos de cualquiera de las secuencias SEQ ID Nº 331-443 y las reivindicaciones 8 a 10 han sido eliminadas.

En virtud de los argumentos expuestos y en vista de las enmiendas realizadas a las reivindicaciones, la invención reivindicada es clara y cumple con el requisito de unidad de invención. En consecuencia, se solicita reconsiderar todas las objeciones manifestadas por ese despacho y proceder con la concesión del privilegio de patente de invención a la presente solicitud.

Señor Superintendente,

DILIA MARÍA RODRÍGUEZ DCALEMAN
C.C. 41.654.882 de Bogotá.
T.P. 20824 CSJ

REIVINDICACIONES

1. Una composición caracterizada porque comprende:
   a. Al menos una proteína que comprende una secuencia de aminoácidos de cualquiera de las secuencias SEQ ID Nº 331 - 443 impares; o
   b. Al menos una proteína codificada por un polinucleótido que hibridiza bajo condiciones severas con un polinucleótido que comprende una secuencia de ácido nucleico de cualquiera de las secuencias SEQ ID Nº 330 - 442 pares;
   c. Al menos una porción inmunogénica de al menos una proteína descrita en (a) o (b) que comprende la secuencia de aminoácidos de una cualquiera de las secuencias SEQ ID Nº 444 - 452; o
   d. Al menos un equivalente biológico que tiene una homología de al menos 90% a la proteína descrita en (a) o en (b) o a la porción inmunogénica descrita en (c) y tiene las mismas propiedades inmunogénicas.

2. La composición de la reivindicación 1, caracterizada porque la composición comprende adicionalmente al menos una proteína de unión transferrina, Por A, Por B o una proteína de opacidad (Opc).

3. La composición de acuerdo con la reivindicación 1, caracterizada porque la composición comprende adicionalmente al menos un antígeno de la especie *Neisseria*, siendo dicho antígeno de superficie adicional una proteína no-ORF2086.

4. La composición de acuerdo con la reivindicación 1, caracterizada porque la al menos una proteína tiene un peso molecular de 26.000 a 30.000, según se midió mediante espectrometría de masas.

5. La composición de acuerdo con la reivindicación 1, caracterizada porque la al menos una proteína tiene un peso molecular de 28 a 35 KDa, según se midió en un gel de poliacrilamida SDS 10% a 20%.

6. La composición de acuerdo con la reivindicación 1, caracterizada porque la composición comprende adicionalmente un buffer, un dilúyete, un adyuvante o un cargador farmacéuticamente aceptable.

7. La composición de acuerdo con la reivindicación 6, caracterizada porque la composición comprende un adyuvante farmacéuticamente aceptable.

8. Una composición caracterizada porque que comprende un vector que comprende cualquiera de:
   a. Al menos un polinucleótido que codifica al menos uno de los polipéptido de las secuencias SEQ ID N° 331-443 impares; o
   b. Al menos un polinucleótido que hibridiza bajo condiciones severas con al menos un polinucleótido de (a).

9. La composición de la reivindicación 8, donde el vector comprende la secuencia de ácido nucleico de cualquiera de las secuencias SEQ ID N° 330 a 442 pares.

10. Un método para preparar la composición de la reivindicación 1, caracterizado porque comprende

    a. Aislar y purificar al menos una proteína que comprende la secuencia de aminoácidos de cualquiera de las secuencias SEQ ID N° 331-443; o al menos una proteína codificada por un polinucleótido que hibridiza bajo condiciones severas con un polinucleótido que comprende una secuencia de ácido nucleico de una cualquiera de las secuencias SEQ ID N° 330-442 pares; o al menos una porción inmunogénica de al menos una proteína descrita en (a) o (b) que comprende la secuencia de aminoácidos de una cualquiera de las secuencias SEQ ID N° 444 - 452; o al menos un equivalente biológico que tiene una homología de al menos 90% a la proteína descrita en (a) o en (b) o a la porción

inmunogénica , descrita en (c) y tiene las mismas propiedades inmunogénicas, y

b. Mezclar el polipéptido del paso a) con un buffer, un dilúyete, un adyuvante o un cargador farmacéuticamente aceptable.

11. Un método para preparar la composición de la reivindicación 1, caracterizado porque comprende

a. Expresar en una célula huésped una secuencia de ácido nucleico que codifica un cualquiera de: una proteína que comprende la secuencia de aminoácidos de cualquiera de las secuencias SEQ ID Nº 331-443; una proteína codificada por un polinucleótido que hibridiza bajo condiciones severas con un polinucleótido que comprende una secuencia de ácido nucleico de una cualquiera de las secuencias SEQ ID Nº 330-442 pares; una porción inmunogénica de al menos una proteína descrita en (a) o (b) que comprende la secuencia de aminoácidos de una cualquiera de las secuencias SEQ ID Nº 444 - 452; o un equivalente biológico que tiene una homología de al menos 90% a la proteína descrita en (a) o en (b) o a la porción inmunogénica descrita en (c) y tiene las mismas propiedades inmunogénicas, y

b. Mezclar el polipéptido del paso a) con un buffer, un dilúyete, un adyuvante o un cargador farmacéuticamente aceptable.

12. El método de la reivindicación 11, caracterizado porque la secuencia de ácido nucleico es expresada In Vivo o In Vitro.

13. El método de la reivindicación 11, caracterizado porque el ácido nucleico es introducido en un vector.

14. El método de la reivindicación 14, caracterizado porque el vector un plásmido o un fago.

15. El método de la reivindicación 11, caracterizado porque además comprende una secuencia líder no nativa asociada con dicho por lo menos un polinucleótido aislado.

16. El método de la reivindicación 15, caracterizado porque la secuencia líder no nativa es la secuencia líder P4 (SEQ ID N° 267).

17. Una línea celular transformada /transfectada o infectada, caracterizada porque comprende una célula recombinante que expresa una secuencia de ácido que

    a. codifica al menos una proteína aislada que comprende la secuencia de aminoácidos de cualquier de las SEQ ID N° 444-452, o
    b. hibridiza bajo condiciones severas con cualquiera de los polinucleótidos descritos en (a).

18. Una línea celular transformada/transfectada o infectada caracterizada porque comprende una célula recombinante que expresa una secuencia de ácido nucleico que codifica al menos un polipéptido que comprende una secuencia de aminoácidos de cualquiera de las secuencias SEQ ID N° 331-443 impares.

19. La línea celular transformada/transfectada o infectada de la reivindicación 18, caracterizada porque el polipéptido es un anticuerpo monoclonal.

20. La línea celular transformada/transfectada o infectada de la reivindicación 18, caracterizada porque la célula recombinante es un hibridoma o un trioma.

21. Una línea celular transformada/transfectada o infectada caracterizada porque comprende:

- Una célula recombinante que expresa una secuencia de ácido nucleico que comprende:
  a. Al menos un polinucleótido que codifica una proteína que comprende una secuencia de aminoácidos de cualquiera de las secuencias SEQ ID N° 331-443 impares; o
  b. Al menos un polinucleótido que comprende una secuencia de ácido nucleico de una cualquiera de las secuencias SEQ ID N° 330-442 pares;
  c. Al menos un polinucleótido que hibridiza bajo condiciones severas con cualquiera de las secuencias descrita en (a) o (b); o

- Una célula recombinante que expresa una secuencia de ácido nucleico que codifica:
  d. Al menos un polipéptido codificado por cualquiera de (a), (b) o (c); o
  e. Al menos un polipéptido que comprende una secuencia de aminoácidos de cualquiera de las secuencias SEQ ID N° 331-443 impares.

22. La línea celular transformada/transfectada o infectada de la reivindicación 21, caracterizada porque el polipéptido es un anticuerpo monoclonal.

23. La línea celular transformada/transfectada o infectada de la reivindicación 21, caracterizada la célula recombinante es un hibridoma o un trioma.

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<130> BIE118740EP

<140> N°de la demande EP
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John, Farley
Bernfield, Liesel
Zagursky, Robert
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ataagggaaa aggttcacga aatcggcatc gccagcaaac agtag 765

<210> 8
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 8

Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Thr Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

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

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Gln Ile Tyr Lys Gln Asn His Ser Ala Val Val Ala Leu Gln Ile Glu
            100                 105                 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
        115                 120                 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
    130                 135                 140

Pro Asp Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145                 150                 155                 160

Pro Asn Gly Arg Leu His Tyr Ser Ile Asp Phe Thr Lys Lys Gln Gly
                165                 170                 175

Tyr Gly Arg Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
            180                 185                 190

Ala Ser Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
        195                 200                 205

Gly Asp Thr Arg Tyr Gly Gly Glu Glu Lys Gly Thr Tyr His Leu Ala
    210                 215                 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Pro Ala Thr Val Lys
225                 230                 235                 240

Ile Arg Glu Lys Val His Glu Ile Gly Ile Ala Ser Lys Gln
                245                 250
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<210> 9
<211> 768
<212> DNA
<213> Neisseria meningitidis
<400> 9

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tgcggatcca gcggaggcgg cggtgtcgcc gccgacatcg gcgcggggct tgccgatgca     60

ctaaccacac cgctcgacca taaagacaaa agtttgcagt ctttgacgct ggatcagtcc    120

gtcaggaaaa acgagaaact gaagctggcg gcacaaggtg cggaaaaaac ttatggaaac    180

ggcgacagcc tcaatacggg caaattgaag aacgacaagg tcagccgctt cgactttatc    240

cgtcaaatcg aagtggacgg acaaaccatc acgctggcaa gcggcgaatt tcaaatatac    300

aaacagaacc actccgccgt cgttgcccta cagattgaaa aaatcaacaa ccccgacaaa    360
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atcgacagcc tgataaacca acgctccttc cttgtcagcg gtttgggcgg agaacatacc 420

gccttcaacc aactgcctga cggcaaagcc gagtatcacg gcaaagcatt cagctccgac 480

gacccgaacg gcaggctgca ctactccatt gattttacca aaaaacaggg ttacggcaga 540

atcgaacacc tgaaaacgcc cgagcagaat gtcgagcttg cctccgccga actcaaagca 600

gatgaaaaat cacacgccgt cattttgggc gacacgcgct acggcggcga agaaaaaggc 660

acttaccacc tcgccctttt cggcgaccgc gcccaagaaa tcgccggccc ggcaaccgtg 720

aagataaggg aaaaggttca cgaaatcggc atcgccagca aacagtag 768

<210> 10
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 10

Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1 5 10 15

Leu Ala Asp Ala Leu Thr Thr Pro Leu Asp His Lys Asp Lys Ser Leu
20 25 30

Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
35 40 45

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
50 55 60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65 70 75 80

Arg Gln Ile Glu Val Asp Gly Gln Thr Ile Thr Leu Ala Ser Gly Glu
85 90 95

Phe Gln Ile Tyr Lys Gln Asn His Ser Ala Val Val Ala Leu Gln Ile
100 105 110

Glu Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg
115 120 125

Ser Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln
130 135 140

17

Leu Pro Asp Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp
145 150 155 160

Asp Pro Asn Gly Arg Leu His Tyr Ser Ile Asp Phe Thr Lys Lys Gln
165 170 175

Gly Tyr Gly Arg Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu
180 185 190

Leu Ala Ser Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile
195 200 205

Leu Gly Asp Thr Arg Tyr Gly Gly Glu Glu Lys Gly Thr Tyr His Leu
210 215 220

Ala Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Pro Ala Thr Val
225 230 235 240

Lys Ile Arg Glu Lys Val His Glu Ile Gly Ile Ala Ser Lys Gln
245 250 255

<210> 11
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 11
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accacaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaacttа tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacggaca aaccatcacg ctggcaagcg gcgaatttca aatatacaaa 300

cagaaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggcggaga acataccgcc 420

ttcaaccaac tgcctgacgg caaagccgag tatcacggca aagcattcag ctccgacgac 480

ccgaacggca ggctgcacta ctccattgat tttaccaaaa aacagggtta cggcagaatc 540

gaacacctga aaacgcccga gcagaatgtc gagcttgcct ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcggcgaaga aaaaggcact 660

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggcccggc aaccgtgaag 720

ataagggaaa aggttcacga aatcggcatc gccagcaaac agtag 765

<210> 12
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 12

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Thr Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

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

Gln Ile Tyr Lys Gln Asn His Ser Ala Val Val Ala Leu Gln Ile Glu
100 105 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
115 120 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
130 135 140

Pro Asp Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145 150 155 160

Pro Asn Gly Arg Leu His Tyr Ser Ile Asp Phe Thr Lys Lys Gln Gly
165 170 175

Tyr Gly Arg Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
180 185 190

Ala Ser Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
195 200 205

Gly Asp Thr Arg Tyr Gly Gly Glu Glu Lys Gly Thr Tyr His Leu Ala
210 215 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Pro Ala Thr Val Lys
225 230 235 240

Ile Arg Glu Lys Val His Glu Ile Gly Ile Ala Ser Lys Gln
245 250

<210> 13
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 13
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accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcggag tggacggaca aaccatcacg ctggcaagcg gcgaatttca aatatacaaa 300

cagaaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggcggaga acataccgcc 420

ttcaaccaac tgcctgacgg caaagccgag tatcacggca aagcattcag ctccgacgac 480

ccgaacggca ggctgcacta ctccattgat tttaccaaaa aacagggtta cggcagaatc 540

gaacacctga aaacgcccga gcagaatgtc gagcttgcct ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcggcgaaga aaaaggcact 660

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag 720

ataagggaaa aggttcacga aatcggcatc gccggcaaac agtag 765

<210> 14
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 14

20

Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

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

Gln Ile Tyr Lys Gln Asn His Ser Ala Val Val Ala Leu Gln Ile Glu
100 105 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
115 120 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
130 135 140

Pro Asp Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145 150 155 160

Pro Asn Gly Arg Leu His Tyr Ser Ile Asp Phe Thr Lys Lys Gln Gly
165 170 175

Tyr Gly Arg Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
180 185 190

Ala Ser Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
195 200 205

Gly Asp Thr Arg Tyr Gly Gly Glu Glu Lys Gly Thr Tyr His Leu Ala
210 215 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys

225 230 235 240

Ile Arg Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
245 250

<210> 15
<211> 768
<212> DNA
<213> Neisseria meningitidis

<400> 15
tgcggatcca gcggaggcgg cggtgtcgcc gccgacatcg gcgcggggct tgccgatgca 60

ctaaccgcac cgctcgacca taaagacaaa agtttgcagt ctttgacgct ggatcagtcc 120

gtcaggaaaa acgagaaact gaagctggcg gcacaaggtg cggaaaaaac ttatggaaac 180

ggcgacagcc tcaatacggg caaattgaag aacgacaagg tcagccgctt cgactttatc 240

cgtcaaatcg gagtggacgg acaaaccatc acgctggcaa gcggcgaatt tcaaatatac 300

aaacagaacc actccgccgt cgttgcccta cagattgaaa aaatcaacaa ccccgacaaa 360

atcgacagcc tgataaacca acgctccttc cttgtcagcg gtttgggcgg agaacatacc 420

gccttcaacc aactgcctga cggcaaagcc gagtatcacg gcaaagcatt cagctccgac 480

gacccgaacg gcaggctgca ctactccatt gattttacca aaaaacaggg ttacggcaga 540

atcgaacacc tgaaaacgcc cgagcagaat gtcgagcttg cctccgccga actcaaagca 600

gatgaaaaat cacacgccgt cattttgggc gacacgcgct acggcggcga agaaaaaggc 660

acttaccacc tcgccctttt cggcgaccgc gcccaagaaa tcgccggctc ggcaaccgtg 720

aagataaggg aaaaggttca cgaaatcggc atcgccggca aacagtag 768

<210> 16
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 16
Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1 5 10 15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu
20 25 30

Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
35 40 45

22

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
50 55 60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65 70 75 80

Arg Gln Ile Gly Val Asp Gly Gln Thr Ile Thr Leu Ala Ser Gly Glu
85 90 95

Phe Gln Ile Tyr Lys Gln Asn His Ser Ala Val Val Ala Leu Gln Ile
100 105 110

Glu Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg
115 120 125

Ser Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln
130 135 140

Leu Pro Asp Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp
145 150 155 160

Asp Pro Asn Gly Arg Leu His Tyr Ser Ile Asp Phe Thr Lys Lys Gln
165 170 175

Gly Tyr Gly Arg Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu
180 185 190

Leu Ala Ser Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile
195 200 205

Leu Gly Asp Thr Arg Tyr Gly Gly Glu Glu Lys Gly Thr Tyr His Leu
210 215 220

Ala Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val
225 230 235 240

Lys Ile Arg Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
245 250 255

<210> 17
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 17
atgagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcggag tggacggaca aaccatcacg ctggcaagcg gcgaatttca aatatacaaa 300

cagaaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggcggaga acataccgcc 420

ttcaaccaac tgcctgacgg caaagccgag tatcacggca aagcattcag ctccgacgac 480

ccgaacggca ggctgcacta ctccattgat tttaccaaaa aacagggtta cggcagaatc 540

gaacacctga aaacgcccga gcagaatgtc gagcttgcct ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcggcgaaga aaaaggcact 660

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag 720

ataagggaaa aggttcacga aatcggcatc gccggcaaac agtag 765

<210> 18
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 18

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Gly Val Asp Gly Gln Thr Ile Thr Leu Ala Ser Gly Glu Phe

85 90 95

Gln Ile Tyr Lys Gln Asn His Ser Ala Val Val Ala Leu Gln Ile Glu
100 105 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
115 120 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
130 135 140

Pro Asp Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145 150 155 160

Pro Asn Gly Arg Leu His Tyr Ser Ile Asp Phe Thr Lys Lys Gln Gly
165 170 175

Tyr Gly Arg Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
180 185 190

Ala Ser Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
195 200 205

Gly Asp Thr Arg Tyr Gly Gly Glu Glu Lys Gly Thr Tyr His Leu Ala
210 215 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225 230 235 240

Ile Arg Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
245 250

<210> 19
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 19
tgcagcagca gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

25

caaatcgaag tggacggaca aaccatcacg ctggcaagcg gcgaatttca aatatacaaa 300

cagaaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggcggaga acataccgcc 420

ttcaaccaac tgcctgacgg caaagccgag tatcacggca aagcattcag ctccgacgac 480

ccgaacggca ggctgcacta ctccattgat tttaccaaaa aacagggtta cggcagaatc 540

gaacacctga aaacgcccga gcagaatgtc gagcttgcct ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcggcgaaga aaaaggcact 660

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag 720

ataagggaaa aggttcacga aatcggcatc gccggcaaac agtag 765

<210> 20
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 20
Cys Ser Ser Arg Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

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

Gln Ile Tyr Lys Gln Asn His Ser Ala Val Val Ala Leu Gln Ile Glu
100 105 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
115 120 125

2C

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Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
    130                 135                 140

Pro Asp Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145                 150                 155                 160

Pro Asn Gly Arg Leu His Tyr Ser Ile Asp Phe Thr Lys Lys Gln Gly
                165                 170                 175

Tyr Gly Arg Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
            180                 185                 190

Ala Ser Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
        195                 200                 205

Gly Asp Thr Arg Tyr Gly Gly Glu Glu Lys Gly Thr Tyr His Leu Ala
    210                 215                 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225                 230                 235                 240

Ile Arg Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
                245                 250
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<210> 21
<211> 768
<212> DNA
<213> Neisseria meningitidis

<400> 21
tgcggatcca gcagaggcgg cggtgtcgcc gccgacatcg gcgcggggct tgccgatgca 60

ctaaccgcac cgctcgacca taaagacaaa agtttgcagt ctttgacgct ggatcagtcc 120

gtcaggaaaa acgagaaact gaagctggcg gcacaaggtg cggaaaaaac ttatggaaac 180

ggcgacagcc tcaatacggg caaattgaag aacgacaagg tcagccgctt cgactttatc 240

cgtcaaatcg aagtggacgg acaaaccatc acgctggcaa gcggcgaatt tcaaatatac 300

aaacagaacc actccgccgt cgttgcccta cagattgaaa aaatcaacaa ccccgacaaa 360

atcgacagcc tgataaacca acgctccttc cttgtcagcg gtttgggcgg agaacatacc 420

gccttcaacc aactgcctga cggcaaagcc gagtatcacg gcaaagcatt cagctccgac 480

gacccgaacg gcaggctgca ctactccatt gattttacca aaaaacaggg ttacggcaga 540

atcgaacacc tgaaaacgcc cgagcagaat gtcgagcttg cctccgccga actcaaagca 600

27

gatgaaaaat cacacgccgt cattttgggc gacacgcgct acggcggcga agaaaaaggc 660

acttaccacc tcgccctttt cggcgaccgc gcccaagaaa tcgccggctc ggcaaccgtg 720

aagataaggg aaaaggttca cgaaatcggc atcgccggca aacagtag 768

<210> 22
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 22

Cys Gly Ser Ser Arg Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1 5 10 15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu
20 25 30

Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
35 40 45

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
50 55 60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65 70 75 80

Arg Gln Ile Glu Val Asp Gly Gln Thr Ile Thr Leu Ala Ser Gly Glu
85 90 95

Phe Gln Ile Tyr Lys Gln Asn His Ser Ala Val Val Ala Leu Gln Ile
100 105 110

Glu Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg
115 120 125

Ser Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln
130 135 140

Leu Pro Asp Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp
145 150 155 160

Asp Pro Asn Gly Arg Leu His Tyr Ser Ile Asp Phe Thr Lys Lys Gln
165 170 175

Gly Tyr Gly Arg Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu
180 185 190

Leu Ala Ser Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile
195 200 205

Leu Gly Asp Thr Arg Tyr Gly Gly Glu Glu Lys Gly Thr Tyr His Leu
210 215 220

Ala Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val
225 230 235 240

Lys Ile Arg Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
245 250 255

<210> 23
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 23
atgagcagca gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacggaca aaccatcacg ctggcaagcg gcgaatttca aatatacaaa 300

cagaaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggcggaga acataccgcc 420

ttcaaccaac tgcctgacgg caaagccgag tatcacggca aagcattcag ctccgacgac 480

ccgaacggca ggctgcacta ctccattgat tttaccaaaa aacagggtta cggcagaatc 540

gaacacctga aaacgcccga gcagaatgtc gagcttgcct ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcggcgaaga aaaaggcact 660

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag 720

ataagggaaa aggttcacga aatcggcatc gccggcaaac agtag 765

<210> 24
<211> 254
<212> PRT

<213> Neisseria meningitidis

<400> 24

Met Ser Ser Arg Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

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

Gln Ile Tyr Lys Gln Asn His Ser Ala Val Val Ala Leu Gln Ile Glu
100 105 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
115 120 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
130 135 140

Pro Asp Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145 150 155 160

Pro Asn Gly Arg Leu His Tyr Ser Ile Asp Phe Thr Lys Lys Gln Gly
165 170 175

Tyr Gly Arg Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
180 185 190

Ala Ser Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
195 200 205

Gly Asp Thr Arg Tyr Gly Gly Glu Glu Lys Gly Thr Tyr His Leu Ala

30

210 215 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225 230 235 240

Ile Arg Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
245 250

<210> 25
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 25
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accgcaccgt tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa 300

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggtggaga acataccgcc 420

ttcaaccaac tgcccagcgg caaagccgag tatcacggca aagcattcag ctccgacgac 480

ccgaacggca ggctgcacta ctccattgat tttaccaaaa aacagggtta cggcagaatc 540

gaacacctga aaacgcccga gcagaatgtc gagcttgcct ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcggcgaaga aaaaggcact 660

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag 720

ataagggaaa aggttcacga aatcggcatc gccggcaaac agtag 765

<210> 26
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 26
Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Phe Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu
100 105 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
115 120 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
130 135 140

Pro Ser Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145 150 155 160

Pro Asn Gly Arg Leu His Tyr Ser Ile Asp Phe Thr Lys Lys Gln Gly
165 170 175

Tyr Gly Arg Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
180 185 190

Ala Ser Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
195 200 205

Gly Asp Thr Arg Tyr Gly Gly Glu Glu Lys Gly Thr Tyr His Leu Ala
210 215 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225 230 235 240

Ile Arg Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
245 250

<210> 27
<211> 768
<212> DNA
<213> Neisseria meningitidis

<400> 27
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ctaaccgcac cgttcgacca taaagacaaa agtttgcagt ctttgacgct ggatcagtcc 120

gtcaggaaaa acgagaaact gaagctggcg gcacaaggtg cggaaaaaac ttatggaaac 180

ggcgacagcc tcaatacggg caaattgaag aacgacaagg tcagccgctt cgactttatc 240

cgtcaaatcg aagtggacgg gcagctcatt accttggaga gcggagagtt ccaaatatac 300

aaacaggacc actccgccgt cgttgcccta cagattgaaa aaatcaacaa ccccgacaaa 360

atcgacagcc tgataaacca acgctccttc cttgtcagcg gtttgggtgg agaacatacc 420

gccttcaacc aactgcccag cggcaaagcc gagtatcacg gcaaagcatt cagctccgac 480

gacccgaacg gcaggctgca ctactccatt gattttacca aaaaacaggg ttacggcaga 540

atcgaacacc tgaaaacgcc cgagcagaat gtcgagcttg cctccgccga actcaaagca 600

gatgaaaaat cacacgccgt cattttgggc gacacgcgct acggcggcga agaaaaaggc 660

acttaccacc tcgccctttt cggcgaccgc gcccaagaaa tcgccggctc ggcaaccgtg 720

aagataaggg aaaaggttca cgaaatcggc atcgccggca aacagtag 768

<210> 28
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 28
Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1 5 10 15

Leu Ala Asp Ala Leu Thr Ala Pro Phe Asp His Lys Asp Lys Ser Leu
20 25 30

Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
35 40 45

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
50 55 60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65 70 75 80

Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu
85 90 95

Phe Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile
100 105 110

Glu Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg
115 120 125

Ser Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln
130 135 140

Leu Pro Ser Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp
145 150 155 160

Asp Pro Asn Gly Arg Leu His Tyr Ser Ile Asp Phe Thr Lys Lys Gln
165 170 175

Gly Tyr Gly Arg Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu
180 185 190

Leu Ala Ser Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile
195 200 205

Leu Gly Asp Thr Arg Tyr Gly Gly Glu Glu Lys Gly Thr Tyr His Leu
210 215 220

Ala Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val
225 230 235 240

Lys Ile Arg Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
245 250 255

<210> 29
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 29
atgagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgt tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa 300

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggtggaga acataccgcc 420

ttcaaccaac tgcccagcgg caaagccgag tatcacggca aagcattcag ctccgacgac 480

ccgaacggca ggctgcacta ctccattgat tttaccaaaa aacagggtta cggcagaatc 540

gaacacctga aaacgcccga gcagaatgtc gagcttgcct ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcggcgaaga aaaaggcact 660

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag 720

ataagggaaa aggttcacga aatcggcatc gccggcaaac agtag 765

<210> 30
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 30

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Phe Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu
100 105 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
115 120 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
130 135 140

Pro Ser Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145 150 155 160

Pro Asn Gly Arg Leu His Tyr Ser Ile Asp Phe Thr Lys Lys Gln Gly
165 170 175

Tyr Gly Arg Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
180 185 190

Ala Ser Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
195 200 205

Gly Asp Thr Arg Tyr Gly Gly Glu Glu Lys Gly Thr Tyr His Leu Ala
210 215 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225 230 235 240

Ile Arg Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
245 250

<210> 31
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 31
tgcagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa 300

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggtggaga acataccgcc 420

ttcaaccaac tgcccagcgg caaagccgag tatcacggca aagcattcag ctccgacgac 480

ccgaacggca ggctgcacta ctccattgat tttaccaaaa aacagggtta cggcagaatc 540

gaacacctga aaacgcccga gcagaatgtc gagcttgcct ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcggcgaaga aaaaggcact 660

taccacctcg ccctttccgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag 720

ataagggaaa aggttcacga aatcggcatc gccggcaaac agtag 765

<210> 32
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 32
Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu
100 105 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
115 120 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
130 135 140

Pro Ser Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145 150 155 160

Pro Asn Gly Arg Leu His Tyr Ser Ile Asp Phe Thr Lys Lys Gln Gly
165 170 175

Tyr Gly Arg Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
180 185 190

Ala Ser Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
195 200 205

Gly Asp Thr Arg Tyr Gly Gly Glu Glu Lys Gly Thr Tyr His Leu Ala
210 215 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225 230 235 240

Ile Arg Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
245 250

<210> 33
<211> 768
<212> DNA
<213> Neisseria meningitidis

<400> 33
tgcggatcca gcggaggcgg cggtgtcgcc gccgacatcg gcgcggggct tgccgatgca 60

ctaaccgcac cgctcgacca taaagacaaa agtttgcagt ctttgacgct ggatcagtcc 120

gtcaggaaaa acgagaaact gaagctggcg gcacaaggtg cggaaaaaac ttatggaaac 180

ggcgacagcc tcaatacggg caaattgaag aacgacaagg tcagccgctt cgactttatc 240

cgtcaaatcg aagtggacgg gcagctcatt accttggaga gcggagagtt ccaaatatac 300

aaacaggacc actccgccgt cgttgcccta cagattgaaa aaatcaacaa ccccgacaaa 360

atcgacagcc tgataaacca acgctccttc cttgtcagcg gtttgggtgg agaacatacc 420

gccttcaacc aactgcccag cggcaaagcc gagtatcacg gcaaagcatt cagctccgac 480

gacccgaacg gcaggctgca ctactccatt gattttacca aaaaacaggg ttacggcaga 540

atcgaacacc tgaaaacgcc cgagcagaat gtcgagcttg cctccgccga actcaaagca 600

gatgaaaaat cacacgccgt cattttgggc gacacgcgct acggcggcga agaaaaaggc 660

acttaccacc tcgccctttt cggcgaccgc gcccaagaaa tcgccggctc ggcaaccgtg 720

aagataaggg aaaaggttca cgaaatcggc atcgccggca aacagtag 768

<210> 34
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 34
Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1 5 10 15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu
20 25 30

Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
35 40 45

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
50 55 60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65 70 75 80

Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu
85 90 95

Phe Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile
100 105 110

Glu Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg
115 120 125

Ser Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln
130 135 140

Leu Pro Ser Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp
145 150 155 160

Asp Pro Asn Gly Arg Leu His Tyr Ser Ile Asp Phe Thr Lys Lys Gln
165 170 175

Gly Tyr Gly Arg Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu
180 185 190

Leu Ala Ser Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile
195 200 205

Leu Gly Asp Thr Arg Tyr Gly Gly Glu Glu Lys Gly Thr Tyr His Leu
210 215 220

Ala Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val
225 230 235 240

Lys Ile Arg Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
245 250 255

<210> 35
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 35
atgagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa 300

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggtggaga acataccgcc 420

ttcaaccaac tgcccagcgg caaagccgag tatcacggca aagcattcag ctccgacgac 480

ccgaacggca ggctgcacta ctccattgat tttaccaaaa aacagggtta cggcagaatc 540

gaacacctga aaacgcccga gcagaatgtc gagcttgcct ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcggcgaaga aaaaggcact 660

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag 720

ataagggaaa aggttcacga aatcggcatc gccggcaaac agtag 765

<210> 36
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 36

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

40

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu
100 105 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
115 120 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
130 135 140

Pro Ser Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145 150 155 160

Pro Asn Gly Arg Leu His Tyr Ser Ile Asp Phe Thr Lys Lys Gln Gly
165 170 175

Tyr Gly Arg Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
180 185 190

Ala Ser Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
195 200 205

Gly Asp Thr Arg Tyr Gly Gly Glu Glu Lys Gly Thr Tyr His Leu Ala
210 215 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225 230 235 240

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Ile Arg Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
                245                 250
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<210> 37
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 37

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tgcagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta     60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc    120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc    180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt    240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa    300

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc    360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggtggaga acataccgcc    420

ttcaaccaac tgcccagcgg caaagccgag tatcacggca aagcattcag ctccgacgac    480

ccgaacggca ggctgcacta ctccattgat tttaccaaaa aacagggtta cggcagaatc    540

gaacacctga aaacgcccga gcagaatgtc gagcttgcct ccgccgaact caaagcagat    600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcggcgaaga aaaaggcact    660

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag    720

ataagggaaa aggttcacga aatcggcatc gccggcaaac agtag                    765
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<210> 38
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 38

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Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1               5                  10                  15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
            20                  25                  30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
        35                  40                  45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
    50                  55                  60
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Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65                  70                  75                  80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
                85                  90                  95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu
            100                 105                 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
        115                 120                 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
    130                 135                 140

Pro Ser Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145                 150                 155                 160

Pro Asn Gly Arg Leu His Tyr Ser Ile Asp Phe Thr Lys Lys Gln Gly
                165                 170                 175

Tyr Gly Arg Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
            180                 185                 190

Ala Ser Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
        195                 200                 205

Gly Asp Thr Arg Tyr Gly Gly Glu Glu Lys Gly Thr Tyr His Leu Ala
    210                 215                 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225                 230                 235                 240

Ile Arg Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
                245                 250
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<210> 39
<211> 768
<212> DNA
<213> Neisseria meningitidis

<400> 39
tgcggatcca gcggaggcgg cggtgtcgcc gccgacatcg gcgcggggct tgccgatgca 60

ctaaccgcac cgctcgacca taaagacaaa agtttgcagt ctttgacgct ggatcagtcc 120

gtcaggaaaa acgagaaact gaagctggcg gcacaaggtg cggaaaaaac ttatggaaac 180

ggcgacagcc tcaatacggg caaattgaag aacgacaagg tcagccgctt cgactttatc 240

cgtcaaatcg aagtggacgg gcagctcatt accttggaga gcggagagtt ccaaatatac 300

aaacaggacc actccgccgt cgttgcccta cagattgaaa aaatcaacaa ccccgacaaa 360

atcgacagcc tgataaacca acgctccttc cttgtcagcg gtttgggtgg agaacatacc 420

gccttcaacc aactgcccag cggcaaagcc gagtatcacg gcaaagcatt cagctccgac 480

gacccgaacg gcaggctgca ctactccatt gattttacca aaaaacaggg ttacggcaga 540

atcgaacacc tgaaaacgcc cgagcagaat gtcgagcttg cctccgccga actcaaagca 600

gatgaaaaat cacacgccgt cattttgggc gacacgcgct acggcggcga agaaaaaggc 660

acttaccacc tcgccctttt cggcgaccgc gcccaagaaa tcgccggctc ggcaaccgtg 720

aagataaggg aaaaggttca cgaaatcggc atcgccggca aacagtag 768

<210> 40
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 40

Cys	Gly	Ser	Ser	Gly	Gly	Gly	Gly	Val	Ala	Ala	Asp	Ile	Gly	Ala	Gly
1				5					10					15	

Leu	Ala	Asp	Ala	Leu	Thr	Ala	Pro	Leu	Asp	His	Lys	Asp	Lys	Ser	Leu
			20					25					30		

Gln	Ser	Leu	Thr	Leu	Asp	Gln	Ser	Val	Arg	Lys	Asn	Glu	Lys	Leu	Lys
		35					40					45			

Leu	Ala	Ala	Gln	Gly	Ala	Glu	Lys	Thr	Tyr	Gly	Asn	Gly	Asp	Ser	Leu
	50					55					60				

Asn	Thr	Gly	Lys	Leu	Lys	Asn	Asp	Lys	Val	Ser	Arg	Phe	Asp	Phe	Ile
65					70					75					80

Arg	Gln	Ile	Glu	Val	Asp	Gly	Gln	Leu	Ile	Thr	Leu	Glu	Ser	Gly	Glu
			85					90					95		

Phe	Gln	Ile	Tyr	Lys	Gln	Asp	His	Ser	Ala	Val	Val	Ala	Leu	Gln	Ile

100 105 110

Glu Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg
115 120 125

Ser Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln
130 135 140

Leu Pro Ser Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp
145 150 155 160

Asp Pro Asn Gly Arg Leu His Tyr Ser Ile Asp Phe Thr Lys Lys Gln
165 170 175

Gly Tyr Gly Arg Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu
180 185 190

Leu Ala Ser Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile
195 200 205

Leu Gly Asp Thr Arg Tyr Gly Gly Glu Glu Lys Gly Thr Tyr His Leu
210 215 220

Ala Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val
225 230 235 240

Lys Ile Arg Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
245 250 255

<210> 41
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 41
atgagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa 300

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

95

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggtggaga acataccgcc 420

ttcaaccaac tgcccagcgg caaagccgag tatcacggca aagcattcag ctccgacgac 480

ccgaacggca ggctgcacta ctccattgat tttaccaaaa aacagggtta cggcagaatc 540

gaacacctga aaacgcccga gcagaatgtc gagcttgcct ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcggcgaaga aaaaggcact 660

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag 720

ataagggaaa aggttcacga aatcggcatc gccggcaaac agtag 765

<210> 42
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 42

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu
100 105 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
115 120 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
130 135 140

```
Pro Ser Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145                 150                 155                 160

Pro Asn Gly Arg Leu His Tyr Ser Ile Asp Phe Thr Lys Lys Gln Gly
                165                 170                 175

Tyr Gly Arg Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
            180                 185                 190

Ala Ser Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
        195                 200                 205

Gly Asp Thr Arg Tyr Gly Gly Glu Glu Lys Gly Thr Tyr His Leu Ala
    210                 215                 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225                 230                 235                 240

Ile Arg Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
                245                 250
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<210> 43
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 43
tgcagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa 300

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggtggaga acataccgcc 420

ttcaaccaac tgcccagcgg caaagccgag tatcacggca aagcattcag ctccgacgac 480

ccgaacggca ggctgcacta ctccattgat tttaccaaaa aacagggtta cggcagaatc 540

gaacacctga aaacgcccga gcagaatgtc gagcttgcct ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcggcgaaga aaaaggcact 660

Y7

taccacctcg ccctttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag 720

ataagggaaa aggttcacga aatcggcatc gccggcaaac agtag 765

<210> 44
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 44

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Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1               5                  10                  15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
            20                  25                  30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
        35                  40                  45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
    50                  55                  60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65                  70                  75                  80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
                85                  90                  95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu
            100                 105                 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
        115                 120                 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
    130                 135                 140

Pro Ser Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145                 150                 155                 160

Pro Asn Gly Arg Leu His Tyr Ser Ile Asp Phe Thr Lys Lys Gln Gly
                165                 170                 175

Tyr Gly Arg Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
            180                 185                 190
```

Ala Ser Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
195 200 205

Gly Asp Thr Arg Tyr Gly Gly Glu Glu Lys Gly Thr Tyr His Leu Ala
210 215 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225 230 235 240

Ile Arg Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
245 250

<210> 45
<211> 768
<212> DNA
<213> Neisseria meningitidis

<400> 45
tgcggatcca gcggaggcgg cggtgtcgcc gccgacatcg gcgcggggct tgccgatgca 60

ctaaccgcac cgctcgacca taaagacaaa agtttgcagt ctttgacgct ggatcagtcc 120

gtcaggaaaa acgagaaact gaagctggcg gcacaaggtg cggaaaaaac ttatggaaac 180

ggcgacagcc tcaatacggg caaattgaag aacgacaagg tcagccgctt cgactttatc 240

cgtcaaatcg aagtggacgg gcagctcatt accttggaga gcggagagtt ccaaatatac 300

aaacaggacc actccgccgt cgttgcccta cagattgaaa aaatcaacaa ccccgacaaa 360

atcgacagcc tgataaacca acgctccttc cttgtcagcg gtttgggtgg agaacatacc 420

gccttcaacc aactgcccag cggcaaagcc gagtatcacg gcaaagcatt cagctccgac 480

gacccgaacg gcaggctgca ctactccatt gattttacca aaaaacaggg ttacggcaga 540

atcgaacacc tgaaaacgcc cgagcagaat gtcgagcttg cctccgccga actcaaagca 600

gatgaaaaat cacacgccgt cattttgggc gacacgcgct acggcggcga agaaaaaggc 660

acttaccacc tcgccctttt cggcgaccgc gcccaagaaa tcgccggctc ggcaaccgtg 720

aagataaggg aaaaggttca cgaaatcggc atcgccggca aacagtag 768

<210> 46
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 46

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Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1               5                  10                  15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu
            20                  25                  30

Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
        35                  40                  45

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
    50                  55                  60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65                  70                  75                  80

Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu
                85                  90                  95

Phe Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile
            100                 105                 110

Glu Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg
        115                 120                 125

Ser Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln
    130                 135                 140

Leu Pro Ser Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp
145                 150                 155                 160

Asp Pro Asn Gly Arg Leu His Tyr Ser Ile Asp Phe Thr Lys Lys Gln
                165                 170                 175

Gly Tyr Gly Arg Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu
            180                 185                 190

Leu Ala Ser Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile
        195                 200                 205

Leu Gly Asp Thr Arg Tyr Gly Gly Glu Glu Lys Gly Thr Tyr His Leu
    210                 215                 220

Ala Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val
```


50

225 230 235 240

Lys Ile Arg Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
245 250 255

<210> 47
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 47
atgagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa 300

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggtggaga acataccgcc 420

ttcaaccaac tgcccagcgg caaagccgag tatcacggca aagcattcag ctccgacgac 480

ccgaacggca ggctgcacta ctccattgat tttaccaaaa aacagggtta cggcagaatc 540

gaacacctga aaacgcccga gcagaatgtc gagcttgcct ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcggcgaaga aaaaggcact 660

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag 720

ataagggaaa aggttcacga aatcggcatc gccggcaaac agtag 765

<210> 48
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 48

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

51

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu
100 105 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
115 120 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
130 135 140

Pro Ser Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145 150 155 160

Pro Asn Gly Arg Leu His Tyr Ser Ile Asp Phe Thr Lys Lys Gln Gly
165 170 175

Tyr Gly Arg Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
180 185 190

Ala Ser Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
195 200 205

Gly Asp Thr Arg Tyr Gly Gly Glu Glu Lys Gly Thr Tyr His Leu Ala
210 215 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225 230 235 240

Ile Arg Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
245 250

<210> 49
<211> 786
<212> DNA

52

<213> Neisseria meningitidis

<400> 49
tgcagcagcg gaagcggaag cggaggcggc ggtgtcgccg ccgacatcgg cacagggctt 60

gccgatgcac taactgcgcc gctcgaccat aaagacaaag gtttgaaatc cctgacattg 120

gaagactcca tttcccaaaa cggaacactg accctgtcgg cacaaggtgc ggaaaaaact 180

ttcaaagtcg gcgacaaaga caacagtctc aatacaggca aattgaagaa cgacaaaatc 240

agccgcttcg actttgtgca aaaaatcgaa gtggacggac aaaccatcac gctggcaagc 300

ggcgaatttc aaatatacaa acaggaccac tccgccgtcg ttgccctaca gattgaaaaa 360

atcaacaacc ccgacaaaat cgacagcctg ataaaccaac gctccttcct tgtcagcggt 420

ttgggcggag aacataccgc cttcaaccaa ctgcccagcg gcaaagccga gtatcacggc 480

aaagcattca gctccgacga tgccggcgga aaactgacct ataccataga ttttgccgcc 540

aaacagggac acggcaaaat cgaacacctg aaaacacccg agcagaatgt cgagcttgcc 600

tccgccgaac tcaaagcaga tgaaaaatca cacgccgtca ttttgggcga cacgcgctac 660

ggcagcgaag aaaaaggcac ttaccacctc gctcttttcg gcgaccgagc ccaagaaatc 720

gccggctcgg caaccgtgaa gataagggaa aaggttcacg aaatcggcat cgccggcaaa 780

cagtag 786

<210> 50
<211> 261
<212> PRT
<213> Neisseria meningitidis

<400> 50
Cys Ser Ser Gly Ser Gly Ser Gly Gly Gly Gly Val Ala Ala Asp Ile
1 5 10 15

Gly Thr Gly Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp
20 25 30

Lys Gly Leu Lys Ser Leu Thr Leu Glu Asp Ser Ile Ser Gln Asn Gly
35 40 45

Thr Leu Thr Leu Ser Ala Gln Gly Ala Glu Lys Thr Phe Lys Val Gly
50 55 60

Asp Lys Asp Asn Ser Leu Asn Thr Gly Lys Leu Lys Asn Asp Lys Ile
65 70 75 80

Ser Arg Phe Asp Phe Val Gln Lys Ile Glu Val Asp Gly Gln Thr Ile
85 90 95

Thr Leu Ala Ser Gly Glu Phe Gln Ile Tyr Lys Gln Asp His Ser Ala
100 105 110

Val Val Ala Leu Gln Ile Glu Lys Ile Asn Asn Pro Asp Lys Ile Asp
115 120 125

Ser Leu Ile Asn Gln Arg Ser Phe Leu Val Ser Gly Leu Gly Gly Glu
130 135 140

His Thr Ala Phe Asn Gln Leu Pro Ser Gly Lys Ala Glu Tyr His Gly
145 150 155 160

Lys Ala Phe Ser Ser Asp Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile
165 170 175

Asp Phe Ala Ala Lys Gln Gly His Gly Lys Ile Glu His Leu Lys Thr
180 185 190

Pro Glu Gln Asn Val Glu Leu Ala Ser Ala Glu Leu Lys Ala Asp Glu
195 200 205

Lys Ser His Ala Val Ile Leu Gly Asp Thr Arg Tyr Gly Ser Glu Glu
210 215 220

Lys Gly Thr Tyr His Leu Ala Leu Phe Gly Asp Arg Ala Gln Glu Ile
225 230 235 240

Ala Gly Ser Ala Thr Val Lys Ile Arg Glu Lys Val His Glu Ile Gly
245 250 255

Ile Ala Gly Lys Gln
260

<210> 51
<211> 789
<212> DNA
<213> Neisseria meningitidis

<400> 51
tgcggatcca gcggaagcgg aagcggaggc ggcggtgtcg ccgccgacat cggcacaggg 60

54

cttgccgatg cactaactgc gccgctcgac cataaagaca aaggtttgaa atccctgaca 120

ttggaagact ccatttccca aaacggaaca ctgaccctgt cggcacaagg tgcggaaaaa 180

actttcaaag tcggcgacaa agacaacagt ctcaatacag gcaaattgaa gaacgacaaa 240

atcagccgct tcgactttgt gcaaaaaatc gaagtggacg gacaaaccat cacgctggca 300

agcggcgaat ttcaaatata caaacaggac cactccgccg tcgttgccct acagattgaa 360

aaaatcaaca accccgacaa aatcgacagc ctgataaacc aacgctcctt ccttgtcagc 420

ggtttgggcg gagaacatac cgccttcaac caactgccca gcggcaaagc cgagtatcac 480

ggcaaagcat tcagctccga cgatgccggc ggaaaactga cctataccat agattttgcc 540

gccaaacagg gacacggcaa aatcgaacac ctgaaaacac ccgagcagaa tgtcgagctt 600

gcctccgccg aactcaaagc agatgaaaaa tcacacgccg tcattttggg cgacacgcgc 660

tacggcagcg aagaaaaagg cacttaccac ctcgctcttt tcggcgaccg agcccaagaa 720

atcgccggct cggcaaccgt gaagataagg gaaaaggttc acgaaatcgg catcgccggc 780

aaacagtag 789

<210> 52
<211> 262
<212> PRT
<213> Neisseria meningitidis

<400> 52

Cys Gly Ser Ser Gly Ser Gly Ser Gly Gly Gly Gly Val Ala Ala Asp
1 5 10 15

Ile Gly Thr Gly Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys
20 25 30

Asp Lys Gly Leu Lys Ser Leu Thr Leu Glu Asp Ser Ile Ser Gln Asn
35 40 45

Gly Thr Leu Thr Leu Ser Ala Gln Gly Ala Glu Lys Thr Phe Lys Val
50 55 60

Gly Asp Lys Asp Asn Ser Leu Asn Thr Gly Lys Leu Lys Asn Asp Lys
65 70 75 80

Ile Ser Arg Phe Asp Phe Val Gln Lys Ile Glu Val Asp Gly Gln Thr
85 90 95

55

Ile Thr Leu Ala Ser Gly Glu Phe Gln Ile Tyr Lys Gln Asp His Ser
100 105 110

Ala Val Val Ala Leu Gln Ile Glu Lys Ile Asn Asn Pro Asp Lys Ile
115 120 125

Asp Ser Leu Ile Asn Gln Arg Ser Phe Leu Val Ser Gly Leu Gly Gly
130 135 140

Glu His Thr Ala Phe Asn Gln Leu Pro Ser Gly Lys Ala Glu Tyr His
145 150 155 160

Gly Lys Ala Phe Ser Ser Asp Asp Ala Gly Gly Lys Leu Thr Tyr Thr
165 170 175

Ile Asp Phe Ala Ala Lys Gln Gly His Gly Lys Ile Glu His Leu Lys
180 185 190

Thr Pro Glu Gln Asn Val Glu Leu Ala Ser Ala Glu Leu Lys Ala Asp
195 200 205

Glu Lys Ser His Ala Val Ile Leu Gly Asp Thr Arg Tyr Gly Ser Glu
210 215 220

Glu Lys Gly Thr Tyr His Leu Ala Leu Phe Gly Asp Arg Ala Gln Glu
225 230 235 240

Ile Ala Gly Ser Ala Thr Val Lys Ile Arg Glu Lys Val His Glu Ile
245 250 255

Gly Ile Ala Gly Lys Gln
260

<210> 53
<211> 786
<212> DNA
<213> Neisseria meningitidis

<400> 53
atgagcagcg gaagcggaag cggaggcggc ggtgtcgccg ccgacatcgg cacagggctt 60

gccgatgcac taactgcgcc gctcgaccat aaagacaaag gtttgaaatc cctgacattg 120

gaagactcca tttcccaaaa cggaacactg accctgtcgg cacaaggtgc ggaaaaaact 180

ttcaaagtcg gcgacaaaga caacagtctc aatacaggca aattgaagaa cgacaaaatc 240

agccgcttcg actttgtgca aaaaatcgaa gtggacggac aaaccatcac gctggcaagc 300

ggcgaatttc aaatatacaa acaggaccac tccgccgtcg ttgccctaca gattgaaaaa 360

atcaacaacc ccgacaaaat cgacagcctg ataaaccaac gctccttcct tgtcagcggt 420

ttgggcggag aacataccgc cttcaaccaa ctgcccagcg gcaaagccga gtatcacggc 480

aaagcattca gctccgacga tgccggcgga aaactgacct ataccataga ttttgccgcc 540

aaacagggac acggcaaaat cgaacacctg aaaacacccg agcagaatgt cgagcttgcc 600

tccgccgaac tcaaagcaga tgaaaaatca cacgccgtca ttttgggcga cacgcgctac 660

ggcagcgaag aaaaaggcac ttaccacctc gctcttttcg gcgaccgagc ccaagaaatc 720

gccggctcgg caaccgtgaa gataagggaa aaggttcacg aaatcggcat cgccggcaaa 780

cagtag 786

<210> 54
<211> 261
<212> PRT
<213> Neisseria meningitidis

<400> 54

Met Ser Ser Gly Ser Gly Ser Gly Gly Gly Gly Val Ala Ala Asp Ile
1 5 10 15

Gly Thr Gly Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp
20 25 30

Lys Gly Leu Lys Ser Leu Thr Leu Glu Asp Ser Ile Ser Gln Asn Gly
35 40 45

Thr Leu Thr Leu Ser Ala Gln Gly Ala Glu Lys Thr Phe Lys Val Gly
50 55 60

Asp Lys Asp Asn Ser Leu Asn Thr Gly Lys Leu Lys Asn Asp Lys Ile
65 70 75 80

Ser Arg Phe Asp Phe Val Gln Lys Ile Glu Val Asp Gly Gln Thr Ile
85 90 95

Thr Leu Ala Ser Gly Glu Phe Gln Ile Tyr Lys Gln Asp His Ser Ala
100 105 110

57

Val Val Ala Leu Gln Ile Glu Lys Ile Asn Asn Pro Asp Lys Ile Asp
115 120 125

Ser Leu Ile Asn Gln Arg Ser Phe Leu Val Ser Gly Leu Gly Gly Glu
130 135 140

His Thr Ala Phe Asn Gln Leu Pro Ser Gly Lys Ala Glu Tyr His Gly
145 150 155 160

Lys Ala Phe Ser Ser Asp Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile
165 170 175

Asp Phe Ala Ala Lys Gln Gly His Gly Lys Ile Glu His Leu Lys Thr
180 185 190

Pro Glu Gln Asn Val Glu Leu Ala Ser Ala Glu Leu Lys Ala Asp Glu
195 200 205

Lys Ser His Ala Val Ile Leu Gly Asp Thr Arg Tyr Gly Ser Glu Glu
210 215 220

Lys Gly Thr Tyr His Leu Ala Leu Phe Gly Asp Arg Ala Gln Glu Ile
225 230 235 240

Ala Gly Ser Ala Thr Val Lys Ile Arg Glu Lys Val His Glu Ile Gly
245 250 255

Ile Ala Gly Lys Gln
260

<210> 55
<211> 786
<212> DNA
<213> Neisseria meningitidis

<400> 55
tgcagcagcg gaagcggaag cggaggcggc ggtgtcgccg ccgacatcgg cacagggctt 60

gccgatgcac taactgcgcc gctcgaccat aaagacaaag gtttgaaatc cctgacattg 120

gaagactcca tttcccaaaa cggaacactg accctgtcgg cacaaggtgc ggaaaaaact 180

ttcaaagtcg gcgacaaaga caacagtctc aatacaggca aattgaagaa cgacaaaatc 240

agccgcttcg actttgtgca aaaaatcgaa gtggacggac aaaccatcac gctggcaagc 300

ggcgaatttc aaatatacaa acaggaccac tccgccgtcg ttgccctaca gattgaaaaa 360

58

atcaacaacc ccgacaaaat cgacagcctg ataaaccaac gctccttcct tgtcagcggt 420

ttgggcggag aacataccgc cttcaaccaa ctgcccagcg gcaaagccga gtatcacggc 480

aaagcattca gctccgacga tgccggcgga aaactgacct ataccataga ttttgccgcc 540

aaacagggac acggcaaaat cgaacacctg aaaacacccg agcagaatgt cgagcttgcc 600

tccgccgaac tcaaagcaga tgaaaaatca cacgccgtca ttttgggcga cacgcgctac 660

ggcagcgaag aaaaaggcac ttaccacctc gctcttttcg gcgaccgagc ccaagaaatc 720

gccggctcgg caaccgtgaa gataagggaa aaggttcacg aaatcggcat cgccggcaaa 780

cagtag 786

<210> 56
<211> 261
<212> PRT
<213> Neisseria meningitidis

<400> 56

Cys Ser Ser Gly Ser Gly Ser Gly Gly Gly Gly Val Ala Ala Asp Ile
1 5 10 15

Gly Thr Gly Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp
20 25 30

Lys Gly Leu Lys Ser Leu Thr Leu Glu Asp Ser Ile Ser Gln Asn Gly
35 40 45

Thr Leu Thr Leu Ser Ala Gln Gly Ala Glu Lys Thr Phe Lys Val Gly
50 55 60

Asp Lys Asp Asn Ser Leu Asn Thr Gly Lys Leu Lys Asn Asp Lys Ile
65 70 75 80

Ser Arg Phe Asp Phe Val Gln Lys Ile Glu Val Asp Gly Gln Thr Ile
85 90 95

Thr Leu Ala Ser Gly Glu Phe Gln Ile Tyr Lys Gln Asp His Ser Ala
100 105 110

Val Val Ala Leu Gln Ile Glu Lys Ile Asn Asn Pro Asp Lys Ile Asp
115 120 125

Ser Leu Ile Asn Gln Arg Ser Phe Leu Val Ser Gly Leu Gly Gly Glu

59

130 135 140

His Thr Ala Phe Asn Gln Leu Pro Ser Gly Lys Ala Glu Tyr His Gly
145 150 155 160

Lys Ala Phe Ser Ser Asp Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile
165 170 175

Asp Phe Ala Ala Lys Gln Gly His Gly Lys Ile Glu His Leu Lys Thr
180 185 190

Pro Glu Gln Asn Val Glu Leu Ala Ser Ala Glu Leu Lys Ala Asp Glu
195 200 205

Lys Ser His Ala Val Ile Leu Gly Asp Thr Arg Tyr Gly Ser Glu Glu
210 215 220

Lys Gly Thr Tyr His Leu Ala Leu Phe Gly Asp Arg Ala Gln Glu Ile
225 230 235 240

Ala Gly Ser Ala Thr Val Lys Ile Arg Glu Lys Val His Glu Ile Gly
245 250 255

Ile Ala Gly Lys Gln
260

<210> 57
<211> 789
<212> DNA
<213> Neisseria meningitidis

<400> 57
tgcggatcca gcggaagcgg aagcggaggc ggcggtgtcg ccgccgacat cggcacaggg 60

cttgccgatg cactaactgc gccgctcgac cataaagaca aaggtttgaa atccctgaca 120

ttggaagact ccatttccca aaacggaaca ctgaccctgt cggcacaagg tgcggaaaaa 180

actttcaaag tcggcgacaa agacaacagt ctcaatacag gcaaattgaa gaacgacaaa 240

atcagccgct tcgactttgt gcaaaaaatc gaagtggacg gacaaaccat cacgctggca 300

agcggcgaat ttcaaatata caaacaggac cactccgccg tcgttgccct acagattgaa 360

aaaatcaaca accccgacaa aatcgacagc ctgataaacc aacgctcctt ccttgtcagc 420

ggtttgggcg gagaacatac cgccttcaac caactgccca gcggcaaagc cgagtatcac 480

60

ggcaaagcat tcagctccga cgatgccggc ggaaaactga cctataccat agattttgcc 540

gccaaacagg gacacggcaa aatcgaacac ctgaaaacac ccgagcagaa tgtcgagctt 600

gcctccgccg aactcaaagc agatgaaaaa tcacacgccg tcattttggg cgacacgcgc 660

tacggcagcg aagaaaaagg cacttaccac ctcgctcttt tcggcgaccg agcccaagaa 720

atcgccggct cggcaaccgt gaagataagg gaaaaggttc acgaaatcgg catcgccggc 780

aaacagtag 789

<210> 58
<211> 262
<212> PRT
<213> Neisseria meningitidis

<400> 58

Cys Gly Ser Ser Gly Ser Gly Ser Gly Gly Gly Gly Val Ala Ala Asp
1 5 10 15

Ile Gly Thr Gly Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys
20 25 30

Asp Lys Gly Leu Lys Ser Leu Thr Leu Glu Asp Ser Ile Ser Gln Asn
35 40 45

Gly Thr Leu Thr Leu Ser Ala Gln Gly Ala Glu Lys Thr Phe Lys Val
50 55 60

Gly Asp Lys Asp Asn Ser Leu Asn Thr Gly Lys Leu Lys Asn Asp Lys
65 70 75 80

Ile Ser Arg Phe Asp Phe Val Gln Lys Ile Glu Val Asp Gly Gln Thr
85 90 95

Ile Thr Leu Ala Ser Gly Glu Phe Gln Ile Tyr Lys Gln Asp His Ser
100 105 110

Ala Val Val Ala Leu Gln Ile Glu Lys Ile Asn Asn Pro Asp Lys Ile
115 120 125

Asp Ser Leu Ile Asn Gln Arg Ser Phe Leu Val Ser Gly Leu Gly Gly
130 135 140

Glu His Thr Ala Phe Asn Gln Leu Pro Ser Gly Lys Ala Glu Tyr His
145 150 155 160

61

Gly Lys Ala Phe Ser Ser Asp Asp Ala Gly Gly Lys Leu Thr Tyr Thr
165 170 175

Ile Asp Phe Ala Ala Lys Gln Gly His Gly Lys Ile Glu His Leu Lys
180 185 190

Thr Pro Glu Gln Asn Val Glu Leu Ala Ser Ala Glu Leu Lys Ala Asp
195 200 205

Glu Lys Ser His Ala Val Ile Leu Gly Asp Thr Arg Tyr Gly Ser Glu
210 215 220

Glu Lys Gly Thr Tyr His Leu Ala Leu Phe Gly Asp Arg Ala Gln Glu
225 230 235 240

Ile Ala Gly Ser Ala Thr Val Lys Ile Arg Glu Lys Val His Glu Ile
245 250 255

Gly Ile Ala Gly Lys Gln
260

<210> 59
<211> 786
<212> DNA
<213> Neisseria meningitidis

<400> 59
atgagcagcg gaagcggaag cggaggcggc ggtgtcgccg ccgacatcgg cacagggctt 60

gccgatgcac taactgcgcc gctcgaccat aaagacaaag gtttgaaatc cctgacattg 120

gaagactcca tttcccaaaa cggaacactg accctgtcgg cacaaggtgc ggaaaaaact 180

ttcaaagtcg gcgacaaaga caacagtctc aatacaggca aattgaagaa cgacaaaatc 240

agccgcttcg actttgtgca aaaaatcgaa gtggacggac aaaccatcac gctggcaagc 300

ggcgaatttc aaatatacaa acaggaccac tccgccgtcg ttgccctaca gattgaaaaa 360

atcaacaacc ccgacaaaat cgacagcctg ataaaccaac gctccttcct tgtcagcggt 420

ttgggcggag aacataccgc cttcaaccaa ctgcccagcg gcaaagccga gtatcacggc 480

aaagcattca gctccgacga tgccggcgga aaactgacct ataccataga ttttgccgcc 540

aaacagggac acggcaaaat cgaacacctg aaaacacccg agcagaatgt cgagcttgcc 600

tccgccgaac tcaaagcaga tgaaaaatca cacgccgtca ttttgggcga cacgcgctac 660

62

ggcagcgaag aaaaaggcac ttaccacctc gctcttttcg gcgaccgagc ccaagaaatc 720

gccggctcgg caaccgtgaa gataagggaa aaggttcacg aaatcggcat cgccggcaaa 780

cagtag 786

<210> 60
<211> 261
<212> PRT
<213> Neisseria meningitidis

<400> 60

Met Ser Ser Gly Ser Gly Ser Gly Gly Gly Gly Val Ala Ala Asp Ile
1 5 10 15

Gly Thr Gly Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp
20 25 30

Lys Gly Leu Lys Ser Leu Thr Leu Glu Asp Ser Ile Ser Gln Asn Gly
35 40 45

Thr Leu Thr Leu Ser Ala Gln Gly Ala Glu Lys Thr Phe Lys Val Gly
50 55 60

Asp Lys Asp Asn Ser Leu Asn Thr Gly Lys Leu Lys Asn Asp Lys Ile
65 70 75 80

Ser Arg Phe Asp Phe Val Gln Lys Ile Glu Val Asp Gly Gln Thr Ile
85 90 95

Thr Leu Ala Ser Gly Glu Phe Gln Ile Tyr Lys Gln Asp His Ser Ala
100 105 110

Val Val Ala Leu Gln Ile Glu Lys Ile Asn Asn Pro Asp Lys Ile Asp
115 120 125

Ser Leu Ile Asn Gln Arg Ser Phe Leu Val Ser Gly Leu Gly Gly Glu
130 135 140

His Thr Ala Phe Asn Gln Leu Pro Ser Gly Lys Ala Glu Tyr His Gly
145 150 155 160

Lys Ala Phe Ser Ser Asp Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile
165 170 175

Asp Phe Ala Ala Lys Gln Gly His Gly Lys Ile Glu His Leu Lys Thr
180 185 190

Pro Glu Gln Asn Val Glu Leu Ala Ser Ala Glu Leu Lys Ala Asp Glu
195 200 205

Lys Ser His Ala Val Ile Leu Gly Asp Thr Arg Tyr Gly Ser Glu Glu
210 215 220

Lys Gly Thr Tyr His Leu Ala Leu Phe Gly Asp Arg Ala Gln Glu Ile
225 230 235 240

Ala Gly Ser Ala Thr Val Lys Ile Arg Glu Lys Val His Glu Ile Gly
245 250 255

Ile Ala Gly Lys Gln
260

<210> 61
<211> 789
<212> DNA
<213> Neisseria meningitidis

<400> 61
tgcagcagcg gaggcggcgg aagcggaggc ggcggtgtcg ccgccgacat cggcacgggg 60

cttgccgatg cactaactgc gccgctcgac cataaagaca aaggtttgaa atccctgaca 120

ttggaagact ctattcccca aaacggaaca ctaaccctgt cggcacaagg tgcggaaaaa 180

actttcaaag ccggcgacaa agacaacagc ctcaacacgg gcaaactgaa gaacgacaaa 240

atcagccgct tcgactttgt gcaaaaaatc gaagtggacg gacaaaccat cacgctggca 300

agcggcgaat ttcaaatata caaacaggac cactccgccg tcgttgccct acagattgaa 360

aaaatcaaca accccgacaa aatcgacagc ctgataaacc aacgctcctt ccttgtcagc 420

ggtttgggcg gagaacatac cgccttcaac caactgcccg gcggcaaagc cgagtatcac 480

ggcaaagcat tcagctccga cgacccgaac ggcaggctgc actactccat tgattttacc 540

aaaaaacagg gttacggcgg aatcgaacac ctgaaaacac ccgagcaaaa tgtcgagctt 600

gcctccgccg aactcaaagc agatgaaaaa tcacacgccg tcattttggg cgacacgcgc 660

tacggcagcg aagaaaaagg cacttaccac ctcgcccttt tcggcgaccg cgcccaagaa 720

atcgccggct cggcaaccgt gaagataggg gaaaaggttc acgaaatcgg catcgccggc 780

64

aaacagtag 789

<210> 62
<211> 262
<212> PRT
<213> Neisseria meningitidis

<400> 62
Cys Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Val Ala Ala Asp
1 5 10 15

Ile Gly Thr Gly Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys
20 25 30

Asp Lys Gly Leu Lys Ser Leu Thr Leu Glu Asp Ser Ile Pro Gln Asn
35 40 45

Gly Thr Leu Thr Leu Ser Ala Gln Gly Ala Glu Lys Thr Phe Lys Ala
50 55 60

Gly Asp Lys Asp Asn Ser Leu Asn Thr Gly Lys Leu Lys Asn Asp Lys
65 70 75 80

Ile Ser Arg Phe Asp Phe Val Gln Lys Ile Glu Val Asp Gly Gln Thr
85 90 95

Ile Thr Leu Ala Ser Gly Glu Phe Gln Ile Tyr Lys Gln Asp His Ser
100 105 110

Ala Val Val Ala Leu Gln Ile Glu Lys Ile Asn Asn Pro Asp Lys Ile
115 120 125

Asp Ser Leu Ile Asn Gln Arg Ser Phe Leu Val Ser Gly Leu Gly Gly
130 135 140

Glu His Thr Ala Phe Asn Gln Leu Pro Gly Gly Lys Ala Glu Tyr His
145 150 155 160

Gly Lys Ala Phe Ser Ser Asp Asp Pro Asn Gly Arg Leu His Tyr Ser
165 170 175

Ile Asp Phe Thr Lys Lys Gln Gly Tyr Gly Gly Ile Glu His Leu Lys
180 185 190

65

Thr Pro Glu Gln Asn Val Glu Leu Ala Ser Ala Glu Leu Lys Ala Asp
195 200 205

Glu Lys Ser His Ala Val Ile Leu Gly Asp Thr Arg Tyr Gly Ser Glu
210 215 220

Glu Lys Gly Thr Tyr His Leu Ala Leu Phe Gly Asp Arg Ala Gln Glu
225 230 235 240

Ile Ala Gly Ser Ala Thr Val Lys Ile Gly Glu Lys Val His Glu Ile
245 250 255

Gly Ile Ala Gly Lys Gln
260

<210> 63
<211> 792
<212> DNA
<213> Neisseria meningitidis

<400> 63
tgcggatcca gcggaggcgg cggaagcgga ggcggcggtg tcgccgccga catcggcacg 60

gggcttgccg atgcactaac tgcgccgctc gaccataaag acaaaggttt gaaatccctg 120

acattggaag actctattcc ccaaaacgga acactaaccc tgtcggcaca aggtgcggaa 180

aaaactttca aagccggcga caaagacaac agcctcaaca cgggcaaact gaagaacgac 240

aaaatcagcc gcttcgactt tgtgcaaaaa atcgaagtgg acggacaaac catcacgctg 300

gcaagcggcg aatttcaaat atacaaacag gaccactccg ccgtcgttgc cctacagatt 360

gaaaaaatca acaaccccga caaaatcgac agcctgataa accaacgctc cttccttgtc 420

agcggtttgg gcggagaaca taccgccttc aaccaactgc ccggcggcaa agccgagtat 480

cacggcaaag cattcagctc cgacgacccg aacggcaggc tgcactactc cattgatttt 540

accaaaaaac agggttacgg cggaatcgaa cacctgaaaa cacccgagca aaatgtcgag 600

cttgcctccg ccgaactcaa agcagatgaa aaatcacacg ccgtcatttt gggcgacacg 660

cgctacggca gcgaagaaaa aggcacttac cacctcgccc ttttcggcga ccgcgcccaa 720

gaaatcgccg gctcggcaac cgtgaagata ggggaaaagg ttcacgaaat cggcatcgcc 780

ggcaaacagt ag 792

<210> 64

66

<211> 263
<212> PRT
<213> Neisseria meningitidis

<400> 64

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Cys Gly Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Val Ala Ala
1               5                  10                  15

Asp Ile Gly Thr Gly Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His
            20                  25                  30

Lys Asp Lys Gly Leu Lys Ser Leu Thr Leu Glu Asp Ser Ile Pro Gln
        35                  40                  45

Asn Gly Thr Leu Thr Leu Ser Ala Gln Gly Ala Glu Lys Thr Phe Lys
    50                  55                  60

Ala Gly Asp Lys Asp Asn Ser Leu Asn Thr Gly Lys Leu Lys Asn Asp
65                  70                  75                  80

Lys Ile Ser Arg Phe Asp Phe Val Gln Lys Ile Glu Val Asp Gly Gln
                85                  90                  95

Thr Ile Thr Leu Ala Ser Gly Glu Phe Gln Ile Tyr Lys Gln Asp His
            100                 105                 110

Ser Ala Val Val Ala Leu Gln Ile Glu Lys Ile Asn Asn Pro Asp Lys
        115                 120                 125

Ile Asp Ser Leu Ile Asn Gln Arg Ser Phe Leu Val Ser Gly Leu Gly
    130                 135                 140

Gly Glu His Thr Ala Phe Asn Gln Leu Pro Gly Gly Lys Ala Glu Tyr
145                 150                 155                 160

His Gly Lys Ala Phe Ser Ser Asp Asp Pro Asn Gly Arg Leu His Tyr
                165                 170                 175

Ser Ile Asp Phe Thr Lys Lys Gln Gly Tyr Gly Gly Ile Glu His Leu
            180                 185                 190

Lys Thr Pro Glu Gln Asn Val Glu Leu Ala Ser Ala Glu Leu Lys Ala
        195                 200                 205
```

Asp Glu Lys Ser His Ala Val Ile Leu Gly Asp Thr Arg Tyr Gly Ser
210 215 220

Glu Glu Lys Gly Thr Tyr His Leu Ala Leu Phe Gly Asp Arg Ala Gln
225 230 235 240

Glu Ile Ala Gly Ser Ala Thr Val Lys Ile Gly Glu Lys Val His Glu
245 250 255

Ile Gly Ile Ala Gly Lys Gln
260

<210> 65
<211> 789
<212> DNA
<213> Neisseria meningitidis

<400> 65
atgagcagcg gaggcggcgg aagcggaggc ggcggtgtcg ccgccgacat cggcacgggg 60

cttgccgatg cactaactgc gccgctcgac cataaagaca aaggtttgaa atccctgaca 120

ttggaagact ctattcccca aaacggaaca ctaaccctgt cggcacaagg tgcggaaaaa 180

actttcaaag ccggcgacaa agacaacagc ctcaacacgg gcaaactgaa gaacgacaaa 240

atcagccgct tcgactttgt gcaaaaaatc gaagtggacg gacaaaccat cacgctggca 300

agcggcgaat ttcaaatata caaacaggac actccgccg tcgttgccct acagattgaa 360

aaaatcaaca accccgacaa aatcgacagc ctgataaacc aacgctcctt ccttgtcagc 420

ggtttgggcg gagaacatac cgccttcaac caactgcccg gcggcaaagc cgagtatcac 480

ggcaaagcat tcagctccga cgacccgaac ggcaggctgc actactccat tgattttacc 540

aaaaaacagg gttacggcgg aatcgaacac ctgaaaacac ccgagcaaaa tgtcgagctt 600

gcctccgccg aactcaaagc agatgaaaaa tcacacgccg tcattttggg cgacacgcgc 660

tacggcagcg aagaaaaagg cacttaccac ctcgcccttt tcggcgaccg cgcccaagaa 720

atcgccggct cggcaaccgt gaagataggg gaaaaggttc acgaaatcgg catcgccggc 780

aaacagtag 789

<210> 66
<211> 262
<212> PRT
<213> Neisseria meningitidis

<400> 66

Met Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Val Ala Ala Asp
1 5 10 15

Ile Gly Thr Gly Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys
20 25 30

Asp Lys Gly Leu Lys Ser Leu Thr Leu Glu Asp Ser Ile Pro Gln Asn
35 40 45

Gly Thr Leu Thr Leu Ser Ala Gln Gly Ala Glu Lys Thr Phe Lys Ala
50 55 60

Gly Asp Lys Asp Asn Ser Leu Asn Thr Gly Lys Leu Lys Asn Asp Lys
65 70 75 80

Ile Ser Arg Phe Asp Phe Val Gln Lys Ile Glu Val Asp Gly Gln Thr
85 90 95

Ile Thr Leu Ala Ser Gly Glu Phe Gln Ile Tyr Lys Gln Asp His Ser
100 105 110

Ala Val Val Ala Leu Gln Ile Glu Lys Ile Asn Asn Pro Asp Lys Ile
115 120 125

Asp Ser Leu Ile Asn Gln Arg Ser Phe Leu Val Ser Gly Leu Gly Gly
130 135 140

Glu His Thr Ala Phe Asn Gln Leu Pro Gly Gly Lys Ala Glu Tyr His
145 150 155 160

Gly Lys Ala Phe Ser Ser Asp Asp Pro Asn Gly Arg Leu His Tyr Ser
165 170 175

Ile Asp Phe Thr Lys Lys Gln Gly Tyr Gly Gly Ile Glu His Leu Lys
180 185 190

Thr Pro Glu Gln Asn Val Glu Leu Ala Ser Ala Glu Leu Lys Ala Asp
195 200 205

Glu Lys Ser His Ala Val Ile Leu Gly Asp Thr Arg Tyr Gly Ser Glu
210 215 220

Glu Lys Gly Thr Tyr His Leu Ala Leu Phe Gly Asp Arg Ala Gln Glu
225 230 235 240

Ile Ala Gly Ser Ala Thr Val Lys Ile Gly Glu Lys Val His Glu Ile
245 250 255

Gly Ile Ala Gly Lys Gln
260

<210> 67
<211> 774
<212> DNA
<213> Neisseria meningitidis

<400> 67
tgcagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaggt ttgaaatccc tgacattgga agactccatt 120

tcccaaaacg gaacactgac cctgtcggca caaggtgcgg aaaaaacttt caaagtcggc 180

gacaaagaca acagtctcaa tacaggcaaa ttgaagaacg acaaaatcag ccgcttcgac 240

tttgtgcaaa aaatcgaagt ggacggacaa accatcacgc tggcaagcgg cgaatttcaa 300

atatacaaac agaaccactc cgccgtcgtt gccctacaga ttgaaaaaat caacaacccc 360

gacaaaatcg acagcctgat aaaccaacgc tccttccttg tcagcggttt gggcggagaa 420

cataccgcct tcaaccaact gcccggcggc aaagccgagt atcacggcaa agcattcagc 480

tccgacgatg ccggcggaaa actgacctat accatagatt ttgccgccaa acagggacac 540

ggcaaaatcg aacacctgaa aacacccgag caaaatgtcg agcttgccgc cgccgaactc 600

aaagcagatg aaaaatcaca cgccgtcatt ttgggcgaca cgcgctacgg cagcgaagaa 660

aaaggcactt accacctcgc ccttttcggc gaccgcgctc aagaaatcgc cggctcggca 720

accgtgaaga taggagaaaa ggttcacgaa atcagcatcg ccggcaaaca gtag 774

<210> 68
<211> 257
<212> PRT
<213> Neisseria meningitidis

<400> 68
Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Lys
20 25 30

70

Ser Leu Thr Leu Glu Asp Ser Ile Ser Gln Asn Gly Thr Leu Thr Leu
35 40 45

Ser Ala Gln Gly Ala Glu Lys Thr Phe Lys Val Gly Asp Lys Asp Asn
50 55 60

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

Phe Val Gln Lys Ile Glu Val Asp Gly Gln Thr Ile Thr Leu Ala Ser
85 90 95

Gly Glu Phe Gln Ile Tyr Lys Gln Asn His Ser Ala Val Val Ala Leu
100 105 110

Gln Ile Glu Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn
115 120 125

Gln Arg Ser Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe
130 135 140

Asn Gln Leu Pro Gly Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser
145 150 155 160

Ser Asp Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala
165 170 175

Lys Gln Gly His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn
180 185 190

Val Glu Leu Ala Ala Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala
195 200 205

Val Ile Leu Gly Asp Thr Arg Tyr Gly Ser Glu Glu Lys Gly Thr Tyr
210 215 220

His Leu Ala Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala
225 230 235 240

Thr Val Lys Ile Gly Glu Lys Val His Glu Ile Ser Ile Ala Gly Lys
245 250 255

Gln

<210> 69
<211> 777
<212> DNA
<213> Neisseria meningitidis

<400> 69
tgcggatcca gcggaggcgg cggtgtcgcc gccgacatcg gcgcggggct tgccgatgca 60

ctaaccgcac cgctcgacca taaagacaaa ggtttgaaat ccctgacatt ggaagactcc 120

atttcccaaa acggaacact gaccctgtcg gcacaaggtg cggaaaaaac tttcaaagtc 180

ggcgacaaag acaacagtct caatacaggc aaattgaaga acgacaaaat cagccgcttc 240

gactttgtgc aaaaaatcga agtggacgga caaaccatca cgctggcaag cggcgaattt 300

caaatataca aacagaacca ctccgccgtc gttgccctac agattgaaaa aatcaacaac 360

cccgacaaaa tcgacagcct gataaaccaa cgctccttcc ttgtcagcgg tttgggcgga 420

gaacataccg ccttcaacca actgcccggc ggcaaagccg agtatcacgg caaagcattc 480

agctccgacg atgccggcgg aaaactgacc tataccatag attttgccgc caaacaggga 540

cacggcaaaa tcgaacacct gaaaacaccc gagcaaaatg tcgagcttgc cgccgccgaa 600

ctcaaagcag atgaaaaatc acacgccgtc attttgggcg acacgcgcta cggcagcgaa 660

gaaaaaggca cttaccacct cgccctttтc ggcgaccgcg ctcaagaaat cgccggctcg 720

gcaaccgtga agataggaga aaaggttcac gaaatcagca tcgccggcaa acagtag 777

<210> 70
<211> 258
<212> PRT
<213> Neisseria meningitidis

<400> 70
Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1 5 10 15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu
20 25 30

Lys Ser Leu Thr Leu Glu Asp Ser Ile Ser Gln Asn Gly Thr Leu Thr
35 40 45

Leu Ser Ala Gln Gly Ala Glu Lys Thr Phe Lys Val Gly Asp Lys Asp

72

50 55 60

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

Asp Phe Val Gln Lys Ile Glu Val Asp Gly Gln Thr Ile Thr Leu Ala
85 90 95

Ser Gly Glu Phe Gln Ile Tyr Lys Gln Asn His Ser Ala Val Val Ala
100 105 110

Leu Gln Ile Glu Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile
115 120 125

Asn Gln Arg Ser Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala
130 135 140

Phe Asn Gln Leu Pro Gly Gly Lys Ala Glu Tyr His Gly Lys Ala Phe
145 150 155 160

Ser Ser Asp Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala
165 170 175

Ala Lys Gln Gly His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln
180 185 190

Asn Val Glu Leu Ala Ala Ala Glu Leu Lys Ala Asp Glu Lys Ser His
195 200 205

Ala Val Ile Leu Gly Asp Thr Arg Tyr Gly Ser Glu Glu Lys Gly Thr
210 215 220

Tyr His Leu Ala Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser
225 230 235 240

Ala Thr Val Lys Ile Gly Glu Lys Val His Glu Ile Ser Ile Ala Gly
245 250 255

Lys Gln

<210> 71
<211> 774

<212> DNA
<213> Neisseria meningitidis

<400> 71
atgagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaggt ttgaaatccc tgacattgga agactccatt 120

tcccaaaacg gaacactgac cctgtcggca caaggtgcgg aaaaaacttt caaagtcggc 180

gacaaagaca acagtctcaa tacaggcaaa ttgaagaacg acaaaatcag ccgcttcgac 240

tttgtgcaaa aaatcgaagt ggacggacaa accatcacgc tggcaagcgg cgaatttcaa 300

atatacaaac agaaccactc cgccgtcgtt gccctacaga ttgaaaaaat caacaacccc 360

gacaaaatcg acagcctgat aaaccaacgc tccttccttg tcagcggttt gggcggagaa 420

cataccgcct tcaaccaact gcccggcggc aaagccgagt atcacggcaa agcattcagc 480

tccgacgatg ccggcggaaa actgacctat accatagatt ttgccgccaa acagggacac 540

ggcaaaatcg aacacctgaa aacacccgag caaaatgtcg agcttgccgc cgccgaactc 600

aaagcagatg aaaaatcaca cgccgtcatt ttgggcgaca cgcgctacgg cagcgaagaa 660

aaaggcactt accacctcgc ccttttcggc gaccgcgctc aagaaatcgc cggctcggca 720

accgtgaaga taggagaaaa ggttcacgaa atcagcatcg ccggcaaaca gtag 774

<210> 72
<211> 257
<212> PRT
<213> Neisseria meningitidis

<400> 72

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Lys
20 25 30

Ser Leu Thr Leu Glu Asp Ser Ile Ser Gln Asn Gly Thr Leu Thr Leu
35 40 45

Ser Ala Gln Gly Ala Glu Lys Thr Phe Lys Val Gly Asp Lys Asp Asn
50 55 60

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

Phe Val Gln Lys Ile Glu Val Asp Gly Gln Thr Ile Thr Leu Ala Ser
85 90 95

Gly Glu Phe Gln Ile Tyr Lys Gln Asn His Ser Ala Val Val Ala Leu
100 105 110

Gln Ile Glu Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn
115 120 125

Gln Arg Ser Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe
130 135 140

Asn Gln Leu Pro Gly Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser
145 150 155 160

Ser Asp Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala
165 170 175

Lys Gln Gly His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn
180 185 190

Val Glu Leu Ala Ala Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala
195 200 205

Val Ile Leu Gly Asp Thr Arg Tyr Gly Ser Glu Glu Lys Gly Thr Tyr
210 215 220

His Leu Ala Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala
225 230 235 240

Thr Val Lys Ile Gly Glu Lys Val His Glu Ile Ser Ile Ala Gly Lys
245 250 255

Gln

<210> 73
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 73
tgcagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

75

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa 300

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggtggaga acataccgcc 420

ttcaaccaac tgcccagcgg caaagccgag tatcacggca aagcattcag ctccgacgat 480

gctggcggaa aactgaccta taccatagat ttcgccgcca aacagggaca cggcaaaatc 540

gaacacttga aaacacccga gcaaaatgtc gagcttgcct ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcggcgaaga aaaaggcact 660

taccacctcg cccttctcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag 720

ataagggaaa aggttcacga aatcggcatt gccggcaaac agtag 765

<210> 74
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 74

Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu
100 105 110

```
Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
        115                 120                 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
    130                 135                 140

Pro Ser Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145                 150                 155                 160

Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly
            165                 170                 175

His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
        180                 185                 190

Ala Ser Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
        195                 200                 205

Gly Asp Thr Arg Tyr Gly Gly Glu Glu Lys Gly Thr Tyr His Leu Ala
    210                 215                 220

Leu Leu Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225                 230                 235                 240

Ile Arg Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
                245                 250
```

<210> 75
<211> 768
<212> DNA
<213> Neisseria meningitidis

<400> 75
tgcggatcca gcggaggcgg cggtgtcgcc gccgacatcg gcgcggggct tgccgatgca 60

ctaaccgcac cgctcgacca taaagacaaa agtttgcagt ctttgacgct ggatcagtcc 120

gtcaggaaaa acgagaaact gaagctggcg gcacaaggtg cggaaaaaac ttatggaaac 180

ggcgacagcc tcaatacggg caaattgaag aacgacaagg tcagccgctt cgactttatc 240

cgtcaaatcg aagtggacgg gcagctcatt accttggaga gcggagagtt ccaaatatac 300

aaacaggacc actccgccgt cgttgcccta cagattgaaa aaatcaacaa ccccgacaaa 360

atcgacagcc tgataaacca acgctccttc cttgtcagcg gtttgggtgg agaacatacc 420

77

gccttcaacc aactgcccag cggcaaagcc gagtatcacg gcaaagcatt cagctccgac 480

gatgctggcg gaaaactgac ctataccata gatttcgccg ccaaacaggg acacggcaaa 540

atcgaacact tgaaaacacc cgagcaaaat gtcgagcttg cctccgccga actcaaagca 600

gatgaaaaat cacacgccgt cattttgggc gacacgcgct acggcggcga agaaaaaggc 660

acttaccacc tcgcccttct cggcgaccgc gcccaagaaa tcgccggctc ggcaaccgtg 720

aagataaggg aaaaggttca cgaaatcggc attgccggca aacagtag 768

<210> 76
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 76
Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1 5 10 15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu
20 25 30

Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
35 40 45

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
50 55 60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65 70 75 80

Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu
85 90 95

Phe Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile
100 105 110

Glu Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg
115 120 125

Ser Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln
130 135 140

Leu Pro Ser Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp

145 150 155 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
165 170 175

Gly His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu
180 185 190

Leu Ala Ser Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile
195 200 205

Leu Gly Asp Thr Arg Tyr Gly Gly Glu Glu Lys Gly Thr Tyr His Leu
210 215 220

Ala Leu Leu Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val
225 230 235 240

Lys Ile Arg Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
245 250 255

<210> 77
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 77
atgagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa 300

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggtggaga acataccgcc 420

ttcaaccaac tgcccagcgg caaagccgag tatcacggca aagcattcag ctccgacgat 480

gctggcggaa aactgaccta taccatagat ttcgccgcca aacagggaca cggcaaaatc 540

gaacacttga aaacacccga gcaaaatgtc gagcttgcct ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcggcgaaga aaaaggcact 660

taccacctcg cccttctcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag 720

ataagggaaa aggttcacga aatcggcatt gccggcaaac agtag 765

<210> 78
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 78

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu
100 105 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
115 120 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
130 135 140

Pro Ser Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145 150 155 160

Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly
165 170 175

His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
180 185 190

80

Ala Ser Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
195 200 205

Gly Asp Thr Arg Tyr Gly Gly Glu Glu Lys Gly Thr Tyr His Leu Ala
210 215 220

Leu Leu Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225 230 235 240

Ile Arg Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
245 250

<210> 79
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 79
tgcagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa 300

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggtggaga acataccgcc 420

ttcaaccaac tgcccagcgg caaagccgag tatcacggca aagcattcag ctccgacgat 480

gctggcggaa aactgaccta taccatagat ttcgccgcca aacagggaca cggcaaaatc 540

gaacacttga aaacacccga gcaaaatgtc gagcttgcct ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcggcgaaga aaaaggcact 660

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag 720

ataagggaaa aggttcacga aatcggcatc gccggcaaac agtag 765

<210> 80
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 80
Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu

81

```
1               5                   10                  15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
            20                  25                  30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
        35                  40                  45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
    50                  55                  60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65                  70                  75                  80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
                85                  90                  95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu
            100                 105                 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
        115                 120                 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
    130                 135                 140

Pro Ser Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145                 150                 155                 160

Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly
                165                 170                 175

His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
            180                 185                 190

Ala Ser Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
        195                 200                 205

Gly Asp Thr Arg Tyr Gly Gly Glu Glu Lys Gly Thr Tyr His Leu Ala
    210                 215                 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225                 230                 235                 240
```

Ile Arg Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
245 250

<210> 81
<211> 768
<212> DNA
<213> Neisseria meningitidis

<400> 81
tgcggatcca gcggaggcgg cggtgtcgcc gccgacatcg gcgcggggct tgccgatgca 60

ctaaccgcac cgctcgacca taaagacaaa agtttgcagt ctttgacgct ggatcagtcc 120

gtcaggaaaa acgagaaact gaagctggcg gcacaaggtg cggaaaaaac ttatggaaac 180

ggcgacagcc tcaatacggg caaattgaag aacgacaagg tcagccgctt cgactttatc 240

cgtcaaatcg aagtggacgg gcagctcatt accttggaga gcggagagtt ccaaatatac 300

aaacaggacc actccgccgt cgttgcccta cagattgaaa aaatcaacaa ccccgacaaa 360

atcgacagcc tgataaacca acgctccttc cttgtcagcg gtttgggtgg agaacatacc 420

gccttcaacc aactgcccag cggcaaagcc gagtatcacg gcaaagcatt cagctccgac 480

gatgctggcg gaaaactgac ctataccata gatttcgccg ccaaacaggg acacggcaaa 540

atcgaacact tgaaaacacc cgagcaaaat gtcgagcttg cctccgccga actcaaagca 600

gatgaaaaat cacacgccgt cattttgggc gacacgcgct acggcggcga agaaaaaggc 660

acttaccacc tcgccctttt cggcgaccgc gcccaagaaa tcgccggctc ggcaaccgtg 720

aagataaggg aaaaggttca cgaaatcggc atcgccggca aacagtag 768

<210> 82
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 82
Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1 5 10 15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu
20 25 30

Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
35 40 45

```
Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
    50                  55                  60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65                  70                  75                  80

Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu
                85                  90                  95

Phe Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile
            100                 105                 110

Glu Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg
        115                 120                 125

Ser Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln
    130                 135                 140

Leu Pro Ser Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp
145                 150                 155                 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
                165                 170                 175

Gly His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu
            180                 185                 190

Leu Ala Ser Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile
        195                 200                 205

Leu Gly Asp Thr Arg Tyr Gly Gly Glu Glu Lys Gly Thr Tyr His Leu
    210                 215                 220

Ala Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val
225                 230                 235                 240

Lys Ile Arg Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
                245                 250                 255
```

<210> 83
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 83
atgagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa 300

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggtggaga acataccgcc 420

ttcaaccaac tgcccagcgg caaagccgag tatcacggca aagcattcag ctccgacgat 480

gctggcggaa aactgaccta taccatagat ttcgccgcca aacagggaca cggcaaaatc 540

gaacacttga aaacacccga gcaaaatgtc gagcttgcct ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcggcgaaga aaaaggcact 660

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag 720

ataagggaaa aggttcacga aatcggcatc gccggcaaac agtag 765

<210> 84
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 84

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

```
Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu
            100                 105                 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
        115                 120                 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
    130                 135                 140

Pro Ser Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145                 150                 155                 160

Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly
                165                 170                 175

His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
            180                 185                 190

Ala Ser Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
        195                 200                 205

Gly Asp Thr Arg Tyr Gly Gly Glu Glu Lys Gly Thr Tyr His Leu Ala
    210                 215                 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225                 230                 235                 240

Ile Arg Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
                245                 250
```

<210> 85
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 85
tgcagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa 300

86

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggtggaga acataccgcc 420

ttcaaccaac tgcccagcgg caaagccgag tatcacggca aagcattcag ctccgacgat 480

gctggcggaa aactgaccta taccatagat ttcgccgcca aacagggaca cggcaaaatc 540

gaacacttga aaacacccga gcaaaatgtc gagcttgcct ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcggcgaaga aaaaggcact 660

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag 720

ataagggaaa aggttcacga aatcggcatc gccggcaaac agtag 765

<210> 86
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 86
Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu
100 105 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
115 120 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu

87

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    130                 135                 140

Pro Ser Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145                 150                 155                 160

Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly
                165                 170                 175

His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
            180                 185                 190

Ala Ser Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
        195                 200                 205

Gly Asp Thr Arg Tyr Gly Gly Glu Glu Lys Gly Thr Tyr His Leu Ala
    210                 215                 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225                 230                 235                 240

Ile Arg Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
                245                 250
```

<210> 87
<211> 768
<212> DNA
<213> Neisseria meningitidis

<400> 87
tgcggatcca gcggaggcgg cggtgtcgcc gccgacatcg gcgcggggct tgccgatgca 60

ctaaccgcac cgctcgacca taaagacaaa agtttgcagt ctttgacgct ggatcagtcc 120

gtcaggaaaa acgagaaact gaagctggcg gcacaaggtg cggaaaaaac ttatggaaac 180

ggcgacagcc tcaatacggg caaattgaag aacgacaagg tcagccgctt cgactttatc 240

cgtcaaatcg aagtggacgg gcagctcatt accttggaga gcggagagtt ccaaatatac 300

aaacaggacc actccgccgt cgttgcccta cagattgaaa aaatcaacaa ccccgacaaa 360

atcgacagcc tgataaacca acgctccttc cttgtcagcg gtttgggtgg agaacatacc 420

gccttcaacc aactgcccag cggcaaagcc gagtatcacg gcaaagcatt cagctccgac 480

gatgctggcg gaaaactgac ctataccata gatttcgccg ccaaacaggg acacggcaaa 540

atcgaacact tgaaaacacc cgagcaaaat gtcgagcttg cctccgccga actcaaagca 600

gatgaaaaat cacacgccgt cattttgggc gacacgcgct acggcggcga agaaaaaggc 660

acttaccacc tcgccctttt cggcgaccgc gcccaagaaa tcgccggctc ggcaaccgtg 720

aagataaggg aaaaggttca cgaaatcggc atcgccggca aacagtag 768

<210> 88
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 88
Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1 5 10 15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu
20 25 30

Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
35 40 45

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
50 55 60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65 70 75 80

Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu
85 90 95

Phe Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile
100 105 110

Glu Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg
115 120 125

Ser Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln
130 135 140

Leu Pro Ser Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp
145 150 155 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
165 170 175

```
Gly His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu
            180                 185                 190

Leu Ala Ser Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile
        195                 200                 205

Leu Gly Asp Thr Arg Tyr Gly Gly Glu Glu Lys Gly Thr Tyr His Leu
    210                 215                 220

Ala Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val
225                 230                 235                 240

Lys Ile Arg Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
                245                 250                 255
```

<210> 89
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 89
atgagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa 300

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggtggaga acataccgcc 420

ttcaaccaac tgcccagcgg caaagccgag tatcacggca aagcattcag ctccgacgat 480

gctggcggaa aactgaccta taccatagat ttcgccgcca aacagggaca cggcaaaatc 540

gaacacttga aaacacccga gcaaaatgtc gagcttgcct ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcggcgaaga aaaaggcact 660

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag 720

ataagggaaa aggttcacga aatcggcatc gccggcaaac agtag 765

<210> 90
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 90

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu
100 105 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
115 120 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
130 135 140

Pro Ser Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145 150 155 160

Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly
165 170 175

His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
180 185 190

Ala Ser Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
195 200 205

Gly Asp Thr Arg Tyr Gly Gly Glu Glu Lys Gly Thr Tyr His Leu Ala
210 215 220

```
Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225                 230                 235                 240

Ile Arg Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
                245                 250
```

<210> 91
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 91

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tgcagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta     60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc    120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc    180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt    240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa    300

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc    360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggtggaga acataccgcc    420

ttcaaccaac tgcccagcgg caaagccgag tatcacggca aagcattcag ctccgacgat    480

gctggcggaa aactgaccta taccatagat ttcgccgcca aacagggaca cggcaaaatc    540

gaacacttga aaacacccga gcaaaatgtc gagcttgcct ccgccgaact caaagcagat    600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcggcgaaga aaaaggcact    660

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag    720

ataagggaaa aggttcacga aatcggcatc gccggcaaac agtag                    765
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<210> 92
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 92

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Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1               5                   10                  15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
            20                  25                  30
```


92

```
Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
        35                  40                  45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
    50                  55                  60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65                  70                  75                  80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
                85                  90                  95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu
            100                 105                 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
        115                 120                 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
    130                 135                 140

Pro Ser Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145                 150                 155                 160

Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly
                165                 170                 175

His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
            180                 185                 190

Ala Ser Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
        195                 200                 205

Gly Asp Thr Arg Tyr Gly Gly Glu Glu Lys Gly Thr Tyr His Leu Ala
    210                 215                 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225                 230                 235                 240

Ile Arg Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
                245                 250
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<210> 93

<211> 768
<212> DNA
<213> Neisseria meningitidis

<400> 93
tgcggatcca gcggaggcgg cggtgtcgcc gccgacatcg gcgcggggct tgccgatgca 60

ctaaccgcac cgctcgacca taaagacaaa agtttgcagt ctttgacgct ggatcagtcc 120

gtcaggaaaa acgagaaact gaagctggcg gcacaaggtg cggaaaaaac ttatggaaac 180

ggcgacagcc tcaatacggg caaattgaag aacgacaagg tcagccgctt cgactttatc 240

cgtcaaatcg aagtggacgg gcagctcatt accttggaga gcggagagtt ccaaatatac 300

aaacaggacc actccgccgt cgttgcccta cagattgaaa aaatcaacaa ccccgacaaa 360

atcgacagcc tgataaacca acgctccttc cttgtcagcg gtttgggtgg agaacatacc 420

gccttcaacc aactgcccag cggcaaagcc gagtatcacg gcaaagcatt cagctccgac 480

gatgctggcg gaaaactgac ctataccata gatttcgccg ccaaacaggg acacggcaaa 540

atcgaacact tgaaaacacc cgagcaaaat gtcgagcttg cctccgccga actcaaagca 600

gatgaaaaat cacacgccgt cattttgggc gacacgcgct acggcggcga agaaaaaggc 660

acttaccacc tcgccctttt cggcgaccgc gcccaagaaa tcgccggctc ggcaaccgtg 720

aagataaggg aaaaggttca cgaaatcggc atcgccggca aacagtag 768

<210> 94
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 94
Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1 5 10 15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu
20 25 30

Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
35 40 45

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
50 55 60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65 70 75 80

Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu
85 90 95

Phe Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile
100 105 110

Glu Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg
115 120 125

Ser Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln
130 135 140

Leu Pro Ser Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp
145 150 155 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
165 170 175

Gly His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu
180 185 190

Leu Ala Ser Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile
195 200 205

Leu Gly Asp Thr Arg Tyr Gly Gly Glu Glu Lys Gly Thr Tyr His Leu
210 215 220

Ala Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val
225 230 235 240

Lys Ile Arg Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
245 250 255

<210> 95
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 95
atgagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

95

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa 300

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggtggaga acataccgcc 420

ttcaaccaac tgcccagcgg caaagccgag tatcacggca aagcattcag ctccgacgat 480

gctggcggaa aactgaccta taccatagat ttcgccgcca aacagggaca cggcaaaatc 540

gaacacttga aaacacccga gcaaaatgtc gagcttgcct ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcggcgaaga aaaaggcact 660

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag 720

ataagggaaa aggttcacga aatcggcatc gccggcaaac agtag 765

<210> 96
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 96

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu
100 105 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser

96

115 120 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
130 135 140

Pro Ser Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145 150 155 160

Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly
165 170 175

His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
180 185 190

Ala Ser Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
195 200 205

Gly Asp Thr Arg Tyr Gly Gly Glu Glu Lys Gly Thr Tyr His Leu Ala
210 215 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225 230 235 240

Ile Arg Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
245 250

<210> 97
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 97
tgcagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa 300

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggtggaga acataccgcc 420

ttcaaccaac tgcccagcgg caaagccgag tatcacggca aagcattcag ctccgacgat 480

97

gctggcggaa aactgaccta taccatagat ttcgccgcca aacagggaca cggcaaaatc 540

gaacacttga aaacacccga gcaaaatgtc gagcttgcct ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcggcgaaga aaaaggcact 660

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag 720

ataagggaaa aggttcacga aatcggcatc gccggcaaac agtaa 765

<210> 98
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 98

Cys	Ser	Ser	Gly	Gly	Gly	Gly	Val	Ala	Ala	Asp	Ile	Gly	Ala	Gly	Leu
1				5					10					15	
Ala	Asp	Ala	Leu	Thr	Ala	Pro	Leu	Asp	His	Lys	Asp	Lys	Ser	Leu	Gln
			20					25					30		
Ser	Leu	Thr	Leu	Asp	Gln	Ser	Val	Arg	Lys	Asn	Glu	Lys	Leu	Lys	Leu
		35					40					45			
Ala	Ala	Gln	Gly	Ala	Glu	Lys	Thr	Tyr	Gly	Asn	Gly	Asp	Ser	Leu	Asn
	50					55					60				
Thr	Gly	Lys	Leu	Lys	Asn	Asp	Lys	Val	Ser	Arg	Phe	Asp	Phe	Ile	Arg
65					70					75					80
Gln	Ile	Glu	Val	Asp	Gly	Gln	Leu	Ile	Thr	Leu	Glu	Ser	Gly	Glu	Phe
				85					90					95	
Gln	Ile	Tyr	Lys	Gln	Asp	His	Ser	Ala	Val	Val	Ala	Leu	Gln	Ile	Glu
			100					105					110		
Lys	Ile	Asn	Asn	Pro	Asp	Lys	Ile	Asp	Ser	Leu	Ile	Asn	Gln	Arg	Ser
		115					120					125			
Phe	Leu	Val	Ser	Gly	Leu	Gly	Gly	Glu	His	Thr	Ala	Phe	Asn	Gln	Leu
	130					135					140				
Pro	Ser	Gly	Lys	Ala	Glu	Tyr	His	Gly	Lys	Ala	Phe	Ser	Ser	Asp	Asp
145					150					155					160

98

Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly
165 170 175

His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
180 185 190

Ala Ser Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
195 200 205

Gly Asp Thr Arg Tyr Gly Gly Glu Glu Lys Gly Thr Tyr His Leu Ala
210 215 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225 230 235 240

Ile Arg Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
245 250

<210> 99
<211> 768
<212> DNA
<213> Neisseria meningitidis

<400> 99
tgcggatcca gcggaggcgg cggtgtcgcc gccgacatcg gcgcggggct tgccgatgca 60

ctaaccgcac cgctcgacca taaagacaaa agtttgcagt ctttgacgct ggatcagtcc 120

gtcaggaaaa acgagaaact gaagctggcg gcacaaggtg cggaaaaaac ttatggaaac 180

ggcgacagcc tcaatacggg caaattgaag aacgacaagg tcagccgctt cgactttatc 240

cgtcaaatcg aagtggacgg gcagctcatt accttggaga gcggagagtt ccaaatatac 300

aaacaggacc actccgccgt cgttgcccta cagattgaaa aaatcaacaa ccccgacaaa 360

atcgacagcc tgataaacca acgctccttc cttgtcagcg gtttgggtgg agaacatacc 420

gccttcaacc aactgcccag cggcaaagcc gagtatcacg gcaaagcatt cagctccgac 480

gatgctggcg gaaaactgac ctataccata gatttcgccg ccaaacaggg acacggcaaa 540

atcgaacact tgaaaacacc cgagcaaaat gtcgagcttg cctccgccga actcaaagca 600

gatgaaaaat cacacgccgt cattttgggc gacacgcgct acggcggcga agaaaaaggc 660

acttaccacc tcgccctttt cggcgaccgc gcccaagaaa tcgccggctc ggcaaccgtg 720

aagataaggg aaaaggttca cgaaatcggc atcgccggca aacagtaa 768

99

<210> 100
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 100
Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1 5 10 15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu
20 25 30

Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
35 40 45

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
50 55 60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65 70 75 80

Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu
85 90 95

Phe Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile
100 105 110

Glu Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg
115 120 125

Ser Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln
130 135 140

Leu Pro Ser Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp
145 150 155 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
165 170 175

Gly His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu
180 185 190

Leu Ala Ser Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile
195 200 205

100

```
Leu Gly Asp Thr Arg Tyr Gly Gly Glu Glu Lys Gly Thr Tyr His Leu
    210                 215                 220

Ala Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val
225                 230                 235                 240

Lys Ile Arg Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
                245                 250                 255
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<210> 101
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 101
atgagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa 300

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggtggaga acataccgcc 420

ttcaaccaac tgcccagcgg caaagccgag tatcacggca aagcattcag ctccgacgat 480

gctggcggaa aactgaccta taccatagat ttcgccgcca aacagggaca cggcaaaatc 540

gaacacttga aaacacccga gcaaaatgtc gagcttgcct ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcggcgaaga aaaaggcact 660

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag 720

ataagggaaa aggttcacga aatcggcatc gccggcaaac agtaa 765

<210> 102
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 102

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Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1               5                   10                  15
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101

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Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
            20                  25                  30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
        35                  40                  45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
    50                  55                  60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65                  70                  75                  80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
                85                  90                  95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu
            100                 105                 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
        115                 120                 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
    130                 135                 140

Pro Ser Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145                 150                 155                 160

Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly
                165                 170                 175

His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
            180                 185                 190

Ala Ser Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
        195                 200                 205

Gly Asp Thr Arg Tyr Gly Gly Glu Glu Lys Gly Thr Tyr His Leu Ala
    210                 215                 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225                 230                 235                 240

Ile Arg Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
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245 250

<210> 103
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 103
tgcagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagccttа atacgggcaa attgaagaac gacaaggtca gccgtttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa 300

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggtggaga acataccgcc 420

ttcaaccaac tgcccagcgg caaagccgag tatcacggca aagcattcag ctccgacgat 480

gctggcggaa aactgaccta taccatagat ttcgccgcca aacagggaca cggcaaaatc 540

gaacacttga aaacacccga gcaaaatgtc gagcttgcct ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcggcgaaga aaaaggcact 660

taccacctcg ccctttтcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag 720

ataagggaaa aggttcacga aatcggcatc gccggcaaac agtag 765

<210> 104
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 104
Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

103

```
Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65                  70                  75                  80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
                85                  90                  95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu
            100                 105                 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
        115                 120                 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
    130                 135                 140

Pro Ser Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145                 150                 155                 160

Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly
                165                 170                 175

His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
            180                 185                 190

Ala Ser Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
        195                 200                 205

Gly Asp Thr Arg Tyr Gly Gly Glu Glu Lys Gly Thr Tyr His Leu Ala
    210                 215                 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225                 230                 235                 240

Ile Arg Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
                245                 250
```

<210> 105
<211> 768
<212> DNA
<213> Neisseria meningitidis

<400> 105
tgcggatcca gcggaggcgg cggtgtcgcc gccgacatcg gcgcggggct tgccgatgca 60

ctaaccgcac cgctcgacca taaagacaaa agtttgcagt ctttgacgct ggatcagtcc 120

gtcaggaaaa acgagaaact gaagctggcg gcacaaggtg cggaaaaaac ttatggaaac 180

ggcgacagcc ttaatacggg caaattgaag aacgacaagg tcagccgttt cgactttatc 240

cgtcaaatcg aagtggacgg gcagctcatt accttggaga gcggagagtt ccaaatatac 300

aaacaggacc actccgccgt cgttgcccta cagattgaaa aaatcaacaa ccccgacaaa 360

atcgacagcc tgataaacca acgctccttc cttgtcagcg gtttgggtgg agaacatacc 420

gccttcaacc aactgcccag cggcaaagcc gagtatcacg gcaaagcatt cagctccgac 480

gatgctggcg gaaaactgac ctataccata gatttcgccg ccaaacaggg acacggcaaa 540

atcgaacact tgaaaacacc cgagcaaaat gtcgagcttg cctccgccga actcaaagca 600

gatgaaaaat cacacgccgt cattttgggc gacacgcgct acggcggcga agaaaaaggc 660

acttaccacc tcgccctttt cggcgaccgc gcccaagaaa tcgccggctc ggcaaccgtg 720

aagataaggg aaaaggttca cgaaatcggc atcgccggca aacagtag 768

<210> 106
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 106
Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1 5 10 15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu
20 25 30

Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
35 40 45

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
50 55 60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65 70 75 80

Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu
85 90 95

Phe Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile
100 105 110

105

```
Glu Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg
        115                 120                 125

Ser Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln
    130                 135                 140

Leu Pro Ser Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp
145                 150                 155                 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
                165                 170                 175

Gly His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu
            180                 185                 190

Leu Ala Ser Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile
        195                 200                 205

Leu Gly Asp Thr Arg Tyr Gly Gly Glu Glu Lys Gly Thr Tyr His Leu
    210                 215                 220

Ala Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val
225                 230                 235                 240

Lys Ile Arg Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
                245                 250                 255
```

<210> 107
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 107
atgagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctta atacgggcaa attgaagaac gacaaggtca gccgtttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa 300

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggtggaga acataccgcc 420

ttcaaccaac tgcccagcgg caaagccgag tatcacggca aagcattcag ctccgacgat 480

gctggcggaa aactgaccta taccatagat ttcgccgcca aacagggaca cggcaaaatc 540

gaacacttga aaacacccga gcaaaatgtc gagcttgcct ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcggcgaaga aaaaggcact 660

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag 720

ataagggaaa aggttcacga aatcggcatc gccggcaaac agtag 765

<210> 108
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 108

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu
100 105 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
115 120 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
130 135 140

```
Pro Ser Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145                 150                 155                 160

Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly
                165                 170                 175

His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
            180                 185                 190

Ala Ser Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
        195                 200                 205

Gly Asp Thr Arg Tyr Gly Gly Glu Glu Lys Gly Thr Tyr His Leu Ala
    210                 215                 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225                 230                 235                 240

Ile Arg Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
                245                 250
```

<210> 109
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 109
tgcagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg agaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa 300

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggcggaga acataccgcc 420

ttcaaccaac tgcctgacgg caaagccgag tatcacggca aagcattcag ctccgacgat 480

gctggcggaa aactgaccta taccatagat ttcgccgcca aacagggaca cggcaaaatc 540

gaacacctga aaacacccga gcaaaatgtc gagcttgccg ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcagcgaaga aaaaggcact 660

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag 720

108

ataggggaaa aggttcacga aatcggcatc gccggcaaac agtag 765

<210> 110
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 110
Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu
100 105 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
115 120 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
130 135 140

Pro Asp Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145 150 155 160

Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly
165 170 175

His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
180 185 190

Ala Ala Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
195 200 205

Gly Asp Thr Arg Tyr Gly Ser Glu Glu Lys Gly Thr Tyr His Leu Ala
210 215 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225 230 235 240

Ile Gly Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
245 250

<210> 111
<211> 768
<212> DNA
<213> Neisseria meningitidis

<400> 111
tgcggatcca gcggaggcgg cggtgtcgcc gccgacatcg gcgcggggct tgccgatgca 60

ctaaccgcac cgctcgacca taaagacaaa agtttgcagt ctttgacgct ggatcagtcc 120

gtcaggaaaa acgagaaact gaagctggcg gcacaaggtg cggagaaaac ttatggaaac 180

ggcgacagcc tcaatacggg caaattgaag aacgacaagg tcagccgctt cgactttatc 240

cgtcaaatcg aagtggacgg gcagctcatt accttggaga gcggagagtt ccaaatatac 300

aaacaggacc actccgccgt cgttgcccta cagattgaaa aaatcaacaa ccccgacaaa 360

atcgacagcc tgataaacca acgctccttc cttgtcagcg gtttgggcgg agaacatacc 420

gccttcaacc aactgcctga cggcaaagcc gagtatcacg gcaaagcatt cagctccgac 480

gatgctggcg gaaaactgac ctataccata gatttcgccg ccaaacaggg acacggcaaa 540

atcgaacacc tgaaaacacc cgagcaaaat gtcgagcttg ccgccgccga actcaaagca 600

gatgaaaaat cacacgccgt cattttgggc gacacgcgct acggcagcga agaaaaaggc 660

acttaccacc tcgccctttt cggcgaccgc gcccaagaaa tcgccggctc ggcaaccgtg 720

aagatagggg aaaaggttca cgaaatcggc atcgccggca aacagtag 768

<210> 112
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 112
Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly

110

```
1               5                   10                  15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu
            20                  25                  30

Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
        35                  40                  45

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
    50                  55                  60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65                  70                  75                  80

Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu
                85                  90                  95

Phe Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile
            100                 105                 110

Glu Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg
        115                 120                 125

Ser Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln
    130                 135                 140

Leu Pro Asp Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp
145                 150                 155                 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
                165                 170                 175

Gly His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu
            180                 185                 190

Leu Ala Ala Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile
        195                 200                 205

Leu Gly Asp Thr Arg Tyr Gly Ser Glu Glu Lys Gly Thr Tyr His Leu
    210                 215                 220

Ala Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val
225                 230                 235                 240
```


111

Lys Ile Gly Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
245 250 255

<210> 113
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 113
atgagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg agaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa 300

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggcggaga acataccgcc 420

ttcaaccaac tgcctgacgg caaagccgag tatcacggca aagcattcag ctccgacgat 480

gctggcggaa aactgaccta taccatagat ttcgccgcca aacagggaca cggcaaaatc 540

gaacacctga aaacacccga gcaaaatgtc gagcttgccg ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcagcgaaga aaaaggcact 660

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag 720

ataggggaaa aggttcacga aatcggcatc gccggcaaac agtag 765

<210> 114
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 114

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

112

```
Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
    50                  55                  60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65                  70                  75                  80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
                85                  90                  95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu
            100                 105                 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
        115                 120                 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
    130                 135                 140

Pro Asp Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145                 150                 155                 160

Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly
                165                 170                 175

His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
            180                 185                 190

Ala Ala Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
        195                 200                 205

Gly Asp Thr Arg Tyr Gly Ser Glu Glu Lys Gly Thr Tyr His Leu Ala
    210                 215                 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225                 230                 235                 240

Ile Gly Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
                245                 250
```

<210> 115
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 115
tgcagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa 300

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggcggaga acataccgcc 420

ttcaaccaac tgcctgacgg caaagccgag tatcacggca aagcattcag ctccgacgat 480

gctggcggaa aactgaccta taccatagat ttcgccgcca aacagggaca cggcaaaatc 540

gaacacctga aaacacccga gcaaaatgtc gagcttgccg ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcagcgaaga aaaaggcact 660

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag 720

ataggggaaa aggttcacga aatcggcatc gccggcaaac agtag 765

<210> 116
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 116
Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

```
Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu
            100                 105                 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
        115                 120                 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
    130                 135                 140

Pro Asp Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145                 150                 155                 160

Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly
                165                 170                 175

His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
            180                 185                 190

Ala Ala Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
        195                 200                 205

Gly Asp Thr Arg Tyr Gly Ser Glu Glu Lys Gly Thr Tyr His Leu Ala
    210                 215                 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225                 230                 235                 240

Ile Gly Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
                245                 250
```

<210> 117
<211> 768
<212> DNA
<213> Neisseria meningitidis

<400> 117
tgcggatcca gcggaggcgg cggtgtcgcc gccgacatcg gcgcggggct tgccgatgca 60

ctaaccgcac cgctcgacca taaagacaaa agtttgcagt ctttgacgct ggatcagtcc 120

gtcaggaaaa acgagaaact gaagctggcg gcacaaggtg cggaaaaaac ttatggaaac 180

ggcgacagcc tcaatacggg caaattgaag aacgacaagg tcagccgctt cgactttatc 240

cgtcaaatcg aagtggacgg gcagctcatt accttggaga gcggagagtt ccaaatatac 300

116

aaacaggacc actccgccgt cgttgcccta cagattgaaa aaatcaacaa ccccgacaaa 360

atcgacagcc tgataaacca acgctccttc cttgtcagcg gtttgggcgg agaacatacc 420

gccttcaacc aactgcctga cggcaaagcc gagtatcacg gcaaagcatt cagctccgac 480

gatgctggcg gaaaactgac ctataccata gatttcgccg ccaaacaggg acacggcaaa 540

atcgaacacc tgaaaacacc cgagcaaaat gtcgagcttg ccgccgccga actcaaagca 600

gatgaaaaat cacacgccgt cattttgggc gacacgcgct acggcagcga agaaaaaggc 660

acttaccacc tcgccctttt cggcgaccgc gcccaagaaa tcgccggctc ggcaaccgtg 720

aagatagggg aaaaggttca cgaaatcggc atcgccggca aacagtag 768

<210> 118
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 118
Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1 5 10 15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu
20 25 30

Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
35 40 45

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
50 55 60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65 70 75 80

Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu
85 90 95

Phe Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile
100 105 110

Glu Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg
115 120 125

Ser Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln

```
    130                 135                 140

Leu Pro Asp Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp
145                 150                 155                 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
                165                 170                 175

Gly His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu
            180                 185                 190

Leu Ala Ala Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile
        195                 200                 205

Leu Gly Asp Thr Arg Tyr Gly Ser Glu Glu Lys Gly Thr Tyr His Leu
    210                 215                 220

Ala Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val
225                 230                 235                 240

Lys Ile Gly Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
                245                 250                 255
```

<210> 119
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 119

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atgagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta     60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc    120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc    180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt    240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa    300

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc    360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggcggaga acataccgcc    420

ttcaaccaac tgcctgacgg caaagccgag tatcacggca aagcattcag ctccgacgat    480

gctggcggaa aactgaccta taccatagat ttcgccgcca aacagggaca cggcaaaatc    540

gaacacctga aaacacccga gcaaaatgtc gagcttgccg ccgccgaact caaagcagat    600
```


117

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcagcgaaga aaaaggcact 660

taccacctcg ccctttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag 720

ataggggaaa aggttcacga aatcggcatc gccggcaaac agtag 765

<210> 120
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 120

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu
100 105 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
115 120 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
130 135 140

Pro Asp Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145 150 155 160

Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly
165 170 175

```
His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
            180                 185                 190

Ala Ala Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
        195                 200                 205

Gly Asp Thr Arg Tyr Gly Ser Glu Glu Lys Gly Thr Tyr His Leu Ala
    210                 215                 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225                 230                 235                 240

Ile Gly Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
                245                 250
```

<210> 121
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 121

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tgcagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta     60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc    120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc    180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt    240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa    300

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc    360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggcggaga acataccgcc    420

ttcaaccaac tgcctgacgg caaagccgag tatcacggca aagcattcag ctccgacgat    480

gctggcggaa aactgaccta taccatagat ttcgccgcca aacagggaca cggcaaaatc    540

gaacacctga aaacacccga gcaaaatgtc gagcttgccg ccgccgaact caaagcagat    600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcagcgaaga aaaaggcact    660

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag    720

ataggggaaa aggttcacga aatcggcatc gccggcaaac agtag                     765
```

<210> 122
<211> 254
<212> PRT

<213> Neisseria meningitidis

<400> 122

```
Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1               5                  10                  15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
            20                  25                  30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
        35                  40                  45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
    50                  55                  60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65                  70                  75                  80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
                85                  90                  95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu
            100                 105                 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
        115                 120                 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
    130                 135                 140

Pro Asp Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145                 150                 155                 160

Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly
                165                 170                 175

His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
            180                 185                 190

Ala Ala Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
        195                 200                 205

Gly Asp Thr Arg Tyr Gly Ser Glu Glu Lys Gly Thr Tyr His Leu Ala
    210                 215                 220
```

```
Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225                 230                 235                 240

Ile Gly Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
                245                 250
```

<210> 123
<211> 768
<212> DNA
<213> Neisseria meningitidis

<400> 123

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tgcggatcca gcggaggcgg cggtgtcgcc gccgacatcg gcgcggggct tgccgatgca     60

ctaaccgcac cgctcgacca taaagacaaa agtttgcagt ctttgacgct ggatcagtcc    120

gtcaggaaaa acgagaaact gaagctggcg gcacaaggtg cggaaaaaac ttatggaaac    180

ggcgacagcc tcaatacggg caaattgaag aacgacaagg tcagccgctt cgactttatc    240

cgtcaaatcg aagtggacgg gcagctcatt accttggaga gcggagagtt ccaaatatac    300

aaacaggacc actccgccgt cgttgcccta cagattgaaa aaatcaacaa ccccgacaaa    360

atcgacagcc tgataaacca acgctccttc cttgtcagcg gtttgggcgg agaacatacc    420

gccttcaacc aactgcctga cggcaaagcc gagtatcacg gcaaagcatt cagctccgac    480

gatgctggcg gaaaactgac ctataccata gatttcgccg ccaaacaggg acacggcaaa    540

atcgaacacc tgaaaacacc cgagcaaaat gtcgagcttg ccgccgccga actcaaagca    600

gatgaaaaat cacacgccgt cattttgggc gacacgcgct acggcagcga agaaaaaggc    660

acttaccacc tcgccctttt cggcgaccgc gcccaagaaa tcgccggctc ggcaaccgtg    720

aagatagggg aaaaggttca cgaaatcggc atcgccggca aacagtag                 768
```

<210> 124
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 124

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Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1               5                   10                  15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu
            20                  25                  30
```


124

Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
35 40 45

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
50 55 60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65 70 75 80

Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu
85 90 95

Phe Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile
100 105 110

Glu Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg
115 120 125

Ser Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln
130 135 140

Leu Pro Asp Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp
145 150 155 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
165 170 175

Gly His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu
180 185 190

Leu Ala Ala Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile
195 200 205

Leu Gly Asp Thr Arg Tyr Gly Ser Glu Glu Lys Gly Thr Tyr His Leu
210 215 220

Ala Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val
225 230 235 240

Lys Ile Gly Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
245 250 255

<210> 125

<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 125
atgagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa 300

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggcggaga acataccgcc 420

ttcaaccaac tgcctgacgg caaagccgag tatcacggca aagcattcag ctccgacgat 480

gctggcggaa aactgaccta taccatagat ttcgccgcca aacagggaca cggcaaaatc 540

gaacacctga aaacacccga gcaaaatgtc gagcttgccg ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcagcgaaga aaaaggcact 660

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag 720

ataggggaaa aggttcacga aatcggcatc gccggcaaac agtag 765

<210> 126
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 126

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

123

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu
100 105 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
115 120 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
130 135 140

Pro Asp Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145 150 155 160

Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly
165 170 175

His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
180 185 190

Ala Ala Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
195 200 205

Gly Asp Thr Arg Tyr Gly Ser Glu Glu Lys Gly Thr Tyr His Leu Ala
210 215 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225 230 235 240

Ile Gly Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
245 250

<210> 127
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 127
tgcagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa 300

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggcggaga acataccgcc 420

ttcaaccaac tgcctgacgg caaagccgag tatcacggca aagcattcag ctccgacgat 480

gctggcggaa aactgaccta taccatagat ttcgccgcca aacagggaca cggcaaaatc 540

gaacacctga aaacacccga gcaaaatgtc gagcttgccg ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcagcgaaga aaaaggcact 660

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag 720

ataggggaaa aggttcacga aatcggcatc gccggcaaac agtag 765

<210> 128
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 128
Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu
100 105 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser

125

```
        115                 120                 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
    130                 135                 140

Pro Asp Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145                 150                 155                 160

Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly
                165                 170                 175

His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
            180                 185                 190

Ala Ala Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
        195                 200                 205

Gly Asp Thr Arg Tyr Gly Ser Glu Glu Lys Gly Thr Tyr His Leu Ala
    210                 215                 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225                 230                 235                 240

Ile Gly Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
                245                 250
```

<210> 129
<211> 768
<212> DNA
<213> Neisseria meningitidis

<400> 129
tgcggatcca gcggaggcgg cggtgtcgcc gccgacatcg gcgcggggct tgccgatgca 60

ctaaccgcac cgctcgacca taaagacaaa agtttgcagt ctttgacgct ggatcagtcc 120

gtcaggaaaa acgagaaact gaagctggcg gcacaaggtg cggaaaaaac ttatggaaac 180

ggcgacagcc tcaatacggg caaattgaag aacgacaagg tcagccgctt cgactttatc 240

cgtcaaatcg aagtggacgg gcagctcatt accttggaga gcggagagtt ccaaatatac 300

aaacaggacc actccgccgt cgttgcccta cagattgaaa aaatcaacaa ccccgacaaa 360

atcgacagcc tgataaacca acgctccttc cttgtcagcg gtttgggcgg agaacatacc 420

gccttcaacc aactgcctga cggcaaagcc gagtatcacg gcaaagcatt cagctccgac 480

126

gatgctggcg gaaaactgac ctataccata gatttcgccg ccaaacaggg acacggcaaa 540

atcgaacacc tgaaaacacc cgagcaaaat gtcgagcttg ccgccgccga actcaaagca 600

gatgaaaaat cacacgccgt cattttgggc gacacgcgct acggcagcga agaaaaaggc 660

acttaccacc tcgccctttt cggcgaccgc gcccaagaaa tcgccggctc ggcaaccgtg 720

aagatagggg aaaaggttca cgaaatcggc atcgccggca aacagtag 768

<210> 130
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 130
Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1 5 10 15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu
20 25 30

Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
35 40 45

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
50 55 60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65 70 75 80

Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu
85 90 95

Phe Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile
100 105 110

Glu Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg
115 120 125

Ser Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln
130 135 140

Leu Pro Asp Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp
145 150 155 160

```
Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
                165                 170                 175

Gly His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu
            180                 185                 190

Leu Ala Ala Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile
        195                 200                 205

Leu Gly Asp Thr Arg Tyr Gly Ser Glu Glu Lys Gly Thr Tyr His Leu
    210                 215                 220

Ala Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val
225                 230                 235                 240

Lys Ile Gly Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
                245                 250                 255
```

<210> 131
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 131

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atgagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta     60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc    120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc    180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt    240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa    300

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc    360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggcggaga acataccgcc    420

ttcaaccaac tgcctgacgg caaagccgag tatcacggca aagcattcag ctccgacgat    480

gctggcggaa aactgaccta taccatagat ttcgccgcca aacagggaca cggcaaaatc    540

gaacacctga aaacacccga gcaaaatgtc gagcttgccg ccgccgaact caaagcagat    600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcagcgaaga aaaaggcact    660

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag    720

ataggggaaa aggttcacga aatcggcatc gccggcaaac agtag                     765
```


128

<210> 132
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 132

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu
100 105 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
115 120 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
130 135 140

Pro Asp Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145 150 155 160

Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly
165 170 175

His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
180 185 190

Ala Ala Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
195 200 205

Gly Asp Thr Arg Tyr Gly Ser Glu Glu Lys Gly Thr Tyr His Leu Ala
210 215 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225 230 235 240

Ile Gly Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
245 250

<210> 133
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 133
tgcagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa 300

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggcggaga acataccgcc 420

ttcaaccaac tgcctgacgg caaagccgag tatcacggca aagcattcag ctccgacgat 480

gctggcggaa aactgaccta taccatagat ttcgccgcca aacagggaca cggcaaaatc 540

gaacacctga aaacacccga gcaaaatgtc gagcttgccg ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcagcgaaga aaaaggcact 660

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag 720

ataggggaaa aggttcacga aatcggcatc gccggcaaac agtaa 765

<210> 134
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 134
Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

130

```
Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
            20                  25                  30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
        35                  40                  45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
    50                  55                  60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65                  70                  75                  80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
                85                  90                  95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu
            100                 105                 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
        115                 120                 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
    130                 135                 140

Pro Asp Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145                 150                 155                 160

Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly
                165                 170                 175

His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
            180                 185                 190

Ala Ala Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
        195                 200                 205

Gly Asp Thr Arg Tyr Gly Ser Glu Glu Lys Gly Thr Tyr His Leu Ala
    210                 215                 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225                 230                 235                 240

Ile Gly Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
```

245 250

<210> 135
<211> 768
<212> DNA
<213> Neisseria meningitidis

<400> 135
tgcggatcca gcggaggcgg cggtgtcgcc gccgacatcg gcgcggggct tgccgatgca 60

ctaaccgcac cgctcgacca taaagacaaa agtttgcagt ctttgacgct ggatcagtcc 120

gtcaggaaaa acgagaaact gaagctggcg gcacaaggtg cggaaaaaac ttatggaaac 180

ggcgacagcc tcaatacggg caaattgaag aacgacaagg tcagccgctt cgactttatc 240

cgtcaaatcg aagtggacgg gcagctcatt accttggaga gcggagagtt ccaaatatac 300

aaacaggacc actccgccgt cgttgcccta cagattgaaa aaatcaacaa ccccgacaaa 360

atcgacagcc tgataaacca acgctccttc cttgtcagcg gtttgggcgg agaacatacc 420

gccttcaacc aactgcctga cggcaaagcc gagtatcacg gcaaagcatt cagctccgac 480

gatgctggcg gaaaactgac ctataccata gatttcgccg ccaaacaggg acacggcaaa 540

atcgaacacc tgaaaacacc cgagcaaaat gtcgagcttg ccgccgccga actcaaagca 600

gatgaaaaat cacacgccgt cattttgggc gacacgcgct acggcagcga agaaaaaggc 660

acttaccacc tcgccctttt cggcgaccgc gcccaagaaa tcgccggctc ggcaaccgtg 720

aagatagggg aaaaggttca cgaaatcggc atcgccggca aacagtaa 768

<210> 136
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 136
Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1 5 10 15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu
20 25 30

Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
35 40 45

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
50 55 60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65 70 75 80

Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu
85 90 95

Phe Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile
100 105 110

Glu Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg
115 120 125

Ser Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln
130 135 140

Leu Pro Asp Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp
145 150 155 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
165 170 175

Gly His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu
180 185 190

Leu Ala Ala Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile
195 200 205

Leu Gly Asp Thr Arg Tyr Gly Ser Glu Glu Lys Gly Thr Tyr His Leu
210 215 220

Ala Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val
225 230 235 240

Lys Ile Gly Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
245 250 255

<210> 137
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 137
atgagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa 300

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggcggaga acataccgcc 420

ttcaaccaac tgcctgacgg caaagccgag tatcacggca aagcattcag ctccgacgat 480

gctggcggaa aactgaccta taccatagat ttcgccgcca aacagggaca cggcaaaatc 540

gaacacctga aaacacccga gcaaaatgtc gagcttgccg ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcagcgaaga aaaaggcact 660

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag 720

ataggggaaa aggttcacga aatcggcatc gccggcaaac agtaa 765

<210> 138
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 138

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu

100 105 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
115 120 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
130 135 140

Pro Asp Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145 150 155 160

Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly
165 170 175

His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
180 185 190

Ala Ala Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
195 200 205

Gly Asp Thr Arg Tyr Gly Ser Glu Glu Lys Gly Thr Tyr His Leu Ala
210 215 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225 230 235 240

Ile Gly Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
245 250

<210> 139
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 139
tgcagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctta atacgggcaa attgaagaac gacaaggtca gccgtttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa 300

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

135

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggtggaga acataccgcc 420

ttcaaccaac tgcccagcgg caaagccgag tatcacggca aagcattcag ctccgacgat 480

gctggcggaa aactgaccta taccatagat ttcgccacca aacagggaca cggcaaaatc 540

gaacacttga aaacacccga gcaaaatgtc gagcttgccg ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcagcgaaga aaaaggcact 660

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag 720

ataggggaaa aggttcacga aatcggcatc gccggcaaac agtag 765

<210> 140
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 140
Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu
100 105 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
115 120 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
130 135 140

aagatagggg aaaaggttca cgaaatcggc atcgccggca aacagtag 768

<210> 142
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 142

```
Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1               5                  10                  15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu
            20                  25                  30

Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
        35                  40                  45

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
    50                  55                  60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65                  70                  75                  80

Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu
                85                  90                  95

Phe Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile
            100                 105                 110

Glu Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg
        115                 120                 125

Ser Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln
    130                 135                 140

Leu Pro Ser Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp
145                 150                 155                 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Thr Lys Gln
                165                 170                 175

Gly His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu
            180                 185                 190
```

```
Leu Ala Ala Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile
        195                 200                 205

Leu Gly Asp Thr Arg Tyr Gly Ser Glu Glu Lys Gly Thr Tyr His Leu
    210                 215                 220

Ala Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val
225                 230                 235                 240

Lys Ile Gly Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
                245                 250                 255
```

<210> 143
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 143

```
atgagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta     60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc    120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc    180

gacagcctta atacgggcaa attgaagaac gacaaggtca gccgtttcga ctttatccgt    240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa    300

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc    360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggtggaga acataccgcc    420

ttcaaccaac tgcccagcgg caaagccgag tatcacggca aagcattcag ctccgacgat    480

gctggcggaa aactgaccta taccatagat ttcgccacca aacagggaca cggcaaaatc    540

gaacacttga aaacacccga gcaaaatgtc gagcttgccg ccgccgaact caaagcagat    600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcagcgaaga aaaaggcact    660

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag    720

ataggggaaa aggttcacga aatcggcatc gccggcaaac agtag                     765
```

<210> 144
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 144

```
Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1               5                  10                  15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
            20                  25                  30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
        35                  40                  45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
    50                  55                  60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65                  70                  75                  80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
                85                  90                  95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu
            100                 105                 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
        115                 120                 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
    130                 135                 140

Pro Ser Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145                 150                 155                 160

Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Thr Lys Gln Gly
                165                 170                 175

His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
            180                 185                 190

Ala Ala Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
        195                 200                 205

Gly Asp Thr Arg Tyr Gly Ser Glu Glu Lys Gly Thr Tyr His Leu Ala
    210                 215                 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
```

225 230 235 240

Ile Gly Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
245 250

<210> 145
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 145
tgcagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctta atacgggcaa attgaagaac gacaaggtca gccgtttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa 300

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggtggaga acataccgcc 420

ttcaaccaac tgcccagcgg caaagccgag tatcacggca aagcattcag ctccgacgat 480

gctggcggaa aactgaccta taccatagat ttcgccacca aacagggaca cggcaaaatc 540

gaacacttga aaacacccga gcaaaatgtc gagcttgccg ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcagcgaaga aaaaggcact 660

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag 720

ataggggaaa aggttcacga aatcggcatc gccggcaaac agtag 765

<210> 146
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 146
Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

```
Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
    50                  55                  60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65                  70                  75                  80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
                85                  90                  95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu
            100                 105                 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
        115                 120                 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
    130                 135                 140

Pro Ser Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145                 150                 155                 160

Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Thr Lys Gln Gly
                165                 170                 175

His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
            180                 185                 190

Ala Ala Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
        195                 200                 205

Gly Asp Thr Arg Tyr Gly Ser Glu Glu Lys Gly Thr Tyr His Leu Ala
    210                 215                 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225                 230                 235                 240

Ile Gly Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
                245                 250
```

<210> 147
<211> 768
<212> DNA
<213> Neisseria meningitidis

<400> 147
tgcggatcca gcggaggcgg cggtgtcgcc gccgacatcg gcgcggggct tgccgatgca 60

ctaaccgcac cgctcgacca taaagacaaa agtttgcagt ctttgacgct ggatcagtcc 120

gtcaggaaaa acgagaaact gaagctggcg gcacaaggtg cggaaaaaac ttatggaaac 180

ggcgacagcc ttaatacggg caaattgaag aacgacaagg tcagccgttt cgactttatc 240

cgtcaaatcg aagtggacgg gcagctcatt accttggaga gcggagagtt ccaaatatac 300

aaacaggacc actccgccgt cgttgcccta cagattgaaa aaatcaacaa ccccgacaaa 360

atcgacagcc tgataaacca acgctccttc cttgtcagcg gtttgggtgg agaacatacc 420

gccttcaacc aactgcccag cggcaaagcc gagtatcacg gcaaagcatt cagctccgac 480

gatgctggcg gaaaactgac ctataccata gatttcgcca ccaaacaggg acacggcaaa 540

atcgaacact tgaaaacacc cgagcaaaat gtcgagcttg ccgccgccga actcaaagca 600

gatgaaaaat cacacgccgt cattttgggc gacacgcgct acggcagcga agaaaaaggc 660

acttaccacc tcgccctttt cggcgaccgc gcccaagaaa tcgccggctc ggcaaccgtg 720

aagatagggg aaaaggttca cgaaatcggc atcgccggca aacagtag 768

<210> 148
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 148
Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1 5 10 15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu
20 25 30

Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
35 40 45

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
50 55 60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65 70 75 80

Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu
85 90 95

```
Phe Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile
            100                 105                 110

Glu Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg
        115                 120                 125

Ser Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln
    130                 135                 140

Leu Pro Ser Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp
145                 150                 155                 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Thr Lys Gln
                165                 170                 175

Gly His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu
            180                 185                 190

Leu Ala Ala Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile
        195                 200                 205

Leu Gly Asp Thr Arg Tyr Gly Ser Glu Glu Lys Gly Thr Tyr His Leu
    210                 215                 220

Ala Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val
225                 230                 235                 240

Lys Ile Gly Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
                245                 250                 255
```

<210> 149
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 149

```
atgagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta     60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc    120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc    180

gacagcctta atacgggcaa attgaagaac gacaaggtca gccgtttcga ctttatccgt    240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa    300
```

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggtggaga acataccgcc 420

ttcaaccaac tgcccagcgg caaagccgag tatcacggca aagcattcag ctccgacgat 480

gctggcggaa aactgaccta taccatagat ttcgccacca aacagggaca cggcaaaatc 540

gaacacttga aaacacccga gcaaaatgtc gagcttgccg ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcagcgaaga aaaaggcact 660

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag 720

ataggggaaa aggttcacga aatcggcatc gccggcaaac agtag 765

<210> 150
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 150

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu
100 105 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
115 120 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
130 135 140

Pro Ser Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145 150 155 160

Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Thr Lys Gln Gly
165 170 175

His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
180 185 190

Ala Ala Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
195 200 205

Gly Asp Thr Arg Tyr Gly Ser Glu Glu Lys Gly Thr Tyr His Leu Ala
210 215 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225 230 235 240

Ile Gly Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
245 250

<210> 151
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 151
tgcagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctta atacgggcaa attgaagaac gacaaggtca gccgtttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa 300

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggtggaga acataccgcc 420

ttcaaccaac tgcccagcgg caaagccgag tatcacggca aagcattcag ctccgacgat 480

gctggcggaa aactgaccta taccatagat ttcgccacca aacagggaca cggcaaaatc 540

gaacacttga aaacacccga gcaaaatgtc gagcttgccg ccgccgaact caaagcagat 600

145

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcagcgaaga aaaaggcact 660

taccacctcg ccctttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag 720

ataggggaaa aggttcacga aatcggcatc gccggcaaac agtag 765

<210> 152
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 152

```
Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1               5                  10                  15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
            20                  25                  30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
        35                  40                  45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
    50                  55                  60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65                  70                  75                  80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
                85                  90                  95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu
            100                 105                 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
        115                 120                 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
    130                 135                 140

Pro Ser Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145                 150                 155                 160

Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Thr Lys Gln Gly
                165                 170                 175
```

```
His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
            180                 185                 190

Ala Ala Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
        195                 200                 205

Gly Asp Thr Arg Tyr Gly Ser Glu Glu Lys Gly Thr Tyr His Leu Ala
    210                 215                 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225                 230                 235                 240

Ile Gly Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
                245                 250
```

<210> 153
<211> 768
<212> DNA
<213> Neisseria meningitidis

<400> 153

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tgcggatcca gcggaggcgg cggtgtcgcc gccgacatcg gcgcggggct tgccgatgca     60

ctaaccgcac cgctcgacca taaagacaaa agtttgcagt ctttgacgct ggatcagtcc    120

gtcaggaaaa acgagaaact gaagctggcg gcacaaggtg cggaaaaaac ttatggaaac    180

ggcgacagcc ttaatacggg caaattgaag aacgacaagg tcagccgttt cgactttatc    240

cgtcaaatcg aagtggacgg gcagctcatt accttggaga gcggagagtt ccaaatatac    300

aaacaggacc actccgccgt cgttgcccta cagattgaaa aaatcaacaa ccccgacaaa    360

atcgacagcc tgataaacca acgctccttc cttgtcagcg gtttgggtgg agaacatacc    420

gccttcaacc aactgcccag cggcaaagcc gagtatcacg gcaaagcatt cagctccgac    480

gatgctggcg gaaaactgac ctataccata gatttcgcca ccaaacaggg acacggcaaa    540

atcgaacact tgaaaacacc cgagcaaaat gtcgagcttg ccgccgccga actcaaagca    600

gatgaaaaat cacacgccgt cattttgggc gacacgcgct acggcagcga agaaaaaggc    660

acttaccacc tcgccctttt cggcgaccgc gcccaagaaa tcgccggctc ggcaaccgtg    720

aagatagggg aaaaggttca cgaaatcggc atcgccggca aacagtag                 768
```

<210> 154
<211> 255
<212> PRT

147

<213> Neisseria meningitidis

<400> 154

```
Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1               5                  10                  15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu
            20                  25                  30

Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
        35                  40                  45

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
    50                  55                  60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65                  70                  75                  80

Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu
                85                  90                  95

Phe Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile
            100                 105                 110

Glu Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg
        115                 120                 125

Ser Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln
    130                 135                 140

Leu Pro Ser Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp
145                 150                 155                 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Thr Lys Gln
                165                 170                 175

Gly His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu
            180                 185                 190

Leu Ala Ala Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile
        195                 200                 205

Leu Gly Asp Thr Arg Tyr Gly Ser Glu Glu Lys Gly Thr Tyr His Leu
    210                 215                 220
```

Ala Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val
225 230 235 240

Lys Ile Gly Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
245 250 255

<210> 155
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 155
atgagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctta atacgggcaa attgaagaac gacaaggtca gccgtttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa 300

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggtggaga acataccgcc 420

ttcaaccaac tgcccagcgg caaagccgag tatcacggca aagcattcag ctccgacgat 480

gctggcggaa aactgaccta taccatagat ttcgccacca aacagggaca cggcaaaatc 540

gaacacttga aaacacccga gcaaaatgtc gagcttgccg ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcagcgaaga aaaaggcact 660

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag 720

ataggggaaa aggttcacga aatcggcatc gccggcaaac agtag 765

<210> 156
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 156

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

```
Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
        35                  40                  45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
    50                  55                  60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65                  70                  75                  80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
                85                  90                  95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu
            100                 105                 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
        115                 120                 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
    130                 135                 140

Pro Ser Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145                 150                 155                 160

Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Thr Lys Gln Gly
                165                 170                 175

His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
            180                 185                 190

Ala Ala Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
        195                 200                 205

Gly Asp Thr Arg Tyr Gly Ser Glu Glu Lys Gly Thr Tyr His Leu Ala
    210                 215                 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225                 230                 235                 240

Ile Gly Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
                245                 250
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<210> 157
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 157
tgcagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgactataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa 300

caggaccact ccgccgtcgt tgccctatag attgaaaaaa tcaacaaccc cgacaaaatc 360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggtggaga acataccgcc 420

ttcaaccaac tgcccggcgg caaagccgag tatcacggca aagcattcag ctccgacgat 480

gctggcggaa aactgaccta taccatagat ttcgccgcca aacagggaca cggcaaaatc 540

gaacacctga aaacacccga gcaaaatgtc gagcttgccg ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcagcgaaga aaaaggcact 660

taccacctcg ccctttttcgg cgaccgcgct caagaaatcg ccggctcggc aaccgtgaag 720

ataggggaaa aggttcacga aatcggcatc gccggcaaac agtag 765

<210> 158
<211> 253
<212> PRT
<213> Neisseria meningitidis

<400> 158
Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp Tyr Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

151

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Ile Glu Lys
100 105 110

Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser Phe
115 120 125

Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu Pro
130 135 140

Gly Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp Ala
145 150 155 160

Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly His
165 170 175

Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu Ala
180 185 190

Ala Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu Gly
195 200 205

Asp Thr Arg Tyr Gly Ser Glu Glu Lys Gly Thr Tyr His Leu Ala Leu
210 215 220

Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys Ile
225 230 235 240

Gly Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
245 250

<210> 159
<211> 768
<212> DNA
<213> Neisseria meningitidis

<400> 159
tgcggatcca gcggaggcgg cggtgtcgcc gccgacatcg gcgcggggct tgccgatgca 60

ctaaccgcac cgctcgacta taaagacaaa agtttgcagt ctttgacgct ggatcagtcc 120

gtcaggaaaa acgagaaact gaagctggcg gcacaaggtg cggaaaaaac ttatggaaac 180

152

ggcgacagcc tcaatacggg caaattgaag aacgacaagg tcagccgctt cgactttatc 240

cgtcaaatcg aagtggacgg gcagctcatt accttggaga gcggagagtt ccaaatatac 300

aaacaggacc actccgccgt cgttgcccta tagattgaaa aaatcaacaa ccccgacaaa 360

atcgacagcc tgataaacca acgctccttc cttgtcagcg gtttgggtgg agaacatacc 420

gccttcaacc aactgcccgg cggcaaagcc gagtatcacg gcaaagcatt cagctccgac 480

gatgctggcg gaaaactgac ctataccata gatttcgccg ccaaacaggg acacggcaaa 540

atcgaacacc tgaaaacacc cgagcaaaat gtcgagcttg ccgccgccga actcaaagca 600

gatgaaaaat cacacgccgt cattttgggc gacacgcgct acggcagcga agaaaaaggc 660

acttaccacc tcgccctttt cggcgaccgc gctcaagaaa tcgccggctc ggcaaccgtg 720

aagatagggg aaaaggttca cgaaatcggc atcgccggca aacagtag 768

<210> 160
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 160
Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1 5 10 15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp Tyr Lys Asp Lys Ser Leu
20 25 30

Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
35 40 45

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
50 55 60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65 70 75 80

Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu
85 90 95

Phe Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Ile Glu
100 105 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser

153

115 120 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
130 135 140

Pro Gly Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145 150 155 160

Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly
165 170 175

His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
180 185 190

Ala Ala Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
195 200 205

Gly Asp Thr Arg Tyr Gly Ser Glu Glu Lys Gly Thr Tyr His Leu Ala
210 215 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225 230 235 240

Ile Gly Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
245 250

<210> 161
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 161
atgagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgactataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa 300

caggaccact ccgccgtcgt tgccctatag attgaaaaaa tcaacaaccc cgacaaaatc 360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggtggaga acataccgcc 420

ttcaaccaac tgcccggcgg caaagccgag tatcacggca aagcattcag ctccgacgat 480

154

gctggcggaa aactgaccta taccatagat ttcgccgcca aacagggaca cggcaaaatc 540

gaacacctga aaacacccga gcaaaatgtc gagcttgccg ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcagcgaaga aaaaggcact 660

taccacctcg ccctttttcgg cgaccgcgct caagaaatcg ccggctcggc aaccgtgaag 720

ataggggaaa aggttcacga aatcggcatc gccggcaaac agtag 765

<210> 162
<211> 253
<212> PRT
<213> Neisseria meningitidis

<400> 162

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp Tyr Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Ile Glu Lys
100 105 110

Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser Phe
115 120 125

Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu Pro
130 135 140

Gly Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp Ala
145 150 155 160

Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly His
165 170 175

Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu Ala
180 185 190

Ala Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu Gly
195 200 205

Asp Thr Arg Tyr Gly Ser Glu Glu Lys Gly Thr Tyr His Leu Ala Leu
210 215 220

Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys Ile
225 230 235 240

Gly Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
245 250

<210> 163
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 163
tgcagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa 300

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

gacagcctga taaaccgacg ctccttcctt gtcagcggtt tgggcggaga acataccgcc 420

ttcaaccaac tgcctgacgg caaagccgag tatcacggca aagcattcag ctccgacgat 480

gctggcggaa aactgaccta taccatagat ttcgccgcca aacagggaca cggcaaaatc 540

gaacacctga aaacacccga gcaaaatgtc gagcttgccg ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcagcgaaga aaaaggcact 660

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag 720

ataggggaaa aggttcacga aatcggcatc gccggcaaac agtag 765

156

<210> 164
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 164
Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu
100 105 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Arg Arg Ser
115 120 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
130 135 140

Pro Asp Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145 150 155 160

Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly
165 170 175

His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
180 185 190

Ala Ala Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
195 200 205

157

Gly Asp Thr Arg Tyr Gly Ser Glu Glu Lys Gly Thr Tyr His Leu Ala
210 215 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225 230 235 240

Ile Gly Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
245 250

<210> 165
<211> 768
<212> DNA
<213> Neisseria meningitidis

<400> 165
tgcggatcca gcggaggcgg cggtgtcgcc gccgacatcg gcgcggggct tgccgatgca 60

ctaaccgcac cgctcgacca taaagacaaa agtttgcagt ctttgacgct ggatcagtcc 120

gtcaggaaaa acgagaaact gaagctggcg gcacaaggtg cggaaaaaac ttatggaaac 180

ggcgacagcc tcaatacggg caaattgaag aacgacaagg tcagccgctt cgactttatc 240

cgtcaaatcg aagtggacgg gcagctcatt accttggaga gcggagagtt ccaaatatac 300

aaacaggacc actccgccgt cgttgcccta cagattgaaa aaatcaacaa ccccgacaaa 360

atcgacagcc tgataaaccg acgctccttc cttgttcagcg gtttgggcgg agaacatacc 420

gccttcaacc aactgcctga cggcaaagcc gagtatcacg gcaaagcatt cagctccgac 480

gatgctggcg gaaaactgac ctataccata gatttcgccg ccaaacaggg acacggcaaa 540

atcgaacacc tgaaaacacc cgagcaaaat gtcgagcttg ccgccgccga actcaaagca 600

gatgaaaaat cacacgccgt cattttgggc gacacgcgct acggcagcga agaaaaaggc 660

acttaccacc tcgccctttt cggcgaccgc gcccaagaaa tcgccggctc ggcaaccgtg 720

aagatagggg aaaaggttca cgaaatcggc atcgccggca aacagtag 768

<210> 166
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 166
Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1 5 10 15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu
20 25 30

Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
35 40 45

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
50 55 60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65 70 75 80

Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu
85 90 95

Phe Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile
100 105 110

Glu Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Arg Arg
115 120 125

Ser Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln
130 135 140

Leu Pro Asp Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp
145 150 155 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
165 170 175

Gly His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu
180 185 190

Leu Ala Ala Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile
195 200 205

Leu Gly Asp Thr Arg Tyr Gly Ser Glu Glu Lys Gly Thr Tyr His Leu
210 215 220

Ala Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val
225 230 235 240

Lys Ile Gly Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln

245 250 255

<210> 167
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 167
atgagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa 300

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

gacagcctga taaaccgacg ctccttcctt gtcagcggtt tgggcggaga acataccgcc 420

ttcaaccaac tgcctgacgg caaagccgag tatcacggca aagcattcag ctccgacgat 480

gctggcggaa aactgaccta taccatagat ttcgccgcca aacagggaca cggcaaaatc 540

gaacacctga aaacacccga gcaaaatgtc gagcttgccg ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcagcgaaga aaaaggcact 660

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag 720

ataggggaaa aggttcacga aatcggcatc gccggcaaac agtag 765

<210> 168
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 168

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

160

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu
100 105 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Arg Arg Ser
115 120 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
130 135 140

Pro Asp Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145 150 155 160

Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly
165 170 175

His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
180 185 190

Ala Ala Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
195 200 205

Gly Asp Thr Arg Tyr Gly Ser Glu Glu Lys Gly Thr Tyr His Leu Ala
210 215 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225 230 235 240

Ile Gly Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
245 250

<210> 169
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 169
tgcagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

161

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa 300

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggcggaga acataccgcc 420

ttcaaccaac tgcctgacgg caaagccgag tatcacggca aagcattcag ctccgacgat 480

gctggcggaa aactgaccta taccatagat ttcgccgcca aacagggaca cggcaaaatc 540

gaacacctga aaacacccga gcaaaatgtc gagcttgccg ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcagcgaaga aaaaggcact 660

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtggag 720

ataggggaaa aggttcacga aatcggcatc gccggcaaac agtag 765

<210> 170
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 170
Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu

100 105 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
115 120 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
130 135 140

Pro Asp Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145 150 155 160

Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly
165 170 175

His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
180 185 190

Ala Ala Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
195 200 205

Gly Asp Thr Arg Tyr Gly Ser Glu Glu Lys Gly Thr Tyr His Leu Ala
210 215 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Glu
225 230 235 240

Ile Gly Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
245 250

<210> 171
<211> 768
<212> DNA
<213> Neisseria meningitidis

<400> 171
tgcggatcca gcggaggcgg cggtgtcgcc gccgacatcg gcgcggggct tgccgatgca 60

ctaaccgcac cgctcgacca taaagacaaa agtttgcagt ctttgacgct ggatcagtcc 120

gtcaggaaaa acgagaaact gaagctggcg gcacaaggtg cggaaaaaac ttatggaaac 180

ggcgacagcc tcaatacggg caaattgaag aacgacaagg tcagccgctt cgactttatc 240

cgtcaaatcg aagtggacgg gcagctcatt accttggaga gcggagagtt ccaaatatac 300

aaacaggacc actccgccgt cgttgcccta cagattgaaa aaatcaacaa ccccgacaaa 360

atcgacagcc tgataaacca acgctccttc cttgtcagcg gtttgggcgg agaacatacc 420

gccttcaacc aactgcctga cggcaaagcc gagtatcacg gcaaagcatt cagctccgac 480

gatgctggcg gaaaactgac ctataccata gatttcgccg ccaaacaggg acacggcaaa 540

atcgaacacc tgaaaacacc cgagcaaaat gtcgagcttg ccgccgccga actcaaagca 600

gatgaaaaat cacacgccgt cattttgggc gacacgcgct acggcagcga agaaaaaggc 660

acttaccacc tcgccctttt cggcgaccgc gcccaagaaa tcgccggctc ggcaaccgtg 720

gagatagggg aaaaggttca cgaaatcggc atcgccggca aacagtag 768

<210> 172
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 172

Cys	Gly	Ser	Ser	Gly	Gly	Gly	Gly	Val	Ala	Ala	Asp	Ile	Gly	Ala	Gly
1				5					10					15	

Leu	Ala	Asp	Ala	Leu	Thr	Ala	Pro	Leu	Asp	His	Lys	Asp	Lys	Ser	Leu
			20					25					30		

Gln	Ser	Leu	Thr	Leu	Asp	Gln	Ser	Val	Arg	Lys	Asn	Glu	Lys	Leu	Lys
		35					40					45			

Leu	Ala	Ala	Gln	Gly	Ala	Glu	Lys	Thr	Tyr	Gly	Asn	Gly	Asp	Ser	Leu
	50					55					60				

Asn	Thr	Gly	Lys	Leu	Lys	Asn	Asp	Lys	Val	Ser	Arg	Phe	Asp	Phe	Ile
65					70					75					80

Arg	Gln	Ile	Glu	Val	Asp	Gly	Gln	Leu	Ile	Thr	Leu	Glu	Ser	Gly	Glu
				85					90					95	

Phe	Gln	Ile	Tyr	Lys	Gln	Asp	His	Ser	Ala	Val	Val	Ala	Leu	Gln	Ile
			100					105					110		

Glu	Lys	Ile	Asn	Asn	Pro	Asp	Lys	Ile	Asp	Ser	Leu	Ile	Asn	Gln	Arg
		115					120					125			

Ser	Phe	Leu	Val	Ser	Gly	Leu	Gly	Gly	Glu	His	Thr	Ala	Phe	Asn	Gln
	130					135					140				

Leu Pro Asp Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp
145 150 155 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
165 170 175

Gly His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu
180 185 190

Leu Ala Ala Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile
195 200 205

Leu Gly Asp Thr Arg Tyr Gly Ser Glu Glu Lys Gly Thr Tyr His Leu
210 215 220

Ala Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val
225 230 235 240

Glu Ile Gly Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
245 250 255

<210> 173
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 173
atgagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa 300

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggcggaga acataccgcc 420

ttcaaccaac tgcctgacgg caaagccgag tatcacggca aagcattcag ctccgacgat 480

gctggcggaa aactgaccta taccatagat ttcgccgcca aacagggaca cggcaaaatc 540

gaacacctga aaacacccga gcaaaatgtc gagcttgccg ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcagcgaaga aaaaggcact 660

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtggag 720

165

ataggggaaa aggttcacga aatcggcatc gccggcaaac agtag 765

<210> 174
<211> 254
<212> PRT
<213> Neisseria meningitidis

<400> 174

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu
100 105 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
115 120 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
130 135 140

Pro Asp Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145 150 155 160

Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly
165 170 175

His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
180 185 190

Ala Ala Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
195 200 205

Gly Asp Thr Arg Tyr Gly Ser Glu Glu Lys Gly Thr Tyr His Leu Ala
210 215 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Glu
225 230 235 240

Ile Gly Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
245 250

<210> 175
<211> 768
<212> DNA
<213> Neisseria meningitidis

<400> 175
tgcagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggtgcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca agtgtacaaa 300

caaagccatt ccgccttaac cgcccttcag accgagcaag tacaagattc ggagcattca 360

gggaagatgg ttgcgaaacg ccagttcaga atcggcgata tagcgggtga acatacatct 420

tttgacaagc ttcccgaagg cggcagggcg acatatcgcg ggacggcatt cggttcagac 480

gatgccagtg gaaaactgac ctacaccata gatttcgccg ccaagcaggg acacggcaaa 540

atcgaacatt tgaaatcgcc agaactcaat gttgacctgg ccgcctccga tatcaagccg 600

gataaaaaac gccatgccgt catcagcggt tccgtccttt acaaccaagc cgagaaaggc 660

agttactctc taggcatctt tggcgggcaa gcccaggaag ttgccggcag cgcagaagtg 720

gaaaccgcaa acggcatacg ccatatcggt cttgccgcca agcagtaa 768

<210> 176
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 176

167

Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Val Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr Glu
100 105 110

Gln Val Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln
115 120 125

Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu
130 135 140

Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp
145 150 155 160

Asp Ala Ser Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
165 170 175

Gly His Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp
180 185 190

Leu Ala Ala Ser Asp Ile Lys Pro Asp Lys Lys Arg His Ala Val Ile
195 200 205

Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser Leu
210 215 220

Gly Ile Phe Gly Gly Gln Ala Gln Glu Val Ala Gly Ser Ala Glu Val

225 230 235 240

Glu Thr Ala Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
245 250 255

<210> 177
<211> 771
<212> DNA
<213> Neisseria meningitidis

<400> 177
tgcggatcca gcggaggcgg cggtgtcgcc gccgacatcg gcgcggtgct tgccgatgca 60

ctaaccgcac cgctcgacca taaagacaaa agtttgcagt ctttgacgct ggatcagtcc 120

gtcaggaaaa acgagaaact gaagctggcg gcacaaggtg cggaaaaaac ttatggaaac 180

ggcgacagcc tcaatacggg caaattgaag aacgacaagg tcagccgctt cgactttatc 240

cgtcaaatcg aagtggacgg gcagctcatt accttggaga gcggagagtt ccaagtgtac 300

aaacaaagcc attccgcctt aaccgccctt cagaccgagc aagtacaaga ttcggagcat 360

tcagggaaga tggttgcgaa acgccagttc agaatcggcg atatagcggg tgaacataca 420

tcttttgaca agcttcccga aggcggcagg gcgacatatc gcgggacggc attcggttca 480

gacgatgcca gtggaaaact gacctacacc atagatttcg ccgccaagca gggacacggc 540

aaaatcgaac atttgaaatc gccagaactc aatgttgacc tggccgcctc cgatatcaag 600

ccggataaaa aacgccatgc cgtcatcagc ggttccgtcc tttacaacca agccgagaaa 660

ggcagttact ctctaggcat ctttggcggg caagcccagg aagttgccgg cagcgcagaa 720

gtggaaaccg caaacggcat acgccatatc ggtcttgccg ccaagcagta a 771

<210> 178
<211> 256
<212> PRT
<213> Neisseria meningitidis

<400> 178
Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Val
1 5 10 15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu
20 25 30

Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
35 40 45

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
50 55 60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65 70 75 80

Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu
85 90 95

Phe Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr
100 105 110

Glu Gln Val Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg
115 120 125

Gln Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys
130 135 140

Leu Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser
145 150 155 160

Asp Asp Ala Ser Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys
165 170 175

Gln Gly His Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val
180 185 190

Asp Leu Ala Ala Ser Asp Ile Lys Pro Asp Lys Lys Arg His Ala Val
195 200 205

Ile Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser
210 215 220

Leu Gly Ile Phe Gly Gly Gln Ala Gln Glu Val Ala Gly Ser Ala Glu
225 230 235 240

Val Glu Thr Ala Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
245 250 255

<210> 179
<211> 768
<212> DNA
<213> Neisseria meningitidis

<400> 179
atgagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggtgcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca agtgtacaaa 300

caaagccatt ccgccttaac cgcccttcag accgagcaag tacaagattc ggagcattca 360

gggaagatgg ttgcgaaacg ccagttcaga atcggcgata tagcgggtga acatacatct 420

tttgacaagc ttcccgaagg cggcagggcg acatatcgcg ggacggcatt cggttcagac 480

gatgccagtg gaaaactgac ctacaccata gatttcgccg ccaagcaggg acacggcaaa 540

atcgaacatt tgaaatcgcc agaactcaat gttgacctgg ccgcctccga tatcaagccg 600

gataaaaaac gccatgccgt catcagcggt tccgtccttt acaaccaagc cgagaaaggc 660

agttactctc taggcatctt tggcgggcaa gcccaggaag ttgccggcag cgcagaagtg 720

gaaaccgcaa acggcatacg ccatatcggt cttgccgcca agcagtaa 768

<210> 180
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 180

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Val Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe

85 90 95

Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr Glu
100 105 110

Gln Val Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln
115 120 125

Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu
130 135 140

Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp
145 150 155 160

Asp Ala Ser Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
165 170 175

Gly His Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp
180 185 190

Leu Ala Ala Ser Asp Ile Lys Pro Asp Lys Lys Arg His Ala Val Ile
195 200 205

Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser Leu
210 215 220

Gly Ile Phe Gly Gly Gln Ala Gln Glu Val Ala Gly Ser Ala Glu Val
225 230 235 240

Glu Thr Ala Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
245 250 255

<210> 181
<211> 747
<212> DNA
<213> Neisseria meningitidis

<400> 181
tgcagcagcg gagggggtgg tgtcgccgcc gacatcggtg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaggt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggt 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgtttcga ctttatccgc 240

172

caaatcgaag tggacgggca gctcattacc ttggagagtg gagagttcca agtatacaaa 300

caaagccatt ccgccttaac cgcctttcag accgagcaaa tacaagattc ggagcattcc 360

gggaagatgg ttgcgaaacg ccagttcaga atcggcgaca tagcgggcga acatacatct 420

tttgacaagc ttcccgaagg cggcagggcg acatatcgcg ggacggcgtt cggttcagac 480

gatgccggcg gaaaactgac ctacaccata gatttcgccg ccaagcaggg aaacggcaaa 540

atcgaacatt tgaaatcgcc agaactcaat gtcgacctgg ccgccgccga tatcaagccg 600

gatggaaaac gccatgccgt catcagcggt tccgtccttt acaaccaagc cgagaaaggc 660

agttactccc tcggtatctt tggcggaaaa gcccaggaag ttgccggcag cgcggaagtg 720

aaaaccgtaa acggcatacg ccatatc 747

<210> 182
<211> 249
<212> PRT
<213> Neisseria meningitidis

<400> 182
Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Phe Gln Thr Glu
100 105 110

Gln Ile Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln
115 120 125

Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu
130 135 140

Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp
145 150 155 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
165 170 175

Gly Asn Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp
180 185 190

Leu Ala Ala Ala Asp Ile Lys Pro Asp Gly Lys Arg His Ala Val Ile
195 200 205

Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser Leu
210 215 220

Gly Ile Phe Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val
225 230 235 240

Lys Thr Val Asn Gly Ile Arg His Ile
245

<210> 183
<211> 750
<212> DNA
<213> Neisseria meningitidis

<400> 183
tgcggatcca gcggaggggg tggtgtcgcc gccgacatcg gtgcggggct tgccgatgca 60

ctaaccgcac cgctcgacca taaagacaaa ggtttgcagt ctttgacgct ggatcagtcc 120

gtcaggaaaa acgagaaact gaagctggcg gcacaaggtg cggaaaaaac ttatggaaac 180

ggtgacagcc tcaatacggg caaattgaag aacgacaagg tcagccgttt cgactttatc 240

cgccaaatcg aagtggacgg gcagctcatt accttggaga gtggagagtt ccaagtatac 300

aaacaaagcc attccgcctt aaccgccttt cagaccgagc aaatacaaga ttcggagcat 360

tccgggaaga tggttgcgaa acgccagttc agaatcggcg acatagcggg cgaacataca 420

tcttttgaca agcttcccga aggcggcagg gcgacatatc gcgggacggc gttcggttca 480

gacgatgccg gcggaaaact gacctacacc atagatttcg ccgccaagca gggaaacggc 540

aaaatcgaac atttgaaatc gccagaactc aatgtcgacc tggccgccgc cgatatcaag 600

174

ccggatggaa aacgccatgc cgtcatcagc ggttccgtcc tttacaacca agccgagaaa 660

ggcagttact ccctcggtat ctttggcgga aaagcccagg aagttgccgg cagcgcggaa 720

gtgaaaaccg taaacggcat acgccatatc 750

<210> 184
<211> 250
<212> PRT
<213> Neisseria meningitidis

<400> 184

Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1 5 10 15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu
20 25 30

Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
35 40 45

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
50 55 60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65 70 75 80

Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu
85 90 95

Phe Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Phe Gln Thr
100 105 110

Glu Gln Ile Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg
115 120 125

Gln Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys
130 135 140

Leu Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser
145 150 155 160

Asp Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys
165 170 175

```
Gln Gly Asn Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val
            180                 185                 190

Asp Leu Ala Ala Ala Asp Ile Lys Pro Asp Gly Lys Arg His Ala Val
        195                 200                 205

Ile Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser
    210                 215                 220

Leu Gly Ile Phe Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu
225                 230                 235                 240

Val Lys Thr Val Asn Gly Ile Arg His Ile
                245                 250
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<210> 185
<211> 747
<212> DNA
<213> Neisseria meningitidis

<400> 185

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atgagcagcg gaggggggtgg tgtcgccgcc gacatcggtg cggggcttgc cgatgcacta     60

accgcaccgc tcgaccataa agacaaaggt ttgcagtctt tgacgctgga tcagtccgtc     120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaacttа tggaaacggt     180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgtttcga ctttatccgc     240

caaatcgaag tggacgggca gctcattacc ttggagagtg gagagttcca agtatacaaa     300

caaagccatt ccgccttaac cgcctttcag accgagcaaa tacaagattc ggagcattcc     360

gggaagatgg ttgcgaaacg ccagttcaga atcggcgaca tagcgggcga acatacatct     420

tttgacaagc ttcccgaagg cggcagggcg acatatcgcg ggacggcgtt cggttcagac     480

gatgccggcg gaaaactgac ctacaccata gatttcgccg ccaagcaggg aaacggcaaa     540

atcgaacatt tgaaatcgcc agaactcaat gtcgacctgg ccgccgccga tatcaagccg     600

gatggaaaac gccatgccgt catcagcggt tccgtccttt acaaccaagc cgagaaaggc     660

agttactccc tcggtatctt tggcggaaaa gcccaggaag ttgccggcag cgcggaagtg     720

aaaaccgtaa acggcatacg ccatatc                                         747
```

<210> 186
<211> 249
<212> PRT

176

<213> Neisseria meningitidis

<400> 186

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Phe Gln Thr Glu
100 105 110

Gln Ile Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln
115 120 125

Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu
130 135 140

Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp
145 150 155 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
165 170 175

Gly Asn Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp
180 185 190

Leu Ala Ala Ala Asp Ile Lys Pro Asp Gly Lys Arg His Ala Val Ile
195 200 205

Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser Leu

210 215 220

Gly Ile Phe Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val
225 230 235 240

Lys Thr Val Asn Gly Ile Arg His Ile
245

<210> 187
<211> 747
<212> DNA
<213> Neisseria meningitidis

<400> 187
tgcagcagcg gagggggtgg tgtcgccgcc gacatcggtg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaggt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggt 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgtttcga ctttatccgc 240

caaatcgaag tggacgggca gctcattacc ttggagagtg gagagttcca agtatacaaa 300

caaagccatt ccgccttaac cgcctttcag accgagcaaa tacaagattc ggagcattcc 360

gggaagatgg ttgcgaaacg ccagttcaga atcggcgaca tagcgggcga acatacatct 420

tttgacaagc ttcccgaagg cggcagggcg acatatcgcg ggacggcgtt cggttcagac 480

gatgccggcg gaaaactgac ctacaccata gatttcgccg ccaagcaggg aaacggcaaa 540

atcgaacatt tgaaatcgcc agaactcaat gtcgacctgg ccgccgccga tatcaagccg 600

gatggaaaac gccatgccgt catcagcggt tccgtccttt acaaccaagc cgagaaaggc 660

agttactccc tcggtatctt tggcggaaaa gcccaggaag ttgccggcag cgcggaagtg 720

aaaaccgtaa acggcatacg ccatatc 747

<210> 188
<211> 249
<212> PRT
<213> Neisseria meningitidis

<400> 188
Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln
20 25 30

178

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Phe Gln Thr Glu
100 105 110

Gln Ile Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln
115 120 125

Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu
130 135 140

Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp
145 150 155 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
165 170 175

Gly Asn Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp
180 185 190

Leu Ala Ala Ala Asp Ile Lys Pro Asp Gly Lys Arg His Ala Val Ile
195 200 205

Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser Leu
210 215 220

Gly Ile Phe Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val
225 230 235 240

Lys Thr Val Asn Gly Ile Arg His Ile
245

<210> 189
<211> 750
<212> DNA
<213> Neisseria meningitidis

<400> 189
tgcggatcca gcggaggggg tggtgtcgcc gccgacatcg gtgcggggct tgccgatgca 60

ctaaccgcac cgctcgacca taaagacaaa ggtttgcagt ctttgacgct ggatcagtcc 120

gtcaggaaaa acgagaaact gaagctggcg gcacaaggtg cggaaaaaac ttatggaaac 180

ggtgacagcc tcaatacggg caaattgaag aacgacaagg tcagccgttt cgactttatc 240

cgccaaatcg aagtggacgg gcagctcatt accttggaga gtggagagtt ccaagtatac 300

aaacaaagcc attccgcctt aaccgccttt cagaccgagc aaatacaaga ttcggagcat 360

tccgggaaga tggttgcgaa acgccagttc agaatcggcg acatagcggg cgaacataca 420

tcttttgaca agcttcccga aggcggcagg gcgacatatc gcgggacggc gttcggttca 480

gacgatgccg gcggaaaact gacctacacc atagatttcg ccgccaagca gggaaacggc 540

aaaatcgaac atttgaaatc gccagaactc aatgtcgacc tggccgccgc cgatatcaag 600

ccggatggaa aacgccatgc cgtcatcagc ggttccgtcc tttacaacca agccgagaaa 660

ggcagttact ccctcggtat ctttggcgga aaagcccagg aagttgccgg cagcgcggaa 720

gtgaaaaccg taaacggcat acgccatatc 750

<210> 190
<211> 250
<212> PRT
<213> Neisseria meningitidis

<400> 190
Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1 5 10 15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu
20 25 30

Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
35 40 45

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
50 55 60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65 70 75 80

180

Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu
85 90 95

Phe Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Phe Gln Thr
100 105 110

Glu Gln Ile Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg
115 120 125

Gln Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys
130 135 140

Leu Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser
145 150 155 160

Asp Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys
165 170 175

Gln Gly Asn Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val
180 185 190

Asp Leu Ala Ala Ala Asp Ile Lys Pro Asp Gly Lys Arg His Ala Val
195 200 205

Ile Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser
210 215 220

Leu Gly Ile Phe Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu
225 230 235 240

Val Lys Thr Val Asn Gly Ile Arg His Ile
245 250

<210> 191
<211> 747
<212> DNA
<213> Neisseria meningitidis

<400> 191
atgagcagcg gagggggtgg tgtcgccgcc gacatcggtg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaggt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggt 180

181

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgtttcga ctttatccgc 240

caaatcgaag tggacgggca gctcattacc ttggagagtg gagagttcca agtatacaaa 300

caaagccatt ccgccttaac cgcctttcag accgagcaaa tacaagattc ggagcattcc 360

gggaagatgg ttgcgaaacg ccagttcaga atcggcgaca tagcgggcga acatacatct 420

tttgacaagc ttcccgaagg cggcagggcg acatatcgcg ggacggcgtt cggttcagac 480

gatgccggcg gaaaactgac ctacaccata gatttcgccg ccaagcaggg aaacggcaaa 540

atcgaacatt tgaaatcgcc agaactcaat gtcgacctgg ccgccgccga tatcaagccg 600

gatggaaaac gccatgccgt catcagcggt tccgtccttt acaaccaagc cgagaaaggc 660

agttactccc tcggtatctt tggcggaaaa gcccaggaag ttgccggcag cgcggaagtg 720

aaaaccgtaa acggcatacg ccatatc 747

<210> 192
<211> 249
<212> PRT
<213> Neisseria meningitidis

<400> 192

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Phe Gln Thr Glu
100 105 110

```
Gln Ile Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln
        115                 120                 125

Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu
    130                 135                 140

Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp
145                 150                 155                 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
                165                 170                 175

Gly Asn Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp
            180                 185                 190

Leu Ala Ala Ala Asp Ile Lys Pro Asp Gly Lys Arg His Ala Val Ile
        195                 200                 205

Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser Leu
    210                 215                 220

Gly Ile Phe Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val
225                 230                 235                 240

Lys Thr Val Asn Gly Ile Arg His Ile
                245
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<210> 193
<211> 768
<212> DNA
<213> Neisseria meningitidis

<400> 193
tgcagcagcg gagggggtgg tgtcgccgcc gacatcggtg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaggt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggt 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgtttcga ctttatccgc 240

caaatcgaag tggacgggca gctcattacc ttggagagtg gagagttcca agtatacaaa 300

caaagccatt ccgccttaac cgcctttcag accgagcaaa tacaagattc ggagcattcc 360

gggaagatgg ttgcgaaacg ccagttcaga atcggcgaca tagcgggcga acatacatct 420

tttgacaagc ttcccgaagg cggcagggcg acatatcgcg ggacggcgtt cggttcagac 480

183

gatgccggcg gaaaactgac ctacaccata gatttcgccg ccaagcaggg aaacggcaaa 540

atcgaacatt tgaaatcgcc agaactcaat gtcgacctgg ccgccgccga tatcaagccg 600

gatggaaaac gccatgccgt catcagcggt tccgtccttt acaaccaagc cgagaaaggc 660

agttactccc tcggtatctt tggcggaaaa gcccaggaag ttgccggcag cgcggaagtg 720

aaaaccgtaa acggcatacg ccatatcggc cttgccgcca agcaataa 768

<210> 194
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 194
Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Phe Gln Thr Glu
100 105 110

Gln Ile Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln
115 120 125

Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu
130 135 140

Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp
145 150 155 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
165 170 175

Gly Asn Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp
180 185 190

Leu Ala Ala Ala Asp Ile Lys Pro Asp Gly Lys Arg His Ala Val Ile
195 200 205

Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser Leu
210 215 220

Gly Ile Phe Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val
225 230 235 240

Lys Thr Val Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
245 250 255

<210> 195
<211> 771
<212> DNA
<213> Neisseria meningitidis

<400> 195
tgcggatcca gcggaggggg tggtgtcgcc gccgacatcg gtgcgggget tgccgatgca 60

ctaaccgcac cgctcgacca taaagacaaa ggtttgcagt ctttgacgct ggatcagtcc 120

gtcaggaaaa acgagaaact gaagctggcg gcacaaggtg cggaaaaaac ttatggaaac 180

ggtgacagcc tcaatacggg caaattgaag aacgacaagg tcagccgttt cgactttatc 240

cgccaaatcg aagtggacgg gcagctcatt accttggaga gtggagagtt ccaagtatac 300

aaacaaagcc attccgcctt aaccgccttt cagaccgagc aaatacaaga ttcggagcat 360

tccgggaaga tggttgcgaa acgccagttc agaatcggcg acatagcggg cgaacataca 420

tcttttgaca agcttcccga aggcggcagg gcgacatatc gcgggacggc gttcggttca 480

gacgatgccg gcggaaaact gacctacacc atagatttcg ccgccaagca gggaaacggc 540

aaaatcgaac atttgaaatc gccagaactc aatgtcgacc tggccgccgc cgatatcaag 600

ccggatggaa aacgccatgc cgtcatcagc ggttccgtcc tttacaacca agccgagaaa 660

ggcagttact ccctcggtat ctttggcgga aaagcccagg aagttgccgg cagcgcggaa 720

gtgaaaaccg taaacggcat acgccatatc ggccttgccg ccaagcaata a 771

<210> 196
<211> 256
<212> PRT
<213> Neisseria meningitidis

<400> 196
Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1 5 10 15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu
20 25 30

Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
35 40 45

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
50 55 60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65 70 75 80

Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu
85 90 95

Phe Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Phe Gln Thr
100 105 110

Glu Gln Ile Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg
115 120 125

Gln Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys
130 135 140

Leu Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser
145 150 155 160

Asp Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys
165 170 175

Gln Gly Asn Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val
180 185 190

Asp Leu Ala Ala Ala Asp Ile Lys Pro Asp Gly Lys Arg His Ala Val
195 200 205

Ile Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser
210 215 220

Leu Gly Ile Phe Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu
225 230 235 240

Val Lys Thr Val Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
245 250 255

<210> 197
<211> 768
<212> DNA
<213> Neisseria meningitidis

<400> 197
atgagcagcg gagggggtgg tgtcgccgcc gacatcggtg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaggt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggt 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgtttcga ctttatccgc 240

caaatcgaag tggacgggca gctcattacc ttggagagtg gagagttcca agtatacaaa 300

caaagccatt ccgccttaac cgcctttcag accgagcaaa tacaagattc ggagcattcc 360

gggaagatgg ttgcgaaacg ccagttcaga atcggcgaca tagcgggcga acatacatct 420

tttgacaagc ttcccgaagg cggcagggcg acatatcgcg ggacggcgtt cggttcagac 480

gatgccggcg gaaaactgac ctacaccata gattttgccg ccaagcaggg aaacggcaaa 540

atcgaacatt tgaaatcgcc agaactcaat gtcgacctgg ccgccgccga tatcaagccg 600

gatggaaaac gccatgccgt catcagcggt tccgtccttt acaaccaagc cgagaaaggc 660

agttactccc tcggtatctt tggcggaaaa gcccaggaag ttgccggcag cgcggaagtg 720

aaaaccgtaa acggcatacg ccatatcggc cttgccgcca agcaataa 768

<210> 198
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 198

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

187

```
Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln
            20                  25                  30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
        35                  40                  45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
    50                  55                  60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65                  70                  75                  80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
                85                  90                  95

Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Phe Gln Thr Glu
            100                 105                 110

Gln Ile Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln
        115                 120                 125

Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu
    130                 135                 140

Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp
145                 150                 155                 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
                165                 170                 175

Gly Asn Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp
            180                 185                 190

Leu Ala Ala Ala Asp Ile Lys Pro Asp Gly Lys Arg His Ala Val Ile
        195                 200                 205

Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser Leu
    210                 215                 220

Gly Ile Phe Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val
225                 230                 235                 240
```

```
Lys Thr Val Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
                245                 250                 255
```

<210> 199
<211> 768
<212> DNA
<213> Neisseria meningitidis

<400> 199

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tgcagcagcg gaggggtgg tgtcgccgcc gacatcggtg cggggcttgc cgatgcacta     60

accgcaccgc tcgaccataa agacaaaggt ttgcagtctt tgacgctgga tcagtccgtc    120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggt    180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgtttcga ctttatccgc    240

caaatcgaag tggacgggca gctcattacc ttggagagtg gagagttcca agtatacaaa    300

caaagccatt ccgccttaac cgcctttcag accgagcaaa tacaagattc ggagcattcc    360

gggaagatgg ttgcgaaacg ccagttcaga atcggcgaca tagcgggcga acatacatct    420

tttgacaagc ttcccgaagg cggcagggcg acatatcgcg ggacggcgtt cggttcagac    480

gatgccggcg gaaaactgac ctacaccata gatttcgccg ccaagcaggg aaacggcaaa    540

atcgaacatt tgaaatcgcc agaactcaat gtcgacctgg ccgccgccga tatcaagccg    600

gatggaaaac gccatgccgt catcagcggt tccgtccttt acaaccaagc cgagaaaggc    660

agttactccc tcggtatctt tggcggaaaa gcccaggaag ttgccggcag cgcggaagtg    720

aaaaccgtaa acggcatacg ccatatcggc cttgccgcca agcaataa                 768
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<210> 200
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 200

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Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1               5                  10                  15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln
            20                  25                  30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
        35                  40                  45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
    50                  55                  60
```

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Phe Gln Thr Glu
100 105 110

Gln Ile Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln
115 120 125

Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu
130 135 140

Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp
145 150 155 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
165 170 175

Gly Asn Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp
180 185 190

Leu Ala Ala Ala Asp Ile Lys Pro Asp Gly Lys Arg His Ala Val Ile
195 200 205

Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser Leu
210 215 220

Gly Ile Phe Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val
225 230 235 240

Lys Thr Val Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
245 250 255

<210> 201
<211> 771
<212> DNA
<213> Neisseria meningitidis

<400> 201
tgcggatcca gcggaggggg tggtgtcgcc gccgacatcg gtgcggggct tgccgatgca 60

190

ctaaccgcac cgctcgacca taaagacaaa ggtttgcagt ctttgacgct ggatcagtcc 120

gtcaggaaaa acgagaaact gaagctggcg gcacaaggtg cggaaaaaac ttatggaaac 180

ggtgacagcc tcaatacggg caaattgaag aacgacaagg tcagccgttt cgactttatc 240

cgccaaatcg aagtggacgg gcagctcatt accttggaga gtggagagtt ccaagtatac 300

aaacaaagcc attccgcctt aaccgccttt cagaccgagc aaatacaaga ttcggagcat 360

tccgggaaga tggttgcgaa acgccagttc agaatcggcg acatagcggg cgaacataca 420

tcttttgaca agcttcccga aggcggcagg gcgacatatc gcgggacggc gttcggttca 480

gacgatgccg gcggaaaact gacctacacc atagatttcg ccgccaagca gggaaacggc 540

aaaatcgaac atttgaaatc gccagaactc aatgtcgacc tggccgccgc cgatatcaag 600

ccggatggaa aacgccatgc cgtcatcagc ggttccgtcc tttacaacca agccgagaaa 660

ggcagttact ccctcggtat ctttggcgga aaagcccagg aagttgccgg cagcgcggaa 720

gtgaaaaccg taaacggcat acgccatatc ggccttgccg ccaagcaata a 771

<210> 202
<211> 256
<212> PRT
<213> Neisseria meningitidis

<400> 202

Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1 5 10 15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu
20 25 30

Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
35 40 45

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
50 55 60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65 70 75 80

Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu
85 90 95

Phe Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Phe Gln Thr

100 105 110

Glu Gln Ile Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg
115 120 125

Gln Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys
130 135 140

Leu Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser
145 150 155 160

Asp Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys
165 170 175

Gln Gly Asn Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val
180 185 190

Asp Leu Ala Ala Ala Asp Ile Lys Pro Asp Gly Lys Arg His Ala Val
195 200 205

Ile Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser
210 215 220

Leu Gly Ile Phe Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu
225 230 235 240

Val Lys Thr Val Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
245 250 255

<210> 203
<211> 768
<212> DNA
<213> Neisseria meningitidis

<400> 203
atgagcagcg gaggggggtgg tgtcgccgcc gacatcggtg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaggt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggt 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgtttcga ctttatccgc 240

caaatcgaag tggacgggca gctcattacc ttggagagtg gagagttcca agtatacaaa 300

caaagccatt ccgccttaac cgcctttcag accgagcaaa tacaagattc ggagcattcc 360

192

gggaagatgg ttgcgaaacg ccagttcaga atcggcgaca tagcgggcga acatacatct 420

tttgacaagc ttcccgaagg cggcagggcg acatatcgcg ggacggcgtt cggttcagac 480

gatgccggcg gaaaactgac ctacaccata gatttcgccg ccaagcaggg aaacggcaaa 540

atcgaacatt tgaaatcgcc agaactcaat gtcgacctgg ccgccgccga tatcaagccg 600

gatggaaaac gccatgccgt catcagcggt tccgtccttt acaaccaagc cgagaaaggc 660

agttactccc tcggtatctt tggcggaaaa gcccaggaag ttgccggcag cgcggaagtg 720

aaaaccgtaa acggcatacg ccatatcggc cttgccgcca agcaataa 768

<210> 204
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 204

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Phe Gln Thr Glu
100 105 110

Gln Ile Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln
115 120 125

Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu
130 135 140

```
Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp
145                 150                 155                 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
                165                 170                 175

Gly Asn Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp
            180                 185                 190

Leu Ala Ala Ala Asp Ile Lys Pro Asp Gly Lys Arg His Ala Val Ile
        195                 200                 205

Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser Leu
    210                 215                 220

Gly Ile Phe Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val
225                 230                 235                 240

Lys Thr Val Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
                245                 250                 255
```

<210> 205
<211> 768
<212> DNA
<213> Neisseria meningitidis

<400> 205

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tgcagcagcg gagggggtgg tgtcgccgcc gacatcggtg cggggcttgc cgatgcacta     60

accgcaccgc tcgaccataa agacaaaggt ttgcagtctt tgacgctgga tcagtccgtc    120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggt    180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgtttcga ctttatccgc    240

caaatcgaag tggacgggca gctcattacc ttggagagtg gagagttcca agtatacaaa    300

caaagccatt ccgccttaac cgcctttcag accgagcaaa tacaagattc ggagcattcc    360

gggaagatgg ttgcgaaacg ccagttcaga atcggcgaca tagcgggcga acatacatct    420

tttgacaagc ttcccgaagg cggcagggcg acatatcgcg ggacggcgtt cggttcagac    480

gatgccggcg gaaaactgac ctacaccata gatttcgccg ccaagcaggg aaacggcaaa    540

atcgaacatt tgaaatcgcc agaactcaat gtcgacctgg ccgccgccga tatcaagccg    600

gatggaaaac gccatgccgt catcagcggt tccgtccttt acaaccaagc cgagaaaggc    660
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agttactccc tcggtatctt tggcggaaaa gcccaggaag ttgccggcag cgcggaagtg 720

aaaaccgtaa acggcatacg ccatatcggc cttgccgcca agcaataa 768

<210> 206
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 206

Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Phe Gln Thr Glu
100 105 110

Gln Ile Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln
115 120 125

Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu
130 135 140

Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp
145 150 155 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
165 170 175

Gly Asn Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp
180 185 190

Leu Ala Ala Ala Asp Ile Lys Pro Asp Gly Lys Arg His Ala Val Ile
195 200 205

Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser Leu
210 215 220

Gly Ile Phe Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val
225 230 235 240

Lys Thr Val Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
245 250 255

<210> 207
<211> 771
<212> DNA
<213> Neisseria meningitidis

<400> 207
tgcggatcca gcggaggggg tggtgtcgcc gccgacatcg gtgcggggct tgccgatgca 60

ctaaccgcac cgctcgacca taaagacaaa ggtttgcagt ctttgacgct ggatcagtcc 120

gtcaggaaaa acgagaaact gaagctggcg gcacaaggtg cggaaaaaac ttatggaaac 180

ggtgacagcc tcaatacggg caaattgaag aacgacaagg tcagccgttt cgactttatc 240

cgccaaatcg aagtggacgg gcagctcatt accttggaga gtggagagtt ccaagtatac 300

aaacaaagcc attccgcctt aaccgccttt cagaccgagc aaatacaaga ttcggagcat 360

tccgggaaga tggttgcgaa acgccagttc agaatcggcg acatagcggg cgaacataca 420

tcttttgaca agcttcccga aggcggcagg gcgacatatc gcgggacggc gttcggttca 480

gacgatgccg gcggaaaact gacctacacc atagatttcg ccgccaagca gggaaacggc 540

aaaatcgaac atttgaaatc gccagaactc aatgtcgacc tggccgccgc cgatatcaag 600

ccggatggaa aacgccatgc cgtcatcagc ggttccgtcc tttacaacca agccgagaaa 660

ggcagttact ccctcggtat ctttggcgga aaagcccagg aagttgccgg cagcgcggaa 720

gtgaaaaccg taaacggcat acgccatatc ggccttgccg ccaagcaata a 771

<210> 208
<211> 256
<212> PRT
<213> Neisseria meningitidis

<400> 208

196

Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1 5 10 15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu
20 25 30

Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
35 40 45

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
50 55 60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65 70 75 80

Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu
85 90 95

Phe Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Phe Gln Thr
100 105 110

Glu Gln Ile Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg
115 120 125

Gln Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys
130 135 140

Leu Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser
145 150 155 160

Asp Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys
165 170 175

Gln Gly Asn Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val
180 185 190

Asp Leu Ala Ala Ala Asp Ile Lys Pro Asp Gly Lys Arg His Ala Val
195 200 205

Ile Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser
210 215 220

Leu Gly Ile Phe Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu

225 230 235 240

Val Lys Thr Val Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
245 250 255

<210> 209
<211> 768
<212> DNA
<213> Neisseria meningitidis

<400> 209
atgagcagcg gaggggggtgg tgtcgccgcc gacatcggtg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaggt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggt 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgtttcga ctttatccgc 240

caaatcgaag tggacgggca gctcattacc ttggagagtg gagagttcca agtatacaaa 300

caaagccatt ccgccttaac cgcctttcag accgagcaaa tacaagattc ggagcattcc 360

gggaagatgg ttgcgaaacg ccagttcaga atcggcgaca tagcgggcga acatacatct 420

tttgacaagc ttcccgaagg cggcagggcg acatatcgcg ggacggcgtt cggttcagac 480

gatgccggcg gaaaactgac ctacaccata gatttcgccg ccaagcaggg aaacggcaaa 540

atcgaacatt tgaaatcgcc agaactcaat gtcgacctgg ccgccgccga tatcaagccg 600

gatggaaaac gccatgccgt catcagcggt tccgtccttt acaaccaagc cgagaaaggc 660

agttactccc tcggtatctt tggcggaaaa gcccaggaag ttgccggcag cgcggaagtg 720

aaaaccgtaa acggcatacg ccatatcggc cttgccgcca agcaataa 768

<210> 210
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 210

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Phe Gln Thr Glu
100 105 110

Gln Ile Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln
115 120 125

Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu
130 135 140

Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp
145 150 155 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
165 170 175

Gly Asn Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp
180 185 190

Leu Ala Ala Ala Asp Ile Lys Pro Asp Gly Lys Arg His Ala Val Ile
195 200 205

Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser Leu
210 215 220

Gly Ile Phe Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val
225 230 235 240

Lys Thr Val Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
245 250 255

<210> 211
<211> 768
<212> DNA

<213> Neisseria meningitidis

<400> 211
tgcagcagcg gaggggggtgg tgtcgccgcc gacatcggtg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaggt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggt 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgtttcga ctttatccgc 240

caaatcgaag tggacgggca gctcattacc ttggagagtg gagagttcca agtatacaaa 300

caaagccatt ccgccttaac cgcctttcag accgagcaaa tacaagattc ggagcattcc 360

gggaagatgg ttgcgaaacg ccagttcaga atcggcgaca tagcgggcga acatacatct 420

tttgacaagc ttcccgaagg cggcagggcg acatatcgcg ggacggcgtt cggttcagac 480

gatgccggcg gaaaactgac ctacaccata gatttcgccg ccaagcaggg aaacggcaaa 540

atcgaacatt tgaaatcgcc agaactcaat gtcgacctgg ccgccgccga tatcaagccg 600

gatggaaaac gccatgccgt catcagcggt tccgtccttt acaaccaagc cgagaaaggc 660

agttactccc tcggtatctt tggcggaaaa gcccaggaag ttgccggcag cgccggaagtg 720

aaaaccgtaa acggcatacg ccatatcggt cttgccgcca agcagtaa 768

<210> 212
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 212
Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe

85 90 95

Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Phe Gln Thr Glu
100 105 110

Gln Ile Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln
115 120 125

Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu
130 135 140

Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp
145 150 155 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
165 170 175

Gly Asn Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp
180 185 190

Leu Ala Ala Ala Asp Ile Lys Pro Asp Gly Lys Arg His Ala Val Ile
195 200 205

Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser Leu
210 215 220

Gly Ile Phe Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val
225 230 235 240

Lys Thr Val Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
245 250 255

<210> 213
<211> 771
<212> DNA
<213> Neisseria meningitidis

<400> 213
tgcggatcca gcggaggggg tggtgtcgcc gccgacatcg gtgcggggct tgccgatgca 60

ctaaccgcac cgctcgacca taaagacaaa ggtttgcagt ctttgacgct ggatcagtcc 120

gtcaggaaaa acgagaaact gaagctggcg gcacaaggtg cggaaaaaac ttatggaaac 180

ggtgacagcc tcaatacggg caaattgaag aacgacaagg tcagccgttt cgactttatc 240

201
200

cgccaaatcg aagtggacgg gcagctcatt accttggaga gtggagagtt ccaagtatac 300

aaacaaagcc attccgcctt aaccgccttt cagaccgagc aaatacaaga ttcggagcat 360

tccgggaaga tggttgcgaa acgccagttc agaatcggcg acatagcggg cgaacataca 420

tcttttgaca agcttcccga aggcggcagg gcgacatatc gcgggacggc gttcggttca 480

gacgatgccg gcggaaaact gacctacacc atagatttcg ccgccaagca gggaaacggc 540

aaaatcgaac atttgaaatc gccagaactc aatgtcgacc tggccgccgc cgatatcaag 600

ccggatggaa aacgccatgc cgtcatcagc ggttccgtcc tttacaacca agccgagaaa 660

ggcagttact ccctcggtat ctttggcgga aaagcccagg aagttgccgg cagcgcggaa 720

gtgaaaaccg taaacggcat acgccatatc ggtcttgccg ccaagcagta a 771

<210> 214
<211> 256
<212> PRT
<213> Neisseria meningitidis

<400> 214

Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1 5 10 15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu
20 25 30

Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
35 40 45

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
50 55 60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65 70 75 80

Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu
85 90 95

Phe Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Phe Gln Thr
100 105 110

Glu Gln Ile Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg
115 120 125

~~201~~
202

Gln Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys
130 135 140

Leu Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser
145 150 155 160

Asp Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys
165 170 175

Gln Gly Asn Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val
180 185 190

Asp Leu Ala Ala Ala Asp Ile Lys Pro Asp Gly Lys Arg His Ala Val
195 200 205

Ile Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser
210 215 220

Leu Gly Ile Phe Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu
225 230 235 240

Val Lys Thr Val Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
245 250 255

<210> 215
<211> 768
<212> DNA
<213> Neisseria meningitidis

<400> 215
atgagcagcg gagggggtgg tgtcgccgcc gacatcggtg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaggt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggt 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgtttcga ctttatccgc 240

caaatcgaag tggacgggca gctcattacc ttggagagtg gagagttcca agtatacaaa 300

caaagccatt ccgccttaac cgcctttcag accgagcaaa tacaagattc ggagcattcc 360

gggaagatgg ttgcgaaacg ccagttcaga atcggcgaca tagcgggcga acatacatct 420

tttgacaagc ttcccgaagg cggcagggcg acatatcgcg ggacggcgtt cggttcagac 480

gatgccggcg gaaaactgac ctacaccata gatttcgccg ccaagcaggg aaacggcaaa 540

atcgaacatt tgaaatcgcc agaactcaat gtcgacctgg ccgccgccga tatcaagccg 600

203
202

gatggaaaac gccatgccgt catcagcggt tccgtccttt acaaccaagc cgagaaaggc 660

agttactccc tcggtatctt tggcggaaaa gcccaggaag ttgccggcag cgcggaagtg 720

aaaaccgtaa acggcatacg ccatatcggt cttgccgcca agcagtaa 768

<210> 216
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 216

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Phe Gln Thr Glu
100 105 110

Gln Ile Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln
115 120 125

Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu
130 135 140

Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp
145 150 155 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
165 170 175

204
203

Gly Asn Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp
180 185 190

Leu Ala Ala Ala Asp Ile Lys Pro Asp Gly Lys Arg His Ala Val Ile
195 200 205

Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser Leu
210 215 220

Gly Ile Phe Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val
225 230 235 240

Lys Thr Val Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
245 250 255

<210> 217
<211> 768
<212> DNA
<213> Neisseria meningitidis

<400> 217
tgcagcagcg gaggggcgg tgtcgccgcc gacatcggtg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaggt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacaggca gctcattacc ttggagagcg gagagttcca agtgtacaaa 300

caaagccatt ccgccttaac cgcccttcag accgagcaag tacaagactc ggagcattcc 360

gggaagatgg ttgcgaaacg tcagttcaga atcggcgaca tagcgggtga acatacatct 420

tttgacaagc ttcccgaagg cggcagggcg acatatcgcg ggacggcgtt cggttcagac 480

gatgccggcg gaaaactgat ttacaccata gatttcgccg ctaagcaggg acacggtaaa 540

atcgaacatt tgaaatcgcc agaactcaat gtcgacctgg ccgccgccga tatcaagccg 600

gatgaaaaac accatgccgt catcagcggt tccgtccttt acaaccaagc cgagaaaggc 660

agttactccc tcggtatctt tggcggaaaa gcccaggaag ttgccggcag cgcggaagtg 720

aaaaccgtaa acggtatacg ccatatcggc cttgccgcca agcaataa 768

<210> 218
<211> 255

205
204

<212> PRT
<213> Neisseria meningitidis

<400> 218
Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Arg Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr Glu
100 105 110

Gln Val Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln
115 120 125

Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu
130 135 140

Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp
145 150 155 160

Asp Ala Gly Gly Lys Leu Ile Tyr Thr Ile Asp Phe Ala Ala Lys Gln
165 170 175

Gly His Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp
180 185 190

Leu Ala Ala Ala Asp Ile Lys Pro Asp Glu Lys His His Ala Val Ile
195 200 205

Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser Leu

206
~~205~~

210 215 220

Gly Ile Phe Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val
225 230 235 240

Lys Thr Val Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
245 250 255

<210> 219
<211> 771
<212> DNA
<213> Neisseria meningitidis

<400> 219
tgcggatcca gcggaggggg cggtgtcgcc gccgacatcg gtgcggggct tgccgatgca 60

ctaaccgcac cgctcgacca taaagacaaa ggtttgcagt ctttgacgct ggatcagtcc 120

gtcaggaaaa acgagaaact gaagctggcg gcacaaggtg cggaaaaaac ttatggaaac 180

ggcgacagcc tcaatacggg caaattgaag aacgacaagg tcagccgctt cgactttatc 240

cgtcaaatcg aagtggacag gcagctcatt accttggaga gcggagagtt ccaagtgtac 300

aaacaaagcc attccgcctt aaccgccctt cagaccgagc aagtacaaga ctcggagcat 360

tccgggaaga tggttgcgaa acgtcagttc agaatcggcg acatagcggg tgaacataca 420

tcttttgaca agcttcccga aggcggcagg gcgacatatc gcgggacggc gttcggttca 480

gacgatgccg gcggaaaact gatttacacc atagatttcg ccgctaagca gggacacggt 540

aaaatcgaac atttgaaatc gccagaactc aatgtcgacc tggccgccgc cgatatcaag 600

ccggatgaaa aacaccatgc cgtcatcagc ggttccgtcc tttacaacca agccgagaaa 660

ggcagttact ccctcggtat ctttggcgga aaagcccagg aagttgccgg cagcgcggaa 720

gtgaaaaccg taaacggtat acgccatatc ggccttgccg ccaagcaata a 771

<210> 220
<211> 256
<212> PRT
<213> Neisseria meningitidis

<400> 220
Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1 5 10 15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu
20 25 30

207
206

Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
35 40 45

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
50 55 60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65 70 75 80

Arg Gln Ile Glu Val Asp Arg Gln Leu Ile Thr Leu Glu Ser Gly Glu
85 90 95

Phe Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr
100 105 110

Glu Gln Val Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg
115 120 125

Gln Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys
130 135 140

Leu Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser
145 150 155 160

Asp Asp Ala Gly Gly Lys Leu Ile Tyr Thr Ile Asp Phe Ala Ala Lys
165 170 175

Gln Gly His Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val
180 185 190

Asp Leu Ala Ala Ala Asp Ile Lys Pro Asp Glu Lys His His Ala Val
195 200 205

Ile Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser
210 215 220

Leu Gly Ile Phe Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu
225 230 235 240

Val Lys Thr Val Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
245 250 255

208

~~207~~

<210> 221
<211> 768
<212> DNA
<213> Neisseria meningitidis

<400> 221
atgagcagcg gagggggcgg tgtcgccgcc gacatcggtg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaggt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaacttta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacaggca gctcattacc ttggagagcg gagagttcca agtgtacaaa 300

caaagccatt ccgccttaac cgcccttcag accgagcaag tacaagactc ggagcattcc 360

gggaagatgg ttgcgaaacg tcagttcaga atcggcgaca tagcgggtga acatacatct 420

tttgacaagc ttcccgaagg cggcagggcg acatatcgcg ggacggcgtt cggttcagac 480

gatgccggcg gaaaactgat ttacaccata gatttcgccg ctaagcaggg acacggtaaa 540

atcgaacatt tgaaatcgcc agaactcaat gtcgacctgg ccgccgccga tatcaagccg 600

gatgaaaaac accatgccgt catcagcggt tccgtccttt acaaccaagc cgagaaaggc 660

agttactccc tcggtatctt tggcggaaaa gcccaggaag ttgccggcag cgcggaagtg 720

aaaaccgtaa acggtatacg ccatatcggc cttgccgcca agcaataa 768

<210> 222
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 222

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg

209
~~208~~

65 70 75 80

Gln Ile Glu Val Asp Arg Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr Glu
100 105 110

Gln Val Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln
115 120 125

Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu
130 135 140

Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp
145 150 155 160

Asp Ala Gly Gly Lys Leu Ile Tyr Thr Ile Asp Phe Ala Ala Lys Gln
165 170 175

Gly His Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp
180 185 190

Leu Ala Ala Ala Asp Ile Lys Pro Asp Glu Lys His His Ala Val Ile
195 200 205

Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser Leu
210 215 220

Gly Ile Phe Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val
225 230 235 240

Lys Thr Val Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
245 250 255

<210> 223
<211> 768
<212> DNA
<213> Neisseria meningitidis

<400> 223
tgcagcagcg gagggggcgg tgtcgccgcc gacatcggtg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaggt ttgcagtctt taacgctgga tcagtccgtc 120

210
209

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaacttа tggaaacggc 180

gacagcctta atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggaa gctcattacc ttggagagcg gagagttcca agtgtacaaa 300

caaagccatt ccgccttaac cgcccttcag accgagcaag tacaagactc ggaggattcc 360

gggaagatgg ttgcgaaacg ccagttcaga atcggcgaca tagcgggcga acatacatct 420

tttgacaagc ttcccaaagg cggcagtgcg acatatcgcg ggacggcgtt cggttcagac 480

gatgctggcg gaaaactgac ctatactata gatttcgccg ccaagcaggg acacggcaaa 540

atcgaacatt tgaaatcgcc cgaactcaat gtcgagcttg ccaccgccta tatcaagccg 600

gatgaaaaac gccatgccgt tatcagcggt tccgtccttt acaaccaaga cgagaaaggc 660

agttactccc tcggtatctt tggcgggcaa gcccaggaag ttgccggcag cgcggaagtg 720

gaaaccgcaa acggcataca ccatatcggt cttgccgcca agcagtaa 768

<210> 224
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 224
Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Lys Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr Glu
100 105 110

211
240

Gln Val Gln Asp Ser Glu Asp Ser Gly Lys Met Val Ala Lys Arg Gln
115 120 125

Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu
130 135 140

Pro Lys Gly Gly Ser Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp
145 150 155 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
165 170 175

Gly His Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Glu
180 185 190

Leu Ala Thr Ala Tyr Ile Lys Pro Asp Glu Lys Arg His Ala Val Ile
195 200 205

Ser Gly Ser Val Leu Tyr Asn Gln Asp Glu Lys Gly Ser Tyr Ser Leu
210 215 220

Gly Ile Phe Gly Gly Gln Ala Gln Glu Val Ala Gly Ser Ala Glu Val
225 230 235 240

Glu Thr Ala Asn Gly Ile His His Ile Gly Leu Ala Ala Lys Gln
245 250 255

<210> 225
<211> 771
<212> DNA
<213> Neisseria meningitidis

<400> 225
tgcggatcca gcggaggggg cggtgtcgcc gccgacatcg gtgcggggct tgccgatgca 60

ctaaccgcac cgctcgacca taaagacaaa ggtttgcagt ctttaacgct ggatcagtcc 120

gtcaggaaaa acgagaaact gaagctggcg gcacaaggtg cggaaaaaac ttatggaaac 180

ggcgacagcc ttaatacggg caaattgaag aacgacaagg tcagccgctt cgactttatc 240

cgtcaaatcg aagtggacgg gaagctcatt accttggaga gcggagagtt ccaagtgtac 300

aaacaaagcc attccgcctt aaccgccctt cagaccgagc aagtacaaga ctcggaggat 360

tccgggaaga tggttgcgaa acgccagttc agaatcggcg acatagcggg cgaacataca 420

tcttttgaca agcttcccaa aggcggcagt gcgacatatc gcgggacggc gttcggttca 480

212
24

gacgatgctg gcggaaaact gacctatact atagatttcg ccgccaagca gggacacggc 540

aaaatcgaac atttgaaatc gcccgaactc aatgtcgagc ttgccaccgc ctatatcaag 600

ccggatgaaa aacgccatgc cgttatcagc ggttccgtcc tttacaacca agacgagaaa 660

ggcagttact ccctcggtat ctttggcggg caagcccagg aagttgccgg cagcgcggaa 720

gtggaaaccg caaacggcat acaccatatc ggtcttgccg ccaagcagta a 771

<210> 226
<211> 256
<212> PRT
<213> Neisseria meningitidis

<400> 226
Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1 5 10 15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu
20 25 30

Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
35 40 45

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
50 55 60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65 70 75 80

Arg Gln Ile Glu Val Asp Gly Lys Leu Ile Thr Leu Glu Ser Gly Glu
85 90 95

Phe Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr
100 105 110

Glu Gln Val Gln Asp Ser Glu Asp Ser Gly Lys Met Val Ala Lys Arg
115 120 125

Gln Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys
130 135 140

Leu Pro Lys Gly Gly Ser Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser
145 150 155 160

213
~~212~~

Asp Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys
165 170 175

Gln Gly His Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val
180 185 190

Glu Leu Ala Thr Ala Tyr Ile Lys Pro Asp Glu Lys Arg His Ala Val
195 200 205

Ile Ser Gly Ser Val Leu Tyr Asn Gln Asp Glu Lys Gly Ser Tyr Ser
210 215 220

Leu Gly Ile Phe Gly Gly Gln Ala Gln Glu Val Ala Gly Ser Ala Glu
225 230 235 240

Val Glu Thr Ala Asn Gly Ile His His Ile Gly Leu Ala Ala Lys Gln
245 250 255

<210> 227
<211> 768
<212> DNA
<213> Neisseria meningitidis

<400> 227
atgagcagcg gagggggcgg tgtcgccgcc gacatcggtg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaggt ttgcagtctt taacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctta atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggaa gctcattacc ttggagagcg gagagttcca agtgtacaaa 300

caaagccatt ccgccttaac cgcccttcag accgagcaag tacaagactc ggaggattcc 360

gggaagatgg ttgcgaaacg ccagttcaga atcggcgaca tagcgggcga acatacatct 420

tttgacaagc ttcccaaagg cggcagtgcg acatatcgcg ggacggcgtt cggttcagac 480

gatgctggcg gaaaactgac ctatactata gatttcgccg ccaagcaggg acacggcaaa 540

atcgaacatt tgaaatcgcc cgaactcaat gtcgagcttg ccaccgccta tatcaagccg 600

gatgaaaaac gccatgccgt tatcagcggt tccgtccttt acaaccaaga cgagaaaggc 660

agttactccc tcggtatctt tggcgggcaa gcccaggaag ttgccggcag cgcggaagtg 720

gaaaccgcaa acggcataca ccatatcggt cttgccgcca agcagtaa 768

214
213

<210> 228
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 228

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Lys Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr Glu
100 105 110

Gln Val Gln Asp Ser Glu Asp Ser Gly Lys Met Val Ala Lys Arg Gln
115 120 125

Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu
130 135 140

Pro Lys Gly Gly Ser Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp
145 150 155 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
165 170 175

Gly His Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Glu
180 185 190

Leu Ala Thr Ala Tyr Ile Lys Pro Asp Glu Lys Arg His Ala Val Ile

215
~~214~~

195 200 205

Ser Gly Ser Val Leu Tyr Asn Gln Asp Glu Lys Gly Ser Tyr Ser Leu
210 215 220

Gly Ile Phe Gly Gly Gln Ala Gln Glu Val Ala Gly Ser Ala Glu Val
225 230 235 240

Glu Thr Ala Asn Gly Ile His His Ile Gly Leu Ala Ala Lys Gln
245 250 255

<210> 229
<211> 768
<212> DNA
<213> Neisseria meningitidis

<400> 229
tgcagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagccttа atacgggcaa attgaagaac gacaaggtca gccgtttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca agtgtacaaa 300

caaagccatt ccgccttaac cgcccttcag accgagcaag aacaagatcc agagcattcc 360

gggaagatgg ttgcgaaacg ccggttcaaa atcggcgaca tagcgggcga acatacatct 420

tttgacaagc ttcccaaaga cgtcatggcg acatatcgcg ggacggcgtt cggttcagac 480

gatgccggcg gaaaactgac ctatactata gattttgctg ccaaacaggg acacggcaaa 540

atcgaacatt tgaaatcgcc cgaactcaat gtcgagcttg ccaccgccta tatcaagccg 600

gatgaaaaac accatgccgt catcagcggt tccgtccttt acaatcaaga cgagaaaggc 660

agttactccc tcggtatctt tggcgggcaa gcccaggaag ttgccggcag cgcggaagtg 720

gaaaccgcaa acggcataca ccatatcggt cttgccgcca agcaataa 768

<210> 230
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 230
Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

216

```
Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
            20                  25                  30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
        35                  40                  45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
    50                  55                  60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65                  70                  75                  80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
                85                  90                  95

Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr Glu
            100                 105                 110

Gln Glu Gln Asp Pro Glu His Ser Gly Lys Met Val Ala Lys Arg Arg
        115                 120                 125

Phe Lys Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu
    130                 135                 140

Pro Lys Asp Val Met Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp
145                 150                 155                 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
                165                 170                 175

Gly His Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Glu
            180                 185                 190

Leu Ala Thr Ala Tyr Ile Lys Pro Asp Glu Lys His His Ala Val Ile
        195                 200                 205

Ser Gly Ser Val Leu Tyr Asn Gln Asp Glu Lys Gly Ser Tyr Ser Leu
    210                 215                 220

Gly Ile Phe Gly Gly Gln Ala Gln Glu Val Ala Gly Ser Ala Glu Val
225                 230                 235                 240
```

```
Glu Thr Ala Asn Gly Ile His His Ile Gly Leu Ala Ala Lys Gln
                245                 250                 255
```

<210> 231
<211> 771
<212> DNA
<213> Neisseria meningitidis

<400> 231

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tgcggatcca gcggaggcgg cggtgtcgcc gccgacatcg gcgcggggct tgccgatgca     60

ctaaccgcac cgctcgacca taaagacaaa agtttgcagt ctttgacgct ggatcagtcc    120

gtcaggaaaa acgagaaact gaagctggcg gcacaaggtg cggaaaaaac ttatggaaac    180

ggcgacagcc ttaatacggg caaattgaag aacgacaagg tcagccgttt cgactttatc    240

cgtcaaatcg aagtggacgg gcagctcatt accttggaga gcggagagtt ccaagtgtac    300

aaacaaagcc attccgcctt aaccgccctt cagaccgagc aagaacaaga tccagagcat    360

tccgggaaga tggttgcgaa acgccggttc aaaatcggcg acatagcggg cgaacataca    420

tcttttgaca agcttcccaa agacgtcatg gcgacatatc gcgggacggc gttcggttca    480

gacgatgccg gcggaaaact gacctatact atagattttg ctgccaaaca gggacacggc    540

aaaatcgaac atttgaaatc gcccgaactc aatgtcgagc ttgccaccgc ctatatcaag    600

ccggatgaaa aacaccatgc cgtcatcagc ggttccgtcc tttacaatca agacgagaaa    660

ggcagttact ccctcggtat ctttggcggg caagcccagg aagttgccgg cagcgcggaa    720

gtggaaaccg caaacggcat acaccatatc ggtcttgccg ccaagcaata a              771
```

<210> 232
<211> 256
<212> PRT
<213> Neisseria meningitidis

<400> 232

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Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1               5                  10                  15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu
            20                  25                  30

Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
        35                  40                  45

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
    50                  55                  60
```


218
~~247~~

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65 70 75 80

Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu
85 90 95

Phe Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr
100 105 110

Glu Gln Glu Gln Asp Pro Glu His Ser Gly Lys Met Val Ala Lys Arg
115 120 125

Arg Phe Lys Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys
130 135 140

Leu Pro Lys Asp Val Met Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser
145 150 155 160

Asp Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys
165 170 175

Gln Gly His Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val
180 185 190

Glu Leu Ala Thr Ala Tyr Ile Lys Pro Asp Glu Lys His His Ala Val
195 200 205

Ile Ser Gly Ser Val Leu Tyr Asn Gln Asp Glu Lys Gly Ser Tyr Ser
210 215 220

Leu Gly Ile Phe Gly Gly Gln Ala Gln Glu Val Ala Gly Ser Ala Glu
225 230 235 240

Val Glu Thr Ala Asn Gly Ile His His Ile Gly Leu Ala Ala Lys Gln
245 250 255

<210> 233
<211> 768
<212> DNA
<213> Neisseria meningitidis

<400> 233
atgagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

219
248

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctta atacgggcaa attgaagaac gacaaggtca gccgtttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca agtgtacaaa 300

caaagccatt ccgccttaac cgcccttcag accgagcaag aacaagatcc agagcattcc 360

gggaagatgg ttgcgaaacg ccggttcaaa atcggcgaca tagcgggcga acatacatct 420

tttgacaagc ttcccaaaga cgtcatggcg acatatcgcg ggacggcgtt cggttcagac 480

gatgccggcg gaaaactgac ctatactata gattttgctg ccaaacaggg acacggcaaa 540

atcgaacatt tgaaatcgcc cgaactcaat gtcgagcttg ccaccgccta tatcaagccg 600

gatgaaaaac accatgccgt catcagcggt tccgtccttt acaatcaaga cgagaaaggc 660

agttactccc tcggtatctt tggcgggcaa gcccaggaag ttgccggcag cgcggaagtg 720

gaaaccgcaa acggcataca ccatatcggt cttgccgcca agcaataa 768

<210> 234
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 234

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

219
220

Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr Glu
100 105 110

Gln Glu Gln Asp Pro Glu His Ser Gly Lys Met Val Ala Lys Arg Arg
115 120 125

Phe Lys Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu
130 135 140

Pro Lys Asp Val Met Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp
145 150 155 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
165 170 175

Gly His Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Glu
180 185 190

Leu Ala Thr Ala Tyr Ile Lys Pro Asp Glu Lys His His Ala Val Ile
195 200 205

Ser Gly Ser Val Leu Tyr Asn Gln Asp Glu Lys Gly Ser Tyr Ser Leu
210 215 220

Gly Ile Phe Gly Gly Gln Ala Gln Glu Val Ala Gly Ser Ala Glu Val
225 230 235 240

Glu Thr Ala Asn Gly Ile His His Ile Gly Leu Ala Ala Lys Gln
245 250 255

<210> 235
<211> 768
<212> DNA
<213> Neisseria meningitidis

<400> 235
tgcagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctta atacgggcaa attgaagaac gacaaggtca gccgtttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca agtgtacaaa 300

caaagccatt ccgccttaac cgcccttcag accgagcaag aacaagatcc agagcattcc 360

221
2200

gggaagatgg ttgcgaaacg ccggttcaaa atcggcgaca tagcgggcga acatacatct 420

tttgacaagc ttcccaaaga cgtcatggcg acatatcgcg ggacggcgtt cggttcagac 480

gatgccggcg gaaaactgac ctatactata gattttgctg ccaaacaggg acacggcaaa 540

atcgaacatt tgaaatcgcc cgaactcaat gtcgagcttg ccaccgccta tatcaagccg 600

gatgaaaaac accatgccgt catcagcggt tccgtccttt acaatcaaga cgagaaaggc 660

agttactccc tcggtatctt tggcgggcaa gcccaggaag ttgccggcag cgcggaagtg 720

gaaaccgcaa acggcataca ccatatcggt cttgccgcca agcaataa 768

<210> 236
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 236
Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr Glu
100 105 110

Gln Glu Gln Asp Pro Glu His Ser Gly Lys Met Val Ala Lys Arg Arg
115 120 125

Phe Lys Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu
130 135 140

~~221~~
222

```
Pro Lys Asp Val Met Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp
145                 150                 155                 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
                165                 170                 175

Gly His Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Glu
            180                 185                 190

Leu Ala Thr Ala Tyr Ile Lys Pro Asp Glu Lys His His Ala Val Ile
        195                 200                 205

Ser Gly Ser Val Leu Tyr Asn Gln Asp Glu Lys Gly Ser Tyr Ser Leu
    210                 215                 220

Gly Ile Phe Gly Gly Gln Ala Gln Glu Val Ala Gly Ser Ala Glu Val
225                 230                 235                 240

Glu Thr Ala Asn Gly Ile His His Ile Gly Leu Ala Ala Lys Gln
                245                 250                 255
```

<210> 237
<211> 771
<212> DNA
<213> Neisseria meningitidis

<400> 237

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tgcggatcca gcggaggcgg cggtgtcgcc gccgacatcg gcgcggggct tgccgatgca     60

ctaaccgcac cgctcgacca taaagacaaa agtttgcagt ctttgacgct ggatcagtcc    120

gtcaggaaaa acgagaaact gaagctggcg gcacaaggtg cggaaaaaac ttatggaaac    180

ggcgacagcc ttaatacggg caaattgaag aacgacaagg tcagccgttt cgactttatc    240

cgtcaaatcg aagtggacgg gcagctcatt accttggaga gcggagagtt ccaagtgtac    300

aaacaaagcc attccgcctt aaccgccctt cagaccgagc aagaacaaga tccagagcat    360

tccgggaaga tggttgcgaa acgccggttc aaaatcggcg acatagcggg cgaacataca    420

tcttttgaca agcttcccaa agacgtcatg gcgacatatc gcgggacggc gttcggttca    480

gacgatgccg gcggaaaact gacctatact atagattttg ctgccaaaca gggacacggc    540

aaaatcgaac atttgaaatc gcccgaactc aatgtcgagc ttgccaccgc ctatatcaag    600

ccggatgaaa aacaccatgc cgtcatcagc ggttccgtcc tttacaatca agacgagaaa    660
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~~222~~
223

ggcagttact ccctcggtat ctttggcggg caagcccagg aagttgccgg cagcgcggaa 720

gtggaaaccg caaacggcat acaccatatc ggtcttgccg ccaagcaata a 771

<210> 238
<211> 256
<212> PRT
<213> Neisseria meningitidis

<400> 238
Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1 5 10 15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu
20 25 30

Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
35 40 45

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
50 55 60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65 70 75 80

Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu
85 90 95

Phe Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr
100 105 110

Glu Gln Glu Gln Asp Pro Glu His Ser Gly Lys Met Val Ala Lys Arg
115 120 125

Arg Phe Lys Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys
130 135 140

Leu Pro Lys Asp Val Met Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser
145 150 155 160

Asp Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys
165 170 175

Gln Gly His Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val
180 185 190

223
224

Glu Leu Ala Thr Ala Tyr Ile Lys Pro Asp Glu Lys His His Ala Val
195 200 205

Ile Ser Gly Ser Val Leu Tyr Asn Gln Asp Glu Lys Gly Ser Tyr Ser
210 215 220

Leu Gly Ile Phe Gly Gly Gln Ala Gln Glu Val Ala Gly Ser Ala Glu
225 230 235 240

Val Glu Thr Ala Asn Gly Ile His His Ile Gly Leu Ala Ala Lys Gln
245 250 255

<210> 239
<211> 768
<212> DNA
<213> Neisseria meningitidis

<400> 239
atgagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctta atacgggcaa attgaagaac gacaaggtca gccgtttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca agtgtacaaa 300

caaagccatt ccgccttaac cgcccttcag accgagcaag aacaagatcc agagcattcc 360

gggaagatgg ttgcgaaacg ccggttcaaa atcggcgaca tagcgggcga acatacatct 420

tttgacaagc ttcccaaaga cgtcatggcg acatatcgcg ggacggcgtt cggttcagac 480

gatgccggcg gaaaactgac ctatactata gattttgctg ccaaacaggg acacggcaaa 540

atcgaacatt tgaaatcgcc cgaactcaat gtcgagcttg ccaccgccta tatcaagccg 600

gatgaaaaac accatgccgt catcagcggt tccgtccttt acaatcaaga cgagaaaggc 660

agttactccc tcggtatctt tggcgggcaa gcccaggaag ttgccggcag cgcggaagtg 720

gaaaccgcaa acggcataca ccatatcggt cttgccgcca agcaataa 768

<210> 240
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 240

224
225

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Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1               5                  10                  15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
            20                  25                  30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
        35                  40                  45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
    50                  55                  60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65                  70                  75                  80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
                85                  90                  95

Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr Glu
            100                 105                 110

Gln Glu Gln Asp Pro Glu His Ser Gly Lys Met Val Ala Lys Arg Arg
        115                 120                 125

Phe Lys Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu
    130                 135                 140

Pro Lys Asp Val Met Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp
145                 150                 155                 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
                165                 170                 175

Gly His Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Glu
            180                 185                 190

Leu Ala Thr Ala Tyr Ile Lys Pro Asp Glu Lys His His Ala Val Ile
        195                 200                 205

Ser Gly Ser Val Leu Tyr Asn Gln Asp Glu Lys Gly Ser Tyr Ser Leu
    210                 215                 220
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225
226

Gly Ile Phe Gly Gly Gln Ala Gln Glu Val Ala Gly Ser Ala Glu Val
225 230 235 240

Glu Thr Ala Asn Gly Ile His His Ile Gly Leu Ala Ala Lys Gln
245 250 255

<210> 241
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 241
tgcagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctta atacgggcaa attgaagaac gacaaggtca gccgtttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca agtgtacaaa 300

caaagccatt ccgccttaac cgcccttcag accgagcaag aacaagatcc agagcattcc 360

gggaagatgg ttgcgaaacg ccggttcaaa atcggcgaca tagcgggcga acatacatct 420

tttgacaagc ttcccaaaga cgtcatggcg acatatcgcg ggacggcgtt cggttcagac 480

gatgccggcg gaaaactgac ctatactata gattttgctg ccaaacaggg acacggcaaa 540

atcgaacatt tgaaatcgcc cgaactcaat gtcgagcttg ccaccgccta tatcaagccg 600

gatgaaaaac accatgccgt catcagcggt tccgtccttt acaatcaaga cgagaaaggc 660

agttactccc tcggtatctt tggcgggcaa gcccaggaag ttgccggcag cgcggaagtg 720

gaaaccgcaa acggcataca ccatatcggt cttgccgcca agcaa 765

<210> 242
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 242
Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

226
227

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr Glu
100 105 110

Gln Glu Gln Asp Pro Glu His Ser Gly Lys Met Val Ala Lys Arg Arg
115 120 125

Phe Lys Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu
130 135 140

Pro Lys Asp Val Met Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp
145 150 155 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
165 170 175

Gly His Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Glu
180 185 190

Leu Ala Thr Ala Tyr Ile Lys Pro Asp Glu Lys His His Ala Val Ile
195 200 205

Ser Gly Ser Val Leu Tyr Asn Gln Asp Glu Lys Gly Ser Tyr Ser Leu
210 215 220

Gly Ile Phe Gly Gly Gln Ala Gln Glu Val Ala Gly Ser Ala Glu Val
225 230 235 240

Glu Thr Ala Asn Gly Ile His His Ile Gly Leu Ala Ala Lys Gln
245 250 255

<210> 243
<211> 768
<212> DNA

~~227~~ 228

<213> Neisseria meningitidis

<400> 243
tgcggatcca gcggaggcgg cggtgtcgcc gccgacatcg gcgcggggct tgccgatgca 60

ctaaccgcac cgctcgacca taaagacaaa agtttgcagt ctttgacgct ggatcagtcc 120

gtcaggaaaa acgagaaact gaagctggcg gcacaaggtg cggaaaaaac ttatggaaac 180

ggcgacagcc ttaatacggg caaattgaag aacgacaagg tcagccgttt cgactttatc 240

cgtcaaatcg aagtggacgg gcagctcatt accttggaga gcggagagtt ccaagtgtac 300

aaacaaagcc attccgcctt aaccgccctt cagaccgagc aagaacaaga tccagagcat 360

tccgggaaga tggttgcgaa acgccggttc aaaatcggcg acatagcggg cgaacataca 420

tcttttgaca agcttcccaa agacgtcatg gcgacatatc gcgggacggc gttcggttca 480

gacgatgccg gcggaaaact gacctatact atagattttg ctgccaaaca gggacacggc 540

aaaatcgaac atttgaaatc gcccgaactc aatgtcgagc ttgccaccgc ctatatcaag 600

ccggatgaaa aacaccatgc cgtcatcagc ggttccgtcc tttacaatca agacgagaaa 660

ggcagttact ccctcggtat ctttggcggg caagcccagg aagttgccgg cagcgcggaa 720

gtggaaaccg caaacggcat acaccatatc ggtcttgccg ccaagcaa 768

<210> 244
<211> 256
<212> PRT
<213> Neisseria meningitidis

<400> 244
Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1 5 10 15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu
20 25 30

Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
35 40 45

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
50 55 60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65 70 75 80

Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu

228
229

85 90 95

Phe Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr
100 105 110

Glu Gln Glu Gln Asp Pro Glu His Ser Gly Lys Met Val Ala Lys Arg
115 120 125

Arg Phe Lys Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys
130 135 140

Leu Pro Lys Asp Val Met Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser
145 150 155 160

Asp Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys
165 170 175

Gln Gly His Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val
180 185 190

Glu Leu Ala Thr Ala Tyr Ile Lys Pro Asp Glu Lys His His Ala Val
195 200 205

Ile Ser Gly Ser Val Leu Tyr Asn Gln Asp Glu Lys Gly Ser Tyr Ser
210 215 220

Leu Gly Ile Phe Gly Gly Gln Ala Gln Glu Val Ala Gly Ser Ala Glu
225 230 235 240

Val Glu Thr Ala Asn Gly Ile His His Ile Gly Leu Ala Ala Lys Gln
245 250 255

<210> 245
<211> 765
<212> DNA
<213> Neisseria meningitidis

<400> 245
atgagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctta atacgggcaa attgaagaac gacaaggtca gccgtttcga ctttatccgt 240

229
230

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca agtgtacaaa 300

caaagccatt ccgccttaac cgcccttcag accgagcaag aacaagatcc agagcattcc 360

gggaagatgg ttgcgaaacg ccggttcaaa atcggcgaca tagcgggcga acatacatct 420

tttgacaagc ttcccaaaga cgtcatggcg acatatcgcg ggacggcgtt cggttcagac 480

gatgccggcg gaaaactgac ctatactata gattttgctg ccaaacaggg acacggcaaa 540

atcgaacatt tgaaatcgcc cgaactcaat gtcgagcttg ccaccgccta tatcaagccg 600

gatgaaaaac accatgccgt catcagcggt tccgtccttt acaatcaaga cgagaaaggc 660

agttactccc tcggtatctt tggcgggcaa gcccaggaag ttgccggcag cgcggaagtg 720

gaaaccgcaa acggcataca ccatatcggt cttgccgcca agcaa 765

<210> 246
<211> 255
<212> PRT
<213> Neisseria meningitidis

<400> 246

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr Glu
100 105 110

Gln Glu Gln Asp Pro Glu His Ser Gly Lys Met Val Ala Lys Arg Arg
115 120 125

~~230~~
231

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Phe Lys Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu
    130                 135                 140

Pro Lys Asp Val Met Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp
145                 150                 155                 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
                165                 170                 175

Gly His Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Glu
            180                 185                 190

Leu Ala Thr Ala Tyr Ile Lys Pro Asp Glu Lys His His Ala Val Ile
        195                 200                 205

Ser Gly Ser Val Leu Tyr Asn Gln Asp Glu Lys Gly Ser Tyr Ser Leu
    210                 215                 220

Gly Ile Phe Gly Gly Gln Ala Gln Glu Val Ala Gly Ser Ala Glu Val
225                 230                 235                 240

Glu Thr Ala Asn Gly Ile His His Ile Gly Leu Ala Ala Lys Gln
                245                 250                 255
```

<210> 247
<211> 783
<212> DNA
<213> Neisseria meningitidis

<400> 247

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tgcagcagcg gaggcggcgg aagcggaggc ggcggtgtca ccgccgacat cggcacgggg     60

cttgccgatg cactaactgc gccgctcgac cataaagaca aaggcttgaa atccctgaca    120

ttggaagact ccatttccca aaacggaaca ctgaccctgt cggcacaagg tgcggaaaaa    180

acttatggaa acggcgacag ccttaatacg ggcaaattga agaacgacaa ggtcagccgt    240

ttcgacttta tccgtcaaat cgaagtggac gggcagctca ttaccttgga gagcggagag    300

ttccaagtgt acaaacaaag ccattccgcc ttaaccgccc ttcagaccga gcaagaacaa    360

gatccagagc attccgagaa gatggttgcg aaacgccggt tcagaatcgg cgacatagcg    420

ggcgaacata catcttttga caagcttccc aaagacgtca tggcgacata tcgcgggacg    480

gcgttcggtt cagacgatgc cggcggaaaa ctgacctata ctatagattt tgctgccaaa    540
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232

cagggacacg gcaaaatcga acatttgaaa tcgccggaac tcaatgtcga tctggccgtc 600

gcctatatca agccggatga aaaacaccat gccgtcatca gcggttccgt tctttacaac 660

caagacgaga aaggcagtta ctccctcggt atctttggcg aaaaagccca ggaagttgcc 720

ggcagcgcgg aagtggaaac cgcaaacggc atacaccata tcggtcttgc cgccaagcag 780

taa 783

<210> 248
<211> 260
<212> PRT
<213> Neisseria meningitidis

<400> 248

Cys Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Val Thr Ala Asp
1 5 10 15

Ile Gly Thr Gly Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys
20 25 30

Asp Lys Gly Leu Lys Ser Leu Thr Leu Glu Asp Ser Ile Ser Gln Asn
35 40 45

Gly Thr Leu Thr Leu Ser Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn
50 55 60

Gly Asp Ser Leu Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg
65 70 75 80

Phe Asp Phe Ile Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu
85 90 95

Glu Ser Gly Glu Phe Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr
100 105 110

Ala Leu Gln Thr Glu Gln Glu Gln Asp Pro Glu His Ser Glu Lys Met
115 120 125

Val Ala Lys Arg Arg Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr
130 135 140

Ser Phe Asp Lys Leu Pro Lys Asp Val Met Ala Thr Tyr Arg Gly Thr
145 150 155 160

Ala Phe Gly Ser Asp Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp
165 170 175

Phe Ala Ala Lys Gln Gly His Gly Lys Ile Glu His Leu Lys Ser Pro
180 185 190

Glu Leu Asn Val Asp Leu Ala Val Ala Tyr Ile Lys Pro Asp Glu Lys
195 200 205

His His Ala Val Ile Ser Gly Ser Val Leu Tyr Asn Gln Asp Glu Lys
210 215 220

Gly Ser Tyr Ser Leu Gly Ile Phe Gly Glu Lys Ala Gln Glu Val Ala
225 230 235 240

Gly Ser Ala Glu Val Glu Thr Ala Asn Gly Ile His His Ile Gly Leu
245 250 255

Ala Ala Lys Gln
260

<210> 249
<211> 786
<212> DNA
<213> Neisseria meningitidis

<400> 249
tgcggatcca gcggaggcgg cggaagcgga ggcggcggtg tcaccgccga catcggcacg 60

gggcttgccg atgcactaac tgcgccgctc gaccataaag acaaaggctt gaaatccctg 120

acattggaag actccatttc ccaaaacgga acactgaccc tgtcggcaca aggtgcggaa 180

aaaacttatg gaaacggcga cagccttaat acgggcaaat tgaagaacga caaggtcagc 240

cgtttcgact ttatccgtca aatcgaagtg gacgggcagc tcattacctt ggagagcgga 300

gagttccaag tgtacaaaca aagccattcc gccttaaccg cccttcagac cgagcaagaa 360

caagatccag agcattccga gaagatggtt gcgaaacgcc ggttcagaat cggcgacata 420

gcgggcgaac atacatcttt tgacaagctt cccaaagacg tcatggcgac atatcgcggg 480

acggcgttcg gttcagacga tgccggcgga aaactgacct atactataga ttttgctgcc 540

aaacagggac acggcaaaat cgaacatttg aaatcgccgg aactcaatgt cgatctggcc 600

gtcgcctata tcaagccgga tgaaaaacac catgccgtca tcagcggttc cgttctttac 660

aaccaagacg agaaaggcag ttactccctc ggtatctttg gcgaaaaagc ccaggaagtt 720

239

gccggcagcg cggaagtgga aaccgcaaac ggcatacacc atatcggtct tgccgccaag 780

cagtaa 786

<210> 250
<211> 261
<212> PRT
<213> Neisseria meningitidis

<400> 250

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Cys Gly Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Val Thr Ala
1               5                  10                  15

Asp Ile Gly Thr Gly Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His
            20                  25                  30

Lys Asp Lys Gly Leu Lys Ser Leu Thr Leu Glu Asp Ser Ile Ser Gln
        35                  40                  45

Asn Gly Thr Leu Thr Leu Ser Ala Gln Gly Ala Glu Lys Thr Tyr Gly
    50                  55                  60

Asn Gly Asp Ser Leu Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser
65                  70                  75                  80

Arg Phe Asp Phe Ile Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr
                85                  90                  95

Leu Glu Ser Gly Glu Phe Gln Val Tyr Lys Gln Ser His Ser Ala Leu
            100                 105                 110

Thr Ala Leu Gln Thr Glu Gln Glu Gln Asp Pro Glu His Ser Glu Lys
        115                 120                 125

Met Val Ala Lys Arg Arg Phe Arg Ile Gly Asp Ile Ala Gly Glu His
    130                 135                 140

Thr Ser Phe Asp Lys Leu Pro Lys Asp Val Met Ala Thr Tyr Arg Gly
145                 150                 155                 160

Thr Ala Phe Gly Ser Asp Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile
                165                 170                 175

Asp Phe Ala Ala Lys Gln Gly His Gly Lys Ile Glu His Leu Lys Ser
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180 185 190

Pro Glu Leu Asn Val Asp Leu Ala Val Ala Tyr Ile Lys Pro Asp Glu
195 200 205

Lys His His Ala Val Ile Ser Gly Ser Val Leu Tyr Asn Gln Asp Glu
210 215 220

Lys Gly Ser Tyr Ser Leu Gly Ile Phe Gly Glu Lys Ala Gln Glu Val
225 230 235 240

Ala Gly Ser Ala Glu Val Glu Thr Ala Asn Gly Ile His His Ile Gly
245 250 255

Leu Ala Ala Lys Gln
260

<210> 251
<211> 783
<212> DNA
<213> Neisseria meningitidis

<400> 251
atgagcagcg gaggcggcgg aagcggaggc ggcggtgtca ccgccgacat cggcacgggg 60

cttgccgatg cactaactgc gccgctcgac ataaagaca aaggcttgaa atccctgaca 120

ttggaagact ccatttccca aaacggaaca ctgaccctgt cggcacaagg tgcggaaaaa 180

acttatggaa acggcgacag ccttaatacg ggcaaattga agaacgacaa ggtcagccgt 240

ttcgacttta tccgtcaaat cgaagtggac gggcagctca ttaccttgga gagcggagag 300

ttccaagtgt acaaacaaag ccattccgcc ttaaccgccc ttcagaccga gcaagaacaa 360

gatccagagc attccgagaa gatggttgcg aaacgccggt tcagaatcgg cgacatagcg 420

ggcgaacata catcttttga caagcttccc aaagacgtca tggcgacata tcgcgggacg 480

gcgttcggtt cagacgatgc cggcggaaaa ctgacctata ctatagattt tgctgccaaa 540

cagggacacg gcaaaatcga acatttgaaa tcgccggaac tcaatgtcga tctggccgtc 600

gcctatatca agccggatga aaaacaccat gccgtcatca gcggttccgt tctttacaac 660

caagacgaga aaggcagtta ctccctcggt atctttggcg aaaaagccca ggaagttgcc 720

ggcagcgcgg aagtggaaac cgcaaacggc atacaccata tcggtcttgc cgccaagcag 780

taa 783

236

<210> 252
<211> 260
<212> PRT
<213> Neisseria meningitidis

<400> 252

Met Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Val Thr Ala Asp
1 5 10 15

Ile Gly Thr Gly Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys
20 25 30

Asp Lys Gly Leu Lys Ser Leu Thr Leu Glu Asp Ser Ile Ser Gln Asn
35 40 45

Gly Thr Leu Thr Leu Ser Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn
50 55 60

Gly Asp Ser Leu Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg
65 70 75 80

Phe Asp Phe Ile Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu
85 90 95

Glu Ser Gly Glu Phe Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr
100 105 110

Ala Leu Gln Thr Glu Gln Glu Gln Asp Pro Glu His Ser Glu Lys Met
115 120 125

Val Ala Lys Arg Arg Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr
130 135 140

Ser Phe Asp Lys Leu Pro Lys Asp Val Met Ala Thr Tyr Arg Gly Thr
145 150 155 160

Ala Phe Gly Ser Asp Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp
165 170 175

Phe Ala Ala Lys Gln Gly His Gly Lys Ile Glu His Leu Lys Ser Pro
180 185 190

Glu Leu Asn Val Asp Leu Ala Val Ala Tyr Ile Lys Pro Asp Glu Lys

```
        195                 200                 205

His His Ala Val Ile Ser Gly Ser Val Leu Tyr Asn Gln Asp Glu Lys
    210                 215                 220

Gly Ser Tyr Ser Leu Gly Ile Phe Gly Glu Lys Ala Gln Glu Val Ala
225                 230                 235                 240

Gly Ser Ala Glu Val Glu Thr Ala Asn Gly Ile His His Ile Gly Leu
                245                 250                 255

Ala Ala Lys Gln
            260
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<210> 253
<211> 390
<212> DNA
<213> Neisseria meningitidis

<400> 253

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gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggcggaga acataccgcc     60

ttcaaccaac tgcctgacgg caaagccgag tatcacggca aagcattcag ctccgacgat    120

gctggcggaa aactgaccta taccatagat ttcgccgcca aacagggaca cggcaaaatc    180

gaacacctga aaacacccga gcaaaatgtc gagcttgccg ccgccgaact caaagcagat    240

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcagcgaaga aaaaggcact    300

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag    360

ataggggaaa aggttcacga aatcggcatc                                      390
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<210> 254
<211> 10
<212> PRT
<213> Neisseria meningitidis

<220>
<221> MISC_FEATURE
<222> (5)..(5)
<223> Xaa equals any of the naturally occurring L-amino acids

<400> 254

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Ala Asp Ile Gly Xaa Gly Leu Ala Asp Ala
1               5                   10
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<210> 255
<211> 10
<212> PRT
<213> Neisseria meningitidis

<220>
<221> MISC_FEATURE
<222> (3)..(3)
<223> Xaa equals any of the naturally occurring L-amino acids

<400> 255

Ile Gly Xaa Gly Leu Ala Asp Ala Leu Thr
1 5 10

<210> 256
<211> 10
<212> PRT
<213> Neisseria meningitidis

<400> 256

Ser Leu Asn Thr Gly Lys Leu Lys Asn Asp
1 5 10

<210> 257
<211> 17
<212> PRT
<213> Neisseria meningitidis

<220>
<221> MISC_FEATURE
<222> (12)..(12)
<223> Xaa equals any of the naturally occurring L-amino acids

<400> 257

Ser Leu Asn Thr Gly Lys Leu Lys Asn Asp Lys Xaa Ser Arg Phe Asp
1 5 10 15

Phe

<210> 258
<211> 9
<212> PRT
<213> Neisseria meningitidis

<220>
<221> MISC_FEATURE
<222> (6)..(6)

<223> Xaa equals any of the naturally occurring L-amino acids

<400> 258

Ser Gly Glu Phe Gln Xaa Tyr Lys Gln
1 5

<210> 259
<211> 8
<212> PRT
<213> Neisseria meningitidis

<220>
<221> MISC_FEATURE
<222> (6)..(6)
<223> Xaa equals any of the naturally occurring L-amino acids

<400> 259

Ile Glu His Leu Lys Xaa Pro Glu
1 5

<210> 260
<211> 10
<212> PRT
<213> Neisseria meningitidis

<220>
<221> MISC_FEATURE
<222> (10)..(10)
<223> Xaa equals any of the naturally occurring L-amino acids

<400> 260

Gly Gly Gly Val Ala Ala Asp Ile Gly Xaa
1 5 10

<210> 261
<211> 9
<212> PRT
<213> Neisseria meningitidis

<400> 261

Ser Gly Glu Phe Gln Ile Tyr Lys Gln
1 5

<210> 262
<211> 10
<212> PRT

<213> Neisseria meningitidis

<400> 262

His Ser Ala Val Val Ala Leu Gln Ile Glu
1 5 10

<210> 263
<211> 10
<212> PRT
<213> Neisseria meningitidis

<400> 263

Glu Lys Ile Asn Asn Pro Asp Lys Ile Asp
1 5 10

<210> 264
<211> 10
<212> PRT
<213> Neisseria meningitidis

<400> 264

Ser Leu Ile Asn Gln Arg Ser Phe Leu Val
1 5 10

<210> 265
<211> 10
<212> PRT
<213> Neisseria meningitidis

<400> 265

Ser Gly Leu Gly Gly Glu His Thr Ala Phe
1 5 10

<210> 266
<211> 10
<212> PRT
<213> Neisseria meningitidis

<400> 266

Gly Glu His Thr Ala Phe Asn Gln Leu Pro
1 5 10

<210> 267
<211> 11
<212> PRT
<213> Neisseria meningitidis

<400> 267

Ser Phe Leu Val Ser Gly Leu Gly Gly Glu His
1 5 10

<210> 268
<211> 34
<212> PRT
<213> Neisseria meningitidis

<400> 268

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Ala Asp Ala Leu Thr Xaa Pro Xaa Asp Xaa Lys Asp Lys Xaa Leu Xaa
20 25 30

Ser Leu Thr Leu Xaa Xaa Ser Xaa Xaa Xaa Asn Xaa Xaa Leu Xaa Leu
35 40 45

Xaa Ala Gln Gly Ala Glu Lys Thr Xaa Xaa Xaa Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Xaa Ser Arg Phe Asp Phe Xaa Xaa
65 70 75 80

Xaa Ile Xaa Val Asp Gly Gln Xaa Ile Thr Leu Xaa Ser Gly Glu Phe
85 90 95

Gln Ile Tyr Lys Gln Xaa His Ser Ala Val Val Ala Leu Gln Ile Glu
100 105 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
115 120 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
130 135 140

Pro Xaa Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145 150 155 160

Xaa Xaa Gly Xaa Leu Xaa Tyr Xaa Ile Asp Phe Xaa Xaa Lys Gln Gly
165 170 175

Xaa Gly Xaa Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
180 185 190

Ala Xaa Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu

195 200 205

Gly Asp Thr Arg Tyr Gly Xaa Glu Glu Lys Gly Thr Tyr His Leu Ala
210 215 220

Leu Xaa Gly Asp Arg Ala Gln Glu Ile Ala Gly Xaa Ala Thr Val Lys
225 230 235 240

Ile Xaa Glu Lys Val His Glu Ile Xaa Ile Ala Xaa Lys Gln
245 250

<210> 302
<211> 255
<212> PRT
<213> Neisseria meningitidis

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Cys Ser Ser Gly Gly Gly Gly Val Xaa Ala Asp Ile Gly Xaa Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Xaa Leu Xaa
20 25 30

Ser Leu Thr Leu Xaa Xaa Ser Xaa Xaa Xaa Asn Xaa Xaa Leu Xaa Leu
35 40 45

Xaa Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Xaa Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr Glu
100 105 110

Gln Xaa Gln Asp Xaa Glu Xaa Ser Xaa Lys Met Val Ala Lys Arg Xaa
115 120 125

Phe Xaa Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu

290

130 135 140

Pro Lys Xaa Xaa Xaa Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp
145 150 155 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
165 170 175

Gly His Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Xaa
180 185 190

Leu Ala Xaa Xaa Tyr Ile Lys Pro Asp Glu Lys Xaa His Ala Val Ile
195 200 205

Ser Gly Ser Val Leu Tyr Asn Gln Asp Glu Lys Gly Ser Tyr Ser Leu
210 215 220

Gly Ile Phe Gly Xaa Xaa Ala Gln Glu Val Ala Gly Ser Ala Glu Val
225 230 235 240

Glu Thr Ala Asn Gly Ile His His Ile Gly Leu Ala Ala Lys Gln
245 250 255

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<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 303
gcgcggatcc ttactgcttg gcggcaagac c 31

<210> 304
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 304
ctatttctgca tatgactagg agc 23

<210> 305
<211> 21

271
~~270~~

<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 305
agcagcggag gcggcggtgt c 21

<210> 306
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 306
tgccgatgca ctaaccgcac c 21

<210> 307
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 307
cgtttcgcaa ccatcttccc g 21

<210> 308
<211> 44
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 308
gagatctcac tcactcatta ctgcttggcg gcaagaccga tatg 44

<210> 309
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 309
gcggatccag cggagggggt ggtgtcgcc 29

272
~~271~~

<210> 310
<211> 35
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 310
gcgcatgctt actgcttggc ggcaagaccg atatg 35

<210> 311
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 311
gcggatccag cggaggcggc ggaagc 26

<210> 312
<211> 65
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<220>
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<220>
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<222> (49)..(49)
<223> "W" equals A or T

<400> 312

gcgcagatct catatgagca gcggaggggg tggtgtcgcc gccgayatwg gtgcggggct 60

tgccg 65

<210> 313
<211> 19
<212> DNA
<213> Artificial Sequence

273
~~272~~

<220>
<223> Primer

<400> 313

ctattctgcg tatgactag 19

<210> 314
<211> 22
<212> DNA
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<220>
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<400> 314

gtccgaacgg taaattatcg tg 22

<210> 315
<211> 29
<212> DNA
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<220>
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<400> 315

gcggatccag cggaggcggc ggtgtcgcc 29

<210> 316
<211> 34
<212> DNA
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<220>
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<400> 316

gagatctcat atgagcagcg gaggcggcgg aagc 34

<210> 317
<211> 16
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 317

274
~~273~~

gacagcctga taaacc 16

<210> 318
<211> 19
<212> DNA
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<220>
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<400> 318

gatgccgatt tcgtgaacc 19

<210> 319
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
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<400> 319

gcgcatgcct actgtttgcc ggcgatg 27

<210> 320
<211> 44
<212> DNA
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<220>
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<400> 320

gagatctcac tcactcacta ctgtttgccg gcgatgccga tttc 44

<210> 321
<211> 70
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 321

gcgcagatct catatgagca gcggaggcgg cggaagcgga ggcggcggtg tcaccgccga 60

cataggcacg 70

275
~~274~~

<210> 322
<211> 59
<212> DNA
<213> Artificial Sequence

<220>
<223> Leader

<400> 322

atgaaaacaa cgttaaaaat gaccgcactt gcggctcttt ctgcttttgt tttagctgg 59

<210> 323
<211> 75
<212> DNA
<213> Artificial Sequence

<220>
<223> Leader

<400> 323

atgactagga gcaaacctgt gaaccgaact gccttctgct gcctttccct gaccgccgcc 60

ctgattctga ccgcc 75

<210> 324
<211> 75
<212> DNA
<213> Artificial Sequence

<220>
<223> Leader

<400> 324

atgactagga gcaaacctgt gaaccgaact gccttctgct gcttttctct gaccgccgcc 60

ctgattctga ccgcc 75

<210> 325
<211> 75
<212> DNA
<213> Artificial Sequence

<220>
<223> Leader

<400> 325

atgactagga gcaaacctgt gaaccgaact accttctgtt gcctttctct gaccgccgcc 60

ctgattctga ccgcc 75

276
~~275~~

<210> 326
<211> 75
<212> DNA
<213> Artificial Sequence

<220>
<223> Leader

<400> 326

atgactagga gtaaacctgt gaatcgaact gccttctgct gcctttctct gaccactgcc 60

ctgattctga ccgcc 75

<210> 327
<211> 335
<212> PRT
<213> Neisseria meningitidis

<400> 327

Cys Ser Pro Ala Ala Asp Ser Asn His Pro Ser Gly Gln Asn Ala Pro
1 5 10 15

Ala Asn Thr Glu Ser Asp Gly Lys Asn Ile Thr Leu Leu Asn Ala Ser
20 25 30

Tyr Asp Val Ala Arg Asp Phe Tyr Lys Glu Tyr Asn Pro Leu Phe Ile
35 40 45

Lys Thr Tyr Gln Ser Glu His Pro Gly Thr Ser Val Ser Ile Gln Gln
50 55 60

Ser His Gly Gly Ser Ser Lys Gln Ala Leu Ser Val Ala Asn Gly Leu
65 70 75 80

Gln Ala Asp Val Val Thr Met Asn Gln Ser Ser Asp Ile Asp Leu Leu
85 90 95

Glu Lys Lys Gly Leu Val Glu Lys Gly Trp Gln Gln Ala Leu Pro Asp
100 105 110

His Ala Ala Pro Tyr Thr Ser Thr Met Val Phe Leu Val Arg Lys Asn
115 120 125

Asn Pro Lys Gln Ile Arg Asp Trp Asn Asp Leu Ala Lys Asp Gly Val
130 135 140

277
~~276~~

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Asn Ile Val Ile Ala Asn Pro Lys Thr Ser Gly Asn Gly Arg Tyr Ala
145                 150                 155                 160

Phe Leu Gly Ala Tyr Gly Tyr Gly Leu Lys Thr Thr Asn Gly Asn Glu
                165                 170                 175

Gln Glu Ala Gln Lys Leu Val Ala Ser Ile Leu Lys Asn Thr Pro Val
            180                 185                 190

Phe Glu Asn Gly Gly Arg Ala Ala Thr Thr Thr Phe Thr Gln Arg Asn
        195                 200                 205

Ile Gly Asp Val Leu Ile Thr Phe Glu Asn Glu Ala Asn Tyr Val Ser
    210                 215                 220

Lys Lys Leu Thr Gln Gly Gln Phe Glu Ile Val Tyr Pro Ser Tyr Thr
225                 230                 235                 240

Ile Ser Ala Glu Ser Pro Val Ala Val Val Asn Ser Val Val Ala Lys
                245                 250                 255

Lys Gly Thr Gln Lys Thr Ala Arg Ala Tyr Leu Glu Tyr Leu Trp Ser
            260                 265                 270

Glu Pro Ala Gln Glu Leu Ala Ala Ser Leu Tyr Leu Arg Pro Arg Asn
        275                 280                 285

Pro Glu Val Leu Ala Arg His Lys Ala Asp Phe Pro Asp Leu Asp Thr
    290                 295                 300

Phe Ser Pro Glu Glu Lys Phe Gly Gly Trp Asp Asn Ile Met Lys Thr
305                 310                 315                 320

Tyr Phe Ala Asp Gly Gly Ile Phe Asp Arg Leu Thr Ala Gln Lys
                325                 330                 335
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<210> 328
<211> 68
<212> PRT
<213> Neisseria meningitidis

<400> 328

Cys Ala Gly Thr Trp Glu Gly Ala Lys Gln Asp Thr Ala Arg Asn Leu
1 5 10 15

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

Ala Val Glu Lys Gly Trp Asp Lys Thr Lys Glu Ala Val Lys Lys Gly
35 40 45

Gly Asn Ala Val Gly Arg Gly Ile Ser His Leu Gly Gly Lys Ile Glu
50 55 60

Asn Ala Thr Glu
65

<210> 329
<211> 21
<212> PRT
<213> Neisseria meningitidis

<400> 329

Cys Met Lys Thr Thr Leu Lys Met Thr Ala Leu Ala Ala Leu Ser Ala
1 5 10 15

Phe Val Leu Ala Gly
20

<210> 330
<211> 1304
<212> DNA
<213> Neisseria meningitides

<400> 330

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tgccgtctga accgttgttc ggacggcatt tgatttttgc ttctttgacc tgcctcattg 120

atgcagtatg caaaaaaaga taccataacc aaaatgttta tatatcatct attctgcgta 180

tgactaggag caaacctgtg aaccgaactg ccttccgctg cttttctctg accgccgccc 240

tgattctgac cgcctgcagc agcggaggcg gcggtgtcgc cgccgacatc ggcgcggggc 300

ttgccgatgc actaaccgca ccgctcgacc ataaagacag aagtttgcag tctttgacgc 360

tggatcagtc cgtcaggaaa aacgagaaac tgaagctggc ggcacaaggt gcggaaaaaa 420

cttatggaaa cggcgacagc cttaatacgg gcaaattgaa gaacgacaag gtcagccgtt 480

279

tcgactttat ccgtcaaatc gaagtggacg ggcagctcat taccttggag agcggagagt 540

tccaagtgta caaacaaagc cattccgcct taaccgccct tcagaccgag caagaacaag 600

atccagagca ttccgggaag atggttgcga aacgccggtt caaaatcggc gacatagcgg 660

gcgaacatac atcttttgac aagcttccca aagacgtcat ggcgacatat cgcgggacgg 720

cgttcggttc agacgatgcc ggcggaaaac tgacctatac tatagatttt gctgccaaac 780

agggacacgg caaaatcgaa catttgaaat cgcccgaact caatgtcgag cttgccaccg 840

cctatatcaa gccggatgaa aaacaccatg ccgtcatcag cggttccgtc ctttacaatc 900

aagacgagaa aggcagttac tccctcggta tctttggcgg gcaagcccag gaagttgccg 960

gcagcgcgga agtggaaacc gcaaacggca tacaccatat cggtcttgcc gccaagcaat 1020

aaccattgtg aaaatgccgt ccgaacacga taatttaccg ttcggacggc atttttgcgc 1080

cataccgccc taggacacga cggcacggca ggcaagccgg tttcactata taatgccgtc 1140

tgaaccaacg agagaatgcc atgcaagctg attttaaccg ccccgtcctc gccgtcgata 1200

ccggaacttc ctatttgtcg ctcgcgctgc gcgccgacgg cgaaacctgc ctgttccatc 1260

aggaagtcgg cagccgccag tccgcactga ttctgccgga aatc 1304

<210> 331
<211> 332
<212> PRT
<213> Neisseria meningitides

<400> 331

Thr Lys Ser Ser Asn Asn Arg Leu Leu Val Asn Lys Met Pro Ser Glu
1 5 10 15

Pro Leu Phe Gly Arg His Leu Ile Phe Ala Ser Leu Thr Cys Leu Ile
20 25 30

Asp Ala Val Cys Lys Lys Arg Tyr His Asn Gln Asn Val Tyr Ile Ser
35 40 45

Ser Ile Leu Arg Met Thr Arg Ser Lys Pro Val Asn Arg Thr Ala Phe
50 55 60

Arg Cys Phe Ser Leu Thr Ala Ala Leu Ile Leu Thr Ala Cys Ser Ser
65 70 75 80

280
~~279~~

Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu Ala Asp Ala
85 90 95

Leu Thr Ala Pro Leu Asp His Lys Asp Arg Ser Leu Gln Ser Leu Thr
100 105 110

Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu Ala Ala Gln
115 120 125

Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn Thr Gly Lys
130 135 140

Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg Gln Ile Glu
145 150 155 160

Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe Gln Val Tyr
165 170 175

Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr Glu Gln Glu Gln
180 185 190

Asp Pro Glu His Ser Gly Lys Met Val Ala Lys Arg Arg Phe Lys Ile
195 200 205

Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu Pro Lys Asp
210 215 220

Val Met Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp Asp Ala Gly
225 230 235 240

Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly His Gly
245 250 255

Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Glu Leu Ala Thr
260 265 270

Ala Tyr Ile Lys Pro Asp Glu Lys His His Ala Val Ile Ser Gly Ser
275 280 285

Val Leu Tyr Asn Gln Asp Glu Lys Gly Ser Tyr Ser Leu Gly Ile Phe
290 295 300

Gly Gly Gln Ala Gln Glu Val Ala Gly Ser Ala Glu Val Glu Thr Ala

281
280

305 310 315 320

Asn Gly Ile His His Ile Gly Leu Ala Ala Lys Gln
325 330

<210> 332
<211> 1310
<212> DNA
<213> Neisseria meningitides

<400> 332

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tgccgtctga accgttgttc ggacggcatt tgatttttgc ttctttgacc tgcctcattg 120

atgcagtatg caaaaaaaga taccataacc aaaatgttta tatatcatct attctgcgta 180

tgactaggag caaacctgtg aaccgaactg ccttccgctg cttttctctg accgccgccc 240

tgattctgac cgcctgcgga tccagcagcg gaggcggcgg tgtcgccgcc gacatcggcg 300

cggggcttgc cgatgcacta accgcaccgc tcgaccataa agacagaagt ttgcagtctt 360

tgacgctgga tcagtccgtc aggaaaaacg agaaactgaa gctggcggca caaggtgcgg 420

aaaaaactta tggaaacggc gacagcctta atacgggcaa attgaagaac gacaaggtca 480

gccgtttcga ctttatccgt caaatcgaag tggacgggca gctcattacc ttggagagcg 540

gagagttcca agtgtacaaa caaagccatt ccgccttaac cgcccttcag accgagcaag 600

aacaagatcc agagcattcc gggaagatgg ttgcgaaacg ccggttcaaa atcggcgaca 660

tagcgggcga acatacatct tttgacaagc ttcccaaaga cgtcatggcg acatatcgcg 720

ggacggcgtt cggttcagac gatgccggcg gaaaactgac ctatactata gattttgctg 780

ccaaacaggg acacggcaaa atcgaacatt tgaaatcgcc cgaactcaat gtcgagcttg 840

ccaccgccta tatcaagccg gatgaaaaac accatgccgt catcagcggt tccgtccttt 900

acaatcaaga cgagaaaggc agttactccc tcggtatctt tggcgggcaa gcccaggaag 960

ttgccggcag cgcggaagtg gaaaccgcaa acggcataca ccatatcggt cttgccgcca 1020

agcaataacc attgtgaaaa tgccgtccga acacgataat ttaccgttcg gacggcattt 1080

ttgcgccata ccgccctagg acacgacggc acggcaggca agccggtttc actatataat 1140

gccgtctgaa ccaacgagag aatgccatgc aagctgattt taaccgcccc gtcctcgccg 1200

tcgataccgg aacttcctat ttgtcgctcg cgctgcgcgc cgacggcgaa acctgcctgt 1260

tccatcagga agtcggcagc cgccagtccg cactgattct gccggaaatc 1310

282
281

<210> 333
<211> 333
<212> PRT
<213> Neisseria meningitides

<400> 333

Thr Lys Ser Ser Asn Asn Arg Leu Leu Val Asn Lys Met Pro Ser Glu
1 5 10 15

Pro Leu Phe Gly Arg His Leu Ile Phe Ala Ser Leu Thr Cys Leu Ile
20 25 30

Asp Ala Val Cys Lys Lys Arg Tyr His Asn Gln Asn Val Tyr Ile Ser
35 40 45

Ser Ile Leu Arg Met Thr Arg Ser Lys Pro Val Asn Arg Thr Ala Phe
50 55 60

Arg Cys Phe Ser Leu Thr Ala Ala Leu Ile Leu Thr Ala Cys Gly Ser
65 70 75 80

Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu Ala Asp
85 90 95

Ala Leu Thr Ala Pro Leu Asp His Lys Asp Arg Ser Leu Gln Ser Leu
100 105 110

Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu Ala Ala
115 120 125

Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn Thr Gly
130 135 140

Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg Gln Ile
145 150 155 160

Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe Gln Val
165 170 175

Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr Glu Gln Glu
180 185 190

Gln Asp Pro Glu His Ser Gly Lys Met Val Ala Lys Arg Arg Phe Lys
195 200 205

Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu Pro Lys
210 215 220

Asp Val Met Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp Asp Ala
225 230 235 240

Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly His
245 250 255

Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Glu Leu Ala
260 265 270

Thr Ala Tyr Ile Lys Pro Asp Glu Lys His His Ala Val Ile Ser Gly
275 280 285

Ser Val Leu Tyr Asn Gln Asp Glu Lys Gly Ser Tyr Ser Leu Gly Ile
290 295 300

Phe Gly Gly Gln Ala Gln Glu Val Ala Gly Ser Ala Glu Val Glu Thr
305 310 315 320

Ala Asn Gly Ile His His Ile Gly Leu Ala Ala Lys Gln
325 330

<210> 334
<211> 1304
<212> DNA
<213> Neisseria meningitides

<400> 334

ccgttatgcc aagggcgaat tgaaccaaat cgtcaaataa caggttgctt gtaaacaaaa 60

tgccgtctga accgttgttc ggacggcatt tgatttttgc ttctttgacc tgcctcattg 120

atgcagtatg caaaaaaaga taccataacc aaaatgttta tatatcatct attctgcgta 180

tgactaggag caaacctgtg aaccgaactg ccttccgctg cttttctctg accgccgccc 240

tgattctgac cgccatgagc agcggaggcg gcggtgtcgc cgccgacatc ggcgcggggc 300

ttgccgatgc actaaccgca ccgctcgacc ataaagacag aagtttgcag tctttgacgc 360

tggatcagtc cgtcaggaaa aacgagaaac tgaagctggc ggcacaaggt gcggaaaaaa 420

284

283

cttatggaaa cggcgacagc cttaatacgg gcaaattgaa gaacgacaag gtcagccgtt 480

tcgactttat ccgtcaaatc gaagtggacg ggcagctcat taccttggag agcggagagt 540

tccaagtgta caaacaaagc cattccgcct taaccgccct tcagaccgag caagaacaag 600

atccagagca ttccgggaag atggttgcga aacgccggtt caaaatcggc gacatagcgg 660

gcgaacatac atcttttgac aagcttccca aagacgtcat ggcgacatat cgcgggacgg 720

cgttcggttc agacgatgcc ggcggaaaac tgacctatac tatagatttt gctgccaaac 780

agggacacgg caaaatcgaa catttgaaat cgcccgaact caatgtcgag cttgccaccg 840

cctatatcaa gccggatgaa aaacaccatg ccgtcatcag cggttccgtc ctttacaatc 900

aagacgagaa aggcagttac tccctcggta tctttggcgg gcaagcccag gaagttgccg 960

gcagcgcgga agtggaaacc gcaaacggca tacaccatat cggtcttgcc gccaagcaat 1020

aaccattgtg aaaatgccgt ccgaacacga taatttaccg ttcggacggc atttttgcgc 1080

cataccgccc taggacacga cggcacggca ggcaagccgg tttcactata taatgccgtc 1140

tgaaccaacg agagaatgcc atgcaagctg attttaaccg ccccgtcctc gccgtcgata 1200

ccggaacttc ctatttgtcg ctcgcgctgc gcgccgacgg cgaaacctgc ctgttccatc 1260

aggaagtcgg cagccgccag tccgcactga ttctgccgga aatc 1304

<210> 335
<211> 332
<212> PRT
<213> Neisseria meningitides

<400> 335

Thr Lys Ser Ser Asn Asn Arg Leu Leu Val Asn Lys Met Pro Ser Glu
1 5 10 15

Pro Leu Phe Gly Arg His Leu Ile Phe Ala Ser Leu Thr Cys Leu Ile
20 25 30

Asp Ala Val Cys Lys Lys Arg Tyr His Asn Gln Asn Val Tyr Ile Ser
35 40 45

Ser Ile Leu Arg Met Thr Arg Ser Lys Pro Val Asn Arg Thr Ala Phe
50 55 60

Arg Cys Phe Ser Leu Thr Ala Ala Leu Ile Leu Thr Ala Met Ser Ser
65 70 75 80

285
~~284~~

```
Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu Ala Asp Ala
                85                  90                  95

Leu Thr Ala Pro Leu Asp His Lys Asp Arg Ser Leu Gln Ser Leu Thr
            100                 105                 110

Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu Ala Ala Gln
        115                 120                 125

Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn Thr Gly Lys
    130                 135                 140

Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg Gln Ile Glu
145                 150                 155                 160

Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe Gln Val Tyr
                165                 170                 175

Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr Glu Gln Glu Gln
            180                 185                 190

Asp Pro Glu His Ser Gly Lys Met Val Ala Lys Arg Arg Phe Lys Ile
        195                 200                 205

Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu Pro Lys Asp
    210                 215                 220

Val Met Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp Asp Ala Gly
225                 230                 235                 240

Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly His Gly
                245                 250                 255

Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Glu Leu Ala Thr
            260                 265                 270

Ala Tyr Ile Lys Pro Asp Glu Lys His His Ala Val Ile Ser Gly Ser
        275                 280                 285

Val Leu Tyr Asn Gln Asp Glu Lys Gly Ser Tyr Ser Leu Gly Ile Phe
    290                 295                 300
```


286

~~285~~

Gly Gly Gln Ala Gln Glu Val Ala Gly Ser Ala Glu Val Glu Thr Ala
305 310 315 320

Asn Gly Ile His His Ile Gly Leu Ala Ala Lys Gln
325 330

<210> 336
<211> 1322
<212> DNA
<213> Neisseria meningitides

<400> 336

ccettccgtt atgccaaggg cgaattgaac caaatcgtca aataacaggt tgcctgtaaa 60

caaaatgccg tctgaaccgc cgttcggacg acatttgatt tttgcttctt tgacctgcct 120

cattgatgcg gtatgcaaaa aaagatacca taaccaaaat gtttatatat tatctattct 180

gcgtatgact aggagtaaac ctgtgaatcg aactgccttc tgctgccttt ctctgaccac 240

tgccctgatt ctgaccgcct gcagcagcgg agggggtggt gtcgccgccg acatcggtgc 300

ggggcttgcc gatgcactaa ccgcaccgct cgaccataaa gacaaaggtt tgcagtcttt 360

gacgctggat cagtccgtca ggaaaaacga gaaactgaag ctggcggcac aaggtgcgga 420

aaaaacttat ggaaacggtg acagcctcaa tacgggcaaa ttgaagaacg acaaggtcag 480

ccgtttcgac tttatccgcc aaatcgaagt ggacgggcag ctcattacct tggagagtgg 540

agagttccaa gtatacaaac aaagccattc cgccttaacc gcctttcaga ccgagcaaat 600

acaagattcg gagcattccg ggaagatggt tgcgaaacgc cagttcagaa tcggcgacat 660

agcgggcgaa catacatctt ttgacaagct tcccgaaggc ggcagggcga catatcgcgg 720

gacggcgttc ggttcagacg atgccggcgg aaaactgacc tacaccatag atttcgccgc 780

caagcaggga aacggcaaaa tcgaacattt gaaatcgcca gaactcaatg tcgacctggc 840

cgccgccgat atcaagccgg atggaaaacg ccatgccgtc atcagcggtt ccgtccttta 900

caaccaagcc gagaaaggca gttactccct cggtatcttt ggcggaaaag cccaggaagt 960

tgccggcagc gcggaagtga aaaccgtaaa cggcatacgc catatcggcc ttgccgccaa 1020

gcaataacca ttgtgaaaat gccgtccgaa cacgataatt taccgttcgg acggcatttt 1080

gtattgcacc gtccgacggc atgcccaagg ggggaaatcc ctattttcag gccaaccgct 1140

atataatgcc gtctgaacca acgagagaat gccatgcaag ctgattttaa ccgtcccgtc 1200

ctggccgtcg ataccggtac ttcccgtttg tcgctcgcgc tgcgtgccga cggcgaaacc 1260

287
286

cgtctgttcc atcaggaagt cggcagccgc cagtccgaac tgattctgcc ggaaatcaag 1320

gg 1322

<210> 337
<211> 331
<212> PRT
<213> Neisseria meningitides

<400> 337

Lys Ser Ser Asn Asn Arg Leu Pro Val Asn Lys Met Pro Ser Glu Pro
1 5 10 15

Pro Phe Gly Arg His Leu Ile Phe Ala Ser Leu Thr Cys Leu Ile Asp
20 25 30

Ala Val Cys Lys Lys Arg Tyr His Asn Gln Asn Val Tyr Ile Leu Ser
35 40 45

Ile Leu Arg Met Thr Arg Ser Lys Pro Val Asn Arg Thr Ala Phe Cys
50 55 60

Cys Leu Ser Leu Thr Thr Ala Leu Ile Leu Thr Ala Cys Ser Ser Gly
65 70 75 80

Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu Ala Asp Ala Leu
85 90 95

Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln Ser Leu Thr Leu
100 105 110

Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu Ala Ala Gln Gly
115 120 125

Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn Thr Gly Lys Leu
130 135 140

Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg Gln Ile Glu Val
145 150 155 160

Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe Gln Val Tyr Lys
165 170 175

Gln Ser His Ser Ala Leu Thr Ala Phe Gln Thr Glu Gln Ile Gln Asp
180 185 190

288
287

Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln Phe Arg Ile Gly
195 200 205

Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu Pro Glu Gly Gly
210 215 220

Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp Asp Ala Gly Gly
225 230 235 240

Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly Asn Gly Lys
245 250 255

Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp Leu Ala Ala Ala
260 265 270

Asp Ile Lys Pro Asp Gly Lys Arg His Ala Val Ile Ser Gly Ser Val
275 280 285

Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser Leu Gly Ile Phe Gly
290 295 300

Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val Lys Thr Val Asn
305 310 315 320

Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
325 330

<210> 338
<211> 1327
<212> DNA
<213> Neisseria meningitides

<400> 338

ccttccgtta tgccaagggc gaattgaacc aaatcgtcaa ataacaggtt gcctgtaaac 60

aaaatgccgt ctgaaccgcc gttcggacga catttgattt ttgcttcttt gacctgcctc 120

attgatgcgg tatgcaaaaa aagataccat aaccaaaatg tttatatatt atctatttctg 180

cgtatgacta ggagtaaacc tgtgaatcga actgccttct gctgcctttc tctgaccact 240

gccctgattc tgaccgcctg cggatccagc agcggagggg gtggtgtcgc cgccgacatc 300

ggtgcggggc ttgccgatgc actaaccgca ccgctcgacc ataaagacaa aggtttgcag 360

289
~~288~~

tctttgacgc tggatcagtc cgtcaggaaa aacgagaaac tgaagctggc ggcacaaggt 420

gcggaaaaaa cttatggaaa cggtgacagc ctcaatacgg gcaaattgaa gaacgacaag 480

gtcagccgtt tcgactttat ccgccaaatc gaagtggacg ggcagctcat taccttggag 540

agtggagagt tccaagtata caaacaaagc cattccgcct taaccgcctt tcagaccgag 600

caaatacaag attcggagca ttccgggaag atggttgcga aacgccagtt cagaatcggc 660

gacatagcgg gcgaacatac atcttttgac aagcttcccg aaggcggcag ggcgacatat 720

cgcgggacgg cgttcggttc agacgatgcc ggcggaaaac tgacctacac catagatttc 780

gccgccaagc agggaaacgg caaaatcgaa catttgaaat cgccagaact caatgtcgac 840

ctggccgccg ccgatatcaa gccggatgga aaacgccatg ccgtcatcag cggttccgtc 900

ctttacaacc aagccgagaa aggcagttac tccctcggta tctttggcgg aaaagcccag 960

gaagttgccg gcagcgcgga agtgaaaacc gtaaacggca tacgccatat cggccttgcc 1020

gccaagcaat aaccattgtg aaaatgccgt ccgaacacga taatttaccg ttcggacggc 1080

attttgtatt gcaccgtccg acggcatgcc caaggggga aatccctatt ttcaggccaa 1140

ccgctatata atgccgtctg aaccaacgag agaatgccat gcaagctgat tttaaccgtc 1200

ccgtcctggc cgtcgatacc ggtacttccc gtttgtcgct cgcgctgcgt gccgacggcg 1260

aaacccgtct gttccatcag gaagtcggca gccgccagtc cgaactgatt ctgccggaaa 1320

tcaaggg 1327

<210> 339
<211> 333
<212> PRT
<213> Neisseria meningitides

<400> 339

Thr Lys Ser Ser Asn Asn Arg Leu Pro Val Asn Lys Met Pro Ser Glu
1 5 10 15

Pro Pro Phe Gly Arg His Leu Ile Phe Ala Ser Leu Thr Cys Leu Ile
20 25 30

Asp Ala Val Cys Lys Lys Arg Tyr His Asn Gln Asn Val Tyr Ile Leu
35 40 45

Ser Ile Leu Arg Met Thr Arg Ser Lys Pro Val Asn Arg Thr Ala Phe
50 55 60

240
~~289~~

```
Cys Cys Leu Ser Leu Thr Thr Ala Leu Ile Leu Thr Ala Cys Gly Ser
65                  70                  75                  80

Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu Ala Asp
                85                  90                  95

Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln Ser Leu
            100                 105                 110

Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu Ala Ala
        115                 120                 125

Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn Thr Gly
    130                 135                 140

Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg Gln Ile
145                 150                 155                 160

Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe Gln Val
                165                 170                 175

Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Phe Gln Thr Glu Gln Ile
            180                 185                 190

Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln Phe Arg
        195                 200                 205

Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu Pro Glu
    210                 215                 220

Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp Asp Ala
225                 230                 235                 240

Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly Asn
                245                 250                 255

Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp Leu Ala
            260                 265                 270

Ala Ala Asp Ile Lys Pro Asp Gly Lys Arg His Ala Val Ile Ser Gly
        275                 280                 285

Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser Leu Gly Ile
```

290 295 300

Phe Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val Lys Thr
305 310 315 320

Val Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
325 330

<210> 340
<211> 1322
<212> DNA
<213> Neisseria meningitides

<400> 340

ccctttccgtt atgccaaggg cgaattgaac caaatcgtca aataacaggt tgcctgtaaa 60

caaaatgccg tctgaaccgc cgttcggacg acatttgatt tttgcttctt tgacctgcct 120

cattgatgcg gtatgcaaaa aaagatacca taaccaaaat gtttatatat tatctattct 180

gcgtatgact aggagtaaac ctgtgaatcg aactgccttc tgctgccttt ctctgaccac 240

tgccctgatt ctgaccgcca tgagcagcgg agggggtggt gtcgccgccg acatcggtgc 300

ggggcttgcc gatgcactaa ccgcaccgct cgaccataaa gacaaaggtt tgcagtcttt 360

gacgctggat cagtccgtca ggaaaaacga gaaactgaag ctggcggcac aaggtgcgga 420

aaaaacttat ggaaacggtg acagcctcaa tacgggcaaa ttgaagaacg acaaggtcag 480

ccgtttcgac tttatccgcc aaatcgaagt ggacgggcag ctcattacct tggagagtgg 540

agagttccaa gtatacaaac aaagccattc cgccttaacc gcctttcaga ccgagcaaat 600

acaagattcg gagcattccg ggaagatggt tgcgaaacgc cagttcagaa tcggcgacat 660

agcgggcgaa catacatctt ttgacaagct tcccgaaggc ggcagggcga catatcgcgg 720

gacggcgttc ggttcagacg atgccggcgg aaaactgacc tacaccatag atttcgccgc 780

caagcaggga aacggcaaaa tcgaacattt gaaatcgcca gaactcaatg tcgacctggc 840

cgccgccgat atcaagccgg atggaaaacg ccatgccgtc atcagcggtt ccgtccttta 900

caaccaagcc gagaaaggca gttactccct cggtatcttt ggcggaaaag cccaggaagt 960

tgccggcagc gcggaagtga aaaccgtaaa cggcatacgc catatcggcc ttgccgccaa 1020

gcaataacca ttgtgaaaat gccgtccgaa cacgataatt taccgttcgg acggcatttt 1080

gtattgcacc gtccgacggc atgcccaagg ggggaaatcc ctattttcag gccaaccgct 1140

atataatgcc gtctgaacca acgagagaat gccatgcaag ctgattttaa ccgtcccgtc 1200

292
297

ctggccgtcg ataccggtac ttcccgtttg tcgctcgcgc tgcgtgccga cggcgaaacc 1260

cgtctgttcc atcaggaagt cggcagccgc cagtccgaac tgattctgcc ggaaatcaag 1320

gg 1322

<210> 341
<211> 332
<212> PRT
<213> Neisseria meningitides .

<400> 341

Thr Lys Ser Ser Asn Asn Arg Leu Pro Val Asn Lys Met Pro Ser Glu
1 5 10 15

Pro Pro Phe Gly Arg His Leu Ile Phe Ala Ser Leu Thr Cys Leu Ile
20 25 30

Asp Ala Val Cys Lys Lys Arg Tyr His Asn Gln Asn Val Tyr Ile Leu
35 40 45

Ser Ile Leu Arg Met Thr Arg Ser Lys Pro Val Asn Arg Thr Ala Phe
50 55 60

Cys Cys Leu Ser Leu Thr Thr Ala Leu Ile Leu Thr Ala Met Ser Ser
65 70 75 80

Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu Ala Asp Ala
85 90 95

Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln Ser Leu Thr
100 105 110

Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu Ala Ala Gln
115 120 125

Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn Thr Gly Lys
130 135 140

Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg Gln Ile Glu
145 150 155 160

Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe Gln Val Tyr
165 170 175

293
292

Lys Gln Ser His Ser Ala Leu Thr Ala Phe Gln Thr Glu Gln Ile Gln
180 185 190

Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln Phe Arg Ile
195 200 205

Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu Pro Glu Gly
210 215 220

Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp Asp Ala Gly
225 230 235 240

Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly Asn Gly
245 250 255

Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp Leu Ala Ala
260 265 270

Ala Asp Ile Lys Pro Asp Gly Lys Arg His Ala Val Ile Ser Gly Ser
275 280 285

Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser Leu Gly Ile Phe
290 295 300

Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val Lys Thr Val
305 310 315 320

Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
325 330

<210> 342
<211> 1311
<212> DNA
<213> Neisseria meningitides

<400> 342

cgttatgcca agggcgaatt gaaccaaatc gtcaaataac aggttgcctg taaacaaaat 60

gccgtctgaa ccgccgttcg gacgacattt gatttttgct tctttgacct gcctcattga 120

tgcggtatgc aaaaaaagat accataacca aaatgtttat atattatcta ttctgcgtat 180

gactaggagt aaacctgtga atcgaactgc cttctgctgc ctttctctga ccactgccct 240

gattctgacc gcctgcagca gcggaggggg tggtgtcgcc gccgacatcg gtgcggggct 300

294
~~293~~

tgccgatgca ctaaccgcac cgctcgacca taaagacaaa ggtttgcagt ctttgacgct 360

ggatcagtcc gtcaggaaaa acgagaaact gaagctggcg gcacaaggtg cggaaaaaac 420

ttatggaaac ggtgacagcc tcaatacggg caaattgaag aacgacaagg tcagccgttt 480

cgactttatc cgccaaatcg aagtggacgg gcagctcatt accttggaga gtggagagtt 540

ccaagtatac aaacaaagcc attccgcctt aaccgccttt cagaccgagc aaatacaaga 600

ttcggagcat tccgggaaga tggttgcgaa acgccagttc agaatcggcg acatagcggg 660

cgaacataca tcttttgaca agcttcccga aggcggcagg gcgacatatc gcgggacggc 720

gttcggttca gacgatgccg gcggaaaact gacctacacc atagatttcg ccgccaagca 780

gggaaacggc aaaatcgaac atttgaaatc gccagaactc aatgtcgacc tggccgccgc 840

cgatatcaag ccggatggaa aacgccatgc cgtcatcagc ggttccgtcc tttacaacca 900

agccgagaaa ggcagttact ccctcggtat ctttggcgga aaagcccagg aagttgccgg 960

cagcgcggaa gtgaaaaccg taaacggcat acgccatatc ggccttgccg ccaagcaata 1020

accattgtga aaatgccgtc cgaacacgat aatttaccgt tcggacggca ttttgtattg 1080

caccgtccga cggcatgccc aaggggggaa atccctattt tcaggccaac cgctatataa 1140

tgccgtctga accaacgaga gaatgccatg caagctgatt ttaaccgtcc cgtcctggcc 1200

gtcgataccg gtacttcccg tttgtcgctc gcgctgcgtg ccgacggcga aacccgtctg 1260

ttccatcagg aagtcggcag ccgccagtcc gaactgattc tgccggaaat c 1311

<210> 343
<211> 332
<212> PRT
<213> Neisseria meningitides

<400> 343

Thr Lys Ser Ser Asn Asn Arg Leu Pro Val Asn Lys Met Pro Ser Glu
1 5 10 15

Pro Pro Phe Gly Arg His Leu Ile Phe Ala Ser Leu Thr Cys Leu Ile
20 25 30

Asp Ala Val Cys Lys Lys Arg Tyr His Asn Gln Asn Val Tyr Ile Leu
35 40 45

Ser Ile Leu Arg Met Thr Arg Ser Lys Pro Val Asn Arg Thr Ala Phe
50 55 60

295
~~294~~

```
Cys Cys Leu Ser Leu Thr Thr Ala Leu Ile Leu Thr Ala Cys Ser Ser
65                  70                  75                  80

Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu Ala Asp Ala
                85                  90                  95

Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln Ser Leu Thr
            100                 105                 110

Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu Ala Ala Gln
        115                 120                 125

Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn Thr Gly Lys
    130                 135                 140

Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg Gln Ile Glu
145                 150                 155                 160

Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe Gln Val Tyr
                165                 170                 175

Lys Gln Ser His Ser Ala Leu Thr Ala Phe Gln Thr Glu Gln Ile Gln
            180                 185                 190

Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln Phe Arg Ile
        195                 200                 205

Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu Pro Glu Gly
    210                 215                 220

Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp Asp Ala Gly
225                 230                 235                 240

Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly Asn Gly
                245                 250                 255

Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp Leu Ala Ala
            260                 265                 270

Ala Asp Ile Lys Pro Asp Gly Lys Arg His Ala Val Ile Ser Gly Ser
        275                 280                 285
```


296

~~295~~

Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser Leu Gly Ile Phe
290 295 300

Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val Lys Thr Val
305 310 315 320

Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
325 330

<210> 344
<211> 1318
<212> DNA
<213> Neisseria meningitides

<400> 344

ccgttatgcc aagggcgaat tgaaccaaat cgtcaaataa caggttgcct gtaaacaaaa 60

tgccgtctga accgccgttc ggacgacatt tgatttttgc ttctttgacc tgcctcattg 120

atgcggtatg caaaaaaaga taccataacc aaaatgttta tatattatct attctgcgta 180

tgactaggag taaacctgtg aatcgaactg cctttctgctg cctttctctg accactgccc 240

tgattctgac cgcctgcgga tccagcagcg gaggggtgg tgtcgccgcc gacatcggtg 300

cggggcttgc cgatgcacta accgcaccgc tcgaccataa agacaaaggt ttgcagtctt 360

tgacgctgga tcagtccgtc aggaaaaacg agaaactgaa gctggcggca caaggtgcgg 420

aaaaaactta tggaaacggt gacagcctca atacgggcaa attgaagaac gacaaggtca 480

gccgtttcga ctttatccgc caaatcgaag tggacgggca gctcattacc ttggagagtg 540

gagagttcca agtatacaaa caaagccatt ccgccttaac cgcctttcag accgagcaaa 600

tacaagattc ggagcattcc gggaagatgg ttgcgaaacg ccagttcaga atcggcgaca 660

tagcgggcga acatacatct tttgacaagc ttcccgaagg cggcagggcg acatatcgcg 720

ggacggcgtt cggttcagac gatgccggcg gaaaactgac ctacaccata gatttcgccg 780

ccaagcaggg aaacggcaaa atcgaacatt tgaaatcgcc agaactcaat gtcgacctgg 840

ccgccgccga tatcaagccg gatggaaaac gccatgccgt catcagcggt tccgtccttt 900

acaaccaagc cgagaaaggc agttactccc tcggtatctt tggcggaaaa gcccaggaag 960

ttgccggcag cgcggaagtg aaaaccgtaa acggcatacg ccatatcggc cttgccgcca 1020

agcaataacc attgtgaaaa tgccgtccga acacgataat ttaccgttcg gacggcattt 1080

tgtattgcac cgtccgacgg catgcccaag gggggaaatc cctattttca ggccaaccgc 1140

297
296

tatataatgc cgtctgaacc aacgagagaa tgccatgcaa gctgatttta accgtcccgt 1200

cctggccgtc gataccggta cttcccgttt gtcgctcgcg ctgcgtgccg acggcgaaac 1260

ccgtctgttc catcaggaag tcggcagccg ccagtccgaa ctgattctgc cggaaatc 1318

<210> 345
<211> 333
<212> PRT
<213> Neisseria meningitides

<400> 345

Thr Lys Ser Ser Asn Asn Arg Leu Pro Val Asn Lys Met Pro Ser Glu
1 5 10 15

Pro Pro Phe Gly Arg His Leu Ile Phe Ala Ser Leu Thr Cys Leu Ile
20 25 30

Asp Ala Val Cys Lys Lys Arg Tyr His Asn Gln Asn Val Tyr Ile Leu
35 40 45

Ser Ile Leu Arg Met Thr Arg Ser Lys Pro Val Asn Arg Thr Ala Phe
50 55 60

Cys Cys Leu Ser Leu Thr Thr Ala Leu Ile Leu Thr Ala Cys Gly Ser
65 70 75 80

Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu Ala Asp
85 90 95

Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln Ser Leu
100 105 110

Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu Ala Ala
115 120 125

Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn Thr Gly
130 135 140

Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg Gln Ile
145 150 155 160

Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe Gln Val
165 170 175

298
297

```
Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Phe Gln Thr Glu Gln Ile
            180                 185                 190

Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln Phe Arg
        195                 200                 205

Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu Pro Glu
    210                 215                 220

Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp Asp Ala
225                 230                 235                 240

Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly Asn
                245                 250                 255

Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp Leu Ala
            260                 265                 270

Ala Ala Asp Ile Lys Pro Asp Gly Lys Arg His Ala Val Ile Ser Gly
        275                 280                 285

Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser Leu Gly Ile
    290                 295                 300

Phe Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val Lys Thr
305                 310                 315                 320

Val Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
                325                 330
```

<210> 346
<211> 1312
<212> DNA
<213> Neisseria meningitides

<400> 346

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ccgttatgcc aagggcgaat tgaaccaaat cgtcaaataa caggttgcct gtaaacaaaa     60

tgccgtctga accgccgttc ggacgacatt tgatttttgc ttctttgacc tgcctcattg    120

atgcggtatg caaaaaaaga taccataacc aaaatgttta tatattatct attctgcgta    180

tgactaggag taaacctgtg aatcgaactg ccttctgctg cctttctctg accactgccc    240

tgattctgac cgccatgagc agcggagggg gtggtgtcgc cgccgacatc ggtgcggggc    300
```


299
~~298~~

ttgccgatgc actaaccgca ccgctcgacc ataaagacaa aggtttgcag tctttgacgc 360

tggatcagtc cgtcaggaaa aacgagaaac tgaagctggc ggcacaaggt gcggaaaaaa 420

cttatggaaa cggtgacagc ctcaatacgg gcaaattgaa gaacgacaag gtcagccgtt 480

tcgactttat ccgccaaatc gaagtggacg ggcagctcat taccttggag agtggagagt 540

tccaagtata caaacaaagc cattccgcct taaccgcctt tcagaccgag caaatacaag 600

attcggagca ttccgggaag atggttgcga aacgccagtt cagaatcggc gacatagcgg 660

gcgaacatac atcttttgac aagcttcccg aaggcggcag ggcgacatat cgcgggacgg 720

cgttcggttc agacgatgcc ggcggaaaac tgacctacac catagatttc gccgccaagc 780

agggaaacgg caaaatcgaa catttgaaat cgccagaact caatgtcgac ctggccgccg 840

ccgatatcaa gccggatgga aaacgccatg ccgtcatcag cggttccgtc ctttacaacc 900

aagccgagaa aggcagttac tccctcggta tctttggcgg aaaagcccag gaagttgccg 960

gcagcgcgga agtgaaaacc gtaaacggca tacgccatat cggccttgcc gccaagcaat 1020

aaccattgtg aaaatgccgt ccgaacacga taatttaccg ttcggacggc attttgtatt 1080

gcaccgtccg acggcatgcc caaggggga aatccctatt ttcaggccaa ccgctatata 1140

atgccgtctg aaccaacgag agaatgccat gcaagctgat tttaaccgtc ccgtcctggc 1200

cgtcgatacc ggtacttccc gtttgtcgct cgcgctgcgt gccgacggcg aaacccgtct 1260

gttccatcag gaagtcggca gccgccagtc cgaactgatt ctgccggaaa tc 1312

<210> 347
<211> 332
<212> PRT
<213> Neisseria meningitides

<400> 347

Thr Lys Ser Ser Asn Asn Arg Leu Pro Val Asn Lys Met Pro Ser Glu
1 5 10 15

Pro Pro Phe Gly Arg His Leu Ile Phe Ala Ser Leu Thr Cys Leu Ile
20 25 30

Asp Ala Val Cys Lys Lys Arg Tyr His Asn Gln Asn Val Tyr Ile Leu
35 40 45

Ser Ile Leu Arg Met Thr Arg Ser Lys Pro Val Asn Arg Thr Ala Phe
50 55 60

300
299

```
Cys Cys Leu Ser Leu Thr Thr Ala Leu Ile Leu Thr Ala Met Ser Ser
65                  70                  75                  80

Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu Ala Asp Ala
                85                  90                  95

Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln Ser Leu Thr
            100                 105                 110

Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu Ala Ala Gln
        115                 120                 125

Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn Thr Gly Lys
    130                 135                 140

Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg Gln Ile Glu
145                 150                 155                 160

Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe Gln Val Tyr
                165                 170                 175

Lys Gln Ser His Ser Ala Leu Thr Ala Phe Gln Thr Glu Gln Ile Gln
            180                 185                 190

Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln Phe Arg Ile
        195                 200                 205

Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu Pro Glu Gly
    210                 215                 220

Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp Asp Ala Gly
225                 230                 235                 240

Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly Asn Gly
                245                 250                 255

Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp Leu Ala Ala
            260                 265                 270

Ala Asp Ile Lys Pro Asp Gly Lys Arg His Ala Val Ile Ser Gly Ser
        275                 280                 285

Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser Leu Gly Ile Phe
```

290 295 300

Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val Lys Thr Val
305 310 315 320

Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
325 330

<210> 348
<211> 1491
<212> DNA
<213> Neisseria meningitides

<400> 348

ccgttatgcc aagggcgaat tgaaccaaat cgtcaaataa caggttgctt gtaaacaaaa 60

tgccgtctga accgttgttc ggacggcatt tgatttttgc ttctttgacc tgcctcattg 120

atgcagtatg caaaaaaaga taccataacc aaaatgttta tatattgaga cctttgcaat 180

aacataggtt actaaaattt tatgctcaat ctcattttca aaatgcaaaa cttttctgat 240

ttttcctact ttttgctcaa tattaggaag gtttttaggc aattgaaaat tttttggcgc 300

atttttatgc gtcaaatttc gttaacagac tatttttgca aaggtctcat attatctatt 360

ctgcgtatga ctaggagcaa acctgtgaac cgaactgcct tctgctgcct ttctttgacc 420

gccgccctga ttctgaccgc ctgcagcagc ggaggcggcg gtgtcgccgc cgacatcggc 480

gcggggcttg ccgatgcact aaccgcaccg ctcgaccata aagacaaaag tttgcagtct 540

ttgacgctgg atcagtccgt caggaaaaac gagaaactga agctggcggc acaaggtgcg 600

gaaaaaactt atggaaacgg cgacagcctc aatacgggca aattgaagaa cgacaaggtc 660

agccgcttcg actttatccg tcaaatcgaa gtggacgggc agctcattac cttggagagc 720

ggagagttcc aagtgtacaa acaaagccat tccgccttaa ccgcccttca gaccgagcaa 780

gtacaagatt cggagcattc agggaagatg gttgcgaaac gccagttcag aatcggcgat 840

atagcgggtg aacatacatc ttttgacaaa cttcccgaag gcggcagggc gacatatcgc 900

gggacggcat tcggttcaga cgatgccagt ggaaaactga cctacaccat agatttcgcc 960

gccaagcagg gacacggcaa aatcgaacat ttgaaatcgc cagaactcaa tgttgacctg 1020

gccgcctccg atatcaagcc ggataaaaaa cgccatgccg tcatcagcgg ttccgtcctt 1080

tacaaccaag ccgagaaagg cagttactct ctaggcatct ttggcgggca agcccaggaa 1140

gttgccggca gcgcagaagt ggaaaccgca aacggcatac gccatatcgg tcttgccgcc 1200

302
301

aagcagtaac cattgtgaaa atgccgtccg aacacgataa tttaccgttc ggacggcatt 1260

tttgcgccat accgccctag atacgacggc acggcaggca agccggtttc actatataat 1320

gccgtctgaa ccaacgagaa ccacaccatg caagccgatt tcaaccgccc cgtcctcgcc 1380

gtcgataccg gaacttccta tttgtcgctc gcgctgcgcg ccgacggcga aacccgtctg 1440

ttccatcagg aagtcggcag ccgccagtcc gcactgattc tgccggaaat c 1491

<210> 349
<211> 337
<212> PRT
<213> Neisseria meningitides

<400> 349

Asn Phe Met Leu Asn Leu Ile Phe Lys Met Gln Asn Phe Ser Asp Phe
1 5 10 15

Ser Tyr Phe Leu Leu Asn Ile Arg Lys Val Phe Arg Gln Leu Lys Ile
20 25 30

Phe Trp Arg Ile Phe Met Arg Gln Ile Ser Leu Thr Asp Tyr Phe Cys
35 40 45

Lys Gly Leu Ile Leu Ser Ile Leu Arg Met Thr Arg Ser Lys Pro Val
50 55 60

Asn Arg Thr Ala Phe Cys Cys Leu Ser Leu Thr Ala Ala Leu Ile Leu
65 70 75 80

Thr Ala Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala
85 90 95

Gly Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser
100 105 110

Leu Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu
115 120 125

Lys Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser
130 135 140

Leu Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe
145 150 155 160

Ile Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly
165 170 175

Glu Phe Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln
180 185 190

Thr Glu Gln Val Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys
195 200 205

Arg Gln Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp
210 215 220

Lys Leu Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly
225 230 235 240

Ser Asp Asp Ala Ser Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala
245 250 255

Lys Gln Gly His Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn
260 265 270

Val Asp Leu Ala Ala Ser Asp Ile Lys Pro Asp Lys Lys Arg His Ala
275 280 285

Val Ile Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr
290 295 300

Ser Leu Gly Ile Phe Gly Gly Gln Ala Gln Glu Val Ala Gly Ser Ala
305 310 315 320

Glu Val Glu Thr Ala Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys
325 330 335

Gln

<210> 350
<211> 1497
<212> DNA
<213> Neisseria meningitides

<400> 350

ccgttatgcc aagggcgaat tgaaccaaat cgtcaaataa caggttgctt gtaaacaaaa 60

tgccgtctga accgttgttc ggacggcatt tgatttttgc ttctttgacc tgcctcattg 120

atgcagtatg caaaaaaaga taccataacc aaaatgttta tatattgaga cctttgcaat 180

aacataggtt actaaaattt tatgctcaat ctcattttca aaatgcaaaa cttttctgat 240

ttttcctact ttttgctcaa tattaggaag gtttttaggc aattgaaaat ttttttggcgc 300

atttttatgc gtcaaatttc gttaacagac tatttttgca aaggtctcat attatctatt 360

ctgcgtatga ctaggagcaa acctgtgaac cgaactgcct tctgctgcct ttctttgacc 420

gccgccctga ttctgaccgc ctgcggatcc agcagcggag gcggcggtgt cgccgccgac 480

atcggcgcgg ggcttgccga tgcactaacc gcaccgctcg accataaaga caaaagtttg 540

cagtctttga cgctggatca gtccgtcagg aaaaacgaga aactgaagct ggcggcacaa 600

ggtgcggaaa aaacttatgg aaacggcgac agcctcaata cgggcaaatt gaagaacgac 660

aaggtcagcc gcttcgactt tatccgtcaa atcgaagtgg acgggcagct cattaccttg 720

gagagcggag agttccaagt gtacaaacaa agccattccg ccttaaccgc ccttcagacc 780

gagcaagtac aagattcgga gcattcaggg aagatggttg cgaaacgcca gttcagaatc 840

ggcgatatag cgggtgaaca tacatctttt gacaaacttc ccgaaggcgg cagggcgaca 900

tatcgcggga cggcattcgg ttcagacgat gccagtggaa aactgaccta caccatagat 960

ttcgccgcca agcagggaca cggcaaaatc gaacatttga aatcgccaga actcaatgtt 1020

gacctggccg cctccgatat caagccggat aaaaaacgcc atgccgtcat cagcggttcc 1080

gtcctttaca accaagccga gaaaggcagt tactctctag gcatctttgg cgggcaagcc 1140

caggaagttg ccggcagcgc agaagtggaa accgcaaacg gcatacgcca tatcggtctt 1200

gccgccaagc agtaaccatt gtgaaaatgc cgtccgaaca cgataattta ccgttcggac 1260

ggcatttttg cgccataccg ccctagatac gacggcacgg caggcaagcc ggtttcacta 1320

tataatgccg tctgaaccaa cgagaaccac accatgcaag ccgatttcaa ccgccccgtc 1380

ctcgccgtcg ataccggaac ttcctatttg tcgctcgcgc tgcgcgccga cggcgaaacc 1440

cgtctgttcc atcaggaagt cggcagccgc cagtccgcac tgattctgcc ggaaatc 1497

<210> 351
<211> 338
<212> PRT
<213> Neisseria meningitides

<400> 351

305
304

```
Asn Phe Met Leu Asn Leu Ile Phe Lys Met Gln Asn Phe Ser Asp Phe
1               5                  10                  15

Ser Tyr Phe Leu Leu Asn Ile Arg Lys Val Phe Arg Gln Leu Lys Ile
            20                  25                  30

Phe Trp Arg Ile Phe Met Arg Gln Ile Ser Leu Thr Asp Tyr Phe Cys
        35                  40                  45

Lys Gly Leu Ile Leu Ser Ile Leu Arg Met Thr Arg Ser Lys Pro Val
    50                  55                  60

Asn Arg Thr Ala Phe Cys Cys Leu Ser Leu Thr Ala Ala Leu Ile Leu
65                  70                  75                  80

Thr Ala Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly
                85                  90                  95

Ala Gly Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys
            100                 105                 110

Ser Leu Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys
        115                 120                 125

Leu Lys Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp
    130                 135                 140

Ser Leu Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp
145                 150                 155                 160

Phe Ile Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser
                165                 170                 175

Gly Glu Phe Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu
            180                 185                 190

Gln Thr Glu Gln Val Gln Asp Ser Glu His Ser Gly Lys Met Val Ala
        195                 200                 205

Lys Arg Gln Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe
    210                 215                 220
```


306
~~305~~

Asp Lys Leu Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe
225 230 235 240

Gly Ser Asp Asp Ala Ser Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala
245 250 255

Ala Lys Gln Gly His Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu
260 265 270

Asn Val Asp Leu Ala Ala Ser Asp Ile Lys Pro Asp Lys Lys Arg His
275 280 285

Ala Val Ile Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser
290 295 300

Tyr Ser Leu Gly Ile Phe Gly Gly Gln Ala Gln Glu Val Ala Gly Ser
305 310 315 320

Ala Glu Val Glu Thr Ala Asn Gly Ile Arg His Ile Gly Leu Ala Ala
325 330 335

Lys Gln

<210> 352
<211> 1491
<212> DNA
<213> Neisseria meningitides

<400> 352

ccgttatgcc aagggcgaat tgaaccaaat cgtcaaataa caggttgctt gtaaacaaaa 60

tgccgtctga accgttgttc ggacggcatt tgatttttgc ttctttgacc tgcctcattg 120

atgcagtatg caaaaaaaga taccataacc aaaatgttta tatattgaga cctttgcaat 180

aacataggtt actaaaattt tatgctcaat ctcattttca aaatgcaaaa cttttctgat 240

ttttcctact ttttgctcaa tattaggaag gtttttaggc aattgaaaat tttttggcgc 300

atttttatgc gtcaaatttc gttaacagac tatttttgca aaggtctcat attatctatt 360

ctgcgtatga ctaggagcaa acctgtgaac cgaactgcct tctgctgcct ttctttgacc 420

gccgccctga ttctgaccgc catgagcagc ggaggcggcg gtgtcgccgc cgacatcggc 480

gcggggcttg ccgatgcact aaccgcaccg ctcgaccata aagacaaaag tttgcagtct 540

307
306

ttgacgctgg atcagtccgt caggaaaaac gagaaactga agctggcggc acaaggtgcg 600

gaaaaaactt atggaaacgg cgacagcctc aatacgggca aattgaagaa cgacaaggtc 660

agccgcttcg actttatccg tcaaatcgaa gtggacgggc agctcattac cttggagagc 720

ggagagttcc aagtgtacaa acaaagccat tccgccttaa ccgcccttca gaccgagcaa 780

gtacaagatt cggagcattc agggaagatg gttgcgaaac gccagttcag aatcggcgat 840

atagcgggtg aacatacatc ttttgacaaa cttcccgaag gcggcagggc gacatatcgc 900

gggacggcat tcggttcaga cgatgccagt ggaaaactga cctacaccat agatttcgcc 960

gccaagcagg gacacggcaa aatcgaacat ttgaaatcgc cagaactcaa tgttgacctg 1020

gccgcctccg atatcaagcc ggataaaaaa cgccatgccg tcatcagcgg ttccgtcctt 1080

tacaaccaag ccgagaaagg cagttactct ctaggcatct ttggcgggca agcccaggaa 1140

gttgccggca gcgcagaagt ggaaaccgca aacggcatac gccatatcgg tcttgccgcc 1200

aagcagtaac cattgtgaaa atgccgtccg aacacgataa tttaccgttc ggacggcatt 1260

tttgcgccat accgccctag atacgacggc acggcaggca agccggtttc actatataat 1320

gccgtctgaa ccaacgagaa ccacaccatg caagccgatt tcaaccgccc cgtcctcgcc 1380

gtcgataccg gaacttccta tttgtcgctc gcgctgcgcg ccgacggcga aacccgtctg 1440

ttccatcagg aagtcggcag ccgccagtcc gcactgattc tgccggaaat c 1491

<210> 353
<211> 337
<212> PRT
<213> Neisseria meningitides

<400> 353

Asn Phe Met Leu Asn Leu Ile Phe Lys Met Gln Asn Phe Ser Asp Phe
1 5 10 15

Ser Tyr Phe Leu Leu Asn Ile Arg Lys Val Phe Arg Gln Leu Lys Ile
20 25 30

Phe Trp Arg Ile Phe Met Arg Gln Ile Ser Leu Thr Asp Tyr Phe Cys
35 40 45

Lys Gly Leu Ile Leu Ser Ile Leu Arg Met Thr Arg Ser Lys Pro Val
50 55 60

Asn Arg Thr Ala Phe Cys Cys Leu Ser Leu Thr Ala Ala Leu Ile Leu

308
307

65 70 75 80

Thr Ala Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala
85 90 95

Gly Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser
100 105 110

Leu Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu
115 120 125

Lys Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser
130 135 140

Leu Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe
145 150 155 160

Ile Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly
165 170 175

Glu Phe Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln
180 185 190

Thr Glu Gln Val Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys
195 200 205

Arg Gln Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp
210 215 220

Lys Leu Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly
225 230 235 240

Ser Asp Asp Ala Ser Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala
245 250 255

Lys Gln Gly His Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn
260 265 270

Val Asp Leu Ala Ala Ser Asp Ile Lys Pro Asp Lys Lys Arg His Ala
275 280 285

Val Ile Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr
290 295 300

309
~~308~~

Ser Leu Gly Ile Phe Gly Gly Gln Ala Gln Glu Val Ala Gly Ser Ala
305 310 315 320

Glu Val Glu Thr Ala Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys
325 330 335

Gln

<210> 354
<211> 768
<212> DNA
<213> Neisseria meningitides

<400> 354

tgcagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca agtgtacaaa 300

caaagccatt ccgccttaac cgccccttcag accgagcaag tacaagattc ggagcattca 360

gggaagatgg ttgcgaaacg ccagttcaga atcggcgata tagcgggtga acatacatct 420

tttgacaaac ttcccgaagg cggcagggcg acatatcgcg ggacggcatt cggttcagac 480

gatgccagtg gaaaactgac ctacaccata gatttcgccg ccaagcaggg acacggcaaa 540

atcgaacatt tgaaatcgcc agaactcaat gttgacctgg ccgcctccga tatcaagccg 600

gataaaaaac gccatgccgt catcagcggt tccgtccttt acaaccaagc cgagaaaggc 660

agttactctc taggcatctt tggcgggcaa gcccaggaag ttgccggcag cgcagaagtg 720

gaaaccgcaa acggcatacg ccatatcggt cttgccgcca agcagtaa 768

<210> 355
<211> 255
<212> PRT
<213> Neisseria meningitides

<400> 355

Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

310
309

```
Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
            20                  25                  30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
        35                  40                  45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
    50                  55                  60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65                  70                  75                  80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
                85                  90                  95

Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr Glu
            100                 105                 110

Gln Val Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln
        115                 120                 125

Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu
    130                 135                 140

Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp
145                 150                 155                 160

Asp Ala Ser Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
                165                 170                 175

Gly His Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp
            180                 185                 190

Leu Ala Ala Ser Asp Ile Lys Pro Asp Lys Lys Arg His Ala Val Ile
        195                 200                 205

Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser Leu
    210                 215                 220

Gly Ile Phe Gly Gly Gln Ala Gln Glu Val Ala Gly Ser Ala Glu Val
225                 230                 235                 240
```


311

310

Glu Thr Ala Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
245 250 255

<210> 356
<211> 774
<212> DNA
<213> Neisseria meningitides

<400> 356

tgcggatcca gcagcggagg cggcggtgtc gccgccgaca tcggcgcggg gcttgccgat 60

gcactaaccg caccgctcga ccataaagac aaaagtttgc agtctttgac gctggatcag 120

tccgtcagga aaaacgagaa actgaagctg gcggcacaag gtgcggaaaa aacttatgga 180

aacggcgaca gcctcaatac gggcaaattg aagaacgaca aggtcagccg cttcgacttt 240

atccgtcaaa tcgaagtgga cgggcagctc attaccttgg agagcggaga gttccaagtg 300

tacaaacaaa gccattccgc cttaaccgcc cttcagaccg agcaagtaca agattcggag 360

cattcaggga agatggttgc gaaacgccag ttcagaatcg gcgatatagc gggtgaacat 420

acatcttttg acaaacttcc cgaaggcggc agggcgacat atcgcgggac ggcattcggt 480

tcagacgatg ccagtggaaa actgacctac accatagatt tcgccgccaa gcagggacac 540

ggcaaaatcg aacatttgaa atcgccagaa ctcaatgttg acctggccgc ctccgatatc 600

aagccggata aaaaacgcca tgccgtcatc agcggttccg tcctttacaa ccaagccgag 660

aaaggcagtt actctctagg catctttggc gggcaagccc aggaagttgc cggcagcgca 720

gaagtggaaa ccgcaaacgg catacgccat atcggtcttg ccgccaagca gtaa 774

<210> 357
<211> 256
<212> PRT
<213> Neisseria meningitides

<400> 357

Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1 5 10 15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu
20 25 30

Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
35 40 45

312
377

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
50 55 60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65 70 75 80

Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu
85 90 95

Phe Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr
100 105 110

Glu Gln Val Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg
115 120 125

Gln Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys
130 135 140

Leu Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser
145 150 155 160

Asp Asp Ala Ser Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys
165 170 175

Gln Gly His Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val
180 185 190

Asp Leu Ala Ala Ser Asp Ile Lys Pro Asp Lys Lys Arg His Ala Val
195 200 205

Ile Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser
210 215 220

Leu Gly Ile Phe Gly Gly Gln Ala Gln Glu Val Ala Gly Ser Ala Glu
225 230 235 240

Val Glu Thr Ala Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
245 250 255

<210> 358
<211> 768
<212> DNA
<213> Neisseria meningitides

313
~~312~~

<400> 358

atgagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca agtgtacaaa 300

caaagccatt ccgccttaac cgcccttcag accgagcaag tacaagattc ggagcattca 360

gggaagatgg ttgcgaaacg ccagttcaga atcggcgata tagcgggtga acatacatct 420

tttgacaaac ttcccgaagg cggcagggcg acatatcgcg ggacggcatt cggttcagac 480

gatgccagtg gaaaactgac ctacaccata gatttcgccg ccaagcaggg acacggcaaa 540

atcgaacatt tgaaatcgcc agaactcaat gttgacctgg ccgcctccga tatcaagccg 600

gataaaaaac gccatgccgt catcagcggt tccgtccttt acaaccaagc cgagaaaggc 660

agttactctc taggcatctt tggcgggcaa gcccaggaag ttgccggcag cgcagaagtg 720

gaaaccgcaa acggcatacg ccatatcggt cttgccgcca agcagtaa 768

<210> 359
<211> 255
<212> PRT
<213> Neisseria meningitides

<400> 359

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe

314

~~313~~

85 90 95

Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr Glu
100 105 110

Gln Val Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln
115 120 125

Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu
130 135 140

Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp
145 150 155 160

Asp Ala Ser Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
165 170 175

Gly His Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp
180 185 190

Leu Ala Ala Ser Asp Ile Lys Pro Asp Lys Lys Arg His Ala Val Ile
195 200 205

Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser Leu
210 215 220

Gly Ile Phe Gly Gly Gln Ala Gln Glu Val Ala Gly Ser Ala Glu Val
225 230 235 240

Glu Thr Ala Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
245 250 255

<210> 360
<211> 1332
<212> DNA
<213> Neisseria meningitides

<400> 360

agaattcccc ttcgttatgc caagggcgaa ttgaaccaaa tcgtcaaata acaggttgcc 60

ggtaaacaaa atgccgtctg aaccgctgtt cggacggcat ttgatttttg ctttgacctg 120

cctcattgat gcagtatgca aaaaaagata ccataaccaa aatgtttata tattatctat 180

tctgcgtatg acaaggagta aacctgtgaa ccgaactacc ttctgttgcc tttctttgac 240

cgccgccctg attctgaccg cctgcagcag cggaggggge ggtgtcgccg ccgacatcgg 300

tgcggggctt gccgatgcac taaccgcacc gctcgaccat aaagacaaaa gtttgcagtc 360

tttgacgctg gatcagtccg tcaggaaaaa cgagaaactg aagctggcgg cacaaggtgc 420

ggaaaaaact tatggaaacg gcgacagcct caatacgggc aaattgaaga acgacaaggt 480

cagccgcttc gactttatcc gtcaaatcga agtggacggg cagctcatta ccttggagag 540

cggagagttc caagtgtaca aacaaagcca ttccgccttа accgcccttc agaccgagca 600

agtacaagat tcggagcatt cagggaagat ggttgcgaaa cgccagttca gaatcggcga 660

tatagcgggt gaacatacat cttttgacaa gcttcccgaa ggcggcaggg cgacatatcg 720

cgggacggcg ttcagttcag acgatgccgg tggaaaactg acctacacca tagatttcgc 780

cgccaagcag ggacacggca aaatcgaaca tttgaaatcg ccagaactca atgttgatct 840

ggccgccgcc gatatcaagc cggatgaaaa acaccatgcc gtcatcagcg gttccgtcct 900

ttacaaccaa gacgagaaag gcagttactc cctcggtatc tttggcggaa aagcccagga 960

agttgccggc agcgcggaag tgaaaaccgt aaacggcata cgccatatcg gccttgccgc 1020

caagcaataa ccattgtgaa aatgccgtcc gaacacaata atttaccgtt cggacggcat 1080

tttgtattgc accgtccgac ggcatgtccg agggggggaga tccctatttt caggccaacc 1140

gctatataat gccgtctgaa ccaacgagag aataccatgc aagctgattt taaccgtccc 1200

gtcctggccg tcgataccgg tacttcccgt ttgtcgctcg cgctgcgtgc cgacggcgaa 1260

acccgtctgt tccatcagga agtcggcagc cgccagtccg aactgattct gccggaaatc 1320

aagggcgaat tc 1332

<210> 361
<211> 331
<212> PRT
<213> Neisseria meningitides

<400> 361

Thr Lys Ser Ser Asn Asn Arg Leu Pro Val Asn Lys Met Pro Ser Glu
1 5 10 15

Pro Leu Phe Gly Arg His Leu Ile Phe Ala Leu Thr Cys Leu Ile Asp
20 25 30

Ala Val Cys Lys Lys Arg Tyr His Asn Gln Asn Val Tyr Ile Leu Ser
35 40 45

316
315

Ile Leu Arg Met Thr Arg Ser Lys Pro Val Asn Arg Thr Thr Phe Cys
50 55 60

Cys Leu Ser Leu Thr Ala Ala Leu Ile Leu Thr Ala Cys Ser Ser Gly
65 70 75 80

Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu Ala Asp Ala Leu
85 90 95

Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln Ser Leu Thr Leu
100 105 110

Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu Ala Ala Gln Gly
115 120 125

Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn Thr Gly Lys Leu
130 135 140

Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg Gln Ile Glu Val
145 150 155 160

Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe Gln Val Tyr Lys
165 170 175

Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr Glu Gln Val Gln Asp
180 185 190

Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln Phe Arg Ile Gly
195 200 205

Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu Pro Glu Gly Gly
210 215 220

Arg Ala Thr Tyr Arg Gly Thr Ala Phe Ser Ser Asp Asp Ala Gly Gly
225 230 235 240

Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly His Gly Lys
245 250 255

Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp Leu Ala Ala Ala
260 265 270

Asp Ile Lys Pro Asp Glu Lys His His Ala Val Ile Ser Gly Ser Val
275 280 285

Leu Tyr Asn Gln Asp Glu Lys Gly Ser Tyr Ser Leu Gly Ile Phe Gly
290 295 300

Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val Lys Thr Val Asn
305 310 315 320

Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
325 330

<210> 362
<211> 1338
<212> DNA
<213> Neisseria meningitides

<400> 362

agaattcccc ttcgttatgc caagggcgaa ttgaaccaaa tcgtcaaata acaggttgcc 60

ggtaaacaaa atgccgtctg aaccgctgtt cggacggcat ttgatttttg ctttgacctg 120

cctcattgat gcagtatgca aaaaaagata ccataaccaa aatgtttata tattatctat 180

tctgcgtatg acaaggagta aacctgtgaa ccgaactacc ttctgttgcc tttctttgac 240

cgccgccctg attctgaccg cctgcggatc cagcagcgga gggggcggtg tcgccgccga 300

catcggtgcg gggcttgccg atgcactaac cgcaccgctc gaccataaag acaaaagttt 360

gcagtctttg acgctggatc agtccgtcag gaaaaacgag aaactgaagc tggcggcaca 420

aggtgcggaa aaaacttatg gaaacggcga cagcctcaat acgggcaaat tgaagaacga 480

caaggtcagc cgcttcgact ttatccgtca aatcgaagtg gacgggcagc tcattacctt 540

ggagagcgga gagttccaag tgtacaaaca aagccattcc gccttaaccg cccttcagac 600

cgagcaagta caagattcgg agcattcagg gaagatggtt gcgaaacgcc agttcagaat 660

cggcgatata gcgggtgaac atacatcttt tgacaagctt cccgaaggcg gcagggcgac 720

atatcgcggg acggcgttca gttcagacga tgccggtgga aaactgacct acaccataga 780

tttcgccgcc aagcagggac acggcaaaat cgaacatttg aaatcgccag aactcaatgt 840

tgatctggcc gccgccgata tcaagccgga tgaaaaacac catgccgtca tcagcggttc 900

cgtcctttac aaccaagacg agaaaggcag ttactccctc ggtatctttg gcggaaaagc 960

ccaggaagtt gccggcagcg cggaagtgaa aaccgtaaac ggcatacgcc atatcggcct 1020

318
317

tgccgccaag caataaccat tgtgaaaatg ccgtccgaac acaataattt accgttcgga 1080

cggcattttg tattgcaccg tccgacggca tgtccgaggg gggagatccc tattttcagg 1140

ccaaccgcta tataatgccg tctgaaccaa cgagagaata ccatgcaagc tgattttaac 1200

cgtcccgtcc tggccgtcga taccggtact tcccgtttgt cgctcgcgct gcgtgccgac 1260

ggcgaaaccc gtctgttcca tcaggaagtc ggcagccgcc agtccgaact gattctgccg 1320

gaaatcaagg gcgaattc 1338

<210> 363
<211> 332
<212> PRT
<213> Neisseria meningitides

<400> 363

Thr Lys Ser Ser Asn Asn Arg Leu Pro Val Asn Lys Met Pro Ser Glu
1 5 10 15

Pro Leu Phe Gly Arg His Leu Ile Phe Ala Leu Thr Cys Leu Ile Asp
20 25 30

Ala Val Cys Lys Lys Arg Tyr His Asn Gln Asn Val Tyr Ile Leu Ser
35 40 45

Ile Leu Arg Met Thr Arg Ser Lys Pro Val Asn Arg Thr Thr Phe Cys
50 55 60

Cys Leu Ser Leu Thr Ala Ala Leu Ile Leu Thr Ala Cys Gly Ser Ser
65 70 75 80

Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu Ala Asp Ala
85 90 95

Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln Ser Leu Thr
100 105 110

Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu Ala Ala Gln
115 120 125

Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn Thr Gly Lys
130 135 140

Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg Gln Ile Glu
145 150 155 160

Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe Gln Val Tyr
165 170 175

Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr Glu Gln Val Gln
180 185 190

Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln Phe Arg Ile
195 200 205

Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu Pro Glu Gly
210 215 220

Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Ser Ser Asp Asp Ala Gly
225 230 235 240

Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly His Gly
245 250 255

Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp Leu Ala Ala
260 265 270

Ala Asp Ile Lys Pro Asp Glu Lys His His Ala Val Ile Ser Gly Ser
275 280 285

Val Leu Tyr Asn Gln Asp Glu Lys Gly Ser Tyr Ser Leu Gly Ile Phe
290 295 300

Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val Lys Thr Val
305 310 315 320

Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
325 330

<210> 364
<211> 1332
<212> DNA
<213> Neisseria meningitides

<400> 364

agaattcccc ttcgttatgc caagggcgaa ttgaaccaaa tcgtcaaata acaggttgcc 60

ggtaaacaaa atgccgtctg aaccgctgtt cggacggcat ttgatttttg ctttgacctg 120

320
349

cctcattgat gcagtatgca aaaaaagata ccataaccaa aatgtttata tattatctat 180

tctgcgtatg acaaggagta aacctgtgaa ccgaactacc ttctgttgcc tttctttgac 240

cgccgccctg attctgaccg ccatgagcag cggaggggge ggtgtcgccg ccgacatcgg 300

tgcggggctt gccgatgcac taaccgcacc gctcgaccat aaagacaaaa gtttgcagtc 360

tttgacgctg gatcagtccg tcaggaaaaa cgagaaactg aagctggcgg cacaaggtgc 420

ggaaaaaact tatggaaacg gcgacagcct caatacgggc aaattgaaga acgacaaggt 480

cagccgcttc gactttatcc gtcaaatcga agtggacggg cagctcatta ccttggagag 540

cggagagttc caagtgtaca aacaaagcca ttccgcctta accgcccttc agaccgagca 600

agtacaagat tcggagcatt cagggaagat ggttgcgaaa cgccagttca gaatcggcga 660

tatagcgggt gaacatacat cttttgacaa gcttcccgaa ggcggcaggg cgacatatcg 720

cgggacggcg ttcagttcag acgatgccgg tggaaaactg acctacacca tagatttcgc 780

cgccaagcag ggacacggca aaatcgaaca tttgaaatcg ccagaactca atgttgatct 840

ggccgccgcc gatatcaagc cggatgaaaa acaccatgcc gtcatcagcg gttccgtcct 900

ttacaaccaa gacgagaaag gcagttactc cctcggtatc tttggcggaa aagcccagga 960

agttgccggc agcgcggaag tgaaaaccgt aaacggcata cgccatatcg gccttgccgc 1020

caagcaataa ccattgtgaa aatgccgtcc gaacacaata atttaccgtt cggacggcat 1080

tttgtattgc accgtccgac ggcatgtccg agggggggaga tccctatttt caggccaacc 1140

gctatataat gccgtctgaa ccaacgagag aataccatgc aagctgattt taaccgtccc 1200

gtcctggccg tcgataccgg tacttcccgt ttgtcgctcg cgctgcgtgc cgacggcgaa 1260

acccgtctgt tccatcagga agtcggcagc cgccagtccg aactgattct gccggaaatc 1320

aagggcgaat tc 1332

<210> 365
<211> 331
<212> PRT
<213> Neisseria meningitides

<400> 365

Thr Lys Ser Ser Asn Asn Arg Leu Pro Val Asn Lys Met Pro Ser Glu
1 5 10 15

Pro Leu Phe Gly Arg His Leu Ile Phe Ala Leu Thr Cys Leu Ile Asp
20 25 30

321
322

Ala Val Cys Lys Lys Arg Tyr His Asn Gln Asn Val Tyr Ile Leu Ser
35 40 45

Ile Leu Arg Met Thr Arg Ser Lys Pro Val Asn Arg Thr Thr Phe Cys
50 55 60

Cys Leu Ser Leu Thr Ala Ala Leu Ile Leu Thr Ala Met Ser Ser Gly
65 70 75 80

Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu Ala Asp Ala Leu
85 90 95

Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln Ser Leu Thr Leu
100 105 110

Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu Ala Ala Gln Gly
115 120 125

Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn Thr Gly Lys Leu
130 135 140

Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg Gln Ile Glu Val
145 150 155 160

Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe Gln Val Tyr Lys
165 170 175

Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr Glu Gln Val Gln Asp
180 185 190

Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln Phe Arg Ile Gly
195 200 205

Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu Pro Glu Gly Gly
210 215 220

Arg Ala Thr Tyr Arg Gly Thr Ala Phe Ser Ser Asp Asp Ala Gly Gly
225 230 235 240

Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly His Gly Lys
245 250 255

Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp Leu Ala Ala Ala

322

~~321~~

260 265 270

Asp Ile Lys Pro Asp Glu Lys His His Ala Val Ile Ser Gly Ser Val
275 280 285

Leu Tyr Asn Gln Asp Glu Lys Gly Ser Tyr Ser Leu Gly Ile Phe Gly
290 295 300

Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val Lys Thr Val Asn
305 310 315 320

Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
325 330

<210> 366
<211> 768
<212> DNA
<213> Neisseria meningitides

<400> 366

tgcagcagcg gaggggcgg tgtcgccgcc gacatcggtg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca agtgtacaaa 300

caaagccatt ccgccttaac cgcccttcag accgagcaag tacaagattc ggagcattca 360

gggaagatgg ttgcgaaacg ccagttcaga atcggcgata tagcgggtga acatacatct 420

tttgacaagc ttcccgaagg cggcagggcg acatatcgcg ggacggcgtt cagttcagac 480

gatgccggtg gaaaactgac ctacaccata gatttcgccg ccaagcaggg acacggcaaa 540

atcgaacatt tgaaatcgcc agaactcaat gttgatctgg ccgccgccga tatcaagccg 600

gatgaaaaac accatgccgt catcagcggt tccgtccttt acaaccaaga cgagaaaggc 660

agttactccc tcggtatctt tggcggaaaa gcccaggaag ttgccggcag cgcggaagtg 720

aaaaccgtaa acggcatacg ccatatcggc cttgccgcca agcaataa 768

<210> 367
<211> 255
<212> PRT
<213> Neisseria meningitides

323
322

<400> 367

```
Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1               5                  10                  15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
            20                  25                  30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
        35                  40                  45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
    50                  55                  60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65                  70                  75                  80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
                85                  90                  95

Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr Glu
            100                 105                 110

Gln Val Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln
        115                 120                 125

Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu
    130                 135                 140

Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Ser Ser Asp
145                 150                 155                 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
                165                 170                 175

Gly His Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp
            180                 185                 190

Leu Ala Ala Ala Asp Ile Lys Pro Asp Glu Lys His His Ala Val Ile
        195                 200                 205

Ser Gly Ser Val Leu Tyr Asn Gln Asp Glu Lys Gly Ser Tyr Ser Leu
    210                 215                 220
```


324

~~323~~

Gly Ile Phe Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val
225 230 235 240

Lys Thr Val Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
245 250 255

<210> 368
<211> 774
<212> DNA
<213> Neisseria meningitides

<400> 368

tgcggatcca gcagcggagg gggcggtgtc gccgccgaca tcggtgcggg gcttgccgat 60

gcactaaccg caccgctcga ccataaagac aaaagtttgc agtctttgac gctggatcag 120

tccgtcagga aaaacgagaa actgaagctg gcggcacaag gtgcggaaaa aacttatgga 180

aacggcgaca gcctcaatac gggcaaattg aagaacgaca aggtcagccg cttcgacttt 240

atccgtcaaa tcgaagtgga cgggcagctc attaccttgg agagcggaga gttccaagtg 300

tacaaacaaa gccattccgc cttaaccgcc cttcagaccg agcaagtaca agattcggag 360

cattcaggga agatggttgc gaaacgccag ttcagaatcg gcgatatagc gggtgaacat 420

acatcttttg acaagcttcc cgaaggcggc agggcgacat atcgcgggac ggcgttcagt 480

tcagacgatg ccggtggaaa actgacctac accatagatt tcgccgccaa gcagggacac 540

ggcaaaatcg aacatttgaa atcgccagaa ctcaatgttg atctggccgc cgccgatatc 600

aagccggatg aaaaacacca tgccgtcatc agcggttccg tcctttacaa ccaagacgag 660

aaaggcagtt actccctcgg tatctttggc ggaaaagccc aggaagttgc cggcagcgcg 720

gaagtgaaaa ccgtaaacgg catacgccat atcggccttg ccgccaagca ataa 774

<210> 369
<211> 256
<212> PRT
<213> Neisseria meningitides

<400> 369

Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1 5 10 15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu
20 25 30

325
324

```
Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
        35                  40                  45

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
    50                  55                  60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65                  70                  75                  80

Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu
                85                  90                  95

Phe Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr
            100                 105                 110

Glu Gln Val Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg
        115                 120                 125

Gln Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys
    130                 135                 140

Leu Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Ser Ser
145                 150                 155                 160

Asp Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys
                165                 170                 175

Gln Gly His Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val
            180                 185                 190

Asp Leu Ala Ala Ala Asp Ile Lys Pro Asp Glu Lys His His Ala Val
        195                 200                 205

Ile Ser Gly Ser Val Leu Tyr Asn Gln Asp Glu Lys Gly Ser Tyr Ser
    210                 215                 220

Leu Gly Ile Phe Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu
225                 230                 235                 240

Val Lys Thr Val Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
                245                 250                 255
```


~~325~~
326

<210> 370
<211> 768
<212> DNA
<213> Neisseria meningitides

<400> 370

atgagcagcg gagggggcgg tgtcgccgcc gacatcggtg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca agtgtacaaa 300

caaagccatt ccgccttaac cgcccttcag accgagcaag tacaagattc ggagcattca 360

gggaagatgg ttgcgaaacg ccagttcaga atcggcgata tagcgggtga acatacatct 420

tttgacaagc ttcccgaagg cggcagggcg acatatcgcg ggacggcgtt cagttcagac 480

gatgccggtg gaaaactgac ctacaccata gatttcgccg ccaagcaggg acacggcaaa 540

atcgaacatt tgaaatcgcc agaactcaat gttgatctgg ccgccgccga tatcaagccg 600

gatgaaaaac accatgccgt catcagcggt tccgtccttt acaaccaaga cgagaaaggc 660

agttactccc tcggtatctt tggcggaaaa gcccaggaag ttgccggcag cgcggaagtg 720

aaaaccgtaa acggcatacg ccatatcggc cttgccgcca agcaataa 768

<210> 371
<211> 255
<212> PRT
<213> Neisseria meningitides

<400> 371

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

~~326~~
327

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr Glu
100 105 110

Gln Val Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln
115 120 125

Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu
130 135 140

Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Ser Ser Asp
145 150 155 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
165 170 175

Gly His Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp
180 185 190

Leu Ala Ala Ala Asp Ile Lys Pro Asp Glu Lys His His Ala Val Ile
195 200 205

Ser Gly Ser Val Leu Tyr Asn Gln Asp Glu Lys Gly Ser Tyr Ser Leu
210 215 220

Gly Ile Phe Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val
225 230 235 240

Lys Thr Val Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
245 250 255

<210> 372
<211> 1312
<212> DNA
<213> Neisseria meningitides

<400> 372

ccgttatgcc aagggcgaat tgaaccaaat cgtcaaataa caggttgcct gtaaacaaaa 60

~~327~~
328

tgccgtctga accgccgttc ggacgacatt tgatttttgc ttctttgacc tgcctcattg 120

atgcgggatg caaaaaaaga taccataacc aaaatgttta tatattatct attctgcgta 180

tgactaggag taaacctgtg aatcgaactg cctttctgctg cctttctctg accactgccc 240

tgattctgac cgcctgcagc agcggagggg gtggtgtcgc cgccgacatc ggtgcggggc 300

ttgccgatgc actaaccgca ccgctcgacc ataaagacaa aggtttgcag tctttgacgc 360

tggatcagtc cgtcaggaaa aacgagaaac tgaagctggc ggcacaaggt gcggaaaaaa 420

cttatggaaa cggtgacagc ctcaatacgg gcaaattgaa gaacgacaag gtcagccgtt 480

tcgactttat ccgccaaatc gaagtggacg ggtagctcat taccttggag agtggagagt 540

tccaagtata caaacaaagc cattccgcct taaccgcctt tcagaccgag caaatacaag 600

attcggagca ttccgggaag atggttgcga aacgccagtt cagaatcggc gacatagcgg 660

gcgaacatac atcttttgac aagcttcccg aaggcggcag ggcgacatat cgcgggacgg 720

cgttcggttc agacgatgcc ggcggaaaac tgacctacac catagatttc gccgccaagc 780

agggaaacgg caaaatcgaa catttgaaat cgccagaact caatgtcgac ctggccgccg 840

ccgatatcaa gccggatgga aaacgccatg ccgtcatcag cggttccgtc ctttacaacc 900

aagccgagaa aggcagttac tccctcggta tctttggcgg aaaagcccag gaagttgccg 960

gcagcgcgga agtgaaaacc gtaaacggca tacgccatat cggccttgcc gccaagcaat 1020

aaccattgtg aaaatgccgt ccgaacacga taatttaccg ttcggacggc attttgtatt 1080

gcaccgtccg acggcatgcc caaggggga aatccctatt ttcaggccaa ccgctatata 1140

atgccgtctg aaccaacgag agaatgccat gcaagctgat tttaaccgtc ccgtcctggc 1200

cgtcgatacc ggtacttccc gtttgtcgct cgcgctgcgt gccgacggcg aaacccgtct 1260

gttccatcag gaagtcggca gccgccagtc cgaactgatt ctgccggaaa tc 1312

<210> 373
<211> 331
<212> PRT
<213> Neisseria meningitides

<400> 373

Thr Lys Ser Ser Asn Asn Arg Leu Pro Val Asn Lys Met Pro Ser Glu
1 5 10 15

Pro Pro Phe Gly Arg His Leu Ile Phe Ala Ser Leu Thr Cys Leu Ile
20 25 30

328
329

```
Asp Ala Gly Cys Lys Lys Arg Tyr His Asn Gln Asn Val Tyr Ile Leu
        35                  40                  45

Ser Ile Leu Arg Met Thr Arg Ser Lys Pro Val Asn Arg Thr Ala Phe
    50                  55                  60

Cys Cys Leu Ser Leu Thr Thr Ala Leu Ile Leu Thr Ala Cys Ser Ser
65                  70                  75                  80

Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu Ala Asp Ala
                85                  90                  95

Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln Ser Leu Thr
            100                 105                 110

Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu Ala Ala Gln
        115                 120                 125

Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn Thr Gly Lys
    130                 135                 140

Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg Gln Ile Glu
145                 150                 155                 160

Val Asp Gly Leu Ile Thr Leu Glu Ser Gly Glu Phe Gln Val Tyr Lys
                165                 170                 175

Gln Ser His Ser Ala Leu Thr Ala Phe Gln Thr Glu Gln Ile Gln Asp
            180                 185                 190

Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln Phe Arg Ile Gly
        195                 200                 205

Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu Pro Glu Gly Gly
    210                 215                 220

Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp Asp Ala Gly Gly
225                 230                 235                 240

Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly Asn Gly Lys
                245                 250                 255
```


329
330

Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp Leu Ala Ala Ala
260 265 270

Asp Ile Lys Pro Asp Gly Lys Arg His Ala Val Ile Ser Gly Ser Val
275 280 285

Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser Leu Gly Ile Phe Gly
290 295 300

Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val Lys Thr Val Asn
305 310 315 320

Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
325 330

<210> 374
<211> 1318
<212> DNA
<213> Neisseria meningitides

<400> 374

ccgttatgcc aagggcgaat tgaaccaaat cgtcaaataa caggttgcct gtaaacaaaa 60

tgccgtctga accgccgttc ggacgacatt tgatttttgc ttctttgacc tgcctcattg 120

atgcgggatg caaaaaaaga taccataacc aaaatgttta tatattatct attctgcgta 180

tgactaggag taaacctgtg aatcgaactg cctttctgctg cctttctctg accactgccc 240

tgattctgac cgcctgcgga tccagcagcg gaggggggtgg tgtcgccgcc gacatcggtg 300

cggggcttgc cgatgcacta accgcaccgc tcgaccataa agacaaaggt ttgcagtctt 360

tgacgctgga tcagtccgtc aggaaaaacg agaaactgaa gctggcggca caaggtgcgg 420

aaaaaactta tggaaacggt gacagcctca atacgggcaa attgaagaac gacaaggtca 480

gccgtttcga ctttatccgc caaatcgaag tggacgggta gctcattacc ttggagagtg 540

gagagttcca agtatacaaa caaagccatt ccgccttaac cgcctttcag accgagcaaa 600

tacaagattc ggagcattcc gggaagatgg ttgcgaaacg ccagttcaga atcggcgaca 660

tagcgggcga acatacatct tttgacaagc ttcccgaagg cggcagggcg acatatcgcg 720

ggacggcgtt cggttcagac gatgccggcg gaaaactgac ctacaccata gatttcgccg 780

ccaagcaggg aaacggcaaa atcgaacatt tgaaatcgcc agaactcaat gtcgacctgg 840

ccgccgccga tatcaagccg gatggaaaac gccatgccgt catcagcggt tccgtccttt 900

330
331

acaaccaagc cgagaaaggc agttactccc tcggtatctt tggcggaaaa gcccaggaag 960

ttgccggcag cgcggaagtg aaaaccgtaa acggcatacg ccatatcggc cttgccgcca 1020

agcaataacc attgtgaaaa tgccgtccga acacgataat ttaccgttcg gacggcattt 1080

tgtattgcac cgtccgacgg catgcccaag gggggaaatc cctattttca ggccaaccgc 1140

tatataatgc cgtctgaacc aacgagagaa tgccatgcaa gctgatttta accgtcccgt 1200

cctggccgtc gataccggta cttcccgttt gtcgctcgcg ctgcgtgccg acggcgaaac 1260

ccgtctgttc catcaggaag tcggcagccg ccagtccgaa ctgattctgc cggaaatc 1318

<210> 375
<211> 332
<212> PRT
<213> Neisseria meningitides

<400> 375

Thr Lys Ser Ser Asn Asn Arg Leu Pro Val Asn Lys Met Pro Ser Glu
1 5 10 15

Pro Pro Phe Gly Arg His Leu Ile Phe Ala Ser Leu Thr Cys Leu Ile
20 25 30

Asp Ala Gly Cys Lys Lys Arg Tyr His Asn Gln Asn Val Tyr Ile Leu
35 40 45

Ser Ile Leu Arg Met Thr Arg Ser Lys Pro Val Asn Arg Thr Ala Phe
50 55 60

Cys Cys Leu Ser Leu Thr Thr Ala Leu Ile Leu Thr Ala Cys Gly Ser
65 70 75 80

Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu Ala Asp
85 90 95

Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln Ser Leu
100 105 110

Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu Ala Ala
115 120 125

Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn Thr Gly
130 135 140

331
332

Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg Gln Ile
145 150 155 160

Glu Val Asp Gly Leu Ile Thr Leu Glu Ser Gly Glu Phe Gln Val Tyr
165 170 175

Lys Gln Ser His Ser Ala Leu Thr Ala Phe Gln Thr Glu Gln Ile Gln
180 185 190

Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln Phe Arg Ile
195 200 205

Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu Pro Glu Gly
210 215 220

Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp Asp Ala Gly
225 230 235 240

Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly Asn Gly
245 250 255

Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp Leu Ala Ala
260 265 270

Ala Asp Ile Lys Pro Asp Gly Lys Arg His Ala Val Ile Ser Gly Ser
275 280 285

Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser Leu Gly Ile Phe
290 295 300

Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val Lys Thr Val
305 310 315 320

Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
325 330

<210> 376
<211> 1312
<212> DNA
<213> Neisseria meningitides

<400> 376

ccgttatgcc aagggcgaat tgaaccaaat cgtcaaataa caggttgcct gtaaacaaaa 60

~~332~~
333

tgccgtctga accgccgttc ggacgacatt tgatttttgc ttctttgacc tgcctcattg 120

atgcgggatg caaaaaaaga taccataacc aaaatgttta tatattatct attctgcgta 180

tgactaggag taaacctgtg aatcgaactg ccttctgctg cctttctctg accactgccc 240

tgattctgac cgccatgagc agcggagggg gtggtgtcgc cgccgacatc ggtgcggggc 300

ttgccgatgc actaaccgca ccgctcgacc ataaagacaa aggtttgcag tctttgacgc 360

tggatcagtc cgtcaggaaa aacgagaaac tgaagctggc ggcacaaggt gcggaaaaaa 420

cttatggaaa cggtgacagc ctcaatacgg gcaaattgaa gaacgacaag gtcagccgtt 480

tcgactttat ccgccaaatc gaagtggacg ggtagctcat taccttggag agtggagagt 540

tccaagtata caaacaaagc cattccgcct taaccgcctt tcagaccgag caaatacaag 600

attcggagca ttccgggaag atggttgcga aacgccagtt cagaatcggc gacatagcgg 660

gcgaacatac atcttttgac aagcttcccg aaggcggcag ggcgacatat cgcgggacgg 720

cgttcggttc agacgatgcc ggcggaaaac tgacctacac catagatttc gccgccaagc 780

agggaaacgg caaaatcgaa catttgaaat cgccagaact caatgtcgac ctggccgccg 840

ccgatatcaa gccggatgga aaacgccatg ccgtcatcag cggttccgtc ctttacaacc 900

aagccgagaa aggcagttac tccctcggta tctttggcgg aaaagcccag gaagttgccg 960

gcagcgcgga agtgaaaacc gtaaacggca tacgccatat cggccttgcc gccaagcaat 1020

aaccattgtg aaaatgccgt ccgaacacga taatttaccg ttcggacggc attttgtatt 1080

gcaccgtccg acggcatgcc caaggggga aatccctatt ttcaggccaa ccgctatata 1140

atgccgtctg aaccaacgag agaatgccat gcaagctgat tttaaccgtc ccgtcctggc 1200

cgtcgatacc ggtacttccc gtttgtcgct cgcgctgcgt gccgacggcg aaacccgtct 1260

gttccatcag gaagtcggca gccgccagtc cgaactgatt ctgccggaaa tc 1312

<210> 377
<211> 331
<212> PRT
<213> Neisseria meningitides

<400> 377

Thr Lys Ser Ser Asn Asn Arg Leu Pro Val Asn Lys Met Pro Ser Glu
1 5 10 15

Pro Pro Phe Gly Arg His Leu Ile Phe Ala Ser Leu Thr Cys Leu Ile
20 25 30

333
334

Asp Ala Gly Cys Lys Lys Arg Tyr His Asn Gln Asn Val Tyr Ile Leu
35 40 45

Ser Ile Leu Arg Met Thr Arg Ser Lys Pro Val Asn Arg Thr Ala Phe
50 55 60

Cys Cys Leu Ser Leu Thr Thr Ala Leu Ile Leu Thr Ala Met Ser Ser
65 70 75 80

Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu Ala Asp Ala
85 90 95

Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln Ser Leu Thr
100 105 110

Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu Ala Ala Gln
115 120 125

Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn Thr Gly Lys
130 135 140

Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg Gln Ile Glu
145 150 155 160

Val Asp Gly Leu Ile Thr Leu Glu Ser Gly Glu Phe Gln Val Tyr Lys
165 170 175

Gln Ser His Ser Ala Leu Thr Ala Phe Gln Thr Glu Gln Ile Gln Asp
180 185 190

Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln Phe Arg Ile Gly
195 200 205

Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu Pro Glu Gly Gly
210 215 220

Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp Asp Ala Gly Gly
225 230 235 240

Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly Asn Gly Lys
245 250 255

Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp Leu Ala Ala Ala

~~334~~
335

260 265 270

Asp Ile Lys Pro Asp Gly Lys Arg His Ala Val Ile Ser Gly Ser Val
275 280 285

Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser Leu Gly Ile Phe Gly
290 295 300

Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val Lys Thr Val Asn
305 310 315 320

Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
325 330

<210> 378
<211> 768
<212> DNA
<213> Neisseria meningitides

<400> 378

tgcagcagcg gaggggtgg tgtcgccgcc gacatcggtg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaggt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggt 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgtttcga ctttatccgc 240

caaatcgaag tggacgggta gctcattacc ttggagagtg gagagttcca agtatacaaa 300

caaagccatt ccgccttaac cgcctttcag accgagcaaa tacaagattc ggagcattcc 360

gggaagatgg ttgcgaaacg ccagttcaga atcggcgaca tagcgggcga acatacatct 420

tttgacaagc ttcccgaagg cggcagggcg acatatcgcg ggacggcgtt cggttcagac 480

gatgccggcg gaaaactgac ctacaccata gatttcgccg ccaagcaggg aaacggcaaa 540

atcgaacatt tgaaatcgcc agaactcaat gtcgacctgg ccgccgccga tatcaagccg 600

gatggaaaac gccatgccgt catcagcggt tccgtccttt acaaccaagc cgagaaaggc 660

agttactccc tcggtatctt tggcggaaaa gcccaggaag ttgccggcag cgcggaagtg 720

aaaaccgtaa acggcatacg ccatatcggc cttgccgcca agcaataa 768

<210> 379
<211> 254
<212> PRT
<213> Neisseria meningitides

~~335~~
336

<400> 379

Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Leu Ile Thr Leu Glu Ser Gly Glu Phe Gln
85 90 95

Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Phe Gln Thr Glu Gln
100 105 110

Ile Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln Phe
115 120 125

Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu Pro
130 135 140

Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp Asp
145 150 155 160

Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly
165 170 175

Asn Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp Leu
180 185 190

Ala Ala Ala Asp Ile Lys Pro Asp Gly Lys Arg His Ala Val Ile Ser
195 200 205

Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser Leu Gly
210 215 220

~~336~~
337

Ile Phe Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val Lys
225 230 235 240

Thr Val Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
245 250

<210> 380
<211> 774
<212> DNA
<213> Neisseria meningitides

<400> 380

tgcggatcca gcagcggagg gggtggtgtc gccgccgaca tcggtgcggg gcttgccgat 60

gcactaaccg caccgctcga ccataaagac aaaggtttgc agtctttgac gctggatcag 120

tccgtcagga aaaacgagaa actgaagctg gcggcacaag gtgcggaaaa aacttatgga 180

aacggtgaca gcctcaatac gggcaaattg aagaacgaca aggtcagccg tttcgacttt 240

atccgccaaa tcgaagtgga cgggtagctc attaccttgg agagtggaga gttccaagta 300

tacaaacaaa gccattccgc cttaaccgcc tttcagaccg agcaaataca agattcggag 360

cattccggga agatggttgc gaaacgccag ttcagaatcg gcgacatagc gggcgaacat 420

acatcttttg acaagcttcc cgaaggcggc agggcgacat atcgcgggac ggcgttcggt 480

tcagacgatg ccggcggaaa actgacctac accatagatt tcgccgccaa gcagggaaac 540

ggcaaaatcg aacatttgaa atcgccagaa ctcaatgtcg acctggccgc cgccgatatc 600

aagccggatg gaaaacgcca tgccgtcatc agcggttccg tcctttacaa ccaagccgag 660

aaaggcagtt actccctcgg tatctttggc ggaaaagccc aggaagttgc cggcagcgcg 720

gaagtgaaaa ccgtaaacgg catacgccat atcggccttg ccgccaagca ataa 774

<210> 381
<211> 255
<212> PRT
<213> Neisseria meningitides

<400> 381

Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1 5 10 15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu
20 25 30

~~337~~
338

```
Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
        35                  40                  45

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
    50                  55                  60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65                  70                  75                  80

Arg Gln Ile Glu Val Asp Gly Leu Ile Thr Leu Glu Ser Gly Glu Phe
                85                  90                  95

Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Phe Gln Thr Glu
            100                 105                 110

Gln Ile Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln
        115                 120                 125

Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu
    130                 135                 140

Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp
145                 150                 155                 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
                165                 170                 175

Gly Asn Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp
            180                 185                 190

Leu Ala Ala Ala Asp Ile Lys Pro Asp Gly Lys Arg His Ala Val Ile
        195                 200                 205

Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser Leu
    210                 215                 220

Gly Ile Phe Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val
225                 230                 235                 240

Lys Thr Val Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
                245                 250                 255
```


~~338~~
339

<210> 382
<211> 768
<212> DNA
<213> Neisseria meningitides

<400> 382

atgagcagcg gagggggtgg tgtcgccgcc gacatcggtg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaggt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggt 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgtttcga ctttatccgc 240

caaatcgaag tggacgggta gctcattacc ttggagagtg gagagttcca agtatacaaa 300

caaagccatt ccgccttaac cgcctttcag accgagcaaa tacaagattc ggagcattcc 360

gggaagatgg ttgcgaaacg ccagttcaga atcggcgaca tagcgggcga acatacatct 420

tttgacaagc ttcccgaagg cggcagggcg acatatcgcg ggacggcgtt cggttcagac 480

gatgccggcg gaaaactgac ctacaccata gatttcgccg ccaagcaggg aaacggcaaa 540

atcgaacatt tgaaatcgcc agaactcaat gtcgacctgg ccgccgccga tatcaagccg 600

gatggaaaac gccatgccgt catcagcggt tccgtccttt acaaccaagc cgagaaaggc 660

agttactccc tcggtatctt tggcggaaaa gcccaggaag ttgccggcag cgcggaagtg 720

aaaaccgtaa acggcatacg ccatatcggc cttgccgcca agcaataa 768

<210> 383
<211> 254
<212> PRT
<213> Neisseria meningitides

<400> 383

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

339
340

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Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65                  70                  75                  80

Gln Ile Glu Val Asp Gly Leu Ile Thr Leu Glu Ser Gly Glu Phe Gln
                85                  90                  95

Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Phe Gln Thr Glu Gln
            100                 105                 110

Ile Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln Phe
        115                 120                 125

Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu Pro
    130                 135                 140

Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp Asp
145                 150                 155                 160

Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly
                165                 170                 175

Asn Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp Leu
            180                 185                 190

Ala Ala Ala Asp Ile Lys Pro Asp Gly Lys Arg His Ala Val Ile Ser
        195                 200                 205

Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser Leu Gly
    210                 215                 220

Ile Phe Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val Lys
225                 230                 235                 240

Thr Val Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
                245                 250
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<210> 384
<211> 1492
<212> DNA
<213> Neisseria meningitides

<400> 384

ccgttatgcc aagggcgaat tgaaccaaat cgtcaaataa caggttgctt gtaaacaaaa 60

340
341

tgccgtctga accgttgttc ggacggcatt tgatttttgc ttctttgacc tgcctcattg 120

atgcagtatg caaaaaaaga taccataacc aaaatgttta tatattgaga cctttgcaat 180

aacataggtt actaaaattt tatgctcaat ctcattttca aaatgcaaaa cttttctgat 240

ttttcctact ttttgctcaa tattaggaag gtttttaggc aattgaaaat ttttttggcgc 300

atttttatgc gtcaaatttc gttaacagac tatttttgca aaggtctcat attatctatt 360

ctgcgtatga ctaggagcaa acctgtgaac cgaactgcct tctgctgcct ttctttgacc 420

gccgccctga ttctgaccgc ctgcagcagc ggaggcggcg gtgtcgccgc cgacatcggc 480

gcggggcttg ccgatgcact aaccgcaccg ctcgaccata aagacaaaag tttgcagtct 540

ttgacgctgg atcagtccgt caggaaaaac gagaaactga agctggcggc acaaggtgcg 600

gaaaaaactt atggaaacgg cgacagcctc aatacgggca aattgaagaa cgacaaggtc 660

agccgcttcg actttatccg tcaaatcgaa gtggacgggc agctcattac cttggagagc 720

ggagagttcc aagtgtacaa acaaagccat tccgccttaa ccgcccttca gaccgagcaa 780

gtacaagatt cggagcattc agggaagatg gttgcgaaac gccagttcag aatcggcgat 840

atagcgggtg aacatacatc ttttgacaaa cttcccgaag gcggcagggc gacatatcgc 900

gggacggcat tcggttcaga cgatgccagt ggaaaactga cctacaccat agatttcgcc 960

gccaagcagg gacacggcaa aatcgaacat ttgaaatcgc cagaactcaa tgttgacctg 1020

gccgcctccg atatcaagcc ggataaaaaa cgccatgccg tcatcagcgg ttccgtcctt 1080

tacaaccaag ccgagaaagg cagttactct ctaggcatct ttggcgggca agcccaggaa 1140

gttgccggca gcgcagaagt ggaaaccgca aacggcatac gccatatcgg tcttgccgcc 1200

aagcagtaac cattgtgaaa atgccgtccg aacacgataa tttaccgttc ggacggcatt 1260

tttgcgccat accgccctag gatacgacgg cacggcaggc aagccggttt cactatataa 1320

tgccgtctga accaacgaga accacaccat gcaagctgat tttaaccgtc ccgtcctggc 1380

catcgatacc agtacttccc gtttgtcgct cgcgctgcgt gtcgacggcg aaacccgtct 1440

gttccatcag gaggcaggca gccgccagtc cgaactgatt ctgccggaaa tc 1492

<210> 385
<211> 337
<212> PRT
<213> Neisseria meningitides

<400> 385

344
342

Asn Phe Met Leu Asn Leu Ile Phe Lys Met Gln Asn Phe Ser Asp Phe
1 5 10 15

Ser Tyr Phe Leu Leu Asn Ile Arg Lys Val Phe Arg Gln Leu Lys Ile
20 25 30

Phe Trp Arg Ile Phe Met Arg Gln Ile Ser Leu Thr Asp Tyr Phe Cys
35 40 45

Lys Gly Leu Ile Leu Ser Ile Leu Arg Met Thr Arg Ser Lys Pro Val
50 55 60

Asn Arg Thr Ala Phe Cys Cys Leu Ser Leu Thr Ala Ala Leu Ile Leu
65 70 75 80

Thr Ala Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala
85 90 95

Gly Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser
100 105 110

Leu Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu
115 120 125

Lys Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser
130 135 140

Leu Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe
145 150 155 160

Ile Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly
165 170 175

Glu Phe Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln
180 185 190

Thr Glu Gln Val Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys
195 200 205

Arg Gln Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp
210 215 220

Lys Leu Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly

~~342~~
343

225 230 235 240

Ser Asp Asp Ala Ser Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala
245 250 255

Lys Gln Gly His Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn
260 265 270

Val Asp Leu Ala Ala Ser Asp Ile Lys Pro Asp Lys Lys Arg His Ala
275 280 285

Val Ile Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr
290 295 300

Ser Leu Gly Ile Phe Gly Gly Gln Ala Gln Glu Val Ala Gly Ser Ala
305 310 315 320

Glu Val Glu Thr Ala Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys
325 330 335

Gln

<210> 386
<211> 1498
<212> DNA
<213> Neisseria meningitides

<400> 386

ccgttatgcc aagggcgaat tgaaccaaat cgtcaaataa caggttgctt gtaaacaaaa 60

tgccgtctga accgttgttc ggacggcatt tgatttttgc ttctttgacc tgcctcattg 120

atgcagtatg caaaaaaaga taccataacc aaaatgttta tatattgaga cctttgcaat 180

aacataggtt actaaaattt tatgctcaat ctcattttca aaatgcaaaa ctttttctgat 240

ttttcctact ttttgctcaa tattaggaag gtttttaggc aattgaaaat ttttttggcgc 300

atttttatgc gtcaaatttc gttaacagac tatttttgca aaggtctcat attatctatt 360

ctgcgtatga ctaggagcaa acctgtgaac cgaactgcct tctgctgcct ttctttgacc 420

gccgccctga ttctgaccgc ctgcggatcc agcagcggag gcggcggtgt cgccgccgac 480

atcggcgcgg ggcttgccga tgcactaacc gcaccgctcg accataaaga caaaagtttg 540

cagtctttga cgctggatca gtccgtcagg aaaaacgaga aactgaagct ggcggcacaa 600

343
344

ggtgcggaaa aaacttatgg aaacggcgac agcctcaata cgggcaaatt gaagaacgac 660

aaggtcagcc gcttcgactt tatccgtcaa atcgaagtgg acgggcagct cattaccttg 720

gagagcggag agttccaagt gtacaaacaa agccattccg ccttaaccgc ccttcagacc 780

gagcaagtac aagattcgga gcattcaggg aagatggttg cgaaacgcca gttcagaatc 840

ggcgatatag cgggtgaaca tacatctttt gacaaacttc ccgaaggcgg cagggcgaca 900

tatcgcggga cggcattcgg ttcagacgat gccagtggaa aactgaccta caccatagat 960

ttcgccgcca agcagggaca cggcaaaatc gaacatttga aatcgccaga actcaatgtt 1020

gacctggccg cctccgatat caagccggat aaaaaacgcc atgccgtcat cagcggttcc 1080

gtcctttaca accaagccga gaaaggcagt tactctctag gcatctttgg cgggcaagcc 1140

caggaagttg ccggcagcgc agaagtggaa accgcaaacg gcatacgcca tatcggtctt 1200

gccgccaagc agtaaccatt gtgaaaatgc cgtccgaaca cgataattta ccgttcggac 1260

ggcatttttg cgccataccg ccctaggata cgacggcacg gcaggcaagc cggtttcact 1320

atataatgcc gtctgaacca acgagaacca caccatgcaa gctgatttta accgtcccgt 1380

cctggccatc gataccagta cttcccgttt gtcgctcgcg ctgcgtgtcg acggcgaaac 1440

ccgtctgttc catcaggagg caggcagccg ccagtccgaa ctgattctgc cggaaatc 1498

<210> 387
<211> 338
<212> PRT
<213> Neisseria meningitides

<400> 387

Asn Phe Met Leu Asn Leu Ile Phe Lys Met Gln Asn Phe Ser Asp Phe
1 5 10 15

Ser Tyr Phe Leu Leu Asn Ile Arg Lys Val Phe Arg Gln Leu Lys Ile
20 25 30

Phe Trp Arg Ile Phe Met Arg Gln Ile Ser Leu Thr Asp Tyr Phe Cys
35 40 45

Lys Gly Leu Ile Leu Ser Ile Leu Arg Met Thr Arg Ser Lys Pro Val
50 55 60

Asn Arg Thr Ala Phe Cys Cys Leu Ser Leu Thr Ala Ala Leu Ile Leu
65 70 75 80

344
345

Thr Ala Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly
85 90 95

Ala Gly Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys
100 105 110

Ser Leu Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys
115 120 125

Leu Lys Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp
130 135 140

Ser Leu Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp
145 150 155 160

Phe Ile Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser
165 170 175

Gly Glu Phe Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu
180 185 190

Gln Thr Glu Gln Val Gln Asp Ser Glu His Ser Gly Lys Met Val Ala
195 200 205

Lys Arg Gln Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe
210 215 220

Asp Lys Leu Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe
225 230 235 240

Gly Ser Asp Asp Ala Ser Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala
245 250 255

Ala Lys Gln Gly His Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu
260 265 270

Asn Val Asp Leu Ala Ala Ser Asp Ile Lys Pro Asp Lys Lys Arg His
275 280 285

Ala Val Ile Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser
290 295 300

~~345~~
346

Tyr Ser Leu Gly Ile Phe Gly Gly Gln Ala Gln Glu Val Ala Gly Ser
305 310 315 320

Ala Glu Val Glu Thr Ala Asn Gly Ile Arg His Ile Gly Leu Ala Ala
325 330 335

Lys Gln

<210> 388
<211> 1492
<212> DNA
<213> Neisseria meningitides

<400> 388

ccgttatgcc aagggcgaat tgaaccaaat cgtcaaataa caggttgctt gtaaacaaaa 60

tgccgtctga accgttgttc ggacggcatt tgatttttgc ttctttgacc tgcctcattg 120

atgcagtatg caaaaaaaga taccataacc aaaatgttta tatattgaga cctttgcaat 180

aacataggtt actaaaattt tatgctcaat ctcattttca aaatgcaaaa cttttctgat 240

ttttcctact ttttgctcaa tattaggaag gtttttaggc aattgaaaat tttttggcgc 300

atttttatgc gtcaaatttc gttaacagac tatttttgca aaggtctcat attatctatt 360

ctgcgtatga ctaggagcaa acctgtgaac cgaactgcct tctgctgcct ttctttgacc 420

gccgccctga ttctgaccgc catgagcagc ggaggcggcg gtgtcgccgc cgacatcggc 480

gcggggcttg ccgatgcact aaccgcaccg ctcgaccata aagacaaaag tttgcagtct 540

ttgacgctgg atcagtccgt caggaaaaac gagaaactga agctggcggc acaaggtgcg 600

gaaaaaactt atggaaacgg cgacagcctc aatacgggca aattgaagaa cgacaaggtc 660

agccgcttcg actttatccg tcaaatcgaa gtggacgggc agctcattac cttggagagc 720

ggagagttcc aagtgtacaa acaaagccat tccgccttaa ccgcccttca gaccgagcaa 780

gtacaagatt cggagcattc agggaagatg gttgcgaaac gccagttcag aatcggcgat 840

atagcgggtg aacatacatc ttttgacaaa cttcccgaag gcggcagggc gacatatcgc 900

gggacggcat tcggttcaga cgatgccagt ggaaaactga cctacaccat agatttcgcc 960

gccaagcagg gacacggcaa aatcgaacat ttgaaatcgc cagaactcaa tgttgacctg 1020

gccgcctccg atatcaagcc ggataaaaaa cgccatgccg tcatcagcgg ttccgtcctt 1080

tacaaccaag ccgagaaagg cagttactct ctaggcatct ttggcgggca agcccaggaa 1140

346
347

gttgccggca gcgcagaagt ggaaaccgca aacggcatac gccatatcgg tcttgccgcc 1200

aagcagtaac cattgtgaaa atgccgtccg aacacgataa tttaccgttc ggacggcatt 1260

tttgcgccat accgccctag gatacgacgg cacggcaggc aagccggttt cactatataa 1320

tgccgtctga accaacgaga accacaccat gcaagctgat tttaaccgtc ccgtcctggc 1380

catcgatacc agtacttccc gtttgtcgct cgcgctgcgt gtcgacggcg aaacccgtct 1440

gttccatcag gaggcaggca gccgccagtc cgaactgatt ctgccggaaa tc 1492

<210> 389
<211> 337
<212> PRT
<213> Neisseria meningitides

<400> 389

Asn Phe Met Leu Asn Leu Ile Phe Lys Met Gln Asn Phe Ser Asp Phe
1 5 10 15

Ser Tyr Phe Leu Leu Asn Ile Arg Lys Val Phe Arg Gln Leu Lys Ile
20 25 30

Phe Trp Arg Ile Phe Met Arg Gln Ile Ser Leu Thr Asp Tyr Phe Cys
35 40 45

Lys Gly Leu Ile Leu Ser Ile Leu Arg Met Thr Arg Ser Lys Pro Val
50 55 60

Asn Arg Thr Ala Phe Cys Cys Leu Ser Leu Thr Ala Ala Leu Ile Leu
65 70 75 80

Thr Ala Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala
85 90 95

Gly Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser
100 105 110

Leu Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu
115 120 125

Lys Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser
130 135 140

347
348

Leu Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe
145 150 155 160

Ile Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly
165 170 175

Glu Phe Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln
180 185 190

Thr Glu Gln Val Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys
195 200 205

Arg Gln Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp
210 215 220

Lys Leu Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly
225 230 235 240

Ser Asp Asp Ala Ser Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala
245 250 255

Lys Gln Gly His Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn
260 265 270

Val Asp Leu Ala Ala Ser Asp Ile Lys Pro Asp Lys Lys Arg His Ala
275 280 285

Val Ile Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr
290 295 300

Ser Leu Gly Ile Phe Gly Gly Gln Ala Gln Glu Val Ala Gly Ser Ala
305 310 315 320

Glu Val Glu Thr Ala Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys
325 330 335

Gln

<210> 390
<211> 768
<212> DNA
<213> Neisseria meningitides

378
379

<400> 390

tgcagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca agtgtacaaa 300

caaagccatt ccgccttaac cgcccttcag accgagcaag tacaagattc ggagcattca 360

gggaagatgg ttgcgaaacg ccagttcaga atcggcgata tagcgggtga acatacatct 420

tttgacaaac ttcccgaagg cggcagggcg acatatcgcg ggacggcatt cggttcagac 480

gatgccagtg gaaaactgac ctacaccata gatttcgccg ccaagcaggg acacggcaaa 540

atcgaacatt tgaaatcgcc agaactcaat gttgacctgg ccgcctccga tatcaagccg 600

gataaaaaac gccatgccgt catcagcggt tccgtccttt acaaccaagc cgagaaaggc 660

agttactctc taggcatctt tggcgggcaa gcccaggaag ttgccggcag cgcagaagtg 720

gaaaccgcaa acggcatacg ccatatcggt cttgccgcca agcagtaa 768

<210> 391
<211> 255
<212> PRT
<213> Neisseria meningitides

<400> 391

Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe

85 90 95

Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr Glu
100 105 110

Gln Val Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln
115 120 125

Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu
130 135 140

Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp
145 150 155 160

Asp Ala Ser Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
165 170 175

Gly His Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp
180 185 190

Leu Ala Ala Ser Asp Ile Lys Pro Asp Lys Lys Arg His Ala Val Ile
195 200 205

Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser Leu
210 215 220

Gly Ile Phe Gly Gly Gln Ala Gln Glu Val Ala Gly Ser Ala Glu Val
225 230 235 240

Glu Thr Ala Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
245 250 255

<210> 392
<211> 774
<212> DNA
<213> Neisseria meningitides

<400> 392

tgcggatcca gcagcggagg cggcggtgtc gccgccgaca tcggcgcggg gcttgccgat 60

gcactaaccg caccgctcga ccataaagac aaaagtttgc agtctttgac gctggatcag 120

tccgtcagga aaaacgagaa actgaagctg gcggcacaag gtgcggaaaa aacttatgga 180

aacggcgaca gcctcaatac gggcaaattg aagaacgaca aggtcagccg cttcgacttt 240

360
351

atccgtcaaa tcgaagtgga cgggcagctc attaccttgg agagcggaga gttccaagtg 300

tacaaacaaa gccattccgc cttaaccgcc cttcagaccg agcaagtaca agattcggag 360

cattcaggga agatggttgc gaaacgccag ttcagaatcg gcgatatagc gggtgaacat 420

acatcttttg acaaacttcc cgaaggcggc agggcgacat atcgcgggac ggcattcggt 480

tcagacgatg ccagtggaaa actgacctac accatagatt tcgccgccaa gcagggacac 540

ggcaaaatcg aacatttgaa atcgccagaa ctcaatgttg acctggccgc ctccgatatc 600

aagccggata aaaaacgcca tgccgtcatc agcggttccg tcctttacaa ccaagccgag 660

aaaggcagtt actctctagg catctttggc gggcaagccc aggaagttgc cggcagcgca 720

gaagtggaaa ccgcaaacgg catacgccat atcggtcttg ccgccaagca gtaa 774

<210> 393
<211> 256
<212> PRT
<213> Neisseria meningitides

<400> 393

Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1 5 10 15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu
20 25 30

Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
35 40 45

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
50 55 60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65 70 75 80

Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu
85 90 95

Phe Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr
100 105 110

Glu Gln Val Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg
115 120 125

351
352

Gln Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys
130 135 140

Leu Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser
145 150 155 160

Asp Asp Ala Ser Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys
165 170 175

Gln Gly His Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val
180 185 190

Asp Leu Ala Ala Ser Asp Ile Lys Pro Asp Lys Lys Arg His Ala Val
195 200 205

Ile Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser
210 215 220

Leu Gly Ile Phe Gly Gly Gln Ala Gln Glu Val Ala Gly Ser Ala Glu
225 230 235 240

Val Glu Thr Ala Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
245 250 255

<210> 394
<211> 768
<212> DNA
<213> Neisseria meningitides

<400> 394

atgagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca agtgtacaaa 300

caaagccatt ccgccttaac cgcccttcag accgagcaag tacaagattc ggagcattca 360

gggaagatgg ttgcgaaacg ccagttcaga atcggcgata tagcgggtga acatacatct 420

tttgacaaac ttcccgaagg cggcagggcg acatatcgcg ggacggcatt cggttcagac 480

353

gatgccagtg gaaaactgac ctacaccata gatttcgccg ccaagcaggg acacggcaaa 540

atcgaacatt tgaaatcgcc agaactcaat gttgacctgg ccgcctccga tatcaagccg 600

gataaaaaac gccatgccgt catcagcggt tccgtccttt acaaccaagc cgagaaaggc 660

agttactctc taggcatctt tggcgggcaa gcccaggaag ttgccggcag cgcagaagtg 720

gaaaccgcaa acggcatacg ccatatcggt cttgccgcca agcagtaa 768

<210> 395
<211> 255
<212> PRT
<213> Neisseria meningitides

<400> 395

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr Glu
100 105 110

Gln Val Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln
115 120 125

Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu
130 135 140

Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp
145 150 155 160

353
354

Asp Ala Ser Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
165 170 175

Gly His Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp
180 185 190

Leu Ala Ala Ser Asp Ile Lys Pro Asp Lys Lys Arg His Ala Val Ile
195 200 205

Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser Leu
210 215 220

Gly Ile Phe Gly Gly Gln Ala Gln Glu Val Ala Gly Ser Ala Glu Val
225 230 235 240

Glu Thr Ala Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
245 250 255

<210> 396
<211> 1305
<212> DNA
<213> Neisseria meningitides

<400> 396

ccgttatgcc aagggcgaat tgaaccaaat cgtcaaataa caggttgctt gtaaacaaaa 60

tgccgtctga accgttgttc gaacggcatt tgatttttgc ttctttgacc tgcctcattg 120

atgcagtatg caaaaaaaga taccataacc aaaatgttta tatattatct attctgcgta 180

tgactaggag taaacctgtg aaccgaactg cctttctgctg ctttttctctg accgccgccc 240

tgattctgac cgcctgcagc agcggagggg gcggtgtcgc cgccgacatc ggtgcggggc 300

ttgccgatgc actaaccgca ccgctcgacc ataaagacaa aggtttgcag tctttaacgc 360

tggatcagtc cgtcaggaaa aacgagaaac tgaagctggc ggcacaaggt gcggaaaaaa 420

cttatggaaa cggcgacagc cttaatacgg gcaaattgaa gaacgacaag gtcagccgct 480

tcgactttat ccgtcaaatc gaagtggacg ggaagctcat taccttggag agcggagagt 540

tccaagtgta caaacaaagc cattccgcct taaccgccct tcagaccgag caagtacaag 600

actcggagga ttccgggaag atggttgcga aacgccagtt cagaatcggc gacatagcgg 660

gcgaacatac atcttttgac aagcttccca aaggcggcag tgcgacatat cgcgggacgg 720

cgttgggttc agacgatgct ggcggaaaac tgacctatac tatagatttc gccgccaagc 780

354
355

agggacacgg caaaatcgaa catttgaaat cgcccgaact caatgtcgag cttgccaccg 840

cctatatcaa gccggatgaa aaacgccatg ccgttatcag cggttccgtc ctttacaacc 900

aagacgagaa aggcagttac tccctcggta tctttggcgg gcaagcccag gaagttgccg 960

gcagcgcgga agtggaaacc gtaaacggca tacaccatat cggtcttgcc gccaagcagt 1020

aaccattgtg aaaatgccgt ccgaacacaa taatttaccg ttcggacggc atttttgcgc 1080

cataccgccc taggacacga cggcacggca ggcaagctga tttcactata taatgccgtc 1140

tgaaccaacg agaaccatac catgcaagct gattttaacc gtcccgtcct ggccatcgat 1200

accggtactt cctatttgtc gctcgcgctg cgcgccgacg gcgaaaccca cctgttccat 1260

caagaggccg gcagccgcca atccgaactg attctgccgg aaatc 1305

<210> 397
<211> 332
<212> PRT
<213> Neisseria meningitides

<400> 397

Thr Lys Ser Ser Asn Asn Arg Leu Leu Val Asn Lys Met Pro Ser Glu
1 5 10 15

Pro Leu Phe Glu Arg His Leu Ile Phe Ala Ser Leu Thr Cys Leu Ile
20 25 30

Asp Ala Val Cys Lys Lys Arg Tyr His Asn Gln Asn Val Tyr Ile Leu
35 40 45

Ser Ile Leu Arg Met Thr Arg Ser Lys Pro Val Asn Arg Thr Ala Phe
50 55 60

Cys Cys Phe Ser Leu Thr Ala Ala Leu Ile Leu Thr Ala Cys Ser Ser
65 70 75 80

Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu Ala Asp Ala
85 90 95

Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln Ser Leu Thr
100 105 110

Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu Ala Ala Gln
115 120 125

355
356

Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn Thr Gly Lys
130 135 140

Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg Gln Ile Glu
145 150 155 160

Val Asp Gly Lys Leu Ile Thr Leu Glu Ser Gly Glu Phe Gln Val Tyr
165 170 175

Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr Glu Gln Val Gln
180 185 190

Asp Ser Glu Asp Ser Gly Lys Met Val Ala Lys Arg Gln Phe Arg Ile
195 200 205

Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu Pro Lys Gly
210 215 220

Gly Ser Ala Thr Tyr Arg Gly Thr Ala Leu Gly Ser Asp Asp Ala Gly
225 230 235 240

Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly His Gly
245 250 255

Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Glu Leu Ala Thr
260 265 270

Ala Tyr Ile Lys Pro Asp Glu Lys Arg His Ala Val Ile Ser Gly Ser
275 280 285

Val Leu Tyr Asn Gln Asp Glu Lys Gly Ser Tyr Ser Leu Gly Ile Phe
290 295 300

Gly Gly Gln Ala Gln Glu Val Ala Gly Ser Ala Glu Val Glu Thr Val
305 310 315 320

Asn Gly Ile His His Ile Gly Leu Ala Ala Lys Gln
325 330

<210> 398
<211> 1311
<212> DNA
<213> Neisseria meningitides

356
357

<400> 398

ccgttatgcc aagggcgaat tgaaccaaat cgtcaaataa caggttgctt gtaaacaaaa 60

tgccgtctga accgttgttc gaacggcatt tgatttttgc ttctttgacc tgcctcattg 120

atgcagtatg caaaaaaaga taccataacc aaaatgttta tatattatct attctgcgta 180

tgactaggag taaacctgtg aaccgaactg ccttctgctg cttttctctg accgccgccc 240

tgattctgac cgcctgcgga tccagcagcg gagggggcgg tgtcgccgcc gacatcggtg 300

cggggcttgc cgatgcacta accgcaccgc tcgaccataa agacaaaggt ttgcagtctt 360

taacgctgga tcagtccgtc aggaaaaacg agaaactgaa gctggcggca caaggtgcgg 420

aaaaaactta tggaaacggc gacagcctta atacgggcaa attgaagaac gacaaggtca 480

gccgcttcga ctttatccgt caaatcgaag tggacgggaa gctcattacc ttggagagcg 540

gagagttcca agtgtacaaa caaagccatt ccgccttaac cgcccttcag accgagcaag 600

tacaagactc ggaggattcc gggaagatgg ttgcgaaacg ccagttcaga atcggcgaca 660

tagcgggcga acatacatct tttgacaagc ttcccaaagg cggcagtgcg acatatcgcg 720

ggacggcgtt gggttcagac gatgctggcg gaaaactgac ctatactata gatttcgccg 780

ccaagcaggg acacggcaaa atcgaacatt tgaaatcgcc cgaactcaat gtcgagcttg 840

ccaccgccta tatcaagccg gatgaaaaac gccatgccgt tatcagcggt tccgtccttt 900

acaaccaaga cgagaaaggc agttactccc tcggtatctt tggcgggcaa gcccaggaag 960

ttgccggcag cgcggaagtg gaaaccgtaa acggcataca ccatatcggt cttgccgcca 1020

agcagtaacc attgtgaaaa tgccgtccga acacaataat ttaccgttcg gacggcattt 1080

ttgcgccata ccgccctagg acacgacggc acggcaggca agctgatttc actatataat 1140

gccgtctgaa ccaacgagaa ccataccatg caagctgatt ttaaccgtcc cgtcctggcc 1200

atcgataccg gtacttccta tttgtcgctc gcgctgcgcg ccgacggcga aacccacctg 1260

ttccatcaag aggccggcag ccgccaatcc gaactgattc tgccggaaat c 1311

<210> 399
<211> 333
<212> PRT
<213> Neisseria meningitides

<400> 399

Thr Lys Ser Ser Asn Asn Arg Leu Leu Val Asn Lys Met Pro Ser Glu
1 5 10 15

357
358

```
Pro Leu Phe Glu Arg His Leu Ile Phe Ala Ser Leu Thr Cys Leu Ile
            20                  25                  30

Asp Ala Val Cys Lys Lys Arg Tyr His Asn Gln Asn Val Tyr Ile Leu
        35                  40                  45

Ser Ile Leu Arg Met Thr Arg Ser Lys Pro Val Asn Arg Thr Ala Phe
    50                  55                  60

Cys Cys Phe Ser Leu Thr Ala Ala Leu Ile Leu Thr Ala Cys Gly Ser
65                  70                  75                  80

Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu Ala Asp
                85                  90                  95

Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln Ser Leu
            100                 105                 110

Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu Ala Ala
        115                 120                 125

Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn Thr Gly
    130                 135                 140

Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg Gln Ile
145                 150                 155                 160

Glu Val Asp Gly Lys Leu Ile Thr Leu Glu Ser Gly Glu Phe Gln Val
                165                 170                 175

Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr Glu Gln Val
            180                 185                 190

Gln Asp Ser Glu Asp Ser Gly Lys Met Val Ala Lys Arg Gln Phe Arg
        195                 200                 205

Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu Pro Lys
    210                 215                 220

Gly Gly Ser Ala Thr Tyr Arg Gly Thr Ala Leu Gly Ser Asp Asp Ala
225                 230                 235                 240
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358
359

Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly His
245 250 255

Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Glu Leu Ala
260 265 270

Thr Ala Tyr Ile Lys Pro Asp Glu Lys Arg His Ala Val Ile Ser Gly
275 280 285

Ser Val Leu Tyr Asn Gln Asp Glu Lys Gly Ser Tyr Ser Leu Gly Ile
290 295 300

Phe Gly Gly Gln Ala Gln Glu Val Ala Gly Ser Ala Glu Val Glu Thr
305 310 315 320

Val Asn Gly Ile His His Ile Gly Leu Ala Ala Lys Gln
325 330

<210> 400
<211> 1305
<212> DNA
<213> Neisseria meningitides

<400> 400

ccgttatgcc aagggcgaat tgaaccaaat cgtcaaataa caggttgctt gtaaacaaaa 60

tgccgtctga accgttgttc gaacggcatt tgatttttgc ttctttgacc tgcctcattg 120

atgcagtatg caaaaaaaga taccataacc aaaatgttta tatattatct attctgcgta 180

tgactaggag taaacctgtg aaccgaactg ccttctgctg cttttctctg accgccgccc 240

tgattctgac cgccatgagc agcggagggg gcggtgtcgc cgccgacatc ggtgcggggc 300

ttgccgatgc actaaccgca ccgctcgacc ataaagacaa aggtttgcag tctttaacgc 360

tggatcagtc cgtcaggaaa aacgagaaac tgaagctggc ggcacaaggt gcggaaaaaa 420

cttatggaaa cggcgacagc cttaatacgg gcaaattgaa gaacgacaag gtcagccgct 480

tcgactttat ccgtcaaatc gaagtggacg ggaagctcat taccttggag agcggagagt 540

tccaagtgta caaacaaagc cattccgcct taaccgccct tcagaccgag caagtacaag 600

actcggagga ttccgggaag atggttgcga aacgccagtt cagaatcggc gacatagcgg 660

gcgaacatac atcttttgac aagcttccca aaggcggcag tgcgacatat cgcgggacgg 720

cgttgggttc agacgatgct ggcggaaaac tgacctatac tatagatttc gccgccaagc 780

359
360

agggacacgg caaaatcgaa catttgaaat cgcccgaact caatgtcgag cttgccaccg 840

cctatatcaa gccggatgaa aaacgccatg ccgttatcag cggttccgtc ctttacaacc 900

aagacgagaa aggcagttac tccctcggta tctttggcgg gcaagcccag gaagttgccg 960

gcagcgcgga agtggaaacc gtaaacggca tacaccatat cggtcttgcc gccaagcagt 1020

aaccattgtg aaaatgccgt ccgaacacaa taatttaccg ttcggacggc atttttgcgc 1080

cataccgccc taggacacga cggcacggca ggcaagctga tttcactata taatgccgtc 1140

tgaaccaacg agaaccatac catgcaagct gattttaacc gtcccgtcct ggccatcgat 1200

accggtactt cctatttgtc gctcgcgctg cgcgccgacg gcgaaaccca cctgttccat 1260

caagaggccg gcagccgcca atccgaactg attctgccgg aaatc 1305

<210> 401
<211> 332
<212> PRT
<213> Neisseria meningitides

<400> 401

Thr Lys Ser Ser Asn Asn Arg Leu Leu Val Asn Lys Met Pro Ser Glu
1 5 10 15

Pro Leu Phe Glu Arg His Leu Ile Phe Ala Ser Leu Thr Cys Leu Ile
20 25 30

Asp Ala Val Cys Lys Lys Arg Tyr His Asn Gln Asn Val Tyr Ile Leu
35 40 45

Ser Ile Leu Arg Met Thr Arg Ser Lys Pro Val Asn Arg Thr Ala Phe
50 55 60

Cys Cys Phe Ser Leu Thr Ala Ala Leu Ile Leu Thr Ala Met Ser Ser
65 70 75 80

Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu Ala Asp Ala
85 90 95

Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln Ser Leu Thr
100 105 110

Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu Ala Ala Gln
115 120 125

360
361

```
Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn Thr Gly Lys
    130                 135                 140

Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg Gln Ile Glu
145                 150                 155                 160

Val Asp Gly Lys Leu Ile Thr Leu Glu Ser Gly Glu Phe Gln Val Tyr
                165                 170                 175

Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr Glu Gln Val Gln
            180                 185                 190

Asp Ser Glu Asp Ser Gly Lys Met Val Ala Lys Arg Gln Phe Arg Ile
        195                 200                 205

Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu Pro Lys Gly
    210                 215                 220

Gly Ser Ala Thr Tyr Arg Gly Thr Ala Leu Gly Ser Asp Asp Ala Gly
225                 230                 235                 240

Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly His Gly
                245                 250                 255

Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Glu Leu Ala Thr
            260                 265                 270

Ala Tyr Ile Lys Pro Asp Glu Lys Arg His Ala Val Ile Ser Gly Ser
        275                 280                 285

Val Leu Tyr Asn Gln Asp Glu Lys Gly Ser Tyr Ser Leu Gly Ile Phe
    290                 295                 300

Gly Gly Gln Ala Gln Glu Val Ala Gly Ser Ala Glu Val Glu Thr Val
305                 310                 315                 320

Asn Gly Ile His His Ile Gly Leu Ala Ala Lys Gln
                325                 330
```

<210> 402
<211> 768
<212> DNA
<213> Neisseria meningitides

361
362

<400> 402

tgcagcagcg gaggggggcgg tgtcgccgcc gacatcggtg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaggt ttgcagtctt taacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctta atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggaa gctcattacc ttggagagcg gagagttcca agtgtacaaa 300

caaagccatt ccgccttaac cgcccttcag accgagcaag tacaagactc ggaggattcc 360

gggaagatgg ttgcgaaacg ccagttcaga atcggcgaca tagcgggcga acatacatct 420

tttgacaagc ttcccaaagg cggcagtgcg acatatcgcg ggacggcgtt gggttcagac 480

gatgctggcg gaaaactgac ctatactata gatttcgccg ccaagcaggg acacggcaaa 540

atcgaacatt tgaaatcgcc cgaactcaat gtcgagcttg ccaccgccta tatcaagccg 600

gatgaaaaac gccatgccgt tatcagcggt tccgtccttt acaaccaaga cgagaaaggc 660

agttactccc tcggtatctt tggcgggcaa gcccaggaag ttgccggcag cgcggaagtg 720

gaaaccgtaa acggcataca ccatatcggt cttgccgcca agcagtaa 768

<210> 403
<211> 255
<212> PRT
<213> Neisseria meningitides

<400> 403

Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Lys Leu Ile Thr Leu Glu Ser Gly Glu Phe

362
363

85 90 95

Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr Glu
100 105 110

Gln Val Gln Asp Ser Glu Asp Ser Gly Lys Met Val Ala Lys Arg Gln
115 120 125

Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu
130 135 140

Pro Lys Gly Gly Ser Ala Thr Tyr Arg Gly Thr Ala Leu Gly Ser Asp
145 150 155 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
165 170 175

Gly His Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Glu
180 185 190

Leu Ala Thr Ala Tyr Ile Lys Pro Asp Glu Lys Arg His Ala Val Ile
195 200 205

Ser Gly Ser Val Leu Tyr Asn Gln Asp Glu Lys Gly Ser Tyr Ser Leu
210 215 220

Gly Ile Phe Gly Gly Gln Ala Gln Glu Val Ala Gly Ser Ala Glu Val
225 230 235 240

Glu Thr Val Asn Gly Ile His His Ile Gly Leu Ala Ala Lys Gln
245 250 255

<210> 404
<211> 774
<212> DNA
<213> Neisseria meningitides

<400> 404

tgcgaatcca gcagcggagg gggcggtgtc gccgccgaca tcggtgcggg gcttgccgat 60

gcactaaccg caccgctcga ccataaagac aaaggtttgc agtctttaac gctggatcag 120

tccgtcagga aaaacgagaa actgaagctg gcggcacaag gtgcggaaaa aacttatgga 180

aacggcgaca gccttaatac gggcaaattg aagaacgaca aggtcagccg cttcgacttt 240

atccgtcaaa tcgaagtgga cgggaagctc attaccttgg agagcggaga gttccaagtg 300

tacaaacaaa gccattccgc cttaaccgcc cttcagaccg agcaagtaca agactcggag 360

gattccggga agatggttgc gaaacgccag ttcagaatcg gcgacatagc gggcgaacat 420

acatcttttg acaagcttcc caaaggcggc agtgcgacat atcgcgggac ggcgttgggt 480

tcagacgatg ctggcggaaa actgacctat actatagatt tcgccgccaa gcagggacac 540

ggcaaaatcg aacatttgaa atcgcccgaa ctcaatgtcg agcttgccac cgcctatatc 600

aagccggatg aaaaacgcca tgccgttatc agcggttccg tcctttacaa ccaagacgag 660

aaaggcagtt actccctcgg tatctttggc gggcaagccc aggaagttgc cggcagcgcg 720

gaagtggaaa ccgtaaacgg catacaccat atcggtcttg ccgccaagca gtaa 774

<210> 405
<211> 256
<212> PRT
<213> Neisseria meningitides

<400> 405

Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1 5 10 15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu
20 25 30

Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
35 40 45

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
50 55 60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65 70 75 80

Arg Gln Ile Glu Val Asp Gly Lys Leu Ile Thr Leu Glu Ser Gly Glu
85 90 95

Phe Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr
100 105 110

Glu Gln Val Gln Asp Ser Glu Asp Ser Gly Lys Met Val Ala Lys Arg
115 120 125

364
365

Gln Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys
130 135 140

Leu Pro Lys Gly Gly Ser Ala Thr Tyr Arg Gly Thr Ala Leu Gly Ser
145 150 155 160

Asp Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys
165 170 175

Gln Gly His Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val
180 185 190

Glu Leu Ala Thr Ala Tyr Ile Lys Pro Asp Glu Lys Arg His Ala Val
195 200 205

Ile Ser Gly Ser Val Leu Tyr Asn Gln Asp Glu Lys Gly Ser Tyr Ser
210 215 220

Leu Gly Ile Phe Gly Gly Gln Ala Gln Glu Val Ala Gly Ser Ala Glu
225 230 235 240

Val Glu Thr Val Asn Gly Ile His His Ile Gly Leu Ala Ala Lys Gln
245 250 255

<210> 406
<211> 768
<212> DNA
<213> Neisseria meningitides

<400> 406

atgagcagcg gaggggcgg tgtcgccgcc gacatcggtg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaggt ttgcagtctt taacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctta atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggaa gctcattacc ttggagagcg gagagttcca agtgtacaaa 300

caaagccatt ccgccttaac cgcccttcag accgagcaag tacaagactc ggaggattcc 360

gggaagatgg ttgcgaaacg ccagttcaga atcggcgaca tagcgggcga acatacatct 420

tttgacaagc ttcccaaagg cggcagtgcg acatatcgcg ggacggcgtt gggttcagac 480

gatgctggcg gaaaactgac ctatactata gatttcgccg ccaagcaggg acacggcaaa 540

atcgaacatt tgaaatcgcc cgaactcaat gtcgagcttg ccaccgccta tatcaagccg 600

gatgaaaaac gccatgccgt tatcagcggt tccgtccttt acaaccaaga cgagaaaggc 660

agttactccc tcggtatctt tggcgggcaa gcccaggaag ttgccggcag cgcggaagtg 720

gaaaccgtaa acggcataca ccatatcggt cttgccgcca agcagtaa 768

<210> 407
<211> 255
<212> PRT
<213> Neisseria meningitides

<400> 407

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Lys Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr Glu
100 105 110

Gln Val Gln Asp Ser Glu Asp Ser Gly Lys Met Val Ala Lys Arg Gln
115 120 125

Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu
130 135 140

Pro Lys Gly Gly Ser Ala Thr Tyr Arg Gly Thr Ala Leu Gly Ser Asp
145 150 155 160

366
367

```
Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
                165                 170                 175

Gly His Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Glu
            180                 185                 190

Leu Ala Thr Ala Tyr Ile Lys Pro Asp Glu Lys Arg His Ala Val Ile
        195                 200                 205

Ser Gly Ser Val Leu Tyr Asn Gln Asp Glu Lys Gly Ser Tyr Ser Leu
    210                 215                 220

Gly Ile Phe Gly Gly Gln Ala Gln Glu Val Ala Gly Ser Ala Glu Val
225                 230                 235                 240

Glu Thr Val Asn Gly Ile His His Ile Gly Leu Ala Ala Lys Gln
                245                 250                 255
```

<210> 408
<211> 1311
<212> DNA
<213> Neisseria meningitides

<400> 408

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ccgttatgcc aagggcgaat tgaaccaaat cgtcaaataa caggttgact gtaaacaaaa     60

tgccgtctga accgccgttc ggacggcatt tgatttttgc ttctttgacc tgcctcattg    120

gtgcggtata caaaaaaaga taccataacc aagatgtttt tatattatct attctgcgta    180

tgactaggag taaacctgtg aatcgaactg ccttctgctg cctttctctg accactgccc    240

tgattctgac cgcctgcagc agcggagggg gcggtgttgc cgccgacatc ggtgcggggc    300

ttgccgatgc actaaccgca ccgctcgacc ataaagacaa aggtttgcag tctttgatgc    360

tggatcagtc cgtcaggaaa aacgagaaac tgaagctggc ggcacaaggt gcggaaaaaa    420

cttatggaaa cggcgacagc ctcaatacgg gcaaattgaa gaacgacaag gtcagccgct    480

tcgactttat ccgtcaaatc gaagtggacg ggcagctcat taccttggag aacggagagt    540

tccaagtgta caaacaaagc cattccgcct taaccgccct tcagaccgag caagtacaag    600

actcggagca ttcgggaagt atggttgcga aacgccagtt cagaatcggc gacatagcgg    660

gcgaacatac atcttttgac aagcttcccg aaggcggcag ggcgacatat cgcgggacgg    720

cgttcggttc agacgatgca ggcggaaaac tgatctacac catagatttc gccgccaagc    780
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367
368

agggacacgg caaaatcgaa catttgaaat cgccagaact caatgtcgac ctagccgctg 840

cctatatcaa accggatgaa aaacaccatg ccgtcatcag cggttccgtc ctttacaacc 900

aagccgagaa aggcagttac tccctcggta tctttggcgg aaaagcccag gaagttgccg 960

gcagcgcgga agtgaaaacc gtaaacggca tacgccatat cggccttgcc gccaagcaat 1020

aaccattgtg aaaatgccgt ccgaacacga taatttaccg ttcggacggc attttgtatt 1080

gcaccgtccg acggcatgtc cgagggggg atccctattt tcaggccaac cgctatataa 1140

tgccgtctga accaacgaga gaatgccatg caagctgatt ttaaccgtcc cgtcctggcc 1200

gttgataccg gtacttcccg tttgtcgctc gcgctgcgtg ccgacggcga aacccgtctg 1260

ttccatcagg aagtcggcag ccgccagtcc gaactgattc tgccggaaat c 1311

<210> 409
<211> 332
<212> PRT
<213> Neisseria meningitides

<400> 409

Thr Lys Ser Ser Asn Asn Arg Leu Thr Val Asn Lys Met Pro Ser Glu
1 5 10 15

Pro Pro Phe Gly Arg His Leu Ile Phe Ala Ser Leu Thr Cys Leu Ile
20 25 30

Gly Ala Val Tyr Lys Lys Arg Tyr His Asn Gln Asp Val Phe Ile Leu
35 40 45

Ser Ile Leu Arg Met Thr Arg Ser Lys Pro Val Asn Arg Thr Ala Phe
50 55 60

Cys Cys Leu Ser Leu Thr Thr Ala Leu Ile Leu Thr Ala Cys Ser Ser
65 70 75 80

Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu Ala Asp Ala
85 90 95

Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln Ser Leu Met
100 105 110

Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu Ala Ala Gln
115 120 125

~~368~~
369

```
Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn Thr Gly Lys
    130                 135                 140

Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg Gln Ile Glu
145                 150                 155                 160

Val Asp Gly Gln Leu Ile Thr Leu Glu Asn Gly Glu Phe Gln Val Tyr
                165                 170                 175

Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr Glu Gln Val Gln
            180                 185                 190

Asp Ser Glu His Ser Gly Ser Met Val Ala Lys Arg Gln Phe Arg Ile
        195                 200                 205

Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu Pro Glu Gly
    210                 215                 220

Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp Asp Ala Gly
225                 230                 235                 240

Gly Lys Leu Ile Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly His Gly
                245                 250                 255

Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp Leu Ala Ala
            260                 265                 270

Ala Tyr Ile Lys Pro Asp Glu Lys His His Ala Val Ile Ser Gly Ser
        275                 280                 285

Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser Leu Gly Ile Phe
    290                 295                 300

Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val Lys Thr Val
305                 310                 315                 320

Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
                325                 330
```

<210> 410
<211> 1317
<212> DNA
<213> Neisseria meningitides

369
370

<400> 410

ccgttatgcc aagggcgaat tgaaccaaat cgtcaaataa caggttgact gtaaacaaaa 60

tgccgtctga accgccgttc ggacggcatt tgatttttgc ttctttgacc tgcctcattg 120

gtgcggtata caaaaaaaga taccataacc aagatgtttt tatattatct attctgcgta 180

tgactaggag taaacctgtg aatcgaactg ccttctgctg cctttctctg accactgccc 240

tgattctgac cgcctgcgga tccagcagcg gaggggggcgg tgttgccgcc gacatcggtg 300

cggggcttgc cgatgcacta accgcaccgc tcgaccataa agacaaaggt ttgcagtctt 360

tgatgctgga tcagtccgtc aggaaaaacg agaaactgaa gctggcggca caaggtgcgg 420

aaaaaactta tggaaacggc gacagcctca atacgggcaa attgaagaac gacaaggtca 480

gccgcttcga ctttatccgt caaatcgaag tggacgggca gctcattacc ttggagaacg 540

gagagttcca agtgtacaaa caaagccatt ccgccttaac cgcccttcag accgagcaag 600

tacaagactc ggagcattcg ggaagtatgg ttgcgaaacg ccagttcaga atcggcgaca 660

tagcgggcga acatacatct tttgacaagc ttcccgaagg cggcagggcg acatatcgcg 720

ggacggcgtt cggttcagac gatgcaggcg gaaaactgat ctacaccata gatttcgccg 780

ccaagcaggg acacggcaaa atcgaacatt tgaaatcgcc agaactcaat gtcgacctag 840

ccgctgccta tatcaaaccg gatgaaaaac accatgccgt catcagcggt tccgtccttt 900

acaaccaagc cgagaaaggc agttactccc tcggtatctt tggcggaaaa gcccaggaag 960

ttgccggcag cgcggaagtg aaaaccgtaa acggcatacg ccatatcggc cttgccgcca 1020

agcaataacc attgtgaaaa tgccgtccga acacgataat ttaccgttcg gacggcattt 1080

tgtattgcac cgtccgacgg catgtccgag gggggatcc ctatttcag gccaaccgct 1140

atataatgcc gtctgaacca acgagagaat gccatgcaag ctgattttaa ccgtcccgtc 1200

ctggccgttg ataccggtac ttcccgtttg tcgctcgcgc tgcgtgccga cggcgaaacc 1260

cgtctgttcc atcaggaagt cggcagccgc cagtccgaac tgattctgcc ggaaatc 1317

<210> 411
<211> 333
<212> PRT
<213> Neisseria meningitides

<400> 411

Thr Lys Ser Ser Asn Asn Arg Leu Thr Val Asn Lys Met Pro Ser Glu
1 5 10 15

370
371

```
Pro Pro Phe Gly Arg His Leu Ile Phe Ala Ser Leu Thr Cys Leu Ile
            20                  25                  30

Gly Ala Val Tyr Lys Lys Arg Tyr His Asn Gln Asp Val Phe Ile Leu
        35                  40                  45

Ser Ile Leu Arg Met Thr Arg Ser Lys Pro Val Asn Arg Thr Ala Phe
    50                  55                  60

Cys Cys Leu Ser Leu Thr Thr Ala Leu Ile Leu Thr Ala Cys Gly Ser
65                  70                  75                  80

Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu Ala Asp
                85                  90                  95

Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln Ser Leu
            100                 105                 110

Met Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu Ala Ala
        115                 120                 125

Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn Thr Gly
    130                 135                 140

Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg Gln Ile
145                 150                 155                 160

Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Asn Gly Glu Phe Gln Val
                165                 170                 175

Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr Glu Gln Val
            180                 185                 190

Gln Asp Ser Glu His Ser Gly Ser Met Val Ala Lys Arg Gln Phe Arg
        195                 200                 205

Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu Pro Glu
    210                 215                 220

Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp Asp Ala
225                 230                 235                 240
```


371
372

Gly Gly Lys Leu Ile Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly His
245 250 255

Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp Leu Ala
260 265 270

Ala Ala Tyr Ile Lys Pro Asp Glu Lys His His Ala Val Ile Ser Gly
275 280 285

Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser Leu Gly Ile
290 295 300

Phe Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val Lys Thr
305 310 315 320

Val Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
325 330

<210> 412
<211> 1311
<212> DNA
<213> Neisseria meningitides

<400> 412

ccgttatgcc aagggcgaat tgaaccaaat cgtcaaataa caggttgact gtaaacaaaa 60

tgccgtctga accgccgttc ggacggcatt tgatttttgc ttctttgacc tgcctcattg 120

gtgcggtata caaaaaaaga taccataacc aagatgtttt tatattatct attctgcgta 180

tgactaggag taaacctgtg aatcgaactg ccttctgctg cctttctctg accactgccc 240

tgattctgac cgccatgagc agcggagggg gcggtgttgc cgccgacatc ggtgcggggc 300

ttgccgatgc actaaccgca ccgctcgacc ataaagacaa aggtttgcag tctttgatgc 360

tggatcagtc cgtcaggaaa aacgagaaac tgaagctggc ggcacaaggt gcggaaaaaa 420

cttatggaaa cggcgacagc ctcaatacgg gcaaattgaa gaacgacaag gtcagccgct 480

tcgactttat ccgtcaaatc gaagtggacg ggcagctcat taccttggag aacggagagt 540

tccaagtgta caaacaaagc cattccgcct taaccgccct tcagaccgag caagtacaag 600

actcggagca ttcgggaagt atggttgcga aacgccagtt cagaatcggc gacatagcgg 660

gcgaacatac atcttttgac aagcttcccg aaggcggcag ggcgacatat cgcgggacgg 720

cgttcggttc agacgatgca ggcggaaaac tgatctacac catagatttc gccgccaagc 780

372
373

agggacacgg caaaatcgaa catttgaaat cgccagaact caatgtcgac ctagccgctg 840

cctatatcaa accggatgaa aaacaccatg ccgtcatcag cggttccgtc ctttacaacc 900

aagccgagaa aggcagttac tccctcggta tctttggcgg aaaagcccag gaagttgccg 960

gcagcgcgga agtgaaaacc gtaaacggca tacgccatat cggccttgcc gccaagcaat 1020

aaccattgtg aaaatgccgt ccgaacacga taatttaccg ttcggacggc attttgtatt 1080

gcaccgtccg acggcatgtc cgagggggg atccctattt tcaggccaac cgctatataa 1140

tgccgtctga accaacgaga gaatgccatg caagctgatt ttaaccgtcc cgtcctggcc 1200

gttgataccg gtacttcccg tttgtcgctc gcgctgcgtg ccgacggcga aacccgtctg 1260

ttccatcagg aagtcggcag ccgccagtcc gaactgattc tgccggaaat c 1311

<210> 413
<211> 332
<212> PRT
<213> Neisseria meningitides

<400> 413

Thr Lys Ser Ser Asn Asn Arg Leu Thr Val Asn Lys Met Pro Ser Glu
1 5 10 15

Pro Pro Phe Gly Arg His Leu Ile Phe Ala Ser Leu Thr Cys Leu Ile
20 25 30

Gly Ala Val Tyr Lys Lys Arg Tyr His Asn Gln Asp Val Phe Ile Leu
35 40 45

Ser Ile Leu Arg Met Thr Arg Ser Lys Pro Val Asn Arg Thr Ala Phe
50 55 60

Cys Cys Leu Ser Leu Thr Thr Ala Leu Ile Leu Thr Ala Met Ser Ser
65 70 75 80

Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu Ala Asp Ala
85 90 95

Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln Ser Leu Met
100 105 110

Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu Ala Ala Gln
115 120 125

373
374

```
Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn Thr Gly Lys
    130                 135                 140

Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg Gln Ile Glu
145                 150                 155                 160

Val Asp Gly Gln Leu Ile Thr Leu Glu Asn Gly Glu Phe Gln Val Tyr
                165                 170                 175

Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr Glu Gln Val Gln
            180                 185                 190

Asp Ser Glu His Ser Gly Ser Met Val Ala Lys Arg Gln Phe Arg Ile
        195                 200                 205

Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu Pro Glu Gly
    210                 215                 220

Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp Asp Ala Gly
225                 230                 235                 240

Gly Lys Leu Ile Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly His Gly
                245                 250                 255

Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp Leu Ala Ala
            260                 265                 270

Ala Tyr Ile Lys Pro Asp Glu Lys His His Ala Val Ile Ser Gly Ser
        275                 280                 285

Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser Leu Gly Ile Phe
    290                 295                 300

Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val Lys Thr Val
305                 310                 315                 320

Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
                325                 330
```

<210> 414
<211> 768
<212> DNA
<213> Neisseria meningitides

379
375

<400> 414

tgcagcagcg gaggggggcgg tgttgccgcc gacatcggtg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaggt ttgcagtctt tgatgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagaacg gagagttcca agtgtacaaa 300

caaagccatt ccgccttaac cgcccttcag accgagcaag tacaagactc ggagcattcg 360

ggaagtatgg ttgcgaaacg ccagttcaga atcggcgaca tagcgggcga acatacatct 420

tttgacaagc ttcccgaagg cggcagggcg acatatcgcg ggacggcgtt cggttcagac 480

gatgcaggcg gaaaactgat ctacaccata gatttcgccg ccaagcaggg acacggcaaa 540

atcgaacatt tgaaatcgcc agaactcaat gtcgacctag ccgctgccta tatcaaaccg 600

gatgaaaaac accatgccgt catcagcggt tccgtccttt acaaccaagc cgagaaaggc 660

agttactccc tcggtatctt tggcggaaaa gcccaggaag ttgccggcag cgcggaagtg 720

aaaaccgtaa acggcatacg ccatatcggc cttgccgcca agcaataa 768

<210> 415
<211> 255
<212> PRT
<213> Neisseria meningitides

<400> 415

Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln
20 25 30

Ser Leu Met Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Asn Gly Glu Phe

375
376

85 90 95

Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr Glu
100 105 110

Gln Val Gln Asp Ser Glu His Ser Gly Ser Met Val Ala Lys Arg Gln
115 120 125

Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu
130 135 140

Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp
145 150 155 160

Asp Ala Gly Gly Lys Leu Ile Tyr Thr Ile Asp Phe Ala Ala Lys Gln
165 170 175

Gly His Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp
180 185 190

Leu Ala Ala Ala Tyr Ile Lys Pro Asp Glu Lys His His Ala Val Ile
195 200 205

Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser Leu
210 215 220

Gly Ile Phe Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val
225 230 235 240

Lys Thr Val Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
245 250 255

<210> 416
<211> 774
<212> DNA
<213> Neisseria meningitides

<400> 416

tgcggatcca gcagcggagg gggcggtgtt gccgccgaca tcggtgcggg gcttgccgat 60

gcactaaccg caccgctcga ccataaagac aaaggtttgc agtctttgat gctggatcag 120

tccgtcagga aaaacgagaa actgaagctg gcggcacaag gtgcggaaaa aacttatgga 180

aacggcgaca gcctcaatac gggcaaattg aagaacgaca aggtcagccg cttcgacttt 240

atccgtcaaa tcgaagtgga cgggcagctc attaccttgg agaacggaga gttccaagtg 300

tacaaacaaa gccattccgc cttaaccgcc cttcagaccg agcaagtaca agactcggag 360

cattcgggaa gtatggttgc gaaacgccag ttcagaatcg gcgacatagc gggcgaacat 420

acatcttttg acaagcttcc cgaaggcggc agggcgacat atcgcgggac ggcgttcggt 480

tcagacgatg caggcggaaa actgatctac accatagatt tcgccgccaa gcagggacac 540

ggcaaaatcg aacatttgaa atcgccagaa ctcaatgtcg acctagccgc tgcctatatc 600

aaaccggatg aaaaacacca tgccgtcatc agcggttccg tcctttacaa ccaagccgag 660

aaaggcagtt actccctcgg tatctttggc ggaaaagccc aggaagttgc cggcagcgcg 720

gaagtgaaaa ccgtaaacgg catacgccat atcggccttg ccgccaagca ataa 774

<210> 417
<211> 256
<212> PRT
<213> Neisseria meningitides

<400> 417

Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1 5 10 15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu
20 25 30

Gln Ser Leu Met Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
35 40 45

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
50 55 60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65 70 75 80

Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Asn Gly Glu
85 90 95

Phe Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr
100 105 110

Glu Gln Val Gln Asp Ser Glu His Ser Gly Ser Met Val Ala Lys Arg
115 120 125

377
378

```
Gln Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys
    130                 135                 140

Leu Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser
145                 150                 155                 160

Asp Asp Ala Gly Gly Lys Leu Ile Tyr Thr Ile Asp Phe Ala Ala Lys
                165                 170                 175

Gln Gly His Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val
            180                 185                 190

Asp Leu Ala Ala Ala Tyr Ile Lys Pro Asp Glu Lys His His Ala Val
        195                 200                 205

Ile Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser
    210                 215                 220

Leu Gly Ile Phe Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu
225                 230                 235                 240

Val Lys Thr Val Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
                245                 250                 255
```

<210> 418
<211> 768
<212> DNA
<213> Neisseria meningitides

<400> 418

atgagcagcg gaggggcgg tgttgccgcc gacatcggtg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaggt ttgcagtctt tgatgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagaacg gagagttcca agtgtacaaa 300

caaagccatt ccgccttaac cgcccttcag accgagcaag tacaagactc ggagcattcg 360

ggaagtatgg ttgcgaaacg ccagttcaga atcggcgaca tagcgggcga acatacatct 420

tttgacaagc ttcccgaagg cggcagggcg acatatcgcg ggacggcgtt cggttcagac 480

378
379

gatgcaggcg gaaaactgat ctacaccata gatttcgccg ccaagcaggg acacggcaaa 540

atcgaacatt tgaaatcgcc agaactcaat gtcgacctag ccgctgccta tatcaaaccg 600

gatgaaaaac accatgccgt catcagcggt tccgtccttt acaaccaagc cgagaaaggc 660

agttactccc tcggtatctt tggcggaaaa gcccaggaag ttgccggcag cgcggaagtg 720

aaaaccgtaa acggcatacg ccatatcggc cttgccgcca agcaataa 768

<210> 419
<211> 255
<212> PRT
<213> Neisseria meningitides

<400> 419

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln
20 25 30

Ser Leu Met Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Asn Gly Glu Phe
85 90 95

Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Leu Gln Thr Glu
100 105 110

Gln Val Gln Asp Ser Glu His Ser Gly Ser Met Val Ala Lys Arg Gln
115 120 125

Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu
130 135 140

Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp
145 150 155 160

379
380

```
Asp Ala Gly Gly Lys Leu Ile Tyr Thr Ile Asp Phe Ala Ala Lys Gln
                165                 170                 175

Gly His Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp
            180                 185                 190

Leu Ala Ala Ala Tyr Ile Lys Pro Asp Glu Lys His His Ala Val Ile
        195                 200                 205

Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Gly Ser Tyr Ser Leu
    210                 215                 220

Gly Ile Phe Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val
225                 230                 235                 240

Lys Thr Val Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
                245                 250                 255
```

<210> 420
<211> 1322
<212> DNA
<213> Neisseria meningitides

<400> 420

```
cccttccgtt atgccaaggg cgaattgaac caaatcgtca aataacaggt tgcctgtaaa     60

caaaatgccg tctgaaccgc cgttcggacg acatttgatt tttgcttctt tgacctgcct    120

cattgatgcg gtatgcaaaa aaagatacca taaccaaaat gtttatatat tatctattct    180

gcgtatgact aggagtaaac ctgtgaatcg aactgccttc tgctgccttt ctctgaccac    240

tgccctgatt ctgaccgcct gcagcagtgg agggggtggt gtcgccgccg acatcggtgc    300

ggggcttgcc gatgcactaa ccgcaccgct cgaccataaa gacaaaggtt tgcagtcttt    360

gacgctggat cagtccgtca ggaaaaacga gaaactgaag ctggcggcac aaggtgcgga    420

aaaaacttat ggaaacggtg acagcctcaa tacgggcaaa ttgaagaacg acaaggtcag    480

ccgtttcgac tttatccgcc aaatcgaagt ggacgggcag ctcattacct tggagagtgg    540

agagttccaa gtatacaaac aaagccattc cgccttaacc gcctttcaga ccgagcaaat    600

acaagattcg gagcattccg ggaagatggt tgcgaaacgc cagttcagaa tcggcgacat    660

agcgggcgaa catacatctt ttgacaagct tcccgaaggc ggcagggcga catatcgcgg    720

gacggcgttc ggttcagacg atgccggcgg aaaactgacc tacaccatag atttcgccgc    780
```


380
381

caagcaggga aacggcaaaa tcgaacattt gaaatcgcca gaactcaatg tcgacctggc 840

cgccgccgat atcaagccgg atggaaaacg ccatgccgtc atcagcggtt ccgtccttta 900

caaccaagcc gagaaaagca gttactccct cggtatcttt ggcggaaaag cccaggaagt 960

tgccggcagc gcggaagtga aaaccgtaaa cggcatacgc catatcggcc ttgccgccaa 1020

gcaataacca ttgtgaaaat gccgtccgaa cacgataatt taccgttcgg acggcatttt 1080

gtattgcacc gtccgacggc atgcccaagg ggggaaatcc ctattttcag gccaaccgct 1140

atataatgcc gtctgaacca acgagagaat gccatgcaag ctgattttaa ccgtcccgtc 1200

ctggccgtcg ataccggtac ttcccgtttg tcgctcgcgc tgcgtgccga cggcgaaacc 1260

cgtctgttcc atcaggaagt cggcagccgc cagtccgaac tgattctgcc ggaaatcaag 1320

gg 1322

<210> 421
<211> 332
<212> PRT
<213> Neisseria meningitides

<400> 421

Thr Lys Ser Ser Asn Asn Arg Leu Pro Val Asn Lys Met Pro Ser Glu
1 5 10 15

Pro Pro Phe Gly Arg His Leu Ile Phe Ala Ser Leu Thr Cys Leu Ile
20 25 30

Asp Ala Val Cys Lys Lys Arg Tyr His Asn Gln Asn Val Tyr Ile Leu
35 40 45

Ser Ile Leu Arg Met Thr Arg Ser Lys Pro Val Asn Arg Thr Ala Phe
50 55 60

Cys Cys Leu Ser Leu Thr Thr Ala Leu Ile Leu Thr Ala Cys Ser Ser
65 70 75 80

Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu Ala Asp Ala
85 90 95

Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln Ser Leu Thr
100 105 110

Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu Ala Ala Gln

381
382

115 120 125

Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn Thr Gly Lys
130 135 140

Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg Gln Ile Glu
145 150 155 160

Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe Gln Val Tyr
165 170 175

Lys Gln Ser His Ser Ala Leu Thr Ala Phe Gln Thr Glu Gln Ile Gln
180 185 190

Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln Phe Arg Ile
195 200 205

Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu Pro Glu Gly
210 215 220

Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp Asp Ala Gly
225 230 235 240

Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly Asn Gly
245 250 255

Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp Leu Ala Ala
260 265 270

Ala Asp Ile Lys Pro Asp Gly Lys Arg His Ala Val Ile Ser Gly Ser
275 280 285

Val Leu Tyr Asn Gln Ala Glu Lys Ser Ser Tyr Ser Leu Gly Ile Phe
290 295 300

Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val Lys Thr Val
305 310 315 320

Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
325 330

<210> 422
<211> 1328

<212> DNA
<213> Neisseria meningitides

<400> 422

ccctttccgtt atgccaaggg cgaattgaac caaatcgtca aataacaggt tgcctgtaaa 60

caaaatgccg tctgaaccgc cgttcggacg acatttgatt tttgcttctt tgacctgcct 120

cattgatgcg gtatgcaaaa aaagatacca taaccaaaat gtttatatat tatctattct 180

gcgtatgact aggagtaaac ctgtgaatcg aactgccttc tgctgccttt ctctgaccac 240

tgccctgatt ctgaccgcct gcggatccag cagtggaggg ggtggtgtcg ccgccgacat 300

cggtgcgggg cttgccgatg cactaaccgc accgctcgac cataaagaca aaggtttgca 360

gtctttgacg ctggatcagt ccgtcaggaa aaacgagaaa ctgaagctgg cggcacaagg 420

tgcggaaaaa acttatggaa acggtgacag cctcaatacg ggcaaattga agaacgacaa 480

ggtcagccgt ttcgacttta tccgccaaat cgaagtggac gggcagctca ttaccttgga 540

gagtggagag ttccaagtat acaaacaaag ccattccgcc ttaaccgcct ttcagaccga 600

gcaaatacaa gattcggagc attccgggaa gatggttgcg aaacgccagt tcagaatcgg 660

cgacatagcg ggcgaacata catcttttga caagcttccc gaaggcggca gggcgacata 720

tcgcgggacg gcgttcggtt cagacgatgc cggcggaaaa ctgacctaca ccatagattt 780

cgccgccaag cagggaaacg gcaaaatcga acatttgaaa tcgccagaac tcaatgtcga 840

cctggccgcc gccgatatca agccggatgg aaaacgccat gccgtcatca gcggttccgt 900

cctttacaac caagccgaga aaagcagtta ctccctcggt atctttggcg gaaaagccca 960

ggaagttgcc ggcagcgcgg aagtgaaaac cgtaaacggc atacgccata tcggccttgc 1020

cgccaagcaa taaccattgt gaaaatgccg tccgaacacg ataatttacc gttcggacgg 1080

cattttgtat tgcaccgtcc gacggcatgc ccaaggggg aaatccctat tttcaggcca 1140

accgctatat aatgccgtct gaaccaacga gagaatgcca tgcaagctga ttttaaccgt 1200

cccgtcctgg ccgtcgatac cggtacttcc cgtttgtcgc tcgcgctgcg tgccgacggc 1260

gaaacccgtc tgttccatca ggaagtcggc agccgccagt ccgaactgat tctgccggaa 1320

atcaaggg 1328

<210> 423
<211> 333
<212> PRT
<213> Neisseria meningitides

<400> 423

Thr Lys Ser Ser Asn Asn Arg Leu Pro Val Asn Lys Met Pro Ser Glu
1 5 10 15

Pro Pro Phe Gly Arg His Leu Ile Phe Ala Ser Leu Thr Cys Leu Ile
20 25 30

Asp Ala Val Cys Lys Lys Arg Tyr His Asn Gln Asn Val Tyr Ile Leu
35 40 45

Ser Ile Leu Arg Met Thr Arg Ser Lys Pro Val Asn Arg Thr Ala Phe
50 55 60

Cys Cys Leu Ser Leu Thr Thr Ala Leu Ile Leu Thr Ala Cys Gly Ser
65 70 75 80

Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu Ala Asp
85 90 95

Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln Ser Leu
100 105 110

Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu Ala Ala
115 120 125

Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn Thr Gly
130 135 140

Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg Gln Ile
145 150 155 160

Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe Gln Val
165 170 175

Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Phe Gln Thr Glu Gln Ile
180 185 190

Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln Phe Arg
195 200 205

Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu Pro Glu
210 215 220

384
385

```
Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp Asp Ala
225                 230                 235                 240

Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly Asn
                245                 250                 255

Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp Leu Ala
            260                 265                 270

Ala Ala Asp Ile Lys Pro Asp Gly Lys Arg His Ala Val Ile Ser Gly
        275                 280                 285

Ser Val Leu Tyr Asn Gln Ala Glu Lys Ser Ser Tyr Ser Leu Gly Ile
    290                 295                 300

Phe Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val Lys Thr
305                 310                 315                 320

Val Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
                325                 330
```

<210> 424
<211> 1322
<212> DNA
<213> Neisseria meningitides

<400> 424

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cccttccgtt atgccaaggg cgaattgaac caaatcgtca aataacaggt tgcctgtaaa     60

caaaatgccg tctgaaccgc cgttcggacg acatttgatt tttgcttctt tgacctgcct    120

cattgatgcg gtatgcaaaa aaagatacca taaccaaaat gtttatatat tatctattct    180

gcgtatgact aggagtaaac ctgtgaatcg aactgccttc tgctgccttt ctctgaccac    240

tgccctgatt ctgaccgcca tgagcagtgg agggggtggt gtcgccgccg acatcggtgc    300

ggggcttgcc gatgcactaa ccgcaccgct cgaccataaa gacaaaggtt tgcagtcttt    360

gacgctggat cagtccgtca ggaaaaacga gaaactgaag ctggcggcac aaggtgcgga    420

aaaaacttat ggaaacggtg acagcctcaa tacgggcaaa ttgaagaacg acaaggtcag    480

ccgtttcgac tttatccgcc aaatcgaagt ggacgggcag ctcattacct tggagagtgg    540

agagttccaa gtatacaaac aaagccattc cgccttaacc gcctttcaga ccgagcaaat    600

acaagattcg gagcattccg ggaagatggt tgcgaaacgc cagttcagaa tcggcgacat    660
```


385
386

agcgggcgaa catacatctt ttgacaagct tcccgaaggc ggcagggcga catatcgcgg 720

gacggcgttc ggttcagacg atgccggcgg aaaactgacc tacaccatag atttcgccgc 780

caagcaggga aacggcaaaa tcgaacattt gaaatcgcca gaactcaatg tcgacctggc 840

cgccgccgat atcaagccgg atggaaaacg ccatgccgtc atcagcggtt ccgtccttta 900

caaccaagcc gagaaaagca gttactccct cggtatcttt ggcggaaaag cccaggaagt 960

tgccggcagc gcggaagtga aaaccgtaaa cggcatacgc catatcggcc ttgccgccaa 1020

gcaataacca ttgtgaaaat gccgtccgaa cacgataatt taccgttcgg acggcatttt 1080

gtattgcacc gtccgacggc atgcccaagg ggggaaatcc ctatttttcag gccaaccgct 1140

atataatgcc gtctgaacca acgagagaat gccatgcaag ctgattttaa ccgtcccgtc 1200

ctggccgtcg ataccggtac ttcccgtttg tcgctcgcgc tgcgtgccga cggcgaaacc 1260

cgtctgttcc atcaggaagt cggcagccgc cagtccgaac tgattctgcc ggaaatcaag 1320

gg 1322

<210> 425
<211> 332
<212> PRT
<213> Neisseria meningitides

<400> 425

Thr Lys Ser Ser Asn Asn Arg Leu Pro Val Asn Lys Met Pro Ser Glu
1 5 10 15

Pro Pro Phe Gly Arg His Leu Ile Phe Ala Ser Leu Thr Cys Leu Ile
20 25 30

Asp Ala Val Cys Lys Lys Arg Tyr His Asn Gln Asn Val Tyr Ile Leu
35 40 45

Ser Ile Leu Arg Met Thr Arg Ser Lys Pro Val Asn Arg Thr Ala Phe
50 55 60

Cys Cys Leu Ser Leu Thr Thr Ala Leu Ile Leu Thr Ala Met Ser Ser
65 70 75 80

Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu Ala Asp Ala
85 90 95

Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln Ser Leu Thr
100 105 110

386
387

Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu Ala Ala Gln
115 120 125

Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn Thr Gly Lys
130 135 140

Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg Gln Ile Glu
145 150 155 160

Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe Gln Val Tyr
165 170 175

Lys Gln Ser His Ser Ala Leu Thr Ala Phe Gln Thr Glu Gln Ile Gln
180 185 190

Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln Phe Arg Ile
195 200 205

Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu Pro Glu Gly
210 215 220

Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp Asp Ala Gly
225 230 235 240

Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly Asn Gly
245 250 255

Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp Leu Ala Ala
260 265 270

Ala Asp Ile Lys Pro Asp Gly Lys Arg His Ala Val Ile Ser Gly Ser
275 280 285

Val Leu Tyr Asn Gln Ala Glu Lys Ser Ser Tyr Ser Leu Gly Ile Phe
290 295 300

Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val Lys Thr Val
305 310 315 320

Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
325 330

~~387~~
388

<210> 426
<211> 768
<212> DNA
<213> Neisseria meningitides

<400> 426

tgcagcagtg gaggggtgg tgtcgccgcc gacatcggtg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaggt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggt 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgtttcga ctttatccgc 240

caaatcgaag tggacgggca gctcattacc ttggagagtg gagagttcca agtatacaaa 300

caaagccatt ccgccttaac cgcctttcag accgagcaaa tacaagattc ggagcattcc 360

gggaagatgg ttgcgaaacg ccagttcaga atcggcgaca tagcgggcga acatacatct 420

tttgacaagc ttcccgaagg cggcagggcg acatatcgcg ggacggcgtt cggttcagac 480

gatgccggcg gaaaactgac ctacaccata gatttcgccg ccaagcaggg aaacggcaaa 540

atcgaacatt tgaaatcgcc agaactcaat gtcgacctgg ccgccgccga tatcaagccg 600

gatggaaaac gccatgccgt catcagcggt tccgtccttt acaaccaagc cgagaaaagc 660

agttactccc tcggtatctt tggcggaaaa gcccaggaag ttgccggcag cgcggaagtg 720

aaaaccgtaa acggcatacg ccatatcggc cttgccgcca agcaataa 768

<210> 427
<211> 255
<212> PRT
<213> Neisseria meningitides

<400> 427

Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Phe Gln Thr Glu
100 105 110

Gln Ile Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln
115 120 125

Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu
130 135 140

Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp
145 150 155 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
165 170 175

Gly Asn Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp
180 185 190

Leu Ala Ala Ala Asp Ile Lys Pro Asp Gly Lys Arg His Ala Val Ile
195 200 205

Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Ser Ser Tyr Ser Leu
210 215 220

Gly Ile Phe Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val
225 230 235 240

Lys Thr Val Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
245 250 255

<210> 428
<211> 774
<212> DNA
<213> Neisseria meningitides

<400> 428

tgcggatcca gcagtggagg gggtggtgtc gccgccgaca tcggtgcggg gcttgccgat 60

389
390

gcactaaccg caccgctcga ccataaagac aaaggtttgc agtctttgac gctggatcag 120

tccgtcagga aaaacgagaa actgaagctg gcggcacaag gtgcggaaaa aacttatgga 180

aacggtgaca gcctcaatac gggcaaattg aagaacgaca aggtcagccg tttcgacttt 240

atccgccaaa tcgaagtgga cgggcagctc attaccttgg agagtggaga gttccaagta 300

tacaaacaaa gccattccgc cttaaccgcc tttcagaccg agcaaataca agattcggag 360

cattccggga agatggttgc gaaacgccag ttcagaatcg gcgacatagc gggcgaacat 420

acatcttttg acaagcttcc cgaaggcggc agggcgacat atcgcgggac ggcgttcggt 480

tcagacgatg ccggcggaaa actgacctac accatagatt tcgccgccaa gcagggaaac 540

ggcaaaatcg aacatttgaa atcgccagaa ctcaatgtcg acctggccgc cgccgatatc 600

aagccggatg gaaaacgcca tgccgtcatc agcggttccg tcctttacaa ccaagccgag 660

aaaagcagtt actccctcgg tatctttggc ggaaaagccc aggaagttgc cggcagcgcg 720

gaagtgaaaa ccgtaaacgg catacgccat atcggccttg ccgccaagca ataa 774

<210> 429
<211> 256
<212> PRT
<213> Neisseria meningitides

<400> 429

Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1 5 10 15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu
20 25 30

Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
35 40 45

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
50 55 60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65 70 75 80

Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu
85 90 95

390
391

Phe Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Phe Gln Thr
100 105 110

Glu Gln Ile Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg
115 120 125

Gln Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys
130 135 140

Leu Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser
145 150 155 160

Asp Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys
165 170 175

Gln Gly Asn Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val
180 185 190

Asp Leu Ala Ala Ala Asp Ile Lys Pro Asp Gly Lys Arg His Ala Val
195 200 205

Ile Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Ser Ser Tyr Ser
210 215 220

Leu Gly Ile Phe Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu
225 230 235 240

Val Lys Thr Val Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
245 250 255

<210> 430
<211> 768
<212> DNA
<213> Neisseria meningitides

<400> 430

atgagcagtg gaggggggtgg tgtcgccgcc gacatcggtg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaggt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggt 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgtttcga ctttatccgc 240

caaatcgaag tggacgggca gctcattacc ttggagagtg gagagttcca agtatacaaa 300

391
392

caaagccatt ccgccttaac cgcctttcag accgagcaaa tacaagattc ggagcattcc 360

gggaagatgg ttgcgaaacg ccagttcaga atcggcgaca tagcgggcga acatacatct 420

tttgacaagc ttcccgaagg cggcagggcg acatatcgcg ggacggcgtt cggttcagac 480

gatgccggcg gaaaactgac ctacaccata gatttcgccg ccaagcaggg aaacggcaaa 540

atcgaacatt tgaaatcgcc agaactcaat gtcgacctgg ccgccgccga tatcaagccg 600

gatggaaaac gccatgccgt catcagcggt tccgtccttt acaaccaagc cgagaaaagc 660

agttactccc tcggtatctt tggcggaaaa gcccaggaag ttgccggcag cgcggaagtg 720

aaaaccgtaa acggcatacg ccatatcggc cttgccgcca agcaataa 768

<210> 431
<211> 255
<212> PRT
<213> Neisseria meningitides

<400> 431

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Gly Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Val Tyr Lys Gln Ser His Ser Ala Leu Thr Ala Phe Gln Thr Glu
100 105 110

Gln Ile Gln Asp Ser Glu His Ser Gly Lys Met Val Ala Lys Arg Gln
115 120 125

Phe Arg Ile Gly Asp Ile Ala Gly Glu His Thr Ser Phe Asp Lys Leu

392
393

```
    130                 135                 140

Pro Glu Gly Gly Arg Ala Thr Tyr Arg Gly Thr Ala Phe Gly Ser Asp
145                 150                 155                 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
                165                 170                 175

Gly Asn Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val Asp
            180                 185                 190

Leu Ala Ala Ala Asp Ile Lys Pro Asp Gly Lys Arg His Ala Val Ile
        195                 200                 205

Ser Gly Ser Val Leu Tyr Asn Gln Ala Glu Lys Ser Ser Tyr Ser Leu
    210                 215                 220

Gly Ile Phe Gly Gly Lys Ala Gln Glu Val Ala Gly Ser Ala Glu Val
225                 230                 235                 240

Lys Thr Val Asn Gly Ile Arg His Ile Gly Leu Ala Ala Lys Gln
                245                 250                 255
```

<210> 432
<211> 1301
<212> DNA
<213> Neisseria meningitides

<400> 432

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ccgttatgcc aagggcgaat tgaaccaaat cgtcaaataa caggttgctt gtaaacaaaa     60

tgccgtctga accgttgttc ggacggcatt tgatttttgc ttctttgacc tgcctcattg    120

atgcagtatg caaaaaaaga taccataacc aaaatgttta tatattatct attctgcgta    180

tgactaggag caaacctgtg aaccgaactg ccttctgctg cctttccctg accgccgccc    240

tgattctgac cgcctgcagc agcggaggcg gcggtgtcgc cgccgacatc ggcgcgggge    300

ttgccgatgc actaaccgca ccgctcgacc ataaagacaa aagtttgcag tctttgacgc    360

tggatcagtc cgtcaggaaa aacgagaaac tgaagctggc ggcacaaggt gcggaaaaaa    420

cttatggaaa cggcgacagc ctcaatacgg gcaaattgaa gaacgacaag gtcagccgct    480

tcgactttat ccgtcaaatc gaagtggacg ggcagctcat taccttggag agcggagagt    540

tccaaatata caaacaggac cactccgccg tcgttgccct acagattgaa aaaatcaaca    600
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393
394

accccgacaa aatcgacagc ctgataaacc aacgctcctt ccttgtcagc ggtttgggcg 660

gagaacatac cgccttcaac caactgcctg acggcaaagc cgagtatcac ggcaaagcat 720

tcagctccga cgatgctggc ggaaaactga cctataccat agatttcgcc gccaaacagg 780

gacacggcaa aatcgaacac ctgaaaacac ccgagcaaaa tgtcgagctt gccgccgccg 840

aactcaaagc agatgaaaaa tcacacgccg tcattttggg cgacacgcgc tacggcagcg 900

aagaaaaagg cacttaccac ctcgcccttt tcggcgaccg cgcccaagaa atcgccggct 960

cggcaaccgt gaagataggg gaaaaggttc acgaaatcgg catcgccggc aaacagtagc 1020

atttgaaaaa tgccgtccga acacgataat ttaccgttcg gacggcattt ttgcgccata 1080

ccgccctagg atacgacggc acggcaggca agccggtttc actatataat gccgtctgaa 1140

ccaacgagaa ccataccatg caagctgatt ttaaccgtcc cgtcctcgcc gtcgataccg 1200

gtacttccca tttgtcgctc gcgctgcgcg ccgacggcga aacccacctg ttccatcaag 1260

aggccggcag ccgccaatcc gaactgattc tgccggaaat c 1301

<210> 433
<211> 331
<212> PRT
<213> Neisseria meningitides

<400> 433

Thr Lys Ser Ser Asn Asn Arg Leu Leu Val Asn Lys Met Pro Ser Glu
1 5 10 15

Pro Leu Phe Gly Arg His Leu Ile Phe Ala Ser Leu Thr Cys Leu Ile
20 25 30

Asp Ala Val Cys Lys Lys Arg Tyr His Asn Gln Asn Val Tyr Ile Leu
35 40 45

Ser Ile Leu Arg Met Thr Arg Ser Lys Pro Val Asn Arg Thr Ala Phe
50 55 60

Cys Cys Leu Ser Leu Thr Ala Ala Leu Ile Leu Thr Ala Cys Ser Ser
65 70 75 80

Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu Ala Asp Ala
85 90 95

Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln Ser Leu Thr

399
395

100 105 110

Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu Ala Ala Gln
115 120 125

Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn Thr Gly Lys
130 135 140

Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg Gln Ile Glu
145 150 155 160

Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe Gln Ile Tyr
165 170 175

Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu Lys Ile Asn
180 185 190

Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser Phe Leu Val
195 200 205

Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu Pro Asp Gly
210 215 220

Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp Ala Gly Gly
225 230 235 240

Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly His Gly Lys
245 250 255

Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu Ala Ala Ala
260 265 270

Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu Gly Asp Thr
275 280 285

Arg Tyr Gly Ser Glu Glu Lys Gly Thr Tyr His Leu Ala Leu Phe Gly
290 295 300

Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys Ile Gly Glu
305 310 315 320

Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
325 330

395
396

<210> 434
<211> 1307
<212> DNA
<213> Neisseria meningitides

<400> 434

ccgttatgcc aagggcgaat tgaaccaaat cgtcaaataa caggttgctt gtaaacaaaa 60

tgccgtctga accgttgttc ggacggcatt tgatttttgc ttctttgacc tgcctcattg 120

atgcagtatg caaaaaaaga taccataacc aaaatgttta tatattatct attctgcgta 180

tgactaggag caaacctgtg aaccgaactg ccttctgctg cctttccctg accgccgccc 240

tgattctgac cgcctgcgga tccagcagcg gaggcggcgg tgtcgccgcc gacatcggcg 300

cggggcttgc cgatgcacta accgcaccgc tcgaccataa agacaaaagt ttgcagtctt 360

tgacgctgga tcagtccgtc aggaaaaacg agaaactgaa gctggcggca caaggtgcgg 420

aaaaaactta tggaaacggc gacagcctca atacgggcaa attgaagaac gacaaggtca 480

gccgcttcga ctttatccgt caaatcgaag tggacgggca gctcattacc ttggagagcg 540

gagagttcca aatatacaaa caggaccact ccgccgtcgt tgccctacag attgaaaaaa 600

tcaacaaccc cgacaaaatc gacagcctga taaaccaacg ctccttcctt gtcagcggtt 660

tgggcggaga acataccgcc ttcaaccaac tgcctgacgg caaagccgag tatcacggca 720

aagcattcag ctccgacgat gctggcggaa aactgaccta taccatagat ttcgccgcca 780

aacagggaca cggcaaaatc gaacacctga aaacacccga gcaaaatgtc gagcttgccg 840

ccgccgaact caaagcagat gaaaaatcac acgccgtcat tttgggcgac acgcgctacg 900

gcagcgaaga aaaaggcact taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg 960

ccggctcggc aaccgtgaag ataggggaaa aggttcacga aatcggcatc gccggcaaac 1020

agtagcattt gaaaaatgcc gtccgaacac gataatttac cgttcggacg gcatttttgc 1080

gccataccgc cctaggatac gacggcacgg caggcaagcc ggtttcacta tataatgccg 1140

tctgaaccaa cgagaaccat accatgcaag ctgattttaa ccgtcccgtc ctcgccgtcg 1200

ataccggtac ttcccatttg tcgctcgcgc tgcgcgccga cggcgaaacc cacctgttcc 1260

atcaagaggc cggcagccgc caatccgaac tgattctgcc ggaaatc 1307

<210> 435
<211> 332
<212> PRT

396
397

<213> Neisseria meningitides

<400> 435

Thr Lys Ser Ser Asn Asn Arg Leu Leu Val Asn Lys Met Pro Ser Glu
1 5 10 15

Pro Leu Phe Gly Arg His Leu Ile Phe Ala Ser Leu Thr Cys Leu Ile
20 25 30

Asp Ala Val Cys Lys Lys Arg Tyr His Asn Gln Asn Val Tyr Ile Leu
35 40 45

Ser Ile Leu Arg Met Thr Arg Ser Lys Pro Val Asn Arg Thr Ala Phe
50 55 60

Cys Cys Leu Ser Leu Thr Ala Ala Leu Ile Leu Thr Ala Cys Gly Ser
65 70 75 80

Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu Ala Asp
85 90 95

Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln Ser Leu
100 105 110

Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu Ala Ala
115 120 125

Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn Thr Gly
130 135 140

Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg Gln Ile
145 150 155 160

Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe Gln Ile
165 170 175

Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu Lys Ile
180 185 190

Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser Phe Leu
195 200 205

Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu Pro Asp
210 215 220

397
398

```
Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp Ala Gly
225                 230                 235                 240

Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly His Gly
                245                 250                 255

Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu Ala Ala
            260                 265                 270

Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu Gly Asp
        275                 280                 285

Thr Arg Tyr Gly Ser Glu Glu Lys Gly Thr Tyr His Leu Ala Leu Phe
    290                 295                 300

Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys Ile Gly
305                 310                 315                 320

Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
                325                 330
```

<210> 436
<211> 1301
<212> DNA
<213> Neisseria meningitides

<400> 436

```
ccgttatgcc aagggcgaat tgaaccaaat cgtcaaataa caggttgctt gtaaacaaaa     60

tgccgtctga accgttgttc ggacggcatt tgatttttgc ttctttgacc tgcctcattg    120

atgcagtatg caaaaaaaga taccataacc aaaatgttta tatattatct atttctgcgta    180

tgactaggag caaacctgtg aaccgaactg ccttctgctg cctttccctg accgccgccc    240

tgattctgac cgccatgagc agcggaggcg gcggtgtcgc cgccgacatc ggcgcggggc    300

ttgccgatgc actaaccgca ccgctcgacc ataaagacaa aagtttgcag tctttgacgc    360

tggatcagtc cgtcaggaaa aacgagaaac tgaagctggc ggcacaaggt gcggaaaaaa    420

cttatggaaa cggcgacagc ctcaatacgg gcaaattgaa gaacgacaag gtcagccgct    480

tcgactttat ccgtcaaatc gaagtggacg ggcagctcat taccttggag agcggagagt    540

tccaaatata caaacaggac cactccgccg tcgttgccct acagattgaa aaaatcaaca    600
```


398
399

accccgacaa aatcgacagc ctgataaacc aacgctcctt ccttgtcagc ggtttgggcg 660

gagaacatac cgccttcaac caactgcctg acggcaaagc cgagtatcac ggcaaagcat 720

tcagctccga cgatgctggc ggaaaactga cctataccat agatttcgcc gccaaacagg 780

gacacggcaa aatcgaacac ctgaaaacac ccgagcaaaa tgtcgagctt gccgccgccg 840

aactcaaagc agatgaaaaa tcacacgccg tcattttggg cgacacgcgc tacggcagcg 900

aagaaaaagg cacttaccac ctcgcccttt tcggcgaccg cgcccaagaa atcgccggct 960

cggcaaccgt gaagataggg gaaaaggttc acgaaatcgg catcgccggc aaacagtagc 1020

atttgaaaaa tgccgtccga acacgataat ttaccgttcg gacggcattt ttgcgccata 1080

ccgccctagg atacgacggc acggcaggca agccggtttc actatataat gccgtctgaa 1140

ccaacgagaa ccataccatg caagctgatt ttaaccgtcc cgtcctcgcc gtcgataccg 1200

gtacttccca tttgtcgctc gcgctgcgcg ccgacggcga aacccacctg ttccatcaag 1260

aggccggcag ccgccaatcc gaactgattc tgccggaaat c 1301

<210> 437
<211> 331
<212> PRT
<213> Neisseria meningitides

<400> 437

Thr Lys Ser Ser Asn Asn Arg Leu Leu Val Asn Lys Met Pro Ser Glu
1 5 10 15

Pro Leu Phe Gly Arg His Leu Ile Phe Ala Ser Leu Thr Cys Leu Ile
20 25 30

Asp Ala Val Cys Lys Lys Arg Tyr His Asn Gln Asn Val Tyr Ile Leu
35 40 45

Ser Ile Leu Arg Met Thr Arg Ser Lys Pro Val Asn Arg Thr Ala Phe
50 55 60

Cys Cys Leu Ser Leu Thr Ala Ala Leu Ile Leu Thr Ala Met Ser Ser
65 70 75 80

Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu Ala Asp Ala
85 90 95

Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln Ser Leu Thr
100 105 110

399
400

```
Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu Ala Ala Gln
        115                 120                 125

Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn Thr Gly Lys
    130                 135                 140

Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg Gln Ile Glu
145                 150                 155                 160

Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe Gln Ile Tyr
                165                 170                 175

Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu Lys Ile Asn
            180                 185                 190

Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser Phe Leu Val
        195                 200                 205

Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu Pro Asp Gly
    210                 215                 220

Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp Ala Gly Gly
225                 230                 235                 240

Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly His Gly Lys
                245                 250                 255

Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu Ala Ala Ala
            260                 265                 270

Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu Gly Asp Thr
        275                 280                 285

Arg Tyr Gly Ser Glu Glu Lys Gly Thr Tyr His Leu Ala Leu Phe Gly
    290                 295                 300

Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys Ile Gly Glu
305                 310                 315                 320

Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
                325                 330
```


400
Y.01

<210> 438
<211> 765
<212> DNA
<213> Neisseria meningitides

<400> 438

tgcagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa 300

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggcggaga acataccgcc 420

ttcaaccaac tgcctgacgg caaagccgag tatcacggca aagcattcag ctccgacgat 480

gctggcggaa aactgaccta taccatagat ttcgccgcca aacagggaca cggcaaaatc 540

gaacacctga aaacacccga gcaaaatgtc gagcttgccg ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcagcgaaga aaaaggcact 660

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag 720

ataggggaaa aggttcacga aatcggcatc gccggcaaac agtag 765

<210> 439
<211> 254
<212> PRT
<213> Neisseria meningitide

<400> 439

Cys Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

401
402

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu
100 105 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
115 120 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
130 135 140

Pro Asp Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145 150 155 160

Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly
165 170 175

His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
180 185 190

Ala Ala Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
195 200 205

Gly Asp Thr Arg Tyr Gly Ser Glu Glu Lys Gly Thr Tyr His Leu Ala
210 215 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225 230 235 240

Ile Gly Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
245 250

<210> 440
<211> 771
<212> DNA
<213> Neisseria meningitide

<400> 440

tgcggatcca gcagcggagg cggcggtgtc gccgccgaca tcggcgcggg gcttgccgat 60

402
403

gcactaaccg caccgctcga ccataaagac aaaagtttgc agtctttgac gctggatcag 120

tccgtcagga aaaacgagaa actgaagctg gcggcacaag gtgcggaaaa aacttatgga 180

aacggcgaca gcctcaatac gggcaaattg aagaacgaca aggtcagccg cttcgacttt 240

atccgtcaaa tcgaagtgga cgggcagctc attaccttgg agagcggaga gttccaaata 300

tacaaacagg accactccgc cgtcgttgcc ctacagattg aaaaaatcaa caaccccgac 360

aaaatcgaca gcctgataaa ccaacgctcc ttccttgtca gcggtttggg cggagaacat 420

accgccttca accaactgcc tgacggcaaa gccgagtatc acggcaaagc attcagctcc 480

gacgatgctg gcggaaaact gacctatacc atagatttcg ccgccaaaca gggacacggc 540

aaaatcgaac acctgaaaac acccgagcaa aatgtcgagc ttgccgccgc cgaactcaaa 600

gcagatgaaa aatcacacgc cgtcattttg ggcgacacgc gctacggcag cgaagaaaaa 660

ggcacttacc acctcgccct tttcggcgac cgcgcccaag aaatcgccgg ctcggcaacc 720

gtgaagatag gggaaaaggt tcacgaaatc ggcatcgccg gcaaacagta g 771

<210> 441
<211> 255
<212> PRT
<213> Neisseria meningitides

<400> 441

Cys Gly Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly
1 5 10 15

Leu Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu
20 25 30

Gln Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys
35 40 45

Leu Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu
50 55 60

Asn Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile
65 70 75 80

Arg Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu
85 90 95

403
404

Phe Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile
100 105 110

Glu Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg
115 120 125

Ser Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln
130 135 140

Leu Pro Asp Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp
145 150 155 160

Asp Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln
165 170 175

Gly His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu
180 185 190

Leu Ala Ala Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile
195 200 205

Leu Gly Asp Thr Arg Tyr Gly Ser Glu Glu Lys Gly Thr Tyr His Leu
210 215 220

Ala Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val
225 230 235 240

Lys Ile Gly Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
245 250 255

<210> 442
<211> 765
<212> DNA
<213> Neisseria meningitides

<400> 442
atgagcagcg gaggcggcgg tgtcgccgcc gacatcggcg cggggcttgc cgatgcacta 60

accgcaccgc tcgaccataa agacaaaagt ttgcagtctt tgacgctgga tcagtccgtc 120

aggaaaaacg agaaactgaa gctggcggca caaggtgcgg aaaaaactta tggaaacggc 180

gacagcctca atacgggcaa attgaagaac gacaaggtca gccgcttcga ctttatccgt 240

caaatcgaag tggacgggca gctcattacc ttggagagcg gagagttcca aatatacaaa 300

caggaccact ccgccgtcgt tgccctacag attgaaaaaa tcaacaaccc cgacaaaatc 360

404
406

gacagcctga taaaccaacg ctccttcctt gtcagcggtt tgggcggaga acataccgcc 420

ttcaaccaac tgcctgacgg caaagccgag tatcacggca aagcattcag ctccgacgat 480

gctggcggaa aactgaccta taccatagat ttcgccgcca aacagggaca cggcaaaatc 540

gaacacctga aaacacccga gcaaaatgtc gagcttgccg ccgccgaact caaagcagat 600

gaaaaatcac acgccgtcat tttgggcgac acgcgctacg gcagcgaaga aaaaggcact 660

taccacctcg ccctttttcgg cgaccgcgcc caagaaatcg ccggctcggc aaccgtgaag 720

ataggggaaa aggttcacga aatcggcatc gccggcaaac agtag 765

<210> 443
<211> 254
<212> PRT
<213> Neisseria meningitides

<400> 443

Met Ser Ser Gly Gly Gly Gly Val Ala Ala Asp Ile Gly Ala Gly Leu
1 5 10 15

Ala Asp Ala Leu Thr Ala Pro Leu Asp His Lys Asp Lys Ser Leu Gln
20 25 30

Ser Leu Thr Leu Asp Gln Ser Val Arg Lys Asn Glu Lys Leu Lys Leu
35 40 45

Ala Ala Gln Gly Ala Glu Lys Thr Tyr Gly Asn Gly Asp Ser Leu Asn
50 55 60

Thr Gly Lys Leu Lys Asn Asp Lys Val Ser Arg Phe Asp Phe Ile Arg
65 70 75 80

Gln Ile Glu Val Asp Gly Gln Leu Ile Thr Leu Glu Ser Gly Glu Phe
85 90 95

Gln Ile Tyr Lys Gln Asp His Ser Ala Val Val Ala Leu Gln Ile Glu
100 105 110

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln Arg Ser
115 120 125

Phe Leu Val Ser Gly Leu Gly Gly Glu His Thr Ala Phe Asn Gln Leu
130 135 140

405
406

```
Pro Asp Gly Lys Ala Glu Tyr His Gly Lys Ala Phe Ser Ser Asp Asp
145                 150                 155                 160

Ala Gly Gly Lys Leu Thr Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly
                165                 170                 175

His Gly Lys Ile Glu His Leu Lys Thr Pro Glu Gln Asn Val Glu Leu
            180                 185                 190

Ala Ala Ala Glu Leu Lys Ala Asp Glu Lys Ser His Ala Val Ile Leu
        195                 200                 205

Gly Asp Thr Arg Tyr Gly Ser Glu Glu Lys Gly Thr Tyr His Leu Ala
    210                 215                 220

Leu Phe Gly Asp Arg Ala Gln Glu Ile Ala Gly Ser Ala Thr Val Lys
225                 230                 235                 240

Ile Gly Glu Lys Val His Glu Ile Gly Ile Ala Gly Lys Gln
                245                 250
```

<210> 444
<211> 10
<212> PRT
<213> Neisseria meningitides

<400> 444

```
Met Val Ala Lys Arg Gln Phe Arg Ile Gly
1               5                   10
```

<210> 445
<211> 12
<212> PRT
<213> Neisseria meningitides

<400> 445

```
Asp Ile Ala Glu His Thr Ser Phe Asp Lys Leu Pro
1               5                   10
```

<210> 446
<211> 10
<212> PRT
<213> Neisseria meningitides

406
407

<400> 446

Tyr Thr Ile Asp Phe Ala Ala Lys Gln Gly
1 5 10

<210> 447
<211> 13
<212> PRT
<213> Neisseria meningitides

<400> 447

Gly Lys Ile Glu His Leu Lys Ser Pro Glu Leu Asn Val
1 5 10

<210> 448
<211> 12
<212> PRT
<213> Neisseria meningitides

<400> 448

His Ala Val Ile Ser Gly Ser Val Leu Tyr Asn Gln
1 5 10

<210> 449
<211> 10
<212> PRT
<213> Neisseria meningitides

<400> 449

Ala Gln Glu Val Ala Gly Ser Ala Glu Val
1 5 10

<210> 450
<211> 14
<212> PRT
<213> Neisseria meningitides

<400> 450

Lys Ile Asn Asn Pro Asp Lys Ile Asp Ser Leu Ile Asn Gln
1 5 10

<210> 451
<211> 10
<212> PRT
<213> Neisseria meningitides

<400> 451

407
408

Asp Glu Lys Ser His Ala Val Ile Leu Gly
1 5 10

<210> 452
<211> 10
<212> PRT
<213> Neisseria meningitides

<400> 452

Lys Ile Gly Glu Lys Val His Glu Ile Gly
1 5 10

408
409