

REIVINDICACIONES MODIFICADAS

1. Una variante de un polipéptido parental que tiene actividad alfa-amilasa, en donde dicha variante es un polipéptido de fusión y en donde dicha variante comprende una modificación correspondiente a la posición H1* de la SEQ ID NO: 13, y en donde dicha variante tiene actividad alfa-amilasa.

2. La variante de acuerdo con la reivindicación 1, en donde dicha variante tiene un rendimiento de lavado mejorado a baja temperatura, en donde dicha baja temperatura es de 5°C a 40°C, preferentemente de 10°C a 30°C, aún más preferentemente de 15°C a 20°C.

3. La variante de acuerdo con una cualquiera de las reivindicaciones anteriores, en donde dicho rendimiento de lavado mejorado tiene un factor de mejora (IF) de ≥ 1 cuando se compara con dicho polipéptido parental que tiene actividad alfa-amilasa.

4. La variante de acuerdo con una cualquiera de las reivindicaciones anteriores, en donde dicha variante comprende una secuencia de aminoácidos que tiene al menos 65%, tal como al menos 70%, tal como al menos 75%, tal como al menos 80%, tal como al menos 85%, tal como al menos 90%, tal como al menos 95%, tal como al menos 97%, tal como al menos 99%, pero menos del 100% de identidad de secuencia con cualquiera de la SEQ ID NO: 13.

5. La variante de acuerdo con una cualquiera de las reivindicaciones anteriores, que además comprende modificaciones en una o más de las siguientes posiciones correspondientes a las posiciones; T5, G7, Q11, N16, V17, Q32, A37, T40, P45, W48, G50, T51, N54, V56, K72, R87, Q98, M105, G109, F113, R116, Q118, Q125, G133, T134, W140, G142, G149,

T165, W167, Q169, R171, Q172, L173, A174, G184, A186, E190, T193, N195, A204, V206, P211, I214, V215, L217, L219, A225, L235, V238, K242, S244, M246, M248, L250, G255, Q256, N260, A263, V264, Y267, K269, N270, G273, S280, W284, T285, M286, F289, V291, Y295, Q299, R320, H321, S323, H324, V326, F328, T334, D337, Q345, G346, G348, T355, S376, D377, D379, Y382, S383, Q385, K391, K393, Q395, A420, G423, T444, A445, Q449, T459, P473, C474, G476, G477, y K484 de la SEQ ID NO: 13.

6. La variante de acuerdo con una cualquiera de las reivindicaciones anteriores, en donde dicha variante comprende uno o más de las siguientes alteraciones: T5K, G7K, G7A, Q11H, N16S, N16H, V17L, Q32S, A37H, A37M, A37V, A37S, A37Y, A37R, A37L, T40G, T40K, P45A, W48G, W48Y, W48F, G50A, T51K, T51E, T51G, T51A, T51S, T51G, T51D, N54S, V56T, K72R, K72H, K72S, K72Q, K72E, K72N, K72A, K72M, R87S, Q98S, Q98A, M105F, M105I, M105V, M105L, G109A, G109S, F113W, F113S, F113N, F113Y, F113R, F113L, F113Q, R116Q, R116V, R116K, R116W, R116L, R116A, R116H, R116M, R116E, R116S, R116I, R116G, Q118N, Q118K, Q118G, Q118S, Q118F, Q118R, Q125P, Q125K, Q125A, Q125T, G133S, T134E, W140Y, G142T, G149Q, T165S, T165G, T165V, W167I, W167G, W167F, W167R, W167S, W167H, W167L, W167M, W167Y, Q169E, R171H, Q172G, Q172R, Q172N, Q172D, Q172Y, Q172M, Q172S, Q172T, Q172K, Q172H, Q172E, L173V, L173G, L173H, L173A, L173I, L173P, L173T, L173F, L173M, A174S, A174D, A174P, A174M, A174T, A174H, A174K, A174G, A174Q, A174N, A174V, A174L, G184T, A186D, A186N, A186E, A186Q, A186H, E190P, T193K, N195F, A204T, A204V, A204S, A204G, V206L, V206S, V206Y, P211D, I214G, I214H, I214S, I214T, I214L, I214E, I214W, V215T, L217T, L217Q, L219V, L219H, A225V, L235V, L235A, V238A, V238T, V238G, K242Q, S244Q, M246L, M246A, M246I, M246F, M246V, M246S, M248T, L250I, L250V, L250T, L250A, L250F, L250M, G255N, G255A, G255S, Q256A, N260G, A263G, V264I, V264T, Y267I, Y267M,

Y267H, Y267L, K269Q, N270G, N270T, G273R, S280W, S280L, S280T, S280A, S280K, S280Q, W284H, T285L, T285Q, M286F, M286L, A288L, A288V, F289I, F289L, V291G, V291A, V291T, Y295N, Y295F, Q299V, S340R, S304N, R320A, R320V, H321Y, S323N, H324L, V326L, F328L, F328M, F328V, F328I, T334S, D337H, Q345D, G346T, G346D, G346P, G348S, G348P, T355L, T355F, S376H, S376T, S376V, D377H, D377S, D377A, D377Q, D379S, D379G, D379R, D379A, Y382M, Y382I, Y382L, Y382F, S383G, S383A, Q385L, K391A, K391Y, K391V, K391M, K391E, K391D, K391R, K391H, K391W, K391I, K391Q, K391L, K393Y, K393R, K393Q, K393S, Q395P, T400P, H402R, A420Q, A420S, A420K, A420L, G423H, T444Q, T444S, T444D, T444Y, T444H, T444V, T444R, T444A, A445Q, Q449T, T459N, P473R, P473A, P473G, P473T, P473K, C474V, G476K, G477A, G477Q, K484A, K484G, K484P, K484E, K484Q, y K484S de SEQ ID NO: 13.

7. La variante de acuerdo con una cualquiera de las reivindicaciones anteriores, en donde la variante además comprende una eliminación y/o una sustitución en dos o más posiciones correspondientes a las posiciones: R181, G182, D183, y G184.

8. La variante de acuerdo con la reivindicación 7, en donde la eliminación es seleccionada de un grupo que consiste en R181+G182, R181+D183, R181+G184, G182+D183, G182+G184, o D183+G184.

9. La variante de acuerdo con una cualquiera de las reivindicaciones anteriores, en donde dicha variante tiene un IF de >1 cuando se compara con dicho polipéptido parental y en donde dicha variante se selecciona entre

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+G476K,

H1*+N54S+V56T+R87S+G109A+A174S+G182*+D183*+N195F+V206L+K391A+G476K,

H1*+T40G+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K
391A+G476K,

H1*+T51K+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K
391A+G476K,

H1*+N54S+V56T+K72R+G109A+A174S+G182*+D183*+N195F+V206L+K
391A+G476K,

H1*+N54S+V56T+K72H+G109A+A174S+G182*+D183*+N195F+V206L+K
391A+G476K,

H1*+A37H+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K
391A+G476K,

H1*+A37M+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K
391A+G476K,

H1*+A37V+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K
391A+G476K,

H1*+A37S+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K
391A+G476K,

H1*+A37Y+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K
391A+G476K,

H1*+A37R+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K
391A+G476K,

H1*+N54S+V56T+G109A+F113W+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+F113S+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+F113N+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+F113Y+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+F113R+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+Q118N+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+R116Q+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+R116V+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+R116K+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+R116W+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+R116L+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+G142T+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+Q125P+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+Q125K+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+S381G+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+M246T+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+V213T+
K391A+G476K,

H1*+A37L+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K
391A+G476K,

H1*+N54S+V56T+G109A+Q118K+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+R116A+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+R116H+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+Q125A+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+Q172G+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+Q172R+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+D377S+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+D377G+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+D377R+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+D377A+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+I214G+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+S381A+
K391A+G476K,

H1*+N54S+V56T+G109A+W167I+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+W167G+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+G346S+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+G346P+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+I214H+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+I214S+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+I214T+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
A420Q+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+A420S+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+A420K+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+A420L+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+K391Y+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+K391R+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+P473R+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+P473A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+P473G+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+P473T+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+Q395P+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+T444Q+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+T444S+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+T444D+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+T444Y+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+S280W+K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+S280L+K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+S280T+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+S280A+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+G255N+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+T285L+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+T285Q+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
Q449T+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
P473K+G476K,

H1*+N54S+V56T+K72S+G109A+A174S+G182*+D183*+N195F+V206L+K
391A+G476K,

H1*+T40K+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+G
346T+K391A+

G476K,

H1*+G50A+N54S+V56T+G109A++Q172N+A174S+G182*+D183*+N195F+
V206L+K391A+

G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
G476K+K484A,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
G476K+K484G,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
G476K+K484P,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
G476K+K484E,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
G476K+K484Q,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
G476K+K484S,

H1*K+G50A+N54S+V56T+G109A+W167F+A174S+G182*+D183*+N195F+
V206L+K391A+

G476K,

H1*+N54S+V56T+G109A+L173V+A174S+G182*+D183*+N195F+A204T+
V206L+K391A+

G476K,

H1*+N54S+V56T+G109A+W140Y+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+Q98S+G109A+A174S+G182*+D183*+N195F+V206L+R
320A+K391A+

G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+H324L+
K391A+G476K,

H1*+N54S+V56T+G109A+G149Q+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+G346T+
K391A+G476K+

G477A,

H1*+N54S+V56T+G109A+G255A++A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+G50A+N54S+V56T+G109A+F113L+R116L+A174S+G182*+D183*+N
195F+V206L+

K391A+G476K,

H1*+N54S+V56T+G109A+W167F+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+L173V+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+K72R+G109A+W167F+A174S+G182*+D183*+N195F+V
206L+K391A+

G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
G476K+G477Q,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+Q345D+
K391A+G476K+

G477Q,

H1*+G50A+N54S+V56T+G109A+Q172D+A174S+G182*+D183*+N195F+V
206L+K391A+

G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+V264I+
K391A+G423H+

G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+R320V+
K391A+G476Y,

H1*+T5K+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K3
91A+G476K,

H1*+N54S+V56T+G109A+R116M+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+Q172Y+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+I214L+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+L217V+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+L217H+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+P211D+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
K391Q+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
T444H+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
T444V+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
T444R+G476K,

H1*+G50A+N54S+V56T+G109A+L173V+A174S+G182*+D183*+N195F+A
204V+V206L+

K391A+G476K,

H1*+G50A+N54S+V56T+G109A+F113L+W167F+A174S+G182*+D183*+N
195F+V206L+

K391A+G476K,

H1*+G7K+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+R3
20A+K391A+G476K,

H1*+N54S+V56T+G109A+Q118G+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+S280K+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+N270G+
K391A+G476K,

H1*+N54S+V56T+G109A+Q172D+A174S+G182*+D183*+N195F+V206L+
G346T+K391A+

G476K+G477A,

H1*+N54S+V56T+G109A+Q118S+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+R320A+
K391A+G476K,

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K391A+G476K,

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G476K,

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K391A+G476K,
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K391A+G476K,
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K391A+G476K,
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G476K,
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K391A+G476K,
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D377H+K391A+
G476K,
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D377H+K391A+
G476K,
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D377H+K391A+
G476K,
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D377H+K391A+
G476K,
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D377H+K391A+
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G476K,

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G476K,
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G476K,
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K391A+G476K,
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N195F+V206L+
K391A+G476K,
H1*+N54S+V56T+G109S+R116Q+W167F+Q172G+A174S+G182*+D183*+
N195F+V206L+
K391A+P473R+G476K,
H1*+N54S+V56T+G109S+F113Q+W167F+Q172N+A174S+G182*+D183*+
N195F+V206L+

K391A+G476K,
H1*+A37V+N54S+V56T+G109S+F113Q+W167F+Q172R+A174S+G182*+D
183*+N195F+
V206L+K391A+G476K,
H1*+N54S+V56T+K72R+G109A+R116H+T134E+W167F+Q172G+L173V+A
174S+G182*+
D183*+N195F+V206L+G255A+K391A+G476K,
H1*+N54S+V56T+K72R+G109A+R116H+T134E+W167F+Q172G+L173V+A
174S+G182*+
D183*+N195F+V206L+G255A+K391A+Q395P+T444Q+P473R+G476K,
H1*+N54S+V56T+K72R+G109A+F113Q+R116Q+W167F+Q172G+A174S+G
182*+D183*+
G184T+N195F+V206L+K391A+P473R+G476K,
H1*+N54S+V56T+K72R+G109A+F113Q+R116Q+T134E+W167F+Q172R+A
174S+G182*+
D183*+N195F+V206L+G255A+K391A+T444Q+P473R+G476K,
H1*+N54S+V56T+K72R+G109A+F113Q+T134E+W167F+Q172R+A174S+G
182*+D183*+
N195F+V206L+G255A+K391A+Q395P+A445Q+P473R+G476K,
H1*+N54S+V56T+K72R+G109A+F113Q+R116H+T134E+W167F+Q172R+A
174S+G182*+
D183*+N195F+V206L+G255A+K391A+Q395P+G476K,
H1*+N54S+V56T+K72R+G109A+T134E+W167F+Q172N+A174S+G182*+D
183*+N195F+
V206L+G255A+A265G+K391A+T444Q+P473R+G476K,
H1*+N54S+V56T+K72R+G109A+G133Q+W167F+Q172R+A174S+G182*+D
183*+N195F+
V206L+K391A+G476K,
H1*+N54S+V56T+K72R+G109A+F113Q+R116Q+W167F+Q172G+A174S+G
182*+D183*+
N195F+A204G+V206L+K391A+G476K,

H1*+N54S+V56T+K72R+G109A+F113Q+R116Q+W167F+Q172N+L173V+A
174S+G182*+
D183*+G184T+N195F+V206L+K391A+T444Q+P473R+G476K,
H1*+A37H+N54S+V56T+G109A+F113Q+W167F+Q172N+A174S+G182*+D
183*+N195F+
V206L+K391A+G476K,
H1*+A37H+N54S+V56T+G109A+F113Q+A174S+G182*+D183*+N195F+V
206L+K391A+
G476K,
H1*+N54S+V56T+G109A+F113Q+W167F+Q172N+A174S+G182*+D183*+
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K391A+T459N+G476K,
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K391A+T444Q+G476K,
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V206L+K391A+
P473R+G476K,
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V206L+K391A+G476K,
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183*+N195F+
V206L+K391A+G476K,
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83*+N195F+V206+K391A+G476K,
H1*+A37H+N54S+V56T+A60V+G109A+R116Q+T165G+A174S+G182*+D1
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H1*+N54S+V56T+A60V+G109A+R116Q+W167F+Q172G+L173V+A174S+G
182*+D183*+
N195F+V206L+K391A+G476K,

H1*+N54S+V56T+A60V+G109A+R116Q+A174S+G182*+D183*+N195F+V
206L+K391A+
G476K,
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N195F+V206L+K391A+G476K,
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195F+V206L+
K391A+T444Q+P473R+G476K,
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206L+K391A+
T444Q+P473R+G476K,
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N195F+V206L+K391A+G476K,
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183*+N195F+
V206L+K391A+G476K,
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N195F+A204G+
V206L+K391A+P473R+G476K,
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P473R+G476K,
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K,
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G476K,
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V206L+K391A+
G476K,
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V206L+K391A+
G476K,
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195F+V206L+
G255A+K391A+G476K,
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195F+V206L+
G255A+K391A+P473R+G476K,
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K391A+G476K,
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195F+V206L+
K391A+G476K,

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195F+V206L+
M246F+K391A+G476K,
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184T+N195F+
V206L+K391A+T444Q+G476K,
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K391A+T444Q+
G476K,
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G182*+D183*+
N195F+V206L+K391A+P473R+G476K,
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D183*+N195F+
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M246F+K391A+G476K,
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K391A+G476K,
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K391A+G476K,
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391A+C474V+
G476K,
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K391A+C474V+
G476K,
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K391A+G476K,
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06L+K391A+G476K,

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K391A+G476K,

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K391A+G476K,

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+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+G476K,

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Q256A+K391A+

G476K,

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K391A+G476K,

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+A174S+G182*+D183*+N195F+V206L+K391A+G476K,

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K391A+G476K,

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G476K,

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G476K,

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G476K,

H1*+N16H+V17L+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V2
06L+Y382F+K391A+G476K,

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385L+K391A+

G476K,

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G476K,

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N195F+V206L+

K391A+G476K,

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G476K,

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+G184T+N195F+

V206L+K391A+P473R+G476K,

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182*+D183*+

G184T+N195F+V206L+P473R+G476K,

H1*+N54S+V56T+G109A+Q169E+Q172G+A174*+G182*+D183*+N195F+
V206L+K391A+

G476K,

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N195F+V206L+

K391A+G476K,

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391A+G476K,

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N195F+V206L+

K391A+G476K,

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V206L+Y295N+

K391A+G476K,

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K391A+G476K,

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N195F+V206L+

K391A+G476K,

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V206L+A288V+

K391A+G476K,

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V206L+G255A+

K391A+G476K,

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+K391A+G476K,

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K391A+G476K,

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V206L+V291A+

K391A+G476K,

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K391A+G476K,

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V206L+R320A+

S323N+K391A+G476K,

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+K391A+G476K,

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182*+D183*+

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V206L+G476K,

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V206L+N260G+

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A+G476K,

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K391A+G476K,

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K391A+G476K,

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V206L+K391A+

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K391A+G476K,
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V206L+F328L+
K391A+G476K,
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K391A+G476K,
H1*+W48F+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K
391A+G476K,
H1*+N54S+V56T+G109A+A174T+G182*+D183*+N195F+V206L+K391A+
G476K,
H1*+N54S+V56T+G109A+R116W+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+V238A+
K391A+G476K,
G182*+D183*+A186N,
H1*+N54S+V56T+G109A+A174S+V206L+G182*+D183*+K391A+G476K,
H1*+N54S+V56T+Q169E+Q172K+A174*+G182*+D183*+N195F+V206L+
K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206F+K391A+
G476K,
H1*+N54S+V56T+G109A+G182*+D183*+N195F+V206L+K391A+G476K,
H1*+N54S+V56T+G109A+Q172K+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,
H1*+N54S+V56T+G109A+Q172K+A174*+G182*+D183*+N195F+V206L+
K391A+G476K,
H1*+N54S+V56T+G109A+A174N+G182*+D183*+N195F+V206L+K391A+
G476K,

H1*+N54S+V56T+G109A+A174S+A186N+G182*+D183*+N195F+V206L+K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+F289L+K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+Y295F+K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+V291A+K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+S244Q+K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+A225V+K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+P473R+G476K,

H1*+W48Y+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+G476K,

H1*+N54S+V56T+G109A+Q169E+Q172K+A174*+G182*+D183*+N195F+V206L+K391A+

G476K,

H1*+N54S+V56T+Q98A+G109A+A174S+G182*+D183*+N195F+V206L+K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206Y+K391A+G476K,

H1*+D183*+G182*,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+G184T+N195F+V206L+K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+G255A+K391A+G476K,

H1*+N54S+V56T+G109A+Q169E+Q172K+A174S+G182*+D183*+N195F+V206L+K391A+

G476K, en donde la numeración es acorde a la SEQ ID NO: 13.

10. La variante de acuerdo con cualquiera de las reivindicaciones precedentes, en donde dicha variante es seleccionada del grupo que consiste en:

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+G476K

H1*+G50A+T51A+V56T+G109A+A174S+G182*+D183*+N195F+V206L+G476K

H1*+N54S+V56T+M105F+G109A+A174S+G182*+D183*+N195F+V206L+R320A+S323N+

K391A+G476K

H1*+T40K+N54S+V56T+G109A+G149H+A174S+G182*+D183*+N195F+V206L+K391A+

G476K

H1*+N54S+V56T+K72R+G109A+A174S+G182*+D183*+N195F+V206L+G255A+K391A+

G476K

H1*+N16H+V17L+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+G476K

H1*+Q22N+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+G476K

H1*+Q32S+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+G476K

H1*+H28N+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+G476K

H1*+N29S+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+G476K

H1*+H28N+N29S+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+G476K

H1*+N54S+V56T+G109A+A174S+R176K+G182*+D183*+N195F+V206L+K391A+G476K

H1*+N54S+V56T+G109A+Q169E+Q172K+A174*+R176K+G182*+D183*+
N195F+V206L+

K391A+G476K

H1*+N54S+V56T+G109A+A174S+N175G+G182*+D183*+N195F+V206L+
K391A+G476K

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+V291A+
Y295N+Q299T+

K391A+G476K

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K269S+
A274K+K391A+

G476K

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+L235I+
K391A+G476K

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+L235V+
V238A+K391A+

G476K

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+Q365S+
K391A+G476K

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
H402R+G476K

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+R320S+
H321N+K391A+

G476K

H1*+N54S+V56T+G109A+Q169E+Q172K+A174*+G182*+D183*+N195F+
V206L+K391A+

G476K

H1*+N54S+V56T+G109A+Q125S+A174S+G182*+D183*+N195F+V206L+
K391A+G476K

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+L235V+
K391A+G476K

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+A265G+
K391A+G476K

H1*+T51Q+N54S+V56T+G109A+A174S+G182*+D183*+N195F+Y203F+V
206L+K391A+
G476K
H1*+N54S+V56T+G109A+Q169E+Q172K+A174*+N175Q+G182*+D183*+
N195F+V206L+
K391A+G476K
H1*+H28N+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K
391A+G476K
H1*+N54S+V56T+G109A+T134E+A174S+G182*+D183*+N195F+V206L+
K391A+G476K
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+D377H+
K391A+G476K
H1*+G50A+T51A+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V2
06L+K391A+G476K
H1*+G7K+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K3
91A+G476K
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+M202V+V206L+
K391A+G476K
H1*+N54S+V56T+M105F+G109A+A174S+G182*+D183*+N195F+V206L+
M246F+K391A+
G476K
H1*+N16H+V17L+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V2
06L+D377H+K391A+G476K
H1*+T51G+N54S+V56T+G109A+A174S+G182*+D183*+N195F+Y203G+V
206L+K391A+
G476K
H1*+T51G+N54S+V56T+G109A+G110N+A174S+G182*+D183*+N195F+V
206L+K391A+
G476K
H1*+N54S+V56T+G109A+Q125S+A174S+N175G+G182*+D183*+N195F+
V206L+K391A+
G476K

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+A265G+V291A+F328L+

K391A+G476K

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+M246F+A265G+V291A+

F328L+Q365S+K391A+G476K

H1*+N16Y+N54S+V56T+G109A+R116H+A174S+G182*+D183*+N195F+V206L+G337E+

D377H+K391A+G476K,

H1*+I9L+N54S+V56T+G109A+Q125S+V131T+A174*+G182*+D183*+V206L+Y267F+F289H+Q361E+K391A+G476K, en donde la numeración es acorde a la SEQ ID NO: 13.

11. La variante de acuerdo con una cualquiera de las reivindicaciones precedentes , en donde dicha variante tiene un IF de >1.5 cuando se compara con dicho polipéptido parental y en donde dicha variante se selecciona entre

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+G476K,

H1*+N54S+V56T+R87S+G109A+A174S+G182*+D183*+N195F+V206L+K391A+G476K,

H1*+T40G+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+G476K,

H1*+T51K+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+G476K,

H1*+N54S+V56T+K72R+G109A+A174S+G182*+D183*+N195F+V206L+K391A+G476K,

H1*+N54S+V56T+K72H+G109A+A174S+G182*+D183*+N195F+V206L+K391A+G476K,

H1*+A37H+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+G476K,

H1*+A37M+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K
391A+G476K,

H1*+A37V+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K
391A+G476K,

H1*+A37S+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K
391A+G476K,

H1*+A37Y+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K
391A+G476K,

H1*+A37R+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K
391A+G476K,

H1*+N54S+V56T+G109A+F113W+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+F113S+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+F113N+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+F113Y+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+Q118N+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+R116Q+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+R116V+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+R116K+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+R116W+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+R116L+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+G142T+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+Q125P+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+Q125K+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+S381G+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+M246T+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+V213T+
K391A+G476K,

H1*+A37L+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K
391A+G476K,

H1*+N54S+V56T+G109A+Q118K+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+R116A+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+R116H+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+Q125A+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+Q172G+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+Q172R+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+D377S+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+D377G+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+D377R+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+D377A+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+I214G+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+S381A+
K391A+G476K,

H1*+N54S+V56T+G109A+W167I+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+W167G+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+G346S+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+G346P+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+I214H+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+I214S+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+I214T+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
A420Q+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
A420S+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
A420K+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
A420L+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
K391Y+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
K391R+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
P473R+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
P473A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
P473G+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
P473T+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
Q395P+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
T444Q+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
T444S+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
T444D+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
T444Y+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+S280W+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+S280L+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+S280T+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+S280A+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+G255N+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+T285L+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+T285Q+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
Q449T+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
P473K+G476K,

H1*+N54S+V56T+K72S+G109A+A174S+G182*+D183*+N195F+V206L+K
391A+G476K,

H1*+T40K+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+G
346T+K391A+

G476K,

H1*+G50A+N54S+V56T+G109A++Q172N+A174S+G182*+D183*+N195F+
V206L+K391A+

G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
G476K+K484A,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
G476K+K484G,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
G476K+K484P,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
G476K+K484E,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
G476K+K484Q,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
G476K+K484S,

H1*K+G50A+N54S+V56T+G109A+W167F+A174S+G182*+D183*+N195F+
V206L+K391A+

G476K,

H1*+N54S+V56T+G109A+L173V+A174S+G182*+D183*+N195F+A204T+
V206L+K391A+

G476K,

H1*+N54S+V56T+G109A+W140Y+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+Q98S+G109A+A174S+G182*+D183*+N195F+V206L+R
320A+K391A+

G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+H324L+
K391A+G476K,
H1*+N54S+V56T+G109A+G149Q+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+G346T+
K391A+G476K+
G477A,
H1*+N54S+V56T+G109A+G255A++A174S+G182*+D183*+N195F+V206L+
K391A+G476K,
H1*+G50A+N54S+V56T+G109A+F113L+R116L+A174S+G182*+D183*+N
195F+V206L+
K391A+G476K,
H1*+N54S+V56T+G109A+W167F+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,
H1*+N54S+V56T+G109A+L173V+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,
H1*+N54S+V56T+K72R+G109A+W167F+A174S+G182*+D183*+N195F+V
206L+K391A+
G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
G476K+G477Q,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+Q345D+
K391A+G476K+
G477Q,
H1*+G50A+N54S+V56T+G109A+Q172D+A174S+G182*+D183*+N195F+V
206L+K391A+
G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+V264I+
K391A+G423H+
G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+R320V+
K391A+G476Y,

H1*+T5K+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K3
91A+G476K,

H1*+N54S+V56T+G109A+R116M+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+Q172Y+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+I214L+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+L217V+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+L217H+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+P211D+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
K391Q+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
T444H+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
T444V+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+
T444R+G476K,

H1*+G50A+N54S+V56T+G109A+L173V+A174S+G182*+D183*+N195F+A
204V+V206L+

K391A+G476K,

H1*+G50A+N54S+V56T+G109A+F113L+W167F+A174S+G182*+D183*+N
195F+V206L+

K391A+G476K,

H1*+G7K+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+R3
20A+K391A+G476K,

H1*+N54S+V56T+G109A+Q118G+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+S280K+
K391A+G476K,

H1*+N54S+V56T+G109A+Q172D+A174S+G182*+D183*+N195F+V206L+
G346T+K391A+

G476K+G477A,

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K391A+G476K,

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K391A+G476K,

H1*+N54S+V56T+G109A+T134E+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

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Q385L+K391A+

G476K,

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K391A+G476K,

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255A+D377H+

K391A+G476K,

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206L+G255A+

K391A+G476K,

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206L+G255A+

K391A+G476K,

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V206L+K391A+

G476K,

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N195F+V206L+

K391A+G476K,
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K391A+G476K,
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391A+G476K,

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206L+K391A+

G476K,

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206L+K391A+

G476K,

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V206L+D377H+

K391A+G476K,

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183*+N195F+

V206L+D377H+K391A+G476K,

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206L+K391A+

G476K,

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206L+D377H+

K391A+G476K,

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195F+V206L+

K391A+G476K,

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K391A+G476K,

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D377H+K391A+

G476K,

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V206L+D377H+

K391A+G476K,

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K391A+G476K+
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206L+K391A+
G476K,
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206L+G255A+
K391A+G476K,
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D377H+K391A+
G476K,
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D377H+K391A+
G476K,
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G476K,
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K391A+G476K,
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G476K,
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V206L+K391A+

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G476K,
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G476K,
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G255A+K391A+G476K,

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391A+G476K,

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391A+G476K,

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206L+K391A+

G476K,

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206L+K391A+

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V206L+G255A+

D377H+K391A+G476K,

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206L+K391A+

G476K,

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206L+G255A+

D377H+K391A+G476K,

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R320A+S323N+

K391A+G476K,

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+G476K,

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K391A+G476K,

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K391A+G476K,

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K391A+G476K,

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K391A+G476K,

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K391A+G476K,

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D377H+K391A+

G476K,

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N195F+V206L+

K391A+G476K,

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K391A+G476K,

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K391A+G476K,

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K391A+G476K,

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K391A+G476K,

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G476K,

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K391A+G476K,

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G476K,

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195F+V206L+

G255A+K391A+G476K,

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206L+K391A+

G476K,

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206L+K391A+

G476K,

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206L+K391A+

G476K,

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206L+K391A+

G476K,

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206L+K391A+

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K391A+G476K,
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G476K,

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G476K,
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K391S+G476K,

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T444A+G476K,

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206L+S323N+

K391A+G476K,

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195F+V206L+

G255A+K391A+G476K,

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G476K,

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206L+D377H+

K391A+G476K,

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K391A+G476K,

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206L+K391A+
G476K,
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G476K,
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D377H+K391A+
G476K,
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D377H+K391A+
G476K,
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D377H+K391A+
G476K,
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D377H+K391A+
G476K,
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D377H+K391A+
G476K,
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D377H+K391A+

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G476K,
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D377H+K391A+

G476K,

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D377H+K391A+

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K391A+G476K,

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N195F+V206L+
K391A+G476K,
H1*+A37V+N54S+V56T+G109S+F113Q+W167F+Q172R+A174S+G182*+D
183*+N195F+
V206L+K391A+G476K,
H1*+N54S+V56T+K72R+G109A+R116H+T134E+W167F+Q172G+L173V+A
174S+G182*+

D183*+N195F+V206L+G255A+K391A+G476K,
H1*+N54S+V56T+K72R+G109A+R116H+T134E+W167F+Q172G+L173V+A
174S+G182*+
D183*+N195F+V206L+G255A+K391A+Q395P+T444Q+P473R+G476K,
H1*+N54S+V56T+K72R+G109A+F113Q+R116Q+W167F+Q172G+A174S+G
182*+D183*+
G184T+N195F+V206L+K391A+P473R+G476K,
H1*+N54S+V56T+K72R+G109A+F113Q+R116Q+T134E+W167F+Q172R+A
174S+G182*+
D183*+N195F+V206L+G255A+K391A+T444Q+P473R+G476K,
H1*+N54S+V56T+K72R+G109A+F113Q+T134E+W167F+Q172R+A174S+G
182*+D183*+
N195F+V206L+G255A+K391A+Q395P+A445Q+P473R+G476K,
H1*+N54S+V56T+K72R+G109A+F113Q+R116H+T134E+W167F+Q172R+A
174S+G182*+
D183*+N195F+V206L+G255A+K391A+Q395P+G476K,
H1*+N54S+V56T+K72R+G109A+T134E+W167F+Q172N+A174S+G182*+D
183*+N195F+
V206L+G255A+A265G+K391A+T444Q+P473R+G476K,
H1*+N54S+V56T+K72R+G109A+G133Q+W167F+Q172R+A174S+G182*+D
183*+N195F+
V206L+K391A+G476K,
H1*+N54S+V56T+K72R+G109A+F113Q+R116Q+W167F+Q172G+A174S+G
182*+D183*+
N195F+A204G+V206L+K391A+G476K,
H1*+N54S+V56T+K72R+G109A+F113Q+R116Q+W167F+Q172N+L173V+A
174S+G182*+
D183*+G184T+N195F+V206L+K391A+T444Q+P473R+G476K,
H1*+A37H+N54S+V56T+G109A+F113Q+W167F+Q172N+A174S+G182*+D
183*+N195F+
V206L+K391A+G476K,

H1*+A37H+N54S+V56T+G109A+F113Q+A174S+G182*+D183*+N195F+V
206L+K391A+
G476K,
H1*+N54S+V56T+G109A+F113Q+W167F+Q172N+A174S+G182*+D183*+
N195F+V206L+
K391A+T459N+G476K,
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N195F+V206L+
K391A+T444Q+G476K,
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V206L+K391A+
P473R+G476K,
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V206L+K391A+G476K,
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V206L+K391A+G476K,
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N195F+V206L+K391A+G476K,
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206L+K391A+
G476K,
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N195F+V206L+K391A+G476K,

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K391A+T444Q+P473R+G476K,
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206L+K391A+
T444Q+P473R+G476K,
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V206L+K391A+G476K,
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P473R+G476K,
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K,
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G476K,
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V206L+K391A+
G476K,
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G476K,
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K391A+G476K,
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M246F+K391A+G476K,
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184T+N195F+

V206L+K391A+T444Q+G476K,
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K391A+T444Q+
G476K,
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N195F+V206L+K391A+P473R+G476K,
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N195F+V206L+
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P473R+G476K,
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K391A+P473R+G476K,
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K391A+G476K,
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N195F+V206L+

K391A+G476K,

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K391A+G476K,

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391A+C474V+

G476K,

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K391A+C474V+

G476K,

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K391A+C474V+

G476K,

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V206L+K391A+

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K391A+G476K,

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06L+K391A+G476K,

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K391A+G476K,

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K391A+G476K,

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+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+G476K,

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Q256A+K391A+

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K391A+G476K,
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K391A+G476K,
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N195F+V206L+
K391A+G476K,
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+G184T+N195F+
V206L+K391A+P473R+G476K,

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K391A+G476K,
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K391A+G476K,

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K391A+G476K,
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K391A+G476K,
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+K391A+G476K,
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K391A+G476K,

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A+G476K,

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K391A+G476K,

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K391A+G476K,

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K391A+G476K,

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K391A+G476K,

G182*+D183*+A186N,

H1*+N54S+V56T+G109A+A174S+V206L+G182*+D183*+K391A+G476K,

H1*+N54S+V56T+Q169E+Q172K+A174*+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206F+K391A+
G476K,

H1*+N54S+V56T+G109A+G182*+D183*+N195F+V206L+K391A+G476K,

H1*+N54S+V56T+G109A+Q172K+A174S+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+Q172K+A174*+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+A174N+G182*+D183*+N195F+V206L+K391A+
G476K,

H1*+N54S+V56T+G109A+A174S+A186N+G182*+D183*+N195F+V206L+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+F289L+
K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+Y295F+K391A+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+V291A+K391A+G476K, en donde dicha numeración es acorde a la SEQ ID NO: 13.

12. La variante de acuerdo con una cualquiera de las reivindicaciones anteriores, en donde dicha variante tiene un IF de al menos >2.0 cuando se compara con dicho polipéptido parental y en donde dicha variante se selecciona entre

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+G476K,

H1*+N54S+V56T+R87S+G109A+A174S+G182*+D183*+N195F+V206L+K391A+G476K,

H1*+T40G+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+G476K,

H1*+T51K+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+G476K,

H1*+N54S+V56T+K72R+G109A+A174S+G182*+D183*+N195F+V206L+K391A+G476K,

H1*+N54S+V56T+K72H+G109A+A174S+G182*+D183*+N195F+V206L+K391A+G476K,

H1*+A37H+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+G476K,

H1*+A37M+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+G476K,

H1*+A37V+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+G476K,

H1*+A37S+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+G476K,

H1*+A37Y+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+G476K,

H1*+A37R+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+G476K,

H1*+N54S+V56T+G109A+F113W+A174S+G182*+D183*+N195F+V206L+K391A+G476K,

H1*+N54S+V56T+G109A+F113S+A174S+G182*+D183*+N195F+V206L+K391A+G476K,

H1*+N54S+V56T+G109A+F113N+A174S+G182*+D183*+N195F+V206L+K391A+G476K,

H1*+N54S+V56T+G109A+R116Q+A174S+G182*+D183*+N195F+V206L+K391A+G476K,

H1*+N54S+V56T+G109A+R116V+A174S+G182*+D183*+N195F+V206
L+K391A+G476K,
H1*+N54S+V56T+G109A+R116K+A174S+G182*+D183*+N195F+V206
L+K391A+G476K,
H1*+N54S+V56T+G109A+Q125P+A174S+G182*+D183*+N195F+V206
L+K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+S381
G+K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+M246
T+K391A+G476K,
H1*+A37L+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L
+K391A+G476K,
H1*+N54S+V56T+G109A+R116A+A174S+G182*+D183*+N195F+V206
L+K391A+G476K,
H1*+N54S+V56T+G109A+R116H+A174S+G182*+D183*+N195F+V206
L+K391A+G476K,
H1*+N54S+V56T+G109A+Q125A+A174S+G182*+D183*+N195F+V206
L+K391A+G476K,
H1*+N54S+V56T+G109A+Q172G+A174S+G182*+D183*+N195F+V206
L+K391A+G476K,
H1*+N54S+V56T+G109A+Q172R+A174S+G182*+D183*+N195F+V206
L+K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+D377
S+K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+D377
A+K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+S381
A+K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+G346
P+K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+I214
H+K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+I214
S+K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391
A+A420Q+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391
A+A420S+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391
A+A420K+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391
A+A420L+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391
A+K391Y+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391
A+P473R+G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391
A+P473A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391
A+P473G+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391
A+T444D+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391
A+T444Y+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+S280
W+K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+S280
L+K391A+G476K,
H1*+N54S+V56T+K72S+G109A+A174S+G182*+D183*+N195F+V206L
+K391A+G476K,
H1*+T40K+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L
+G346T+K391A+
G476K,
H1*+G50A+N54S+V56T+G109A++Q172N+A174S+G182*+D183*+N195
F+V206L+K391A+
G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391
A+G476K+K484S,
H1*K+G50A+N54S+V56T+G109A+W167F+A174S+G182*+D183*+N195
F+V206L+K391A+
G476K,
H1*+N54S+V56T+G109A+L173V+A174S+G182*+D183*+N195F+A204
T+V206L+K391A+
G476K,
H1*+N54S+V56T+G109A+W140Y+A174S+G182*+D183*+N195F+V206
L+K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+G346
T+K391A+G476K+
G477A,
H1*+N54S+V56T+G109AG255A++A174S+G182*+D183*+N195F+V206
L+K391A+G476K,
H1*+G50A+N54S+V56T+G109A+F113L+R116L+A174S+G182*+D183*
+N195F+V206L+
K391A+G476K,
H1*+N54S+V56T+G109A+W167F+A174S+G182*+D183*+N195F+V206
L+K391A+G476K,
H1*+N54S+V56T+K72R+G109A+W167F+A174S+G182*+D183*+N195F
+V206L+K391A+
G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+R320
V+K391A+G476Y,
H1*+N54S+V56T+G109A+R116M+A174S+G182*+D183*+N195F+V206
L+K391A+G476K,

H1*+N54S+V56T+G109A+Q172Y+A174S+G182*+D183*+N195F+V206
L+K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+I214
L+K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+L217
V+K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+L217
H+K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+P211
D+K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391
A+K391Q+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391
A+T444H+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391
A+T444V+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391
A+T444R+G476K,
H1*+G50A+N54S+V56T+G109A+L173V+A174S+G182*+D183*+N195F
+A204V+V206L+
K391A+G476K,
H1*+G7K+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+
R320A+K391A+G476K,
H1*+N54S+V56T+G109A+Q172D+A174S+G182*+D183*+N195F+V206
L+G346T+K391A+
G476K+G477A,
H1*+N54S+V56T+G109A+Q118S+A174S+G182*+D183*+N195F+V206
L+K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+R320
A+K391A+G476K,
H1*+N54S+V56T+G109A+T134E+A174S+G182*+D183*+N195F+V206
L+K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+Y382
M+K391A+G476K,
H1*+N54S+V56T+K72R+G109A+T134E+A174S+G182*+D183*+N195F
+V206L+G255A+
K391A+G476K,
H1*+N54S+V56T+K72R+M105F+G109A+A174S+G182*+D183*+N195F
+V206L+G255A+
K391A+G476K,
H1*+N54S+V56T+M105F+G109A+T134E+A174S+G182*+D183*+N195
F+V206L+K391A+
G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+R320
A+S323N+D377H+
K391A+G476K,

H1*+T51E+N54S+V56T+G109A+A174H+G182*+D183*+N195F+V206L
+K391A+G476K,
H1*+N54S+V56T+G109A+L173A+A174S+G182*+D183*+N195F+V206
L+K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+Q299
V+K391A+G476K,
H1*+N54S+V56T+G109A+L173G+A174S+G182*+D183*+N195F+V206
L+K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+T355
L+K391A+G476K,
H1*+G50A+N54S+V56T+G109A+A174S+G182*+D183*+N195F+A204T
+V206L+K391A+
G476K,
H1*+N54S+V56T+K72R+G109A+A174S+G182*+D183*+N195F+V206L
+R320A+S323N+
K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+M246
L+K391A+G476K,
H1*+N54S+V56T+K72Q+G109A+W167H+A174S+G182*+D183*+N195F
+V206L+K391A+
G476K,
H1*+N54S+V56T+K72R+G109A+T134E+A174S+G182*+D183*+N195F
+V206L+K391A+
G476K,
H1*+N54S+V56T+K72R+G109A+T134E+A174S+G182*+D183*+N195F
+V206L+D377H+
K391A+G476K,
H1*+N54S+V56T+K72R+G109A+T134E+A174S+G182*+D183*+G184T
+N195F+V206L+
K391A+G476K,
H1*+N54S+V56T+G109A+Q118R+T134E+A174S+G182*+D183*+N195
F+V206L+G255A+
K391A+G476K,
H1*+N54S+V56T+G109A+Q118R+A174S+G182*+D183*+N195F+V206
L+D377H+K391A+
G476K,
H1*+N54S+V56T+G109A+T134E+A174S+G182*+D183*+G184T+N195
F+V206L+D377H+
K391A+G476K,
H1*+N54S+V56T+G109A+Q172D+A174Q+G182*+D183*+N195F+V206
L+K391A+G476K+
G477A,
H1*+N54S+V56T+K72R+G109A+A174S+G182*+D183*+G184T+N195F
+V206L+G255A+
K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+G184T+N195F+V206
L+D377H+K391A+

G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+G255
A+D377H+K391A+
G476K,
H1*+N54S+V56T+G109A+T134E+A174S+G182*+D183*+G184T+N195
F+V206L+K391A+
G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+V238
T+D377H+K391A+
G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+V291
A+D377H+K391A+
G476K,
H1*+N54S+V56T+K72R+G109A+T134E+A174S+G182*+D183*+G184T
+N195F+V206L+
G255A+K391A+G476K,
H1*+N54S+V56T+G109A+L173H+A174S+G182*+D183*+N195F+V206
L+K391A+G476K,
H1*+N54S+V56T+K72N+G109A+A174S+G182*+D183*+N195F+V206L
+K391A+G476K,
H1*+N54S+V56T+K72N+G109A+W167L+A174S+G182*+D183*+N195F
+V206L+K391A+
G476K,
H1*+N54S+V56T+G109A+Q118R+T134E+A174S+G182*+D183*+N195
F+V206L+G255A+
D377H+K391A+G476K,
H1*+N54S+V56T+K72R+G109A+A174S+G182*+D183*+N195F+G184T
+V206L+K391A+
G476K,
H1*+N54S+V56T+K72R+G109A+Q118R+A174S+G182*+D183*+N195F
+V206L+G255A+
D377H+K391A+G476K,
H1*+N54S+V56T+G109A+G182*+D183*+N195F+V206L+D377H+K391
A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+D377H+K391
A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+D377
H+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+D377
H+K391A,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+D377
S+K391A+G476K,
H1*+N54S+V56T+G109A+R116E+A174S+G182*+D183*+N195F+V206
L+K391A+G476K,
H1*+N54S+V56T+G109A+T134E+A174S+G182*+D183*+N195F+V206
L+D377H+K391A+
G476K,

H1*+N54S+V56T+G109A+R116S+A174S+G182*+D183*+N195F+V206
L+K391A+G476K,
H1*+N54S+V56T+G109A+R116I+A174S+G182*+D183*+N195F+V206
L+K391A+G476K,
H1*+N54S+V56T+G109A+R116G+A174S+G182*+D183*+N195F+V206
L+K391A+G476K,
H1*+T51A+N54S+V56T+G109A+Q172S+A174S+G182*+D183*+N195F
+V206L+K391A+
G476K,
H1*+T51E+N54S+V56T+G109A+Q172T+A174S+G182*+D183*+N195F
+V206L+K391A+
G476K,
H1*+T51S+N54S+V56T+G109A+Q172N+A174S+G182*+D183*+N195F
+V206L+K391A+
G476K,
H1*+T51E+N54S+V56T+G109A+Q172L+A174S+G182*+D183*+N195F
+V206L+K391A+
G476K,
H1*+T51E+N54S+V56T+G109A+Q172R+A174S+G182*+D183*+N195F
+V206L+K391A+
G476K,
H1*+N54S+V56T+G109A+Q172K+A174S+G182*+D183*+N195F+V206
L+K391A+G476K,
H1*+N54S+V56T+K72R+G109A+Q172S+A174S+G182*+D183*+N195F
+V206L+K391A+
G476K,
H1*+N54S+V56T+K72H+G109A+Q172T+A174S+G182*+D183*+N195F
+V206L+K391A+
G476K,
H1*+N54S+V56T+K72Q+G109A+Q172R+A174S+G182*+D183*+N195F
+V206L+K391A+
G476K,
H1*+N54S+V56T+K72R+G109A+Q172T+A174S+G182*+D183*+N195F
+V206L+K391A+
G476K,
H1*+N54S+V56T+K72M+G109A+Q172S+A174S+G182*+D183*+N195F
+V206L+K391A+
G476K,
H1*+N54S+V56T+K72Q+G109A+Q172M+A174S+G182*+D183*+N195F
+V206L+K391A+
G476K,
H1*+N54S+V56T+K72S+G109A+A174H+G182*+D183*+N195F+V206L
+K391A+G476K,
H1*+N54S+V56T+K72Q+G109A+A174D+G182*+D183*+N195F+V206L
+K391A+G476K,
H1*+N54S+V56T+K72R+G109A+A174D+G182*+D183*+N195F+V206L
+K391A+G476K,

H1*+N54S+V56T+K72Q+G109A+A174K+G182*+D183*+N195F+V206L
+K391A+G476K,
H1*+N54S+V56T+G109A+A174G+G182*+D183*+N195F+V206L+K391
A+G476K,
H1*+N54S+V56T+K72R+G109A+A174Q+G182*+D183*+N195F+V206L
+K391A+G476K,
H1*+N54S+V56T+K72Q+G109A+A174G+G182*+D183*+N195F+V206L
+K391A+G476K,
H1*+N54S+V56T+K72S+G109A+A174N+G182*+D183*+N195F+V206L
+K391A+G476K,
H1*+N54S+V56T+K72R+G109A+A174H+G182*+D183*+N195F+V206L
+K391A+G476K,
H1*+G50A+N54S+V56T+G109A+A174E+G182*+D183*+N195F+A204T
+V206L+S323N+
K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+A204G+V206
L+K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+Y382
I+K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+I214
W+K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+A204S+V206
L+D377H+K391A+
G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+T334
S+D377H+K391A+
G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+A263
G+D377H+K391A+
G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+M286
F+D377H+K391A+
G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+L235
V+D377H+K391A+
G476K,
H1*+N54S+V56T+M105L+G109A+A174S+G182*+D183*+N195F+V206
L+D377H+K391A+
G476K,
H1*+N54S+V56T+M105I+G109A+A174S+G182*+D183*+N195F+V206
L+D377H+K391A+
G476K,
H1*+N54S+V56T+M105V+G109A+A174S+G182*+D183*+N195F+V206
L+D377H+K391A+
G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+M246
I+D377H+K391A+

G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+L250
I+D377H+K391A+
G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+L250
V+D377H+K391A+
G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391
Y+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391
V+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391
M+G476K,
H1*+N54S+V56T+G109A+T165G+A174S+G182*+D183*+N195F+V206
L+D377H+K391A+
G476K,
H1*+N54S+V56T+G109S+A174S+G182*+D183*+N195F+V206L+K391
A+G476K,
H1*+N54S+V56T+G109A+A174V+G182*+D183*+N195F+V206L+K391
A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+M246
F+D377H+K391A+
G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+M246
V+D377H+K391A+
G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+M246
S+D377H+K391A+
G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391
R+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391
H+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391
W+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391
I+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+L250
T+D377H+K391A+
G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+L250
A+D377H+K391A+
G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+L250
F+D377H+K391A+
G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+L250
M+D377H+K391A+
G476K,
H1*+N54S+V56T+G109A+Q172H+L173A+A174P+G182*+D183*+N195
F+V206L+K391A+
G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+G184T+N195F+V206
L+G255A+D377H+
K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+S376
T+K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+S376
V+K391A+G476K,
H1*+N54S+V56T+G109A+Q172E+L173I+A174N+G182*+D183*+N195
F+V206L+K391A+
G476K,
H1*+N54S+V56T+G109A+Q172D+L173A+A174T+G182*+D183*+N195
F+V206L+K391A+
G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+Y267
M+D377H+K391A+
G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+V238
G+K391A+G476K,
H1*+N54S+V56T+M105V+G109A+A174S+G182*+D183*+N195F+V206
L+K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+V264
T+K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+V264
I+K391A+G476K,
H1*+N54S+V56T+G109A+W167H+Q172N+L173A+A174S+G182*+D183
*+N195F+V206L+
K391A+G476K,
H1*+N54S+V56T+G109A+Q172N+L173T+A174S+G182*+D183*+N195
F+V206L+K391A+
G476K,
H1*+N54S+V56T+G109A+Q172E+L173M+A174H+G182*+D183*+N195
F+V206L+K391A+
G476K,
H1*+N54S+V56T+G109A+W167Y+Q172E+L173V+A174H+G182*+D183
*+N195F+V206L+
K391A+G476K,
H1*+N54S+V56T+G109A+L173A+A174T+G182*+D183*+N195F+V206
L+K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+V291
A+F328L+K391A+
G476K,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+M246
L+K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+L250
V +K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+L250
F +K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+L250
M+K391A+G476K,
H1*+N54S+V56T+G109A+T165G+A174S+G182*+D183*+N195F+V206
L+K391A+G476K,
H1*+T51A+N54S+V56T+G109A+Q172R+A174S+G182*+D183*+N195F
+V206L+K391A+
G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391
L+G476K,
H1*+N54S+V56T+G109A+F113Q+R116H+Q172G+A174S+G182*+D183
*+N195F+V206L+
K391A+G476K,
H1*+N54S+V56T+G109S+F113Q+R116Q+A174S+G182*+D183*+N195
F+V206L+K391A+
G476K,
H1*+N54S+V56T+G109A+Q172D+A174S+G182*+D183*+N195F+A204
G+V206L+K391A+
P473R+G476K,
H1*+N54S+V56T+K72R+G109A+T134E+A174S+G182*+D183*+N195F
+A204G+V206L+
G255A+K391A+P473R+G476K,
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+A204G+V206L+
K391A+G476K,
H1*+N54S+V56T+K72R+G109A+A174S+G182*+D183*+G184T+N195F
+A204G+V206L+
K391A+P473R+G476K,
H1*+N54S+V56T+G109A+W167F+Q172N+A174S+G182*+D183*+N195
F+V206L+K391A+
P473R+G476K,
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P473G+G476K,
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F+V206L+K391A+
P473R+G476K,
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+N195F+V206L+
K391A+G476K,
H1*+N54S+V56T+K72R+G109A+R116H+W167F+Q172R+A174S+G182*
+D183*+N195F+

V206L+K391A+G476K,
H1*+N54S+V56T+M105F+G109A+A174S+G182*+D183*+N195F+V206
L+R320A+S323N+
K391A+C474V+G476K,
H1*+N54S+V56T+K72R+G109A+A174S+G182*+D183*+N195F+V206L
+G255A+K391A+
C474V+G476K,
H1*+N54S+V56T+G109A+T134E+A174S+G182*+D183*+N195F+V206
L+K391A+C474V+
G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+D377
H+K391A+C474V+
G476K,
H1*+N54S+V56T+K72R+G109A+A174S+G182*+D183*+N195F+V206L
+K391A+C474V+
G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+A265
G+K391A+T444Q+
G476K+G477A,
H1*+A37V+N54S+V56T+G109A+W167F+Q172G+A174S+G182*+D183*
+N195F+V206L+
K391A+G346T+G477A+G476K,
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K391A+G476K,
H1*+N54S+V56T+G109S+W167F+Q172G+A174S+G182*+D183*+N195
F+V206L+K391A+
G476K,
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F+V206L+K391A+
T444Q+G476K
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*+N195F+V206L+
K391A+T444Q+G476K,
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L+K391A+C474V+
G476K,
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L+V264I+K391A+
C474V+G476K,

H1*+N54S+V56T+G109A+Q172N+A174S+G182*+D183*+N195F+V206
L+K391A+C474V+
G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+S280
Q+H321Y+K391A+
C474V+G476K,
H1*+N54S+V56T+K72R+G109A+T134E+A174S+G182*+D183*+N195F
+V206L+G255A+
K391A+C474V+G476K,
H1*+N54S+V56T+G109A+F113Q+R116H+Q172G+A174S+G182*+D183
*+N195F+V206L+
K391A+T444Q+P473R+G476K,
H1*+N54S+V56T+G109A+F113Q+R116Q+Q172G+A174S+G182*+D183
*+N195F+V206L+
K391A+T444Q+G476K,
H1*+N54S+V56T+G109A+R116H+W167F+Q172N+A174S+G182*+D183
*+N195F+V206L+
K391A+G476K,
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+D183+N195F+
V206L+K391A+T444Q+G476K,
H1*+N54S+V56T+G109A+F113Q+R116Q+T165G+Q172G+A174S+G182
+D183+N195F+
V206L+K391A+T444Q+G476K,
H1*+N54S+V56T+G109A+F113Q+R116H+W167F+Q172R+A174S+G182
+D183+N195F+
V206L+F289I+K391A+G476K,
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F+V206L+K391A+
T444Q+G476K,
H1*+N54S+V56T+G109A+F113Q+R116H+Q172N+A174S+G182*+D183
*+N195F+V206L+
K391A+G476K,
H1*+N54S+V56T+G109A+F113Q+R116Q+Q172M+A174S+G182*+D183
*+N195F+V206L+
K391A+T444Q+G476K,
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*+N195F+V206L+
K391A+G476K,
H1*+N54S+V56T+G109A+R116H+Q172M+A174S+G182*+D183*+N195
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G476K,
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L+A265G+K391A+
T444Q+P473R+G476K,
H1*+N54S+V56T+G109A+R116Q+A174S+G182*+D183*+N195F+V206
L+K391A+T444Q+

P473R+G476K,
 H1*+N54S+V56T+K72R+G109A+T134E+T165G+A174S+G182*+D183*
 +N195F+V206L+
 G255A+K391A+G476K,
 H1*+N54S+V56T+G109A+F113Q+R116H+W167F+Q172R+A174S+G182
 +D183+N195F+
 V206L+K391A+G476K,
 H1*+N54S+V56T+G109A+R116Q+W167F+Q172R+A174S+G182*+D183
 *+N195F+V206L+
 A265G+K391A+P473R+G476K,
 H1*+N54S+V56T+G109A+F113Q+A174S+G182*+D183*+N195F+V206
 L+K391A+G476K,
 H1*+N54S+V56T+G109A+Q172N+A174S+G182*+D183*+N195F+V206
 L+K391A+G476K,
 H1*+T51V+N54S+V56T+G109A+Q172D+A174S+G182*+D183*+N195F
 +V206L+K391A+
 G476K,
 H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+S280
 Q+H321Y+K391A+
 G476K,
 H1*+N54S+V56T+G109A+F113Q+R116H+Q172N+A174S+G182*+D183
 *+N195F+V206L+
 K391A+G476K,
 H1*+N54S+V56T+G109A+F113Q+R116H+Q172G+L173V+A174S+G182
 +D183+N195F+
 V206L+K391A+T444Q+P473R+G476K,
 H1*+N54S+V56T+G109A+R116Q+W167F+Q172N+L173V+A174S+G182
 +D183+N195F+
 V206L+K391A+T444Q+G476K,
 H1*+N54S+V56T+G109A+G133Q+W167F+Q172N+A174S+G182*+D183
 *+N195F+V206L+
 Q395P+K391A+G476K,
 H1*+N54S+V56T+G109A+F113Q+R116H+W167F+Q172N+L173V+A174
 S+G182*+D183*+
 N195F+V206L+K391A+G476K,
 H1*+A37V+N54S+V56T+K72R+G109A+R116H+W167F+Q172R+A174S+
 G182*+D183*+
 G184T+N195F+V206L+K391A+P473R+G476K,
 H1*+N54S+V56T+K72R+G109A+F113Q+R116H+W167F+Q172G+L173V
 +A174S+G182*+
 D183*+G184T+N195F+V206L+K391A+T444Q+P473R+G476K,
 H1*+N54S+V56T+G109S+R116Q+W167F+Q172R+A174S+G182*+D183
 *+N195F+V206L+
 K391A+G476K,
 H1*+N54S+V56T+G109S+R116Q+W167F+Q172G+A174S+G182*+D183
 *+N195F+V206L+
 K391A+P473R+G476K,

H1*+N54S+V56T+G109S+F113Q+W167F+Q172N+A174S+G182*+D183
 *+N195F+V206L+
 K391A+G476K,
 H1*+A37V+N54S+V56T+G109S+F113Q+W167F+Q172R+A174S+G182*
 +D183*+N195F+
 V206L+K391A+G476K,
 H1*+N54S+V56T+K72R+G109A+R116H+T134E+W167F+Q172G+L173V
 +A174S+G182*+
 D183*+N195F+V206L+G255A+K391A+G476K,
 H1*+N54S+V56T+K72R+G109A+R116H+T134E+W167F+Q172G+L173V
 +A174S+G182*+
 D183*+N195F+V206L+G255A+K391A+Q395P+T444Q+P473R+G476K,
 H1*+N54S+V56T+K72R+G109A+F113Q+R116Q+W167F+Q172G+A174S
 +G182*+D183*+
 G184T+N195F+V206L+K391A+P473R+G476K,
 H1*+N54S+V56T+K72R+G109A+F113Q+R116Q+T134E+W167F+Q172R
 +A174S+G182*+
 D183*+N195F+V206L+G255A+K391A+T444Q+P473R+G476K,
 H1*+N54S+V56T+K72R+G109A+F113Q+R116H+T134E+W167F+Q172R
 +A174S+G182*+
 D183*+N195F+V206L+G255A+K391A+Q395P+G476K,
 H1*+N54S+V56T+K72R+G109A+T134E+W167F+Q172N+A174S+G182*
 +D183*+N195F+
 V206L+G255A+A265G+K391A+T444Q+P473R+G476K,
 H1*+N54S+V56T+K72R+G109A+G133Q+W167F+Q172R+A174S+G182*
 +D183*+N195F+
 V206L+K391A+G476K,
 H1*+N54S+V56T+K72R+G109A+F113Q+R116Q+W167F+Q172G+A174S
 +G182*+D183*+
 N195F+A204G+V206L+K391A+G476K,
 H1*+N54S+V56T+K72R+G109A+F113Q+R116Q+W167F+Q172N+L173V
 +A174S+G182*+
 D183*+G184T+N195F+V206L+K391A+T444Q+P473R+G476K,
 H1*+A37H+N54S+V56T+G109A+F113Q+W167F+Q172N+A174S+G182*
 +D183*+N195F+
 V206L+K391A+G476K,
 H1*+N54S+V56T+G109A+F113Q+W167F+Q172N+A174S+G182*+D183
 *+N195F+V206L+
 K391A+T459N+G476K,
 H1*+N54S+V56T+G109A+F113Q+R116Q+A174S+G182*+D183*+N195
 F+V206L+K391A+
 P473R+G476K,
 H1*+N54S+V56T+A60V+G109A+R116Q+W167F+Q172N+A174S+G182*
 +D183*+N195F+
 V206L+K391A+G476K,
 H1*+N54S+V56T+A60V+G109A+R116H+Q172R+L173V+A174S+G182*
 +D183*+N195F+

V206L+K391A+G476K,
H1*+A37V+N54S+V56T+A60V+G109A+R116Q+T165G+A174S+G182*+
D183*+N195F+V206L+K391A+G476K,
H1*+A37H+N54S+V56T+A60V+G109A+R116Q+T165G+A174S+G182*+
D183*+N195F+V206L+K391A+G476K,
H1*+N54S+V56T+A60V+G109A+R116Q+W167F+Q172G+L173V+A174S
+G182*+D183*+
N195F+V206L+K391A+G476K,
H1*+N54S+V56T+A60V+G109A+R116Q+A174S+G182*+D183*+N195F
+V206L+K391A+
G476K,
H1*+A37H+N54S+V56T+A60V+G109A+R116Q+W167F+Q172R+A174S+
G182*+D183*+
N195F+V206L+K391A+G476K,
H1*+A37H+N54S+V56T+A60V+G109A+R116Q+W167F+Q172N+A174S+
G182*+D183*+
N195F+V206L+K391A+G476K,
H1*+N54S+V56T+A60V+G109A+R116Q+T165G+A174S+G182*+D183*
+N195F+V206L+
K391A+T444Q+P473R+G476K,
H1*+N54S+V56T+A60V+G109A+R116Q+A174S+G182*+D183*+N195F
+V206L+K391A+
T444Q+P473R+G476K,
H1*+N54S+V56T+A60V+G109A+R116Q+W167F+Q172N+L173V+A174S
+G182*+D183*+
N195F+V206L+K391A+G476K,
H1*+N54S+V56T+A60V+G109A+R116Q+W167F+Q172R+A174S+G182*
+D183*+N195F+
V206L+K391A+G476K,
H1*+N54S+V56T+G109A+R116A+W167F+Q172R+A174S+G182*+D183
*+N195F+A204G+
V206L+K391A+P473R+G476K,
H1*+N54S+V56T+G109A+R116A+A174S+G182*+D183*+N195F+A204
G+V206L+K391A+
P473R+G476K,
H1*+N54S+V56T+G109A+R116A+T165G+A174S+G182*+D183*+N195
F+V206L+K391A+
T444Q+P473R+G476K,
H1*+N54S+V56T+G109A+G182*+D183*+N195F+K391A+G476K,
H1*+N54S+V56T+G109A+G182*+D183*+N195F+V206L,
N54S+V56T+G109A+G182*+D183*+N195F,
N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+G4
76K,
H1*+N54S+V56T+G109A+G182*+D183*+N195F+V206L+K391A+G476
K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391
A,

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+G476K,
H1*+N54S+V56T+A174S+G182*+D183*+N195F+V206L+G273R+K391
A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L,
N54S+V56T+G109A+A174S+G182*+D183*+N195F+K391A+G476K,
H1*+N54S+V56T+G109A+F113Q+Q172M+A174S+G182*+D183*+N195
F+V206L+K391A+
G476K,
H1*+N54S+V56T+K72R+G109A+F113Q+T134E+A174S+G182*+D183*
+N195F+V206L+
G255A+K391A+G476K,
H1*+N54S+V56T+K72R+G109A+F113Q+T134E+A174S+G182*+D183*
+N195F+V206L+
G255A+K391A+P473R+G476K,
H1*+N54S+V56T+K72R+G109A+R116Q+A174S+G182*+D183*+G184T
+N195F+V206L+
K391A+G476K,
H1*+A37V+N54S+V56T+G109A+R116A+T165G+A174S+G182*+D183*
+N195F+V206L+
K391A+G476K,
H1*+A37V+N54S+V56T+G109A+R116Q+T165G+A174S+G182*+D183*
+N195F+V206L+
M246F+K391A+G476K,
H1*+V56A+G109A+A174S+G182*+D183*+N195F+V206L+G476K,
H1*+N54S+V56T+K72R+G109A+F113Q+R116H+A174S+G182*+D183*
+G184T+N195F+
V206L+K391A+T444Q+G476K,
H1*+N54S+V56T+G109S+F113Q+A174S+G182*+D183*+N195F+V206
L+K391A+T444Q+
G476K,
H1*+N54S+V56T+G109A+F113Q+R116H+W167F+Q172G+L173V+A174
S+G182*+D183*+
N195F+V206L+K391A+P473R+G476K,
H1*+N54S+V56T+G109A+F113Q+R116Q+Q172N+A174S+G182*+D183
*+N195F+V206L+
A265G+K391A+P473R+G476K,
H1*+N54S+V56T+G109A+F113Q+W167F+Q172N+A174S+G182*+D183
*+N195F+A204G+
V206L+K391A+P473R+G476K,
H1*+N54S+V56T+G109A+F113Q+R116H+W167F+Q172R+A174S+G182
+D183+N195F+
A204G+V206L+K391A+P473R+G476K,
H1*+N54S+V56T+G109A+R116A+A174S+G182*+D183*+N195F+V206
L+K391A+T444Q+
P473R+G476K,
H1*+N54S+V56T+G109A+R116H+Q172R+A174S+G182*+D183*+N195
F+A204G+V206L+

K391A+P473R+G476K,
H1*+A37V+N54S+V56T+G109A+R116Q+T165G+A174S+G182*+D183*
+N195F+V206L+
K391A+G476K,
H1*+A37H+N54S+V56T+G109A+R116H+T165G+A174S+G182*+D183*
+N195F+V206L+
M246F+K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+K391A+G476
K,
H1*+N54S+V56T+G109A+G133S+A174S+G182*+D183*+N195F+K391
A+G476H,
H1*+N54S+V56T+G109A+R116A+Q172N+L173V+A174S+G182*+D183
*+N195F+V206L+
K391A+G476K,
H1*+A37V+N54S+V56T+G109A+R116H+T165G+A174S+G182*+D183*
+N195F+V206L+
K391A+G476K,
H1*+P45A+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L
+K391A+C474V+
G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+P364
A+K391A+C474V+
G476K,
H1*+N54S+V56T+G109A+Q118R+T134E+A174S+G182*+D183*+N195
F+V206L+K391A+
G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+G184T+N195F+V206
L+K391A+G476K,
H1*+G50A+T51A+N54S+V56T+G109A+A174S+G182*+D183*+N195F+
V206L+K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+V264
F+K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+Y382
L+K391A+G476K,
H1*+G7K
+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+G255
A+Q256A+K391A+
G476K,
H1*+N54S+V56T+G109A+W167Y+A174S+G182*+D183*+N195F+V206
L+K391A+G476K,
H1*+N54S+V56T+G109A+W167H+A174S+G182*+D183*+N195F+V206
L+K391A+G476K,
H1*+N54S+V56T+G109A+T165V+A174S+G182*+D183*+N195F+V206
L+K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391
A+G476K,

H1*+N54S+V56T+G109A+A174N+G182*+D183*+N195F+V206L+K391
A+G476K,
H1*+N54S+V56T+G109A+A174Q+G182*+D183*+N195F+V206L+K391
A+G476K,
H1*+N16H+V17L+N54S+V56T+G109A+A174S+G182*+D183*+N195F+
V206L+Y382F+K391A+G476K,
H1*+Q32S+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L
+Q385L+K391A+
G476K,
H1*+N54S+V56T+R87S+G109A+R171H+A174S+G182*+D183*+N195F
+V206L+K391A+
G476K,
H1*+N54S+V56T+G109A+R116H+Q169E+Q172K+A174*+G182*+D183
*+N195F+V206L+
K391A+G476K,
H1*+N54S+V56T+G109A+A174*+G182*+D183*+N195F+V206L+K391
A+G476K,
H1*+K72R+G109A+F113Q+R116Q+W167F+Q172G+A174S+G182*+D18
3*+G184T+N195F+
V206L+K391A+P473R+G476K,
H1*+N54S+V56T+K72R+G109A+F113Q+R116Q+W167F+Q172G+A174S
+G182*+D183*+
G184T+N195F+V206L+P473R+G476K,
H1*+N54S+V56T+G109A+Q169E+Q172G+A174*+G182*+D183*+N195
F+V206L+K391A+
G476K,
H1*+N54S+V56T+K72R+G109A+F113Q+R116Q+W167F+Q172G+A174S
+G182*+D183*+
G184T+N195F+K391A+P473R+G476K,
H1*+N54S+V56T+G109A+R116W+Q169E+Q172K+A174*+G182*+D183
*+N195F+V206L+
K391A+G476K,
H1*+N54S+V56T+G109A+Q169E+Q172K+A174*+G182*+D183*+N195
F+V206F+K391A+
G476K,
H1*+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+G47
6K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+N260
G+K391A+G476K,
H1*+N54S+V56T+K72R+G109A+A174S+G182*+D183*+N195F+V206L
+K391A+G476K,
H1*+N54S+V56T+G109A+Q169E+Q172K+A174*+G182*+D183*+G184
T+N195F+V206L+
K391A+G476K,
H1*+N54S+V56T+G109A+Q169E+Q172K+A174*+G182*+D183*+N195
F+V206L+Y295N+
K391A+G476K,

H1*+N54S+V56T+G109A+W167F+A174S+G182*+D183*+N195F+V206
L+K391A+G476K,
H1*+N54S+V56T+G109A+Q169E+Q172K+A174*+G182*+D183*+A186
N+N195F+V206L+
K391A+G476K,
H1*+N54S+V56T+G109A+Q169E+Q172K+A174*+G182*+D183*+N195
F+V206L+A288V+
K391A+G476K,
H1*+N54S+V56T+G109A+Q169E+Q172K+A174*+G182*+D183*+N195
F+V206L+G255A+
K391A+G476K,
H1*+N54S+G109A+Q169E+Q172K+A174*+G182*+D183*+N195F+V20
6L+K391A+G476K,
H1*+W48F+N54S+V56T+G109A+Q169E+Q172K+A174*+G182*+D183*
+N195F+V206L+
K391A+G476K,
H1*+N54S+V56T+G109A+Q169E+Q172K+A174*+G182*+D183*+N195
F+V206L+V291A+
K391A+G476K,
H1*+N54S+V56T+G109A+F113Q+A174S+G182*+D183*+N195F+V206
L+K391A+G476K,
H1*+N54S+V56T+G109A+Q169E+Q172K+A174*+G182*+D183*+N195
F+V206L+R320A+
S323N+K391A+G476K,
H1*+V56T+G109A+Q169E+Q172K+A174*+G182*+D183*+N195F+V20
6L+K391A+G476K,
H1*+N54S+V56T+K72R+G109A+F113Q+R116H+W167F+Q172G+A174S
+G182*+D183*+
G184T+N195F+V206L+K391A+P473R+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+N270
T+K391A+G476K,
H1*+N54S+V56T+G109A+Q169E+Q172K+A174*+G182*+D183*+N195
F+V206L+G476K,
H1*+N54S+V56T+G109A+Q169E+Q172K+A174*+G182*+D183*+N195
F+V206L+N260G+
K391A+G476K,
H1*+N54S+V56T+G109A+F113Q+R116H+A174S+G182*+D183*+N195
F+V206L+K391A+
G476K,
H1*+N54S+V56T+G109A+Q172G+A174S+G182*+D183*+N195F+V206
L+K391A+G476K,
H1*+N54S+V56T+G109A+A174S+A186D+G182*+D183*+N195F+V206
L+K391A+G476K,
H1*+N54S+V56T+G109A+Q169E+Q172K+A174*+G182*+D183*+N195
F+V206L+A225V+
K391A+G476K,

H1*+G109A+Q169E+Q172K+A174*+G182*+D183*+N195F+V206L+K391A+G476K,
H1*+N54S+V56T+G109A+Q169E+Q172K+A174*+G182*+D183*+N195F+V206L+G255S+
K391A+G476K,
H1*+N54S+V56T+G109A+Q169E+Q172K+A174*+G182*+D183*+N195F+V206L+K269Q+
K391A+G476K,
H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+G255S+K391A+G476K,
H1*+N54S+V56T+G109A+Q169E+Q172K+A174S+G182*+D183*+N195F+V206L+K391A+
G476K; en donde la numeración es acorde a la SEQ ID NO:
13.

13. La variante de acuerdo con cualquiera de las reivindicaciones precedentes, en donde dicha variante es seleccionada del grupo que consiste en:

H1*+N54S+V56T+G109A+A174S+G182*+D183*+N195F+V206L+K391A+G476K

-

H1*+N54S+V56T+G109A+Q169E+Q172K+A174*+G182*+D183*+N195F+V206L+K391A+G476K

-

H1*+N54S+V56T+G109A+R116H+A174S+G182*+D183*+N195F+V206L+K391A+G476K

-

H1*+N54S+V56T+G109A+R116Q+W167F+A174S+G182*+D183*+G184T+N195F+V206L+K391A+G476K

-

H1*+N54S+V56T+K72R+G109A+F113Q+R116Q+W167F+Q172G+A174S+G182*+D183*+N195F+V206L+K391A+G476K

-

H1*+N54S+V56T+K72R+G109A+F113Q+R116Q+W167F+Q172G+A174S+G182*+D183*+

G184T+N195F+V206L+K391A+P473R+G476K

-
H1*+N54S+V56T+G109A+F113Q+R116Q+Q172N+A174S+G182*+D183*+N195F
+V206L+

A265G+K391A+P473R+G476K

-
H1*+N54S+V56T+K72R+G109A+G133Q+W167F+Q172R+A174S+G182*+D183*+
N195F+

V206L+K391A+G476K

-
H1*+N54S+V56T+K72R+G109A+R116H+T134E+W167F+Q172G+L173V+A174S+
G182*+

D183*+N195F+V206L+G255A+K391A+G476K, y

-
H1*+N54S+V56T+K72R+G109A+R116H+T134E+W167F+Q172G+L173V+A174S+
G182*+

en donde la numeración es acorde a la SEQ ID NO: 13.

14. Una composición que comprende la variante de acuerdo con cualquiera de las reivindicaciones precedentes.

15. La composición de acuerdo con la reivindicación 16, en donde dicha composición además comprende al menos un compuesto activo adicional.

16. La composición de acuerdo con cualquiera de las reivindicaciones 14 y 15, en donde dicho compuesto activo adicional es una enzima, tal como una proteasa, lipasa, celulasa, pectato liasa y mananasa.

17. La composición de acuerdo con cualquiera de las reivindicaciones 14 a 16, en donde dicha composición además

comprende un tensioactivo, adyuvante, blanqueante y/o polímero, o en donde dicha composición es libre de fosfato.

18. Una composición líquida, que comprende la composición de acuerdo con cualquiera de las reivindicaciones 14 a 17, en donde la composición líquida es un detergente líquido, o una composición de detergente en dosis unitaria.

19. Una composición en polvo, que comprende la composición de acuerdo con cualquiera de las reivindicaciones 14 a 17, en donde la composición en polvo es una barra de jabón o una composición detergente o una composición de detergente en dosis unitaria.