

SEQUENCE LISTING

<110> Takeda Vaccines, Inc.

<120> METHODS FOR PREVENTING DENGUE AND HEPATITIS A

<130> T08269W03/ES

<150> EP19 195 692.9

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<150> US16/561,953

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<150> PCT/US2019/049749

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<151> 2019-08-16

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<170> PatentIn version 3.5

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Asn Lys Glu Leu Lys Cys Gly Ser Gly Ile Phe Ile Thr Asp Asn Val
785 790 795 800

His Thr Trp Thr Glu Gln Tyr Lys Phe Gln Pro Glu Ser Pro Ser Lys
805 810 815

Leu Ala Ser Ala Ile Gln Lys Ala His Glu Glu Asp Ile Cys Gly Ile
820 825 830

Arg Ser Val Thr Arg Leu Glu Asn Leu Met Trp Lys Gln Ile Thr Pro
835 840 845

Glu Leu Asn His Ile Leu Ser Glu Asn Glu Val Lys Leu Thr Ile Met
850 855 860

Thr Gly Asp Ile Lys Gly Ile Met Gln Ala Gly Lys Arg Ser Leu Arg
865 870 875 880

Pro Gln Pro Thr Glu Leu Lys Tyr Ser Trp Lys Thr Trp Gly Lys Ala
885 890 895

Lys Met Leu Ser Thr Glu Ser His Asn Gln Thr Phe Leu Ile Asp Gly
900 905 910

Pro Glu Thr Ala Glu Cys Pro Asn Thr Asn Arg Ala Trp Asn Ser Leu
915 920 925

Glu Val Glu Asp Tyr Gly Phe Gly Val Phe Thr Thr Asn Ile Trp Leu
930 935 940

Lys Leu Lys Glu Lys Gln Asp Val Phe Cys Asp Ser Lys Leu Met Ser
945 950 955 960

Ala Ala Ile Lys Asp Asn Arg Ala Val His Ala Asp Met Gly Tyr Trp
965 970 975

Ile Glu Ser Ala Leu Asn Asp Thr Trp Lys Ile Glu Lys Ala Ser Phe
980 985 990

Ile Glu Val Lys Asn Cys His Trp Pro Lys Ser His Thr Leu Trp Ser
995 1000 1005

Asn Gly Val Leu Glu Ser Glu Met Ile Ile Pro Lys Asn Leu Ala
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Gly Pro Val Ser Gln His Asn Tyr Arg Pro Gly Tyr His Thr Gln
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Ile Thr Gly Pro Trp His Leu Gly Lys Leu Glu Met Asp Phe Asp
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Phe Cys Asp Gly Thr Thr Val Val Val Thr Glu Asp Cys Gly Asn
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Arg Gly Pro Ser Leu Arg Thr Thr Thr Ala Ser Gly Lys Leu Ile
1070 1075 1080

Thr Glu Trp Cys Cys Arg Ser Cys Thr Leu Pro Pro Leu Arg Tyr
1085 1090 1095

Arg Gly Glu Asp Gly Cys Trp Tyr Gly Met Glu Ile Arg Pro Leu
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Lys Glu Lys Glu Glu Asn Leu Val Asn Ser Leu Val Thr Ala Gly
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His Gly Gln Val Asp Asn Phe Ser Leu Gly Val Leu Gly Met Ala
1130 1135 1140

Leu Phe Leu Glu Glu Met Leu Arg Thr Arg Val Gly Thr Lys His
1145 1150 1155

Ala Ile Leu Leu Val Ala Val Ser Phe Val Thr Leu Ile Thr Gly
1160 1165 1170

Asn Met Ser Phe Arg Asp Leu Gly Arg Val Met Val Met Val Gly
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Ala Thr Met Thr Asp Asp Ile Gly Met Gly Val Thr Tyr Leu Ala
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Leu Leu Ala Ala Phe Lys Val Arg Pro Thr Phe Ala Ala Gly Leu
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Leu Leu Arg Lys Leu Thr Ser Lys Glu Leu Met Met Thr Thr Ile
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Gly Ile Val Leu Leu Ser Gln Ser Thr Leu Pro Glu Thr Ile Leu
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Glu Leu Thr Asp Ala Leu Ala Leu Gly Met Met Val Leu Lys Met
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Val Arg Asn Met Glu Lys Tyr Gln Leu Ala Val Thr Ile Met Ala
1265 1270 1275

Ile Leu Cys Val Pro Asn Ala Val Ile Leu Gln Asn Ala Trp Lys
1280 1285 1290

Val Ser Cys Thr Ile Leu Ala Val Val Ser Val Ser Pro Leu Phe
1295 1300 1305

Leu Thr Ser Ser Gln Gln Lys Thr Asp Trp Ile Pro Leu Ala Leu
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Thr Ile Lys Gly Leu Asn Pro Thr Ala Ile Phe Leu Thr Thr Leu
1325 1330 1335

Ser Arg Thr Ser Lys Lys Arg Ser Trp Pro Leu Asn Glu Ala Ile
1340 1345 1350

Met Ala Val Gly Met Val Ser Ile Leu Ala Ser Ser Leu Leu Lys
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Asn Asp Ile Pro Met Thr Gly Pro Leu Val Ala Gly Gly Leu Leu
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Thr Val Cys Tyr Val Leu Thr Gly Arg Ser Ala Asp Leu Glu Leu
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Glu Arg Ala Ala Asp Val Lys Trp Glu Asp Gln Ala Glu Ile Ser
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Gly Ser Ser Pro Ile Leu Ser Ile Thr Ile Ser Glu Asp Gly Ser
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Met Ser Ile Lys Asn Glu Glu Glu Asp Gln Thr Leu Thr Ile Leu
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Ile Arg Thr Gly Leu Leu Val Ile Ser Gly Leu Phe Pro Val Ser
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Ile Pro Ile Thr Ala Ala Ala Trp Tyr Leu Trp Glu Val Lys Lys
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Gln Arg Ala Gly Val Leu Trp Asp Val Pro Ser Pro Pro Pro Met
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Gly Lys Ala Glu Leu Glu Asp Gly Ala Tyr Arg Ile Lys Gln Lys
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Gly Thr Phe His Thr Met Trp His Val Thr Arg Gly Ala Val Leu
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Met His Lys Gly Lys Arg Ile Glu Pro Ser Trp Ala Asp Val Lys
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Lys Asp Leu Ile Ser Tyr Gly Gly Gly Trp Lys Leu Glu Gly Glu
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Trp Lys Glu Gly Glu Glu Val Gln Val Leu Ala Leu Glu Pro Gly
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Lys Asn Pro Arg Ala Val Gln Thr Lys Pro Gly Leu Phe Lys Thr
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Asn Ala Gly Thr Ile Gly Ala Val Ser Leu Asp Phe Ser Pro Gly
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Thr Ser Gly Ser Pro Ile Ile Asp Lys Lys Gly Lys Val Val Gly
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Leu Tyr Gly Asn Gly Val Val Thr Arg Ser Gly Ala Tyr Val Ser
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Ala Ile Ala Gln Thr Glu Lys Ser Ile Glu Asp Asn Pro Glu Ile
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Glu Asp Asp Ile Phe Arg Lys Arg Arg Leu Thr Ile Met Asp Leu
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His Pro Gly Ala Gly Lys Thr Lys Arg Tyr Leu Pro Ala Ile Val
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Arg Glu Ala Ile Lys Arg Gly Leu Arg Thr Leu Ile Leu Ala Pro
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Thr Arg Val Val Ala Ala Glu Met Glu Glu Ala Leu Arg Gly Leu
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Pro Ile Arg Tyr Gln Thr Pro Ala Ile Arg Ala Val His Thr Gly
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Arg Glu Ile Val Asp Leu Met Cys His Ala Thr Phe Thr Met Arg
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Leu Leu Ser Pro Val Arg Val Pro Asn Tyr Asn Leu Ile Ile Met
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Asp Glu Ala His Phe Thr Asp Pro Ala Ser Ile Ala Ala Arg Gly
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Tyr Ile Ser Thr Arg Val Glu Met Gly Glu Ala Ala Gly Ile Phe
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Met Thr Ala Thr Pro Pro Gly Ser Arg Asp Pro Phe Pro Gln Ser
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Val	Thr	His	Ser	Ser	Ala	Ala	Gln	Arg	Arg	Gly	Arg	Ile	Gly	Arg
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Asn	Pro	Lys	Asn	Glu	Asn	Asp	Gln	Tyr	Ile	Tyr	Met	Gly	Glu	Pro
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Leu	Leu	Asp	Asn	Ile	Asn	Thr	Pro	Glu	Gly	Ile	Ile	Pro	Ser	Met
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Phe	Glu	Pro	Glu	Arg	Glu	Lys	Val	Asp	Ala	Ile	Asp	Gly	Glu	Tyr
1985						1990					1995			
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2015						2020					2025			

Gly Ile Asn Tyr Ala Asp Arg Arg Trp Cys Phe Asp Gly Val Lys
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Asn Asn Gln Ile Leu Glu Glu Asn Val Glu Val Glu Ile Trp Thr
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Lys Glu Gly Glu Arg Lys Lys Leu Lys Pro Arg Trp Leu Asp Ala
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Arg Ile Tyr Ser Asp Pro Leu Ala Leu Lys Glu Phe Lys Glu Phe
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Ala Ala Gly Arg Lys Ser Leu Thr Leu Asn Leu Ile Thr Glu Met
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Gly Arg Leu Pro Thr Phe Met Thr Gln Lys Ala Arg Asp Ala Leu
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Asp Asn Leu Ala Val Leu His Thr Ala Glu Ala Gly Gly Arg Ala
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Tyr Asn His Ala Leu Ser Glu Leu Pro Glu Thr Leu Glu Thr Leu
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Leu Leu Leu Thr Leu Leu Ala Thr Val Thr Gly Gly Ile Phe Leu
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Phe Leu Met Ser Ala Arg Gly Ile Gly Lys Met Thr Leu Gly Met
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Cys Cys Ile Ile Thr Ala Ser Ile Leu Leu Trp Tyr Ala Gln Ile
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Gln Pro His Trp Ile Ala Ala Ser Ile Ile Leu Glu Phe Phe Leu
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Ile Val Leu Leu Ile Pro Glu Pro Glu Lys Gln Arg Thr Pro Gln
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Asp Asn Gln Leu Thr Tyr Val Val Ile Ala Ile Leu Thr Val Val
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Ala Ala Thr Met Ala Asn Glu Met Gly Phe Leu Glu Lys Thr Lys
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Lys Asp Leu Gly Leu Gly Ser Ile Ala Thr Gln Gln Pro Glu Ser
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Asn Ile Leu Asp Ile Asp Leu Arg Pro Ala Ser Ala Trp Thr Leu
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Tyr Ala Val Ala Thr Thr Phe Val Thr Pro Met Leu Arg His Ser
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Gln Ala Thr Val Leu Met Gly Leu Gly Lys Gly Trp Pro Leu Ser
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Lys Met Asp Ile Gly Val Pro Leu Leu Ala Ile Gly Cys Tyr Ser
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Gln Val Asn Pro Ile Thr Leu Thr Ala Ala Leu Phe Leu Leu Val
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Ala His Tyr Ala Ile Ile Gly Pro Gly Leu Gln Ala Lys Ala Thr
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Arg Glu Ala Gln Lys Arg Ala Ala Ala Gly Ile Met Lys Asn Pro
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Thr Val Asp Gly Ile Thr Val Ile Asp Leu Asp Pro Ile Pro Tyr
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Asp Pro Lys Phe Glu Lys Gln Leu Gly Gln Val Met Leu Leu Val
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Leu Cys Val Thr Gln Val Leu Met Met Arg Thr Thr Trp Ala Leu
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Cys Glu Ala Leu Thr Leu Ala Thr Gly Pro Ile Ser Thr Leu Trp
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Glu Gly Asn Pro Gly Arg Phe Trp Asn Thr Thr Ile Ala Val Ser
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Leu Phe Ser Ile Met Lys Asn Thr Thr Asn Thr Arg Arg Gly Thr
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Gly Asn Ile Gly Glu Thr Leu Gly Glu Lys Trp Lys Ser Arg Leu
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Asn Ala Leu Gly Lys Ser Glu Phe Gln Ile Tyr Lys Lys Ser Gly
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Val Asp Leu Gly Cys Gly Arg Gly Gly Trp Ser Tyr Tyr Cys Gly
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Gly Leu Lys Asn Val Arg Glu Val Lys Gly Leu Thr Lys Gly Gly
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Pro Gly His Glu Glu Pro Ile Pro Met Ser Thr Tyr Gly Trp Asn
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Glu Lys Cys Asp Thr Leu Leu Cys Asp Ile Gly Glu Ser Ser Pro
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Val Glu Asn Trp Leu Asn Asn Asn Thr Gln Phe Cys Ile Lys Val
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Leu Asn Pro Tyr Met Pro Ser Val Ile Glu Lys Met Glu Ala Leu
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Gln Arg Lys Tyr Gly Gly Ala Leu Val Arg Asn Pro Leu Ser Arg
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Asn Ser Thr His Glu Met Tyr Trp Val Ser Asn Ala Ser Gly Asn
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Ile Val Ser Ser Val Asn Met Ile Ser Arg Met Leu Ile Asn Arg
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Phe Thr Met Arg Tyr Lys Lys Ala Thr Tyr Glu Pro Asp Val Asp
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Leu Gly Ser Gly Thr Arg Asn Ile Gly Ile Glu Ser Glu Ile Pro
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Asn Leu Asp Ile Ile Gly Lys Arg Ile Glu Lys Ile Lys Gln Glu
2765 2770 2775

His Glu Thr Ser Trp His Tyr Asp Gln Asp His Pro Tyr Lys Thr
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Trp Ala Tyr His Gly Ser Tyr Glu Thr Lys Gln Thr Gly Ser Ala
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Ser Ser Met Val Asn Gly Val Val Arg Leu Leu Thr Lys Pro Trp
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Asp Val Val Pro Met Val Thr Gln Met Ala Met Thr Asp Thr Thr
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Pro Phe Gly Gln Gln Arg Val Phe Lys Glu Lys Val Asp Thr Arg
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Thr Gln Glu Pro Lys Glu Gly Thr Lys Lys Leu Met Lys Ile Thr
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Ala Glu Trp Leu Trp Lys Glu Leu Gly Lys Lys Lys Thr Pro Arg
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Ala Leu Gly Ala Ile Phe Thr Asp Glu Asn Lys Trp Lys Ser Ala
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Glu Arg Asn Leu His Leu Glu Gly Lys Cys Glu Thr Cys Val Tyr
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Ala Lys Gly Ser Arg Ala Ile Trp Tyr Met Trp Leu Gly Ala Arg
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Phe Ser Arg Glu Asn Ser Leu Ser Gly Val Glu Gly Glu Gly Leu
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His Lys Leu Gly Tyr Ile Leu Arg Asp Val Ser Lys Lys Glu Gly
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Gly Ala Met Tyr Ala Asp Asp Thr Ala Gly Trp Asp Thr Arg Ile
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Gln 3095	Val	Gly	Thr	Tyr	Gly	Leu 3100	Asn	Thr	Phe	Thr	Asn 3105	Met	Glu	Ala
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Cys Leu Gly Lys Ser Tyr Ala Gln Met Trp Ser Leu Met Tyr Phe
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His Arg Arg Asp Leu Arg Leu Ala Ala Asn Ala Ile Cys Ser Ala
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Val Pro Ser His Trp Val Pro Thr Ser Arg Thr Thr Trp Ser Ile
 3275 3280 3285

His Ala Lys His Glu Trp Met Thr Thr Glu Asp Met Leu Thr Val
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Trp Asn Arg Val Trp Ile Gln Glu Asn Pro Trp Met Glu Asp Lys
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Thr Pro Val Glu Ser Trp Glu Glu Ile Pro Tyr Leu Gly Lys Arg
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Glu Asp Gln Trp Cys Gly Ser Leu Ile Gly Leu Thr Ser Arg Ala
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Thr Trp Ala Lys Asn Ile Gln Ala Ala Ile Asn Gln Val Arg Ser
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<400> 4

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Phe Ser Leu Gly Met Leu Gln Gly Arg Gly Pro Leu Lys Leu Phe Met
35 40 45

Ala Leu Val Ala Phe Leu Arg Phe Leu Thr Ile Pro Pro Thr Ala Gly
50 55 60

Ile Leu Lys Arg Trp Gly Thr Ile Lys Lys Ser Lys Ala Ile Asn Val
65 70 75 80

Leu Arg Gly Phe Arg Lys Glu Ile Gly Arg Met Leu Asn Ile Leu Asn
85 90 95

Arg Arg Arg Arg Ser Ala Gly Met Ile Ile Met Leu Ile Pro Thr Val
100 105 110

Met Ala Phe His Leu Thr Thr Arg Asn Gly Glu Pro His Met Ile Val
115 120 125

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

Val Asn Met Cys Thr Leu Met Ala Met Asp Leu Gly Glu Leu Cys Glu
145 150 155 160

Asp Thr Ile Thr Tyr Glu Cys Pro Leu Leu Arg Gln Asn Glu Pro Glu
165 170 175

Asp Ile Asp Cys Trp Cys Asn Ser Thr Ser Thr Trp Val Thr Tyr Gly
180 185 190

Thr Cys Thr Thr Met Gly Glu His Arg Arg Glu Lys Arg Ser Val Ala
195 200 205

Leu Val Pro His Val Gly Met Gly Leu Glu Thr Arg Thr Glu Thr Trp
210 215 220

Met Ser Ser Glu Gly Ala Trp Lys His Val Gln Arg Ile Glu Thr Trp
225 230 235 240

Ile Leu Arg His Pro Gly Phe Thr Met Met Ala Ala Ile Leu Ala Tyr
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260 265 270

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Cys Gly Leu Phe Gly Lys Gly Gly Ile Val Thr Cys Ala Met Phe Arg
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Cys Lys Lys Asn Met Glu Gly Lys Val Val Gln Pro Glu Asn Leu Glu
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Tyr Thr Ile Val Ile Thr Pro His Ser Gly Glu Glu His Ala Val Gly
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Asn Asp Thr Gly Lys His Gly Lys Glu Ile Lys Ile Thr Pro Gln Ser
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Cys Ser Pro Arg Thr Gly Leu Asp Phe Asn Glu Met Val Leu Leu Gln
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Met Glu Asn Lys Ala Trp Leu Val His Arg Gln Trp Phe Leu Asp Leu
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Gln Lys Glu Thr Leu Val Thr Phe Lys Asn Pro His Ala Lys Lys Gln
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Asp Val Val Val Leu Gly Ser Gln Glu Gly Ala Met His Thr Ala Leu
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Gly His Leu Lys Cys Arg Leu Arg Met Asp Lys Leu Gln Leu Lys Gly
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Lys Lys Gly Ser Ser Ile Gly Gln Met Phe Glu Thr Thr Met Arg Gly
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Ala Lys Arg Met Ala Ile Leu Gly Asp Thr Ala Trp Asp Phe Gly Ser
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Leu Gly Gly Val Phe Thr Ser Ile Gly Lys Ala Leu His Gln Val Phe
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Ile Leu Ile Gly Val Ile Ile Thr Trp Ile Gly Met Asn Ser Arg Ser
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Thr Ser Leu Ser Val Thr Leu Val Leu Val Gly Ile Val Thr Leu Tyr
755 760 765

Leu Gly Val Met Val Gln Ala Asp Ser Gly Cys Val Val Ser Trp Lys
770 775 780

Asn Lys Glu Leu Lys Cys Gly Ser Gly Ile Phe Ile Thr Asp Asn Val
785 790 795 800

His Thr Trp Thr Glu Gln Tyr Lys Phe Gln Pro Glu Ser Pro Ser Lys
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Leu Ala Ser Ala Ile Gln Lys Ala His Glu Glu Asp Ile Cys Gly Ile
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850 855 860

Thr Gly Asp Ile Lys Gly Ile Met Gln Ala Gly Lys Arg Ser Leu Arg
865 870 875 880

Pro Gln Pro Thr Glu Leu Lys Tyr Ser Trp Lys Thr Trp Gly Lys Ala
885 890 895

Lys Met Leu Ser Thr Glu Ser His Asn Gln Thr Phe Leu Ile Asp Gly
900 905 910

Pro Glu Thr Ala Glu Cys Pro Asn Thr Asn Arg Ala Trp Asn Ser Leu
915 920 925

Glu Val Glu Asp Tyr Gly Phe Gly Val Phe Thr Thr Asn Ile Trp Leu
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Ile Glu Ser Ala Leu Asn Asp Thr Trp Lys Ile Glu Lys Ala Ser Phe
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Ile Glu Val Lys Asn Cys His Trp Pro Lys Ser His Thr Leu Trp Ser
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Asn Gly Val Leu Glu Ser Glu Met Ile Ile Pro Lys Asn Leu Ala
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Gly Pro Val Ser Gln His Asn Tyr Arg Pro Gly Tyr His Thr Gln
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Ile Thr Gly Pro Trp His Leu Gly Lys Leu Glu Met Asp Phe Asp
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Phe Cys Asp Gly Thr Thr Val Val Val Thr Glu Asp Cys Gly Asn
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Thr Glu Trp Cys Cys Arg Ser Cys Thr Leu Pro Pro Leu Arg Tyr
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Arg Gly Glu Asp Gly Cys Trp Tyr Gly Met Glu Ile Arg Pro Leu
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Lys Glu Lys Glu Glu Asn Leu Val Asn Ser Leu Val Thr Ala Gly
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His Gly Gln Val Asp Asn Phe Ser Leu Gly Val Leu Gly Met Ala
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Gly Lys Ala Glu Leu Glu Asp Gly Ala Tyr Arg Ile Lys Gln Lys
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Met His Lys Gly Lys Arg Ile Glu Pro Ser Trp Ala Asp Val Lys
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Met Thr Ala Thr Pro Pro Gly Ser Arg Asp Pro Phe Pro Gln Ser
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Trp Asn Ser Gly His Glu Trp Val Thr Asp Phe Lys Gly Lys Thr
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Val Trp Phe Val Pro Ser Ile Lys Ala Gly Asn Asp Ile Ala Ala
1835 1840 1845

Cys Leu Arg Lys Asn Gly Lys Lys Val Ile Gln Leu Ser Arg Lys
1850 1855 1860

Thr Phe Asp Ser Glu Tyr Val Lys Thr Arg Thr Asn Asp Trp Asp
1865 1870 1875

Phe Val Val Thr Thr Asp Ile Ser Glu Met Gly Ala Asn Phe Lys
1880 1885 1890

Ala Glu Arg Val Ile Asp Pro Arg Arg Cys Met Lys Pro Val Ile
1895 1900 1905

Leu Thr Asp Gly Glu Glu Arg Val Ile Leu Ala Gly Pro Met Pro
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agagacgtga gcaagaaaga gggaggagca atgtatgccg atgacaccgc aggatgggat	9180
acaagaatca cactagaaga cctaaaaaat gaagaaatgg taacaaacca catggaagga	9240
gaacacaaga aactagccga ggccattttc aaactaacgt accaaaacaa ggtggtgcgt	9300
gtgcaaagac caacaccaag aggcacagta atggacatca tatcgagaag agaccaaaga	9360

ggtagtggac aagttggcac ctatggactc aatactttca ccaatatgga agcccaacta	9420
atcagacaga tggagggaga aggagtcttt aaaagcattc agcacctaac aatcacagaa	9480
gaaatcgctg tgcaaaactg gttagcaaga gtggggcgcg aaaggttatc aagaatggcc	9540
atcagtggag atgatttgtt tgtgaaacct ttagatgaca ggcttcgcaag cgctttaaca	9600
gctctaaatg acatgggaaa gattaggaaa gacatacaac aatgggaacc ttcaagagga	9660
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gacggtcgcg tactcgttgt tccatgtaga aaccaagatg aactgattgg cagagcccga	9780
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tgctcggcag taccatcaca ttgggttcca acaagtcgaa caacctggtc catacatgct	9960
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gcaaagaaca tccaagcagc aataaatcaa gttagatccc ttataggcaa tgaagaatac	10200
acagattaca tgccatccat gaaaagattc agaagagaag aggaagaagc aggagttctg	10260
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acggaaaaaa ctatgctacc tgtgagcccc gtccaaggac gttaaaaagaa gtcaggccat	10380
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<211> 3389

<212> PRT

<213> chimeric dengue serotype 2/3 (MVS)

<400> 6

Met Asn Asn Gln Arg Lys Lys Ala Lys Asn Thr Pro Phe Asn Met Leu
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Lys Arg Glu Arg Asn Arg Val Ser Thr Val Gln Gln Leu Thr Lys Arg
20 25 30

Phe Ser Leu Gly Met Leu Gln Gly Arg Gly Pro Leu Lys Leu Phe Met
35 40 45

Ala Leu Val Ala Phe Leu Arg Phe Leu Thr Ile Pro Pro Thr Ala Gly
50 55 60

Ile Leu Lys Arg Trp Gly Thr Ile Lys Lys Ser Lys Ala Ile Asn Val
65 70 75 80

Leu Arg Gly Phe Arg Lys Glu Ile Gly Arg Met Leu Asn Ile Leu Asn
85 90 95

Arg Arg Arg Arg Ser Ala Gly Met Ile Ile Met Leu Ile Pro Thr Val
100 105 110

Met Ala Phe His Leu Thr Thr Arg Asp Gly Glu Pro Arg Met Ile Val
115 120 125

Gly Lys Asn Glu Arg Gly Lys Ser Leu Leu Phe Lys Thr Ala Ser Gly
130 135 140

Ile Asn Met Cys Thr Leu Ile Ala Met Asp Leu Gly Glu Met Cys Asp
145 150 155 160

Asp Thr Val Thr Tyr Lys Cys Pro His Ile Thr Glu Val Glu Pro Glu
165 170 175

Asp Ile Asp Cys Trp Cys Asn Leu Thr Ser Thr Trp Val Thr Tyr Gly
180 185 190

Thr Cys Asn Gln Ala Gly Glu His Arg Arg Asp Lys Arg Ser Val Ala
195 200 205

Leu Ala Pro His Val Gly Met Gly Leu Asp Thr Arg Thr Gln Thr Trp
210 215 220

Met Ser Ala Glu Gly Ala Trp Arg Gln Val Glu Lys Val Glu Thr Trp
225 230 235 240

Ala Leu Arg His Pro Gly Phe Thr Ile Leu Ala Leu Phe Leu Ala His
245 250 255

Tyr Ile Gly Thr Ser Leu Thr Gln Lys Val Val Ile Phe Ile Leu Leu
260 265 270

Met Leu Val Thr Pro Ser Met Thr Met Arg Cys Val Gly Val Gly Asn
275 280 285

Arg Asp Phe Val Glu Gly Leu Ser Gly Ala Thr Trp Val Asp Val Val
290 295 300

Leu Glu His Gly Gly Cys Val Thr Thr Met Ala Lys Asn Lys Pro Thr
305 310 315 320

Leu Asp Ile Glu Leu Gln Lys Thr Glu Ala Thr Gln Leu Ala Thr Leu
325 330 335

Arg Lys Leu Cys Ile Glu Gly Lys Ile Thr Asn Ile Thr Thr Asp Ser
340 345 350

Arg Cys Pro Thr Gln Gly Glu Ala Ile Leu Pro Glu Glu Gln Asp Gln
355 360 365

Asn Tyr Val Cys Lys His Thr Tyr Val Asp Arg Gly Trp Gly Asn Gly
370 375 380

Cys Gly Leu Phe Gly Lys Gly Ser Leu Val Thr Cys Ala Lys Phe Gln
385 390 395 400

Cys Leu Glu Ser Ile Glu Gly Lys Val Val Gln His Glu Asn Leu Lys
405 410 415

Tyr Thr Val Ile Ile Thr Val His Thr Gly Asp Gln His Gln Val Gly
420 425 430

Asn Glu Thr Gln Gly Val Thr Ala Glu Ile Thr Pro Gln Ala Ser Thr
435 440 445

Ala Glu Ala Ile Leu Pro Glu Tyr Gly Thr Leu Gly Leu Glu Cys Ser
450 455 460

Pro Arg Thr Gly Leu Asp Phe Asn Glu Met Ile Ser Leu Thr Met Lys
465 470 475 480

Asn Lys Ala Trp Met Val His Arg Gln Trp Phe Phe Asp Leu Pro Leu
485 490 495

Pro Trp Thr Ser Gly Ala Ser Ala Glu Thr Pro Thr Trp Asn Arg Lys
500 505 510

Glu Leu Leu Val Thr Phe Lys Asn Ala His Ala Lys Lys Gln Glu Val
515 520 525

Val Val Leu Gly Ser Gln Glu Gly Ala Met His Thr Ala Leu Thr Gly
530 535 540

Ala Thr Glu Ile Gln Thr Ser Gly Gly Thr Ser Ile Phe Ala Gly His
545 550 555 560

Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Glu Leu Lys Gly Met Ser
565 570 575

Tyr Ala Met Cys Leu Ser Ser Phe Val Leu Lys Lys Glu Val Ser Glu
580 585 590

Thr Gln His Gly Thr Ile Leu Ile Lys Val Glu Tyr Lys Gly Glu Asp
595 600 605

Ala Pro Cys Lys Ile Pro Phe Ser Thr Glu Asp Gly Gln Gly Lys Ala
610 615 620

Leu Asn Gly Arg Leu Ile Thr Ala Asn Pro Val Val Thr Lys Lys Glu
625 630 635 640

Glu Pro Val Asn Ile Glu Ala Glu Pro Pro Phe Gly Glu Ser Asn Ile
645 650 655

Val Ile Gly Ile Gly Asp Lys Ala Leu Lys Ile Asn Trp Tyr Lys Lys
660 665 670

Gly Ser Ser Ile Gly Lys Met Phe Glu Ala Thr Ala Arg Gly Ala Arg
675 680 685

Arg Met Ala Ile Leu Gly Asp Thr Ala Trp Asp Phe Gly Ser Val Gly
690 695 700

Gly Val Leu Asn Ser Leu Gly Lys Met Val His Gln Ile Phe Gly Ser
705 710 715 720

Ala Tyr Thr Ala Leu Phe Gly Gly Val Ser Trp Met Met Lys Ile Gly
725 730 735

Ile Gly Val Leu Leu Thr Trp Ile Gly Leu Asn Ser Lys Asn Thr Ser
740 745 750

Met Ser Phe Ser Cys Ile Ala Ala Gly Ile Val Thr Leu Tyr Leu Gly
755 760 765

Val Met Val Gln Ala Asp Ser Gly Cys Val Val Ser Trp Lys Asn Lys
770 775 780

Glu Leu Lys Cys Gly Ser Gly Ile Phe Ile Thr Asp Asn Val His Thr
785 790 795 800

Trp Thr Glu Gln Tyr Lys Phe Gln Pro Glu Ser Pro Ser Lys Leu Ala
805 810 815

Ser Ala Ile Gln Lys Ala His Glu Glu Asp Ile Cys Gly Ile Arg Ser
820 825 830

Val Thr Arg Leu Glu Asn Leu Met Trp Lys Gln Ile Thr Pro Glu Leu
835 840 845

Asn His Ile Leu Ser Glu Asn Glu Val Lys Leu Thr Ile Met Thr Gly
850 855 860

Asp Ile Lys Gly Ile Met Gln Ala Gly Lys Arg Ser Leu Arg Pro Gln
865 870 875 880

Pro Thr Glu Leu Lys Tyr Ser Trp Lys Thr Trp Gly Lys Ala Lys Met
885 890 895

Leu Ser Thr Glu Ser His Asn Gln Thr Phe Leu Ile Asp Gly Pro Glu
900 905 910

Thr Ala Glu Cys Pro Asn Thr Asn Arg Ala Trp Asn Ser Leu Glu Val
915 920 925

Glu Asp Tyr Gly Phe Gly Val Phe Thr Thr Asn Ile Trp Leu Lys Leu
930 935 940

Lys Glu Lys Gln Asp Val Phe Cys Asp Ser Lys Leu Met Ser Ala Ala
945 950 955 960

Ile Lys Asp Asn Arg Ala Val His Ala Asp Met Gly Tyr Trp Ile Glu
965 970 975

Ser Ala Leu Asn Asp Thr Trp Lys Ile Glu Lys Ala Ser Phe Ile Glu
980 985 990

Val Lys Asn Cys His Trp Pro Lys Ser His Thr Leu Trp Ser Asn Gly
995 1000 1005

Val Leu Glu Ser Glu Met Ile Ile Pro Lys Asn Leu Ala Gly Pro
1010 1015 1020

Val Ser Gln His Asn Tyr Arg Pro Gly Tyr His Thr Gln Ile Thr
1025 1030 1035

Gly Pro Trp His Leu Gly Lys Leu Glu Met Asp Phe Asp Phe Cys
1040 1045 1050

Asp Gly Thr Thr Val Val Val Thr Glu Asp Cys Gly Asn Arg Gly
1055 1060 1065

Pro Ser Leu Arg Thr Thr Thr Ala Ser Gly Lys Leu Ile Thr Glu
1070 1075 1080

Trp	Cys	Cys	Arg	Ser	Cys	Thr	Leu	Pro	Pro	Leu	Arg	Tyr	Arg	Gly
	1085					1090					1095			
Glu	Asp	Gly	Cys	Trp	Tyr	Gly	Met	Glu	Ile	Arg	Pro	Leu	Lys	Glu
	1100					1105					1110			
Lys	Glu	Glu	Asn	Leu	Val	Asn	Ser	Leu	Val	Thr	Ala	Gly	His	Gly
	1115					1120					1125			
Gln	Val	Asp	Asn	Phe	Ser	Leu	Gly	Val	Leu	Gly	Met	Ala	Leu	Phe
	1130					1135					1140			
Leu	Glu	Glu	Met	Leu	Arg	Thr	Arg	Val	Gly	Thr	Lys	His	Ala	Ile
	1145					1150					1155			
Leu	Leu	Val	Ala	Val	Ser	Phe	Val	Thr	Leu	Ile	Thr	Gly	Asn	Met
	1160					1165					1170			
Ser	Phe	Arg	Asp	Leu	Gly	Arg	Val	Met	Val	Met	Val	Gly	Ala	Thr
	1175					1180					1185			
Met	Thr	Asp	Asp	Ile	Gly	Met	Gly	Val	Thr	Tyr	Leu	Ala	Leu	Leu
	1190					1195					1200			
Ala	Ala	Phe	Lys	Val	Arg	Pro	Thr	Phe	Ala	Ala	Gly	Leu	Leu	Leu
	1205					1210					1215			
Arg	Lys	Leu	Thr	Ser	Lys	Glu	Leu	Met	Met	Thr	Thr	Ile	Gly	Ile
	1220					1225					1230			
Val	Leu	Leu	Ser	Gln	Ser	Thr	Ile	Pro	Glu	Thr	Ile	Leu	Glu	Leu
	1235					1240					1245			
Thr	Asp	Ala	Leu	Ala	Leu	Gly	Met	Met	Val	Leu	Lys	Met	Val	Arg
	1250					1255					1260			
Asn	Met	Glu	Lys	Tyr	Gln	Leu	Ala	Val	Thr	Ile	Met	Ala	Ile	Leu
	1265					1270					1275			

Cys Val Pro Asn Ala Val Ile Leu Gln Asn Ala Trp Lys Val Ser
1280 1285 1290

Cys Thr Ile Leu Ala Val Val Ser Val Ser Pro Leu Phe Leu Thr
1295 1300 1305

Ser Ser Gln Gln Lys Thr Asp Trp Ile Pro Leu Ala Leu Thr Ile
1310 1315 1320

Lys Gly Leu Asn Pro Thr Ala Ile Phe Leu Thr Thr Leu Ser Arg
1325 1330 1335

Thr Ser Lys Lys Arg Ser Trp Pro Leu Asn Glu Ala Ile Met Ala
1340 1345 1350

Val Gly Met Val Ser Ile Leu Ala Ser Ser Leu Leu Lys Asn Asp
1355 1360 1365

Ile Pro Met Thr Gly Pro Leu Val Ala Gly Gly Leu Leu Thr Val
1370 1375 1380

Cys Tyr Val Leu Thr Gly Arg Ser Ala Asp Leu Glu Leu Glu Arg
1385 1390 1395

Ala Ala Asp Val Lys Trp Glu Asp Gln Ala Glu Ile Ser Gly Ser
1400 1405 1410

Ser Pro Ile Leu Ser Ile Thr Ile Ser Glu Asp Gly Ser Met Ser
1415 1420 1425

Ile Lys Asn Glu Glu Glu Glu Gln Thr Leu Thr Ile Leu Ile Arg
1430 1435 1440

Thr Gly Leu Leu Val Ile Ser Gly Leu Phe Pro Val Ser Ile Pro
1445 1450 1455

Ile Thr Ala Ala Ala Trp Tyr Leu Trp Glu Val Lys Lys Gln Arg
1460 1465 1470

Ala Gly Val Leu Trp Asp Val Pro Ser Pro Pro Pro Met Gly Lys
1475 1480 1485

Ala Glu Leu Glu Asp Gly Ala Tyr Arg Ile Lys Gln Lys Gly Ile
1490 1495 1500

Leu Gly Tyr Ser Gln Ile Gly Ala Gly Val Tyr Lys Glu Gly Thr
1505 1510 1515

Phe His Thr Met Trp His Val Thr Arg Gly Ala Val Leu Met His
1520 1525 1530

Lys Gly Lys Arg Ile Glu Pro Ser Trp Ala Asp Val Lys Lys Asp
1535 1540 1545

Leu Ile Ser Tyr Gly Gly Gly Trp Lys Leu Glu Gly Glu Trp Lys
1550 1555 1560

Glu Gly Glu Glu Val Gln Val Leu Ala Leu Glu Pro Gly Lys Asn
1565 1570 1575

Pro Arg Ala Val Gln Thr Lys Pro Gly Leu Phe Lys Thr Asn Ala
1580 1585 1590

Gly Thr Ile Gly Ala Val Ser Leu Asp Phe Ser Pro Gly Thr Ser
1595 1600 1605

Gly Ser Pro Ile Ile Asp Lys Lys Gly Lys Val Val Gly Leu Tyr
1610 1615 1620

Gly Asn Gly Val Val Thr Arg Ser Gly Ala Tyr Val Ser Ala Ile
1625 1630 1635

Ala Gln Thr Glu Lys Ser Ile Glu Asp Asn Pro Glu Ile Glu Asp
1640 1645 1650

Asp Ile Phe Arg Lys Arg Arg Leu Thr Ile Met Asp Leu His Pro
1655 1660 1665

Gly Ala Gly Lys Thr Lys Arg Tyr Leu Pro Ala Ile Val Arg Glu
1670 1675 1680

Ala Ile Lys Arg Gly Leu Arg Thr Leu Ile Leu Ala Pro Thr Arg
1685 1690 1695

Val Val Ala Ala Glu Met Glu Glu Ala Leu Arg Gly Leu Pro Ile
1700 1705 1710

Arg Tyr Gln Thr Pro Ala Ile Arg Ala Val His Thr Gly Arg Glu
1715 1720 1725

Ile Val Asp Leu Met Cys His Ala Thr Phe Thr Met Arg Leu Leu
1730 1735 1740

Ser Pro Val Arg Val Pro Asn Tyr Asn Leu Ile Ile Met Asp Glu
1745 1750 1755

Ala His Phe Thr Asp Pro Ala Ser Ile Ala Ala Arg Gly Tyr Ile
1760 1765 1770

Ser Thr Arg Val Glu Met Gly Glu Ala Ala Gly Ile Phe Met Thr
1775 1780 1785

Ala Thr Pro Pro Gly Ser Arg Asp Pro Phe Pro Gln Ser Asn Ala
1790 1795 1800

Pro Ile Ile Asp Glu Glu Arg Glu Ile Pro Glu Arg Ser Trp Asn
1805 1810 1815

Ser Gly His Glu Trp Val Thr Asp Phe Lys Gly Lys Thr Val Trp
1820 1825 1830

Phe Val Pro Ser Ile Lys Ala Gly Asn Asp Ile Ala Ala Cys Leu
1835 1840 1845

Arg Lys Asn Gly Lys Lys Val Ile Gln Leu Ser Arg Lys Thr Phe
1850 1855 1860

Asp Ser Glu Tyr Val Lys Thr Arg Thr Asn Asp Trp Asp Phe Val
1865 1870 1875

Val Thr Thr Asp Ile Ser Glu Met Gly Ala Asn Phe Lys Ala Glu
1880 1885 1890

Arg Val Ile Asp Pro Arg Arg Cys Met Lys Pro Val Ile Leu Thr
1895 1900 1905

Asp Gly Glu Glu Arg Val Ile Leu Ala Gly Pro Met Pro Val Thr
1910 1915 1920

His Ser Ser Ala Ala Gln Arg Arg Gly Arg Ile Gly Arg Asn Pro
1925 1930 1935

Lys Asn Glu Asn Asp Gln Tyr Ile Tyr Met Gly Glu Pro Leu Glu
1940 1945 1950

Asn Asp Glu Asp Cys Ala His Trp Lys Glu Ala Lys Met Leu Leu
1955 1960 1965

Asp Asn Ile Asn Thr Pro Glu Gly Ile Ile Pro Ser Met Phe Glu
1970 1975 1980

Pro Glu Arg Glu Lys Val Asp Ala Ile Asp Gly Glu Tyr Arg Leu
1985 1990 1995

Arg Gly Glu Ala Arg Lys Thr Phe Val Asp Leu Met Arg Arg Gly
2000 2005 2010

Asp Leu Pro Val Trp Leu Ala Tyr Arg Val Ala Ala Glu Gly Ile
2015 2020 2025

Asn Tyr Ala Asp Arg Arg Trp Cys Phe Asp Gly Val Lys Asn Asn
2030 2035 2040

Gln Ile Leu Glu Glu Asn Val Glu Val Glu Ile Trp Thr Lys Glu
2045 2050 2055

Gly Glu Arg Lys Lys Leu Lys Pro Arg Trp Leu Asp Ala Arg Ile
2060 2065 2070

Tyr Ser Asp Pro Leu Ala Leu Lys Glu Phe Lys Glu Phe Ala Ala
2075 2080 2085

Gly	Arg	Lys	Ser	Leu	Thr	Leu	Asn	Leu	Ile	Thr	Glu	Met	Gly	Arg
2090						2095					2100			
Leu	Pro	Thr	Phe	Met	Thr	Gln	Lys	Ala	Arg	Asp	Ala	Leu	Asp	Asn
2105						2110					2115			
Leu	Ala	Val	Leu	His	Thr	Ala	Glu	Ala	Gly	Gly	Arg	Ala	Tyr	Asn
2120						2125					2130			
His	Ala	Leu	Ser	Glu	Leu	Pro	Glu	Thr	Leu	Glu	Thr	Leu	Leu	Leu
2135						2140					2145			
Leu	Thr	Leu	Leu	Ala	Thr	Val	Thr	Gly	Gly	Ile	Phe	Leu	Phe	Leu
2150						2155					2160			
Met	Ser	Ala	Arg	Gly	Ile	Gly	Lys	Met	Thr	Leu	Gly	Met	Cys	Cys
2165						2170					2175			
Ile	Ile	Thr	Ala	Ser	Ile	Leu	Leu	Trp	Tyr	Ala	Gln	Ile	Gln	Pro
2180						2185					2190			
His	Trp	Ile	Ala	Ala	Ser	Ile	Ile	Leu	Glu	Phe	Phe	Leu	Ile	Val
2195						2200					2205			
Leu	Leu	Ile	Pro	Glu	Pro	Glu	Lys	Gln	Arg	Thr	Pro	Gln	Asp	Asn
2210						2215					2220			
Gln	Leu	Thr	Tyr	Val	Val	Ile	Ala	Ile	Leu	Thr	Val	Val	Ala	Ala
2225						2230					2235			
Thr	Met	Ala	Asn	Glu	Met	Gly	Phe	Leu	Glu	Lys	Thr	Lys	Lys	Asp
2240						2245					2250			
Leu	Gly	Leu	Gly	Ser	Ile	Ala	Thr	Gln	Gln	Pro	Glu	Ser	Asn	Ile
2255						2260					2265			
Leu	Asp	Ile	Asp	Leu	Arg	Pro	Ala	Ser	Ala	Trp	Thr	Leu	Tyr	Ala
2270						2275					2280			
Val	Ala	Thr	Thr	Phe	Val	Thr	Pro	Met	Leu	Arg	His	Ser	Ile	Glu
2285						2290					2295			

Asn Ser Ser Val Asn Val Ser Leu Thr Ala Ile Ala Asn Gln Ala
2300 2305 2310

Thr Val Leu Met Gly Leu Gly Lys Gly Trp Pro Leu Ser Lys Met
2315 2320 2325

Asp Ile Gly Val Pro Leu Leu Ala Ile Gly Cys Tyr Ser Gln Val
2330 2335 2340

Asn Pro Ile Thr Leu Thr Ala Ala Leu Phe Leu Leu Val Ala His
2345 2350 2355

Tyr Ala Ile Ile Gly Pro Gly Leu Gln Ala Lys Ala Thr Arg Glu
2360 2365 2370

Ala Gln Lys Arg Ala Ala Ala Gly Ile Met Lys Asn Pro Thr Val
2375 2380 2385

Asp Gly Ile Thr Val Ile Asp Leu Asp Pro Ile Pro Tyr Asp Pro
2390 2395 2400

Lys Phe Glu Lys Gln Leu Gly Gln Val Met Leu Leu Val Leu Cys
2405 2410 2415

Val Thr Gln Val Leu Met Met Arg Thr Thr Trp Ala Leu Cys Glu
2420 2425 2430

Ala Leu Thr Leu Ala Thr Gly Pro Ile Ser Thr Leu Trp Glu Gly
2435 2440 2445

Asn Pro Gly Arg Phe Trp Asn Thr Thr Ile Ala Val Ser Met Ala
2450 2455 2460

Asn Ile Phe Arg Gly Ser Tyr Leu Ala Gly Ala Gly Leu Leu Phe
2465 2470 2475

Ser Ile Met Lys Asn Thr Thr Asn Thr Arg Arg Gly Thr Gly Asn
2480 2485 2490

Ile Gly Glu Thr Leu Gly Glu Lys Trp Lys Ser Arg Leu Asn Ala
2495 2500 2505

Leu Gly Lys Ser Glu Phe Gln Ile Tyr Lys Lys Ser Gly Ile Gln
2510 2515 2520

Glu Val Asp Arg Thr Leu Ala Lys Glu Gly Ile Lys Arg Gly Glu
2525 2530 2535

Thr Asp His His Ala Val Ser Arg Gly Ser Ala Lys Leu Arg Trp
2540 2545 2550

Phe Val Glu Arg Asn Met Val Thr Pro Glu Gly Lys Val Val Asp
2555 2560 2565

Leu Gly Cys Gly Arg Gly Gly Trp Ser Tyr Tyr Cys Gly Gly Leu
2570 2575 2580

Lys Asn Val Arg Glu Val Lys Gly Leu Thr Lys Gly Gly Pro Gly
2585 2590 2595

His Glu Glu Pro Ile Pro Met Ser Thr Tyr Gly Trp Asn Leu Val
2600 2605 2610

Arg Leu Gln Ser Gly Val Asp Val Phe Phe Ile Pro Pro Glu Lys
2615 2620 2625

Cys Asp Thr Leu Leu Cys Asp Ile Gly Glu Ser Ser Pro Asn Pro
2630 2635 2640

Thr Val Glu Ala Gly Arg Thr Leu Arg Val Leu Asn Leu Val Glu
2645 2650 2655

Asn Trp Leu Asn Asn Asn Thr Gln Phe Cys Ile Lys Val Leu Asn
2660 2665 2670

Pro Tyr Met Pro Ser Val Ile Glu Lys Met Glu Ala Leu Gln Arg
2675 2680 2685

Lys Tyr Gly Gly Ala Leu Val Arg Asn Pro Leu Ser Arg Asn Ser
2690 2695 2700

Thr His Glu Met Tyr Trp Val Ser Asn Ala Ser Gly Asn Ile Val
2705 2710 2715

Ser Ser Val Asn Met Ile Ser Arg Met Leu Ile Asn Arg Phe Thr
2720 2725 2730

Met Arg Tyr Lys Lys Ala Thr Tyr Glu Pro Asp Val Asp Leu Gly
2735 2740 2745

Ser Gly Thr Arg Asn Ile Gly Ile Glu Ser Glu Ile Pro Asn Leu
2750 2755 2760

Asp Ile Ile Gly Lys Arg Ile Glu Lys Ile Lys Gln Glu His Glu
2765 2770 2775

Thr Ser Trp His Tyr Asp Gln Asp His Pro Tyr Lys Thr Trp Ala
2780 2785 2790

Tyr His Gly Ser Tyr Glu Thr Lys Gln Thr Gly Ser Ala Ser Ser
2795 2800 2805

Met Val Asn Gly Val Val Arg Leu Leu Thr Lys Pro Trp Asp Val
2810 2815 2820

Val Pro Met Val Thr Gln Met Ala Met Thr Asp Thr Thr Pro Phe
2825 2830 2835

Gly Gln Gln Arg Val Phe Lys Glu Lys Val Asp Thr Arg Thr Gln
2840 2845 2850

Glu Pro Lys Glu Gly Thr Lys Lys Leu Met Lys Ile Thr Ala Glu
2855 2860 2865

Trp Leu Trp Lys Glu Leu Gly Lys Lys Lys Thr Pro Arg Met Cys
2870 2875 2880

Thr Arg Glu Glu Phe Thr Arg Lys Val Arg Ser Asn Ala Ala Leu
2885 2890 2895

Gly Ala Ile Phe Thr Asp Glu Asn Lys Trp Lys Ser Ala Arg Glu
2900 2905 2910

Ala Val Glu Asp Ser Arg Phe Trp Glu Leu Val Asp Lys Glu Arg
2915 2920 2925

Asn Leu His Leu Glu Gly Lys Cys Glu Thr Cys Val Tyr Asn Met
2930 2935 2940

Met Gly Lys Arg Glu Lys Lys Leu Gly Glu Phe Gly Lys Ala Lys
2945 2950 2955

Gly Ser Arg Ala Ile Trp Tyr Met Trp Leu Gly Ala Arg Phe Leu
2960 2965 2970

Glu Phe Glu Ala Leu Gly Phe Leu Asn Glu Asp His Trp Phe Ser
2975 2980 2985

Arg Glu Asn Ser Leu Ser Gly Val Glu Gly Glu Gly Leu His Lys
2990 2995 3000

Leu Gly Tyr Ile Leu Arg Asp Val Ser Lys Lys Glu Gly Gly Ala
3005 3010 3015

Met Tyr Ala Asp Asp Thr Ala Gly Trp Asp Thr Arg Ile Thr Leu
3020 3025 3030

Glu Asp Leu Lys Asn Glu Glu Met Val Thr Asn His Met Glu Gly
3035 3040 3045

Glu His Lys Lys Leu Ala Glu Ala Ile Phe Lys Leu Thr Tyr Gln
3050 3055 3060

Asn Lys Val Val Arg Val Gln Arg Pro Thr Pro Arg Gly Thr Val
3065 3070 3075

Met Asp Ile Ile Ser Arg Arg Asp Gln Arg Gly Ser Gly Gln Val
3080 3085 3090

Gly Thr Tyr Gly Leu Asn Thr Phe Thr Asn Met Glu Ala Gln Leu
3095 3100 3105

Ile Arg Gln Met Glu Gly Glu Gly Val Phe Lys Ser Ile Gln His
3110 3115 3120

Leu Thr Ile Thr Glu Glu Ile Ala Val Gln Asn Trp Leu Ala Arg
3125 3130 3135

Val Gly Arg Glu Arg Leu Ser Arg Met Ala Ile Ser Gly Asp Asp
3140 3145 3150

Cys Val Val Lys Pro Leu Asp Asp Arg Phe Ala Ser Ala Leu Thr
3155 3160 3165

Ala Leu Asn Asp Met Gly Lys Ile Arg Lys Asp Ile Gln Gln Trp
3170 3175 3180

Glu Pro Ser Arg Gly Trp Asn Asp Trp Thr Gln Val Pro Phe Cys
3185 3190 3195

Ser His His Phe His Glu Leu Ile Met Lys Asp Gly Arg Val Leu
3200 3205 3210

Val Val Pro Cys Arg Asn Gln Asp Glu Leu Ile Gly Arg Ala Arg
3215 3220 3225

Ile Ser Gln Gly Ala Gly Trp Ser Leu Arg Glu Thr Ala Cys Leu
3230 3235 3240

Gly Lys Ser Tyr Ala Gln Met Trp Ser Leu Met Tyr Phe His Arg
3245 3250 3255

Arg Asp Leu Arg Leu Ala Ala Asn Ala Ile Cys Ser Ala Val Pro
3260 3265 3270

Ser His Trp Val Pro Thr Ser Arg Thr Thr Trp Ser Ile His Ala
3275 3280 3285

Lys His Glu Trp Met Thr Thr Glu Asp Met Leu Thr Val Trp Asn
3290 3295 3300

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Thr Ser Met Ala Met Thr Cys Ile Ala Ala Gly Ile Val Thr Leu Tyr
755 760 765

Leu Gly Val Met Val Gln Ala Asp Ser Gly Cys Val Val Ser Trp Lys
770 775 780

Asn Lys Glu Leu Lys Cys Gly Ser Gly Ile Phe Ile Thr Asp Asn Val
785 790 795 800

His Thr Trp Thr Glu Gln Tyr Lys Phe Gln Pro Glu Ser Pro Ser Lys
805 810 815

Leu Ala Ser Ala Ile Gln Lys Ala His Glu Glu Asp Ile Cys Gly Ile
820 825 830

Arg Ser Val Thr Arg Leu Glu Asn Leu Met Trp Lys Gln Ile Thr Pro
835 840 845

Glu Leu Asn His Ile Leu Ser Glu Asn Glu Val Lys Leu Thr Ile Met
850 855 860

Thr Gly Asp Ile Lys Gly Ile Met Gln Ala Gly Lys Arg Ser Leu Arg
865 870 875 880

Pro Gln Pro Thr Glu Leu Lys Tyr Ser Trp Lys Thr Trp Gly Lys Ala
885 890 895

Lys Met Leu Ser Thr Glu Ser His Asn Gln Thr Phe Leu Ile Asp Gly
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Pro Glu Thr Ala Glu Cys Pro Asn Thr Asn Arg Ala Trp Asn Ser Leu
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Glu Val Glu Asp Tyr Gly Phe Gly Val Phe Thr Thr Asn Ile Trp Leu
930 935 940

Lys Leu Lys Glu Lys Gln Asp Val Phe Cys Asp Ser Lys Leu Met Ser
945 950 955 960

Ala Ala Ile Lys Asp Asn Arg Ala Val His Ala Asp Met Gly Tyr Trp
965 970 975

Ile Glu Ser Ala Leu Asn Asp Thr Trp Lys Ile Glu Lys Ala Ser Phe
980 985 990

Ile Glu Val Lys Asn Cys His Trp Pro Lys Ser His Thr Leu Trp Ser
995 1000 1005

Asn Gly Val Leu Glu Ser Glu Met Ile Ile Pro Lys Asn Leu Ala
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Gly Pro Val Ser Gln His Asn Tyr Arg Pro Gly Tyr His Thr Gln
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Ile Thr Gly Pro Trp His Leu Gly Lys Leu Glu Met Asp Phe Asp
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Phe Cys Asp Gly Thr Thr Val Val Val Thr Glu Asp Cys Gly Asn
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Arg Gly Pro Ser Leu Arg Thr Thr Thr Ala Ser Gly Lys Leu Ile
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Thr Glu Trp Cys Cys Arg Ser Cys Thr Leu Pro Pro Leu Arg Tyr
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Arg Gly Glu Asp Gly Cys Trp Tyr Gly Met Glu Ile Arg Pro Leu
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Lys Glu Lys Glu Glu Asn Leu Val Asn Ser Leu Val Thr Ala Gly
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His Gly Gln Val Asp Asn Phe Ser Leu Gly Val Leu Gly Met Ala
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Leu Phe Leu Glu Glu Met Leu Arg Thr Arg Val Gly Thr Lys His
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Ala Ile Leu Leu Val Ala Val Ser Phe Val Thr Leu Ile Thr Gly
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Asn Met Ser Phe Arg Asp Leu Gly Arg Val Met Val Met Val Gly
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Ala Thr Met Thr Gly Asp Ile Gly Met Gly Val Thr Tyr Leu Ala
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Leu Leu Ala Ala Phe Lys Val Arg Pro Thr Phe Ala Ala Gly Leu
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Leu Leu Arg Lys Leu Thr Ser Xaa Glu Leu Met Met Thr Thr Ile
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Gly Ile Val Leu Leu Ser Gln Ser Thr Ile Pro Glu Thr Ile Leu
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Glu Leu Thr Asp Ala Leu Ala Leu Gly Met Met Val Leu Lys Met
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Val Arg Asn Met Glu Lys Tyr Gln Leu Ala Val Thr Ile Met Ala
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Ile Leu Cys Val Pro Asn Ala Val Ile Leu Gln Asn Ala Trp Lys
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Val Ser Cys Thr Ile Leu Ala Val Val Ser Val Ser Pro Leu Phe
1295 1300 1305

Leu Thr Ser Ser Gln Gln Lys Thr Asp Trp Ile Pro Leu Ala Leu
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Thr Ile Lys Gly Leu Asn Pro Thr Ala Ile Phe Leu Thr Thr Leu
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Ser Arg Thr Ser Lys Lys Arg Ser Trp Pro Leu Asn Glu Ala Ile
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Met Ala Val Gly Met Val Ser Ile Leu Ala Ser Ser Leu Leu Lys
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Asn Asp Ile Pro Met Thr Gly Pro Leu Val Ala Gly Gly Leu Leu
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Thr Val Cys Tyr Val Leu Thr Gly Arg Ser Ala Asp Leu Glu Leu
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Glu Arg Ala Ala Asp Val Lys Trp Glu Asp Gln Ala Glu Ile Ser
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Gly Ser Ser Pro Ile Leu Ser Ile Thr Ile Ser Glu Asp Gly Ser
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Met Ser Ile Lys Asn Glu Glu Glu Glu Gln Thr Leu Thr Ile Leu
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Ile Arg Thr Gly Leu Leu Val Ile Ser Gly Leu Phe Pro Val Ser
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Ile Pro Ile Thr Ala Ala Ala Trp Tyr Leu Trp Glu Val Lys Lys
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Lys Asp Leu Ile Ser Tyr Gly Gly Gly Trp Lys Leu Glu Gly Glu
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Lys Asn Pro Arg Ala Val Gln Thr Lys Pro Gly Leu Phe Lys Thr
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Asn Ala Gly Thr Ile Gly Ala Val Ser Leu Asp Phe Ser Pro Gly
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Thr Ser Gly Ser Pro Ile Ile Asp Lys Lys Gly Lys Val Val Gly
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Leu Tyr Gly Asn Gly Val Val Thr Arg Ser Gly Ala Tyr Val Ser
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Ala Ile Ala Gln Thr Glu Lys Ser Ile Glu Asp Asn Pro Glu Ile
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Glu Asp Asp Ile Phe Arg Lys Arg Arg Leu Thr Ile Met Asp Leu
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His Pro Gly Ala Gly Lys Thr Lys Arg Tyr Leu Pro Ala Ile Val
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Arg Glu Ala Ile Lys Arg Gly Leu Arg Thr Leu Ile Leu Ala Pro
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Pro Ile Arg Tyr Gln Thr Pro Ala Ile Arg Ala Val His Thr Gly
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Asp Glu Ala His Phe Thr Asp Pro Ala Ser Ile Ala Ala Arg Gly
1760 1765 1770

Tyr Ile Ser Thr Arg Val Glu Met Gly Glu Ala Ala Gly Ile Phe
1775 1780 1785

Met Thr Ala Thr Pro Pro Gly Ser Arg Asp Pro Phe Pro Gln Ser
1790 1795 1800

Asn Ala Pro Ile Ile Asp Glu Glu Arg Glu Ile Pro Glu Arg Ser
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Trp Asn Ser Gly His Glu Trp Val Thr Asp Phe Lys Gly Lys Thr
1820 1825 1830

Val Trp Phe Val Pro Ser Ile Lys Ala Gly Asn Asp Ile Ala Ala
1835 1840 1845

Cys Leu Arg Lys Asn Gly Lys Lys Val Ile Gln Leu Ser Arg Lys
1850 1855 1860

Thr Phe Asp Ser Glu Tyr Val Lys Thr Arg Thr Asn Asp Trp Asp
1865 1870 1875

Phe Val Val Thr Thr Asp Ile Ser Glu Met Gly Ala Asn Phe Lys
1880 1885 1890

Ala Glu Arg Val Ile Asp Pro Arg Arg Cys Met Lys Pro Val Ile
1895 1900 1905

Leu Thr Asp Gly Glu Glu Arg Val Ile Leu Ala Gly Pro Met Pro
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Val Thr His Ser Ser Ala Ala Gln Arg Arg Gly Arg Ile Gly Arg
1925 1930 1935

Asn Pro Lys Asn Glu Asn Asp Gln Tyr Ile Tyr Met Gly Glu Pro
1940 1945 1950

Leu Glu Asn Asp Glu Asp Cys Ala His Trp Lys Glu Ala Lys Met
1955 1960 1965

Leu Leu Asp Asn Ile Asn Thr Pro Glu Gly Ile Ile Pro Ser Met
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Phe Glu Pro Glu Arg Glu Lys Val Asp Ala Ile Asp Gly Glu Tyr
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Arg Leu Arg Gly Glu Ala Arg Lys Thr Phe Val Asp Leu Met Arg
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Arg Gly Asp Leu Pro Val Trp Leu Ala Tyr Arg Val Ala Ala Glu
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Gly Ile Asn Tyr Ala Asp Arg Arg Trp Cys Phe Asp Gly Val Lys
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Lys Glu Gly Glu Arg Lys Lys Leu Lys Pro Arg Trp Leu Asp Ala
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Arg Ile Tyr Ser Asp Pro Leu Ala Leu Lys Glu Phe Lys Glu Phe
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Ala Ala Gly Arg Lys Ser Leu Thr Leu Asn Leu Ile Thr Glu Met
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Gly Arg Leu Pro Thr Phe Met Thr Gln Lys Val Arg Asp Ala Leu
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Tyr Asn His Ala Leu Ser Glu Leu Pro Glu Thr Leu Glu Thr Leu
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Phe Leu Met Ser Ala Arg Gly Ile Gly Lys Met Thr Leu Gly Met
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Cys Glu Ala Leu Thr Leu Ala Thr Gly Pro Ile Ser Thr Leu Trp
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Glu Gly Asn Pro Gly Arg Phe Trp Asn Thr Thr Ile Ala Val Ser
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Leu Phe Ser Ile Met Lys Asn Thr Thr Asn Thr Arg Arg Gly Thr
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Pro Gly His Glu Glu Pro Ile Pro Met Ser Thr Tyr Gly Trp Asn
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Val Glu Asn Trp Leu Asn Asn Asn Thr Gln Phe Cys Ile Lys Val
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Phe Thr Met Arg Tyr Lys Lys Ala Thr Tyr Glu Pro Asp Val Asp
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His Glu Thr Ser Trp His Tyr Asp Gln Asp His Pro Tyr Lys Thr
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Glu Gly Glu His Lys Lys Leu Ala Glu Ala Ile Phe Lys Leu Thr
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Asp Asp Cys Val Val Lys Pro Leu Asp Asp Arg Phe Ala Ser Ala
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Val Leu Val Val Pro Cys Arg Asn Gln Asp Glu Leu Ile Gly Arg
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Ala Arg Ile Ser Gln Gly Ala Gly Trp Ser Leu Arg Glu Thr Ala
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Cys Leu Gly Lys Ser Tyr Ala Gln Met Trp Ser Leu Met Tyr Phe
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His Arg Arg Asp Leu Arg Leu Ala Ala Asn Ala Ile Cys Ser Ala
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Val Pro Ser His Trp Val Pro Thr Ser Arg Thr Thr Trp Ser Ile
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His Ala Lys His Glu Trp Met Thr Thr Glu Asp Met Leu Thr Val
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Thr Pro Val Glu Ser Trp Glu Glu Ile Pro Tyr Leu Gly Lys Arg
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 <212> PRT
 <213> dengue virus

<400> 10

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			20					25					30		

Phe Ser Lys Gly Leu Leu Ser Gly Gln Gly Pro Met Lys Leu Val Met
35 40 45

Ala Phe Ile Ala Phe Leu Arg Phe Leu Ala Ile Pro Pro Thr Ala Gly
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Ile Leu Ala Arg Trp Gly Ser Phe Lys Lys Asn Gly Ala Ile Lys Val
65 70 75 80

Leu Arg Gly Phe Lys Arg Glu Ile Ser Asn Met Leu Asn Ile Met Asn
85 90 95

Arg Arg Lys Arg Ser Val Thr Met Leu Leu Met Leu Leu Pro Thr Ala
100 105 110

Leu Ala Phe His Leu Thr Thr Arg Gly Gly Glu Pro His Met Ile Val
115 120 125

Ser Lys Gln Glu Arg Gly Lys Ser Leu Leu Phe Lys Thr Ser Ala Gly
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Val Asn Met Cys Thr Leu Ile Ala Met Asp Leu Gly Glu Leu Cys Glu
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Asp Thr Met Thr Tyr Lys Cys Pro Arg Ile Thr Glu Ala Glu Pro Asp
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Asp Val Asp Cys Trp Cys Asn Ala Thr Asp Thr Trp Val Thr Tyr Gly
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Leu Ala Pro His Val Gly Leu Gly Leu Glu Thr Arg Ala Glu Thr Trp
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Met Leu Val Thr Pro Ser Met Ala Met Arg Cys Val Gly Ile Gly Asn
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Leu Glu His Gly Ser Cys Val Thr Thr Met Ala Lys Asn Lys Pro Thr
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325 330 335

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Arg Cys Pro Thr Gln Gly Glu Ala Thr Leu Val Glu Glu Gln Asp Ala
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Asn Phe Val Cys Arg Arg Thr Phe Val Asp Arg Gly Trp Gly Asn Gly
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Cys Gly Leu Phe Gly Lys Gly Ser Leu Ile Thr Cys Ala Lys Phe Lys
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Cys Val Thr Lys Leu Glu Gly Lys Ile Val Gln Tyr Glu Asn Leu Lys
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Tyr Ser Val Ile Val Thr Val His Thr Gly Asp Gln His Gln Val Gly
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Asn Glu Thr Thr Glu His Gly Thr Thr Ala Thr Ile Thr Pro Gln Ala
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Pro Thr Ser Glu Ile Gln Leu Thr Asp Tyr Gly Thr Leu Thr Leu Asp
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Cys Ser Pro Arg Thr Gly Leu Asp Phe Asn Glu Met Val Leu Leu Thr
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Met Lys Glu Arg Ser Trp Leu Val His Lys Gln Trp Phe Leu Asp Leu
485 490 495

Pro Leu Pro Trp Thr Ser Gly Ala Ser Thr Ser Gln Glu Thr Trp Asn
500 505 510

Arg Gln Asp Leu Leu Val Thr Phe Lys Thr Ala His Ala Lys Lys Gln
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Glu Val Val Val Leu Gly Ser Gln Glu Gly Ala Met His Thr Ala Leu
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Thr Gly Ala Thr Glu Ile Gln Thr Ser Gly Thr Thr Thr Ile Phe Ala
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Gly His Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Thr Leu Lys Gly
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Met Ser Tyr Val Met Cys Thr Gly Ser Phe Lys Leu Glu Lys Glu Val
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Ala Glu Thr Gln His Gly Thr Val Leu Val Gln Val Lys Tyr Glu Gly
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Thr Asp Ala Pro Cys Lys Ile Pro Phe Ser Thr Gln Asp Glu Lys Gly
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Lys Lys Gly Ser Ser Ile Gly Lys Met Phe Glu Ala Thr Ala Arg Gly
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His Thr Trp Thr Glu Gln Tyr Lys Phe Gln Ala Asp Ser Pro Lys Arg
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Arg Ser Ala Thr Arg Leu Glu Asn Ile Met Trp Lys Gln Ile Ser Asn
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Glu Leu Asn His Ile Leu Leu Glu Asn Asp Met Lys Phe Thr Val Val
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Val Gly Asp Val Ser Gly Ile Leu Ala Gln Gly Lys Lys Met Ile Arg
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Pro Gln Pro Met Glu His Lys Tyr Ser Trp Lys Ser Trp Gly Lys Ala
885 890 895

Lys Ile Ile Gly Ala Asp Val Gln Asn Thr Thr Phe Ile Ile Asp Gly
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Pro Asn Thr Pro Glu Cys Pro Asp Asn Gln Arg Ala Trp Asn Ile Trp
915 920 925

Glu Val Glu Asp Tyr Gly Phe Gly Ile Phe Thr Thr Asn Ile Trp Leu
930 935 940

Lys Leu Arg Asp Ser Tyr Thr Gln Val Cys Asp His Arg Leu Met Ser
945 950 955 960

Ala Ala Ile Lys Asp Ser Lys Ala Val His Ala Asp Met Gly Tyr Trp
965 970 975

Ile Glu Ser Glu Lys Asn Glu Thr Trp Lys Leu Ala Arg Ala Ser Phe
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Ile Glu Val Lys Thr Cys Ile Trp Pro Lys Ser His Thr Leu Trp Ser
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Asn Gly Val Leu Glu Ser Glu Met Ile Ile Pro Lys Ile Tyr Gly
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Gly Pro Ile Ser Gln His Asn Tyr Arg Pro Gly Tyr Phe Thr Gln
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Thr Ala Gly Pro Trp His Leu Gly Lys Leu Glu Leu Asp Phe Asp
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Phe Cys Glu Gly Thr Thr Val Val Val Asp Glu His Cys Gly Asn
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Arg Gly Pro Ser Leu Arg Thr Thr Thr Val Thr Gly Lys Ile Ile
1070 1075 1080

His Glu Trp Cys Cys Arg Ser Cys Thr Leu Pro Pro Leu Arg Phe
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Lys Gly Glu Asp Gly Cys Trp Tyr Gly Met Glu Ile Arg Pro Val
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Lys Asp Lys Glu Glu Asn Leu Val Lys Ser Met Val Ser Ala Gly
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Gln Leu Thr Trp Ser Asp Leu Ile Arg Leu Cys Ile Met Val Gly
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Asn Lys Ile Trp Gly Arg Lys Ser Trp Pro Leu Asn Glu Gly Ile
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Gly Lys Glu Ile Val Asp Leu Met Cys His Ala Thr Phe Thr Met
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Gly Tyr Ile Ser Thr Arg Val Gly Met Gly Glu Ala Ala Ala Ile
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Ser Asn Ala Ile Ile Gln Asp Glu Glu Arg Asp Ile Pro Glu Arg
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Ser Trp Asn Ser Gly Tyr Asp Trp Ile Thr Asp Phe Pro Gly Lys
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Thr Val Trp Phe Val Pro Ser Ile Lys Ser Gly Asn Asp Ile Ala
1835 1840 1845

Asn Cys Leu Arg Lys Asn Gly Lys Arg Val Ile Gln Leu Ser Arg
1850 1855 1860

Lys Thr Phe Asp Thr Glu Tyr Gln Lys Thr Lys Asn Asn Asp Trp
1865 1870 1875

Asp Tyr Val Val Thr Thr Asp Ile Ser Glu Met Gly Ala Asn Phe
1880 1885 1890

Arg Ala Asp Arg Val Ile Asp Pro Arg Arg Cys Leu Lys Pro Val
1895 1900 1905

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1940						1945					1950			
Pro	Leu	Asn	Asn	Asp	Glu	Asp	His	Ala	His	Trp	Thr	Glu	Ala	Lys
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2000						2005					2010			
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2015						2020					2025			
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2060						2065					2070			
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35 40 45

Ala Leu Val Ala Phe Leu Arg Phe Leu Thr Ile Pro Pro Thr Ala Gly
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Ile Leu Lys Arg Trp Gly Thr Ile Lys Lys Ser Lys Ala Ile Asn Val
65 70 75 80

Leu Arg Gly Phe Arg Lys Glu Ile Gly Arg Met Leu Asn Ile Leu Asn
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Arg Arg Arg Arg Ser Ala Gly Met Ile Ile Met Leu Ile Pro Thr Val
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Met Ala Phe His Leu Thr Thr Arg Asn Gly Glu Pro His Met Ile Val
115 120 125

Ser Arg Gln Glu Lys Gly Lys Ser Leu Leu Phe Lys Thr Glu Asp Gly
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Val Asn Met Cys Thr Leu Met Ala Met Asp Leu Gly Glu Leu Cys Glu
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Asp Thr Ile Thr Tyr Lys Cys Pro Leu Leu Arg Gln Asn Glu Pro Glu
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Asp Ile Asp Cys Trp Cys Asn Ser Thr Ser Thr Trp Val Thr Tyr Gly
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Thr Cys Thr Thr Met Gly Glu His Arg Arg Glu Lys Arg Ser Val Ala
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Leu Val Pro His Val Gly Met Gly Leu Glu Thr Arg Thr Glu Thr Trp
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Met Ser Ser Glu Gly Ala Trp Lys His Val Gln Arg Ile Glu Thr Trp
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Ile Leu Arg His Pro Gly Phe Thr Met Met Ala Ala Ile Leu Ala Tyr
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Thr Ile Gly Thr Thr His Phe Gln Arg Ala Leu Ile Phe Ile Leu Leu
260 265 270

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275 280 285

Arg Asp Phe Val Glu Gly Val Ser Gly Gly Ser Trp Val Asp Ile Val
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Leu Glu His Gly Ser Cys Val Thr Thr Met Ala Lys Asn Lys Pro Thr
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Leu Asp Phe Glu Leu Ile Lys Thr Glu Ala Lys Gln Pro Ala Thr Leu
325 330 335

Arg Lys Tyr Cys Ile Glu Ala Lys Leu Thr Asn Thr Thr Thr Glu Ser
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Arg Cys Pro Thr Gln Gly Glu Pro Ser Leu Asn Glu Glu Gln Asp Lys
355 360 365

Arg Phe Val Cys Lys His Ser Met Val Asp Arg Gly Trp Gly Asn Gly
370 375 380

Cys Gly Leu Phe Gly Lys Gly Gly Ile Val Thr Cys Ala Met Phe Arg
385 390 395 400

Cys Lys Lys Asn Met Glu Gly Lys Val Val Gln Pro Glu Asn Leu Glu
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Tyr Thr Ile Val Ile Thr Pro His Ser Gly Glu Glu His Ala Val Gly
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Asn Asp Thr Gly Lys His Gly Lys Glu Ile Lys Ile Thr Pro Gln Ser
435 440 445

Ser Ile Thr Glu Ala Glu Leu Thr Gly Tyr Gly Thr Val Thr Met Glu
450 455 460

Cys Ser Pro Arg Thr Gly Leu Asp Phe Asn Glu Met Val Leu Leu Gln
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Met Glu Asn Lys Ala Trp Leu Val His Arg Gln Trp Phe Leu Asp Leu
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Pro Leu Pro Trp Leu Pro Gly Ala Asp Thr Gln Gly Ser Asn Trp Ile
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Gln Lys Glu Thr Leu Val Thr Phe Lys Asn Pro His Ala Lys Lys Gln
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Asp Val Val Val Leu Gly Ser Gln Glu Gly Ala Met His Thr Ala Leu
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Gly His Leu Lys Cys Arg Leu Arg Met Asp Lys Leu Gln Leu Lys Gly
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Met Ser Tyr Ser Met Cys Thr Gly Lys Phe Lys Val Val Lys Glu Ile
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Ala Glu Thr Gln His Gly Thr Ile Val Ile Arg Val Gln Tyr Glu Gly
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Asp Gly Ser Pro Cys Lys Ile Pro Phe Glu Ile Met Asp Leu Glu Lys
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Arg His Val Leu Gly Arg Leu Ile Thr Val Asn Pro Ile Val Thr Glu
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Lys Asp Ser Pro Val Asn Ile Glu Ala Glu Pro Pro Phe Gly Asp Ser
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Tyr Ile Ile Ile Gly Val Glu Pro Gly Gln Leu Lys Leu Asn Trp Phe
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Lys Lys Gly Ser Ser Ile Gly Gln Met Phe Glu Thr Thr Met Arg Gly
675 680 685

Ala Lys Arg Met Ala Ile Leu Gly Asp Thr Ala Trp Asp Phe Gly Ser
690 695 700

Leu Gly Gly Val Phe Thr Ser Ile Gly Lys Ala Leu His Gln Val Phe
705 710 715 720

Gly Ala Ile Tyr Gly Ala Ala Phe Ser Gly Val Ser Trp Thr Met Lys
725 730 735

Ile Leu Ile Gly Val Ile Ile Thr Trp Ile Gly Met Asn Ser Arg Ser
740 745 750

Thr Ser Leu Ser Val Thr Leu Val Leu Val Gly Ile Val Thr Leu Tyr
755 760 765

Leu Gly Val Met Val Gln Ala Asp Ser Gly Cys Val Val Ser Trp Lys
770 775 780

Asn Lys Glu Leu Lys Cys Gly Ser Gly Ile Phe Ile Thr Asp Asn Val
785 790 795 800

His Thr Trp Thr Glu Gln Tyr Lys Phe Gln Pro Glu Ser Pro Ser Lys
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Leu Ala Ser Ala Ile Gln Lys Ala His Glu Glu Gly Ile Cys Gly Ile
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Arg Ser Val Thr Arg Leu Glu Asn Leu Met Trp Lys Gln Ile Thr Pro
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Glu Leu Asn His Ile Leu Ser Glu Asn Glu Val Lys Leu Thr Ile Met
850 855 860

Thr Gly Asp Ile Lys Gly Ile Met Gln Ala Gly Lys Arg Ser Leu Arg
865 870 875 880

Pro Gln Pro Thr Glu Leu Lys Tyr Ser Trp Lys Thr Trp Gly Lys Ala
885 890 895

Lys Met Leu Ser Thr Glu Ser His Asn Gln Thr Phe Leu Ile Asp Gly
900 905 910

Pro Glu Thr Ala Glu Cys Pro Asn Thr Asn Arg Ala Trp Asn Ser Leu
915 920 925

Glu Val Glu Asp Tyr Gly Phe Gly Val Phe Thr Thr Asn Ile Trp Leu
930 935 940

Lys Leu Lys Glu Lys Gln Asp Val Phe Cys Asp Ser Lys Leu Met Ser
945 950 955 960

Ala Ala Ile Lys Asp Asn Arg Ala Val His Ala Asp Met Gly Tyr Trp
965 970 975

Ile Glu Ser Ala Leu Asn Asp Thr Trp Lys Ile Glu Lys Ala Ser Phe
980 985 990

Ile Glu Val Lys Asn Cys His Trp Pro Lys Ser His Thr Leu Trp Ser
995 1000 1005

Asn Gly Val Leu Glu Ser Glu Met Ile Ile Pro Lys Asn Leu Ala
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Gly Pro Val Ser Gln His Asn Tyr Arg Pro Gly Tyr His Thr Gln
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Ile Thr Gly Pro Trp His Leu Gly Lys Leu Glu Met Asp Phe Asp
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Arg Gly Pro Ser Leu Arg Thr Thr Thr Ala Ser Gly Lys Leu Ile
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Arg Gly Glu Asp Gly Cys Trp Tyr Gly Met Glu Ile Arg Pro Leu
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Lys Glu Lys Glu Glu Asn Leu Val Asn Ser Leu Val Thr Ala Gly
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His Gly Gln Val Asp Asn Phe Ser Leu Gly Val Leu Gly Met Ala
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Leu Phe Leu Glu Glu Met Leu Arg Thr Arg Val Gly Thr Lys His
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Ala Ile Leu Leu Val Ala Val Ser Phe Val Thr Leu Ile Thr Gly
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Asn Met Ser Phe Arg Asp Leu Gly Arg Val Met Val Met Val Gly
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Ala Thr Met Thr Asp Asp Ile Gly Met Gly Val Thr Tyr Leu Ala
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Leu Leu Ala Ala Phe Lys Val Arg Pro Thr Phe Ala Ala Gly Leu
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Leu Leu Arg Lys Leu Thr Ser Lys Glu Leu Met Met Thr Thr Ile
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Gly Ile Val Leu Leu Ser Gln Ser Thr Ile Pro Glu Thr Ile Leu
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Glu Leu Thr Asp Ala Leu Ala Leu Gly Met Met Val Leu Lys Met
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Val Arg Asn Met Glu Lys Tyr Gln Leu Ala Val Thr Ile Met Ala
1265 1270 1275

Ile Leu Cys Val Pro Asn Ala Val Ile Leu Gln Asn Ala Trp Lys
1280 1285 1290

Val Ser Cys Thr Ile Leu Ala Val Val Ser Val Ser Pro Leu Leu
1295 1300 1305

Leu Thr Ser Ser Gln Gln Lys Thr Asp Trp Ile Pro Leu Ala Leu
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Thr Ile Lys Gly Leu Asn Pro Thr Ala Ile Phe Leu Thr Thr Leu
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Ser Arg Thr Ser Lys Lys Arg Ser Trp Pro Leu Asn Glu Ala Ile
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Met Ala Val Gly Met Val Ser Ile Leu Ala Ser Ser Leu Leu Lys
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Asn Asp Ile Pro Met Thr Gly Pro Leu Val Ala Gly Gly Leu Leu
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Thr Val Cys Tyr Val Leu Thr Gly Arg Ser Ala Asp Leu Glu Leu
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Glu Arg Ala Ala Asp Val Lys Trp Glu Asp Gln Ala Glu Ile Ser
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Gly Ser Ser Pro Ile Leu Ser Ile Thr Ile Ser Glu Asp Gly Ser
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Met Ser Ile Lys Asn Glu Glu Glu Glu Gln Thr Leu Thr Ile Leu
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Ile Arg Thr Gly Leu Leu Val Ile Ser Gly Leu Phe Pro Val Ser
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Ile Pro Ile Thr Ala Ala Ala Trp Tyr Leu Trp Glu Val Lys Lys
1460 1465 1470

Gln Arg Ala Gly Val Leu Trp Asp Val Pro Ser Pro Pro Pro Met
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Gly Lys Ala Glu Leu Glu Asp Gly Ala Tyr Arg Ile Lys Gln Lys
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Gly Ile Leu Gly Tyr Ser Gln Ile Gly Ala Gly Val Tyr Lys Glu
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Gly Thr Phe His Thr Met Trp His Val Thr Arg Gly Ala Val Leu
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Met His Lys Gly Lys Arg Ile Glu Pro Ser Trp Ala Asp Val Lys
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Lys Asp Leu Ile Ser Tyr Gly Gly Gly Trp Lys Leu Glu Gly Glu
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Trp Lys Glu Gly Glu Glu Val Gln Val Leu Ala Leu Glu Pro Gly
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Lys Asn Pro Arg Ala Val Gln Thr Lys Pro Gly Leu Phe Lys Thr
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Asn Ala Gly Thr Ile Gly Ala Val Ser Leu Asp Phe Ser Pro Gly
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Thr Ser Gly Ser Pro Ile Ile Asp Lys Lys Gly Lys Val Val Gly
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Leu Tyr Gly Asn Gly Val Val Thr Arg Ser Gly Ala Tyr Val Ser
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Ala Ile Ala Gln Thr Glu Lys Ser Ile Glu Asp Asn Pro Glu Ile
1640 1645 1650

Glu Asp Asp Ile Phe Arg Lys Arg Arg Leu Thr Ile Met Asp Leu
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His Pro Gly Ala Gly Lys Thr Lys Arg Tyr Leu Pro Ala Ile Val
1670 1675 1680

Arg Glu Ala Ile Lys Arg Gly Leu Arg Thr Leu Ile Leu Ala Pro
1685 1690 1695

Thr Arg Val Val Ala Ala Glu Met Glu Glu Ala Leu Arg Gly Leu
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Pro Ile Arg Tyr Gln Thr Pro Ala Ile Arg Ala Glu His Thr Gly
1715 1720 1725

Arg Glu Ile Val Asp Leu Met Cys His Ala Thr Phe Thr Met Arg
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Leu Leu Ser Pro Val Arg Val Pro Asn Tyr Asn Leu Ile Ile Met
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Asp Glu Ala His Phe Thr Asp Pro Ala Ser Ile Ala Ala Arg Gly
1760 1765 1770

Tyr Ile Ser Thr Arg Val Glu Met Gly Glu Ala Ala Gly Ile Phe
1775 1780 1785

Met Thr Ala Thr Pro Pro Gly Ser Arg Asp Pro Phe Pro Gln Ser
1790 1795 1800

Asn Ala Pro Ile Ile Asp Glu Glu Arg Glu Ile Pro Glu Arg Ser
1805 1810 1815

Trp Asn Ser Gly His Glu Trp Val Thr Asp Phe Lys Gly Lys Thr
1820 1825 1830

Val Trp Phe Val Pro Ser Ile Lys Ala Gly Asn Asp Ile Ala Ala
1835 1840 1845

Cys Leu Arg Lys Asn Gly Lys Lys Val Ile Gln Leu Ser Arg Lys
1850 1855 1860

Thr Phe Asp Ser Glu Tyr Val Lys Thr Arg Thr Asn Asp Trp Asp
1865 1870 1875

Phe Val Val Thr Thr Asp Ile Ser Glu Met Gly Ala Asn Phe Lys
1880 1885 1890

Ala Glu Arg Val Ile Asp Pro Arg Arg Cys Met Lys Pro Val Ile
1895 1900 1905

Leu Thr Asp Gly Glu Glu Arg Val Ile Leu Ala Gly Pro Met Pro
1910 1915 1920

Val Thr His Ser Ser Ala Ala Gln Arg Arg Gly Arg Ile Gly Arg
1925 1930 1935

Asn Pro Lys Asn Glu Asn Asp Gln Tyr Ile Tyr Met Gly Glu Pro
1940 1945 1950

Leu Glu Asn Asp Glu Asp Cys Ala His Trp Lys Glu Ala Lys Met
1955 1960 1965

Leu Leu Asp Asn Ile Asn Thr Pro Glu Gly Ile Ile Pro Ser Met
1970 1975 1980

Phe Glu Pro Glu Arg Glu Lys Val Asp Ala Ile Asp Gly Glu Tyr
1985 1990 1995

Arg Leu Arg Gly Glu Ala Arg Lys Thr Phe Val Asp Leu Met Arg
2000 2005 2010

Arg Gly Asp Leu Pro Val Trp Leu Ala Tyr Arg Val Ala Ala Glu
2015 2020 2025

Gly Ile Asn Tyr Ala Asp Arg Arg Trp Cys Phe Asp Gly Val Lys
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Asn Asn Gln Ile Leu Glu Glu Asn Val Glu Val Glu Ile Trp Thr
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Lys Glu Gly Glu Arg Lys Lys Leu Lys Pro Arg Trp Leu Asp Ala
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Arg Ile Tyr Ser Asp Pro Leu Ala Leu Lys Glu Phe Lys Glu Phe
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Ala Ala Gly Arg Lys Ser Leu Thr Leu Asn Leu Ile Thr Glu Met
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Gly Arg Leu Pro Thr Phe Met Thr Gln Lys Ala Arg Asp Ala Leu
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Tyr Asn His Ala Leu Ser Glu Leu Pro Glu Thr Leu Glu Thr Leu
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Leu Leu Leu Thr Leu Leu Ala Thr Val Thr Gly Gly Ile Phe Leu
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Phe Leu Met Ser Gly Arg Gly Ile Gly Lys Met Thr Leu Gly Met
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Cys Cys Ile Ile Thr Ala Ser Ile Leu Leu Trp Tyr Ala Gln Ile
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Tyr Ala Val Ala Thr Thr Phe Val Thr Pro Met Leu Arg His Ser
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Lys Met Asp Ile Gly Val Pro Leu Leu Ala Ile Gly Cys Tyr Ser
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Gln Val Asn Pro Ile Thr Leu Thr Ala Ala Leu Phe Leu Leu Val
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Cys Glu Ala Leu Thr Leu Ala Thr Gly Pro Ile Ser Thr Leu Trp
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Glu Gly Asn Pro Gly Arg Phe Trp Asn Thr Thr Ile Ala Val Ser
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Leu Phe Ser Ile Met Lys Asn Thr Thr Asn Thr Arg Arg Gly Thr
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Gly Glu Thr Asp His His Ala Val Ser Arg Gly Ser Ala Lys Leu
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Val Glu Asn Trp Leu Asn Asn Asn Thr Gln Phe Cys Ile Lys Val
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Leu Asn Pro Tyr Met Pro Ser Val Ile Glu Lys Met Glu Ala Leu
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Gln Arg Lys Tyr Gly Gly Ala Leu Val Arg Asn Pro Leu Ser Arg
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Ile Val Ser Ser Val Asn Met Ile Ser Arg Met Leu Ile Asn Arg
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Phe Thr Met Arg Tyr Lys Lys Ala Thr Tyr Glu Pro Asp Val Asp
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Asn Leu Asp Ile Ile Gly Lys Arg Ile Glu Lys Ile Lys Gln Glu
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His Glu Thr Ser Trp His Tyr Asp Gln Asp His Pro Tyr Lys Thr
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Trp Ala Tyr His Gly Ser Tyr Glu Thr Lys Gln Thr Gly Ser Ala
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2990 2995 3000

His Lys Leu Gly Tyr Ile Leu Arg Asp Val Ser Lys Lys Glu Gly
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Glu Gly Glu His Lys Lys Leu Ala Glu Ala Ile Phe Lys Leu Thr
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Tyr Gln Asn Lys Val Val Arg Val Gln Arg Pro Thr Pro Arg Gly
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Cys Leu Gly Lys Ser Tyr Ala Gln Met Trp Ser Leu Met Tyr Phe
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Val Pro Ser His Trp Val Pro Thr Ser Arg Thr Thr Trp Ser Ile
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His Ala Lys His Glu Trp Met Thr Thr Glu Asp Met Leu Thr Val
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Trp Asn Arg Val Trp Ile Gln Glu Asn Pro Trp Met Glu Asp Lys
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Thr Pro Val Glu Ser Trp Glu Glu Ile Pro Tyr Leu Gly Lys Arg
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Glu Asp Gln Trp Cys Gly Ser Leu Ile Gly Leu Thr Ser Arg Ala
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Thr Trp Ala Lys Asn Ile Gln Ala Ala Ile Asn Gln Val Arg Ser
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Val Leu Glu Ser Asp Met Ile Ile Pro Lys Ser Leu Ala Gly Pro
1010 1015 1020

Ile Ser Gln His Asn His Arg Pro Gly Tyr His Thr Gln Thr Ala
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Gly Pro Trp His Leu Gly Lys Leu Glu Leu Asp Phe Asn Tyr Cys
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Glu Gly Thr Thr Val Val Ile Ser Glu Asn Cys Gly Thr Arg Gly
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Pro Ser Leu Arg Thr Thr Thr Val Ser Gly Lys Leu Ile His Glu
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Trp Cys Cys Arg Ser Cys Thr Leu Pro Pro Leu Arg Tyr Met Gly
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Glu Asp Gly Cys Trp Tyr Gly Met Glu Ile Arg Pro Ile Asn Glu
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Lys Glu Glu Asn Met Val Lys Ser Leu Ala Ser Ala Gly Ser Gly
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Lys Val Asp Asn Phe Thr Met Gly Val Leu Cys Leu Ala Ile Leu
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Phe Glu Glu Val Met Arg Gly Lys Phe Gly Lys Lys His Met Ile
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Ala Gly Val Leu Phe Thr Phe Val Leu Leu Leu Ser Gly Gln Ile
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Ala Ser Asp Arg Met Gly Met Gly Val Thr Tyr Leu Ala Leu Ile
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Ala Thr Phe Lys Ile Gln Pro Phe Leu Ala Leu Gly Phe Phe Leu
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Arg Lys Leu Thr Ser Arg Glu Asn Leu Leu Leu Gly Val Gly Leu
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Gln Phe Glu Thr Tyr Gln Leu Trp Thr Ala Leu Val Ser Leu Thr
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Cys Ser Asn Thr Ile Phe Thr Leu Thr Val Ala Trp Arg Thr Ala
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Ser Ser Met Arg Lys Thr Asp Trp Leu Pro Met Thr Val Ala Ala
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Met Gly Ala Gln Pro Leu Pro Leu Phe Ile Phe Ser Leu Lys Asp
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Thr Leu Lys Arg Arg Ser Trp Pro Leu Asn Glu Gly Val Met Ala
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Val Gly Leu Val Ser Ile Leu Ala Ser Ser Leu Leu Arg Asn Asp
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Val Pro Met Ala Gly Pro Leu Val Ala Gly Gly Leu Leu Ile Ala
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Cys Tyr Val Ile Thr Gly Thr Ser Ala Asp Leu Thr Val Glu Lys
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Ala Ala Asp Val Thr Trp Glu Glu Glu Ala Glu Gln Thr Gly Val
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Ser His Asn Leu Met Val Thr Val Asp Asp Asp Gly Thr Met Arg
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Ile Lys Asp Asp Glu Thr Glu Asn Ile Leu Thr Val Leu Leu Lys
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Thr Ala Leu Leu Ile Val Ser Gly Ile Phe Pro Tyr Ser Ile Pro
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Ser Gly Val Leu Trp Asp Val Pro Ser Pro Pro Glu Thr Gln Lys
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Leu Ile Ser Tyr Gly Gly Gly Trp Arg Leu Ser Ala Gln Trp Gln
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Leu Ser Pro Val Arg Val Pro Asn Tyr Asn Leu Ile Ile Met Asp
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Glu Ala His Phe Thr Asp Pro Ala Ser Ile Ala Ala Arg Gly Tyr
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Ile Ser Thr Arg Val Gly Met Gly Glu Ala Ala Ala Ile Phe Met
1775 1780 1785

Thr Ala Thr Pro Pro Gly Thr Ala Asp Ala Phe Pro Gln Ser Asn
1790 1795 1800

Ala Pro Ile Gln Asp Glu Glu Arg Asp Ile Pro Glu Arg Ser Trp
1805 1810 1815

Asn Ser Gly Asn Glu Trp Ile Thr Asp Phe Val Gly Lys Thr Val
1820 1825 1830

Trp Phe Val Pro Ser Ile Lys Ala Gly Asn Asp Ile Ala Asn Cys
1835 1840 1845

Leu Arg Lys Asn Gly Lys Lys Val Ile Gln Leu Ser Arg Lys Thr
1850 1855 1860

Phe Asp Thr Glu Tyr Gln Lys Thr Lys Leu Asn Asp Trp Asp Phe
1865 1870 1875

Val Val Thr Thr Asp Ile Ser Glu Met Gly Ala Asn Phe Lys Ala
1880 1885 1890

Asp Arg Val Ile Asp Pro Arg Arg Cys Leu Lys Pro Val Ile Leu
1895 1900 1905

Thr Asp Gly Pro Glu Arg Val Ile Leu Ala Gly Pro Met Pro Val
1910 1915 1920

Thr Val Ala Ser Ala Ala Gln Arg Arg Gly Arg Val Gly Arg Asn
1925 1930 1935

Pro Gln Lys Glu Asn Asp Gln Tyr Ile Phe Met Gly Gln Pro Leu
1940 1945 1950

Asn Asn Asp Glu Asp His Ala His Trp Thr Glu Ala Lys Met Leu
1955 1960 1965

Leu Asp Asn Ile Asn Thr Pro Glu Gly Ile Ile Pro Ala Leu Phe
1970 1975 1980

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 <211> 3387
 <212> PRT
 <213> dengue virus

<400> 16

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

Ser Thr Gly Leu Phe Ser Gly Lys Gly Pro Leu Arg Met Val Leu Ala
35 40 45

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

Leu Lys Arg Trp Gly Gln Leu Lys Lys Asn Lys Ala Ile Arg Ile Leu
65 70 75 80

Ile Gly Phe Arg Lys Glu Ile Gly Arg Met Leu Asn Ile Leu Asn Gly
85 90 95

Arg Lys Arg Ser Thr Ile Thr Leu Leu Cys Leu Ile Pro Thr Val Met
100 105 110

Ala Phe His Leu Ser Thr Arg Asp Gly Glu Pro Leu Met Ile Val Ala
115 120 125

Lys His Glu Arg Gly Arg Pro Leu Leu Phe Lys Thr Thr Glu Gly Ile
130 135 140

Asn Lys Cys Thr Leu Ile Ala Met Asp Leu Gly Glu Met Cys Glu Asp
145 150 155 160

Thr Val Thr Tyr Lys Cys Pro Leu Leu Val Asn Thr Glu Pro Glu Asp
165 170 175

Ile Asp Cys Trp Cys Asn Leu Thr Ser Thr Trp Val Met Tyr Gly Thr
180 185 190

Cys Thr Gln Ser Gly Glu Arg Arg Arg Glu Lys Arg Ser Val Ala Leu
195 200 205

Thr Pro His Ser Gly Met Gly Leu Glu Thr Arg Ala Glu Thr Trp Met
210 215 220

Ser Ser Glu Gly Ala Trp Lys His Ala Gln Arg Val Glu Ser Trp Ile
225 230 235 240

Leu Arg Asn Pro Gly Phe Ala Leu Leu Ala Gly Phe Met Ala Tyr Met
245 250 255

Ile Gly Gln Thr Gly Ile Gln Arg Thr Val Phe Phe Val Leu Met Met
260 265 270

Leu Val Ala Pro Ser Tyr Gly Met Arg Cys Val Gly Val Gly Asn Arg
275 280 285

Asp Phe Val Glu Gly Val Ser Gly Gly Ala Trp Val Asp Leu Val Leu
290 295 300

Glu His Gly Gly Cys Val Thr Thr Met Ala Gln Gly Lys Pro Thr Leu
305 310 315 320

Asp Phe Glu Leu Thr Lys Thr Thr Ala Lys Glu Val Ala Leu Leu Arg
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Thr Tyr Cys Ile Glu Ala Ser Ile Ser Asn Ile Thr Thr Ala Thr Arg
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Cys Pro Thr Gln Gly Glu Pro Tyr Leu Lys Glu Glu Gln Asp Gln Gln
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Tyr Ile Cys Arg Arg Asp Val Val Asp Arg Gly Trp Gly Asn Gly Cys
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Gly Leu Phe Gly Lys Gly Gly Val Val Thr Cys Ala Lys Phe Ser Cys
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Ser Gly Lys Ile Thr Gly Asn Leu Val Gln Ile Glu Asn Leu Glu Tyr
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Thr Val Val Val Thr Val His Asn Gly Asp Thr His Ala Val Gly Asn
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Asp Thr Ser Asn His Gly Val Thr Ala Thr Ile Thr Pro Arg Ser Pro
435 440 445

Ser Val Glu Val Lys Leu Pro Asp Tyr Gly Glu Leu Thr Leu Asp Cys
450 455 460

Glu Pro Arg Ser Gly Ile Asp Phe Asn Glu Met Ile Leu Met Lys Met
465 470 475 480

Lys Lys Lys Thr Trp Leu Val His Lys Gln Trp Phe Leu Asp Leu Pro
485 490 495

Leu Pro Trp Thr Ala Gly Ala Asp Thr Ser Glu Val His Trp Asn Tyr
500 505 510

Lys Glu Arg Met Val Thr Phe Lys Val Pro His Ala Lys Arg Gln Asp
515 520 525

Val Thr Val Leu Gly Ser Gln Glu Gly Ala Met His Ser Ala Leu Ala
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Gly Ala Thr Glu Val Asp Ser Gly Asp Gly Asn His Met Phe Ala Gly
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His Leu Lys Cys Lys Val Arg Met Glu Lys Leu Arg Ile Lys Gly Met
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Ser Tyr Thr Met Cys Ser Gly Lys Phe Ser Ile Asp Lys Glu Met Ala
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Glu Thr Gln His Gly Thr Thr Val Val Lys Val Lys Tyr Glu Gly Ala
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Gly Ala Pro Cys Lys Val Pro Ile Glu Ile Arg Asp Val Asn Lys Glu
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Lys Val Val Gly Arg Ile Ile Ser Ser Thr Pro Leu Ala Glu Asn Thr
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Asn Ser Ala Thr Asn Ile Glu Leu Glu Pro Pro Phe Gly Asp Ser Tyr
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Ile Val Ile Gly Val Gly Asn Ser Ala Leu Thr Leu His Trp Phe Arg
660 665 670

Lys Gly Ser Ser Ile Gly Lys Met Phe Glu Ser Thr Tyr Arg Gly Ala
675 680 685

Lys Arg Met Ala Ile Leu Gly Glu Thr Ala Trp Asp Phe Gly Ser Val
690 695 700

Gly Gly Leu Phe Thr Ser Leu Gly Lys Ala Val His Gln Val Phe Gly
705 710 715 720

Ser Val Tyr Thr Thr Met Phe Gly Gly Val Ser Trp Met Ile Arg Ile
725 730 735

Leu Ile Gly Phe Leu Val Leu Trp Ile Gly Thr Asn Ser Arg Asn Thr
740 745 750

Ser Met Ala Met Thr Cys Ile Ala Val Gly Gly Ile Thr Leu Phe Leu
755 760 765

Gly Phe Thr Val Gln Ala Asp Met Gly Cys Val Val Ser Trp Ser Gly
770 775 780

Lys Glu Leu Lys Cys Gly Ser Gly Ile Phe Val Val Asp Asn Val His
785 790 795 800

Thr Trp Thr Glu Gln Tyr Lys Phe Gln Pro Glu Ser Pro Ala Arg Leu
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Ala Ser Ala Ile Leu Asn Ala His Lys Asp Gly Val Cys Gly Ile Arg
820 825 830

Ser Thr Thr Arg Leu Glu Asn Val Met Trp Lys Gln Ile Thr Asn Glu
835 840 845

Leu Asn Tyr Val Leu Trp Glu Gly Gly His Asp Leu Thr Val Val Ala
850 855 860

Gly Asp Val Lys Gly Val Leu Thr Lys Gly Lys Arg Ala Leu Thr Pro
865 870 875 880

Pro Val Asn Asp Leu Lys Tyr Ser Trp Lys Thr Trp Gly Lys Ala Lys
885 890 895

Ile Phe Thr Pro Glu Ala Arg Asn Ser Thr Phe Leu Ile Asp Gly Pro
900 905 910

Asp Thr Ser Glu Cys Pro Asn Glu Arg Arg Ala Trp Asn Phe Leu Glu
915 920 925

Val Glu Asp Tyr Gly Phe Gly Met Phe Thr Thr Asn Ile Trp Met Lys
930 935 940

Phe Arg Glu Gly Ser Ser Glu Val Cys Asp His Arg Leu Met Ser Ala
945 950 955 960

Ala Ile Lys Asp Gln Lys Ala Val His Ala Asp Met Gly Tyr Trp Ile
965 970 975

Glu Ser Ser Lys Asn Gln Thr Trp Gln Ile Glu Lys Ala Ser Leu Ile
980 985 990

Glu Val Lys Thr Cys Leu Trp Pro Lys Thr His Thr Leu Trp Ser Asn
995 1000 1005

Gly Val Leu Glu Ser Gln Met Leu Ile Pro Lys Ser Tyr Ala Gly
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Pro Phe Ser Gln His Asn Tyr Arg Gln Gly Tyr Ala Thr Gln Thr
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Val Gly Pro Trp His Leu Gly Lys Leu Glu Ile Asp Phe Gly Glu
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Cys Pro Gly Thr Thr Val Ala Ile Gln Glu Asp Cys Asp His Arg
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Gly Pro Ser Leu Arg Thr Thr Thr Ala Ser Gly Lys Leu Val Thr
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Gln Trp Cys Cys Arg Ser Cys Thr Met Pro Pro Leu Arg Phe Leu
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Gly Glu Asp Gly Cys Trp Tyr Gly Met Glu Ile Arg Pro Leu Ser
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Glu Lys Glu Glu Asn Met Val Lys Ser Gln Val Thr Ala Gly Gln
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Gly Thr Ser Glu Thr Phe Ser Met Gly Leu Leu Cys Leu Thr Leu
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Ala Val Phe Lys Met Ser Pro Gly Tyr Val Leu Gly Val Phe Leu
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His Phe Asp Asn Thr Gln Val Gly Thr Leu Ala Leu Ser Leu Thr
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Met Ala Val Leu Phe Val Val Thr Leu Ile Pro Leu Cys Arg Thr
1295 1300 1305

Ser	Cys	Leu	Gln	Lys	Gln	Ser	His	Trp	Val	Glu	Ile	Thr	Ala	Leu
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Lys	Gly	Ala	Ser	Arg	Arg	Ser	Trp	Pro	Leu	Asn	Glu	Gly	Ile	Met
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Ala	Val	Gly	Leu	Val	Ser	Leu	Leu	Gly	Ser	Ala	Leu	Leu	Lys	Asn
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1370						1375					1380			
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Ser	Ser	Pro	Ile	Ile	Glu	Val	Lys	Gln	Asp	Glu	Asp	Gly	Ser	Phe
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Pro	Val	Thr	Met	Thr	Leu	Trp	Tyr	Met	Trp	Gln	Val	Lys	Thr	Gln
1460						1465					1470			
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Lys	Ala	Ala	Leu	Ser	Glu	Gly	Val	Tyr	Arg	Ile	Met	Gln	Arg	Gly
1490						1495					1500			
Leu	Phe	Gly	Lys	Thr	Gln	Val	Gly	Val	Gly	Ile	His	Met	Glu	Gly
1505						1510					1515			

Val	Phe	His	Thr	Met	Trp	His	Val	Thr	Arg	Gly	Ser	Val	Ile	Cys
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His	Glu	Thr	Gly	Arg	Leu	Glu	Pro	Ser	Trp	Ala	Asp	Val	Arg	Asn
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1550						1555					1560			
Asp	Lys	Glu	Glu	Asp	Val	Gln	Val	Leu	Ala	Ile	Glu	Pro	Gly	Lys
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Glu Ala His Phe Thr Asp Pro Ser Ser Val Ala Ala Arg Gly Tyr
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1790 1795 1800

Ser Pro Ile Glu Asp Ile Glu Arg Glu Ile Pro Glu Arg Ser Trp
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Asn Thr Gly Phe Asp Trp Ile Thr Asp Tyr Gln Gly Lys Thr Val
1820 1825 1830

Trp Phe Val Pro Ser Ile Lys Ala Gly Asn Asp Ile Ala Asn Cys
1835 1840 1845

Leu Arg Lys Ser Gly Lys Lys Val Ile Gln Leu Ser Arg Lys Thr
1850 1855 1860

Phe Asp Thr Glu Tyr Pro Lys Thr Lys Leu Thr Asp Trp Asp Phe
1865 1870 1875

Val Val Thr Thr Asp Ile Ser Glu Met Gly Ala Asn Phe Arg Ala
1880 1885 1890

Gly Arg Val Ile Asp Pro Arg Arg Cys Leu Lys Pro Val Ile Leu
1895 1900 1905

Thr Asp Gly Pro Glu Arg Val Ile Leu Ala Gly Pro Ile Pro Val
1910 1915 1920

Thr Pro Ala Ser Ala Ala Gln Arg Arg Gly Arg Ile Gly Arg Asn
1925 1930 1935

Pro Ala Gln Glu Asp Asp Gln Tyr Val Phe Ser Gly Asp Pro Leu
1940 1945 1950

Lys Asn Asp Glu Asp His Ala His Trp Thr Glu Ala Lys Met Leu
1955 1960 1965

Leu Asp Asn Ile Tyr Thr Pro Glu Gly Ile Ile Pro Thr Leu Phe
1970 1975 1980

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1985 1990 1995

Leu Arg Gly Glu Gln Arg Lys Thr Phe Val Glu Leu Met Arg Arg
2000 2005 2010

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Val Tyr Ala Asp Pro Met Ala Leu Lys Asp Phe Lys Glu Phe Ala
2075 2080 2085

Ser Gly Arg Lys Ser Ile Thr Leu Asp Ile Leu Thr Glu Ile Ala
2090 2095 2100

Ser Leu Pro Thr Tyr Leu Ser Ser Arg Ala Lys Leu Ala Leu Asp
2105 2110 2115

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Leu	Val	Ala	Leu	Leu	Gly	Ala	Met	Thr	Ala	Gly	Ile	Phe	Leu	Phe
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Phe	Met	Gln	Gly	Lys	Gly	Ile	Gly	Lys	Leu	Ser	Met	Gly	Leu	Ile
2165						2170					2175			
Thr	Ile	Ala	Val	Ala	Ser	Gly	Leu	Leu	Trp	Val	Ala	Glu	Ile	Gln
2180						2185					2190			
Pro	Gln	Trp	Ile	Ala	Ala	Ser	Ile	Ile	Leu	Glu	Phe	Phe	Leu	Met
2195						2200					2205			
Val	Leu	Leu	Ile	Pro	Glu	Pro	Glu	Lys	Gln	Arg	Thr	Pro	Gln	Asp
2210						2215					2220			
Asn	Gln	Leu	Ile	Tyr	Val	Ile	Leu	Thr	Ile	Leu	Thr	Ile	Ile	Gly
2225						2230					2235			
Leu	Ile	Ala	Ala	Asn	Glu	Met	Gly	Leu	Ile	Glu	Lys	Thr	Lys	Thr
2240						2245					2250			
Asp	Phe	Gly	Phe	Tyr	Gln	Val	Lys	Thr	Glu	Thr	Thr	Ile	Leu	Asp
2255						2260					2265			
Val	Asp	Leu	Arg	Pro	Ala	Ser	Ala	Trp	Thr	Leu	Tyr	Ala	Val	Ala
2270						2275					2280			
Thr	Thr	Ile	Leu	Thr	Pro	Met	Leu	Arg	His	Thr	Ile	Glu	Asn	Thr
2285						2290					2295			
Ser	Ala	Asn	Leu	Ser	Leu	Ala	Ala	Ile	Ala	Asn	Gln	Ala	Ala	Val
2300						2305					2310			
Leu	Met	Gly	Leu	Gly	Lys	Gly	Trp	Pro	Leu	His	Arg	Met	Asp	Leu
2315						2320					2325			

Gly Val Pro Leu Leu Ala Met Gly Cys Tyr Ser Gln Val Asn Pro
2330 2335 2340

Thr Thr Leu Thr Ala Ser Leu Val Met Leu Leu Val His Tyr Ala
2345 2350 2355

Ile Ile Gly Pro Gly Leu Gln Ala Lys Ala Thr Arg Glu Ala Gln
2360 2365 2370

Lys Arg Thr Ala Ala Gly Ile Met Lys Asn Pro Thr Val Asp Gly
2375 2380 2385

Ile Thr Val Ile Asp Leu Glu Pro Ile Ser Tyr Asp Pro Lys Phe
2390 2395 2400

Glu Lys Gln Leu Gly Gln Val Met Leu Leu Val Leu Cys Ala Gly
2405 2410 2415

Gln Leu Leu Leu Met Arg Thr Thr Trp Ala Phe Cys Glu Val Leu
2420 2425 2430

Thr Leu Ala Thr Gly Pro Ile Leu Thr Leu Trp Glu Gly Asn Pro
2435 2440 2445

Gly Arg Phe Trp Asn Thr Thr Ile Ala Val Ser Thr Ala Asn Ile
2450 2455 2460

Phe Arg Gly Ser Tyr Leu Ala Gly Ala Gly Leu Ala Phe Ser Leu
2465 2470 2475

Ile Lys Asn Val Gln Thr Pro Arg Arg Gly Thr Gly Thr Thr Gly
2480 2485 2490

Glu Thr Leu Gly Glu Lys Trp Lys Arg Gln Leu Asn Ser Leu Asp
2495 2500 2505

Arg Lys Glu Phe Glu Glu Tyr Lys Arg Ser Gly Ile Leu Glu Val
2510 2515 2520

Asp Arg Thr Glu Ala Lys Ser Ala Leu Lys Asp Gly Ser Lys Ile
2525 2530 2535

Lys His Ala Val Ser Arg Gly Ser Ser Lys Ile Arg Trp Ile Val
2540 2545 2550

Glu Arg Gly Met Val Lys Pro Lys Gly Lys Val Val Asp Leu Gly
2555 2560 2565

Cys Gly Arg Gly Gly Trp Ser Tyr Tyr Met Ala Thr Leu Lys Asn
2570 2575 2580

Val Thr Glu Val Lys Gly Tyr Thr Lys Gly Gly Pro Gly His Glu
2585 2590 2595

Glu Pro Ile Pro Met Ala Thr Tyr Gly Trp Asn Leu Val Lys Leu
2600 2605 2610

His Ser Gly Val Asp Val Phe Tyr Lys Pro Thr Glu Gln Val Asp
2615 2620 2625

Thr Leu Leu Cys Asp Ile Gly Glu Ser Ser Ser Asn Pro Thr Ile
2630 2635 2640

Glu Glu Gly Arg Thr Leu Arg Val Leu Lys Met Val Glu Pro Trp
2645 2650 2655

Leu Ser Ser Lys Pro Glu Phe Cys Ile Lys Val Leu Asn Pro Tyr
2660 2665 2670

Met Pro Thr Val Ile Glu Glu Leu Glu Lys Leu Gln Arg Lys His
2675 2680 2685

Gly Gly Asn Leu Val Arg Cys Pro Leu Ser Arg Asn Ser Thr His
2690 2695 2700

Glu Met Tyr Trp Val Ser Gly Ala Ser Gly Asn Ile Val Ser Ser
2705 2710 2715

Val Asn Thr Thr Ser Lys Met Leu Leu Asn Arg Phe Thr Thr Arg
2720 2725 2730

His Arg Lys Pro Thr Tyr Glu Lys Asp Val Asp Leu Gly Ala Gly
2735 2740 2745

Thr Arg Ser Val Ser Thr Glu Thr Glu Lys Pro Asp Met Thr Ile
2750 2755 2760

Ile Gly Arg Arg Leu Gln Arg Leu Gln Glu Glu His Lys Glu Thr
2765 2770 2775

Trp His Tyr Asp Gln Glu Asn Pro Tyr Arg Thr Trp Ala Tyr His
2780 2785 2790

Gly Ser Tyr Glu Ala Pro Ser Thr Gly Ser Ala Ser Ser Met Val
2795 2800 2805

Asn Gly Val Val Lys Leu Leu Thr Lys Pro Trp Asp Val Val Pro
2810 2815 2820

Met Val Thr Gln Leu Ala Met Thr Asp Thr Thr Pro Phe Gly Gln
2825 2830 2835

Gln Arg Val Phe Lys Glu Lys Val Asp Thr Arg Thr Pro Gln Pro
2840 2845 2850

Lys Pro Gly Thr Arg Met Val Met Thr Thr Thr Ala Asn Trp Leu
2855 2860 2865

Trp Ala Leu Leu Gly Lys Lys Lys Asn Pro Arg Leu Cys Thr Arg
2870 2875 2880

Glu Glu Phe Ile Ser Lys Val Arg Ser Asn Ala Ala Ile Gly Ala
2885 2890 2895

Val Phe Gln Glu Glu Gln Gly Trp Thr Ser Ala Ser Glu Ala Val
2900 2905 2910

Asn Asp Ser Arg Phe Trp Glu Leu Val Asp Lys Glu Arg Ala Leu
2915 2920 2925

His Gln Glu Gly Lys Cys Glu Ser Cys Val Tyr Asn Met Met Gly
2930 2935 2940

Lys Arg Glu Lys Lys Leu Gly Glu Phe Gly Arg Ala Lys Gly Ser
2945 2950 2955

Arg Ala Ile Trp Tyr Met Trp Leu Gly Ala Arg Phe Leu Glu Phe
2960 2965 2970

Glu Ala Leu Gly Phe Leu Asn Glu Asp His Trp Phe Gly Arg Glu
2975 2980 2985

Asn Ser Trp Ser Gly Val Glu Gly Glu Gly Leu His Arg Leu Gly
2990 2995 3000

Tyr Ile Leu Glu Glu Ile Asp Lys Lys Asp Gly Asp Leu Met Tyr
3005 3010 3015

Ala Asp Asp Thr Ala Gly Trp Asp Thr Arg Ile Thr Glu Asp Asp
3020 3025 3030

Leu Gln Asn Glu Glu Leu Ile Thr Glu Gln Met Ala Pro His His
3035 3040 3045

Lys Ile Leu Ala Lys Ala Ile Phe Lys Leu Thr Tyr Gln Asn Lys
3050 3055 3060

Val Val Lys Val Leu Arg Pro Thr Pro Arg Gly Ala Val Met Asp
3065 3070 3075

Ile Ile Ser Arg Lys Asp Gln Arg Gly Ser Gly Gln Val Gly Thr
3080 3085 3090

Tyr Gly Leu Asn Thr Phe Thr Asn Met Glu Val Gln Leu Ile Arg
3095 3100 3105

Gln Met Glu Ala Glu Gly Val Ile Thr Gln Asp Asp Met Gln Asn
3110 3115 3120

Pro Lys Gly Leu Lys Glu Arg Val Glu Lys Trp Leu Lys Glu Cys
3125 3130 3135

Gly Val Asp Arg Leu Lys Arg Met Ala Ile Ser Gly Asp Asp Cys
3140 3145 3150

Val Val Lys Pro Leu Asp Glu Arg Phe Gly Thr Ser Leu Leu Phe
3155 3160 3165

Leu Asn Asp Met Gly Lys Val Arg Lys Asp Ile Pro Gln Trp Glu
3170 3175 3180

Pro Ser Lys Gly Trp Lys Asn Trp Gln Glu Val Pro Phe Cys Ser
3185 3190 3195

His His Phe His Lys Ile Phe Met Lys Asp Gly Arg Ser Leu Val
3200 3205 3210

Val Pro Cys Arg Asn Gln Asp Glu Leu Ile Gly Arg Ala Arg Ile
3215 3220 3225

Ser Gln Gly Ala Gly Trp Ser Leu Arg Glu Thr Ala Cys Leu Gly
3230 3235 3240

Lys Ala Tyr Ala Gln Met Trp Ser Leu Met Tyr Phe His Arg Arg
3245 3250 3255

Asp Leu Arg Leu Ala Ser Met Ala Ile Cys Ser Ala Val Pro Thr
3260 3265 3270

Glu Trp Phe Pro Thr Ser Arg Thr Thr Trp Ser Ile His Ala His
3275 3280 3285

His Gln Trp Met Thr Thr Glu Asp Met Leu Lys Val Trp Asn Arg
3290 3295 3300

Val Trp Ile Glu Asp Asn Pro Asn Met Thr Asp Lys Thr Pro Val
3305 3310 3315

His Ser Trp Glu Asp Ile Pro Tyr Leu Gly Lys Arg Glu Asp Leu
3320 3325 3330

Trp Cys Gly Ser Leu Ile Gly Leu Ser Ser Arg Ala Thr Trp Ala
3335 3340 3345

Lys Asn Ile His Thr Ala Ile Thr Gln Val Arg Asn Leu Ile Gly
3350 3355 3360

Lys Glu Glu Tyr Val Asp Tyr Met Pro Val Met Lys Arg Tyr Ser
3365 3370 3375

Ala Pro Ser Glu Ser Glu Gly Val Leu
3380 3385