

381698_1.TXT
SEQUENCE LISTING

<110> The University of Queensland
<120> VLP based vaccine delivery system
<130> 16098SG2
<140> PCT/AU2007001478
<141> 2007-10-04
<160> 145
<170> PatentIn version 3.3
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<400> 27

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Tyr

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Tyr

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Tyr

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<400> 31

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Tyr

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Tyr

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Tyr

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Tyr

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Tyr

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<400> 36

Pro Asn Asp Ala Ala Glu Gln Ile Lys Leu Tyr Gln Asn Pro Thr Thr
 1 5 10 15

Tyr

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<400> 37

Pro Asn Asp Ala Ala Glu Gln Thr Lys Leu Tyr Gln Asn Pro Thr Thr
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Tyr

<210> 38
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<400> 38

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Tyr

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Tyr

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Tyr

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Tyr

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1				5					10					15	

Tyr

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Pro Asn Asp Ala Ala Glu Gln Thr Arg Leu Tyr Gln Asn Pro Thr Thr
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<210> 44
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<400> 44

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<400> 45

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Tyr

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Tyr

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5

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Lys Arg Gly Pro Asp Ser Gly
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Lys Arg Arg Ser Asn Lys Ser
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Lys Arg Gly Ser Val Asn Ser
 1 5

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Lys Arg Gly Ser Val Lys Ser
 1 5

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Lys Arg Gly Ser Asp Asn Ser
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Lys Arg Gly Ser Val Lys Ser
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Lys Arg Arg Ser Ile Lys Ser
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Lys Arg Gly Ser Val Asn Ser
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Pro Ser Thr Asp Arg Glu Gln Thr Lys Leu Tyr Val Arg Ala Ser Gly
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Arg

<210> 62

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<400> 62

Pro Ser Thr Asn Gln Glu Gln Thr Ser Leu Tyr Val Gln Ala Ser Gly
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Arg

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<400> 63

Pro Ser Thr Asn Gln Glu Gln Thr Ser Leu Tyr Val Gln Ala Ser Gly
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Arg

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<400> 64

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Arg

<210> 65

<211> 17
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Pro Ser Thr Asp Gln Glu Gln Thr Ser Leu Tyr Val Gln Ala Ser Gly
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Arg

<210> 66
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<400> 66

Pro Ser Thr Asp Ser Asp Gln Ile Ser Ile Tyr Ala Gln Ala Ser Gly
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Arg

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Arg

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Pro Ser Thr Asp Arg Glu Gln Thr Asn Leu Tyr Val Arg Ala Ser Gly
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Arg

<210> 69
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Pro Ser Thr Asp Lys Glu Gln Thr Lys Leu Tyr Val Arg Ala Ser Gly
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Arg

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Arg

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Pro Ser Thr Asp Arg Asp Gln Thr Ser Leu Tyr Val Gln Ala Ser Gly
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Arg

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Pro Ser Thr Asp Ser Asp Gln Thr Ser Leu Tyr Ala Gln Ala Ser Gly
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Arg

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<400> 73

Pro Ser Thr Asp Ser Asp Gln Thr Ser Leu Tyr Val Gln Ala Ser Gly
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Arg

<210> 74
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<400> 74

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Arg

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Tyr

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Pro Ser Thr Asn Gln Glu Gln Thr Ser Leu Tyr Val Gln Ala Ser Gly
 1 5 10 15

Arg

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<400> 80

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Tyr

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Pro Tyr Asn Gly Lys Ser Ser
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Lys Arg Gly Pro Gly Ser Gly
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<400> 83

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<400> 84

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Ser His Lys Gly Lys Ser Ser
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Pro Ser Asn Ile Glu Asp Gln Lys Thr Ile Tyr Arg Lys Glu Asn Ala
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Tyr

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Thr Lys Ala Cys Pro Arg Pro Ala Pro Val Pro Lys Leu Leu Ile Lys
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Gly Gly Met Glu Val Leu Asp Leu Val Thr Gly Pro Asp Ser Val Thr
35 40 45

Glu Ile Glu Ala Phe Leu Asn Pro Arg Met Gly Gln Pro Pro Thr Pro
50 55 60

Glu Ser Leu Thr Glu Gly Gly Gln Tyr Tyr Gly Trp Ser Arg Gly Ile
65 70 75 80

Asn Leu Ala Thr Ser Asp Thr Glu Asp Ser Pro Gly Asn Asn Thr Leu
85 90 95

Pro Thr Trp Ser Met Ala Lys Leu Gln Leu Pro Met Leu Asn Glu Asp
100 105 110

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Leu Thr Cys Asp Thr Leu Gln Met Trp Glu Ala Val Ser Val Lys Thr
 115 120 125
 Glu Val Val Gly Ser Gly Ser Leu Leu Asp Val His Gly Phe Asn Lys
 130 135 140
 Pro Thr Asp Thr Val Asn Thr Lys Gly Ile Ser Thr Pro Val Glu Gly
 145 150 155 160
 Ser Gln Tyr His Val Phe Ala Val Gly Gly Glu Pro Leu Asp Leu Gln
 165 170 175
 Gly Leu Val Thr Asp Ala Arg Thr Lys Tyr Lys Glu Glu Gly Val Val
 180 185 190
 Thr Ile Lys Thr Ile Thr Lys Lys Asp Met Val Asn Lys Asp Gln Val
 195 200 205
 Leu Asn Pro Ile Ser Lys Ala Lys Leu Asp Lys Asp Gly Met Tyr Pro
 210 215 220
 Val Glu Ile Trp His Pro Asp Pro Ala Lys Asn Glu Asn Thr Arg Tyr
 225 230 235 240
 Phe Gly Asn Tyr Thr Gly Gly Thr Thr Thr Pro Pro Val Leu Gln Phe
 245 250 255
 Thr Asn Thr Leu Thr Thr Val Leu Leu Asp Glu Asn Gly Val Gly Pro
 260 265 270
 Leu Cys Lys Gly Glu Gly Leu Tyr Leu Ser Cys Val Asp Ile Met Gly
 275 280 285
 Trp Arg Val Thr Arg Asn Tyr Asp Val His His Trp Arg Gly Leu Pro
 290 295 300
 Arg Tyr Phe Lys Ile Thr Leu Arg Lys Arg Trp Val Lys Asn Pro Tyr
 305 310 315 320
 Pro Met Ala Ser Leu Ile Ser Ser Leu Phe Asn Asn Met Leu Pro Gln
 325 330 335
 Val Gln Gly Gln Pro Met Glu Gly Glu Asn Thr Gln Val Glu Glu Val
 340 345 350
 Arg Val Tyr Asp Gly Thr Glu Pro Val Pro Gly Asp Pro Asp Met Thr
 355 360 365
 Arg Tyr Val Asp Arg Phe Gly Lys Thr Lys Thr Val Phe Pro Gly Asn
 370 375 380

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<210> 88
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<400> 88

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Gly Gly Met Glu Val Leu Asp Leu Val Thr Gly Pro Asp Ser Val Thr
 35 40 45

Glu Ile Glu Ala Phe Leu Asn Pro Arg Met Gly Gln Pro Pro Thr Pro
 50 55 60

Glu Ser Leu Thr Glu Gly Gly Gln Tyr Tyr Gly Trp Ser Arg Gly Ile
 65 70 75 80

Asn Leu Ala Thr Ser Ala Gly Thr Glu Asp Ser Pro Gly Asn Asn Thr
 85 90 95

Leu Pro Thr Trp Ser Met Ala Lys Leu Gln Leu Pro Met Leu Asn Glu
 100 105 110

Asp Leu Thr Cys Asp Thr Leu Gln Met Trp Glu Ala Val Ser Val Lys
 115 120 125

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

Lys Pro Thr Asp Thr Val Asn Thr Lys Gly Ile Ser Thr Pro Val Glu
 145 150 155 160

Gly Ser Gln Tyr His Val Phe Ala Val Gly Gly Glu Pro Leu Asp Leu
 165 170 175

Gln Gly Leu Val Thr Asp Ala Arg Thr Lys Tyr Lys Glu Glu Gly Val
 180 185 190

Val Thr Ile Lys Thr Ile Thr Lys Lys Asp Met Val Asn Lys Asp Gln
 195 200 205

Val Leu Asn Pro Ile Ser Lys Ala Lys Leu Asp Lys Asp Gly Met Tyr
 210 215 220

Pro Val Glu Ile Trp His Pro Asp Pro Ala Lys Asn Glu Asn Thr Arg
 225 230 235 240

Tyr Phe Gly Asn Tyr Thr Gly Gly Thr Thr Thr Pro Pro Val Leu Gln
 245 250 255

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Phe Thr Asn Thr₂₆₀ Leu Thr Thr Val₂₆₅ Leu Leu Asp Glu Asn Gly₂₇₀ Val Gly
 Pro Leu Cys₂₇₅ Lys Gly Glu Gly₂₈₀ Leu Tyr Leu Ser Cys₂₈₅ Val Asp Ile Met
 Gly Trp₂₉₀ Arg Val Thr Arg Asn₂₉₅ Tyr Asp Val His His₃₀₀ Trp Arg Gly Leu
 Pro Arg Tyr Phe Lys Ile₃₁₀ Thr Leu Arg Lys Arg₃₁₅ Trp Val Lys Asn Pro₃₂₀
 Tyr Pro Met Ala Ser₃₂₅ Leu Ile Ser Ser₃₃₀ Leu Phe Asn Asn Met₃₃₅ Leu Pro
 Gln Val Gln Gly₃₄₀ Gln Pro Met Glu Gly₃₄₅ Glu Asn Thr Gln Val₃₅₀ Glu Glu
 Val Arg Val₃₅₅ Tyr Asp Gly Thr Glu₃₆₀ Pro Val Pro Gly Asp₃₆₅ Pro Asp Met
 Thr Arg₃₇₀ Tyr Val Asp Arg Phe₃₇₅ Gly Lys Thr Lys Thr₃₈₀ Val Phe Pro Gly
 Asn
 385
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 Thr Lys Ala Cys₂₀ Pro Arg Pro Ala₂₅ Val Pro Lys Leu₃₀ Leu Ile Lys
 Gly Gly Met₃₅ Glu Val Leu Asp Leu₄₀ Val Thr Gly Pro Asp₄₅ Ser Val Thr
 Glu Ile₅₀ Glu Ala Phe Leu Asn₅₅ Pro Arg Met Gly Gln₆₀ Pro Pro Thr Pro
 Glu Ser Leu Thr Glu Gly₇₀ Gly Gln Tyr Tyr Gly₇₅ Trp Ser Arg Gly Ile₈₀
 Asn Leu Ala Thr Ser₈₅ Asp Thr Glu Asp Ser₉₀ Pro Gly Asn Asn Thr₉₅ Leu

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Pro Thr Trp Ser₁₀₀ Met Ala Lys Leu Gln₁₀₅ Leu Pro Met Leu Asn₁₁₀ Glu Asp
 Leu Thr Cys₁₁₅ Asp Thr Leu Gln₁₂₀ Trp Glu Ala Val Ser₁₂₅ Val Lys Thr
 Glu Val₁₃₀ Val Gly Ser Gly Ser₁₃₅ Leu Leu Asp Val His₁₄₀ Gly Phe Asn Lys
 Pro Thr Asp Thr Val Asn₁₅₀ Thr Lys Gly Ile Ser₁₅₅ Thr Pro Val Glu Gly₁₆₀
 Ser Gln Tyr His Val₁₆₅ Phe Ala Val Gly Gly₁₇₀ Glu Pro Leu Asp Leu₁₇₅ Gln
 Gly Leu Val Thr₁₈₀ Asp Ala Arg Thr Lys₁₈₅ Tyr Lys Glu Glu Gly₁₉₀ Val Val
 Thr Ile Lys₁₉₅ Thr Ile Thr Lys Lys₂₀₀ Asp Met Val Asn Lys₂₀₅ Asp Gln Val
 Leu Asn₂₁₀ Pro Ile Ser Lys Ala₂₁₅ Lys Leu Asp Lys Asp₂₂₀ Gly Met Tyr Pro
 Val₂₂₅ Glu Ile Trp His Pro₂₃₀ Asp Pro Ala Lys Asn₂₃₅ Glu Asn Thr Arg Tyr₂₄₀
 Phe Gly Asn Tyr Thr₂₄₅ Gly Gly Thr Thr Thr₂₅₀ Pro Pro Val Leu Gln₂₅₅ Phe
 Thr Asn Thr Leu₂₆₀ Thr Thr Val Leu Leu₂₆₅ Asp Glu Asn Gly Val₂₇₀ Gly Pro
 Leu Cys Lys₂₇₅ Gly Glu Gly Leu Tyr₂₈₀ Leu Ser Cys Val Asp₂₈₅ Ile Met Gly
 Trp Arg Val Thr Arg Ser Ala₂₉₅ Tyr Asp Val His His₃₀₀ Trp Arg Gly Leu
 Pro Arg Tyr Phe Lys Ile Thr Leu Arg Lys Arg₃₁₅ Trp Val Lys Asn Pro₃₂₀
 Tyr Pro Met Ala Ser₃₂₅ Leu Ile Ser Ser Leu Phe Asn Asn Met Leu₃₃₅ Pro
 Gln Val Gln Gly₃₄₀ Gln Pro Met Glu Gly₃₄₅ Glu Asn Thr Gln Val₃₅₀ Glu Glu
 Val Arg Val Tyr Asp Gly Thr Glu Pro Val Pro Gly Asp Pro Asp Met
 Thr Arg Tyr Val Asp Arg Phe Gly Lys Thr Lys Thr Val Phe Pro Gly

370

375

Asn
385

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Gly Gly Met Glu Val Leu Asp Leu Val Thr Gly Pro Asp Ser Val Thr
35 40 45

Glu Ile Glu Ala Phe Leu Asn Pro Arg Met Gly Gln Pro Pro Thr Pro
50 55 60

Glu Ser Leu Thr Glu Gly Gly Gln Tyr Tyr Gly Trp Ser Arg Gly Ile
65 70 75 80

Asn Leu Ala Thr Ser Asp Thr Glu Asp Ser Pro Gly Asn Asn Thr Leu
85 90 95

Pro Thr Trp Ser Met Ala Lys Leu Gln Leu Pro Met Leu Asn Glu Asp
100 105 110

Leu Thr Cys Asp Thr Leu Gln Met Trp Glu Ala Val Ser Val Lys Thr
115 120 125

Glu Val Val Gly Ser Gly Ser Leu Leu Asp Val His Gly Phe Asn Lys
130 135 140

Pro Thr Asp Thr Val Asn Thr Lys Gly Ile Ser Thr Pro Val Glu Gly
145 150 155 160

Ser Gln Tyr His Val Phe Ala Val Gly Gly Glu Pro Leu Asp Leu Gln
165 170 175

Gly Leu Val Thr Asp Ala Arg Thr Lys Tyr Lys Glu Glu Gly Val Val
180 185 190

Thr Ile Lys Thr Ile Thr Lys Lys Asp Met Val Asn Lys Asp Gln Val
195 200 205

Leu Asn Pro Ile Ser Lys Ala Lys Leu Asp Lys Asp Gly Met Tyr Pro
210 215 220

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Val Glu Ile Trp His Pro Asp Pro Ala Lys Asn Glu Asn Thr Arg Tyr
225 230 235 240

Phe Gly Asn Tyr Thr Gly Gly Thr His Val Thr Pro Pro Val Leu Gln
245 250 255

Phe Thr Asn Thr Leu Thr Thr Val Leu Leu Asp Glu Asn Gly Val Gly
260 265 270

Pro Leu Cys Lys Gly Glu Gly Leu Tyr Leu Ser Cys Val Asp Ile Met
275 280 285

Gly Trp Arg Val Thr Arg Asn Tyr Asp Val His His Trp Arg Gly Leu
290 295 300

Pro Arg Tyr Phe Lys Ile Thr Leu Arg Lys Arg Trp Val Lys Asn Pro
305 310 315 320

Tyr Pro Met Ala Ser Leu Ile Ser Ser Leu Phe Asn Asn Met Leu Pro
325 330 335

Gln Val Gln Gly Gln Pro Met Glu Gly Glu Asn Thr Gln Val Glu Glu
340 345 350

Val Arg Val Tyr Asp Gly Thr Glu Pro Val Pro Gly Asp Pro Asp Met
355 360 365

Thr Arg Tyr Val Asp Arg Phe Gly Lys Thr Lys Thr Val Phe Pro Gly
370 375 380

Asn
385

<210> 91
<211> 387
<212> PRT
<213> Polyomavirus sp

<400> 91

Met Ala Pro Lys Arg Lys Ser Gly Val Ser Lys Cys Glu Thr Lys Cys
1 5 10 15

Thr Lys Ala Cys Pro Arg Pro Ala Pro Val Pro Lys Leu Leu Ile Lys
20 25 30

Gly Gly Met Glu Val Leu Asp Leu Val Thr Gly Pro Asp Ser Val Thr
35 40 45

Glu Ile Glu Ala Phe Leu Asn Pro Arg Met Gly Gln Pro Pro Thr Pro
50 55 60

Glu Ser Leu Thr Glu Gly Gly Gln Tyr Tyr Gly Trp Ser Arg Gly Ile
Page 23

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65              70              75              80
Asn Leu Ala Thr Ser85 Ala Gly Thr Glu Asp90 Ser Pro Gly Asn95 Asn Thr
Leu Pro Thr Trp100 Ser Met Ala Lys Leu105 Gln Leu Pro Met Leu110 Asn Glu
Asp Leu Thr115 Cys Asp Thr Leu Gln120 Met Trp Glu Ala Val125 Ser Val Lys
Thr Glu Val Val Gly Ser Gly135 Ser Leu Leu Asp Val140 His Gly Phe Asn
Lys145 Pro Thr Asp Thr Val150 Asn Thr Lys Gly Ile155 Ser Thr Pro Val Glu160
Gly Ser Gln Tyr His165 Val Phe Ala Val Gly170 Gly Glu Pro Leu Asp175 Leu
Gln Gly Leu Val180 Thr Asp Ala Arg Thr185 Lys Tyr Lys Glu Glu190 Gly Val
Val Thr Ile195 Lys Thr Ile Thr Lys200 Lys Asp Met Val Asn205 Lys Asp Gln
Val Leu210 Asn Pro Ile Ser Lys215 Ala Lys Leu Asp Lys220 Asp Gly Met Tyr
Pro225 Val Glu Ile Trp His230 Pro Asp Pro Ala Lys235 Asn Glu Asn Thr Arg240
Tyr Phe Gly Asn Tyr245 Thr Gly Gly Thr His250 Val Thr Pro Pro Val255 Leu
Gln Phe Thr Asn260 Thr Leu Thr Thr Val265 Leu Leu Asp Glu Asn270 Gly Val
Gly Pro Leu275 Cys Lys Gly Glu Gly280 Leu Tyr Leu Ser Cys285 Val Asp Ile
Met Gly290 Trp Arg Val Thr Arg295 Ser Ala Tyr Asp Val300 His His Trp Arg
Gly305 Leu Pro Arg Tyr Phe310 Lys Ile Thr Leu Arg315 Lys Arg Trp Val Lys320
Asn Pro Tyr Pro Met325 Ala Ser Leu Ile Ser330 Ser Leu Phe Asn Asn335 Met
Leu Pro Gln Val340 Gln Gly Gln Pro Met345 Glu Gly Glu Asn Thr350 Gln Val

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381698_1.TXT

Glu Glu Val Arg Val Tyr Asp Gly Thr Glu Pro Val Pro Gly Asp Pro
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Asp Met Thr Arg Tyr Val Asp Arg Phe Gly Lys Thr Lys Thr Val Phe
370 375 380

Pro Gly Asn
385

<210> 92
<211> 402
<212> PRT
<213> Polyomavirus sp

<400> 92

Met Ala Pro Lys Arg Lys Ser Gly Val Ser Lys Cys Glu Thr Lys Cys
1 5 10 15

Thr Lys Ala Cys Pro Arg Pro Ala Pro Val Pro Lys Leu Leu Ile Lys
20 25 30

Gly Gly Met Glu Val Leu Asp Leu Val Thr Gly Pro Asp Ser Val Thr
35 40 45

Glu Ile Glu Ala Phe Leu Asn Pro Arg Met Gly Gln Pro Pro Thr Pro
50 55 60

Glu Ser Leu Thr Glu Gly Gly Gln Tyr Tyr Gly Trp Ser Arg Gly Ile
65 70 75 80

Asn Leu Ala Thr Ser Ala Pro Asn Asp Ala Ala Glu Gln Thr Lys Leu
85 90 95

Tyr Gln Asn Pro Thr Thr Tyr Gly Thr Glu Asp Ser Pro Gly Asn Asn
100 105 110

Thr Leu Pro Thr Trp Ser Met Ala Lys Leu Gln Leu Pro Met Leu Asn
115 120 125

Glu Asp Leu Thr Cys Asp Thr Leu Gln Met Trp Glu Ala Val Ser Val
130 135 140

Lys Thr Glu Val Val Gly Ser Gly Ser Leu Leu Asp Val His Gly Phe
145 150 155 160

Asn Lys Pro Thr Asp Thr Val Asn Thr Lys Gly Ile Ser Thr Pro Val
165 170 175

Glu Gly Ser Gln Tyr His Val Phe Ala Val Gly Gly Glu Pro Leu Asp
180 185 190

381698_1.TXT

Leu Gln Gly Leu Val Thr Asp Ala Arg Thr Lys Tyr Lys Glu Glu Gly
195 200 205

Val Val Thr Ile Lys Thr Ile Thr Lys Lys Asp Met Val Asn Lys Asp
210 215 220

Gln Val Leu Asn Pro Ile Ser Lys Ala Lys Leu Asp Lys Asp Gly Met
225 230 235 240

Tyr Pro Val Glu Ile Trp His Pro Asp Pro Ala Lys Asn Glu Asn Thr
245 250 255

Arg Tyr Phe Gly Asn Tyr Thr Gly Gly Thr Thr Thr Pro Pro Val Leu
260 265 270

Gln Phe Thr Asn Thr Leu Thr Thr Val Leu Leu Asp Glu Asn Gly Val
275 280 285

Gly Pro Leu Cys Lys Gly Glu Gly Leu Tyr Leu Ser Cys Val Asp Ile
290 295 300

Met Gly Trp Arg Val Thr Arg Asn Tyr Asp Val His His Trp Arg Gly
305 310 315 320

Leu Pro Arg Tyr Phe Lys Ile Thr Leu Arg Lys Arg Trp Val Lys Asn
325 330 335

Pro Tyr Pro Met Ala Ser Leu Ile Ser Ser Leu Phe Asn Asn Met Leu
340 345 350

Pro Gln Val Gln Gly Gln Pro Met Glu Gly Glu Asn Thr Gln Val Glu
355 360 365

Glu Val Arg Val Tyr Asp Gly Thr Glu Pro Val Pro Gly Asp Pro Asp
370 375 380

Met Thr Arg Tyr Val Asp Arg Phe Gly Lys Thr Lys Thr Val Phe Pro
385 390 395 400

Gly Asn

<210> 93
<211> 392
<212> PRT
<213> Polyomavirus sp

<400> 93

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Thr Lys Ala Cys Pro Arg Pro Ala Pro Val Pro Lys Leu Leu Ile Lys
20 25 30

381698_1.TXT

Gly Gly Met Glu Val Leu Asp Leu Val Thr Gly Pro Asp Ser Val Thr
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 Glu Ile Glu Ala Phe Leu Asn Pro Arg Met Gly Gln Pro Pro Thr Pro
 50 55 60
 Glu Ser Leu Thr Glu Gly Gly Gln Tyr Tyr Gly Trp Ser Arg Gly Ile
 65 70 75 80
 Asn Leu Ala Thr Ser Ala Pro Tyr Asn Gly Lys Ser Ser Gly Thr Glu
 85 90 95
 Asp Ser Pro Gly Asn Asn Thr Leu Pro Thr Trp Ser Met Ala Lys Leu
 100 105 110
 Gln Leu Pro Met Leu Asn Glu Asp Leu Thr Cys Asp Thr Leu Gln Met
 115 120 125
 Trp Glu Ala Val Ser Val Lys Thr Glu Val Val Gly Ser Gly Ser Leu
 130 135 140
 Leu Asp Val His Gly Phe Asn Lys Pro Thr Asp Thr Val Asn Thr Lys
 145 150 155 160
 Gly Ile Ser Thr Pro Val Glu Gly Ser Gln Tyr His Val Phe Ala Val
 165 170 175
 Gly Gly Glu Pro Leu Asp Leu Gln Gly Leu Val Thr Asp Ala Arg Thr
 180 185 190
 Lys Tyr Lys Glu Glu Gly Val Val Thr Ile Lys Thr Ile Thr Lys Lys
 195 200 205
 Asp Met Val Asn Lys Asp Gln Val Leu Asn Pro Ile Ser Lys Ala Lys
 210 215 220
 Leu Asp Lys Asp Gly Met Tyr Pro Val Glu Ile Trp His Pro Asp Pro
 225 230 235 240
 Ala Lys Asn Glu Asn Thr Arg Tyr Phe Gly Asn Tyr Thr Gly Gly Thr
 245 250 255
 Thr Thr Pro Pro Val Leu Gln Phe Thr Asn Thr Leu Thr Thr Val Leu
 260 265 270
 Leu Asp Glu Asn Gly Val Gly Pro Leu Cys Lys Gly Glu Gly Leu Tyr
 275 280 285
 Leu Ser Cys Val Asp Ile Met Gly Trp Arg Val Thr Arg Asn Tyr Asp
 290 295 300

381698_1.TXT

Val His His Trp Arg Gly Leu Pro Arg Tyr Phe Lys Ile Thr Leu Arg
305 310 315 320

Lys Arg Trp Val Lys Asn Pro Tyr Pro Met Ala Ser Leu Ile Ser Ser
325 330 335

Leu Phe Asn Asn Met Leu Pro Gln Val Gln Gly Gln Pro Met Glu Gly
340 345 350

Glu Asn Thr Gln Val Glu Glu Val Arg Val Tyr Asp Gly Thr Glu Pro
355 360 365

Val Pro Gly Asp Pro Asp Met Thr Arg Tyr Val Asp Arg Phe Gly Lys
370 375 380

Thr Lys Thr Val Phe Pro Gly Asn
385 390

<210> 94
<211> 408
<212> PRT
<213> Polyomavirus sp

<400> 94

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1 5 10 15

Thr Lys Ala Cys Pro Arg Pro Ala Pro Val Pro Lys Leu Leu Ile Lys
20 25 30

Gly Gly Met Glu Val Leu Asp Leu Val Thr Gly Pro Asp Ser Val Thr
35 40 45

Glu Ile Glu Ala Phe Leu Asn Pro Arg Met Gly Gln Pro Pro Thr Pro
50 55 60

Glu Ser Leu Thr Glu Gly Gly Gln Tyr Tyr Gly Trp Ser Arg Gly Ile
65 70 75 80

Asn Leu Ala Thr Ser Ala Ser Leu Leu Thr Glu Val Glu Thr Pro Thr
85 90 95

Arg Asn Glu Trp Glu Cys Arg Cys Ser Asp Ser Ser Asp Gly Thr Glu
100 105 110

Asp Ser Pro Gly Asn Asn Thr Leu Pro Thr Trp Ser Met Ala Lys Leu
115 120 125

Gln Leu Pro Met Leu Asn Glu Asp Leu Thr Cys Asp Thr Leu Gln Met
130 135 140

Trp Glu Ala Val Ser Val Lys Thr Glu Val Val Gly Ser Gly Ser Leu
Page 28

145 150 155 160
 Leu Asp Val His Gly Phe Asn Lys Pro Thr Asp Thr Val Asn Thr Lys
 165 170 175
 Gly Ile Ser Thr Pro Val Glu Gly Ser Gln Tyr His Val Phe Ala Val
 180 185 190
 Gly Gly Glu Pro Leu Asp Leu Gln Gly Leu Val Thr Asp Ala Arg Thr
 195 200 205
 Lys Tyr Lys Glu Glu Gly Val Val Thr Ile Lys Thr Ile Thr Lys Lys
 210 215 220
 Asp Met Val Asn Lys Asp Gln Val Leu Asn Pro Ile Ser Lys Ala Lys
 225 230 235 240
 Leu Asp Lys Asp Gly Met Tyr Pro Val Glu Ile Trp His Pro Asp Pro
 245 250 255
 Ala Lys Asn Glu Asn Thr Arg Tyr Phe Gly Asn Tyr Thr Gly Gly Thr
 260 265 270
 Thr Thr Pro Pro Val Leu Gln Phe Thr Asn Thr Leu Thr Thr Val Leu
 275 280 285
 Leu Asp Glu Asn Gly Val Gly Pro Leu Cys Lys Gly Glu Gly Leu Tyr
 290 295 300
 Leu Ser Cys Val Asp Ile Met Gly Trp Arg Val Thr Arg Asn Tyr Asp
 305 310 315 320
 Val His His Trp Arg Gly Leu Pro Arg Tyr Phe Lys Ile Thr Leu Arg
 325 330 335
 Lys Arg Trp Val Lys Asn Pro Tyr Pro Met Ala Ser Leu Ile Ser Ser
 340 345 350
 Leu Phe Asn Asn Met Leu Pro Gln Val Gln Gly Gln Pro Met Glu Gly
 355 360 365
 Glu Asn Thr Gln Val Glu Glu Val Arg Val Tyr Asp Gly Thr Glu Pro
 370 375 380
 Val Pro Gly Asp Pro Asp Met Thr Arg Tyr Val Asp Arg Phe Gly Lys
 385 390 395 400
 Thr Lys Thr Val Phe Pro Gly Asn
 405

<210> 95
 <211> 408

<212> PRT

<213> Polyomavirus sp

<400> 95

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Met Ala Pro Lys Arg Lys Ser Gly Val Ser Lys Cys Glu Thr Lys Cys
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Thr Lys Ala Cys Pro Arg Pro Ala Pro Val Pro Lys Leu Leu Ile Lys
      20      25      30

Gly Gly Met Glu Val Leu Asp Leu Val Thr Gly Pro Asp Ser Val Thr
      35      40      45

Glu Ile Glu Ala Phe Leu Asn Pro Arg Met Gly Gln Pro Pro Thr Pro
      50      55      60

Glu Ser Leu Thr Glu Gly Gly Gln Tyr Tyr Gly Trp Ser Arg Gly Ile
65      70      75      80

Asn Leu Ala Thr Ser Ala Ser Leu Leu Thr Glu Val Glu Thr Pro Ile
      85      90      95

Arg Asn Glu Trp Gly Cys Arg Cys Asn Asp Ser Ser Asp Gly Thr Glu
      100      105      110

Asp Ser Pro Gly Asn Asn Thr Leu Pro Thr Trp Ser Met Ala Lys Leu
      115      120      125

Gln Leu Pro Met Leu Asn Glu Asp Leu Thr Cys Asp Thr Leu Gln Met
      130      135      140

Trp Glu Ala Val Ser Val Lys Thr Glu Val Val Gly Ser Gly Ser Leu
145      150      155      160

Leu Asp Val His Gly Phe Asn Lys Pro Thr Asp Thr Val Asn Thr Lys
      165      170      175

Gly Ile Ser Thr Pro Val Glu Gly Ser Gln Tyr His Val Phe Ala Val
      180      185      190

Gly Gly Glu Pro Leu Asp Leu Gln Gly Leu Val Thr Asp Ala Arg Thr
      195      200      205

Lys Tyr Lys Glu Glu Gly Val Val Thr Ile Lys Thr Ile Thr Lys Lys
      210      215      220

Asp Met Val Asn Lys Asp Gln Val Leu Asn Pro Ile Ser Lys Ala Lys
225      230      235      240

Leu Asp Lys Asp Gly Met Tyr Pro Val Glu Ile Trp His Pro Asp Pro
      245      250      255

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381698_1.TXT

Ala Lys Asn Glu Asn Thr Arg Tyr Phe Gly Asn Tyr Thr Gly Gly Thr
260 265 270

Thr Thr Pro Pro Val Leu Gln Phe Thr Asn Thr Leu Thr Thr Val Leu
275 280 285

Leu Asp Glu Asn Gly Val Gly Pro Leu Cys Lys Gly Glu Gly Leu Tyr
290 295 300

Leu Ser Cys Val Asp Ile Met Gly Trp Arg Val Thr Arg Asn Tyr Asp
305 310 315 320

Val His His Trp Arg Gly Leu Pro Arg Tyr Phe Lys Ile Thr Leu Arg
325 330 335

Lys Arg Trp Val Lys Asn Pro Tyr Pro Met Ala Ser Leu Ile Ser Ser
340 345 350

Leu Phe Asn Asn Met Leu Pro Gln Val Gln Gly Gln Pro Met Glu Gly
355 360 365

Glu Asn Thr Gln Val Glu Glu Val Arg Val Tyr Asp Gly Thr Glu Pro
370 375 380

Val Pro Gly Asp Pro Asp Met Thr Arg Tyr Val Asp Arg Phe Gly Lys
385 390 395 400

Thr Lys Thr Val Phe Pro Gly Asn
405

<210> 96
<211> 568
<212> PRT
<213> Influenza A virus

<400> 96

Met Glu Arg Ile Val Leu Leu Leu Ala Ile Val Ser Leu Val Lys Ser
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Asp Gln Ile Cys Ile Gly Tyr His Ala Asn Asn Ser Thr Glu Gln Ala
20 25 30

Asp Thr Ile Met Glu Lys Asn Val Thr Val Thr His Ala Gln Asn Ile
35 40 45

Leu Glu Lys Thr His Asn Gly Lys Leu Cys Asp Leu Asp Gly Val Lys
50 55 60

Pro Leu Ile Leu Arg Asp Cys Ser Val Ala Gly Trp Leu Leu Gly Asn
65 70 75 80

Pro Met Cys Asp Glu Phe Ile Asn Val Pro Glu Trp Ser Tyr Ile Val
85 90 95

381698_1.TXT

Glu Lys Ala Asn₁₀₀ Pro Ala Asn Asp Leu₁₀₅ Cys Tyr Pro Gly Asp₁₁₀ Phe Asn
 Asp Tyr Glu₁₁₅ Glu Leu Lys His Leu₁₂₀ Leu Ser Arg Ile Asn₁₂₅ His Phe Glu
 Lys Ile₁₃₀ Gln Ile Ile Pro Lys₁₃₅ Ser Ser Trp Ser Asn₁₄₀ His Glu Ala Ser
 Ser₁₄₅ Gly Val Arg Ser Ala₁₅₀ Cys Pro Tyr Asn Gly₁₅₅ Lys Ser Ser Phe Phe₁₆₀
 Arg Asn Val Val Trp₁₆₅ Leu Ile Lys Lys Asn₁₇₀ Ser Ala Tyr Pro Thr₁₇₅ Ile
 Lys Arg Ser Tyr₁₈₀ Asn Asn Thr Asn Gln₁₈₅ Glu Asp Leu Leu Ile₁₉₀ Leu Trp
 Gly Ile His₁₉₅ His Pro Asn Asp Ala₂₀₀ Ala Glu Gln Thr Lys₂₀₅ Leu Tyr Gln
 Asn Pro₂₁₀ Ile Thr Tyr Ile Ser₂₁₅ Val Gly Thr Ser Thr₂₂₀ Leu Asn Gln Arg
 Leu₂₂₅ Val Pro Lys Ile Ala₂₃₀ Thr Arg Ser Lys Val₂₃₅ Asn Gly Gln Ser Gly₂₄₀
 Arg Met Glu Phe Phe₂₄₅ Trp Thr Ile Leu Lys₂₅₀ Pro Asn Asp Ala Ile₂₅₅ Asn
 Phe Glu Ser Asn₂₆₀ Gly Asn Phe Ile Ala₂₆₅ Pro Glu Tyr Ala Tyr₂₇₀ Lys Ile
 Val Lys Lys₂₇₅ Gly Asp Ser Ala Ile₂₈₀ Met Lys Ser Glu Leu₂₈₅ Glu Tyr Gly
 Asn Cys₂₉₀ Asn Thr Lys Cys Gln₂₉₅ Thr Pro Met Gly Ala₃₀₀ Ile Asn Ser Ser
 Met₃₀₅ Pro Phe His Asn Ile₃₁₀ His Pro Leu Thr Ile₃₁₅ Gly Glu Cys Pro Lys₃₂₀
 Tyr Val Lys Ser Asn₃₂₅ Arg Leu Val Leu Ala₃₃₀ Thr Gly Leu Arg Asn₃₃₅ Thr
 Pro Gln Arg Glu₃₄₀ Arg Arg Arg Lys Lys₃₄₅ Arg Gly Leu Phe Gly₃₅₀ Ala Ile
 Ala Gly Phe₃₅₅ Ile Glu Gly Gly Trp₃₆₀ Gln Gly Met Val Asp₃₆₅ Gly Trp Tyr

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Gly Tyr His His Ser Asn Glu Gln Gly Ser Gly Tyr Ala Ala Asp Lys
370 375 380

Glu Ser Thr Gln Arg Ala Ile Asp Gly Val Thr Asn Lys Val Asn Ser
385 390 395 400

Ile Ile Gly Lys Met Asn Thr Gln Phe Glu Ala Val Gly Arg Glu Phe
405 410 415

Asn Asn Leu Glu Arg Arg Ile Glu Asn Leu Asn Lys Lys Met Glu Asp
420 425 430

Gly Phe Leu Asp Val Trp Thr Tyr Asn Ala Glu Leu Leu Val Leu Met
435 440 445

Glu Asn Glu Arg Thr Leu Asp Phe His Asp Ser Asn Val Lys Asn Leu
450 455 460

Tyr Asp Lys Val Arg Leu Gln Leu Arg Asp Asn Ala Lys Glu Leu Gly
465 470 475 480

Asn Gly Cys Phe Glu Phe Tyr His Lys Cys Asp Asn Glu Cys Met Glu
485 490 495

Ser Val Lys Asn Gly Thr Tyr Asp Tyr Pro Arg Tyr Ser Glu Glu Ala
500 505 510

Arg Leu Asn Arg Glu Glu Ile Ser Gly Val Lys Leu Glu Ser Met Gly
515 520 525

Thr Tyr Gln Ile Leu Ser Ile Tyr Ser Thr Val Ala Ser Ser Leu Ala
530 535 540

Leu Ala Ile Met Val Ala Gly Leu Ser Leu Trp Met Cys Ser Asn Gly
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Ser Leu Gln Cys Arg Ile Cys Ile
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<210> 97
<211> 568
<212> PRT
<213> Influenza A virus

<400> 97

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1 5 10 15

Asp Gln Ile Cys Ile Gly Tyr His Ala Asn Asn Ser Thr Glu Gln Val
20 25 30

Asp Thr Ile Met Glu Lys Asn Val Thr Val Thr His Ala Gln Asp Ile
Page 33

35

40

45

Leu Glu Lys Thr His Asn Gly Lys Leu Cys Asn Pro Asp Gly Val Lys
 50 55 60

Pro Leu Ile Leu Lys Asp Cys Ser Val Ala Gly Trp Leu Leu Gly Asn
 65 70 75 80

Pro Met Cys Asp Glu Phe Ile Asn Val Pro Glu Trp Ser Tyr Ile Val
 85 90 95

Glu Lys Ala Ser Pro Ala Asn Gly Leu Cys Tyr Pro Gly Asp Phe Asn
 100 105 110

Asp Tyr Glu Glu Leu Lys His Leu Leu Ser Arg Ile Asn His Phe Glu
 115 120 125

Lys Ile Gln Ile Ile Pro Lys Ser Ser Trp Ser Asp His Gly Ala Ser
 130 135 140

Ser Gly Val Ser Ser Ala Cys Ser Tyr Leu Gly Lys Pro Ser Phe Phe
 145 150 155 160

Arg Asn Val Val Trp Leu Ile Lys Lys Asn Asn Thr Tyr Pro Pro Ile
 165 170 175

Lys Val Ser Tyr Asn Asn Thr Asn Gln Glu Asp Leu Leu Val Leu Trp
 180 185 190

Gly Ile His His Pro Asn Asp Glu Ala Glu Gln Ile Lys Ile Tyr Gln
 195 200 205

Asn Pro Thr Thr Tyr Ile Ser Val Gly Thr Ser Thr Leu Asn Gln Arg
 210 215 220

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

Arg Met Glu Phe Phe Trp Thr Ile Leu Lys Pro Asn Asp Ala Ile Asn
 245 250 255

Phe Asp Ser Asn Gly Asn Phe Ile Ala Pro Glu Tyr Ala Tyr Lys Ile
 260 265 270

Val Lys Lys Gly Asp Ser Ala Ile Met Lys Ser Glu Leu Glu Tyr Gly
 275 280 285

Asn Cys Asn Thr Lys Cys Gln Thr Pro Met Gly Ala Ile Asn Ser Ser
 290 295 300

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

381698_1.TXT

Tyr Val Lys Ser Asn Arg Leu Val Leu Ala Thr Gly Leu Arg Asn Ala
 325 330 335
 Pro Gln Arg Glu Gly Gly Arg Lys Lys Arg Gly Leu Phe Gly Ala Ile
 340 345 350
 Ala Gly Phe Ile Glu Gly Gly Trp Gln Gly Met Val Asp Gly Trp Tyr
 355 360 365
 Gly Tyr His His Ser Asn Glu Gln Gly Ser Gly Tyr Ala Ala Asp Lys
 370 375 380
 Glu Ser Thr Gln Lys Ala Ile Asp Gly Val Thr Asn Lys Val Asn Ser
 385 390 395 400
 Ile Ile Asp Lys Met Asn Thr Gln Phe Glu Ala Val Gly Arg Glu Phe
 405 410 415
 Asn Asn Leu Glu Arg Arg Ile Glu Asn Leu Asn Lys Lys Met Glu Asp
 420 425 430
 Gly Phe Leu Asp Val Trp Thr Tyr Asn Ala Glu Leu Leu Val Leu Met
 435 440 445
 Glu Asn Glu Arg Thr Leu Asp Phe His Asp Ser Asn Val Lys Asn Leu
 450 455 460
 Tyr Glu Lys Val Arg Leu Gln Leu Arg Asp Asn Ala Lys Glu Leu Gly
 465 470 475 480
 Asn Gly Cys Phe Glu Phe Tyr His Lys Cys Asp Asn Glu Cys Met Glu
 485 490 495
 Ser Val Lys Asn Gly Thr Tyr Asp Tyr Pro Gln Tyr Ser Glu Glu Ala
 500 505 510
 Arg Leu Asn Arg Glu Glu Ile Ser Gly Val Lys Leu Glu Ser Met Gly
 515 520 525
 Thr Tyr Gln Ile Leu Ser Ile Tyr Ser Thr Val Ala Ser Ser Leu Ala
 530 535 540
 Leu Ala Ile Met Val Ala Gly Leu Ser Leu Trp Met Cys Ser Asn Gly
 545 550 555 560
 Ser Leu Gln Cys Arg Ile Cys Ile
 565

<210> 98
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 <212> PRT

<213> Influenza A virus

<400> 98

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20 25 30

Asp Thr Ile Met Glu Lys Asn Val Thr Val Thr His Ala Gln Asp Ile
35 40 45

Leu Glu Lys Thr His Asn Gly Lys Leu Cys Asp Leu Asp Gly Val Lys
50 55 60

Pro Leu Ile Leu Arg Asp Cys Ser Val Ala Gly Trp Leu Leu Gly Asn
65 70 75 80

Pro Met Cys Asp Glu Phe Ile Asn Val Pro Glu Trp Ser Tyr Ile Val
85 90 95

Glu Lys Ala Ser Pro Ala Asn Asp Leu Cys Tyr Pro Gly Asp Phe Asn
100 105 110

Asp Tyr Glu Glu Leu Lys His Leu Leu Ser Arg Ile Asn His Phe Glu
115 120 125

Lys Ile Gln Ile Ile Pro Lys Ser Ser Trp Ser Asn His Glu Ala Ser
130 135 140

Ser Gly Val Ser Ser Ala Cys Pro Tyr Leu Gly Lys Ser Ser Phe Phe
145 150 155 160

Arg Asn Val Val Trp Leu Ile Lys Lys Asn Ser Ala Tyr Pro Thr Ile
165 170 175

Lys Arg Ser Tyr Asn Asn Thr Asn Gln Glu Asp Leu Leu Val Leu Trp
180 185 190

Gly Ile His His Pro Asn Asp Ala Ala Glu Gln Ile Lys Leu Tyr Gln
195 200 205

Asn Pro Thr Thr Tyr Ile Ser Val Gly Thr Ser Thr Leu Asn Gln Arg
210 215 220

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

Arg Met Glu Phe Phe Trp Thr Ile Leu Lys Pro Asn Asp Ala Ile Asn
245 250 255

Phe Glu Ser Asn Gly Asn Phe Ile Ala Pro Glu Tyr Ala Tyr Lys Ile

260

265

270

Val Lys Lys Gly Asp Ser Ala Ile Met Lys Ser Glu Leu Glu Tyr Gly
 275 280 285
 Asn Cys Asn Thr Lys Cys Gln Thr Pro Met Gly Ala Ile Asn Ser Ser
 290 295 300
 Met Pro Phe His Asn Ile His Pro Leu Thr Ile Gly Glu Cys Pro Lys
 305 310 315 320
 Tyr Val Lys Ser Asn Arg Leu Val Leu Ala Thr Gly Leu Arg Asn Thr
 325 330 335
 Pro Gln Arg Glu Arg Arg Arg Lys Lys Arg Gly Leu Phe Gly Ala Ile
 340 345 350
 Ala Gly Phe Ile Glu Gly Gly Trp Gln Gly Met Val Asp Gly Trp Tyr
 355 360 365
 Gly Tyr His His Ser Asn Glu Gln Gly Ser Gly Tyr Ala Ala Asp Lys
 370 375 380
 Glu Ser Thr Gln Lys Ala Ile Asp Gly Val Thr Asn Lys Val Asn Ser
 385 390 395 400
 Ile Ile Asp Lys Met Asn Thr Gln Phe Glu Ala Val Gly Arg Glu Phe
 405 410 415
 Asn Asn Leu Glu Arg Arg Ile Glu Asn Leu Asn Lys Lys Met Glu Asp
 420 425 430
 Gly Phe Leu Asp Val Trp Thr Tyr Asn Ala Glu Leu Leu Val Leu Met
 435 440 445
 Glu Asn Glu Arg Thr Leu Asp Phe His Asp Ser Asn Val Lys Asn Leu
 450 455 460
 Tyr Asp Lys Val Arg Leu Gln Leu Arg Asp Asn Ala Lys Glu Leu Gly
 465 470 475 480
 Asn Gly Cys Phe Glu Phe Tyr His Lys Cys Asp Asn Glu Cys Met Glu
 485 490 495
 Ser Val Lys Asn Gly Thr Tyr Asp Tyr Pro Gln Tyr Ser Glu Glu Ala
 500 505 510
 Arg Leu Asn Arg Glu Glu Ile Ser Gly Val Lys Leu Glu Ser Met Gly
 515 520 525
 Thr Tyr Gln Ile Leu Ser Ile Tyr Ser Thr Val Val Ser Ser Leu Ala
 530 535 540

Leu Ala Ile Met Val Ala Gly Leu Ser Leu Trp Met Cys Ser Asn Gly
 545 550 555 560

Ser Leu Gln Cys Arg Ile Cys Ile
 565

<210> 99
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 <212> PRT
 <213> Influenza A virus
 <400> 99

Met Glu Lys Ile Val Leu Leu Leu Ala Ile Val Ser Leu Val Lys Ser
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Asp Gln Ile Cys Ile Gly Tyr His Ala Asn Asn Ser Thr Glu Gln Val
 20 25 30

Asp Thr Ile Met Glu Lys Asn Val Thr Val Thr His Ala Gln Asp Ile
 35 40 45

Leu Glu Lys Thr His Asn Gly Lys Leu Cys Asp Leu Asp Gly Val Lys
 50 55 60

Pro Leu Ile Leu Arg Asp Cys Ser Val Ala Gly Trp Leu Leu Gly Asn
 65 70 75 80

Pro Met Cys Asp Glu Phe Leu Asn Val Pro Glu Trp Ser Tyr Ile Val
 85 90 95

Glu Lys Ile Asn Pro Ala Asn Asp Leu Cys Tyr Pro Gly Asn Phe Asn
 100 105 110

Asp Tyr Glu Glu Leu Lys His Leu Leu Ser Arg Ile Asn His Phe Glu
 115 120 125

Lys Ile Gln Ile Ile Pro Lys Ser Ser Trp Ser Asp His Glu Ala Ser
 130 135 140

Ser Gly Val Ser Ser Ala Cys Pro Tyr Gln Gly Arg Ser Ser Phe Phe
 145 150 155 160

Arg Asn Val Val Trp Leu Ile Lys Lys Asp Asn Ala Tyr Pro Thr Ile
 165 170 175

Lys Arg Ser Tyr Asn Asn Thr Asn Gln Glu Asp Leu Leu Val Leu Trp
 180 185 190

Gly Ile His His Pro Asn Asp Ala Ala Glu Gln Thr Arg Leu Tyr Gln
 195 200 205

381698_1.TXT

Asn Pro Thr Thr Tyr Ile Ser Val Gly Thr Ser Thr Leu Asn Gln Arg
210 215 220

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

Arg Met Glu Phe Phe Trp Thr Ile Leu Lys Pro Asn Asp Ala Ile Asn
245 250 255

Phe Glu Ser Asn Gly Asn Phe Ile Ala Pro Glu Asn Ala Tyr Lys Ile
260 265 270

Val Lys Lys Gly Asp Ser Thr Ile Met Lys Ser Glu Leu Glu Tyr Gly
275 280 285

Asn Cys Asn Thr Lys Cys Gln Thr Pro Ile Gly Ala Ile Asn Ser Ser
290 295 300

Met Pro Phe His Asn Ile His Pro Leu Thr Ile Gly Glu Cys Pro Lys
305 310 315 320

Tyr Val Lys Ser Asn Arg Leu Val Leu Ala Thr Gly Leu Arg Asn Ser
325 330 335

Pro Gln Gly Glu Arg Arg Arg Lys Lys Arg Gly Leu Phe Gly Ala Ile
340 345 350

Ala Gly Phe Ile Glu Gly Gly Trp Gln Gly Met Val Asp Gly Trp Tyr
355 360 365

Gly Tyr His His Ser Asn Glu Gln Gly Ser Gly Tyr Ala Ala Asp Lys
370 375 380

Glu Ser Thr Gln Lys Ala Ile Asp Gly Val Thr Asn Lys Val Asn Ser
385 390 395 400

Ile Ile Asp Lys Met Asn Thr Gln Phe Glu Ala Val Gly Arg Glu Phe
405 410 415

Asn Asn Leu Glu Arg Arg Ile Glu Asn Leu Asn Lys Lys Met Glu Asp
420 425 430

Gly Phe Leu Asp Val Trp Thr Tyr Asn Ala Glu Leu Leu Val Leu Met
435 440 445

Glu Asn Glu Arg Thr Leu Asp Phe His Asp Ser Asn Val Lys Asn Leu
450 455 460

Tyr Asp Lys Val Arg Leu Gln Leu Arg Asp Asn Ala Lys Glu Leu Gly
465 470 475 480

Asn Gly Cys Phe Glu Phe Tyr His Arg Cys Asp Asn Glu Cys Met Glu

485

490

495

Ser Val Arg Asn Gly Thr Tyr Asp Tyr Pro Gln Tyr Ser Glu Glu Ala
 500 505 510

Arg Leu Lys Arg Glu Glu Ile Ser Gly Val Lys Leu Glu Ser Ile Gly
 515 520 525

Thr Tyr Gln Ile Leu Ser Ile Tyr Ser Thr Val Ala Ser Ser Leu Ala
 530 535 540

Leu Ala Ile Met Val Ala Gly Leu Ser Leu Trp Met Cys Ser Asn Gly
 545 550 555 560

Ser Leu Gln Cys Arg Ile Cys Ile
 565

<210> 100
 <211> 568
 <212> PRT
 <213> Influenza A virus

<400> 100

Met Glu Lys Ile Val Leu Leu Phe Ala Ile Val Ser Leu Val Lys Ser
 1 5 10 15

Asp Gln Ile Cys Ile Gly Tyr His Ala Asn Asn Ser Thr Glu Gln Val
 20 25 30

Asp Thr Ile Met Glu Lys Asn Val Thr Val Thr His Ala Gln Asp Ile
 35 40 45

Leu Glu Lys Thr His Asn Gly Lys Leu Cys Asp Leu Asp Gly Val Lys
 50 55 60

Pro Leu Ile Leu Arg Asp Cys Ser Val Ala Gly Trp Leu Leu Gly Asn
 65 70 75 80

Pro Met Cys Asp Glu Phe Ile Asn Val Pro Glu Trp Ser Tyr Ile Val
 85 90 95

Glu Lys Ala Asn Pro Val Asn Asp Leu Cys Tyr Pro Gly Asp Phe Asn
 100 105 110

Asp Tyr Glu Glu Leu Lys His Leu Leu Ser Arg Ile Asn His Phe Glu
 115 120 125

Lys Ile Gln Ile Ile Pro Lys Ser Ser Trp Ser Ser His Glu Ala Ser
 130 135 140

Leu Gly Val Ser Ser Ala Cys Pro Tyr Gln Gly Lys Ser Ser Phe Phe
 145 150 155 160

381698_1.TXT

Arg Asn Val Val Trp₁₆₅ Leu Ile Lys Lys Asn₁₇₀ Ser Thr Tyr Pro Thr₁₇₅ Ile
 Lys Arg Ser Tyr₁₈₀ Asn Asn Thr Asn Gln₁₈₅ Glu Asp Leu Leu Val₁₉₀ Leu Trp
 Gly Ile His₁₉₅ His Pro Asn Asp Ala₂₀₀ Ala Glu Gln Thr Lys₂₀₅ Leu Tyr Gln
 Asn Pro₂₁₀ Thr Thr Tyr Ile Ser₂₁₅ Val Gly Thr Ser Thr₂₂₀ Leu Asn Gln Arg
 Leu₂₂₅ Val Pro Arg Ile Ala₂₃₀ Thr Arg Ser Lys Val₂₃₅ Asn Gly Gln Ser Gly₂₄₀
 Arg Met Glu Phe Phe₂₄₅ Trp Thr Ile Leu Lys₂₅₀ Pro Asn Asp Ala Ile₂₅₅ Asn
 Phe Glu Ser Asn₂₆₀ Gly Asn Phe Ile Ala₂₆₅ Pro Glu Tyr Ala Tyr₂₇₀ Lys Ile
 Val Lys Lys₂₇₅ Gly Asp Ser Thr Ile₂₈₀ Met Lys Ser Glu Leu₂₈₅ Glu Tyr Gly
 Asn Cys₂₉₀ Asn Thr Lys Cys Gln₂₉₅ Thr Pro Met Gly Ala₃₀₀ Ile Asn Ser Ser
 Met₃₀₅ Pro Phe His Asn Ile₃₁₀ His Pro Leu Thr Ile₃₁₅ Gly Glu Cys Pro Lys₃₂₀
 Tyr Val Lys Ser Asn₃₂₅ Arg Leu Val Leu Ala₃₃₀ Thr Gly Leu Arg Asn₃₃₅ Ser
 Pro Gln Arg Glu₃₄₀ Arg Arg Arg Lys Lys₃₄₅ Arg Gly Leu Phe Gly₃₅₀ Ala Ile
 Ala Gly Phe₃₅₅ Ile Glu Gly Gly Trp₃₆₀ Gln Gly Met Val Asp₃₆₅ Gly Trp Tyr
 Gly Tyr₃₇₀ His His Ser Asn Glu₃₇₅ Gln Gly Ser Gly Tyr₃₈₀ Ala Ala Asp Lys
 Glu₃₈₅ Ser Thr Gln Lys Ala₃₉₀ Ile Asp Gly Val Thr₃₉₅ Asn Lys Val Asn Ser₄₀₀
 Ile Ile Asp Lys Met₄₀₅ Asn Thr Gln Phe Glu₄₁₀ Ala Val Gly Arg Glu₄₁₅ Phe
 Asn Asn Leu Glu₄₂₀ Arg Arg Ile Glu Asn₄₂₅ Leu Asn Lys Lys Met₄₃₀ Glu Asp

381698_1.TXT

Gly Phe Leu Asp Val Trp Thr Tyr Asn Ala Glu Leu Leu Val Leu Met
435 440 445

Glu Asn Glu Arg Thr Leu Asp Phe His Asp Ser Asn Val Lys Asn Leu
450 455 460

Tyr Asp Lys Val Arg Leu Gln Leu Arg Asp Asn Ala Lys Glu Leu Gly
465 470 475 480

Asn Gly Cys Phe Glu Phe Tyr His Lys Cys Asp Asn Glu Cys Met Glu
485 490 495

Ser Val Arg Asn Gly Thr Tyr Asp Tyr Pro Gln Tyr Ser Glu Glu Ala
500 505 510

Arg Leu Lys Arg Glu Glu Ile Ser Gly Val Lys Leu Glu Ser Ile Gly
515 520 525

Ile Tyr Gln Ile Leu Ser Ile Tyr Ser Thr Val Ala Ser Ser Leu Ala
530 535 540

Leu Ala Ile Met Val Ala Gly Leu Ser Leu Trp Met Cys Ser Asn Gly
545 550 555 560

Ser Leu Gln Cys Arg Ile Cys Ile
565

<210> 101
<211> 568
<212> PRT
<213> Influenza A virus

<400> 101

Met Glu Lys Ile Val Leu Leu Phe Ala Ile Val Ser Leu Val Lys Ser
1 5 10 15

Asp Gln Ile Cys Ile Gly Tyr His Ala Asn Asn Ser Thr Glu Gln Val
20 25 30

Asp Thr Ile Met Glu Lys Asn Val Thr Val Thr His Ala Gln Asp Ile
35 40 45

Leu Glu Lys Thr His Asn Gly Lys Leu Cys Asp Leu Asp Gly Val Lys
50 55 60

Pro Leu Ile Leu Arg Asp Cys Ser Val Ala Gly Trp Leu Leu Gly Asn
65 70 75 80

Pro Met Cys Asp Glu Phe Ile Asn Val Pro Glu Trp Ser Tyr Ile Val
85 90 95

Glu Lys Ala Asn Pro Val Asn Asp Leu Cys Tyr Pro Gly Asp Phe Asn
100 105 110

381698_1.TXT

Asp Tyr Glu Glu Leu Lys His Leu Leu Ser Arg Ile Asn His Phe Glu
 115 120 125
 Lys Ile Gln Ile Ile Pro Lys Ser Ser Trp Ser Ser His Glu Ala Ser
 130 135 140
 Leu Gly Val Ser Ser Ala Cys Pro Tyr Gln Gly Lys Ser Ser Phe Phe
 145 150 155 160
 Arg Asn Val Val Trp Leu Ile Lys Lys Asn Ser Thr Tyr Pro Thr Ile
 165 170 175
 Lys Arg Ser Tyr Asn Asn Thr Asn Gln Glu Asp Leu Leu Val Leu Trp
 180 185 190
 Gly Ile His His Pro Asn Asp Ala Ala Glu Gln Thr Lys Leu Tyr Gln
 195 200 205
 Asn Pro Thr Thr Tyr Ile Ser Val Gly Thr Ser Thr Leu Asn Gln Arg
 210 215 220
 Leu Val Pro Arg Ile Ala Thr Arg Ser Lys Val Asn Gly Gln Ser Gly
 225 230 235 240
 Arg Met Glu Phe Phe Trp Thr Ile Leu Lys Pro Asn Asp Ala Ile Asn
 245 250 255
 Phe Glu Ser Asn Gly Asn Phe Ile Ala Pro Glu Tyr Ala Tyr Lys Ile
 260 265 270
 Val Lys Lys Gly Asp Ser Thr Ile Met Lys Ser Glu Leu Glu Tyr Gly
 275 280 285
 Asn Cys Asn Thr Lys Cys Gln Thr Pro Met Gly Ala Ile Asn Ser Ser
 290 295 300
 Met Pro Phe His Asn Ile His Pro Leu Thr Ile Gly Glu Cys Pro Lys
 305 310 315 320
 Tyr Val Lys Ser Asn Arg Leu Val Leu Ala Thr Gly Leu Arg Asn Ser
 325 330 335
 Pro Gln Arg Glu Arg Arg Arg Lys Lys Arg Gly Leu Phe Gly Ala Ile
 340 345 350
 Ala Gly Phe Ile Glu Gly Gly Trp Gln Gly Met Val Asp Gly Trp Tyr
 355 360 365
 Gly Tyr His His Ser Asn Glu Gln Gly Ser Gly Tyr Ala Ala Asp Lys
 370 375 380

381698_1.TXT

Glu Ser Thr Gln Lys Ala Ile Asp Gly Val Thr Asn Lys Val Asn Ser
385 390 395 400

Ile Ile Asp Lys Met Asn Thr Gln Phe Glu Ala Val Gly Arg Glu Phe
405 410 415

Asn Asn Leu Glu Arg Arg Ile Glu Asn Leu Asn Lys Lys Met Glu Asp
420 425 430

Gly Phe Leu Asp Val Trp Thr Tyr Asn Ala Glu Leu Leu Val Leu Met
435 440 445

Glu Asn Glu Arg Thr Leu Asp Phe His Asp Ser Asn Val Lys Asn Leu
450 455 460

Tyr Asp Lys Val Arg Leu Gln Leu Arg Asp Asn Ala Lys Glu Leu Gly
465 470 475 480

Asn Gly Cys Phe Glu Phe Tyr His Lys Cys Asp Asn Glu Cys Met Glu
485 490 495

Ser Val Arg Asn Gly Thr Tyr Asp Tyr Pro Gln Tyr Ser Glu Glu Ala
500 505 510

Arg Leu Lys Arg Glu Glu Ile Ser Gly Val Lys Leu Glu Ser Ile Gly
515 520 525

Ile Tyr Gln Ile Leu Ser Ile Tyr Ser Thr Val Ala Ser Ser Leu Ala
530 535 540

Leu Ala Ile Met Val Ala Gly Leu Ser Leu Trp Met Cys Ser Asn Gly
545 550 555 560

Ser Leu Gln Cys Arg Ile Cys Ile
565

<210> 102
<211> 568
<212> PRT
<213> Influenza A virus

<400> 102

Met Glu Lys Ile Val Leu Leu Leu Ala Ile Val Ser Leu Val Lys Ser
1 5 10 15

Asp Gln Ile Cys Ile Gly Tyr His Ala Asn Asn Ser Thr Glu Gln Val
20 25 30

Asp Thr Ile Met Glu Lys Asn Val Thr Val Thr His Ala Gln Asn Ile
35 40 45

Leu Glu Lys Thr His Asn Gly Lys Leu Cys Asp Leu Asp Gly Val Lys
Page 44

50

55

60

Pro Leu Ile Leu Arg Asp Cys Ser Val Ala Gly Trp Leu Leu Gly Asn
65 70 75 80

Pro Met Cys Asp Glu Phe Ile Asn Val Pro Glu Trp Ser Tyr Ile Val
85 90 95

Glu Lys Ala Asn Pro Ala Asn Asp Leu Cys Tyr Pro Gly Asp Phe Asn
100 105 110

Asp Tyr Glu Glu Leu Lys His Leu Leu Ser Arg Ile Asn His Phe Glu
115 120 125

Lys Ile Gln Ile Ile Pro Lys Ser Ser Trp Ser Asn His Glu Ala Ser
130 135 140

Ser Gly Val Ser Ser Ala Cys Pro Tyr Asn Gly Lys Ser Ser Phe Phe
145 150 155 160

Arg Asn Val Val Trp Leu Ile Lys Lys Asn Ser Ala Tyr Pro Thr Ile
165 170 175

Lys Arg Ser Tyr Asn Asn Thr Asn Gln Glu Asp Leu Leu Ile Leu Trp
180 185 190

Gly Ile His His Pro Asn Asp Ala Ala Glu Gln Thr Arg Leu Tyr Gln
195 200 205

Asn Pro Ile Thr Tyr Ile Ser Val Gly Thr Ser Thr Leu Asn Gln Arg
210 215 220

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

Arg Met Glu Phe Phe Trp Thr Ile Leu Lys Pro Asn Asp Ala Ile Asn
245 250 255

Phe Glu Ser Asn Gly Asn Phe Ile Ala Pro Glu Tyr Ala Tyr Lys Ile
260 265 270

Val Lys Lys Gly Asp Ser Ala Ile Met Lys Ser Glu Leu Glu Tyr Gly
275 280 285

Asn Cys Asn Thr Lys Cys Gln Thr Pro Met Gly Ala Ile Asn Ser Ser
290 295 300

Met Pro Phe His Asn Ile His Pro Leu Thr Ile Gly Glu Cys Pro Lys
305 310 315 320

Tyr Val Lys Ser Asn Arg Leu Val Leu Ala Thr Gly Leu Arg Asn Thr
325 330 335

381698_1.TXT

Pro Gln Arg Glu Arg Arg Arg Lys Lys Arg Gly Leu Phe Gly Ala Ile
340 345 350

Ala Gly Phe Ile Glu Gly Gly Trp Gln Gly Met Val Asp Gly Trp Tyr
355 360 365

Gly Tyr His His Ser Asn Glu Gln Gly Ser Gly Tyr Ala Ala Asp Lys
370 375 380

Glu Ser Thr Gln Lys Ala Ile Asp Gly Val Thr Asn Lys Val Asn Ser
385 390 395 400

Ile Ile Gly Lys Met Asn Thr Gln Phe Glu Ala Val Gly Arg Glu Phe
405 410 415

Asn Asn Leu Glu Arg Arg Ile Glu Asn Leu Asn Lys Lys Met Glu Asp
420 425 430

Gly Phe Leu Asp Val Trp Thr Tyr Asn Ala Glu Leu Leu Val Leu Met
435 440 445

Glu Asn Glu Arg Thr Leu Asp Phe His Asp Ser Asn Val Lys Asn Leu
450 455 460

Tyr Asp Lys Val Arg Leu Gln Leu Arg Asp Asn Ala Lys Glu Leu Gly
465 470 475 480

Asn Gly Cys Phe Glu Phe Tyr His Lys Cys Asp Asn Glu Cys Met Glu
485 490 495

Ser Val Lys Asn Gly Thr Tyr Asp Tyr Pro Arg Tyr Ser Glu Glu Ala
500 505 510

Arg Leu Asn Arg Glu Glu Ile Ser Gly Val Lys Leu Glu Ser Met Gly
515 520 525

Thr Tyr Gln Ile Leu Ser Ile Tyr Ser Thr Val Ala Ser Ser Leu Ala
530 535 540

Leu Ala Ile Met Val Ala Gly Leu Ser Leu Trp Met Cys Ser Asn Gly
545 550 555 560

Ser Leu Gln Cys Arg Ile Cys Ile
565

<210> 103
<211> 568
<212> PRT
<213> Influenza A virus
<400> 103

381698_1.TXT

Met Glu Lys Ile Val Leu Leu Phe Ala Ile Val Ser Leu Val Lys Ser
 1 5 10 15
 Asp Gln Ile Cys Ile Gly Tyr His Ala Asn Asn Ser Thr Glu Gln Val
 20 25 30
 Asp Thr Ile Met Glu Lys Asn Val Thr Val Thr His Ala Gln Asp Ile
 35 40 45
 Leu Glu Lys Thr His Asn Gly Lys Leu Cys Asp Leu Asp Gly Val Lys
 50 55 60
 Pro Leu Ile Leu Arg Asp Cys Ser Val Ala Gly Trp Leu Leu Gly Asn
 65 70 75 80
 Pro Met Cys Asp Glu Phe Ile Asn Val Pro Glu Trp Ser Tyr Ile Val
 85 90 95
 Glu Lys Ala Asn Pro Val Asn Asp Leu Cys Tyr Pro Gly Asp Phe Asn
 100 105 110
 Asp Tyr Glu Glu Leu Lys His Leu Leu Ser Arg Ile Asn His Phe Glu
 115 120 125
 Lys Ile Gln Ile Ile Pro Lys Ser Ser Trp Ser Ser His Glu Ala Ser
 130 135 140
 Leu Gly Val Ser Ser Ala Cys Pro Tyr Gln Gly Lys Pro Ser Phe Phe
 145 150 155 160
 Arg Asn Val Val Trp Leu Ile Lys Lys Asn Ser Thr Tyr Pro Thr Ile
 165 170 175
 Lys Arg Ser Tyr Asn Asn Thr Asn Gln Glu Asp Leu Val Val Leu Trp
 180 185 190
 Gly Ile His His Pro Asn Asp Ala Ala Glu Gln Thr Lys Leu Tyr Gln
 195 200 205
 Asn Pro Thr Thr Tyr Ile Ser Val Gly Thr Ser Thr Leu Asn Gln Arg
 210 215 220
 Leu Val Pro Arg Ile Ala Thr Arg Ser Lys Val Asn Gly Gln Ser Gly
 225 230 235 240
 Arg Met Glu Phe Phe Trp Thr Ile Leu Lys Pro Asn Asp Ala Ile Asn
 245 250 255
 Phe Glu Ser Asn Gly Asn Phe Ile Ala Pro Glu Tyr Ala Tyr Lys Ile
 260 265 270
 Val Lys Lys Gly Asp Ser Thr Ile Met Lys Ser Glu Leu Glu Tyr Gly
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275

280

285

Asn Cys Asn Thr Lys Cys Gln Thr Pro Met Gly Ala Ile Asn Ser Ser
 290 295 300
 Met Pro Phe His Asn Ile His Pro Leu Thr Ile Gly Glu Cys Pro Lys
 305 310 315 320
 Tyr Val Lys Ser Asn Arg Leu Val Leu Ala Thr Gly Leu Arg Asn Ser
 325 330 335
 Pro Gln Arg Glu Lys Arg Arg Lys Lys Arg Gly Leu Phe Gly Ala Ile
 340 345 350
 Ala Gly Phe Ile Glu Gly Gly Trp Gln Gly Met Val Asp Gly Trp Tyr
 355 360 365
 Gly Tyr His His Ser Asn Lys Gln Gly Ser Gly Tyr Ala Ala Asp Lys
 370 375 380
 Glu Ser Thr Gln Lys Ala Ile Asp Gly Val Thr Asn Lys Val Asn Ser
 385 390 395 400
 Ile Ile Asp Lys Met Asn Thr Gln Phe Glu Ala Val Gly Arg Glu Phe
 405 410 415
 Asn Asn Leu Glu Arg Arg Ile Glu Asn Leu Asn Lys Lys Met Glu Asp
 420 425 430
 Gly Phe Leu Asp Val Trp Thr Tyr Asn Ala Glu Leu Leu Val Leu Met
 435 440 445
 Glu Asn Glu Arg Thr Leu Asp Phe His Asp Ser Asn Val Lys Asn Leu
 450 455 460
 Tyr Asp Lys Val Arg Leu Gln Leu Arg Asp Asn Ala Lys Glu Leu Gly
 465 470 475 480
 Asn Gly Cys Phe Glu Phe Tyr His Lys Cys Asp Asn Glu Cys Met Glu
 485 490 495
 Ser Val Arg Asn Gly Thr Tyr Asp Tyr Pro Gln Tyr Ser Glu Glu Ala
 500 505 510
 Arg Leu Lys Arg Glu Glu Ile Ser Gly Val Lys Leu Glu Ser Ile Gly
 515 520 525
 Ile Tyr Gln Ile Leu Ser Ile Tyr Ser Thr Val Ala Ser Ser Leu Ala
 530 535 540
 Leu Ala Ile Met Val Ala Gly Leu Ser Leu Trp Met Cys Ser Asn Gly
 545 550 555 560

Ser Leu Gln Cys Arg Ile Cys Ile
565

<210> 104
<211> 568
<212> PRT
<213> Influenza A virus

<400> 104

Met Glu Lys Thr Val Leu Leu Leu Ala Ile Val Ser Leu Val Lys Ser
1 5 10 15

Asp Gln Ile Cys Ile Gly Tyr His Ala Asn Asn Ser Thr Glu Gln Val
20 25 30

Asp Thr Ile Met Glu Lys Asn Val Thr Val Thr His Ala Gln Asp Ile
35 40 45

Leu Glu Lys Thr His Asn Gly Lys Leu Cys Asp Leu Asn Gly Val Lys
50 55 60

Pro Leu Ile Leu Arg Asp Cys Ser Val Ala Gly Trp Leu Leu Gly Asn
65 70 75 80

Pro Met Cys Asp Glu Phe Thr Asn Val Pro Glu Trp Ser Tyr Ile Val
85 90 95

Glu Lys Ala Ser Pro Ala Asn Asp Leu Cys Tyr Pro Gly Asp Phe Asn
100 105 110

Asp Tyr Glu Glu Leu Lys His Leu Leu Ser Arg Ile Asn His Phe Glu
115 120 125

Lys Ile Gln Ile Ile Pro Lys Ser Ser Trp Ser Asn His Asp Ala Ser
130 135 140

Ser Gly Val Ser Ser Ala Cys Pro Tyr His Gly Arg Ser Ser Phe Phe
145 150 155 160

Arg Asn Val Val Trp Leu Ile Lys Lys Asn Ser Thr Tyr Pro Thr Ile
165 170 175

Lys Arg Ser Tyr Asn Asn Thr Asn Gln Glu Asp Leu Leu Val Leu Trp
180 185 190

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

Asn Pro Thr Thr Tyr Ile Ser Val Gly Thr Ser Thr Leu Asn Gln Arg
210 215 220

381698_1.TXT

Leu Val Pro Glu Ile Ala Thr Arg Pro Lys Val Asn Gly Gln Ser Gly
 225 230 235 240
 Arg Met Glu Phe Phe Trp Thr Ile Leu Lys Pro Asn Asp Ala Ile Asn
 245 250 255
 Phe Glu Ser Asn Gly Asn Phe Ile Ala Pro Glu Tyr Ala Tyr Lys Ile
 260 265 270
 Val Lys Lys Gly Asp Ser Ala Ile Met Lys Ser Glu Leu Glu Tyr Gly
 275 280 285
 Asn Cys Asn Thr Lys Cys Gln Thr Pro Met Gly Ala Ile Asn Ser Ser
 290 295 300
 Met Pro Phe His Asn Ile His Pro Leu Thr Ile Gly Glu Cys Pro Lys
 305 310 315 320
 Tyr Val Lys Ser Asn Arg Leu Val Leu Ala Thr Gly Leu Arg Asn Thr
 325 330 335
 Pro Gln Arg Glu Arg Arg Arg Lys Lys Arg Gly Leu Phe Gly Ala Ile
 340 345 350
 Ala Gly Phe Ile Glu Gly Gly Trp Gln Gly Met Val Asp Gly Trp Tyr
 355 360 365
 Gly Tyr His His Ser Asn Glu Gln Gly Ser Gly Tyr Ala Ala Asp Lys
 370 375 380
 Glu Ser Thr Gln Lys Ala Ile Asp Gly Val Thr Asn Lys Val Asn Ser
 385 390 395 400
 Ile Ile Asp Lys Met Asn Thr Gln Phe Glu Ala Val Gly Arg Glu Phe
 405 410 415
 Asn Asn Leu Glu Arg Arg Ile Glu Ser Leu Asn Lys Lys Met Glu Asp
 420 425 430
 Gly Phe Leu Asp Val Trp Thr Tyr Asn Ala Glu Leu Leu Val Leu Met
 435 440 445
 Glu Asn Glu Arg Thr Leu Asp Phe His Asp Ser Asn Val Lys Asn Leu
 450 455 460
 Tyr Asp Lys Val Arg Leu Gln Leu Arg Asp Asn Ala Lys Glu Leu Gly
 465 470 475 480
 Asn Gly Cys Phe Glu Phe Tyr His Lys Cys Asp Asn Glu Cys Met Glu
 485 490 495
 Ser Val Lys Asn Gly Thr Tyr Asp Tyr Pro Gln Tyr Ser Glu Glu Ala
 Page 50

500

505

510

Arg Leu Asn Arg Glu Glu Ile Ser Gly Val Lys Leu Glu Ser Met Gly
 515 520 525

Thr Tyr Gln Ile Leu Ser Ile Tyr Ser Thr Val Ala Ser Ser Leu Ala
 530 535 540

Leu Ala Ile Met Val Ala Gly Leu Ser Leu Trp Met Cys Ser Asn Gly
 545 550 555 560

Ser Leu Gln Cys Arg Ile Cys Ile
 565

<210> 105
 <211> 568
 <212> PRT
 <213> Influenza A virus

<400> 105

Met Glu Lys Ile Val Leu Leu Leu Ala Ile Val Ser Leu Val Lys Ser
 1 5 10 15

Asp Gln Ile Cys Ile Gly Tyr His Ala Asn Asn Ser Thr Glu Gln Val
 20 25 30

Asp Thr Ile Met Gln Lys Asn Val Thr Val Thr His Ala Gln Asp Ile
 35 40 45

Leu Glu Lys Thr His Asn Gly Lys Leu Cys Asp Leu Asp Gly Val Lys
 50 55 60

Pro Leu Ile Leu Arg Asp Cys Ser Val Ala Gly Trp Leu Leu Gly Asn
 65 70 75 80

Pro Met Cys Asp Glu Phe Ile Asn Val Pro Glu Trp Ser Tyr Ile Val
 85 90 95

Glu Lys Ala Ser Pro Ala Asn Asp Leu Cys Tyr Pro Gly Asp Phe Asn
 100 105 110

Asp Tyr Glu Glu Leu Lys His Leu Leu Ser Arg Ile Asn His Phe Glu
 115 120 125

Lys Ile Gln Ile Ile Pro Lys Ser Ser Trp Ser Asp His Glu Ala Ser
 130 135 140

Ser Gly Val Ser Ser Ala Cys Pro Tyr Gln Gly Ser Pro Ser Phe Phe
 145 150 155 160

Arg Asn Val Val Trp Leu Ile Lys Lys Asn Ser Ala Tyr Pro Thr Ile
 165 170 175

381698_1.TXT

Lys Arg Ser Tyr Asn Asn Thr Asn Gln Glu Asp Leu Leu Val Leu Trp
 180 185 190
 Gly Ile His His Pro Asn Asp Ala Ala Glu Gln Thr Lys Leu Tyr Gln
 195 200 205
 Asn Pro Thr Thr Tyr Ile Ser Val Gly Thr Ser Thr Leu Asn Gln Arg
 210 215 220
 Leu Val Pro Lys Ile Ala Thr Arg Ser Lys Val Asn Gly Gln Ser Gly
 225 230 235 240
 Arg Met Glu Phe Phe Trp Thr Ile Leu Lys Pro Asn Asp Ala Ile Asn
 245 250 255
 Phe Glu Ser Asn Gly Asn Phe Ile Ala Pro Glu Tyr Ala Tyr Lys Ile
 260 265 270
 Val Lys Lys Gly Asp Ser Ala Ile Met Lys Ser Glu Leu Glu Tyr Gly
 275 280 285
 Asn Cys Asn Thr Lys Cys Gln Thr Pro Met Gly Ala Ile Asn Ser Ser
 290 295 300
 Met Pro Phe His Asn Ile His Pro Leu Thr Ile Gly Glu Cys Pro Lys
 305 310 315 320
 Tyr Val Lys Ser Asn Arg Leu Val Leu Ala Thr Gly Leu Arg Asn Ser
 325 330 335
 Pro Gln Arg Glu Arg Arg Arg Lys Lys Arg Gly Leu Phe Gly Ala Ile
 340 345 350
 Ala Gly Phe Ile Glu Gly Gly Trp Gln Gly Met Val Asp Gly Trp Tyr
 355 360 365
 Gly Tyr His His Ser Asn Glu Gln Gly Ser Gly Tyr Ala Ala Asp Lys
 370 375 380
 Glu Ser Thr Gln Lys Ala Ile Asp Gly Val Thr Asn Lys Val Asn Ser
 385 390 395 400
 Ile Ile Asp Lys Met Asn Thr Gln Phe Glu Ala Val Gly Arg Glu Phe
 405 410 415
 Asn Asn Leu Glu Arg Arg Ile Glu Asn Leu Asn Lys Lys Met Glu Asp
 420 425 430
 Gly Phe Leu Asp Val Trp Thr Tyr Asn Ala Glu Leu Leu Val Leu Met
 435 440 445

381698_1.TXT

Glu Asn Glu Arg Thr Leu Asp Phe His Asp Ser Asn Val Lys Asn Leu
450 455 460

Tyr Glu Lys Val Arg Leu Gln Leu Arg Asp Asn Ala Lys Glu Leu Gly
465 470 475 480

Asn Gly Cys Phe Glu Phe Tyr His Lys Cys Asp Asn Glu Cys Met Glu
485 490 495

Ser Val Lys Asn Gly Thr Tyr Asp Tyr Pro Gln Tyr Ser Glu Glu Ala
500 505 510

Arg Leu Asn Arg Glu Glu Ile Ser Gly Val Lys Leu Glu Ser Ile Gly
515 520 525

Thr Tyr Gln Ile Leu Ser Ile Tyr Ser Thr Val Val Ser Ser Leu Ala
530 535 540

Leu Ala Ile Met Val Ala Gly Leu Ser Leu Trp Met Cys Ser Asn Gly
545 550 555 560

Ser Leu Gln Cys Arg Ile Cys Ile
565

<210> 106
<211> 568
<212> PRT
<213> Influenza A virus

<400> 106

Met Glu Lys Ile Val Leu Leu Leu Ala Ile Val Ser Leu Val Lys Ser
1 5 10 15

Asp Gln Ile Cys Ile Gly Tyr His Ala Asn Asn Ser Thr Glu Gln Val
20 25 30

Asp Thr Ile Met Glu Lys Asn Val Thr Val Thr His Ala Gln Asp Ile
35 40 45

Leu Glu Lys Thr His Asn Gly Lys Leu Cys Asp Leu Asp Gly Val Lys
50 55 60

Pro Leu Ile Leu Arg Asp Cys Ser Val Ala Gly Trp Leu Leu Gly Asn
65 70 75 80

Pro Met Cys Asp Glu Phe Ile Asn Val Pro Glu Trp Ser Tyr Ile Val
85 90 95

Glu Lys Ala Ser Pro Ala Asn Asp Leu Cys Tyr Pro Gly Asp Phe Asn
100 105 110

Asp Tyr Glu Glu Leu Lys His Leu Leu Ser Arg Ile Asn His Phe Glu
115 120 125

381698_1.TXT

Lys Ile Arg Ile Ile Pro Lys Ser Ser Trp Ser Asn His Asp Ala Ser
 130 135 140
 Ser Gly Val Ser Ser Ala Cys Pro Tyr Gln Gly Lys Pro Ser Phe Phe
 145 150 155 160
 Arg Asn Val Val Trp Leu Ile Lys Lys Asn Ser Thr Tyr Pro Thr Ile
 165 170 175
 Lys Arg Ser Tyr Asn Asn Thr Asn Pro Glu Asp Leu Leu Val Leu Trp
 180 185 190
 Gly Ile His His Pro Asn Asp Ala Ala Glu Gln Ile Lys Leu Tyr Gln
 195 200 205
 Asn Pro Thr Thr Tyr Ile Ser Val Gly Thr Ser Thr Leu Asn Gln Arg
 210 215 220
 Leu Val Pro Lys Ile Ala Thr Arg Ser Lys Val Asn Gly Gln Ser Gly
 225 230 235 240
 Arg Met Glu Phe Phe Trp Thr Ile Leu Lys Pro Asn Asp Ala Ile Asn
 245 250 255
 Phe Glu Ser Asn Gly Asn Phe Ile Ala Pro Glu Tyr Ala Tyr Lys Ile
 260 265 270
 Val Lys Lys Gly Asp Ser Ala Ile Met Lys Ser Glu Leu Glu Tyr Gly
 275 280 285
 Asn Cys Asn Thr Lys Cys Gln Thr Pro Met Gly Ala Ile Asn Ser Ser
 290 295 300
 Met Pro Phe His Asn Ile His Pro Leu Thr Ile Gly Glu Cys Pro Lys
 305 310 315 320
 Tyr Val Lys Ser Asn Arg Leu Val Leu Ala Thr Gly Leu Arg Asn Ser
 325 330 335
 Pro Gln Arg Glu Gly Arg Arg Lys Lys Arg Gly Leu Phe Gly Ala Ile
 340 345 350
 Ala Gly Phe Ile Glu Gly Gly Trp Gln Gly Met Val Asp Gly Trp Tyr
 355 360 365
 Gly Tyr His His Ser Asn Glu Gln Gly Ser Gly Tyr Ala Ala Asp Lys
 370 375 380
 Glu Ser Thr Gln Lys Ala Ile Asp Gly Val Thr Asn Lys Val Asn Ser
 385 390 395 400

381698_1.TXT

Ile Ile Asp Lys Met Asn Thr Gln Phe Glu Ala Val Gly Arg Glu Phe
405 410 415

Asn Asn Leu Glu Arg Arg Ile Glu Asn Leu Asn Lys Lys Met Glu Asp
420 425 430

Gly Phe Leu Asp Val Trp Thr Tyr Asn Ala Glu Leu Leu Val Leu Met
435 440 445

Glu Asn Glu Arg Thr Leu Asp Phe His Asp Ser Asn Val Lys Asn Leu
450 455 460

Tyr Glu Lys Val Arg Leu Gln Leu Arg Asp Asn Ala Lys Glu Leu Gly
465 470 475 480

Asn Gly Cys Phe Glu Phe Tyr His Lys Cys Asp Asn Glu Cys Met Glu
485 490 495

Ser Val Lys Asn Gly Thr Tyr Asp Tyr Pro Gln Tyr Thr Glu Glu Ala
500 505 510

Arg Leu Asn Arg Glu Glu Ile Ser Gly Val Lys Leu Glu Ser Ile Gly
515 520 525

Thr Tyr Gln Ile Leu Ser Ile Tyr Ser Thr Val Val Ser Ser Leu Ala
530 535 540

Leu Ala Ile Met Val Ala Gly Leu Ser Leu Trp Met Cys Ser Asn Gly
545 550 555 560

Ser Leu Gln Cys Arg Ile Cys Ile
565

<210> 107
<211> 8
<212> PRT
<213> Nocardia aerocolonigenes

<400> 107

Leu Ala Thr Ser Asp Thr Glu Asp
1 5

<210> 108
<211> 568
<212> PRT
<213> Influenza A virus

<400> 108

Met Glu Lys Ile Val Leu Leu Leu Ala Ile Val Ser Leu Val Lys Ser
1 5 10 15

Asp Gln Ile Cys Ile Gly Tyr His Ala Asn Asn Ser Thr Glu Gln Val
20 25 30

381698_1.TXT

Asp Thr Ile Met Glu Lys Asn Val Thr Val Thr His Ala Gln Asp Ile
 35 40 45
 Leu Glu Lys Thr His Asn Gly Lys Leu Cys Asp Leu Asp Gly Val Lys
 50 55 60
 Pro Leu Ile Leu Lys Asp Cys Ser Val Ala Gly Trp Leu Leu Gly Asn
 65 70 75 80
 Pro Met Cys Asp Glu Phe Ile Asn Val Pro Glu Trp Ser Tyr Ile Val
 85 90 95
 Glu Lys Ala Ser Pro Ala Asn Asp Leu Cys Tyr Pro Gly Asp Phe Asn
 100 105 110
 Asp Tyr Glu Glu Leu Lys His Leu Leu Ser Arg Ile Asn His Phe Glu
 115 120 125
 Lys Ile Gln Ile Ile Pro Lys Ser Ser Trp Ser Asp His Glu Ala Ser
 130 135 140
 Ser Gly Val Ser Ser Ala Cys Pro Tyr Leu Gly Lys Pro Ser Phe Phe
 145 150 155 160
 Arg Asn Val Val Trp Leu Ile Lys Lys Asn Ser Thr Tyr Pro Thr Ile
 165 170 175
 Lys Arg Gly Tyr Asn Asn Thr Asn Gln Glu Asp Leu Leu Val Leu Trp
 180 185 190
 Gly Ile His His Pro Asn Asp Ala Ala Glu Gln Ile Lys Leu Tyr Gln
 195 200 205
 Asn Pro Thr Thr Tyr Ile Ser Val Gly Thr Ser Thr Leu Asn Gln Arg
 210 215 220
 Leu Val Pro Lys Ile Ala Thr Arg Ser Lys Val Asn Gly Gln Ser Gly
 225 230 235 240
 Arg Met Glu Phe Phe Trp Thr Ile Leu Lys Pro Asn Asp Ala Ile Asn
 245 250 255
 Phe Glu Ser Asn Gly Asn Phe Ile Ala Pro Glu Tyr Ala Tyr Lys Ile
 260 265 270
 Val Lys Lys Gly Asp Ser Ala Ile Met Lys Ser Glu Leu Glu Tyr Gly
 275 280 285
 Asn Cys Asn Thr Lys Cys Gln Thr Pro Val Gly Ala Ile Asn Ser Ser
 290 295 300

381698_1.TXT

Met Pro Phe His Asn Ile His Pro Leu Thr Ile Gly Glu Cys Pro Lys
 305 310 315 320
 Tyr Val Lys Ser Asn Arg Leu Val Leu Ala Thr Gly Leu Arg Asn Ala
 325 330 335
 Pro Gln Arg Glu Gly Arg Arg Lys Lys Arg Gly Leu Phe Gly Ala Ile
 340 345 350
 Ala Gly Phe Ile Glu Gly Gly Trp Gln Gly Met Val Asp Gly Trp Tyr
 355 360 365
 Gly Tyr His His Ser Asn Glu Gln Gly Ser Gly Tyr Ala Ala Asp Lys
 370 375 380
 Glu Ser Thr Gln Lys Ala Ile Asp Gly Val Thr Asn Lys Val Asn Ser
 385 390 395 400
 Ile Ile Asp Lys Met Asn Thr Gln Phe Glu Ala Val Gly Arg Glu Phe
 405 410 415
 Asn Asn Leu Glu Arg Arg Ile Glu Asn Leu Asn Lys Lys Met Glu Asp
 420 425 430
 Gly Phe Leu Asp Val Trp Thr Tyr Asn Ala Glu Leu Leu Val Leu Met
 435 440 445
 Glu Asn Glu Arg Thr Leu Asp Phe His Asp Ser Asn Val Lys Asn Leu
 450 455 460
 Tyr Glu Lys Val Arg Leu Gln Leu Arg Asp Asn Ala Lys Glu Leu Gly
 465 470 475 480
 Asn Gly Cys Phe Glu Phe Tyr His Lys Cys Asp Asn Glu Cys Met Glu
 485 490 495
 Ser Val Lys Asn Gly Thr Tyr Asp Tyr Arg Leu Asp Ser Glu Glu Ala
 500 505 510
 Arg Leu Asn Arg Glu Glu Ile Ser Gly Val Lys Leu Glu Ser Ile Gly
 515 520 525
 Thr Tyr Gln Ile Leu Ser Ile Tyr Ser Thr Val Ala Ser Ser Leu Ala
 530 535 540
 Leu Ala Ile Met Val Ala Gly Leu Ser Leu Trp Met Cys Ser Asn Gly
 545 550 555 560
 Ser Leu Gln Cys Arg Ile Cys Ile
 565

<210> 109
 <211> 568
 <212> PRT
 <213> Influenza A virus

<400> 109

Met Glu Lys Ile Val Leu Leu Arg Ala Met Ile Asn Leu Val Lys Ser
 1 5 10 15

Asp Gln Ile Gly Val Gly Tyr His Ala Asp Tyr Ser Thr Glu Gln Gly
 20 25 30

Asp Thr Ile Met Glu Lys Asn Val Thr Val Thr His Ala Gln Asp Ile
 35 40 45

Leu Glu Lys Thr His Asn Gly Lys Leu Cys Asp Leu Asp Gly Val Lys
 50 55 60

Pro Leu Ile Leu Lys Asp Cys Ser Val Ala Gly Trp Leu Leu Gly Asn
 65 70 75 80

Pro Met Cys Asp Glu Phe Ile Asn Val Pro Glu Trp Ser Tyr Ile Val
 85 90 95

Glu Lys Ala Ser Pro Ala Asn Asp Leu Cys Tyr Pro Gly Asp Phe Asn
 100 105 110

Asp Tyr Glu Glu Leu Lys His Leu Leu Ser Arg Ile Asn His Phe Glu
 115 120 125

Lys Ile Gln Ile Ile Pro Lys Ser Ser Trp Ser Asp His Glu Ala Ser
 130 135 140

Ser Gly Val Ser Ser Ala Cys Pro Tyr Leu Gly Lys Pro Ser Phe Phe
 145 150 155 160

Arg Asn Val Val Trp Leu Ile Lys Lys Asn Ser Thr Tyr Pro Thr Ile
 165 170 175

Lys Arg Gly Tyr Asn Asn Thr Asn Pro Glu Asp Leu Leu Val Leu Trp
 180 185 190

Gly Ile His His Pro Asn Asp Ala Ala Glu Gln Ile Lys Leu Tyr Gln
 195 200 205

Asn Pro Thr Thr Tyr Ile Ser Val Gly Thr Ser Thr Leu Asn Gln Arg
 210 215 220

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

Arg Met Glu Phe Phe Trp Thr Ile Leu Lys Pro Asn Asp Ala Ile Asn
 245 250 255

381698_1.TXT

Phe Glu Ser Asn Gly Asn Phe Ile Ala Pro Glu Tyr Ala Tyr Gln Ile
 260 265 270
 Val Lys Lys Gly Asp Ser Ala Ile Met Lys Ser Glu Leu Glu Tyr Gly
 275 280 285
 Asn Cys Asn Thr Lys Cys Gln Thr Pro Met Gly Ala Ile Asn Ser Ser
 290 295 300
 Met Pro Phe His Asn Ile His Pro Leu Thr Ile Gly Glu Cys Pro Lys
 305 310 315 320
 Tyr Val Lys Ser Asn Arg Leu Val Leu Ala Thr Gly Leu Arg Asn Ser
 325 330 335
 Pro Gln Arg Glu Arg Arg Arg Lys Lys Arg Gly Leu Phe Gly Ala Ile
 340 345 350
 Ala Gly Phe Ile Glu Gly Gly Trp Gln Gly Met Val Asp Gly Trp Tyr
 355 360 365
 Gly Tyr His His Ser Asn Glu Gln Gly Ser Gly Tyr Ala Ala Asp Lys
 370 375 380
 Glu Ser Thr Gln Lys Ala Ile Asp Gly Val Thr Asn Lys Val Asn Ser
 385 390 395 400
 Ile Ile Asp Lys Met Asn Thr Gln Phe Glu Ala Val Gly Arg Glu Phe
 405 410 415
 Asn Asn Leu Glu Arg Arg Ile Glu Asn Leu Asn Lys Lys Met Glu Asp
 420 425 430
 Gly Phe Leu Asp Val Trp Thr Tyr Asn Ala Glu Leu Leu Val Leu Met
 435 440 445
 Glu Asn Glu Arg Thr Leu Asp Phe His Asp Ser Asn Val Lys Asn Leu
 450 455 460
 Tyr Glu Lys Val Arg Leu Gln Leu Arg Asp Asn Ala Lys Glu Leu Gly
 465 470 475 480
 Asn Gly Cys Phe Glu Phe Tyr His Lys Cys Asp Asn Glu Cys Met Glu
 485 490 495
 Ser Val Lys Asn Gly Thr Tyr Asp Tyr Pro Gln Tyr Ser Glu Glu Ala
 500 505 510
 Arg Leu Asn Arg Glu Glu Ile Ser Gly Val Lys Leu Glu Ser Ile Gly
 515 520 525

381698_1.TXT

Thr Tyr Gln Ile Leu Ser Ile Tyr Ser Thr Val Ala Ser Ser Leu Ala
530 535 540

Leu Ala Ile Met Val Ala Gly Leu Ser Leu Trp Met Cys Ser Asn Gly
545 550 555 560

Ser Leu Gln Cys Arg Ile Cys Ile
565

<210> 110
<211> 568
<212> PRT
<213> Influenza A virus

<400> 110

Met Glu Lys Ile Val Leu Leu Leu Ala Ile Val Ser Leu Val Lys Ser
1 5 10 15

Asp Gln Ile Cys Ile Gly Tyr His Ala Asn Asn Ser Thr Glu Gln Val
20 25 30

Asp Thr Ile Met Glu Lys Asn Val Thr Val Thr His Ala Gln Asp Val
35 40 45

Leu Asp Lys Thr His Asn Gly Lys Leu Cys Glu Leu Asp Gly Val Lys
50 55 60

Pro Leu Ile Leu Arg Asp Cys Ser Val Ala Gly Trp Leu Leu Gly Asn
65 70 75 80

Pro Met Cys Asp Glu Phe Ile Asn Val Pro Glu Trp Ser Tyr Ile Val
85 90 95

Glu Lys Ala Ser Pro Ala Asn Asp Leu Cys Tyr Pro Gly Asp Phe Asn
100 105 110

Asp Tyr Glu Glu Leu Lys His Leu Leu Ser Arg Ile Asn His Phe Glu
115 120 125

Lys Ile Gln Ile Ile Pro Lys Ser Ser Trp Ser Asp His Glu Ala Ser
130 135 140

Ser Gly Val Ser Ser Ala Cys Pro Tyr Gln Gly Asn Pro Ser Phe Phe
145 150 155 160

Arg Asn Val Val Trp Leu Ile Lys Lys Asn Ser Ala Tyr Pro Thr Ile
165 170 175

Lys Arg Ser Tyr Asn Asn Thr Asn Gln Ala Asp Leu Leu Val Leu Trp
180 185 190

Gly Ile His His Pro Asn Asp Ala Ala Glu Gln Thr Lys Leu Tyr Gln

195

200

205

Asn Pro Thr Thr Tyr Ile Ser Val Gly Thr Ser Thr Leu Asn Gln Arg
 210 215 220
 Leu Val Pro Lys Ile Ala Thr Arg Ser Lys Val Asn Gly Gln Ser Gly
 225 230 235 240
 Arg Met Glu Phe Phe Trp Thr Ile Leu Lys Pro Asn Asp Ala Ile Asn
 245 250 255
 Phe Glu Ser Asn Gly Asn Phe Ile Ala Pro Glu Tyr Ala Tyr Lys Ile
 260 265 270
 Val Lys Lys Gly Asp Ser Ala Ile Met Lys Ser Glu Leu Glu Tyr Gly
 275 280 285
 Asn Cys Asn Thr Lys Cys Gln Thr Pro Met Gly Ala Ile Asn Ser Ser
 290 295 300
 Met Pro Phe His Asn Ile His Pro Leu Thr Ile Gly Glu Cys Pro Lys
 305 310 315 320
 Tyr Val Lys Ser Asn Arg Leu Val Leu Ala Thr Gly Leu Arg Asn Ser
 325 330 335
 Pro Gln Arg Glu Arg Arg Arg Lys Lys Arg Gly Leu Phe Gly Ala Ile
 340 345 350
 Ala Gly Phe Ile Glu Gly Gly Trp Gln Gly Met Val Asp Gly Trp Tyr
 355 360 365
 Gly Tyr His His Ser Asn Glu Gln Gly Ser Gly Tyr Ala Ala Asp Lys
 370 375 380
 Glu Ser Thr Gln Lys Ala Ile Asp Gly Val Thr Asn Lys Val Asn Ser
 385 390 395 400
 Ile Ile Asp Lys Met Asn Thr Gln Phe Glu Ala Val Gly Arg Glu Phe
 405 410 415
 Asn Asn Leu Glu Arg Arg Ile Glu Asn Leu Asn Lys Lys Met Glu Asp
 420 425 430
 Gly Phe Leu Asp Val Trp Thr Tyr Asn Ala Glu Leu Leu Val Leu Met
 435 440 445
 Glu Asn Glu Arg Thr Leu Asp Phe His Asp Ser Asn Val Lys Asn Leu
 450 455 460
 Tyr Glu Lys Val Arg Leu Gln Leu Arg Asp Asn Ala Lys Glu Leu Gly
 465 470 475 480

381698_1.TXT

Asn Gly Cys Phe Glu Phe Tyr His Lys Cys Asp Asn Glu Cys Met Glu
485 490 495

Ser Val Arg Asn Gly Thr Tyr Asp Tyr Pro Gln Tyr Ser Glu Glu Ala
500 505 510

Arg Leu Asn Arg Glu Glu Ile Ser Gly Val Lys Leu Glu Ser Ile Gly
515 520 525

Thr Tyr Gln Ile Leu Ser Ile Tyr Ser Thr Val Ala Ser Ser Leu Ala
530 535 540

Leu Ala Ile Met Val Ala Gly Leu Ser Leu Trp Met Cys Ser Asn Gly
545 550 555 560

Ser Leu Gln Cys Arg Ile Cys Ile
565

<210> 111
<211> 568
<212> PRT
<213> Influenza A virus
<400> 111

Met Glu Lys Ile Val Leu Leu Phe Ala Ile Val Ser Leu Val Lys Ser
1 5 10 15

Asp Gln Ile Cys Ile Gly Tyr His Ala Asn Asn Ser Thr Glu Gln Val
20 25 30

Asp Thr Ile Met Glu Lys Asn Val Thr Val Thr His Ala Gln Asp Ile
35 40 45

Leu Glu Lys Thr His Asn Gly Lys Leu Cys Asp Leu Asp Gly Val Lys
50 55 60

Pro Leu Ile Leu Arg Asp Cys Ser Val Ala Gly Trp Leu Leu Gly Asn
65 70 75 80

Pro Met Cys Asp Glu Phe Ile Asn Val Pro Glu Trp Ser Tyr Ile Val
85 90 95

Glu Lys Ala Asn Pro Val Asn Asp Leu Cys Tyr Pro Gly Asp Phe Asn
100 105 110

Asp Tyr Glu Glu Leu Lys His Leu Leu Ser Arg Ile Asn His Phe Glu
115 120 125

Lys Ile Gln Ile Ile Pro Lys Ser Ser Trp Ser Ser His Glu Ala Ser
130 135 140

381698_1.TXT

Leu Gly Val Ser Ser Ala Cys Pro Tyr Gln Gly Lys Ser Ser Phe Phe
 145 150 155 160
 Arg Asn Val Val Trp Leu Ile Lys Lys Asn Ser Thr Tyr Pro Thr Ile
 165 170 175
 Lys Arg Ser Tyr Asn Asn Thr Asn Gln Glu Asp Leu Leu Val Leu Trp
 180 185 190
 Gly Ile His His Pro Asn Asp Ala Ala Glu Gln Thr Lys Leu Tyr Gln
 195 200 205
 Asn Pro Thr Thr Tyr Ile Ser Val Gly Thr Ser Thr Leu Asn Gln Arg
 210 215 220
 Leu Val Pro Arg Ile Ala Thr Arg Ser Lys Val Asn Gly Gln Ser Gly
 225 230 235 240
 Arg Met Glu Phe Phe Trp Thr Ile Leu Lys Pro Asn Asp Ala Ile Asn
 245 250 255
 Phe Glu Ser Asn Gly Asn Phe Ile Ala Pro Glu Tyr Ala Tyr Lys Ile
 260 265 270
 Val Lys Lys Gly Asp Ser Ala Ile Met Lys Ser Glu Leu Glu Tyr Gly
 275 280 285
 Asn Cys Asn Thr Lys Cys Gln Thr Pro Met Gly Ala Ile Asn Ser Ser
 290 295 300
 Met Pro Phe His Asn Ile His Pro Leu Thr Ile Gly Glu Cys Pro Lys
 305 310 315 320
 Tyr Val Lys Ser Asn Arg Leu Val Leu Ala Thr Gly Leu Arg Asn Ser
 325 330 335
 Pro Gln Arg Glu Arg Arg Arg Lys Lys Arg Gly Leu Phe Gly Ala Ile
 340 345 350
 Ala Gly Phe Ile Glu Gly Gly Trp Gln Gly Met Val Asp Gly Trp Tyr
 355 360 365
 Gly Tyr His His Ser Asn Glu Gln Gly Ser Gly Tyr Ala Ala Asp Lys
 370 375 380
 Glu Ser Thr Gln Lys Ala Ile Asp Gly Val Thr Asn Lys Val Asn Ser
 385 390 395 400
 Ile Ile Asp Lys Met Asn Thr Gln Phe Glu Ala Val Gly Arg Glu Phe
 405 410 415
 Asn Asn Leu Glu Arg Arg Ile Glu Asn Leu Asn Lys Lys Met Glu Asp

420

425

430

Gly Phe Leu Asp Val Trp Thr Tyr Asn Ala Glu Leu Leu Val Leu Met
 435 440 445

Glu Asn Glu Arg Thr Leu Asp Phe His Asp Ser Asn Val Lys Asn Leu
 450 455 460

Tyr Asp Lys Val Arg Leu Gln Leu Arg Asp Asn Ala Lys Glu Leu Gly
 465 470 475 480

Asn Gly Cys Phe Glu Phe Tyr His Lys Cys Asp Asn Glu Cys Met Glu
 485 490 495

Ser Val Arg Asn Gly Thr Tyr Asp Tyr Pro Gln Tyr Ser Glu Glu Ala
 500 505 510

Arg Leu Lys Arg Glu Glu Ile Ser Gly Val Lys Leu Glu Ser Ile Gly
 515 520 525

Ile Tyr Gln Ile Leu Ser Ile Tyr Ser Thr Val Ala Ser Ser Leu Ala
 530 535 540

Leu Ala Ile Met Val Ala Gly Leu Ser Leu Trp Met Cys Ser Asn Gly
 545 550 555 560

Ser Leu Gln Cys Arg Ile Cys Ile
 565

<210> 112
 <211> 568
 <212> PRT
 <213> Influenza A virus

<400> 112

Met Glu Lys Ile Val Leu Leu Phe Ala Ile Val Ser Leu Val Lys Ser
 1 5 10 15

Asp Gln Ile Cys Ile Gly Tyr His Ala Asn Asn Ser Thr Glu Gln Val
 20 25 30

Asp Thr Ile Met Glu Lys Asn Val Thr Val Thr His Ala Gln Asp Ile
 35 40 45

Leu Glu Lys Thr His Asn Gly Lys Leu Cys Asp Leu Asp Gly Val Lys
 50 55 60

Pro Leu Ile Leu Arg Asp Cys Ser Val Ala Gly Trp Leu Leu Gly Asn
 65 70 75 80

Pro Met Cys Asp Glu Phe Ile Asn Val Pro Glu Trp Ser Tyr Ile Val
 85 90 95

381698_1.TXT

Glu Lys Ala Asn Pro Val Asn Asp Leu Cys Tyr Pro Gly Asp Phe Asn
 100 105 110
 Asp Tyr Glu Glu Leu Lys His Leu Leu Ser Arg Ile Asn His Phe Glu
 115 120 125
 Lys Ile Gln Ile Ile Pro Lys Ser Ser Trp Ser Ser His Glu Ala Ser
 130 135 140
 Leu Gly Val Ser Ser Ala Cys Pro Tyr Gln Gly Lys Ser Ser Phe Phe
 145 150 155 160
 Arg Asn Val Val Trp Leu Ile Lys Lys Asn Ser Thr Tyr Pro Thr Ile
 165 170 175
 Lys Arg Ser Tyr Asn Asn Thr Asn Gln Glu Asp Leu Leu Val Leu Trp
 180 185 190
 Gly Ile His His Pro Asn Asp Ala Ala Glu Gln Thr Lys Leu Tyr Gln
 195 200 205
 Asn Pro Thr Thr Tyr Ile Ser Val Gly Thr Ser Thr Leu Asn Gln Arg
 210 215 220
 Leu Val Pro Arg Ile Ala Thr Arg Ser Lys Val Asn Gly Gln Ser Gly
 225 230 235 240
 Arg Met Glu Phe Phe Trp Thr Ile Leu Lys Pro Asn Asp Ala Ile Asn
 245 250 255
 Phe Glu Ser Asn Gly Asn Phe Ile Ala Pro Glu Tyr Ala Tyr Lys Ile
 260 265 270
 Val Lys Lys Gly Asp Ser Thr Ile Met Lys Ser Glu Leu Glu Tyr Gly
 275 280 285
 Asn Cys Asn Thr Lys Cys Gln Thr Pro Met Gly Ala Ile Asn Ser Ser
 290 295 300
 Met Pro Phe His Asn Ile His Pro Leu Thr Ile Gly Glu Cys Pro Lys
 305 310 315 320
 Tyr Val Lys Ser Asn Arg Leu Val Leu Ala Thr Gly Leu Arg Asn Ser
 325 330 335
 Pro Gln Arg Glu Arg Arg Arg Lys Lys Arg Gly Leu Phe Gly Ala Ile
 340 345 350
 Ala Gly Phe Ile Glu Gly Gly Trp Gln Gly Met Val Asp Gly Trp Tyr
 355 360 365

381698_1.TXT

Gly Tyr His His Ser Asn Glu Gln Gly Ser Gly Tyr Ala Ala Asp Lys
370 375 380

Glu Ser Thr Gln Lys Ala Ile Asp Gly Val Thr Asn Lys Val Asn Ser
385 390 395 400

Ile Ile Asp Lys Met Asn Thr Gln Phe Glu Ala Val Gly Arg Glu Phe
405 410 415

Asn Asn Leu Glu Arg Arg Ile Glu Asn Leu Asn Lys Lys Met Glu Asp
420 425 430

Gly Phe Leu Asp Val Trp Thr Tyr Asn Ala Glu Leu Leu Val Leu Met
435 440 445

Glu Asn Glu Arg Thr Leu Asp Phe His Asp Ser Asn Val Lys Asn Leu
450 455 460

Tyr Asp Lys Val Arg Leu Gln Leu Arg Asp Asn Ala Lys Glu Leu Gly
465 470 475 480

Asn Gly Cys Phe Glu Phe Tyr His Lys Cys Asp Asn Glu Cys Met Glu
485 490 495

Ser Val Arg Asn Gly Thr Tyr Asp Tyr Pro Gln Tyr Ser Glu Glu Ala
500 505 510

Arg Leu Lys Arg Glu Glu Ile Ser Gly Val Lys Leu Glu Ser Ile Gly
515 520 525

Ile Tyr Gln Ile Leu Ser Ile Tyr Ser Thr Val Ala Ser Ser Leu Ala
530 535 540

Leu Ala Ile Met Val Ala Gly Leu Ser Leu Trp Met Cys Ser Asn Gly
545 550 555 560

Ser Leu Gln Cys Arg Ile Cys Ile
565

<210> 113
<211> 568
<212> PRT
<213> Influenza A virus

<400> 113

Met Glu Lys Ile Val Leu Leu Phe Ala Ile Val Ser Leu Val Lys Ser
1 5 10 15

Asp Gln Ile Cys Ile Gly Tyr His Ala Asn Asn Ser Thr Glu Gln Val
20 25 30

Asp Thr Ile Met Glu Lys Asn Val Thr Val Thr His Ala Gln Asp Ile
35 40 45

381698_1.TXT

Leu Glu Lys Thr His Asn Gly Lys Leu Cys Asp Leu Asp Gly Val Lys
 50 55 60
 Pro Leu Ile Leu Arg Asp Cys Ser Val Ala Gly Trp Leu Leu Gly Asn
 65 70 75 80
 Pro Met Cys Asp Glu Phe Ile Asn Val Pro Glu Trp Ser Tyr Ile Val
 85 90 95
 Glu Lys Ala Asn Pro Val Asn Asp Leu Cys Tyr Pro Gly Asp Phe Asn
 100 105 110
 Asp Tyr Glu Glu Leu Lys His Leu Leu Ser Arg Ile Asn His Phe Glu
 115 120 125
 Lys Ile Gln Ile Ile Pro Lys Ser Ser Trp Ser Ser His Glu Val Ser
 130 135 140
 Leu Gly Val Ser Ser Ala Cys Pro Tyr Gln Gly Lys Ser Ser Phe Phe
 145 150 155 160
 Arg Asn Val Val Trp Leu Ile Lys Lys Asn Ser Thr Tyr Pro Thr Ile
 165 170 175
 Lys Arg Ser Tyr Asn Asn Thr Asn Gln Glu Asp Leu Leu Val Leu Trp
 180 185 190
 Gly Ile His His Pro Asn Asp Ala Ala Glu Gln Thr Lys Leu Tyr Gln
 195 200 205
 Asn Pro Thr Thr Tyr Ile Ser Val Gly Thr Ser Thr Leu Asn Gln Arg
 210 215 220
 Leu Val Pro Arg Ile Ala Thr Arg Ser Lys Val Asn Gly Gln Ser Gly
 225 230 235 240
 Arg Met Glu Phe Phe Trp Thr Ile Leu Lys Pro Asn Asp Ala Ile Asn
 245 250 255
 Phe Glu Ser Asn Gly Asn Phe Ile Ala Pro Glu Tyr Ala Tyr Lys Ile
 260 265 270
 Val Lys Lys Gly Asp Ser Thr Ile Met Lys Ser Glu Leu Glu Tyr Gly
 275 280 285
 Asn Cys Asn Thr Lys Cys Gln Thr Pro Met Gly Ala Ile Asn Ser Ser
 290 295 300
 Met Pro Phe His Asn Ile His Pro Leu Thr Ile Gly Glu Cys Pro Lys
 305 310 315 320

381698_1.TXT

Tyr Val Lys Ser Asn Arg Leu Val Leu Ala Thr Gly Leu Arg Asn Ser
325 330 335

Pro Gln Arg Glu Arg Arg Arg Lys Lys Arg Gly Leu Phe Gly Ala Ile
340 345 350

Ala Gly Phe Ile Glu Gly Gly Trp Gln Gly Met Val Asp Gly Trp Tyr
355 360 365

Gly Tyr His His Ser Asn Glu Gln Gly Ser Gly Tyr Ala Ala Ala Lys
370 375 380

Glu Ser Thr Gln Lys Ala Ile Asp Gly Val Thr Asn Lys Val Asn Ser
385 390 395 400

Ile Ile Asp Lys Met Asn Thr Gln Phe Glu Ala Val Gly Arg Glu Phe
405 410 415

Asn Asn Leu Glu Arg Arg Ile Glu Asn Leu Asn Lys Lys Met Glu Asp
420 425 430

Gly Phe Leu Asp Val Trp Thr Tyr Asn Ala Glu Leu Leu Val Leu Met
435 440 445

Glu Asn Glu Arg Thr Leu Asp Phe His Asp Ser Asn Val Lys Asn Leu
450 455 460

Tyr Asp Lys Val Arg Leu Gln Leu Lys Asp Asn Ala Lys Glu Leu Gly
465 470 475 480

Asn Gly Cys Phe Glu Phe Tyr His Lys Cys Asp Asn Glu Cys Met Glu
485 490 495

Ser Val Arg Asn Gly Thr Tyr Asp Tyr Pro Gln Tyr Ser Glu Glu Ala
500 505 510

Arg Leu Lys Arg Glu Glu Ile Ser Gly Val Lys Leu Glu Ser Ile Gly
515 520 525

Ile Tyr Gln Ile Leu Ser Ile Tyr Ser Thr Val Ala Ser Ser Leu Ala
530 535 540

Leu Ala Ile Met Val Ala Gly Leu Ser Leu Trp Met Cys Ser Asn Gly
545 550 555 560

Ser Leu Gln Cys Arg Ile Cys Ile
565

<210> 114
<211> 567
<212> PRT
<213> Influenza A virus

<400> 114

Met Glu Lys Ile Val Leu Leu Phe Ala Ile Val Ser Leu Val Lys Ser
1 5 10 15

Asp Gln Ile Cys Ile Gly Tyr His Ala Asn Asn Ser Thr Glu Gln Val
20 25 30

Asp Thr Ile Met Glu Lys Asn Val Thr Val Thr His Ala Gln Asp Ile
35 40 45

Leu Glu Lys Thr His Asn Gly Lys Leu Cys Asp Leu Asp Gly Val Lys
50 55 60

Pro Leu Ile Leu Arg Asp Cys Ser Val Ala Gly Trp Leu Leu Gly Asn
65 70 75 80

Pro Met Cys Asp Glu Phe Ile Asn Val Pro Glu Trp Ser Tyr Ile Val
85 90 95

Glu Lys Ala Asn Pro Val Asn Asp Leu Cys Tyr Pro Gly Asp Phe Asn
100 105 110

Asp Tyr Glu Glu Leu Lys His Leu Leu Ser Arg Ile Asn His Phe Glu
115 120 125

Lys Ile Gln Ile Ile Pro Lys Ser Ser Trp Leu Ser His Glu Ala Ser
130 135 140

Leu Gly Val Ser Ser Ala Cys Pro Tyr Gln Gly Lys Ser Ser Phe Phe
145 150 155 160

Arg Asn Val Val Trp Leu Ile Lys Lys Asn Ser Thr Tyr Pro Thr Ile
165 170 175

Lys Arg Ser Tyr Asn Asn Thr Asn Gln Glu Asp Leu Leu Val Leu Trp
180 185 190

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

Asn Pro Thr Thr Tyr Ile Ser Val Gly Thr Ser Thr Leu Asn Gln Arg
210 215 220

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

Arg Met Glu Phe Phe Trp Thr Ile Leu Lys Pro Asn Asp Ala Ile Asn
245 250 255

Phe Glu Ser Asn Gly Asn Phe Ile Ala Pro Glu Tyr Ala Tyr Lys Ile
260 265 270

381698_1.TXT

Val Lys Lys Gly Asp Ser Thr Ile Met Lys Ser Glu Leu Glu Tyr Gly
 275 280 285
 Asn Cys Asn Thr Lys Cys Gln Thr Pro Met Gly Ala Ile Asn Ser Ser
 290 295 300
 Met Pro Phe His Asn Ile His Pro Leu Thr Ile Gly Glu Cys Pro Lys
 305 310 315 320
 Tyr Val Lys Ser Asn Arg Leu Val Leu Ala Thr Gly Leu Arg Asn Ser
 325 330 335
 Pro Gln Arg Glu Arg Arg Lys Lys Arg Gly Leu Phe Gly Ala Ile Ala
 340 345 350
 Gly Phe Ile Glu Gly Gly Trp Gln Gly Met Val Asp Gly Trp Tyr Gly
 355 360 365
 Tyr His His Ser Asn Glu Gln Gly Ser Gly Tyr Ala Ala Asp Lys Glu
 370 375 380
 Ser Thr Gln Lys Ala Ile Asp Gly Val Thr Asn Lys Val Asn Ser Ile
 385 390 395 400
 Ile Asp Lys Met Asn Thr Gln Phe Glu Ala Val Gly Arg Glu Phe Asn
 405 410 415
 Asn Leu Glu Arg Arg Ile Glu Asn Leu Asn Lys Lys Met Glu Asp Gly
 420 425 430
 Phe Leu Asp Val Trp Thr Tyr Asn Ala Glu Leu Leu Val Leu Met Glu
 435 440 445
 Asn Glu Arg Thr Leu Asp Phe His Asp Ser Asn Val Lys Asn Leu Tyr
 450 455 460
 Asp Lys Val Arg Leu Gln Leu Arg Asp Asn Ala Lys Glu Leu Gly Asn
 465 470 475 480
 Gly Cys Phe Glu Phe Tyr His Lys Cys Asp Asn Glu Cys Met Glu Ser
 485 490 495
 Val Arg Asn Gly Thr Tyr Asp Tyr Pro Gln Tyr Ser Glu Glu Ala Lys
 500 505 510
 Leu Lys Arg Gly Glu Ile Ser Gly Val Lys Leu Glu Ser Ile Gly Ile
 515 520 525
 Tyr Gln Ile Leu Ser Ile Tyr Ser Thr Val Ala Ser Ser Leu Ala Leu
 530 535 540

381698_1.TXT

Ala Ile Met Val Ala Gly Leu Ser Leu Trp Met Cys Ser Asn Gly Ser
545 550 555 560

Leu Gln Cys Arg Ile Cys Ile
565

<210> 115
<211> 568
<212> PRT
<213> Influenza A virus
<400> 115

Met Glu Lys Ile Val Leu Leu Leu Ala Ile Val Ser Leu Val Lys Ser
1 5 10 15

Asp Gln Ile Cys Ile Gly Tyr His Ala Asn Asn Ser Thr Glu Gln Val
20 25 30

Asp Thr Ile Met Glu Lys Asn Val Thr Val Thr His Ala Gln Asp Ile
35 40 45

Leu Glu Lys Thr His Asn Gly Lys Leu Cys Asp Leu Asp Gly Val Lys
50 55 60

Pro Leu Ile Leu Arg Asp Cys Ser Val Ala Gly Trp Leu Leu Gly Asn
65 70 75 80

Pro Met Cys Asp Glu Phe Leu Asn Val Pro Glu Trp Ser Tyr Ile Val
85 90 95

Glu Lys Ile Asn Pro Ala Asn Asp Leu Cys Tyr Pro Gly Asn Phe Asn
100 105 110

Asp Tyr Glu Glu Leu Lys His Leu Leu Ser Arg Ile Asn His Phe Glu
115 120 125

Lys Ile Gln Ile Ile Pro Lys Ser Ser Trp Ser Asp His Glu Ala Ser
130 135 140

Ser Gly Val Ser Ser Ala Cys Pro Tyr Gln Gly Arg Ser Ser Phe Phe
145 150 155 160

Arg Asn Val Val Trp Leu Ile Lys Lys Asp Asn Ala Tyr Pro Thr Ile
165 170 175

Lys Arg Ser Tyr Asn Asn Thr Asn Gln Glu Asp Leu Leu Val Leu Trp
180 185 190

Gly Ile His His Pro Asn Asp Ala Ala Glu Gln Thr Arg Leu Tyr Gln
195 200 205

Asn Pro Thr Thr Tyr Ile Ser Val Gly Thr Ser Thr Leu Asn Gln Arg
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210

215

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

Arg Met Glu Phe Phe Trp Thr Ile Leu Lys Pro Asn Asp Ala Ile Asn
245 250 255

Phe Glu Ser Asn Gly Asn Phe Ile Ala Pro Glu Asn Ala Tyr Lys Ile
260 265 270

Val Lys Lys Gly Asp Ser Thr Ile Met Lys Ser Glu Leu Glu Tyr Gly
275 280 285

Asn Cys Asn Thr Lys Cys Gln Thr Pro Ile Gly Ala Ile Asn Ser Ser
290 295 300

Met Pro Phe His Asn Ile His Pro Leu Thr Ile Gly Glu Cys Pro Lys
305 310 315 320

Tyr Val Lys Ser Asn Arg Leu Val Leu Ala Thr Gly Leu Arg Asn Ser
325 330 335

Pro Gln Gly Glu Arg Arg Arg Arg Lys Arg Gly Leu Phe Gly Ala Ile
340 345 350

Ala Gly Phe Ile Glu Gly Gly Trp Gln Gly Met Val Asp Gly Trp Tyr
355 360 365

Gly Tyr His His Ser Asn Glu Gln Gly Ser Gly Tyr Ala Ala Asp Lys
370 375 380

Glu Ser Thr Gln Lys Ala Ile Asp Gly Val Thr Asn Lys Val Asn Ser
385 390 395 400

Ile Ile Asp Lys Met Asn Thr Gln Phe Glu Ala Val Gly Arg Glu Phe
405 410 415

Asn Asn Leu Glu Arg Arg Ile Glu Asn Leu Asn Lys Lys Met Glu Asp
420 425 430

Gly Phe Leu Asp Val Trp Thr Tyr Asn Ala Glu Leu Leu Val Leu Met
435 440 445

Glu Asn Glu Arg Thr Leu Asp Phe His Asp Ser Asn Val Lys Asn Leu
450 455 460

Tyr Asp Lys Val Arg Leu Gln Leu Arg Asp Asn Ala Lys Glu Leu Gly
465 470 475 480

Asn Gly Cys Phe Glu Phe Tyr His Arg Cys Asp Asn Glu Cys Met Glu
485 490 495

381698_1.TXT

Ser Val Arg Asn Gly Thr Tyr Asp Tyr Pro Gln Tyr Ser Glu Glu Ala
500 505 510

Arg Leu Lys Arg Glu Glu Ile Ser Gly Val Lys Leu Glu Ser Ile Gly
515 520 525

Thr Tyr Gln Ile Leu Ser Ile Tyr Ser Thr Val Ala Ser Ser Leu Ala
530 535 540

Leu Ala Ile Met Val Ala Gly Leu Ser Leu Trp Met Cys Ser Asn Gly
545 550 555 560

Ser Leu Gln Cys Arg Ile Cys Ile
565

<210> 116
<211> 568
<212> PRT
<213> Influenza A virus
<400> 116

Met Glu Asn Ile Val Leu Leu Leu Ala Ile Val Ser Leu Val Lys Ser
1 5 10 15

Asp Gln Ile Cys Ile Gly Tyr His Ala Asn Asn Ser Thr Glu Gln Val
20 25 30

Asp Thr Ile Met Glu Lys Asn Val Thr Val Thr His Ala Gln Asp Ile
35 40 45

Leu Glu Lys Thr His Asn Gly Lys Leu Cys Asp Leu Asp Gly Val Lys
50 55 60

Pro Leu Ile Leu Arg Asn Cys Ser Val Ala Gly Trp Leu Leu Gly Asn
65 70 75 80

Pro Met Cys Asp Glu Phe Leu Asn Val Pro Glu Trp Ser Tyr Ile Val
85 90 95

Glu Lys Ile Asn Pro Ala Asn Asp Leu Cys Tyr Pro Gly Asn Phe Asn
100 105 110

Asp Tyr Glu Glu Leu Lys His Leu Leu Ser Arg Ile Asn His Phe Glu
115 120 125

Lys Ile Gln Ile Ile Pro Lys Ser Ser Trp Ser Asp His Glu Ala Ser
130 135 140

Ser Gly Val Ser Ser Ala Cys Pro Tyr Gln Gly Arg Ser Ser Phe Phe
145 150 155 160

381698_1.TXT

Arg Asn Val Val Trp₁₆₅ Leu Ile Lys Lys Asp₁₇₀ Asn Ala Tyr Pro Thr₁₇₅ Ile
Lys Arg Ser Tyr₁₈₀ Asn Asn Thr Asn Gln₁₈₅ Glu Asp Leu Leu Val₁₉₀ Leu Trp
Gly Ile His₁₉₅ His Pro Asn Asp Ala₂₀₀ Ala Glu Gln Thr Arg₂₀₅ Leu Tyr Gln
Asn Pro₂₁₀ Thr Thr Tyr Ile Ser₂₁₅ Val Gly Thr Ser Thr₂₂₀ Leu Asn Gln Arg
Leu Val₂₂₅ Pro Lys Ile Ala₂₃₀ Thr Arg Ser Lys Val₂₃₅ Asn Gly Gln Ser Gly₂₄₀
Arg Met Glu Phe Phe₂₄₅ Trp Thr Ile Leu Lys₂₅₀ Pro Asn Asp Ala Ile₂₅₅ Asn
Phe Glu Ser Asn₂₆₀ Gly Asn Phe Ile Ala₂₆₅ Pro Glu Asn Ala Tyr₂₇₀ Lys Ile
Val Lys Lys₂₇₅ Gly Asp Ser Thr Ile₂₈₀ Met Lys Ser Glu Leu₂₈₅ Glu Tyr Gly
Asn Cys₂₉₀ Asn Thr Lys Cys Gln₂₉₅ Thr Pro Ile Gly Ala₃₀₀ Ile Asn Ser Ser
Met₃₀₅ Pro Phe His Asn Ile₃₁₀ His Pro Leu Thr Ile₃₁₅ Gly Glu Cys Pro Lys₃₂₀
Tyr Val Lys Ser Asn₃₂₅ Arg Leu Val Leu Ala₃₃₀ Thr Gly Leu Arg Asn₃₃₅ Ser
Pro Gln Gly Glu₃₄₀ Arg Arg Arg Arg Lys₃₄₅ Arg Gly Leu Phe Gly₃₅₀ Ala Ile
Ala Gly Phe₃₅₅ Ile Glu Gly Gly Trp₃₆₀ Gln Gly Met Val Asp₃₆₅ Gly Trp Tyr
Gly Tyr₃₇₀ His His Ser Asn Glu₃₇₅ Gln Gly Ser Gly Tyr₃₈₀ Ala Ala Asp Lys
Glu Ser Thr Gln Lys Ala₃₉₀ Ile Asp Gly Val Thr₃₉₅ Asn Lys Val Asn Ser₄₀₀
Ile Ile Asp Lys Met₄₀₅ Asn Thr Gln Phe Glu₄₁₀ Ala Val Gly Arg Glu₄₁₅ Phe
Asn Asn Leu Glu₄₂₀ Arg Arg Ile Glu Asn₄₂₅ Leu Asn Lys Lys Met₄₃₀ Glu Asp
Gly Phe Leu Asp Val Trp Thr Tyr Asn Ala Glu Leu Leu Val Leu Met

435

440

445

Glu Asn Glu Arg Thr Leu Asp Phe His Asp Ser Asn Val Lys Asn Leu
 450 455 460

Tyr Asp Lys Val Arg Leu Gln Leu Arg Asp Asn Ala Lys Glu Leu Gly
 465 470 475 480

Asn Gly Cys Phe Glu Phe Tyr His Arg Cys Asp Asn Glu Cys Met Glu
 485 490 495

Ser Val Arg Asn Gly Thr Tyr Asp Tyr Pro Gln Tyr Ser Glu Glu Ala
 500 505 510

Arg Leu Lys Arg Glu Glu Ile Ser Gly Val Lys Leu Glu Ser Ile Gly
 515 520 525

Thr Tyr Gln Ile Leu Ser Ile Tyr Ser Thr Val Ala Ser Ser Leu Ala
 530 535 540

Leu Ala Ile Met Val Ala Gly Leu Ser Leu Trp Met Cys Ser Asn Gly
 545 550 555 560

Ser Leu Gln Cys Arg Ile Cys Ile
 565

<210> 117
 <211> 568
 <212> PRT
 <213> Influenza A virus

<400> 117

Met Glu Lys Ile Val Leu Leu Leu Ala Ile Val Ser Leu Val Lys Ser
 1 5 10 15

Asp Gln Ile Cys Ile Gly Tyr His Ala Asn Asn Ser Thr Glu Gln Val
 20 25 30

Asp Thr Ile Met Glu Lys Asn Val Thr Val Thr His Ala Gln Asp Ile
 35 40 45

Leu Glu Lys Thr His Asn Gly Lys Leu Cys Asp Leu Asp Gly Val Lys
 50 55 60

Pro Leu Ile Leu Arg Asp Cys Ser Val Ala Gly Trp Leu Leu Gly Asn
 65 70 75 80

Pro Met Cys Asp Glu Phe Leu Asn Val Pro Glu Trp Ser Tyr Ile Val
 85 90 95

Glu Lys Ile Asn Pro Ala Asn Asp Leu Cys Tyr Pro Gly Asn Phe Asn
 100 105 110

381698_1.TXT

Asp Tyr Glu Glu Leu Lys His Leu Leu Ser Arg Ile Asn His Phe Glu
 115 120 125
 Lys Ile Gln Ile Ile Pro Lys Ser Ser Trp Ser Asp His Glu Ala Ser
 130 135 140
 Ser Gly Val Ser Ser Ala Cys Pro Tyr Gln Gly Arg Ser Ser Phe Phe
 145 150 155 160
 Arg Asn Val Val Trp Leu Ile Lys Lys Asp Asn Ala Tyr Pro Thr Ile
 165 170 175
 Lys Arg Ser Tyr Asn Asn Thr Asn Gln Glu Asp Leu Leu Val Leu Trp
 180 185 190
 Gly Ile His His Pro Asn Asp Ala Ala Glu Gln Thr Arg Leu Tyr Gln
 195 200 205
 Asn Pro Thr Thr Tyr Ile Ser Val Gly Thr Ser Thr Leu Asn Gln Arg
 210 215 220
 Leu Val Pro Lys Ile Ala Thr Arg Ser Lys Val Asn Gly Gln Ser Gly
 225 230 235 240
 Arg Met Glu Phe Phe Trp Thr Ile Leu Lys Pro Asn Asp Ala Ile Asn
 245 250 255
 Phe Glu Ser Asn Gly Asn Phe Ile Ala Pro Glu Asn Ala Tyr Lys Ile
 260 265 270
 Val Lys Lys Gly Asp Ser Thr Ile Met Lys Ser Glu Leu Glu Tyr Gly
 275 280 285
 Asn Cys Asn Thr Lys Cys Gln Thr Pro Ile Gly Ala Ile Asn Ser Ser
 290 295 300
 Met Pro Phe His Asn Ile His Pro Leu Thr Ile Gly Glu Cys Pro Lys
 305 310 315 320
 Tyr Val Lys Ser Asn Arg Leu Val Leu Ala Thr Gly Leu Arg Asn Ser
 325 330 335
 Pro Gln Gly Glu Arg Arg Arg Arg Lys Arg Gly Leu Phe Gly Ala Ile
 340 345 350
 Ala Gly Phe Ile Glu Gly Gly Trp Gln Gly Met Val Asp Gly Trp Tyr
 355 360 365
 Gly Tyr His His Ser Asn Glu Gln Gly Ser Gly Tyr Ala Ala Asp Lys
 370 375 380

381698_1.TXT

Glu Ser Thr Gln Lys Ala Ile Asp Gly Val Thr Asn Lys Val Asn Ser
385 390 395 400

Ile Ile Asp Lys Met Asn Thr Gln Phe Glu Ala Val Gly Arg Glu Phe
405 410 415

Asn Asn Leu Glu Arg Arg Ile Glu Asn Leu Asn Lys Lys Met Glu Asp
420 425 430

Gly Phe Leu Asp Val Trp Thr Tyr Asn Ala Glu Leu Leu Val Leu Met
435 440 445

Glu Asn Glu Arg Thr Leu Asp Phe His Asp Ser Asn Val Lys Asn Leu
450 455 460

Tyr Asp Lys Val Arg Leu Gln Leu Arg Asp Asn Ala Lys Glu Leu Gly
465 470 475 480

Asn Gly Cys Phe Glu Phe Tyr His Arg Cys Asp Asn Glu Cys Met Glu
485 490 495

Ser Val Arg Asn Gly Thr Tyr Asp Tyr Pro Gln Tyr Ser Glu Glu Ala
500 505 510

Arg Leu Lys Arg Glu Glu Ile Ser Gly Val Lys Leu Glu Ser Ile Gly
515 520 525

Thr Tyr Gln Ile Leu Ser Ile Tyr Ser Thr Val Ala Ser Ser Leu Ala
530 535 540

Leu Ala Ile Met Val Ala Gly Leu Ser Leu Trp Met Cys Ser Asn Gly
545 550 555 560

Ser Leu Gln Cys Arg Ile Cys Ile
565

<210> 118
<211> 568
<212> PRT
<213> Influenza A virus

<400> 118

Met Glu Lys Ile Val Leu Leu Leu Ala Ile Val Ser Leu Val Lys Ser
1 5 10 15

Asp Gln Ile Cys Ile Gly Tyr His Ala Asn Asn Ser Thr Glu Gln Val
20 25 30

Asp Thr Ile Met Glu Lys Asn Val Thr Val Thr His Ala Gln Asp Ile
35 40 45

Leu Glu Lys Thr His Asn Gly Lys Leu Cys Asp Leu Asp Gly Val Lys
50 55 60

381698_1.TXT

Pro Leu Ile Leu Arg Asp Cys Ser Val Ala Gly Trp Leu Leu Gly Asn
65 70 75 80

Pro Met Cys Asp Glu Phe Leu Asn Val Pro Glu Trp Ser Tyr Ile Val
85 90 95

Glu Lys Ile Asn Pro Ala Asn Asp Leu Cys Tyr Pro Gly Asn Phe Asn
100 105 110

Asp Tyr Glu Glu Leu Lys His Leu Leu Ser Arg Ile Asn His Phe Glu
115 120 125

Lys Ile Gln Ile Ile Pro Lys Ser Ser Trp Ser Asp His Glu Ala Ser
130 135 140

Ser Gly Val Ser Ser Ala Cys Pro Tyr Gln Gly Arg Ser Ser Phe Phe
145 150 155 160

Arg Asn Val Val Trp Leu Ile Lys Lys Asp Asn Ala Tyr Pro Thr Ile
165 170 175

Lys Arg Ser Tyr Asn Asn Thr Asn Gln Glu Asp Leu Leu Val Leu Trp
180 185 190

Gly Ile His His Pro Asn Asp Ala Ala Glu Gln Thr Arg Leu Tyr Gln
195 200 205

Asn Pro Thr Thr Tyr Ile Ser Val Gly Thr Ser Thr Leu Asn Gln Arg
210 215 220

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

Arg Met Glu Phe Phe Trp Thr Ile Leu Lys Pro Asn Asp Ala Ile Asn
245 250 255

Phe Glu Ser Asn Gly Asn Phe Ile Ala Pro Glu Asn Ala Tyr Lys Ile
260 265 270

Val Lys Lys Gly Asp Ser Thr Ile Met Lys Ser Glu Leu Glu Tyr Gly
275 280 285

Asn Cys Asn Thr Lys Cys Gln Thr Pro Ile Gly Ala Ile Asn Ser Ser
290 295 300

Met Pro Phe His Asn Ile His Pro Leu Thr Ile Gly Glu Cys Pro Lys
305 310 315 320

Tyr Val Lys Ser Asn Arg Leu Val Leu Ala Thr Gly Leu Arg Asn Ser
325 330 335

381698_1.TXT

Pro Gln Gly Glu Arg Arg Arg Lys Lys Arg Gly Leu Phe Gly Ala Ile
340 345 350

Ala Gly Phe Ile Glu Gly Gly Trp Gln Gly Met Val Asp Gly Trp Tyr
355 360 365

Gly Tyr His His Ser Asn Glu Gln Gly Ser Gly Tyr Ala Ala Asp Lys
370 375 380

Glu Ser Thr Gln Lys Ala Ile Tyr Gly Val Thr Asn Thr Val Asn Ser
385 390 395 400

Ile Ile Asp Lys Met Asn Thr Gln Phe Glu Ala Val Gly Arg Glu Phe
405 410 415

Asn Asn Leu Glu Arg Arg Ile Glu Asn Leu Asn Lys Lys Met Glu Asp
420 425 430

Gly Phe Leu Asp Val Trp Thr Tyr Asn Ala Glu Leu Leu Val Leu Met
435 440 445

Glu Asn Glu Arg Thr Leu Asp Phe His Asp Ser Asn Val Lys Asn Leu
450 455 460

Tyr Asp Lys Val Arg Leu Gln Leu Arg Asp Asn Ala Lys Glu Leu Gly
465 470 475 480

Asn Gly Cys Phe Glu Phe Tyr His Arg Cys Asp Asn Glu Cys Met Glu
485 490 495

Ser Val Arg Asn Gly Thr Tyr Asp Tyr Pro Gln Tyr Ser Glu Glu Ala
500 505 510

Arg Leu Lys Arg Glu Glu Ile Ser Gly Val Lys Leu Glu Ser Ile Gly
515 520 525

Thr Tyr Gln Ile Leu Ser Ile Tyr Ser Thr Val Ala Ser Ser Leu Ala
530 535 540

Leu Ala Ile Met Val Ala Gly Leu Ser Leu Trp Met Cys Ser Asn Gly
545 550 555 560

Ser Leu Gln Cys Arg Ile Cys Ile
565

<210> 119
<211> 567
<212> PRT
<213> Influenza A virus

<400> 119

Met Glu Lys Ile Val Leu Leu Leu Ala Ile Val Ser Leu Val Lys Ser
Page 79

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1              5              10              15
Asp Gln Ile Cys Ile Gly Tyr His Ala Asn Asn Ser Thr Glu Gln Val
      20      25      30
Asp Thr Ile Met Glu Lys Asn Val Thr Val Thr His Ala Gln Asp Ile
      35      40      45
Leu Glu Lys Thr His Asn Gly Lys Leu Cys Asp Leu Asp Gly Val Lys
      50      55      60
Pro Leu Ile Leu Arg Asp Cys Ser Val Ala Gly Trp Leu Leu Gly Asn
      65      70      75      80
Pro Met Cys Asp Glu Phe Ile Asn Val Pro Glu Trp Ser Tyr Ile Val
      85      90      95
Glu Lys Ala Asn Pro Ser Asn Asp Leu Cys Tyr Pro Gly Asn Phe Asn
      100      105      110
Asp Tyr Glu Glu Leu Lys His Leu Leu Ser Arg Ile Asn His Phe Glu
      115      120      125
Lys Ile Gln Ile Ile Pro Lys Ser Ser Trp Ser Asp His Glu Ala Ser
      130      135      140
Ser Gly Val Ser Ser Ala Cys Pro Tyr Gln Gly Arg Ser Ser Phe Phe
      145      150      155      160
Arg Asn Val Val Trp Leu Ile Thr Lys Asn Ser Ala Tyr Pro Thr Ile
      165      170      175
Lys Arg Ser Tyr Asn Asn Thr Asn Gln Glu Asp Leu Leu Val Leu Trp
      180      185      190
Gly Ile His His Pro Asn Asp Ala Ala Glu Gln Thr Arg Leu Tyr Gln
      195      200      205
Asn Pro Thr Thr Tyr Ile Ser Val Gly Thr Ser Thr Leu Asn Gln Arg
      210      215      220
Leu Val Pro Lys Ile Ala Thr Arg Ser Lys Val Asn Gly Gln Ser Gly
      225      230      235      240
Arg Met Glu Phe Phe Trp Thr Ile Leu Lys Pro Asn Asp Ala Ile Ser
      245      250      255
Phe Glu Ser Asn Gly Asn Phe Ile Ala Pro Glu Tyr Ala Tyr Lys Ile
      260      265      270
Val Lys Lys Gly Asp Ser Ala Ile Met Lys Ser Glu Leu Glu Tyr Gly
      275      280      285

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381698_1.TXT

Asn Cys Asn Thr Lys Cys Gln Thr Pro Met Gly Ala Ile Asn Ser Ser
 290 295 300
 Met Pro Phe His Asn Ile His Pro Leu Thr Ile Gly Glu Cys Pro Lys
 305 310 315 320
 Tyr Val Lys Ser Ser Arg Leu Val Leu Ala Thr Gly Leu Arg Asn Ser
 325 330 335
 Pro Gln Arg Glu Arg Arg Lys Lys Arg Gly Leu Phe Gly Ala Ile Ala
 340 345 350
 Gly Phe Ile Glu Gly Gly Trp Gln Gly Met Val Asp Gly Trp Tyr Gly
 355 360 365
 Tyr His His Ser Asn Glu Gln Gly Ser Gly Tyr Ala Ala Asp Lys Glu
 370 375 380
 Ser Thr Gln Lys Ala Ile Asp Gly Val Thr Asn Lys Val Asn Ser Ile
 385 390 395 400
 Ile Asn Lys Met Asn Thr Gln Phe Glu Ala Val Gly Arg Glu Phe Asn
 405 410 415
 Asn Leu Glu Arg Arg Ile Glu Asn Leu Asn Lys Lys Met Glu Asp Gly
 420 425 430
 Phe Leu Asp Val Trp Thr Tyr Asn Ala Glu Leu Leu Val Leu Met Glu
 435 440 445
 Asn Glu Arg Thr Leu Asp Phe His Asp Ser Asn Val Lys Asn Leu Tyr
 450 455 460
 Asp Lys Val Arg Leu Gln Leu Arg Asp Asn Ala Lys Glu Leu Gly Asn
 465 470 475 480
 Gly Cys Phe Glu Phe Tyr His Arg Cys Asp Asn Glu Cys Ile Glu Ser
 485 490 495
 Val Arg Asn Gly Thr Tyr Asp Tyr Pro Gln Tyr Ser Glu Glu Ala Arg
 500 505 510
 Leu Lys Arg Glu Glu Ile Ser Gly Val Lys Leu Glu Ser Ile Gly Thr
 515 520 525
 Tyr Gln Ile Leu Ser Ile Tyr Ser Thr Val Ala Ser Ser Leu Ala Leu
 530 535 540
 Ala Ile Met Val Ala Gly Leu Ser Leu Trp Met Cys Ser Asn Gly Ser
 545 550 555 560

Leu Gln Cys Arg Ile Cys Ile
565

<210> 120
<211> 566
<212> PRT
<213> Influenza A virus

<400> 120

Met Lys Thr Ile Ile Ala Leu Ser Tyr Ile Leu Cys Leu Val Phe Ala
1 5 10 15

Gln Lys Leu Pro Gly Asn Asp Asn Ser Thr Ala Thr Leu Cys Leu Gly
20 25 30

His His Ala Val Pro Asn Gly Thr Leu Val Lys Thr Ile Thr Asn Asp
35 40 45

Gln Ile Glu Val Thr Asn Ala Thr Glu Leu Val Gln Ser Ser Ser Thr
50 55 60

Gly Arg Ile Cys Asp Ser Pro His Arg Ile Leu Asp Gly Lys Asn Cys
65 70 75 80

Thr Leu Ile Asp Ala Leu Leu Gly Asp Pro His Cys Asp Gly Phe Gln
85 90 95

Asn Lys Glu Trp Asp Leu Phe Val Glu Arg Ser Lys Ala Tyr Ser Asn
100 105 110

Cys Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Ser Leu Arg Ser Leu Val
115 120 125

Ala Ser Ser Gly Thr Leu Glu Phe Ile Asn Glu Asp Phe Asn Trp Thr
130 135 140

Gly Val Ala Gln Ser Gly Glu Ser Tyr Ala Cys Lys Arg Gly Ser Val
145 150 155 160

Lys Ser Phe Phe Ser Arg Leu Asn Trp Leu His Glu Ser Glu Tyr Lys
165 170 175

Tyr Pro Ala Leu Asn Val Thr Met Pro Asn Asn Gly Lys Phe Asp Lys
180 185 190

Leu Tyr Ile Trp Gly Val His His Pro Ser Thr Asp Arg Glu Gln Thr
195 200 205

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

Ser Gln Gln Thr Val Ile Pro Asn Ile Gly Ser Arg Pro Trp Val Arg

225 230 235 240
 Gly Leu Ser Ser Arg Ile Ser Ile Tyr Trp Thr Ile Val Lys Pro Gly
 245 250 255
 Asp Ile Leu Leu Ile Asn Ser Thr Gly Asn Leu Ile Ala Pro Arg Gly
 260 265 270
 Tyr Phe Lys Ile Arg Thr Gly Lys Ser Ser Ile Met Arg Ser Asp Ala
 275 280 285
 Pro Ile Gly Thr Cys Ser Ser Glu Cys Ile Thr Pro Asn Gly Ser Ile
 290 295 300
 Pro Asn Asp Lys Pro Phe Gln Asn Val Asn Arg Ile Thr Tyr Gly Ala
 305 310 315 320
 Cys Pro Arg Tyr Val Lys Gln Asn Thr Leu Lys Leu Ala Thr Gly Met
 325 330 335
 Arg Asn Val Pro Glu Lys Gln Thr Arg Gly Ile Phe Gly Ala Ile Ala
 340 345 350
 Gly Phe Ile Glu Asn Gly Trp Glu Gly Met Val Asn Gly Trp Tyr Gly
 355 360 365
 Phe Arg His Gln Asn Ser Glu Gly Thr Gly Gln Ala Ala Asp Leu Lys
 370 375 380
 Ser Thr Gln Ala Ala Ile Asp Gln Ile Asn Gly Lys Leu Asn Arg Leu
 385 390 395 400
 Ile Glu Lys Thr Asn Glu Lys Phe His Gln Ile Glu Lys Glu Phe Ser
 405 410 415
 Glu Val Glu Gly Arg Ile Gln Asp Leu Glu Lys Tyr Val Glu Asp Thr
 420 425 430
 Lys Ile Asp Leu Trp Ser Tyr Asn Ala Glu Leu Leu Val Ala Leu Glu
 435 440 445
 Asn Gln His Thr Ile Asp Leu Thr Asp Ser Glu Met Asn Lys Leu Phe
 450 455 460
 Glu Lys Thr Arg Lys Gln Leu Arg Glu Asn Ala Glu Asp Met Gly Asn
 465 470 475 480
 Gly Cys Phe Lys Ile Tyr His Lys Cys Asp Asn Ala Cys Ile Gly Ser
 485 490 495
 Ile Arg Asn Gly Thr Tyr Asp His Asp Val Tyr Arg Asp Glu Ala Leu
 500 505 510

Asn Asn Arg Phe Gln Ile Lys Gly Val Glu Leu Lys Ser Gly Tyr Lys
515 520 525

Asp Trp Ile Leu Trp Ile Ser Phe Ala Ile Ser Cys Phe Leu Leu Cys
530 535 540

Val Val Leu Leu Gly Phe Ile Met Trp Ala Cys Gln Lys Gly Asn Ile
545 550 555 560

Arg Cys Asn Ile Cys Ile
565

<210> 121
<211> 566
<212> PRT
<213> Influenza A virus

<400> 121

Met Lys Thr Ile Ile Ala Leu Ser Tyr Ile Phe Cys Leu Ala Leu Gly
1 5 10 15

Gln Asp Leu Pro Gly Asn Asp Asn Ser Thr Ala Thr Leu Cys Leu Gly
20 25 30

His His Ala Val Pro Asn Gly Thr Leu Val Lys Thr Ile Thr Asp Asp
35 40 45

Gln Ile Glu Val Thr Asn Ala Thr Glu Leu Val Gln Ser Ser Ser Thr
50 55 60

Gly Lys Ile Cys Asn Asn Pro His Arg Ile Leu Asp Gly Ile Asp Cys
65 70 75 80

Thr Leu Ile Asp Ala Leu Leu Gly Asp Pro His Cys Asp Val Phe Gln
85 90 95

Asn Glu Thr Trp Asp Leu Phe Val Glu Arg Ser Lys Ala Phe Ser Asn
100 105 110

Cys Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Ser Leu Arg Ser Leu Val
115 120 125

Ala Ser Ser Gly Thr Leu Glu Phe Ile Thr Glu Gly Phe Thr Trp Thr
130 135 140

Gly Val Thr Gln Asn Gly Gly Ser Asn Ala Cys Lys Arg Gly Pro Gly
145 150 155 160

Ser Gly Phe Phe Ser Arg Leu Asn Trp Leu Thr Lys Ser Gly Ser Thr
165 170 175

381698_1.TXT

Tyr Pro Val Leu Asn Val Thr Met Pro Asn Asn Asp Asn Phe Asp Lys
180 185 190

Leu Tyr Ile Trp Gly Ile His His Pro Ser Thr Asn Gln Glu Gln Thr
195 200 205

Ser Leu Tyr Val Gln Ala Ser Gly Arg Val Thr Val Ser Thr Arg Arg
210 215 220

Ser Gln Gln Thr Ile Ile Pro Asn Ile Gly Ser Arg Pro Trp Val Arg
225 230 235 240

Gly Leu Ser Ser Arg Ile Ser Ile Tyr Trp Thr Ile Val Lys Pro Gly
245 250 255

Asp Val Leu Val Ile Asn Ser Asn Gly Asn Leu Ile Ala Pro Arg Gly
260 265 270

Tyr Phe Lys Met Arg Thr Gly Lys Ser Ser Ile Met Arg Ser Asp Ala
275 280 285

Pro Ile Asp Thr Cys Ile Ser Glu Cys Ile Thr Pro Asn Gly Ser Ile
290 295 300

Pro Asn Asp Lys Pro Phe Gln Asn Val Asn Lys Ile Thr Tyr Gly Ala
305 310 315 320

Cys Pro Lys Tyr Val Lys Gln Asn Thr Leu Lys Leu Ala Thr Gly Met
325 330 335

Arg Asn Val Pro Glu Lys Gln Thr Arg Gly Leu Phe Gly Ala Ile Ala
340 345 350

Gly Phe Ile Glu Asn Gly Trp Glu Gly Met Ile Asp Gly Trp Tyr Gly
355 360 365

Phe Arg His Gln Asn Ser Glu Gly Thr Gly Gln Ala Ala Asp Leu Lys
370 375 380

Ser Thr Gln Ala Ala Ile Asp Gln Ile Asn Gly Lys Leu Asn Arg Val
385 390 395 400

Ile Glu Lys Thr Asn Glu Lys Phe His Gln Ile Glu Lys Glu Phe Ser
405 410 415

Glu Val Glu Gly Arg Ile Gln Asp Leu Glu Lys Tyr Val Glu Asp Thr
420 425 430

Lys Ile Asp Leu Trp Ser Tyr Asn Ala Glu Leu Leu Val Ala Leu Glu
435 440 445

Asn Gln His Thr Ile Asp Leu Thr Asp Ser Glu Met Asn Lys Leu Phe

450

455

460

Glu Lys Thr Arg Arg Gln Leu Arg Glu Asn Ala Glu Glu Met Gly Asn
 465 470 475 480

Gly Cys Phe Lys Ile Tyr His Lys Cys Asp Asn Ala Cys Ile Glu Ser
 485 490 495

Ile Arg Asn Gly Thr Tyr Asp His Asp Val Tyr Arg Asp Glu Ala Leu
 500 505 510

Asn Asn Arg Phe Gln Ile Lys Gly Val Glu Leu Lys Ser Gly Tyr Lys
 515 520 525

Asp Trp Ile Leu Trp Ile Ser Phe Ala Ile Ser Cys Phe Leu Leu Cys
 530 535 540

Val Val Leu Leu Gly Phe Ile Met Trp Ala Cys Gln Arg Gly Asn Ile
 545 550 555 560

Arg Cys Asn Ile Cys Ile
 565

<210> 122
 <211> 566
 <212> PRT
 <213> Influenza A virus

<400> 122

Met Lys Thr Ile Ile Ala Leu Ser His Ile Phe Cys Leu Val Leu Gly
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Gln Tyr Leu Pro Gly Asn Asp Asn Ser Thr Ala Thr Leu Cys Leu Gly
 20 25 30

His His Ala Val Pro Asn Gly Thr Leu Val Lys Thr Ile Thr Asn Asp
 35 40 45

Gln Ile Glu Val Thr Asn Ala Thr Glu Leu Val Gln Ser Ser Ser Thr
 50 55 60

Gly Lys Ile Cys Asn Asn Pro His Arg Ile Leu Asp Gly Ile Asp Cys
 65 70 75 80

Thr Leu Ile Asp Ala Leu Leu Gly Asp Pro His Cys Asp Gly Phe Gln
 85 90 95

Asn Glu Thr Trp Asp Leu Phe Val Glu Arg Ser Lys Ala Phe Ser Asn
 100 105 110

Cys Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Ser Leu Arg Ser Leu Val
 115 120 125

381698_1.TXT

Ala Ser Ser Gly Thr Leu Glu Phe Ile Thr Glu Gly Phe Thr Trp Thr
130 135 140

Gly Val Thr Gln Asn Gly Gly Ser Asn Ala Cys Lys Arg Gly Pro Gly
145 150 155 160

Ser Gly Phe Phe Ser Arg Leu Asn Trp Leu Thr Lys Ser Glu Ser Thr
165 170 175

Tyr Pro Val Leu Asn Val Thr Met Pro Asn Asn Asp Asn Phe Asp Lys
180 185 190

Leu Tyr Ile Trp Gly Val His His Pro Ser Thr Asn Gln Glu Gln Thr
195 200 205

Ser Leu Tyr Val Gln Ala Ser Gly Arg Val Thr Val Ser Thr Arg Arg
210 215 220

Ser Gln Gln Thr Ile Ile Pro Asn Ile Gly Ser Arg Pro Trp Val Arg
225 230 235 240

Gly Leu Ser Ser Arg Ile Ser Ile Tyr Trp Thr Ile Val Lys Pro Gly
245 250 255

Asp Val Leu Val Ile Asn Ser Asn Ala Asn Leu Ile Ala Pro Arg Gly
260 265 270

Tyr Phe Lys Met Arg Thr Gly Lys Ser Ser Ile Met Arg Ser Asp Ala
275 280 285

Pro Ile Asp Thr Cys Ile Ser Glu Cys Ile Thr Pro Asn Gly Ser Ile
290 295 300

Pro Asn Asp Lys Pro Phe Gln Asn Val Asn Lys Ile Thr Tyr Gly Ala
305 310 315 320

Cys Pro Lys Tyr Val Lys Gln Asn Thr Leu Lys Leu Ala Thr Arg Met
325 330 335

Arg Asn Val Pro Glu Lys Gln Thr Arg Gly Leu Phe Gly Ala Ile Ala
340 345 350

Gly Phe Ile Glu Asn Gly Trp Glu Gly Met Ile Asp Gly Trp Tyr Gly
355 360 365

Phe Arg His Gln Asn Ser Glu Gly Thr Gly Gln Ala Ala Asp Leu Lys
370 375 380

Ser Thr Gln Ala Ala Ile Asp Gln Ile Asn Gly Lys Leu Asn Arg Val
385 390 395 400

381698_1.TXT

Ile Glu Lys Thr Asn₄₀₅ Glu Lys Phe His Gln₄₁₀ Ile Glu Lys Glu Phe₄₁₅ Ser

Glu Val Glu Gly₄₂₀ Arg Ile Gln Asp Leu₄₂₅ Glu Lys Tyr Val Glu₄₃₀ Asp Thr

Lys Ile Asp₄₃₅ Leu Trp Ser Tyr Asn₄₄₀ Ala Glu Leu Leu Val₄₄₅ Ala Leu Glu

Asn Gln His Thr Ile Asp Leu₄₅₅ Thr Asp Ser Glu Met₄₆₀ Asn Lys Leu Phe

Glu Lys Thr Arg Arg Gln₄₇₀ Leu Arg Glu Asn Ala₄₇₅ Glu Asp Met Gly Asn₄₈₀

Gly Cys Phe Lys Ile₄₈₅ Tyr Asp Lys Cys Asp₄₉₀ Asn Ala Cys Ile Glu₄₉₅ Ser

Ile Arg Asn Gly₅₀₀ Thr Tyr Asp His Asp₅₀₅ Val Tyr Arg Asp Glu₅₁₀ Ala Leu

Asn Asn Arg₅₁₅ Phe Gln Ile Lys Gly₅₂₀ Val Glu Leu Lys Ser₅₂₅ Gly Tyr Lys

Asp Trp₅₃₀ Ile Leu Trp Ile Ser₅₃₅ Phe Ala Ile Ser Cys₅₄₀ Phe Leu Leu Cys

Val Val Leu Leu Gly Phe₅₅₀ Ile Met Trp Ala Cys₅₅₅ Gln Arg Gly Asn Ile₅₆₀

Arg Cys Asn Ile Cys₅₆₅ Ile

<210> 123
<211> 566
<212> PRT
<213> Influenza A virus

<400> 123

Met Lys Thr Ile Ile₅ Ala Leu Ser Tyr Ile₁₀ Phe Cys Leu Ala Leu₁₅ Gly

Gln Asp Leu Pro₂₀ Gly Asn Asp Asn₂₅ Ser Thr Ala Thr Leu Cys₃₀ Leu Gly

His His Ala₃₅ Val Pro Asn Gly₄₀ Thr Leu Val Lys Thr Ile₄₅ Thr Asp Asp

Gln Ile Glu Val Thr Asn Ala₅₅ Thr Glu Leu Val Gln₆₀ Ser Ser Ser Thr

Gly Lys Ile Cys Asn Asn₇₀ Pro His Arg Ile₇₅ Leu Asp Gly Ile Asp Cys₈₀

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Thr Leu Ile Asp Ala₈₅ Leu Leu Gly Asp₉₀ Pro His Cys Asp Val₉₅ Phe Gln
 Asn Glu Thr Trp₁₀₀ Asp Leu Phe Val₁₀₅ Arg Ser Lys Ala₁₁₀ Phe Ser Asn
 Cys Tyr Pro₁₁₅ Tyr Asp Val₁₂₀ Pro Asp₁₂₅ Tyr Ala Ser Leu Arg Ser Leu Val
 Ala Ser₁₃₀ Ser Gly Thr Leu₁₃₅ Glu Phe Ile Thr Glu₁₄₀ Gly Phe Thr Trp Thr
 Gly₁₄₅ Val Thr Gln Asn₁₅₀ Gly Ser Asn Ala₁₅₅ Cys Lys Arg Gly Pro Gly₁₆₀
 Ser Gly Phe Phe₁₆₅ Arg Leu Asn Trp₁₇₀ Thr Lys Ser Gly₁₇₅ Ser Thr
 Tyr Pro Val₁₈₀ Leu Asn Val Thr Met₁₈₅ Pro Asn Asn Asp Asn₁₉₀ Phe Asp Lys
 Leu Tyr Ile₁₉₅ Trp Gly Ile His₂₀₀ His Pro Ser Thr Asn₂₀₅ Gln Glu Gln Thr
 Ser Leu Tyr Val₂₁₀ Gln Ala Ser₂₁₅ Gly Arg Val Thr₂₂₀ Val Ser Thr Arg Arg
 Ser₂₂₅ Gln Gln Thr Ile₂₃₀ Ile Pro Asn Ile Gly₂₃₅ Ser Arg Pro Trp Val₂₄₀ Arg
 Gly Leu Ser Ser₂₄₅ Arg Ile Ser Ile Tyr Trp₂₅₀ Thr Ile Val Lys₂₅₅ Pro Gly
 Asp Val Leu₂₆₀ Val Ile Asn Ser Asn₂₆₅ Gly Asn Leu Ile Ala₂₇₀ Pro Arg Gly
 Tyr Phe Lys₂₇₅ Met Arg Thr Gly₂₈₀ Lys Ser Ser Ile Met₂₈₅ Arg Ser Asp Ala
 Pro Ile₂₉₀ Asp Thr Cys Ile Ser₂₉₅ Glu Cys Ile Thr₃₀₀ Pro Asn Gly Ser Ile
 Pro₃₀₅ Asn Asp Lys Pro Phe₃₁₀ Gln Asn Val Asn₃₁₅ Lys Ile Thr Tyr Gly Ala₃₂₀
 Cys Pro Lys Tyr Val₃₂₅ Lys Gln Asn Thr Leu₃₃₀ Lys Leu Ala Thr Gly₃₃₅ Met
 Arg Asn Val₃₄₀ Pro Glu Lys Gln Thr Arg₃₄₅ Gly Leu Phe Gly Ala₃₅₀ Ile Ala

381698_1.TXT

Gly Phe Ile Glu Asn Gly Trp Glu Gly Met Ile Asp Gly Trp Tyr Gly
355 360 365

Phe Arg His Gln Asn Ser Glu Gly Thr Gly Gln Ala Ala Asp Leu Lys
370 375 380

Ser Thr Gln Ala Ala Ile Asp Gln Ile Asn Gly Lys Leu Asn Arg Val
385 390 395 400

Ile Glu Lys Thr Asn Glu Lys Phe His Gln Ile Glu Lys Glu Phe Ser
405 410 415

Glu Val Glu Gly Arg Ile Gln Asp Leu Glu Lys Tyr Val Glu Asp Thr
420 425 430

Lys Ile Asp Leu Trp Ser Tyr Asn Ala Glu Leu Leu Val Ala Leu Glu
435 440 445

Asn Gln His Thr Ile Asp Leu Thr Asp Ser Glu Met Asn Lys Leu Phe
450 455 460

Glu Lys Thr Arg Arg Gln Leu Arg Glu Asn Ala Glu Glu Met Gly Asn
465 470 475 480

Gly Cys Phe Lys Ile Tyr His Lys Cys Asp Asn Ala Cys Ile Glu Ser
485 490 495

Ile Arg Asn Gly Thr Tyr Asp His Asp Val Tyr Arg Asp Glu Ala Leu
500 505 510

Asn Asn Arg Phe Gln Ile Lys Gly Val Glu Leu Lys Ser Gly Tyr Lys
515 520 525

Asp Trp Ile Leu Trp Ile Ser Phe Ala Ile Ser Cys Phe Leu Leu Cys
530 535 540

Val Val Leu Leu Gly Phe Ile Met Trp Ala Cys Gln Arg Gly Asn Ile
545 550 555 560

Arg Cys Asn Ile Cys Ile
565

<210> 124
<211> 566
<212> PRT
<213> Influenza A virus

<400> 124

Met Lys Thr Ile Ile Ala Leu Ser Tyr Ile Phe Cys Leu Val Leu Gly
1 5 10 15

Gln Asp Phe Pro Gly Asn Asp Asn Ser Thr Ala Thr Leu Cys Leu Gly
Page 90

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25

30

His His Ala Val Pro Asn Gly Thr Leu Val Lys Thr Ile Thr Asn Asp
 35 40 45
 Gln Ile Glu Val Thr Asn Ala Thr Glu Leu Val Gln Ser Ser Ser Thr
 50 55 60
 Gly Lys Ile Cys Asn Asn Pro His Arg Ile Leu Asp Gly Ile Asp Cys
 65 70 75 80
 Thr Leu Ile Asp Ala Leu Leu Gly Asp Pro His Cys Asp Gly Phe Gln
 85 90 95
 Asn Glu Thr Trp Asp Leu Phe Val Glu Arg Ser Lys Ala Phe Ser Asn
 100 105 110
 Cys Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Ser Leu Arg Ser Leu Val
 115 120 125
 Ala Ser Ser Gly Thr Leu Glu Phe Ile Ser Glu Gly Phe Thr Trp Thr
 130 135 140
 Gly Val Thr Gln Asn Gly Gly Ser Asn Ala Cys Lys Arg Gly Pro Asp
 145 150 155 160
 Ser Gly Phe Phe Ser Arg Leu Asn Trp Leu Tyr Lys Ser Gly Ser Thr
 165 170 175
 Tyr Pro Val Leu Asn Val Thr Met Pro Asn Asn Asp Asn Phe Asp Lys
 180 185 190
 Leu Tyr Ile Trp Gly Val His His Pro Ser Thr Asp Gln Glu Gln Thr
 195 200 205
 Ser Leu Tyr Val Gln Ala Ser Gly Arg Val Thr Val Ser Thr Lys Arg
 210 215 220
 Ser Gln Gln Thr Ile Ile Pro Asn Ile Gly Ser Arg Pro Trp Val Arg
 225 230 235 240
 Gly Leu Ser Ser Arg Ile Ser Ile Tyr Trp Thr Ile Val Lys Pro Gly
 245 250 255
 Asp Ile Leu Val Ile Asn Ser Asn Gly Asn Leu Ile Ala Pro Arg Gly
 260 265 270
 Tyr Phe Lys Met Arg Thr Gly Lys Ser Ser Ile Met Arg Ser Asp Ala
 275 280 285
 Pro Ile Gly Thr Cys Ile Ser Glu Cys Ile Thr Pro Asn Gly Ser Ile
 290 295 300

381698_1.TXT

Pro Asn Asp Lys Pro Phe Gln Asn Val Asn Lys Ile Thr Tyr Gly Ala
 305 310 315 320
 Cys Pro Lys Tyr Val Lys Gln Asn Thr Leu Lys Leu Ala Thr Gly Met
 325 330 335
 Arg Asn Val Pro Glu Lys Gln Thr Arg Gly Leu Phe Gly Ala Ile Ala
 340 345 350
 Gly Phe Ile Glu Asn Gly Trp Glu Gly Met Ile Asp Gly Trp Tyr Gly
 355 360 365
 Phe Arg His Gln Asn Ser Glu Gly Thr Gly Gln Ala Ala Asp Leu Lys
 370 375 380
 Ser Thr Gln Ala Ala Ile Asp Gln Ile Asn Gly Lys Leu Asn Arg Val
 385 390 395 400
 Ile Glu Lys Thr Asn Glu Lys Phe His Gln Ile Glu Lys Glu Phe Ser
 405 410 415
 Glu Val Glu Gly Arg Ile Gln Asp Leu Glu Lys Tyr Val Glu Asp Thr
 420 425 430
 Lys Ile Asp Leu Trp Ser Tyr Asn Ala Glu Leu Leu Val Ala Leu Glu
 435 440 445
 Asn Gln His Thr Ile Asp Leu Thr Asp Ser Glu Met Asn Lys Leu Phe
 450 455 460
 Glu Lys Thr Arg Arg Gln Leu Arg Glu Asn Ala Glu Asp Met Gly Asn
 465 470 475 480
 Gly Cys Phe Lys Ile Tyr His Lys Cys Asp Asn Ala Cys Ile Gly Ser
 485 490 495
 Ile Arg Asn Gly Thr Tyr Asp His Asp Val Tyr Arg Asp Glu Ala Leu
 500 505 510
 Asn Asn Arg Phe Gln Ile Lys Gly Val Glu Leu Lys Ser Gly Tyr Lys
 515 520 525
 Asp Trp Ile Leu Trp Ile Ser Phe Ala Ile Ser Cys Phe Leu Leu Cys
 530 535 540
 Val Val Leu Leu Gly Phe Ile Met Trp Ala Cys Gln Lys Gly Asn Ile
 545 550 555 560
 Arg Cys Asn Ile Cys Ile
 565

<210> 125
 <211> 566
 <212> PRT
 <213> Influenza A virus

<400> 125

Met Lys Thr Ile Ile Ala Leu Ser Tyr Ile Leu Cys Leu Val Phe Ala
 1 5 10 15

Gln Lys Leu Pro Gly Asn Asp Asn Ser Thr Ala Thr Leu Cys Leu Gly
 20 25 30

His His Ala Val Ser Asn Gly Thr Leu Val Lys Thr Ile Thr Asn Asp
 35 40 45

Gln Ile Glu Val Thr Asn Ala Thr Glu Leu Val Gln Ser Ser Ser Thr
 50 55 60

Gly Arg Ile Cys Asp Ser Pro His Gln Ile Leu Asp Gly Glu Asn Cys
 65 70 75 80

Thr Leu Ile Asp Ala Leu Leu Gly Asp Pro His Cys Asp Gly Phe Gln
 85 90 95

Asn Lys Glu Trp Asp Leu Phe Val Glu Arg Ser Lys Ala Tyr Ser Asn
 100 105 110

Cys Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Ser Leu Arg Ser Leu Val
 115 120 125

Ala Ser Ser Gly Thr Leu Glu Phe Asn Asn Glu Ser Phe Asn Trp Thr
 130 135 140

Gly Val Ala Gln Asn Gly Thr Ser Ser Ala Cys Lys Arg Arg Ser Asn
 145 150 155 160

Lys Ser Phe Phe Ser Arg Leu Asn Trp Leu His Gln Leu Lys Tyr Lys
 165 170 175

Tyr Pro Ala Leu Asn Val Thr Met Pro Asn Asn Glu Lys Phe Asp Lys
 180 185 190

Leu Tyr Ile Trp Gly Val His His Pro Ser Thr Asp Ser Asp Gln Ile
 195 200 205

Ser Ile Tyr Ala Gln Ala Ser Gly Arg Val Thr Val Ser Thr Lys Arg
 210 215 220

Ser Gln Gln Thr Val Ile Pro Asn Ile Gly Ser Ser Pro Trp Val Arg
 225 230 235 240

Gly Val Ser Ser Arg Ile Ser Ile Tyr Trp Thr Ile Val Lys Pro Gly

Asp Ile Leu Leu Ile Asn Ser Thr Gly Asn Leu Ile Ala Pro Arg Gly
 260 265 270

Tyr Phe Lys Ile Arg Ser Gly Lys Ser Ser Ile Met Arg Ser Asp Ala
 275 280 285

Pro Ile Gly Lys Cys Asn Ser Glu Cys Ile Thr Pro Asn Gly Ser Ile
 290 295 300

Pro Asn Asp Lys Pro Phe Gln Asn Val Asn Arg Ile Thr Tyr Gly Ala
 305 310 315 320

Cys Pro Arg Tyr Val Lys Gln Asn Thr Leu Lys Leu Ala Thr Gly Met
 325 330 335

Arg Asn Val Pro Glu Lys Gln Thr Arg Gly Ile Phe Gly Ala Ile Ala
 340 345 350

Gly Phe Ile Glu Asn Gly Trp Glu Gly Met Val Asp Gly Trp Tyr Gly
 355 360 365

Phe Arg His Gln Asn Ser Glu Gly Thr Gly Gln Ala Ala Asp Leu Lys
 370 375 380

Ser Thr Gln Ala Ala Ile Asn Gln Ile Asn Gly Lys Leu Asn Arg Leu
 385 390 395 400

Ile Glu Lys Thr Asn Glu Lys Phe His Gln Ile Glu Lys Glu Phe Ser
 405 410 415

Glu Val Glu Gly Arg Ile Gln Asp Leu Glu Lys Tyr Val Glu Asp Thr
 420 425 430

Lys Ile Asp Leu Trp Ser Tyr Asn Ala Glu Leu Leu Val Ala Leu Glu
 435 440 445

Asn Gln His Thr Ile Asp Leu Thr Asp Ser Glu Met Asn Lys Leu Phe
 450 455 460

Glu Arg Thr Lys Lys Gln Leu Arg Glu Asn Ala Glu Asp Met Gly Asn
 465 470 475 480

Gly Cys Phe Lys Ile Tyr His Lys Cys Asp Asn Ala Cys Ile Gly Ser
 485 490 495

Ile Arg Asn Gly Thr Tyr Asp His Asp Val Tyr Arg Asp Glu Ala Leu
 500 505 510

Asn Asn Arg Phe Gln Ile Lys Gly Val Glu Leu Lys Ser Gly Tyr Lys
 515 520 525

381698_1.TXT

Asp Trp Ile Leu Trp Ile Ser Phe Ala Ile Ser Cys Phe Leu Leu Cys
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Val Val Leu Leu Gly Phe Ile Met Trp Ala Cys Gln Lys Gly Asn Ile
545 550 555 560

Arg Cys Asn Ile Cys Ile
565

<210> 126
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<212> PRT
<213> Influenza A virus

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<223> Xaa can be any naturally occurring amino acid

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<223> Xaa can be any naturally occurring amino acid

<400> 126

Met Lys Thr Ile Ile Ala Leu Ser Tyr Ile Phe Cys Leu Val Phe Ala
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Gln Lys Leu Pro Gly Asn Asp Asn Ser Thr Ala Thr Leu Cys Leu Gly
20 25 30

His His Ala Val Pro Asn Gly Thr Leu Val Lys Thr Ile Thr Asn Asp
35 40 45

Gln Ile Glu Val Thr Asn Ala Thr Glu Leu Val Gln Ser Ser Ser Thr
50 55 60

Gly Arg Ile Cys Asp Ser Pro His Arg Ile Leu Asp Gly Lys Asn Cys
65 70 75 80

Thr Leu Ile Asp Ala Leu Leu Gly Asp Pro His Cys Asp Gly Phe Gln
85 90 95

Asn Glu Lys Trp Asp Leu Phe Ile Glu Arg Ser Lys Ala Phe Ser Asn
100 105 110

Cys Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Ser Leu Arg Ser Leu Val
115 120 125

381698_1.TXT

Ala Ser Ser Gly Thr Leu Glu Phe Ile Asn Glu Gly Phe Asn Trp Thr
130 135 140

Gly Val Thr Gln Ser Gly Gly Ser Tyr Xaa Cys Lys Arg Gly Ser Val
145 150 155 160

Asn Ser Phe Phe Ser Arg Leu Asn Trp Leu Tyr Glu Ser Glu Tyr Lys
165 170 175

Tyr Pro Ala Leu Asn Val Thr Met Pro Asn Asn Gly Lys Phe Asp Lys
180 185 190

Leu Tyr Ile Trp Gly Val His His Pro Xaa Thr Glu Lys Glu Gln Thr
195 200 205

Asn Leu Tyr Val Arg Ala Ser Gly Arg Val Thr Val Ser Thr Lys Arg
210 215 220

Ser Gln Gln Thr Val Ile Pro Asn Ile Gly Ser Xaa Pro Trp Val Arg
225 230 235 240

Gly Leu Ser Ser Arg Ile Ser Ile Tyr Trp Thr Ile Val Lys Pro Gly
245 250 255

Asp Ile Leu Leu Ile Asn Ser Thr Gly Asn Leu Ile Ala Pro Arg Gly
260 265 270

Tyr Phe Lys Ile Arg Thr Gly Lys Ser Ser Ile Met Arg Ser Asp Ala
275 280 285

Pro Ile Gly Thr Cys Ser Ser Glu Cys Ile Thr Pro Asn Gly Ser Ile
290 295 300

Pro Asn Asp Lys Pro Phe Gln Asn Val Asn Lys Ile Thr Tyr Gly Ala
305 310 315 320

Cys Pro Arg Tyr Val Lys Gln Asn Thr Leu Lys Leu Ala Thr Gly Met
325 330 335

Arg Asn Val Pro Glu Lys Gln Thr Arg Gly Ile Phe Gly Ala Ile Ala
340 345 350

Gly Phe Ile Glu Asn Gly Trp Glu Gly Met Val Asp Gly Trp Tyr Gly
355 360 365

Phe Arg His Gln Asn Ser Glu Gly Thr Gly Gln Ala Ala Asp Leu Lys
370 375 380

Ser Thr Gln Ala Ala Ile Asp Gln Ile Asn Gly Lys Leu Asn Arg Leu
385 390 395 400

Ile Glu Lys Thr Asn Glu Lys Phe His Gln Ile Glu Lys Glu Phe Ser
Page 96

405

410

415

Glu Val Glu Gly Arg Ile Gln Asp Leu Glu Lys Tyr Val Glu Asp Thr
 420 425 430

Lys Ile Asp Leu Trp Ser Tyr Asn Ala Glu Leu Leu Val Ala Leu Glu
 435 440 445

Asn Gln Tyr Thr Ile Asp Leu Thr Asp Ser Glu Met Asn Lys Leu Phe
 450 455 460

Glu Lys Thr Arg Lys Gln Leu Arg Glu Asn Ala Glu Asp Met Gly Asn
 465 470 475 480

Gly Cys Phe Lys Ile Tyr His Lys Cys Asp Asn Ala Cys Ile Gly Ser
 485 490 495

Ile Arg Asn Gly Thr Tyr Asp His Asp Val Tyr Arg Asp Glu Ala Leu
 500 505 510

Asn Asn Arg Phe Gln Ile Lys Gly Val Glu Leu Lys Ser Gly Tyr Lys
 515 520 525

Asp Trp Ile Leu Trp Ile Ser Phe Ala Ile Ser Cys Phe Leu Leu Cys
 530 535 540

Val Val Leu Leu Gly Phe Ile Met Trp Ala Cys Gln Lys Gly Asn Ile
 545 550 555 560

Arg Cys Asn Ile Cys Ile
 565

<210> 127
 <211> 566
 <212> PRT
 <213> Influenza A virus

<400> 127

Met Lys Thr Ile Ile Ala Leu Ser Tyr Ile Leu Cys Leu Val Phe Ala
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Gln Lys Leu Pro Gly Asn Asp Asn Ser Thr Ala Thr Leu Cys Leu Gly
 20 25 30

His His Ala Val Pro Asn Gly Thr Leu Val Lys Thr Ile Thr Asn Asp
 35 40 45

Gln Ile Glu Val Thr Asn Ala Thr Glu Leu Val Gln Ser Ser Ser Thr
 50 55 60

Gly Arg Ile Cys Asp Ser Pro His Arg Ile Leu Asp Gly Lys Asn Cys
 65 70 75 80

381698_1.TXT

Thr Leu Ile Asp Ala Leu Leu Gly Asp Pro His Cys Asp Gly Phe Gln
85 90 95

Asn Lys Glu Trp Asp Leu Phe Val Glu Arg Ser Lys Ala Tyr Ser Asn
100 105 110

Cys Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Ser Leu Arg Ser Leu Val
115 120 125

Ala Ser Ser Gly Thr Leu Glu Phe Ile Asn Glu Asp Phe Asn Trp Thr
130 135 140

Gly Val Ala Gln Ser Gly Glu Ser Tyr Ala Cys Lys Arg Gly Ser Val
145 150 155 160

Lys Ser Phe Phe Ser Arg Leu Asn Trp Leu His Glu Ser Glu Tyr Lys
165 170 175

Tyr Pro Ala Leu Asn Val Thr Met Pro Asn Asn Gly Lys Phe Asp Lys
180 185 190

Leu Tyr Ile Trp Gly Val His His Pro Ser Thr Asp Arg Glu Gln Thr
195 200 205

Asn Leu Tyr Val Arg Ala Ser Gly Arg Val Thr Val Ser Thr Lys Arg
210 215 220

Ser Gln Gln Thr Val Ile Pro Asn Ile Gly Ser Arg Pro Trp Val Arg
225 230 235 240

Gly Leu Ser Ser Arg Ile Ser Ile Tyr Trp Thr Ile Val Lys Pro Gly
245 250 255

Asp Ile Leu Leu Ile Asn Ser Thr Gly Asn Leu Ile Ala Pro Arg Gly
260 265 270

Tyr Phe Lys Ile Arg Thr Gly Lys Ser Ser Ile Met Arg Ser Asp Ala
275 280 285

Pro Ile Gly Thr Cys Ser Ser Glu Cys Ile Thr Pro Asn Gly Ser Ile
290 295 300

Pro Asn Asp Lys Pro Phe Gln Asn Val Asn Arg Ile Thr Tyr Gly Ala
305 310 315 320

Cys Pro Arg Tyr Val Lys Gln Asn Thr Leu Lys Leu Ala Thr Gly Met
325 330 335

Arg Asn Val Pro Glu Lys Gln Thr Arg Gly Ile Phe Gly Ala Ile Ala
340 345 350

381698_1.TXT

Gly Phe Ile Glu Asn Gly Trp Glu Gly Met Val Asp Gly Trp Tyr Gly
355 360 365

Phe Arg His Gln Asn Ser Glu Gly Thr Gly Gln Ala Ala Asp Leu Lys
370 375 380

Ser Thr Gln Ala Ala Ile Asp Gln Ile Asn Gly Lys Leu Asn Arg Leu
385 390 395 400

Ile Glu Lys Thr Asn Glu Lys Phe His Gln Ile Glu Lys Glu Phe Ser
405 410 415

Glu Val Glu Gly Arg Ile Gln Asp Leu Glu Lys Tyr Val Glu Asp Thr
420 425 430

Lys Ile Asp Leu Trp Ser Tyr Asn Ala Glu Leu Leu Val Ala Leu Glu
435 440 445

Asn Gln His Thr Ile Asp Leu Thr Asp Ser Glu Met Asn Lys Leu Phe
450 455 460

Glu Lys Thr Arg Lys Gln Leu Arg Glu Asn Ala Glu Asp Met Gly Asn
465 470 475 480

Gly Cys Phe Lys Ile Tyr His Lys Cys Asp Asn Ala Cys Ile Gly Ser
485 490 495

Ile Arg Asn Gly Thr Tyr Asp His Asp Val Tyr Arg Asp Glu Ala Leu
500 505 510

Asn Asn Arg Phe Gln Ile Lys Gly Val Glu Leu Lys Ser Gly Tyr Lys
515 520 525

Asp Trp Ile Leu Trp Ile Ser Phe Ala Ile Ser Cys Phe Leu Leu Cys
530 535 540

Val Val Leu Leu Gly Phe Ile Met Trp Ala Cys Gln Lys Gly Asn Ile
545 550 555 560

Arg Cys Asn Ile Cys Ile
565

<210> 128
<211> 566
<212> PRT
<213> Influenza A virus

<400> 128

Met Lys Thr Ile Ile Ala Leu Ser Tyr Ile Phe Cys Leu Val Phe Ala
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Gln Asn Leu Pro Gly Asn Asp Asn Ser Thr Ala Thr Leu Cys Leu Gly
20 25 30

381698_1.TXT

His His Ala Val Pro Asn Gly Thr Leu Val Lys Thr Ile Thr Asn Asp
 35 40 45
 Gln Ile Glu Val Thr Asn Ala Thr Glu Leu Val Gln Ser Ser Ser Thr
 50 55 60
 Gly Arg Ile Cys Asp Ser Pro His Arg Ile Leu Asp Gly Lys Asn Cys
 65 70 75 80
 Thr Leu Ile Asp Ala Leu Leu Gly Asp Pro His Cys Asp Gly Phe Gln
 85 90 95
 Asn Glu Lys Trp Asp Leu Phe Val Glu Arg Ser Lys Ala Phe Ser Asn
 100 105 110
 Cys Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Ser Leu Arg Ser Leu Val
 115 120 125
 Ala Ser Ser Gly Thr Leu Glu Phe Ile Asn Glu Gly Phe Asn Trp Thr
 130 135 140
 Gly Val Thr Gln Ser Gly Gly Ser Tyr Ala Cys Lys Arg Gly Ser Asp
 145 150 155 160
 Asn Ser Phe Phe Ser Arg Leu Asn Trp Leu Tyr Glu Ser Glu Ser Lys
 165 170 175
 Tyr Pro Val Leu Asn Val Thr Met Pro Asn Asn Gly Asn Phe Asp Lys
 180 185 190
 Leu Tyr Ile Trp Gly Val His His Pro Ser Thr Asp Lys Glu Gln Thr
 195 200 205
 Lys Leu Tyr Val Arg Ala Ser Gly Arg Val Thr Val Ser Thr Lys Arg
 210 215 220
 Ser Gln Gln Thr Ile Ile Pro Asn Ile Gly Ser Arg Pro Trp Val Arg
 225 230 235 240
 Gly Leu Ser Ser Gly Ile Ser Ile Tyr Trp Thr Ile Val Lys Pro Gly
 245 250 255
 Asp Ile Leu Leu Ile Asn Ser Asn Gly Asn Leu Ile Ala Pro Arg Gly
 260 265 270
 Tyr Phe Lys Ile Arg Thr Gly Lys Ser Ser Ile Met Arg Ser Asp Ala
 275 280 285
 Pro Ile Gly Thr Cys Ser Ser Glu Cys Ile Thr Pro Asn Gly Ser Ile
 290 295 300

381698_1.TXT

Pro Asn Asp Lys Pro Phe Gln Asn Val Asn Lys Ile Thr Tyr Gly Ala
 305 310 315 320
 Cys Pro Lys Tyr Val Lys Gln Asn Thr Leu Lys Leu Ala Thr Gly Met
 325 330 335
 Arg Asn Val Pro Glu Lys Gln Thr Arg Gly Ile Phe Gly Ala Ile Ala
 340 345 350
 Gly Phe Ile Glu Asn Gly Trp Glu Gly Met Val Asp Gly Trp Tyr Gly
 355 360 365
 Phe Arg His Gln Asn Ser Glu Gly Thr Gly Gln Ala Ala Asp Leu Lys
 370 375 380
 Ser Thr Gln Ala Ala Ile Asp Gln Ile Asn Gly Lys Leu Asn Arg Val
 385 390 395 400
 Ile Glu Lys Thr Asn Glu Lys Phe His Gln Ile Glu Lys Glu Phe Ser
 405 410 415
 Glu Val Glu Gly Arg Ile Gln Asp Leu Glu Lys Tyr Val Glu Asp Thr
 420 425 430
 Lys Ile Asp Leu Trp Ser Tyr Asn Ala Glu Leu Leu Val Ala Leu Glu
 435 440 445
 Asn Gln His Thr Ile Asp Leu Thr Asp Ser Glu Met Asn Lys Leu Phe
 450 455 460
 Glu Lys Thr Arg Arg Gln Leu Arg Glu Asn Ala Glu Asp Met Gly Asn
 465 470 475 480
 Gly Cys Phe Lys Ile Tyr His Lys Cys Asp Asn Ala Cys Ile Gly Ser
 485 490 495
 Ile Arg Asn Gly Thr Tyr Asp His Asp Val Tyr Arg Asp Glu Ala Leu
 500 505 510
 Asn Asn Arg Phe Gln Ile Lys Gly Val Glu Leu Lys Ser Gly Tyr Lys
 515 520 525
 Asp Trp Ile Leu Trp Ile Ser Phe Ala Ile Ser Cys Phe Leu Leu Cys
 530 535 540
 Val Val Leu Leu Gly Phe Ile Met Trp Ala Cys Gln Lys Gly Asn Ile
 545 550 555 560
 Arg Cys Asn Ile Cys Ile
 565

<210> 129
 <211> 566
 <212> PRT
 <213> Influenza A virus

<400> 129

Met Lys Thr Ile Ile Ala Phe Ser Tyr Ile Leu Cys Leu Ile Phe Ala
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Gln Lys Ile Pro Gly Ser Asp Asn Ser Met Ala Thr Leu Cys Leu Gly
 20 25 30

His His Ala Val Pro Asn Gly Thr Leu Val Lys Thr Ile Thr Asp Asp
 35 40 45

Gln Ile Glu Val Thr Asn Ala Thr Glu Leu Val Gln Ser Ser Ser Thr
 50 55 60

Gly Arg Ile Cys Asn Ser Pro His Gln Ile Leu Asp Gly Lys Asn Cys
 65 70 75 80

Thr Leu Ile Asp Ala Leu Leu Gly Asp Pro His Cys Asp Asp Phe Gln
 85 90 95

Asn Lys Glu Trp Asp Leu Phe Val Glu Arg Ser Thr Ala Tyr Ser Asn
 100 105 110

Cys Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Ser Leu Arg Ser Leu Val
 115 120 125

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

Gly Val Ala Gln Asp Gly Thr Ser Ser Ala Cys Lys Arg Gly Ser Val
 145 150 155 160

Lys Ser Phe Phe Ser Arg Leu Asn Trp Leu His Glu Leu Gly Tyr Lys
 165 170 175

Tyr Pro Ala Leu Asn Val Thr Met Pro Asn Asn Asp Lys Phe Asp Lys
 180 185 190

Leu Tyr Ile Trp Gly Val His His Pro Ser Thr Asp Arg Asp Gln Thr
 195 200 205

Ser Leu Tyr Val Gln Ala Ser Gly Arg Val Thr Val Ser Thr Lys Arg
 210 215 220

Ser Gln Gln Thr Val Ile Pro Asn Ile Gly Phe Arg Pro Trp Val Arg
 225 230 235 240

Gly Ile Ser Ser Ile Ile Ser Ile Tyr Trp Thr Ile Val Lys Pro Gly
 245 250 255

381698_1.TXT

Asp Ile Leu Leu Ile Thr Ser Thr Gly Asn Leu Ile Ala Pro Arg Gly
 260 265 270
 Tyr Phe Lys Ile Arg Ser Gly Lys Ser Ser Ile Met Arg Ser Asp Ala
 275 280 285
 Pro Ile Asp Asn Cys Asn Ser Glu Cys Ile Thr Pro Asn Gly Ser Ile
 290 295 300
 Pro Asn Asp Lys Pro Phe Gln Asn Val Asn Arg Ile Thr Tyr Gly Ala
 305 310 315 320
 Cys Pro Arg Tyr Val Lys Gln Asn Thr Leu Lys Leu Ala Thr Gly Met
 325 330 335
 Arg Asn Val Pro Glu Lys Gln Thr Arg Gly Ile Phe Gly Ala Ile Ala
 340 345 350
 Gly Phe Ile Glu Asn Gly Trp Glu Gly Met Val Asp Gly Trp Tyr Gly
 355 360 365
 Phe Arg His Gln Asn Ser Glu Gly Thr Gly Gln Ala Ala Asp Leu Lys
 370 375 380
 Ser Thr Gln Ala Ala Ile Asn Gln Ile Thr Gly Lys Leu Asn Arg Val
 385 390 395 400
 Ile Lys Lys Thr Asn Glu Lys Phe His Gln Ile Glu Lys Glu Phe Ser
 405 410 415
 Glu Val Glu Gly Arg Ile Gln Asp Leu Glu Lys Tyr Val Glu Asp Thr
 420 425 430
 Lys Ile Asp Leu Trp Ser Tyr Asn Ala Glu Leu Leu Val Ala Leu Glu
 435 440 445
 Asn Gln His Thr Ile Asp Leu Thr Asp Ser Glu Met Asn Lys Leu Phe
 450 455 460
 Glu Arg Thr Arg Lys Gln Leu Arg Glu Asn Ala Glu Asp Met Gly Asn
 465 470 475 480
 Gly Cys Phe Lys Ile Tyr His Lys Cys Asp Asn Ala Cys Ile Gly Ser
 485 490 495
 Ile Arg Asn Gly Thr Tyr Asp His Asp Val Tyr Arg Asp Glu Ala Leu
 500 505 510
 Asn Asn Arg Phe Gln Ile Lys Gly Val Glu Leu Lys Ser Gly Tyr Lys
 515 520 525

381698_1.TXT

Asp Trp Ile Leu Trp Ile Ser Phe Ala Ile Ser Cys Phe Leu Leu Cys
530 535 540

Val Val Leu Leu Gly Phe Ile Met Trp Ala Cys Gln Lys Gly Asn Ile
545 550 555 560

Arg Cys Asn Ile Cys Ile
565

<210> 130
<211> 566
<212> PRT
<213> Influenza A virus
<400> 130

Met Lys Thr Ile Ile Ala Phe Ser Tyr Ile Leu Cys Leu Ile Phe Ala
1 5 10 15

Gln Lys Ile Pro Gly Ser Asp Asn Ser Met Ala Thr Leu Cys Leu Gly
20 25 30

His His Ala Val Pro Asn Gly Thr Leu Val Lys Thr Ile Thr Asp Asp
35 40 45

Gln Ile Glu Val Thr Asn Ala Thr Glu Leu Val Gln Ser Ser Ser Thr
50 55 60

Gly Arg Ile Cys Asn Ser Pro His Gln Ile Leu Asp Gly Lys Asn Cys
65 70 75 80

Thr Leu Ile Asp Ala Leu Leu Gly Asp Pro His Cys Asp Asp Phe Gln
85 90 95

Asn Lys Glu Trp Asp Leu Phe Val Glu Arg Ser Thr Ala Tyr Ser Asn
100 105 110

Cys Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Ser Leu Arg Ser Leu Val
115 120 125

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

Gly Val Ala Gln Asp Gly Thr Ser Ser Ala Cys Lys Arg Gly Ser Val
145 150 155 160

Lys Ser Phe Phe Ser Arg Leu Asn Trp Leu His Glu Leu Gly Tyr Lys
165 170 175

Tyr Pro Ala Leu Asn Val Thr Met Pro Asn Asn Asp Lys Phe Asp Lys
180 185 190

Leu Tyr Ile Trp Gly Val His His Pro Ser Thr Asp Arg Asp Gln Thr
Page 104

195

200

205

Ser Leu Tyr Val Gln Ala Ser Gly Arg Val Thr Val Ser Thr Lys Arg
 210 215 220

Ser Gln Gln Thr Val Ile Pro Asn Ile Gly Phe Arg Pro Trp Val Arg
 225 230 235 240

Gly Ile Ser Ser Ile Ile Ser Ile Tyr Trp Thr Ile Val Lys Pro Gly
 245 250 255

Asp Ile Leu Leu Ile Thr Ser Thr Gly Asn Leu Ile Ala Pro Arg Gly
 260 265 270

Tyr Phe Lys Ile Arg Ser Gly Lys Ser Ser Ile Met Arg Ser Asp Ala
 275 280 285

Pro Ile Asp Asn Cys Asn Ser Glu Cys Ile Thr Pro Asn Gly Ser Ile
 290 295 300

Pro Asn Asp Lys Pro Phe Gln Asn Val Asn Arg Ile Thr Tyr Gly Ala
 305 310 315 320

Cys Pro Arg Tyr Val Lys Gln Asn Thr Leu Lys Leu Ala Thr Gly Met
 325 330 335

Arg Asn Val Pro Glu Lys Gln Thr Arg Gly Ile Phe Gly Ala Ile Ala
 340 345 350

Gly Phe Ile Glu Asn Gly Trp Glu Gly Met Val Asp Gly Trp Tyr Gly
 355 360 365

Phe Arg His Gln Asn Ser Glu Gly Thr Gly Gln Ala Ala Asp Leu Lys
 370 375 380

Ser Thr Gln Ala Ala Ile Asn Gln Ile Thr Gly Lys Leu Asn Arg Val
 385 390 395 400

Ile Lys Lys Thr Asn Glu Lys Phe His Gln Ile Glu Lys Glu Phe Ser
 405 410 415

Glu Val Glu Gly Arg Ile Gln Asp Leu Glu Lys Tyr Val Glu Asp Thr
 420 425 430

Lys Ile Asp Leu Trp Ser Tyr Asn Ala Glu Leu Leu Val Ala Leu Glu
 435 440 445

Asn Gln His Thr Ile Asp Leu Thr Asp Ser Glu Met Asn Lys Leu Phe
 450 455 460

Glu Arg Thr Arg Lys Gln Leu Arg Glu Asn Ala Glu Asp Met Gly Asn
 465 470 475 480

381698_1.TXT

Gly Cys Phe Lys Ile Tyr His Lys Cys Asp Asn Ala Cys Ile Gly Ser
485 490 495

Ile Arg Asn Gly Thr Tyr Asp His Asp Val Tyr Arg Asp Glu Ala Leu
500 505 510

Asn Asn Arg Phe Gln Ile Lys Gly Val Glu Leu Lys Ser Gly Tyr Lys
515 520 525

Asp Trp Ile Leu Trp Ile Ser Phe Ala Ile Ser Cys Phe Leu Leu Cys
530 535 540

Val Val Leu Leu Gly Phe Ile Met Trp Ala Cys Gln Lys Gly Asn Ile
545 550 555 560

Arg Cys Asn Ile Cys Ile
565

<210> 131
<211> 566
<212> PRT
<213> Influenza A virus

<400> 131

Met Lys Thr Ile Ile Ala Leu Ser Tyr Ile Leu Cys Leu Val Phe Ala
1 5 10 15

Gln Lys Leu Pro Gly Asn Asp Asn Ser Thr Ala Thr Leu Cys Leu Gly
20 25 30

His His Ala Val Pro Asn Gly Thr Leu Val Lys Thr Ile Thr Asn Asp
35 40 45

Gln Ile Glu Val Thr Asn Ala Thr Glu Leu Val Gln Ser Ser Ser Thr
50 55 60

Asp Arg Ile Cys Asp Ser Pro His Arg Ile Leu Asp Gly Glu Asn Cys
65 70 75 80

Thr Leu Ile Asp Ala Leu Leu Gly Asp Pro His Cys Asp Gly Phe Gln
85 90 95

Asn Lys Glu Trp Asp Leu Phe Val Glu Arg Ser Lys Ala Tyr Ser Asn
100 105 110

Cys Tyr Pro Tyr Asp Val Gln Asp Tyr Ala Ser Leu Arg Ser Leu Val
115 120 125

Ala Ser Ser Gly Thr Leu Glu Phe Asn Asn Glu Ser Phe Asn Trp Thr
130 135 140

381698_1.TXT

Gly Val Ala Gln Asn Gly Thr Ser Tyr Ala Cys Lys Arg Arg Ser Ile
145 150 155 160

Lys Ser Phe Phe Ser Arg Leu Asn Trp Leu His Gln Leu Lys Tyr Lys
165 170 175

Tyr Pro Ala Leu Asn Val Thr Met Pro Asn Asn Asp Lys Phe Asp Lys
180 185 190

Leu Tyr Ile Trp Gly Val His His Pro Ser Thr Asp Ser Asp Gln Thr
195 200 205

Ser Leu Tyr Ala Gln Ala Ser Gly Arg Val Thr Val Ser Thr Lys Arg
210 215 220

Ser Gln Gln Thr Val Ile Pro Asn Ile Gly Ser Arg Pro Trp Val Arg
225 230 235 240

Gly Val Ser Ser Arg Ile Ser Ile Tyr Trp Thr Ile Val Lys Pro Gly
245 250 255

Asp Ile Leu Leu Ile Asn Ser Thr Gly Asn Leu Ile Ala Pro Arg Gly
260 265 270

Tyr Phe Lys Ile Arg Ser Gly Lys Ser Ser Ile Met Arg Ser Asp Ala
275 280 285

Pro Ile Gly Lys Cys Asn Ser Glu Cys Ile Thr Pro Asn Gly Ser Ile
290 295 300

Pro Asn Asp Lys Pro Phe Gln Asn Val Asn Lys Ile Thr Tyr Gly Ala
305 310 315 320

Cys Pro Lys Tyr Val Lys Gln Asn Thr Leu Lys Leu Ala Thr Gly Met
325 330 335

Arg Asn Val Pro Glu Lys Gln Thr Arg Gly Ile Phe Gly Ala Ile Ala
340 345 350

Gly Phe Ile Glu Asn Gly Trp Glu Gly Met Val Asp Gly Trp Tyr Gly
355 360 365

Phe Arg His Gln Asn Ser Glu Gly Thr Gly Gln Ala Ala Asp Leu Lys
370 375 380

Ser Thr Gln Ala Ala Ile Asp Gln Ile Asn Gly Lys Leu Asn Arg Val
385 390 395 400

Ile Glu Lys Thr Asn Glu Lys Phe His Gln Ile Glu Lys Glu Phe Ser
405 410 415

Glu Val Glu Gly Arg Ile Gln Asp Leu Glu Lys Tyr Val Glu Asp Thr
Page 107

420

425

430

Lys Ile Asp Leu Trp Ser Tyr Asn Ala Glu Leu Leu Val Ala Leu Glu
 435 440 445

Asn Gln His Thr Ile Asp Leu Thr Asp Ser Glu Met Asn Lys Leu Phe
 450 455 460

Glu Arg Thr Arg Lys Gln Leu Arg Glu Asn Ala Glu Asp Met Gly Asn
 465 470 475 480

Gly Cys Phe Lys Ile Tyr His Lys Cys Asp Asn Ala Cys Ile Gly Ser
 485 490 495

Ile Arg Asn Gly Thr Tyr Asp His Asp Val Tyr Arg Asp Glu Ala Leu
 500 505 510

Asn Asn Arg Phe Gln Ile Lys Gly Val Glu Leu Lys Ser Gly Tyr Lys
 515 520 525

Asp Trp Ile Leu Trp Ile Ser Phe Ala Ile Ser Cys Phe Leu Leu Cys
 530 535 540

Val Val Leu Leu Gly Phe Ile Met Trp Ala Cys Gln Lys Gly Asn Ile
 545 550 555 560

Arg Cys Asn Ile Cys Ile
 565

<210> 132
 <211> 566
 <212> PRT
 <213> Influenza A virus

<400> 132

Met Lys Thr Ile Ile Ala Leu Ser Tyr Ile Leu Cys Leu Val Phe Ala
 1 5 10 15

Gln Lys Leu Pro Gly Asn Asp Asn Ser Thr Ala Thr Leu Cys Leu Gly
 20 25 30

His His Ala Val Pro Asn Gly Thr Leu Val Lys Thr Ile Thr Asn Asp
 35 40 45

Gln Ile Glu Val Thr Asn Ala Thr Glu Leu Val Gln Ser Ser Ser Thr
 50 55 60

Gly Arg Ile Cys Asp Ser Pro His Arg Ile Leu Asp Gly Lys Asn Cys
 65 70 75 80

Thr Leu Ile Asp Ala Leu Leu Gly Asp Pro His Cys Asp Gly Phe Gln
 85 90 95

381698_1.TXT

Asn Lys Glu Trp Asp Leu Phe Val Glu Arg Ser Lys Ala Tyr Ser Asn
 100 105 110
 Cys Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Ser Leu Arg Ser Leu Val
 115 120 125
 Ala Ser Ser Gly Thr Leu Glu Phe Thr Asn Glu Gly Phe Asn Trp Thr
 130 135 140
 Gly Val Ala Gln Asp Gly Lys Ser Tyr Ala Cys Lys Arg Gly Ser Val
 145 150 155 160
 Asn Ser Phe Phe Ser Arg Leu Asn Trp Leu His Lys Leu Glu Tyr Lys
 165 170 175
 Tyr Pro Ala Leu Asn Val Thr Met Pro Asn Asn Asp Lys Phe Asp Lys
 180 185 190
 Leu Tyr Ile Trp Gly Val His His Pro Ser Thr Asp Ser Asp Gln Thr
 195 200 205
 Ser Leu Tyr Val Gln Ala Ser Gly Arg Val Thr Val Ser Thr Lys Arg
 210 215 220
 Ser Gln Gln Thr Val Ile Pro Asn Ile Gly Ser Arg Pro Trp Val Arg
 225 230 235 240
 Gly Ile Ser Ser Arg Ile Ser Ile Tyr Trp Thr Ile Val Lys Pro Gly
 245 250 255
 Asp Ile Leu Leu Ile Asn Ser Thr Gly Asn Leu Ile Ala Pro Arg Gly
 260 265 270
 Tyr Phe Lys Ile Arg Asn Gly Lys Ser Ser Ile Met Arg Ser Asp Ala
 275 280 285
 Pro Ile Asp Asn Cys Asn Ser Glu Cys Val Thr Pro Asn Gly Ser Ile
 290 295 300
 Pro Asn Asp Lys Pro Phe Gln Asn Val Asn Arg Ile Thr Tyr Gly Ala
 305 310 315 320
 Cys Pro Arg Tyr Val Lys Gln Asn Thr Leu Lys Leu Ala Thr Gly Met
 325 330 335
 Arg Asn Val Pro Glu Lys Gln Thr Arg Gly Ile Phe Gly Ala Ile Ala
 340 345 350
 Gly Phe Ile Glu Asn Gly Trp Glu Gly Met Val Asp Gly Trp Tyr Gly
 355 360 365

381698_1.TXT

Phe Arg His Gln Asn Ser Glu Gly Thr Gly Gln Ala Ala Asp Leu Lys
370 375 380

Ser Thr Gln Ala Ala Ile Asn Gln Ile Asn Gly Lys Leu Asn Arg Leu
385 390 395 400

Ile Glu Lys Thr Asn Glu Lys Phe His Gln Ile Glu Lys Glu Phe Ser
405 410 415

Glu Val Glu Gly Arg Ile Gln Asp Leu Glu Lys Tyr Val Glu Asp Thr
420 425 430

Lys Ile Asp Leu Trp Ser Tyr Asn Ala Glu Leu Leu Val Ala Leu Glu
435 440 445

Asn Gln His Thr Ile Asp Leu Thr Asp Ser Glu Met Asn Lys Leu Phe
450 455 460

Glu Arg Thr Arg Lys Gln Leu Arg Glu Asn Ala Glu Asp Met Gly Asn
465 470 475 480

Gly Cys Phe Lys Ile Tyr His Lys Cys Asp Asn Ala Cys Ile Gly Ser
485 490 495

Ile Arg Asn Gly Thr Tyr Asn His Asp Val Tyr Arg Asp Glu Ala Leu
500 505 510

Asn Asn Arg Phe Gln Ile Lys Gly Val Glu Leu Lys Ser Gly Tyr Lys
515 520 525

Asp Trp Ile Leu Trp Ile Ser Phe Ala Ile Ser Cys Phe Leu Leu Cys
530 535 540

Val Val Leu Leu Gly Phe Ile Met Trp Ala Cys Gln Lys Gly Asn Ile
545 550 555 560

Arg Cys Asn Ile Cys Ile
565

<210> 133
<211> 566
<212> PRT
<213> Influenza A virus

<220>
<221> misc_feature
<222> (318)..(318)
<223> Xaa can be any naturally occurring amino acid
<400> 133

Met Lys Thr Ile Ile Ala Leu Ser Tyr Ile Phe Cys Leu Val Leu Gly
1 5 10 15

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Gln Asp Phe Pro Gly Asn Asp Asn Ser Thr Ala Thr Leu Cys Leu Gly
 20 25 30
 His His Ala Val Pro Asn Gly Thr Leu Val Lys Thr Ile Thr Asn Asp
 35 40 45
 Gln Ile Glu Val Thr Asn Ala Thr Glu Leu Val Gln Ser Ser Ser Thr
 50 55 60
 Gly Lys Ile Cys Asn Asn Pro His Arg Ile Leu Asp Gly Ile Asp Cys
 65 70 75 80
 Thr Leu Ile Asp Ala Leu Leu Gly Asp Pro His Cys Asp Gly Phe Gln
 85 90 95
 Asn Glu Thr Trp Asp Leu Phe Val Glu Arg Ser Lys Ala Phe Ser Asn
 100 105 110
 Cys Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Ser Leu Arg Ser Leu Val
 115 120 125
 Ala Ser Ser Gly Thr Leu Glu Phe Ile Ser Glu Gly Phe Thr Trp Thr
 130 135 140
 Gly Val Thr Gln Asn Gly Gly Ser Asn Ala Cys Lys Arg Gly Pro Asp
 145 150 155 160
 Ser Gly Phe Phe Ser Arg Leu Asn Trp Leu Tyr Lys Ser Gly Ser Thr
 165 170 175
 Tyr Pro Val Leu Asn Val Thr Met Pro Asn Asn Asp Asn Phe Asp Lys
 180 185 190
 Leu Tyr Ile Trp Gly Val His His Pro Ser Thr Asp Gln Glu Gln Thr
 195 200 205
 Ser Leu Tyr Val Gln Ala Ser Gly Arg Val Thr Val Ser Thr Lys Arg
 210 215 220
 Ser Gln Gln Thr Ile Ile Pro Asn Ile Gly Ser Arg Pro Trp Val Arg
 225 230 235 240
 Gly Leu Ser Ser Arg Ile Ser Ile Tyr Trp Thr Ile Val Lys Pro Gly
 245 250 255
 Asp Ile Leu Val Ile Asn Ser Asn Gly Asn Leu Ile Ala Pro Arg Gly
 260 265 270
 Tyr Phe Lys Met Arg Thr Gly Lys Ser Ser Ile Met Arg Ser Asp Ala
 275 280 285
 Pro Ile Gly Thr Cys Ile Ser Glu Cys Ile Thr Pro Asn Gly Ser Ile
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295

Pro Asn Asp Lys Pro Phe Gln Asn Val Asn Lys Ile Thr Xaa Gly Ala
305 310 315 320

Cys Pro Lys Tyr Val Lys Gln Asn Thr Leu Lys Leu Ala Thr Gly Met
325 330 335

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

Gly Phe Ile Glu Asn Gly Trp Glu Gly Met Ile Asp Gly Trp Tyr Gly
355 360 365

Phe Arg His Gln Asn Ser Glu Gly Thr Gly Gln Pro Ala Asp Leu Lys
370 375 380

Ser Thr Gln Ala Ala Ile Asp Gln Ile Asn Gly Lys Leu Asn Arg Val
385 390 395 400

Ile Glu Lys Thr Asn Glu Lys Phe His Gln Ile Glu Lys Glu Phe Ser
405 410 415

Glu Val Glu Gly Arg Ile Gln Asp Leu Glu Lys Tyr Val Glu Asp Thr
420 425 430

Lys Ile Asp Leu Trp Ser Tyr Asn Ala Glu Leu Leu Val Ala Leu Glu
435 440 445

Asn Gln His Thr Ile Asp Leu Thr Asp Ser Glu Met Asn Lys Leu Phe
450 455 460

Glu Lys Thr Ser Arg Gln Leu Arg Glu Asn Ala Glu Asp Met Gly Asn
465 470 475 480

Gly Cys Phe Lys Ile Tyr His Lys Cys Asp Asn Ala Cys Ile Gly Ser
485 490 495

Ile Arg Asn Gly Thr Tyr Asp His Asp Val Tyr Arg Asp Glu Ala Leu
500 505 510

Asn Asn Arg Phe Gln Ile Lys Gly Val Glu Leu Lys Ser Gly Tyr Lys
515 520 525

Asp Trp Ile Leu Trp Ile Ser Phe Ala Ile Ser Cys Phe Leu Leu Cys
530 535 540

Val Val Leu Leu Gly Phe Ile Met Thr Ala Cys Gln Lys Gly Asn Ile
545 550 555 560

Arg Cys Asn Ile Cys Ile
565

<210> 134
 <211> 392
 <212> PRT
 <213> Polyomavirus sp

<400> 134

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Met Ala Pro Lys Arg Lys Ser Gly Val Ser Lys Cys Glu Thr Lys Cys
1      5      10     15

Thr Lys Ala Cys Pro Arg Pro Ala Pro Val Pro Lys Leu Leu Ile Lys
      20     25     30

Gly Gly Met Glu Val Leu Asp Leu Val Thr Gly Pro Asp Ser Val Thr
      35     40     45

Glu Ile Glu Ala Phe Leu Asn Pro Arg Met Gly Gln Pro Pro Thr Pro
      50     55     60

Glu Ser Leu Thr Glu Gly Gly Gln Tyr Tyr Gly Trp Ser Arg Gly Ile
65     70     75     80

Asn Leu Ala Thr Ser Ala Lys Arg Gly Pro Gly Ser Gly Gly Thr Glu
      85     90     95

Asp Ser Pro Gly Asn Asn Thr Leu Pro Thr Trp Ser Met Ala Lys Leu
      100    105    110

Gln Leu Pro Met Leu Asn Glu Asp Leu Thr Cys Asp Thr Leu Gln Met
      115    120    125

Trp Glu Ala Val Ser Val Lys Thr Glu Val Val Gly Ser Gly Ser Leu
      130    135    140

Leu Asp Val His Gly Phe Asn Lys Pro Thr Asp Thr Val Asn Thr Lys
145    150    155    160

Gly Ile Ser Thr Pro Val Glu Gly Ser Gln Tyr His Val Phe Ala Val
      165    170    175

Gly Gly Glu Pro Leu Asp Leu Gln Gly Leu Val Thr Asp Ala Arg Thr
      180    185    190

Lys Tyr Lys Glu Glu Gly Val Val Thr Ile Lys Thr Ile Thr Lys Lys
      195    200    205

Asp Met Val Asn Lys Asp Gln Val Leu Asn Pro Ile Ser Lys Ala Lys
      210    215    220

Leu Asp Lys Asp Gly Met Tyr Pro Val Glu Ile Trp His Pro Asp Pro
225    230    235    240

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381698_1.TXT

Ala Lys Asn Glu Asn Thr Arg Tyr Phe Gly Asn Tyr Thr Gly Gly Thr
245 250 255

Thr Thr Pro Pro Val Leu Gln Phe Thr Asn Thr Leu Thr Thr Val Leu
260 265 270

Leu Asp Glu Asn Gly Val Gly Pro Leu Cys Lys Gly Glu Gly Leu Tyr
275 280 285

Leu Ser Cys Val Asp Ile Met Gly Trp Arg Val Thr Arg Asn Tyr Asp
290 295 300

Val His His Trp Arg Gly Leu Pro Arg Tyr Phe Lys Ile Thr Leu Arg
305 310 315 320

Lys Arg Trp Val Lys Asn Pro Tyr Pro Met Ala Ser Leu Ile Ser Ser
325 330 335

Leu Phe Asn Asn Met Leu Pro Gln Val Gln Gly Gln Pro Met Glu Gly
340 345 350

Glu Asn Thr Gln Val Glu Glu Val Arg Val Tyr Asp Gly Thr Glu Pro
355 360 365

Val Pro Gly Asp Pro Asp Met Thr Arg Tyr Val Asp Arg Phe Gly Lys
370 375 380

Thr Lys Thr Val Phe Pro Gly Asn
385 390

<210> 135
<211> 402
<212> PRT
<213> Polyomavirus sp

<400> 135

Met Ala Pro Lys Arg Lys Ser Gly Val Ser Lys Cys Glu Thr Lys Cys
1 5 10 15

Thr Lys Ala Cys Pro Arg Pro Ala Pro Val Pro Lys Leu Leu Ile Lys
20 25 30

Gly Gly Met Glu Val Leu Asp Leu Val Thr Gly Pro Asp Ser Val Thr
35 40 45

Glu Ile Glu Ala Phe Leu Asn Pro Arg Met Gly Gln Pro Pro Thr Pro
50 55 60

Glu Ser Leu Thr Glu Gly Gly Gln Tyr Tyr Gly Trp Ser Arg Gly Ile
65 70 75 80

Asn Leu Ala Thr Ser Ala Pro Ser Thr Asn Gln Glu Gln Thr Ser Leu
85 90 95

381698_1.TXT

Tyr Val Gln Ala Ser Gly Arg Gly Thr Glu Asp Ser Pro Gly Asn Asn
 100 105 110
 Thr Leu Pro Thr Trp Ser Met Ala Lys Leu Gln Leu Pro Met Leu Asn
 115 120 125
 Glu Asp Leu Thr Cys Asp Thr Leu Gln Met Trp Glu Ala Val Ser Val
 130 135 140
 Lys Thr Glu Val Val Gly Ser Gly Ser Leu Leu Asp Val His Gly Phe
 145 150 155 160
 Asn Lys Pro Thr Asp Thr Val Asn Thr Lys Gly Ile Ser Thr Pro Val
 165 170 175
 Glu Gly Ser Gln Tyr His Val Phe Ala Val Gly Gly Glu Pro Leu Asp
 180 185 190
 Leu Gln Gly Leu Val Thr Asp Ala Arg Thr Lys Tyr Lys Glu Glu Gly
 195 200 205
 Val Val Thr Ile Lys Thr Ile Thr Lys Lys Asp Met Val Asn Lys Asp
 210 215 220
 Gln Val Leu Asn Pro Ile Ser Lys Ala Lys Leu Asp Lys Asp Gly Met
 225 230 235 240
 Tyr Pro Val Glu Ile Trp His Pro Asp Pro Ala Lys Asn Glu Asn Thr
 245 250 255
 Arg Tyr Phe Gly Asn Tyr Thr Gly Gly Thr Thr Thr Pro Pro Val Leu
 260 265 270
 Gln Phe Thr Asn Thr Leu Thr Thr Val Leu Leu Asp Glu Asn Gly Val
 275 280 285
 Gly Pro Leu Cys Lys Gly Glu Gly Leu Tyr Leu Ser Cys Val Asp Ile
 290 295 300
 Met Gly Trp Arg Val Thr Arg Asn Tyr Asp Val His His Trp Arg Gly
 305 310 315 320
 Leu Pro Arg Tyr Phe Lys Ile Thr Leu Arg Lys Arg Trp Val Lys Asn
 325 330 335
 Pro Tyr Pro Met Ala Ser Leu Ile Ser Ser Leu Phe Asn Asn Met Leu
 340 345 350
 Pro Gln Val Gln Gly Gln Pro Met Glu Gly Glu Asn Thr Gln Val Glu
 355 360 365

381698_1.TXT

Glu Val Arg Val Tyr Asp Gly Thr Glu Pro Val Pro Gly Asp Pro Asp
370 375 380

Met Thr Arg Tyr Val Asp Arg Phe Gly Lys Thr Lys Thr Val Phe Pro
385 390 395 400

Gly Asn

<210> 136
<211> 392
<212> PRT
<213> Polyomavirus sp

<400> 136

Met Ala Pro Lys Arg Lys Ser Gly Val Ser Lys Cys Glu Thr Lys Cys
1 5 10 15

Thr Lys Ala Cys Pro Arg Pro Ala Pro Val Pro Lys Leu Leu Ile Lys
20 25 30

Gly Gly Met Glu Val Leu Asp Leu Val Thr Gly Pro Asp Ser Val Thr
35 40 45

Glu Ile Glu Ala Phe Leu Asn Pro Arg Met Gly Gln Pro Pro Thr Pro
50 55 60

Glu Ser Leu Thr Glu Gly Gly Gln Tyr Tyr Gly Trp Ser Arg Gly Ile
65 70 75 80

Asn Leu Ala Thr Ser Asp Thr Glu Asp Ser Pro Gly Asn Asn Thr Leu
85 90 95

Pro Thr Trp Ser Met Ala Lys Leu Gln Leu Pro Met Leu Asn Glu Asp
100 105 110

Leu Thr Cys Asp Thr Leu Gln Met Trp Glu Ala Val Ser Val Lys Thr
115 120 125

Glu Val Val Gly Ser Gly Ser Leu Leu Asp Val His Gly Phe Asn Lys
130 135 140

Pro Thr Asp Thr Val Asn Thr Lys Gly Ile Ser Thr Pro Val Glu Gly
145 150 155 160

Ser Gln Tyr His Val Phe Ala Val Gly Gly Glu Pro Leu Asp Leu Gln
165 170 175

Gly Leu Val Thr Asp Ala Arg Thr Lys Tyr Lys Glu Glu Gly Val Val
180 185 190

Thr Ile Lys Thr Ile Thr Lys Lys Asp Met Val Asn Lys Asp Gln Val
Page 116

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200

205

Leu Asn Pro Ile Ser Lys Ala Lys Leu Asp Lys Asp Gly Met Tyr Pro
 210 215 220

Val Glu Ile Trp His Pro Asp Pro Ala Lys Asn Glu Asn Thr Arg Tyr
 225 230 235 240

Phe Gly Asn Tyr Thr Gly Gly Thr Thr Thr Pro Pro Val Leu Gln Phe
 245 250 255

Thr Asn Thr Leu Thr Thr Val Leu Leu Asp Glu Asn Gly Val Gly Pro
 260 265 270

Leu Cys Lys Gly Glu Gly Leu Tyr Leu Ser Cys Val Asp Ile Met Gly
 275 280 285

Trp Arg Val Thr Arg Ser Lys Arg Gly Pro Gly Ser Gly Ala Tyr Asp
 290 295 300

Val His His Trp Arg Gly Leu Pro Arg Tyr Phe Lys Ile Thr Leu Arg
 305 310 315 320

Lys Arg Trp Val Lys Asn Pro Tyr Pro Met Ala Ser Leu Ile Ser Ser
 325 330 335

Leu Phe Asn Asn Met Leu Pro Gln Val Gln Gly Gln Pro Met Glu Gly
 340 345 350

Glu Asn Thr Gln Val Glu Glu Val Arg Val Tyr Asp Gly Thr Glu Pro
 355 360 365

Val Pro Gly Asp Pro Asp Met Thr Arg Tyr Val Asp Arg Phe Gly Lys
 370 375 380

Thr Lys Thr Val Phe Pro Gly Asn
 385 390

<210> 137
 <211> 402
 <212> PRT
 <213> Polyomavirus sp

<400> 137

Met Ala Pro Lys Arg Lys Ser Gly Val Ser Lys Cys Glu Thr Lys Cys
 1 5 10 15

Thr Lys Ala Cys Pro Arg Pro Ala Pro Val Pro Lys Leu Leu Ile Lys
 20 25 30

Gly Gly Met Glu Val Leu Asp Leu Val Thr Gly Pro Asp Ser Val Thr
 35 40 45

381698_1.TXT

Glu Ile Glu Ala Phe Leu Asn Pro Arg Met Gly Gln Pro Pro Thr Pro
 50 55 60
 Glu Ser Leu Thr Glu Gly Gly Gln Tyr Tyr Gly Trp Ser Arg Gly Ile
 65 70 75 80
 Asn Leu Ala Thr Ser Asp Thr Glu Asp Ser Pro Gly Asn Asn Thr Leu
 85 90 95
 Pro Thr Trp Ser Met Ala Lys Leu Gln Leu Pro Met Leu Asn Glu Asp
 100 105 110
 Leu Thr Cys Asp Thr Leu Gln Met Trp Glu Ala Val Ser Val Lys Thr
 115 120 125
 Glu Val Val Gly Ser Gly Ser Leu Leu Asp Val His Gly Phe Asn Lys
 130 135 140
 Pro Thr Asp Thr Val Asn Thr Lys Gly Ile Ser Thr Pro Val Glu Gly
 145 150 155 160
 Ser Gln Tyr His Val Phe Ala Val Gly Gly Glu Pro Leu Asp Leu Gln
 165 170 175
 Gly Leu Val Thr Asp Ala Arg Thr Lys Tyr Lys Glu Glu Gly Val Val
 180 185 190
 Thr Ile Lys Thr Ile Thr Lys Lys Asp Met Val Asn Lys Asp Gln Val
 195 200 205
 Leu Asn Pro Ile Ser Lys Ala Lys Leu Asp Lys Asp Gly Met Tyr Pro
 210 215 220
 Val Glu Ile Trp His Pro Asp Pro Ala Lys Asn Glu Asn Thr Arg Tyr
 225 230 235 240
 Phe Gly Asn Tyr Thr Gly Gly Thr Thr Thr Pro Pro Val Leu Gln Phe
 245 250 255
 Thr Asn Thr Leu Thr Thr Val Leu Leu Asp Glu Asn Gly Val Gly Pro
 260 265 270
 Leu Cys Lys Gly Glu Gly Leu Tyr Leu Ser Cys Val Asp Ile Met Gly
 275 280 285
 Trp Arg Val Thr Arg Ser Pro Ser Thr Asn Gln Glu Gln Thr Ser Leu
 290 295 300
 Tyr Val Gln Ala Ser Gly Arg Ala Tyr Asp Val His His Trp Arg Gly
 305 310 315 320

381698_1.TXT

Leu Pro Arg Tyr Phe Lys Ile Thr Leu Arg Lys Arg Trp Val Lys Asn
325 330 335

Pro Tyr Pro Met Ala Ser Leu Ile Ser Ser Leu Phe Asn Asn Met Leu
340 345 350

Pro Gln Val Gln Gly Gln Pro Met Glu Gly Glu Asn Thr Gln Val Glu
355 360 365

Glu Val Arg Val Tyr Asp Gly Thr Glu Pro Val Pro Gly Asp Pro Asp
370 375 380

Met Thr Arg Tyr Val Asp Arg Phe Gly Lys Thr Lys Thr Val Phe Pro
385 390 395 400

Gly Asn

<210> 138
<211> 392
<212> PRT
<213> Polyomavirus sp

<400> 138

Met Ala Pro Lys Arg Lys Ser Gly Val Ser Lys Cys Glu Thr Lys Cys
1 5 10 15

Thr Lys Ala Cys Pro Arg Pro Ala Pro Val Pro Lys Leu Leu Ile Lys
20 25 30

Gly Gly Met Glu Val Leu Asp Leu Val Thr Gly Pro Asp Ser Val Thr
35 40 45

Glu Ile Glu Ala Phe Leu Asn Pro Arg Met Gly Gln Pro Pro Thr Pro
50 55 60

Glu Ser Leu Thr Glu Gly Gly Gln Tyr Tyr Gly Trp Ser Arg Gly Ile
65 70 75 80

Asn Leu Ala Thr Ser Asp Thr Glu Asp Ser Pro Gly Asn Asn Thr Leu
85 90 95

Pro Thr Trp Ser Met Ala Lys Leu Gln Leu Pro Met Leu Asn Glu Asp
100 105 110

Leu Thr Cys Asp Thr Leu Gln Met Trp Glu Ala Val Ser Val Lys Thr
115 120 125

Glu Val Val Gly Ser Gly Ser Leu Leu Asp Val His Gly Phe Asn Lys
130 135 140

Pro Thr Asp Thr Val Asn Thr Lys Gly Ile Ser Thr Pro Val Glu Gly
145 150 155 160

381698_1.TXT

Ser Gln Tyr His Val₁₆₅ Phe Ala Val Gly₁₇₀ Glu Pro Leu Asp Leu₁₇₅ Gln
 Gly Leu Val Thr₁₈₀ Asp Ala Arg Thr Lys₁₈₅ Tyr Lys Glu Glu Gly₁₉₀ Val Val
 Thr Ile Lys₁₉₅ Thr Ile Thr Lys Lys₂₀₀ Asp Met Val Asn Lys₂₀₅ Asp Gln Val
 Leu Asn₂₁₀ Pro Ile Ser Lys Ala₂₁₅ Lys Leu Asp Lys Asp₂₂₀ Gly Met Tyr Pro
 Val₂₂₅ Glu Ile Trp His Pro₂₃₀ Asp Pro Ala Lys Asn₂₃₅ Glu Asn Thr Arg Tyr₂₄₀
 Phe Gly Asn Tyr Thr₂₄₅ Gly Gly Thr Thr Thr₂₅₀ Pro Pro Val Leu Gln₂₅₅ Phe
 Thr Asn Thr Leu₂₆₀ Thr Thr Val Leu Leu₂₆₅ Asp Glu Asn Gly Val₂₇₀ Gly Pro
 Leu Cys Lys₂₇₅ Gly Glu Gly Leu Tyr₂₈₀ Leu Ser Cys Val Asp₂₈₅ Ile Met Gly
 Trp Arg Val Thr Arg Ser Pro₂₉₅ Tyr Asn Gly Lys Ser₃₀₀ Ser Ala Tyr Asp
 Val₃₀₅ His His Trp Arg Gly₃₁₀ Leu Pro Arg Tyr Phe₃₁₅ Lys Ile Thr Leu Arg₃₂₀
 Lys Arg Trp Val Lys₃₂₅ Asn Pro Tyr Pro Met₃₃₀ Ala Ser Leu Ile Ser₃₃₅ Ser
 Leu Phe Asn Asn₃₄₀ Met Leu Pro Gln Val₃₄₅ Gln Gly Gln Pro Met₃₅₀ Glu Gly
 Glu Asn Thr₃₅₅ Gln Val Glu Glu Val₃₆₀ Arg Val Tyr Asp Gly₃₆₅ Thr Glu Pro
 Val₃₇₀ Pro Gly Asp Pro Asp Met₃₇₅ Thr Arg Tyr Val Asp₃₈₀ Arg Phe Gly Lys
 Thr₃₈₅ Lys Thr Val Phe Pro₃₉₀ Gly Asn

<210> 139
 <211> 402
 <212> PRT
 <213> Polyomavirus sp
 <400> 139

381698_1.TXT

Glu Ala Phe Leu Asn Pro Arg Met Gly Gln Pro Pro Thr Pro Glu Ser
 1 5 10 15
 Leu Thr Glu Gly Gly Gln Tyr Tyr Gly Trp Ser Arg Gly Ile Asn Leu
 20 25 30
 Ala Thr Ser Asp Thr Glu Asp Ser Pro Gly Asn Asn Thr Leu Pro Thr
 35 40 45
 Trp Ser Met Ala Lys Leu Gln Leu Pro Met Leu Asn Glu Asp Leu Thr
 50 55 60
 Cys Asp Thr Leu Gln Met Trp Glu Ala Val Ser Val Lys Thr Glu Val
 65 70 75 80
 Val Gly Ser Gly Ser Leu Leu Asp Val His Gly Phe Asn Lys Pro Thr
 85 90 95
 Asp Thr Val Asn Thr Lys Gly Ile Ser Thr Pro Val Glu Gly Ser Gln
 100 105 110
 Tyr His Val Phe Ala Val Gly Gly Glu Pro Leu Asp Leu Gln Gly Leu
 115 120 125
 Val Thr Asp Ala Arg Thr Lys Tyr Lys Glu Glu Gly Val Val Thr Ile
 130 135 140
 Lys Thr Ile Thr Lys Lys Asp Met Val Asn Lys Asp Gln Val Leu Asn
 145 150 155 160
 Pro Ile Ser Lys Ala Lys Leu Asp Lys Asp Gly Met Tyr Pro Val Glu
 165 170 175
 Ile Trp His Pro Asp Pro Ala Lys Asn Glu Asn Thr Arg Tyr Phe Gly
 180 185 190
 Asn Tyr Thr Gly Gly Thr Thr Thr Pro Pro Val Leu Gln Phe Thr Asn
 195 200 205
 Thr Leu Thr Thr Val Leu Leu Asp Glu Asn Gly Val Gly Pro Leu Cys
 210 215 220
 Lys Gly Glu Gly Leu Tyr Leu Ser Cys Val Asp Ile Met Gly Trp Arg
 225 230 235 240
 Val Thr Arg Ser Pro Asn Asp Ala Ala Glu Gln Thr Lys Leu Tyr Gln
 245 250 255
 Asn Pro Thr Thr Tyr Ala Tyr Asp Val His His Trp Arg Gly Leu Pro
 260 265 270
 Arg Tyr Phe Lys Ile Thr Leu Arg Lys Arg Trp Val Lys Asn Pro Tyr
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280

285

Pro Met Ala Ser Leu Ile Ser Ser Leu Phe Asn Asn Met Leu Pro Gln
 290 295 300

Val Gln Gly Gln Pro Met Glu Gly Glu Asn Thr Gln Val Glu Glu Val
 305 310 315 320

Arg Val Tyr Asp Gly Thr Glu Pro Val Pro Gly Asp Pro Asp Met Thr
 325 330 335

Arg Tyr Val Asp Arg Phe Gly Lys Thr Lys Thr Val Phe Pro Gly Asn
 340 345 350

Met Ala Pro Lys Arg Lys Ser Gly Val Ser Lys Cys Glu Thr Lys Cys
 355 360 365

Thr Lys Ala Cys Pro Arg Pro Ala Pro Val Pro Lys Leu Leu Ile Lys
 370 375 380

Gly Gly Met Glu Val Leu Asp Leu Val Thr Gly Pro Asp Ser Val Thr
 385 390 395 400

Glu Ile

<210> 140
 <211> 408
 <212> PRT
 <213> Polyomavirus sp

<400> 140

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 1 5 10 15

Thr Lys Ala Cys Pro Arg Pro Ala Pro Val Pro Lys Leu Leu Ile Lys
 20 25 30

Gly Gly Met Glu Val Leu Asp Leu Val Thr Gly Pro Asp Ser Val Thr
 35 40 45

Glu Ile Glu Ala Phe Leu Asn Pro Arg Met Gly Gln Pro Pro Thr Pro
 50 55 60

Glu Ser Leu Thr Glu Gly Gly Gln Tyr Tyr Gly Trp Ser Arg Gly Ile
 65 70 75 80

Asn Leu Ala Thr Ser Asp Thr Glu Asp Ser Pro Gly Asn Asn Thr Leu
 85 90 95

Pro Thr Trp Ser Met Ala Lys Leu Gln Leu Pro Met Leu Asn Glu Asp
 100 105 110

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Leu Thr Cys Asp Thr Leu Gln Met Trp Glu Ala Val Ser Val Lys Thr
 115 120 125
 Glu Val Val Gly Ser Gly Ser Leu Leu Asp Val His Gly Phe Asn Lys
 130 135 140
 Pro Thr Asp Thr Val Asn Thr Lys Gly Ile Ser Thr Pro Val Glu Gly
 145 150 155 160
 Ser Gln Tyr His Val Phe Ala Val Gly Gly Glu Pro Leu Asp Leu Gln
 165 170 175
 Gly Leu Val Thr Asp Ala Arg Thr Lys Tyr Lys Glu Glu Gly Val Val
 180 185 190
 Thr Ile Lys Thr Ile Thr Lys Lys Asp Met Val Asn Lys Asp Gln Val
 195 200 205
 Leu Asn Pro Ile Ser Lys Ala Lys Leu Asp Lys Asp Gly Met Tyr Pro
 210 215 220
 Val Glu Ile Trp His Pro Asp Pro Ala Lys Asn Glu Asn Thr Arg Tyr
 225 230 235 240
 Phe Gly Asn Tyr Thr Gly Gly Thr Thr Thr Pro Pro Val Leu Gln Phe
 245 250 255
 Thr Asn Thr Leu Thr Thr Val Leu Leu Asp Glu Asn Gly Val Gly Pro
 260 265 270
 Leu Cys Lys Gly Glu Gly Leu Tyr Leu Ser Cys Val Asp Ile Met Gly
 275 280 285
 Trp Arg Val Thr Arg Ser Ser Leu Leu Thr Glu Val Glu Thr Pro Ile
 290 295 300
 Arg Asn Glu Trp Gly Cys Arg Cys Asn Asp Ser Ser Asp Ala Tyr Asp
 305 310 315 320
 Val His His Trp Arg Gly Leu Pro Arg Tyr Phe Lys Ile Thr Leu Arg
 325 330 335
 Lys Arg Trp Val Lys Asn Pro Tyr Pro Met Ala Ser Leu Ile Ser Ser
 340 345 350
 Leu Phe Asn Asn Met Leu Pro Gln Val Gln Gly Gln Pro Met Glu Gly
 355 360 365
 Glu Asn Thr Gln Val Glu Glu Val Arg Val Tyr Asp Gly Thr Glu Pro
 370 375 380

Val Pro Gly Asp Pro Asp Met Thr Arg Tyr Val Asp Arg Phe Gly Lys
 385 390 395 400

Thr Lys Thr Val Phe Pro Gly Asn
 405

<210> 141
 <211> 9
 <212> PRT
 <213> Nocardia aerocolonigenes

<400> 141

Leu Ala Thr Ser Ala Gly Thr Glu Asp
 1 5

<210> 142
 <211> 3
 <212> PRT
 <213> Pseudomonas sp

<400> 142

Gly Thr Thr
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<210> 143
 <211> 4
 <212> PRT
 <213> Pseudomonas sp.

<400> 143

Gly Thr His Val
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<210> 144
 <211> 6
 <212> PRT
 <213> Alcaligenes faecalis

<400> 144

Thr Arg Asn Tyr Asp Val
 1 5

<210> 145
 <211> 7
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<400> 145

Thr Arg Ser Ala Tyr Asp Val
 1 5