

578-35 SEQ listing Final.txt  
SEQUENCE LISTING

<110> Okairos AG  
<120> Novel paramyxovirus vaccines  
<130> 578-35  
<160> 7  
<170> PatentIn version 3.5  
<210> 1  
<211> 360  
<212> PRT  
<213> Respiratory Syncytial virus  
  
<220>  
<221> F protein minimal sequence  
<222> (1)..(360)  
  
<400> 1  
Val Leu His Leu Glu Gly Glu Val Asn Lys Ile Lys Ser Ala Leu Leu  
1 5 10 15  
Ser Thr Asn Lys Ala Val Val Ser Leu Ser Asn Gly Val Ser Val Leu  
20 25 30  
Thr Ser Lys Val Leu Asp Leu Lys Asn Tyr Ile Asp Lys Gln Leu Leu  
35 40 45  
Pro Ile Val Asn Lys Gln Ser Cys Ser Ile Ser Asn Ile Glu Thr Val  
50 55 60  
Ile Glu Phe Gln Gln Lys Asn Asn Arg Leu Leu Glu Ile Thr Arg Glu  
65 70 75 80  
Phe Ser Val Asn Ala Gly Val Thr Thr Pro Val Ser Thr Tyr Met Leu  
85 90 95  
Thr Asn Ser Glu Leu Leu Ser Leu Ile Asn Asp Met Pro Ile Thr Asn  
100 105 110  
Asp Gln Lys Lys Leu Met Ser Asn Asn Val Gln Ile Val Arg Gln Gln  
115 120 125  
Ser Tyr Ser Ile Met Ser Ile Ile Lys Glu Glu Val Leu Ala Tyr Val  
130 135 140  
Val Gln Leu Pro Leu Tyr Gly Val Ile Asp Thr Pro Cys Trp Lys Leu  
145 150 155 160  
His Thr Ser Pro Leu Cys Thr Thr Asn Thr Lys Glu Gly Ser Asn Ile  
165 170 175

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Cys Leu Thr Arg Thr Asp Arg Gly Trp Tyr Cys Asp Asn Ala Gly Ser  
180 185 190

Val Ser Phe Phe Pro Gln Ala Glu Thr Cys Lys Val Gln Ser Asn Arg  
195 200 205

Val Phe Cys Asp Thr Met Asn Ser Leu Thr Leu Pro Ser Glu Val Asn  
210 215 220

Leu Cys Asn Val Asp Ile Phe Asn Pro Lys Tyr Asp Cys Lys Ile Met  
225 230 235 240

Thr Ser Lys Thr Asp Val Ser Ser Ser Val Ile Thr Ser Leu Gly Ala  
245 250 255

Ile Val Ser Cys Tyr Gly Lys Thr Lys Cys Thr Ala Ser Asn Lys Asn  
260 265 270

Arg Gly Ile Ile Lys Thr Phe Ser Asn Gly Cys Asp Tyr Val Ser Asn  
275 280 285

Lys Gly Val Asp Thr Val Ser Val Gly Asn Thr Leu Tyr Tyr Val Asn  
290 295 300

Lys Gln Glu Gly Lys Ser Leu Tyr Val Lys Gly Glu Pro Ile Ile Asn  
305 310 315 320

Phe Tyr Asp Pro Leu Val Phe Pro Ser Asp Glu Phe Asp Ala Ser Ile  
325 330 335

Ser Gln Val Asn Glu Lys Ile Asn Gln Ser Leu Ala Phe Ile Arg Lys  
340 345 350

Ser Asp Glu Leu Leu His Asn Val  
355 360

<210> 2  
<211> 524  
<212> PRT  
<213> Respiratory Syncytial virus

<220>  
<221> F0deltaTM  
<222> (1)..(524)

<400> 2

Met Glu Leu Leu Ile Leu Lys Ala Asn Ala Ile Thr Thr Ile Leu Thr  
1 5 10 15

Ala Val Thr Phe Cys Phe Ala Ser Gly Gln Asn Ile Thr Glu Glu Phe  
20 25 30

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Tyr Gln Ser Thr Cys Ser Ala Val Ser Lys Gly Tyr Leu Ser Ala Leu  
35 40 45

Arg Thr Gly Trp Tyr Thr Ser Val Ile Thr Ile Glu Leu Ser Asn Ile  
50 55 60

Lys Glu Asn Lys Cys Asn Gly Thr Asp Ala Lys Val Lys Leu Ile Lys  
65 70 75 80

Gln Glu Leu Asp Lys Tyr Lys Asn Ala Val Thr Glu Leu Gln Leu Leu  
85 90 95

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

Arg Phe Met Asn Tyr Thr Leu Asn Asn Ala Lys Lys Thr Asn Val Thr  
115 120 125

Leu Ser Lys Lys Arg Lys Arg Arg Phe Leu Gly Phe Leu Leu Gly Val  
130 135 140

Gly Ser Ala Ile Ala Ser Gly Val Ala Val Ser Lys Val Leu His Leu  
145 150 155 160

Glu Gly Glu Val Asn Lys Ile Lys Ser Ala Leu Leu Ser Thr Asn Lys  
165 170 175

Ala Val Val Ser Leu Ser Asn Gly Val Ser Val Leu Thr Ser Lys Val  
180 185 190

Leu Asp Leu Lys Asn Tyr Ile Asp Lys Gln Leu Leu Pro Ile Val Asn  
195 200 205

Lys Gln Ser Cys Ser Ile Ser Asn Ile Glu Thr Val Ile Glu Phe Gln  
210 215 220

Gln Lys Asn Asn Arg Leu Leu Glu Ile Thr Arg Glu Phe Ser Val Asn  
225 230 235 240

Ala Gly Val Thr Thr Pro Val Ser Thr Tyr Met Leu Thr Asn Ser Glu  
245 250 255

Leu Leu Ser Leu Ile Asn Asp Met Pro Ile Thr Asn Asp Gln Lys Lys  
260 265 270

Leu Met Ser Asn Asn Val Gln Ile Val Arg Gln Gln Ser Tyr Ser Ile  
275 280 285

Met Ser Ile Ile Lys Glu Glu Val Leu Ala Tyr Val Val Gln Leu Pro  
290 295 300

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Leu Tyr Gly Val Ile Asp Thr Pro Cys Trp Lys Leu His Thr Ser Pro  
305 310 315 320

Leu Cys Thr Thr Asn Thr Lys Glu Gly Ser Asn Ile Cys Leu Thr Arg  
325 330 335

Thr Asp Arg Gly Trp Tyr Cys Asp Asn Ala Gly Ser Val Ser Phe Phe  
340 345 350

Pro Gln Ala Glu Thr Cys Lys Val Gln Ser Asn Arg Val Phe Cys Asp  
355 360 365

Thr Met Asn Ser Leu Thr Leu Pro Ser Glu Val Asn Leu Cys Asn Val  
370 375 380

Asp Ile Phe Asn Pro Lys Tyr Asp Cys Lys Ile Met Thr Ser Lys Thr  
385 390 395 400

Asp Val Ser Ser Ser Val Ile Thr Ser Leu Gly Ala Ile Val Ser Cys  
405 410 415

Tyr Gly Lys Thr Lys Cys Thr Ala Ser Asn Lys Asn Arg Gly Ile Ile  
420 425 430

Lys Thr Phe Ser Asn Gly Cys Asp Tyr Val Ser Asn Lys Gly Val Asp  
435 440 445

Thr Val Ser Val Gly Asn Thr Leu Tyr Tyr Val Asn Lys Gln Glu Gly  
450 455 460

Lys Ser Leu Tyr Val Lys Gly Glu Pro Ile Ile Asn Phe Tyr Asp Pro  
465 470 475 480

Leu Val Phe Pro Ser Asp Glu Phe Asp Ala Ser Ile Ser Gln Val Asn  
485 490 495

Glu Lys Ile Asn Gln Ser Leu Ala Phe Ile Arg Lys Ser Asp Glu Leu  
500 505 510

Leu His Asn Val Asn Ala Gly Lys Ser Thr Thr Asn  
515 520

<210> 3  
<211> 170  
<212> PRT  
<213> Respiratory Syncytial Virus

<220>  
<221> N protein minimal sequence  
<222> (1)..(170)

<400> 3

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Ile Lys Ile Leu Arg Asp Ala Gly Tyr His Val Lys Ala Asn Gly Val  
 1 5 10 15  
 Asp Val Thr Thr His Arg Gln Asp Ile Asn Gly Lys Glu Met Lys Phe  
 20 25 30  
 Glu Val Leu Thr Leu Ala Ser Leu Thr Thr Glu Ile Gln Ile Asn Ile  
 35 40 45  
 Glu Ile Glu Ser Arg Lys Ser Tyr Lys Lys Met Leu Lys Glu Met Gly  
 50 55 60  
 Glu Val Ala Pro Glu Tyr Arg His Asp Ser Pro Asp Cys Gly Met Ile  
 65 70 75 80  
 Ile Leu Cys Ile Ala Ala Leu Val Ile Thr Lys Leu Ala Ala Gly Asp  
 85 90 95  
 Arg Ser Gly Leu Thr Ala Val Ile Arg Arg Ala Asn Asn Val Leu Lys  
 100 105 110  
 Asn Glu Met Lys Arg Tyr Lys Gly Leu Leu Pro Lys Asp Ile Ala Asn  
 115 120 125  
 Ser Phe Tyr Glu Val Phe Glu Lys Tyr Pro His Phe Ile Asp Val Phe  
 130 135 140  
 Val His Phe Gly Ile Ala Gln Ser Ser Thr Arg Gly Gly Ser Arg Val  
 145 150 155 160  
 Glu Gly Ile Phe Ala Gly Leu Phe Met Asn  
 165 170

<210> 4  
 <211> 391  
 <212> PRT  
 <213> Respiratory Syncytial Virus

<220>  
 <221> N protein  
 <222> (1)..(391)

<400> 4

Met Ala Leu Ser Lys Val Lys Leu Asn Asp Thr Leu Asn Lys Asp Gln  
 1 5 10 15  
 Leu Leu Ser Ser Ser Lys Tyr Thr Ile Gln Arg Ser Thr Gly Asp Ser  
 20 25 30  
 Ile Asp Thr Pro Asn Tyr Asp Val Gln Lys His Ile Asn Lys Leu Cys  
 35 40 45

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Gly Met Leu Leu Ile Thr Glu Asp Ala Asn His Lys Phe Thr Gly Leu  
50 55 60

Ile Gly Met Leu Tyr Ala Met Ser Arg Leu Gly Arg Glu Asp Thr Ile  
65 70 75 80

Lys Ile Leu Arg Asp Ala Gly Tyr His Val Lys Ala Asn Gly Val Asp  
85 90 95

Val Thr Thr His Arg Gln Asp Ile Asn Gly Lys Glu Met Lys Phe Glu  
100 105 110

Val Leu Thr Leu Ala Ser Leu Thr Thr Glu Ile Gln Ile Asn Ile Glu  
115 120 125

Ile Glu Ser Arg Lys Ser Tyr Lys Lys Met Leu Lys Glu Met Gly Glu  
130 135 140

Val Ala Pro Glu Tyr Arg His Asp Ser Pro Asp Cys Gly Met Ile Ile  
145 150 155 160

Leu Cys Ile Ala Ala Leu Val Ile Thr Lys Leu Ala Ala Gly Asp Arg  
165 170 175

Ser Gly Leu Thr Ala Val Ile Arg Arg Ala Asn Asn Val Leu Lys Asn  
180 185 190

Glu Met Lys Arg Tyr Lys Gly Leu Leu Pro Lys Asp Ile Ala Asn Ser  
195 200 205

Phe Tyr Glu Val Phe Glu Lys Tyr Pro His Phe Ile Asp Val Phe Val  
210 215 220

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

Gly Ile Phe Ala Gly Leu Phe Met Asn Ala Tyr Gly Ala Gly Gln Val  
245 250 255

Met Leu Arg Trp Gly Val Leu Ala Lys Ser Val Lys Asn Ile Met Leu  
260 265 270

Gly His Ala Ser Val Gln Ala Glu Met Glu Gln Val Val Glu Val Tyr  
275 280 285

Glu Tyr Ala Gln Lys Leu Gly Gly Glu Ala Gly Phe Tyr His Ile Leu  
290 295 300

Asn Asn Pro Lys Ala Ser Leu Leu Ser Leu Thr Gln Phe Pro His Phe  
305 310 315 320

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Ser Ser Val Val Leu Gly Asn Ala Ala Gly Leu Gly Ile Met Gly Glu  
325 330 335

Tyr Arg Gly Thr Pro Arg Asn Gln Asp Leu Tyr Asp Ala Ala Lys Ala  
340 345 350

Tyr Ala Glu Gln Leu Lys Glu Asn Gly Val Ile Asn Tyr Ser Val Leu  
355 360 365

Asp Leu Thr Ala Glu Glu Leu Glu Ala Ile Lys His Gln Leu Asn Pro  
370 375 380

Lys Asp Asn Asp Val Glu Leu  
385 390

<210> 5  
<211> 194  
<212> PRT  
<213> Respiratory Syncytial Virus

<220>  
<221> M 2-1  
<222> (1)..(194)

<400> 5

Met Ser Arg Arg Asn Pro Cys Lys Phe Glu Ile Arg Gly His Cys Leu  
1 5 10 15

Asn Gly Lys Arg Cys His Phe Ser His Asn Tyr Phe Glu Trp Pro Pro  
20 25 30

His Ala Leu Leu Val Arg Gln Asn Phe Met Leu Asn Arg Ile Leu Lys  
35 40 45

Ser Met Asp Lys Ser Ile Asp Thr Leu Ser Glu Ile Ser Gly Ala Ala  
50 55 60

Glu Leu Asp Arg Thr Glu Glu Tyr Ala Leu Gly Val Val Gly Val Leu  
65 70 75 80

Glu Ser Tyr Ile Gly Ser Ile Asn Asn Ile Thr Lys Gln Ser Ala Cys  
85 90 95

Val Ala Met Ser Lys Leu Leu Thr Glu Leu Asn Ser Asp Asp Ile Lys  
100 105 110

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

Asn Thr Val Ile Ser Tyr Ile Glu Ser Asn Arg Lys Asn Asn Lys Gln  
130 135 140

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Thr Ile His Leu Leu Lys Arg Leu Pro Ala Asp Val Leu Lys Lys Thr  
145 150 155 160

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

Lys Glu Ser Thr Val Ser Asp Thr Asn Asp His Ala Lys Asn Asn Asp  
180 185 190

Thr Thr

<210> 6  
<211> 7  
<212> PRT  
<213> PEPTIDE

<220>  
<221> Peptide Linker  
<222> (1)..(7)

<400> 6

Gly Gly Gly Ser Gly Gly Gly  
1 5

<210> 7  
<211> 1146  
<212> PRT  
<213> Respiratory Syncytial virus

<220>  
<221> F0deltaTM-N-M2-1  
<222> (1)..(1146)

<400> 7

Met Glu Leu Leu Ile Leu Lys Ala Asn Ala Ile Thr Thr Ile Leu Thr  
1 5 10 15

Ala Val Thr Phe Cys Phe Ala Ser Gly Gln Asn Ile Thr Glu Glu Phe  
20 25 30

Tyr Gln Ser Thr Cys Ser Ala Val Ser Lys Gly Tyr Leu Ser Ala Leu  
35 40 45

Arg Thr Gly Trp Tyr Thr Ser Val Ile Thr Ile Glu Leu Ser Asn Ile  
50 55 60

Lys Glu Asn Lys Cys Asn Gly Thr Asp Ala Lys Val Lys Leu Ile Lys  
65 70 75 80

Gln Glu Leu Asp Lys Tyr Lys Asn Ala Val Thr Glu Leu Gln Leu Leu  
85 90 95



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

Arg Phe Met Asn Tyr Thr Leu Asn Asn Ala Lys Lys Thr Asn Val Thr  
115 120 125

Leu Ser Lys Lys Arg Lys Arg Arg Phe Leu Gly Phe Leu Leu Gly Val  
130 135 140

Gly Ser Ala Ile Ala Ser Gly Val Ala Val Ser Lys Val Leu His Leu  
145 150 155 160

Glu Gly Glu Val Asn Lys Ile Lys Ser Ala Leu Leu Ser Thr Asn Lys  
165 170 175

Ala Val Val Ser Leu Ser Asn Gly Val Ser Val Leu Thr Ser Lys Val  
180 185 190

Leu Asp Leu Lys Asn Tyr Ile Asp Lys Gln Leu Leu Pro Ile Val Asn  
195 200 205

Lys Gln Ser Cys Ser Ile Ser Asn Ile Glu Thr Val Ile Glu Phe Gln  
210 215 220

Gln Lys Asn Asn Arg Leu Leu Glu Ile Thr Arg Glu Phe Ser Val Asn  
225 230 235 240

Ala Gly Val Thr Thr Pro Val Ser Thr Tyr Met Leu Thr Asn Ser Glu  
245 250 255

Leu Leu Ser Leu Ile Asn Asp Met Pro Ile Thr Asn Asp Gln Lys Lys  
260 265 270

Leu Met Ser Asn Asn Val Gln Ile Val Arg Gln Gln Ser Tyr Ser Ile  
275 280 285

Met Ser Ile Ile Lys Glu Glu Val Leu Ala Tyr Val Val Gln Leu Pro  
290 295 300

Leu Tyr Gly Val Ile Asp Thr Pro Cys Trp Lys Leu His Thr Ser Pro  
305 310 315 320

Leu Cys Thr Thr Asn Thr Lys Glu Gly Ser Asn Ile Cys Leu Thr Arg  
325 330 335

Thr Asp Arg Gly Trp Tyr Cys Asp Asn Ala Gly Ser Val Ser Phe Phe  
340 345 350

Pro Gln Ala Glu Thr Cys Lys Val Gln Ser Asn Arg Val Phe Cys Asp  
355 360 365

578-35 SEQ listing Final.txt

Thr Met Asn Ser Leu Thr Leu Pro Ser Glu Val Asn Leu Cys Asn Val  
370 375 380

Asp Ile Phe Asn Pro Lys Tyr Asp Cys Lys Ile Met Thr Ser Lys Thr  
385 390 395 400

Asp Val Ser Ser Ser Val Ile Thr Ser Leu Gly Ala Ile Val Ser Cys  
405 410 415

Tyr Gly Lys Thr Lys Cys Thr Ala Ser Asn Lys Asn Arg Gly Ile Ile  
420 425 430

Lys Thr Phe Ser Asn Gly Cys Asp Tyr Val Ser Asn Lys Gly Val Asp  
435 440 445

Thr Val Ser Val Gly Asn Thr Leu Tyr Tyr Val Asn Lys Gln Glu Gly  
450 455 460

Lys Ser Leu Tyr Val Lys Gly Glu Pro Ile Ile Asn Phe Tyr Asp Pro  
465 470 475 480

Leu Val Phe Pro Ser Asp Glu Phe Asp Ala Ser Ile Ser Gln Val Asn  
485 490 495

Glu Lys Ile Asn Gln Ser Leu Ala Phe Ile Arg Lys Ser Asp Glu Leu  
500 505 510

Leu His Asn Val Asn Ala Gly Lys Ser Thr Thr Asn Arg Lys Arg Arg  
515 520 525

Ala Pro Val Lys Gln Thr Leu Asn Phe Asp Leu Leu Lys Leu Ala Gly  
530 535 540

Asp Val Glu Ser Asn Pro Gly Pro Met Ala Leu Ser Lys Val Lys Leu  
545 550 555 560

Asn Asp Thr Leu Asn Lys Asp Gln Leu Leu Ser Ser Ser Lys Tyr Thr  
565 570 575

Ile Gln Arg Ser Thr Gly Asp Ser Ile Asp Thr Pro Asn Tyr Asp Val  
580 585 590

Gln Lys His Ile Asn Lys Leu Cys Gly Met Leu Leu Ile Thr Glu Asp  
595 600 605

Ala Asn His Lys Phe Thr Gly Leu Ile Gly Met Leu Tyr Ala Met Ser  
610 615 620

Arg Leu Gly Arg Glu Asp Thr Ile Lys Ile Leu Arg Asp Ala Gly Tyr  
625 630 635 640

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His Val Lys Ala Asn Gly Val Asp Val Thr Thr His Arg Gln Asp Ile  
645 650 655

Asn Gly Lys Glu Met Lys Phe Glu Val Leu Thr Leu Ala Ser Leu Thr  
660 665 670

Thr Glu Ile Gln Ile Asn Ile Glu Ile Glu Ser Arg Lys Ser Tyr Lys  
675 680 685

Lys Met Leu Lys Glu Met Gly Glu Val Ala Pro Glu Tyr Arg His Asp  
690 695 700

Ser Pro Asp Cys Gly Met Ile Ile Leu Cys Ile Ala Ala Leu Val Ile  
705 710 715 720

Thr Lys Leu Ala Ala Gly Asp Arg Ser Gly Leu Thr Ala Val Ile Arg  
725 730 735

Arg Ala Asn Asn Val Leu Lys Asn Glu Met Lys Arg Tyr Lys Gly Leu  
740 745 750

Leu Pro Lys Asp Ile Ala Asn Ser Phe Tyr Glu Val Phe Glu Lys Tyr  
755 760 765

Pro His Phe Ile Asp Val Phe Val His Phe Gly Ile Ala Gln Ser Ser  
770 775 780

Thr Arg Gly Gly Ser Arg Val Glu Gly Ile Phe Ala Gly Leu Phe Met  
785 790 795 800

Asn Ala Tyr Gly Ala Gly Gln Val Met Leu Arg Trp Gly Val Leu Ala  
805 810 815

Lys Ser Val Lys Asn Ile Met Leu Gly His Ala Ser Val Gln Ala Glu  
820 825 830

Met Glu Gln Val Val Glu Val Tyr Glu Tyr Ala Gln Lys Leu Gly Gly  
835 840 845

Glu Ala Gly Phe Tyr His Ile Leu Asn Asn Pro Lys Ala Ser Leu Leu  
850 855 860

Ser Leu Thr Gln Phe Pro His Phe Ser Ser Val Val Leu Gly Asn Ala  
865 870 875 880

Ala Gly Leu Gly Ile Met Gly Glu Tyr Arg Gly Thr Pro Arg Asn Gln  
885 890 895

Asp Leu Tyr Asp Ala Ala Lys Ala Tyr Ala Glu Gln Leu Lys Glu Asn  
900 905 910

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Gly Val Ile Asn Tyr Ser Val Leu Asp Leu Thr Ala Glu Glu Leu Glu  
915 920 925

Ala Ile Lys His Gln Leu Asn Pro Lys Asp Asn Asp Val Glu Leu Gly  
930 935 940

Gly Gly Gly Ser Gly Gly Gly Gly Met Ser Arg Arg Asn Pro Cys Lys  
945 950 955 960

Phe Glu Ile Arg Gly His Cys Leu Asn Gly Lys Arg Cys His Phe Ser  
965 970 975

His Asn Tyr Phe Glu Trp Pro Pro His Ala Leu Leu Val Arg Gln Asn  
980 985 990

Phe Met Leu Asn Arg Ile Leu Lys Ser Met Asp Lys Ser Ile Asp Thr  
995 1000 1005

Leu Ser Glu Ile Ser Gly Ala Ala Glu Leu Asp Arg Thr Glu Glu  
1010 1015 1020

Tyr Ala Leu Gly Val Val Gly Val Leu Glu Ser Tyr Ile Gly Ser  
1025 1030 1035

Ile Asn Asn Ile Thr Lys Gln Ser Ala Cys Val Ala Met Ser Lys  
1040 1045 1050

Leu Leu Thr Glu Leu Asn Ser Asp Asp Ile Lys Lys Leu Arg Asp  
1055 1060 1065

Asn Glu Glu Leu Asn Ser Pro Lys Ile Arg Val Tyr Asn Thr Val  
1070 1075 1080

Ile Ser Tyr Ile Glu Ser Asn Arg Lys Asn Asn Lys Gln Thr Ile  
1085 1090 1095

His Leu Leu Lys Arg Leu Pro Ala Asp Val Leu Lys Lys Thr Ile  
1100 1105 1110

Lys Asn Thr Leu Asp Ile His Lys Ser Ile Thr Ile Asn Asn Pro  
1115 1120 1125

Lys Glu Ser Thr Val Ser Asp Thr Asn Asp His Ala Lys Asn Asn  
1130 1135 1140

Asp Thr Thr  
1145