

SEQUENCE LISTING

<110> FLAGSHIP PIONEERING INNOVATIONS V, INC.

<120> FUSOSOME COMPOSITIONS AND USES THEREOF

<130> V2050-7023W0

<140> Not Yet Assigned

<141> Concurrently Herewith

<150> 62/671,838

<151> 2018-05-15

<150> 62/695,529

<151> 2018-07-09

<160> 169

<170> PatentIn version 3.5

<210> 1

<211> 589

<212> PRT

<213> Human respiratory syncytial virus

<220>

<221> MISC_FEATURE

<223> fusion protein

<400> 1

Met Ile Pro Gln Ala Arg Thr Glu Leu Asn Leu Gly Gln Ile Thr Met
1 5 10 15

Glu Leu Leu Ile His Arg Ser Ser Ala Ile Phe Leu Thr Leu Ala Ile
20 25 30

Asn Ala Leu Tyr Leu Thr Ser Ser Gln Asn Ile Thr Glu Glu Phe Tyr
35 40 45

Gln Ser Thr Cys Ser Ala Val Ser Arg Gly Tyr Leu Ser Ala Leu Arg
50 55 60

Thr Gly Trp Tyr Thr Ser Val Ile Thr Ile Glu Leu Ser Asn Ile Lys
65 70 75 80

Glu Thr Lys Cys Asn Gly Thr Asp Thr Lys Val Lys Leu Ile Lys Gln
85 90 95

Glu Leu Asp Lys Tyr Lys Asn Ala Val Thr Glu Leu Gln Leu Leu Met
100 105 110

Gln Asn Thr Pro Ala Ala Asn Asn Arg Ala Arg Arg Glu Ala Pro Gln
115 120 125

Tyr Met Asn Tyr Thr Ile Asn Thr Thr Gly Ser Leu Asn Val Ser Ile
130 135 140

Ser Lys Lys Arg Lys Arg Arg Phe Leu Gly Phe Leu Leu Gly Val Gly
145 150 155 160

Ser Ala Ile Ala Ser Gly Ile Ala Val Ser Lys Val Leu His Leu Glu
165 170 175

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

Val Val Ser Leu Ser Asn Gly Val Ser Val Leu Thr Ser Lys Val Leu
195 200 205

Asp Leu Lys Asn Tyr Ile Asn Asn Gln Leu Leu Pro Ile Val Asn Gln
210 215 220

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

Lys Asn Ser Arg Leu Leu Glu Ile Thr Arg Glu Phe Ser Val Asn Ala
245 250 255

Gly Val Thr Thr Pro Leu Ser Thr Tyr Met Leu Thr Asn Ser Glu Leu

260

265

270

Leu Ser Leu Ile Asn Asp Met Pro Ile Thr Asn Asp Gln Lys Lys Leu
 275 280 285

Met Ser Ser Asn Val Gln Ile Val Arg Gln Gln Ser Tyr Ser Ile Met
 290 295 300

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

Tyr Gly Val Ile Asp Thr Pro Cys Trp Lys Leu His Thr Ser Pro Leu
 325 330 335

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

Asp Arg Gly Trp Tyr Cys Asp Asn Ala Gly Ser Val Ser Phe Phe Pro
 355 360 365

Gln Ala Asp Thr Cys Lys Val Gln Ser Asn Arg Val Phe Cys Asp Thr
 370 375 380

Met Asn Ser Leu Thr Leu Pro Ser Glu Val Ser Leu Cys Asn Thr Asp
 385 390 395 400

Ile Phe Asn Ser Lys Tyr Asp Cys Lys Ile Met Thr Ser Lys Thr Asp
 405 410 415

Ile Ser Ser Ser Val Ile Thr Ser Leu Gly Ala Ile Val Ser Cys Tyr
 420 425 430

Gly Lys Thr Lys Cys Thr Ala Ser Asn Lys Asn Arg Gly Ile Ile Lys
 435 440 445

Thr Phe Ser Asn Gly Cys Asp Tyr Val Ser Asn Lys Gly Val Asp Thr
 450 455 460

Val Ser Val Gly Asn Thr Leu Tyr Tyr Val Asn Lys Leu Glu Gly Lys
465 470 475 480

Asn Leu Tyr Val Lys Gly Glu Pro Ile Ile Asn Tyr Tyr Asp Pro Leu
485 490 495

Val Phe Pro Ser Asp Glu Phe Asp Ala Ser Ile Ser Gln Val Asn Glu
500 505 510

Lys Ile Asn Gln Ser Leu Ala Phe Ile Arg Arg Ser Asp Glu Leu Leu
515 520 525

His Asn Val Asn Thr Gly Lys Ser Thr Thr Asn Ile Met Ile Thr Ala
530 535 540

Ile Ile Ile Val Ile Ile Val Val Leu Leu Ser Leu Ile Ala Ile Gly
545 550 555 560

Leu Leu Leu Tyr Cys Lys Ala Lys Asn Thr Pro Val Thr Leu Ser Lys
565 570 575

Asp Gln Leu Ser Gly Ile Asn Asn Ile Ala Phe Ser Lys
580 585

<210> 2
<211> 553
<212> PRT
<213> Newcastle disease virus

<220>
<221> misc_feature
<223> fusion protein

<400> 2

Met Asp Pro Lys Pro Ser Thr Ser Tyr Leu His Ala Phe Pro Leu Ile
1 5 10 15

Phe Val Ala Ile Ser Leu Val Phe Met Ala Gly Arg Ala Ser Ala Leu
20 25 30

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

Ala Val Asn Ile Tyr Thr Ser Ser Gln Thr Gly Thr Ile Ile Ile Lys
50 55 60

Leu Leu Pro Asn Met Pro Lys Asp Lys Glu Gln Cys Ala Lys Ser Pro
65 70 75 80

Leu Asp Ala Tyr Asn Arg Thr Leu Thr Thr Leu Leu Ala Pro Leu Gly
85 90 95

Asp Ser Ile Arg Arg Ile Gln Glu Ser Val Thr Thr Ser Gly Gly Glu
100 105 110

Arg Gln Glu Arg Leu Val Gly Ala Ile Ile Gly Gly Val Ala Leu Gly
115 120 125

Val Ala Thr Ala Ala Gln Ile Thr Ala Ala Ser Ala Leu Ile Gln Ala
130 135 140

Asn Gln Asn Ala Ala Asn Ile Leu Lys Leu Lys Glu Ser Ile Ala Ala
145 150 155 160

Thr Asn Glu Ala Val His Glu Val Thr Ser Gly Leu Ser Gln Leu Ala
165 170 175

Val Ala Val Gly Lys Met Gln Gln Phe Val Asn Asp Gln Phe Asn Lys
180 185 190

Thr Ala Gln Glu Ile Asp Cys Ile Lys Ile Thr Gln Gln Val Gly Val
195 200 205

Glu Leu Asn Leu Tyr Leu Thr Glu Leu Thr Thr Val Phe Gly Pro Gln
210 215 220

Ile Thr Ser Pro Ala Leu Thr Gln Leu Thr Ile Gln Ala Leu Tyr Asn
225 230 235 240

Leu Ala Gly Gly Asn Met Asp Tyr Met Leu Thr Lys Leu Gly Val Gly
245 250 255

Asn Asn Gln Leu Ser Ser Leu Ile Ser Ser Gly Leu Ile Ser Gly Asn
260 265 270

Pro Ile Leu Tyr Asp Ser Gln Thr Gln Leu Leu Gly Ile Gln Val Thr
275 280 285

Leu Pro Ser Val Gly Asn Leu Asn Asn Met Arg Ala Thr Tyr Leu Glu
290 295 300

Thr Leu Ser Val Ser Thr Asn Lys Gly Phe Ala Ser Ala Leu Val Pro
305 310 315 320

Lys Val Val Thr Gln Val Gly Ser Val Ile Glu Glu Leu Asp Thr Ser
325 330 335

Tyr Cys Ile Glu Thr Asp Leu Asp Leu Tyr Cys Thr Arg Ile Val Thr
340 345 350

Phe Pro Met Ser Pro Gly Ile Phe Ser Cys Leu Gly Gly Asn Thr Ser
355 360 365

Ala Cys Met Tyr Ser Lys Thr Glu Gly Ala Leu Thr Thr Pro Tyr Met
370 375 380

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

Cys Ala Asp Pro Pro Gly Ile Ile Ser Gln Asn Tyr Gly Glu Ala Val

405

410

415

Ser Leu Ile Asp Lys Lys Val Cys Asn Ile Leu Thr Leu Asp Gly Ile
 420 425 430

Thr Leu Arg Leu Ser Gly Glu Phe Asp Ala Thr Tyr Gln Lys Asn Ile
 435 440 445

Ser Ile Gln Asp Ser Gln Val Val Ile Thr Gly Asn Leu Asp Ile Ser
 450 455 460

Thr Glu Leu Gly Asn Val Asn Asn Ser Ile Ser Asn Ala Leu Asp Lys
 465 470 475 480

Leu Glu Glu Ser Asn Ser Lys Leu Asp Lys Val Asn Val Arg Leu Thr
 485 490 495

Ser Thr Ser Ala Leu Ile Thr Tyr Ile Val Leu Thr Thr Ile Ala Leu
 500 505 510

Ile Cys Gly Ile Val Ser Leu Val Leu Ala Cys Tyr Ile Met Tyr Lys
 515 520 525

Gln Lys Ala Gln Gln Lys Thr Leu Leu Trp Leu Gly Asn Asn Thr Leu
 530 535 540

Asp Gln Met Arg Ala Thr Thr Lys Met
 545 550

<210> 3
 <211> 553
 <212> PRT
 <213> Measles virus strain AIK-C

<220>
 <221> MISC_FEATURE
 <223> fusion protein

<400> 3

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

Val Leu Leu Thr Leu Gln Thr Pro Thr Gly Gln Ile His Trp Gly Asn
20 25 30

Leu Ser Lys Ile Gly Val Val Gly Ile Gly Ser Ala Ser Tyr Lys Val
35 40 45

Met Thr Arg Ser Ser His Gln Ser Leu Val Ile Lys Leu Met Pro Asn
50 55 60

Ile Thr Leu Leu Asn Asn Cys Thr Arg Val Glu Ile Ala Glu Tyr Arg
65 70 75 80

Arg Leu Leu Arg Thr Val Leu Glu Pro Ile Arg Asp Ala Leu Asn Ala
85 90 95

Met Thr Gln Asn Ile Arg Pro Val Gln Ser Val Ala Ser Ser Arg Arg
100 105 110

His Lys Arg Phe Ala Gly Val Val Leu Ala Gly Ala Ala Leu Gly Val
115 120 125

Ala Thr Ala Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Met
130 135 140

Leu Asn Ser Gln Ala Ile Asp Asn Leu Arg Ala Ser Leu Glu Thr Thr
145 150 155 160

Asn Gln Ala Ile Glu Ala Ile Arg Gln Ala Gly Gln Glu Met Ile Leu
165 170 175

Ala Val Gln Gly Val Gln Asp Tyr Ile Asn Asn Glu Leu Ile Pro Ser
180 185 190

Met Asn Gln Leu Ser Cys Asp Leu Ile Gly Gln Lys Leu Gly Leu Lys
195 200 205

Leu Leu Arg Tyr Tyr Thr Glu Ile Leu Ser Leu Phe Gly Pro Ser Leu
210 215 220

Arg Asp Pro Ile Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala
225 230 235 240

Leu Gly Gly Asp Ile Asn Lys Val Leu Glu Lys Leu Gly Tyr Ser Gly
245 250 255

Gly Asp Leu Leu Gly Ile Leu Glu Ser Arg Gly Ile Lys Ala Arg Ile
260 265 270

Thr His Val Asp Thr Glu Ser Tyr Phe Ile Val Leu Ser Ile Ala Tyr
275 280 285

Pro Thr Leu Ser Glu Ile Lys Gly Val Ile Val His Arg Leu Glu Gly
290 295 300

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

Tyr Val Ala Thr Gln Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser
325 330 335

Cys Thr Phe Met Pro Glu Gly Thr Val Cys Ser Gln Asn Ala Leu Tyr
340 345 350

Pro Met Ser Pro Leu Leu Gln Glu Cys Leu Arg Gly Tyr Thr Lys Ser
355 360 365

Cys Ala Arg Thr Leu Val Ser Gly Ser Phe Gly Asn Arg Phe Ile Leu
370 375 380

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

Tyr Thr Thr Gly Thr Ile Ile Asn Gln Asp Pro Asp Lys Ile Leu Thr
 405 410 415

Tyr Ile Ala Ala Asp Asn Cys Pro Val Val Glu Val Asn Gly Val Thr
 420 425 430

Ile Gln Val Gly Ser Arg Arg Tyr Pro Asp Ala Val Tyr Leu His Arg
 435 440 445

Ile Asp Leu Gly Pro Pro Ile Leu Leu Glu Arg Leu Asp Val Gly Thr
 450 455 460

Asn Leu Gly Asn Ala Ile Ala Lys Leu Glu Asp Ala Lys Glu Leu Leu
 465 470 475 480

Glu Ser Ser Asp Gln Ile Leu Arg Ser Met Lys Gly Leu Ser Ser Thr
 485 490 495

Cys Ile Val Tyr Ile Leu Ile Ala Val Cys Leu Gly Gly Leu Ile Gly
 500 505 510

Ile Pro Ala Leu Ile Cys Cys Cys Arg Gly Arg Cys Asn Lys Lys Gly
 515 520 525

Glu Gln Val Gly Met Ser Arg Pro Gly Leu Lys Pro Asp Leu Thr Gly
 530 535 540

Thr Ser Lys Ser Tyr Val Arg Ser Leu
 545 550

<210> 4
 <211> 539
 <212> PRT
 <213> Human metapneumovirus

<220>

<221> MISC_FEATURE

<223> fusion glycoprotein precursor

<400> 4

Met Ser Trp Lys Val Val Ile Ile Phe Ser Leu Leu Ile Thr Pro Gln
1 5 10 15

His Gly Leu Lys Glu Ser Tyr Leu Glu Glu Ser Cys Ser Thr Ile Thr
20 25 30

Glu Gly Tyr Leu Ser Val Leu Arg Thr Gly Trp Tyr Thr Asn Val Phe
35 40 45

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

Ser Leu Ile Lys Thr Glu Leu Asp Leu Thr Lys Ser Ala Leu Arg Glu
65 70 75 80

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

Lys Pro Arg Gln Ser Arg Phe Val Leu Gly Ala Ile Ala Leu Gly Val
100 105 110

Ala Thr Ala Ala Ala Val Thr Ala Gly Val Ala Ile Ala Lys Thr Ile
115 120 125

Arg Leu Glu Ser Glu Val Thr Ala Ile Lys Asn Ala Leu Lys Thr Thr
130 135 140

Asn Glu Ala Val Ser Thr Leu Gly Asn Gly Val Arg Val Leu Ala Thr
145 150 155 160

Ala Val Arg Glu Leu Lys Asp Phe Val Ser Lys Asn Leu Thr Arg Ala
165 170 175

Ile Asn Lys Asn Lys Cys Asp Ile Asp Asp Leu Lys Met Ala Val Ser
180 185 190

Phe Ser Gln Phe Asn Arg Arg Phe Leu Asn Val Val Arg Gln Phe Ser
195 200 205

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

Ala Glu Leu Ala Arg Ala Val Ser Asn Met Pro Thr Ser Ala Gly Gln
225 230 235 240

Ile Lys Leu Met Leu Glu Asn Arg Ala Met Val Arg Arg Lys Gly Phe
245 250 255

Gly Ile Leu Ile Gly Val Tyr Gly Ser Ser Val Ile Tyr Met Val Gln
260 265 270

Leu Pro Ile Phe Gly Val Ile Asp Thr Pro Cys Trp Ile Val Lys Ala
275 280 285

Ala Pro Ser Cys Ser Glu Lys Lys Gly Asn Tyr Ala Cys Leu Leu Arg
290 295 300

Glu Asp Gln Gly Trp Tyr Cys Gln Asn Ala Gly Ser Thr Val Tyr Tyr
305 310 315 320

Pro Asn Glu Lys Asp Cys Glu Thr Arg Gly Asp His Val Phe Cys Asp
325 330 335

Thr Ala Ala Gly Ile Asn Val Ala Glu Gln Ser Lys Glu Cys Asn Ile
340 345 350

Asn Ile Ser Thr Thr Asn Tyr Pro Cys Lys Val Ser Thr Gly Arg His
355 360 365

Pro Ile Ser Met Val Ala Leu Ser Pro Leu Gly Ala Leu Val Ala Cys
370 375 380

Tyr Lys Gly Val Ser Cys Ser Ile Gly Ser Asn Arg Val Gly Ile Ile
385 390 395 400

Lys Gln Leu Asn Lys Gly Cys Ser Tyr Ile Thr Asn Gln Asp Ala Asp
405 410 415

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

Glu Gln His Val Ile Lys Gly Arg Pro Val Ser Ser Ser Phe Asp Pro
435 440 445

Ile Lys Phe Pro Glu Asp Gln Phe Asn Val Ala Leu Asp Gln Val Phe
450 455 460

Glu Asn Ile Glu Asn Ser Gln Ala Leu Val Asp Gln Ser Asn Arg Ile
465 470 475 480

Leu Ser Ser Ala Glu Lys Gly Asn Thr Gly Phe Ile Ile Val Ile Ile
485 490 495

Leu Ile Ala Val Leu Gly Ser Ser Met Ile Leu Val Ser Ile Phe Ile
500 505 510

Ile Ile Lys Lys Thr Lys Lys Pro Thr Gly Ala Pro Pro Glu Leu Ser
515 520 525

Gly Val Thr Asn Asn Gly Phe Ile Pro His Ser
530 535

<210> 5
<211> 540
<212> PRT
<213> Bovine parainfluenza virus 3

<220>

<221> MISC_FEATURE

<223> fusion protein

<400> 5

Met Ile Ile Ile Val Ile Thr Met Ile Leu Ser Leu Thr Pro Ser Ser
1 5 10 15

Leu Cys Gln Ile Asp Ile Thr Lys Leu Gln Ser Val Gly Val Leu Val
20 25 30

Asn Ser Pro Lys Gly Ile Lys Ile Ser Gln Asn Phe Glu Thr Arg Tyr
35 40 45

Leu Ile Leu Ser Leu Ile Pro Lys Ile Glu Asp Ser His Ser Cys Gly
50 55 60

Asn Gln Gln Ile Asp Gln Tyr Lys Lys Leu Leu Asp Arg Leu Ile Ile
65 70 75 80

Pro Leu Tyr Asp Gly Leu Lys Leu Gln Lys Asp Val Ile Val Val Asn
85 90 95

His Glu Ser His Asn Asn Thr Asn Leu Arg Thr Lys Arg Phe Phe Gly
100 105 110

Glu Ile Ile Gly Thr Ile Ala Ile Gly Ile Ala Thr Ser Ala Gln Ile
115 120 125

Thr Ala Ala Val Ala Leu Val Glu Ala Lys Gln Ala Arg Ser Asp Ile
130 135 140

Asp Lys Leu Lys Glu Ala Ile Lys Asp Thr Asn Lys Ala Val Gln Ser
145 150 155 160

Ile Gln Ser Ser Val Gly Asn Leu Ile Val Ala Val Lys Ser Val Gln

165

170

175

Asp Tyr Val Asn Asn Glu Ile Val Pro Ser Ile Thr Arg Leu Gly Cys
 180 185 190

Glu Ala Ala Gly Leu Gln Leu Gly Ile Ala Leu Thr Gln His Tyr Ser
 195 200 205

Glu Leu Thr Asn Ile Phe Gly Asp Asn Ile Gly Thr Leu Gly Glu Lys
 210 215 220

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

Glu Val Phe Thr Thr Ser Thr Val Asp Gln Tyr Asp Ile Tyr Asp Leu
 245 250 255

Leu Phe Thr Glu Ser Ile Lys Met Arg Val Ile Asp Val Asp Leu Ser
 260 265 270

Asp Tyr Ser Ile Thr Leu Gln Val Arg Leu Pro Leu Leu Thr Lys Val
 275 280 285

Ser Asn Thr Gln Ile Tyr Lys Val Asp Ser Ile Ser Tyr Asn Ile Gln
 290 295 300

Gly Lys Glu Trp Tyr Ile Pro Leu Pro His His Ile Met Thr Lys Gly
 305 310 315 320

Ala Phe Leu Gly Gly Ala Asp Ile Lys Glu Cys Ile Glu Ser Phe Ser
 325 330 335

Asn Tyr Ile Cys Pro Ser Asp Pro Gly Phe Ile Leu Asn His Glu Met
 340 345 350

Glu Asn Cys Leu Ser Gly Asn Ile Thr Gln Cys Pro Lys Thr Ile Val
 355 360 365

Thr Ser Asp Ile Val Pro Arg Tyr Ala Phe Val Asp Gly Gly Val Ile
370 375 380

Ala Asn Cys Ile Pro Thr Thr Cys Thr Cys Asn Gly Ile Asp Asn Arg
385 390 395 400

Ile Asn Gln Ser Pro Asp Gln Gly Ile Lys Ile Ile Thr Tyr Lys Glu
405 410 415

Cys Gln Ile Val Gly Ile Asn Gly Met Leu Phe Lys Thr Asn Gln Glu
420 425 430

Gly Thr Leu Ala Lys Tyr Thr Phe Asp Asn Ile Lys Leu Asn Asn Ser
435 440 445

Val Ala Leu Asn Pro Ile Asp Ile Ser Leu Glu Leu Asn Lys Ala Lys
450 455 460

Ser Asp Leu Glu Glu Ser Lys Arg Trp Ile Glu Lys Ser Asn Gln Lys
465 470 475 480

Leu Asp Ser Ile Gly Ser Trp His Gln Ser Ser Val Thr Ile Ile Ile
485 490 495

Ile Ile Val Met Ile Val Val Leu Leu Ile Ile Asn Ala Ile Ile Ile
500 505 510

Met Ile Met Ile Arg Tyr Leu Arg Asp Arg Asn Arg His Leu Asn Asn
515 520 525

Lys Asp Ser Glu Pro Tyr Val Leu Thr Asn Arg Gln
530 535 540

<210> 6
<211> 538
<212> PRT

<213> Mumps virus

<220>

<221> MISC_FEATURE

<223> fusion protein

<400> 6

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

Ser Val Cys Val Asn Ile Asn Ile Leu Gln Gln Ile Gly Tyr Ile Lys
20 25 30

Gln Gln Val Arg Gln Leu Ser Tyr Tyr Ser Gln Ser Ser Ser Ser Tyr
35 40 45

Ile Val Val Lys Leu Leu Pro Asn Ile Gln Pro Thr Asp Asn Ser Cys
50 55 60

Glu Phe Lys Ser Val Thr Gln Tyr Asn Lys Thr Leu Ser Asn Leu Leu
65 70 75 80

Leu Pro Ile Ala Glu Asn Ile Asn Asn Ile Ala Ser Pro Ser Ser Gly
85 90 95

Ser Arg Arg His Lys Arg Phe Ala Gly Ile Ala Ile Gly Ile Ala Ala
100 105 110

Leu Gly Val Ala Thr Ala Ala Gln Val Thr Ala Ala Val Ser Leu Val
115 120 125

Gln Ala Gln Thr Asn Ala Arg Ala Ile Ala Ala Met Lys Asn Ser Ile
130 135 140

Gln Ala Thr Asn Arg Ala Val Phe Glu Val Lys Glu Gly Thr Gln Arg
145 150 155 160

Leu Ala Ile Ala Val Gln Ala Ile Gln Asp His Ile Asn Thr Ile Met
165 170 175

Asn Thr Gln Leu Asn Asn Met Ser Cys Gln Ile Leu Asp Asn Gln Leu
180 185 190

Ala Thr Ser Leu Gly Leu Tyr Leu Thr Glu Leu Thr Thr Val Phe Gln
195 200 205

Pro Gln Leu Ile Asn Pro Ala Leu Ser Pro Ile Ser Ile Gln Ala Leu
210 215 220

Arg Ser Leu Leu Gly Ser Met Thr Pro Ala Val Val Gln Ala Thr Leu
225 230 235 240

Ser Thr Ser Ile Ser Ala Ala Glu Ile Leu Ser Ala Gly Leu Met Glu
245 250 255

Gly Gln Ile Val Ser Val Leu Leu Asp Glu Met Gln Met Ile Val Lys
260 265 270

Ile Asn Ile Pro Thr Ile Val Thr Gln Ser Asn Ala Leu Val Ile Asp
275 280 285

Phe Tyr Ser Ile Ser Ser Phe Ile Asn Asn Gln Glu Ser Ile Ile Gln
290 295 300

Leu Pro Asp Arg Ile Leu Glu Ile Gly Asn Glu Gln Trp Ser Tyr Pro
305 310 315 320

Ala Lys Asn Cys Lys Leu Thr Arg His His Ile Phe Cys Gln Tyr Asn
325 330 335

Glu Ala Glu Arg Leu Ser Leu Glu Ser Lys Leu Cys Leu Ala Gly Asn
340 345 350

Ile Ser Ala Cys Val Phe Ser Pro Ile Ala Gly Ser Tyr Met Arg Arg

355

360

365

Phe Val Ala Leu Asp Gly Thr Ile Val Ala Asn Cys Arg Ser Leu Thr
 370 375 380

Cys Leu Cys Lys Ser Pro Ser Tyr Pro Ile Tyr Gln Pro Asp His His
 385 390 395 400

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

Gly Leu Asp Phe Ser Ile Val Ser Leu Ser Asn Ile Thr Tyr Ala Glu
 420 425 430

Asn Leu Thr Ile Ser Leu Ser Gln Thr Ile Asn Thr Gln Pro Ile Asp
 435 440 445

Ile Ser Thr Glu Leu Ser Lys Val Asn Ala Ser Leu Gln Asn Ala Val
 450 455 460

Lys Tyr Ile Lys Glu Ser Asn His Gln Leu Gln Ser Val Asn Val Asn
 465 470 475 480

Ser Lys Ile Gly Ala Ile Ile Val Ala Ala Leu Val Leu Ser Ile Leu
 485 490 495

Ser Ile Ile Ile Ser Leu Leu Phe Cys Cys Trp Ala Tyr Val Ala Thr
 500 505 510

Lys Glu Ile Arg Arg Ile Asn Phe Lys Thr Asn His Ile Asn Thr Ile
 515 520 525

Ser Ser Ser Val Asp Asp Leu Ile Arg Tyr
 530 535

<210> 7

<211> 671

<212> PRT
<213> Canine distemper virus

<220>
<221> MISC_FEATURE
<223> fusion protein

<400> 7

Met Asn Pro His Glu Gln Thr Ile Pro Met His Glu Lys Ile Pro Lys
1 5 10 15

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

Ser Thr Lys Ser Ala Glu Ser Lys Thr Ser Arg Ala Arg His Ser Ile
35 40 45

Thr Ser Ala Gln Arg Ser Thr His Tyr Asp Pro Arg Thr Ala Asp Trp
50 55 60

Pro Asp Tyr Tyr Ile Met Lys Arg Thr Arg Ser Cys Lys Gln Ala Ser
65 70 75 80

Tyr Arg Ser Asp Asn Ile Pro Ala His Gly Asp His Asp Gly Ile Ile
85 90 95

His His Thr Pro Glu Ser Val Ser Gln Gly Ala Lys Ser Arg Leu Lys
100 105 110

Met Gly Gln Ser Asn Ala Val Lys Ser Gly Ser Gln Cys Thr Trp Leu
115 120 125

Val Leu Trp Cys Ile Gly Val Ala Ser Leu Phe Leu Cys Ser Lys Ala
130 135 140

Gln Ile His Trp Asn Asn Leu Ser Thr Ile Gly Ile Ile Gly Thr Asp
145 150 155 160

Ser Val His Tyr Lys Ile Met Thr Arg Pro Ser His Gln Tyr Leu Val
165 170 175

Ile Lys Leu Met Pro Asn Val Ser Leu Ile Asp Asn Cys Thr Lys Ala
180 185 190

Glu Leu Asp Glu Tyr Glu Lys Leu Leu Ser Ser Ile Leu Glu Pro Ile
195 200 205

Asn Gln Ala Leu Thr Leu Met Thr Lys Asn Val Lys Pro Leu Gln Ser
210 215 220

Val Gly Ser Gly Arg Arg Gln Arg Arg Phe Ala Gly Val Val Leu Ala
225 230 235 240

Gly Ala Ala Leu Gly Val Ala Thr Ala Ala Gln Ile Thr Ala Gly Ile
245 250 255

Ala Leu His Gln Ser Asn Leu Asn Ala Gln Ala Ile Gln Ser Leu Arg
260 265 270

Thr Ser Leu Glu Gln Ser Asn Lys Ala Ile Glu Glu Ile Arg Glu Ala
275 280 285

Thr Gln Glu Thr Val Ile Ala Val Gln Gly Val Gln Asp Tyr Val Asn
290 295 300

Asn Glu Leu Val Pro Ala Met Gln His Met Ser Cys Glu Leu Val Gly
305 310 315 320

Gln Arg Leu Gly Leu Lys Leu Leu Arg Tyr Tyr Thr Glu Leu Leu Ser
325 330 335

Ile Phe Gly Pro Ser Leu Arg Asp Pro Ile Ser Ala Glu Ile Ser Ile
340 345 350

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

Lys Leu Gly Tyr Ser Gly Asn Asp Met Ile Ala Ile Leu Glu Ser Arg
370 375 380

Gly Ile Lys Thr Lys Ile Thr His Val Asp Leu Pro Gly Lys Phe Ile
385 390 395 400

Ile Leu Ser Val Ser Tyr Pro Thr Leu Ser Glu Val Lys Gly Val Ile
405 410 415

Val His Arg Leu Glu Ala Val Ser Tyr Asn Ile Gly Ser Gln Glu Trp
420 425 430

Tyr Thr Thr Val Pro Arg Tyr Val Ala Thr Asn Gly Tyr Leu Ile Ser
435 440 445

Asn Phe Asp Glu Ser Ser Cys Val Phe Val Ser Glu Ser Ala Ile Cys
450 455 460

Ser Gln Asn Ser Leu Tyr Pro Met Ser Pro Leu Leu Gln Gln Cys Ile
465 470 475 480

Arg Gly Asp Thr Ser Ser Cys Ala Arg Thr Leu Val Ser Gly Thr Met
485 490 495

Gly Asn Lys Phe Ile Leu Ser Lys Gly Asn Ile Val Ala Asn Cys Ala
500 505 510

Ser Ile Leu Cys Lys Cys Tyr Ser Thr Ser Thr Ile Ile Asn Gln Ser
515 520 525

Pro Asp Lys Leu Leu Thr Phe Ile Ala Ser Asp Thr Cys Pro Leu Val
530 535 540

Glu Ile Asp Gly Val Thr Ile Gln Val Gly Ser Arg Gln Tyr Pro Asp

545 550 555 560

Met Val Tyr Glu Ser Lys Val Ala Leu Gly Pro Ala Ile Ser Leu Glu
565 570 575

Arg Leu Asp Val Gly Thr Asn Leu Gly Asn Ala Leu Lys Lys Leu Asp
580 585 590

Asp Ala Lys Val Leu Ile Asp Ser Ser Asn Gln Ile Leu Glu Thr Val
595 600 605

Arg Arg Ser Ser Phe Asn Phe Gly Ser Leu Leu Ser Val Pro Ile Leu
610 615 620

Ser Cys Thr Ala Leu Ala Leu Leu Leu Leu Ile Cys Cys Cys Lys Arg
625 630 635 640

Arg Tyr Gln Gln Thr His Lys Gln Asn Thr Lys Val Asp Pro Thr Phe
645 650 655

Lys Pro Asp Leu Thr Gly Thr Ser Arg Ser Tyr Val Arg Ser Leu
660 665 670

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<210> 8
<211> 546
<212> PRT
<213> Peste-des-petits-ruminants virus
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<220>
<221> MISC_FEATURE
<223> fusion protein
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<400> 8

Met Thr Arg Val Ala Ile Leu Thr Phe Leu Phe Leu Phe Pro Asn Ala
1 5 10 15

Val Ala Cys Gln Ile His Trp Gly Asn Leu Ser Lys Ile Gly Ile Val
20 25 30

Gly Thr Gly Ser Ala Ser Tyr Lys Val Met Thr Arg Pro Ser His Gln
35 40 45

Thr Leu Val Ile Lys Leu Met Pro Asn Ile Thr Ala Ile Asp Asn Cys
50 55 60

Thr Lys Ser Glu Ile Ala Glu Tyr Lys Arg Leu Leu Ile Thr Val Leu
65 70 75 80

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

Ile Gln Thr Leu Thr Pro Gly Arg Arg Thr Arg Arg Phe Ala Gly Ala
100 105 110

Val Leu Ala Gly Val Ala Leu Gly Val Ala Thr Ala Ala Gln Ile Thr
115 120 125

Ala Gly Val Ala Leu His Gln Ser Leu Met Asn Ser Gln Ala Ile Glu
130 135 140

Ser Leu Lys Thr Ser Leu Glu Lys Ser Asn Gln Ala Ile Glu Glu Ile
145 150 155 160

Arg Leu Ala Asn Lys Glu Thr Ile Leu Ala Val Gln Gly Val Gln Asp
165 170 175

Tyr Ile Asn Asn Glu Leu Val Pro Ser Val His Arg Met Ser Cys Glu
180 185 190

Leu Val Gly His Lys Leu Gly Leu Lys Leu Leu Arg Tyr Tyr Thr Glu
195 200 205

Ile Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro Ile Ala Ala Glu
210 215 220

Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu Gly Gly Asp Ile Asn Arg
225 230 235 240

Ile Leu Asp Lys Leu Gly Tyr Ser Gly Gly Asp Phe Leu Ala Ile Leu
245 250 255

Glu Ser Lys Gly Ile Lys Ala Arg Val Thr Tyr Val Asp Thr Arg Asp
260 265 270

Tyr Phe Ile Ile Leu Ser Ile Ala Tyr Pro Thr Leu Ser Glu Ile Lys
275 280 285

Gly Val Ile Val His Lys Ile Glu Ala Ile Thr Tyr Asn Ile Gly Ala
290 295 300

Gln Glu Trp Tyr Thr Thr Ile Pro Lys Tyr Val Ala Thr Gln Gly Tyr
305 310 315 320

Leu Ile Ser Asn Phe Asp Glu Thr Ser Cys Val Phe Thr Pro Asp Gly
325 330 335

Thr Val Cys Ser Gln Asn Ala Leu Tyr Pro Met Ser Pro Leu Leu Gln
340 345 350

Glu Cys Phe Gln Gly Ser Thr Lys Ser Cys Ala Arg Thr Leu Val Ser
355 360 365

Gly Thr Ile Ser Asn Arg Phe Ile Leu Ser Lys Gly Asn Leu Ile Ala
370 375 380

Asn Cys Ala Ser Val Leu Cys Lys Cys Tyr Thr Thr Glu Thr Val Ile
385 390 395 400

Ser Gln Asp Pro Asp Lys Leu Leu Thr Val Val Ala Ser Asp Lys Cys
405 410 415

Pro Val Val Glu Val Asp Gly Val Thr Ile Gln Val Gly Ser Arg Glu
420 425 430

Tyr Pro Asp Ser Val Tyr Leu His Lys Ile Asp Leu Gly Pro Ala Ile
435 440 445

Ser Leu Glu Lys Leu Asp Val Gly Thr Asn Leu Gly Asn Ala Val Thr
450 455 460

Arg Leu Glu Asn Ala Lys Glu Leu Leu Asp Ala Ser Asp Gln Ile Leu
465 470 475 480

Lys Thr Val Lys Gly Val Pro Phe Gly Gly Asn Met Tyr Ile Ala Leu
485 490 495

Ala Ala Cys Ile Gly Val Ser Leu Gly Leu Val Thr Leu Ile Cys Cys
500 505 510

Cys Lys Gly Arg Cys Lys Asn Lys Glu Val Pro Ile Ser Lys Ile Asn
515 520 525

Pro Gly Leu Lys Pro Asp Leu Thr Gly Thr Ser Lys Ser Tyr Val Arg
530 535 540

Ser Leu
545

<210> 9
<211> 546
<212> PRT
<213> Hendra virus

<220>
<221> MISC_FEATURE
<223> fusion protein

<400> 9

Met Ala Thr Gln Glu Val Arg Leu Lys Cys Leu Leu Cys Gly Ile Ile

1	5	10	15
Val	Leu	Val	Leu
	20		
Ser	Leu	Glu	Gly
		25	
Leu	Gly	Ile	Leu
			30
His	Tyr	Glu	Lys
Leu	Ser	Lys	Ile
	35		
Gly	Leu	Val	Lys
		40	
Gly	Ile	Thr	Arg
			45
Lys	Tyr	Lys	Ile
Lys	Ser	Asn	Pro
	50		
Leu	Thr	Lys	Asp
		55	
Ile	Val	Ile	Lys
			60
Met	Ile	Pro	Asn
Val	Ser	Asn	Val
	65		
Ser	Lys	Cys	Thr
	70		
Gly	Thr	Val	Met
		75	
Glu	Asn	Tyr	Lys
			80
Ser	Arg	Leu	Thr
		85	
Gly	Ile	Leu	Ser
			90
Pro	Ile	Lys	Gly
Ala	Ile	Glu	Leu
		95	
Tyr	Asn	Asn	Asn
	100		
Thr	His	Asp	Leu
			105
Val	Gly	Asp	Val
Lys	Leu	Ala	Gly
			110
Val	Val	Met	Ala
	115		
Gly	Ile	Ala	Ile
			120
Gly	Ile	Ala	Thr
			125
Ala	Ala	Gln	Ile
Thr	Ala	Gly	Val
	130		
Ala	Leu	Tyr	Glu
		135	
Ala	Met	Lys	Asn
			140
Ala	Asp	Asn	Ile
Asn	Lys	Leu	Lys
	145		
Ser	Ser	Ile	Glu
	150		
Ser	Thr	Asn	Glu
		155	
Ala	Val	Val	Lys
			160
Leu	Gln	Glu	Thr
		165	
Ala	Glu	Lys	Thr
			170
Val	Tyr	Val	Leu
Thr	Ala	Leu	Gln
			175
Asp	Tyr	Ile	Asn
	180		
Thr	Asn	Leu	Val
			185
Pro	Thr	Ile	Asp
Gln	Ile	Ser	Cys
			190
Lys	Gln	Thr	Glu
	195		
Leu	Ala	Leu	Asp
			200
Leu	Ala	Leu	Ser
Lys	Tyr	Leu	Ser
			205

Asp Leu Leu Phe Val Phe Gly Pro Asn Leu Gln Asp Pro Val Ser Asn
210 215 220

Ser Met Thr Ile Gln Ala Ile Ser Gln Ala Phe Gly Gly Asn Tyr Glu
225 230 235 240

Thr Leu Leu Arg Thr Leu Gly Tyr Ala Thr Glu Asp Phe Asp Asp Leu
245 250 255

Leu Glu Ser Asp Ser Ile Ala Gly Gln Ile Val Tyr Val Asp Leu Ser
260 265 270

Ser Tyr Tyr Ile Ile Val Arg Val Tyr Phe Pro Ile Leu Thr Glu Ile
275 280 285

Gln Gln Ala Tyr Val Gln Glu Leu Leu Pro Val Ser Phe Asn Asn Asp
290 295 300

Asn Ser Glu Trp Ile Ser Ile Val Pro Asn Phe Val Leu Ile Arg Asn
305 310 315 320

Thr Leu Ile Ser Asn Ile Glu Val Lys Tyr Cys Leu Ile Thr Lys Lys
325 330 335

Ser Val Ile Cys Asn Gln Asp Tyr Ala Thr Pro Met Thr Ala Ser Val
340 345 350

Arg Glu Cys Leu Thr Gly Ser Thr Asp Lys Cys Pro Arg Glu Leu Val
355 360 365

Val Ser Ser His Val Pro Arg Phe Ala Leu Ser Gly Gly Val Leu Phe
370 375 380

Ala Asn Cys Ile Ser Val Thr Cys Gln Cys Gln Thr Thr Gly Arg Ala
385 390 395 400

Ile Ser Gln Ser Gly Glu Gln Thr Leu Leu Met Ile Asp Asn Thr Thr
405 410 415

Cys Thr Thr Val Val Leu Gly Asn Ile Ile Ile Ser Leu Gly Lys Tyr
420 425 430

Leu Gly Ser Ile Asn Tyr Asn Ser Glu Ser Ile Ala Val Gly Pro Pro
435 440 445

Val Tyr Thr Asp Lys Val Asp Ile Ser Ser Gln Ile Ser Ser Met Asn
450 455 460

Gln Ser Leu Gln Gln Ser Lys Asp Tyr Ile Lys Glu Ala Gln Lys Ile
465 470 475 480

Leu Asp Thr Val Asn Pro Ser Leu Ile Ser Met Leu Ser Met Ile Ile
485 490 495

Leu Tyr Val Leu Ser Ile Ala Ala Leu Cys Ile Gly Leu Ile Thr Phe
500 505 510

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

Asp Asp Arg Gln Val Arg Pro Val Ser Asn Gly Asp Leu Tyr Tyr Ile
530 535 540

Gly Thr
545

<210> 10
<211> 565
<212> PRT
<213> Sendai virus

<220>
<221> MISC_FEATURE

<223> fusion protein

<400> 10

Met Ala Thr Tyr Ile Gln Arg Val Gln Cys Ile Ser Ala Leu Leu Ser
1 5 10 15

Val Val Leu Thr Thr Leu Val Ser Cys Gln Ile Pro Arg Asp Arg Leu
20 25 30

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

Gly Ser His Glu Ser Arg Tyr Ile Val Leu Ser Leu Val Pro Gly Ile
50 55 60

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

Leu Leu Asn Arg Leu Leu Ile Pro Leu Arg Asp Ala Leu Asp Leu Gln
85 90 95

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

Pro Gln Ser Arg Phe Phe Gly Ala Val Ile Gly Thr Ile Ala Leu Gly
115 120 125

Val Ala Thr Ser Ala Gln Ile Thr Ala Gly Ile Ala Leu Ala Glu Ala
130 135 140

Arg Glu Ala Lys Arg Asp Ile Ala Leu Ile Lys Glu Ser Met Thr Lys
145 150 155 160

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

Leu Ala Leu Lys Thr Leu Gln Asp Phe Val Asn Asp Glu Ile Lys Pro

180

185

190

Ala Ile Ser Glu Leu Gly Cys Glu Thr Ala Ala Leu Arg Leu Gly Ile
 195 200 205

Lys Leu Thr Gln His Tyr Ser Glu Leu Leu Thr Ala Phe Gly Ser Asn
 210 215 220

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

Leu Tyr Ser Ala Asn Ile Thr Glu Ile Met Thr Thr Ile Arg Thr Gly
 245 250 255

Gln Ser Asn Ile Tyr Asp Val Ile Tyr Thr Glu Gln Ile Lys Gly Thr
 260 265 270

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

Ile Pro Ile Leu Ser Glu Val Pro Gly Val Leu Ile His Lys Ala Ser
 290 295 300

Ser Ile Ser Tyr Asn Ile Asp Gly Glu Glu Trp Tyr Val Thr Val Pro
 305 310 315 320

Ser His Ile Leu Ser Arg Ala Ser Phe Leu Gly Gly Ala Asn Ile Ala
 325 330 335

Asp Cys Val Glu Ser Arg Leu Thr Tyr Ile Cys Pro Arg Asp Pro Ala
 340 345 350

Gln Leu Ile Pro Asp Ser Gln Gln Lys Cys Ile Leu Gly Asp Thr Thr
 355 360 365

Arg Cys Pro Val Thr Lys Val Val Asp Asn Ile Ile Pro Lys Phe Ala
 370 375 380

Phe Val Asn Gly Gly Val Val Ala Asn Cys Ile Ala Ser Thr Cys Thr
385 390 395 400

Cys Gly Thr Gly Arg Arg Pro Ile Ser Gln Asp Arg Ser Lys Gly Val
405 410 415

Val Phe Leu Thr His Asp Asn Cys Gly Leu Ile Gly Val Asn Gly Ile
420 425 430

Glu Leu Tyr Ala Asn Arg Lys Gly His Asp Ala Thr Trp Gly Val Gln
435 440 445

Asn Leu Thr Val Gly Pro Ala Ile Ala Ile Arg Pro Val Asp Ile Ser
450 455 460

Leu Asn Leu Ala Ala Ala Thr Asp Phe Leu Gln Asp Ser Arg Ala Glu
465 470 475 480

Leu Glu Lys Ala Arg Lys Ile Leu Ser Glu Val Gly Arg Trp Tyr Asn
485 490 495

Ser Gly Ala Thr Leu Ile Thr Ile Ile Val Val Met Ile Val Val Leu
500 505 510

Val Val Ile Ile Val Ile Val Ile Val Leu Tyr Arg Leu Arg Arg Ser
515 520 525

Met Leu Met Ser Asn Pro Ala Gly Arg Ile Ser Arg Asp Thr Tyr Thr
530 535 540

Leu Glu Pro Lys Ile Arg His Met Tyr Thr Asn Gly Gly Phe Asp Ala
545 550 555 560

Met Thr Glu Lys Arg
565

<210> 11
 <211> 555
 <212> PRT
 <213> Human parainfluenza virus 1 strain Washington/1964

<220>
 <221> MISC_FEATURE
 <223> F glycoprotein

<400> 11

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

Ser Ser Ser Leu Cys Gln Ile Pro Val Glu Lys Leu Ser Asn Val Gly
 20 25 30

Val Ile Ile Asn Glu Gly Lys Leu Leu Lys Ile Ala Gly Ser Tyr Glu
 35 40 45

Ser Arg Tyr Ile Val Leu Ser Leu Val Pro Ser Ile Asp Leu Gln Asp
 50 55 60

Gly Cys Gly Thr Thr Gln Ile Ile Gln Tyr Lys Asn Leu Leu Asn Arg
 65 70 75 80

Leu Leu Ile Pro Leu Lys Asp Ala Leu Asp Leu Gln Glu Ser Leu Ile
 85 90 95

Thr Ile Thr Asn Asp Thr Thr Val Thr Asn Asp Asn Pro Gln Thr Arg
 100 105 110

Phe Phe Gly Ala Val Ile Gly Thr Ile Ala Leu Gly Val Ala Thr Ala
 115 120 125

Ala Gln Ile Thr Ala Gly Ile Ala Leu Ala Glu Ala Arg Glu Ala Arg
 130 135 140

Lys Asp Ile Ala Leu Ile Lys Asp Ser Ile Val Lys Thr His Asn Ser
145 150 155 160

Val Glu Leu Ile Gln Arg Gly Ile Gly Glu Gln Ile Ile Ala Leu Lys
165 170 175

Thr Leu Gln Asp Phe Val Asn Asp Glu Ile Arg Pro Ala Ile Gly Glu
180 185 190

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

His Tyr Ser Glu Leu Ala Thr Ala Phe Ser Ser Asn Leu Gly Thr Ile
210 215 220

Gly Glu Lys Ser Leu Thr Leu Gln Ala Leu Ser Ser Leu Tyr Ser Ala
225 230 235 240

Asn Ile Thr Glu Ile Leu Ser Thr Thr Lys Lys Asp Lys Ser Asp Ile
245 250 255

Tyr Asp Ile Ile Tyr Thr Glu Gln Val Lys Gly Thr Val Ile Asp Val
260 265 270

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

Ser Glu Ile Pro Gly Val Leu Ile Tyr Arg Ala Ser Ser Ile Ser Tyr
290 295 300

Asn Ile Glu Gly Glu Glu Trp His Val Ala Ile Pro Asn Tyr Ile Ile
305 310 315 320

Asn Lys Ala Ser Ser Leu Gly Gly Ala Asp Val Thr Asn Cys Ile Glu
325 330 335

Ser Lys Leu Ala Tyr Ile Cys Pro Arg Asp Pro Thr Gln Leu Ile Pro

340

345

350

Asp Asn Gln Gln Lys Cys Ile Leu Gly Asp Val Ser Lys Cys Pro Val
 355 360 365

Thr Lys Val Ile Asn Asn Leu Val Pro Lys Phe Ala Phe Ile Asn Gly
 370 375 380

Gly Val Val Ala Asn Cys Ile Ala Ser Thr Cys Thr Cys Gly Thr Asn
 385 390 395 400

Arg Ile Pro Val Asn Gln Asp Arg Ser Arg Gly Val Thr Phe Leu Thr
 405 410 415

Tyr Thr Asn Cys Gly Leu Ile Gly Ile Asn Gly Ile Glu Leu Tyr Ala
 420 425 430

Asn Lys Arg Gly Arg Asp Thr Thr Trp Gly Asn Gln Ile Ile Lys Val
 435 440 445

Gly Pro Ala Val Ser Ile Arg Pro Val Asp Ile Ser Leu Asn Leu Ala
 450 455 460

Ser Ala Thr Asn Phe Leu Glu Glu Ser Lys Thr Glu Leu Met Lys Ala
 465 470 475 480

Arg Ala Ile Ile Ser Ala Val Gly Gly Trp His Asn Thr Glu Ser Thr
 485 490 495

Gln Ile Ile Met Ile Ile Ile Val Cys Ile Leu Ile Ile Ile Ile Cys
 500 505 510

Gly Ile Leu Tyr Tyr Leu Tyr Arg Val Arg Arg Leu Leu Val Met Ile
 515 520 525

Asn Ser Thr His Asn Ser Pro Val Asn Ala Tyr Thr Leu Glu Ser Arg
 530 535 540

Met Arg Asn Pro Tyr Met Gly Asn Asn Ser Asn
 545 550 555

<210> 12
 <211> 543
 <212> PRT
 <213> Feline morbillivirus

<220>
 <221> MISC_FEATURE
 <223> fusion protein

<400> 12

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

Ile Thr Thr Ala Gln Val Gly Trp Asp Asn Leu Thr Ser Ile Gly Val
 20 25 30

Ile Ser Thr Lys Gln Tyr Asp Tyr Lys Ile Thr Thr Leu Asn Thr Asn
 35 40 45

Gln Leu Met Val Ile Lys Met Val Pro Asn Ile Ser Ser Ile Ile Asn
 50 55 60

Cys Thr Lys Pro Glu Leu Met Lys Tyr Arg Glu Leu Val Leu Gly Val
 65 70 75 80

Ile Arg Pro Ile Asn Glu Ser Leu Glu Leu Met Asn Ser Tyr Ile Asn
 85 90 95

Met Arg Ala Gly Ser Glu Arg Phe Ile Gly Ala Val Ile Ala Gly Val
 100 105 110

Ala Leu Gly Val Ala Thr Ala Ala Gln Ile Thr Ser Gly Ile Ala Leu
 115 120 125

His Asn Ser Ile Met Asn Lys Arg Gln Ile Gln Glu Leu Arg Lys Ala
130 135 140

Leu Ser Thr Thr Asn Lys Ala Ile Asp Glu Ile Arg Ile Ala Gly Glu
145 150 155 160

Arg Thr Leu Ile Ala Val Gln Gly Val Gln Asp Tyr Ile Asn Asn Ile
165 170 175

Ile Ile Pro Met Gln Asp Lys Leu Gln Cys Asp Ile Leu Ser Ser Gln
180 185 190

Leu Ala Ile Ala Leu Leu Arg Tyr Tyr Thr Asn Ile Leu Thr Val Phe
195 200 205

Gly Pro Ser Ile Arg Asp Pro Val Thr Ser Ile Ile Ser Ile Gln Ala
210 215 220

Leu Ser Gln Ala Phe Asn Gly Asn Leu Gln Ala Leu Leu Asp Gly Leu
225 230 235 240

Gly Tyr Thr Gly Arg Asp Leu Arg Asp Leu Leu Glu Ser Arg Ser Ile
245 250 255

Thr Gly Gln Ile Ile His Ala Asp Met Thr Asp Leu Phe Leu Val Leu
260 265 270

Arg Ile Asn Tyr Pro Ser Ile Thr Glu Met Gln Gly Val Thr Ile Tyr
275 280 285

Glu Leu Asn Ser Ile Thr Tyr His Ile Gly Pro Glu Glu Trp Tyr Thr
290 295 300

Ile Met Pro Asn Phe Ile Ala Val Gln Gly Phe Leu Thr Ser Asn Phe
305 310 315 320

Asp Glu Arg Lys Cys Ser Ile Thr Lys Ser Ser Ile Leu Cys Gln Gln
325 330 335

Asn Ser Ile Tyr Pro Met Ser Thr Glu Met Gln Arg Cys Ile Lys Gly
340 345 350

Glu Ile Arg Phe Cys Pro Arg Ser Lys Ala Val Gly Thr Leu Val Asn
355 360 365

Arg Phe Ile Leu Thr Lys Gly Asn Leu Met Ala Asn Cys Leu Gly Val
370 375 380

Ile Cys Arg Cys Tyr Ser Ser Gly Gln Ile Ile Thr Gln Asp Pro Ser
385 390 395 400

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

Asp Gly Ile Arg Ile Met Val Gly Pro Arg Lys Leu Pro Asp Val Ile
420 425 430

Phe Asn Ala Arg Leu Glu Val Gly Val Pro Ile Ser Leu Ser Lys Leu
435 440 445

Asp Val Gly Thr Asp Leu Ala Ile Ala Ser Ala Lys Leu Asn Asn Ser
450 455 460

Lys Ala Leu Leu Glu Gln Ser Asp Lys Ile Leu Asp Ser Met Ser Lys
465 470 475 480

Leu Asp Ser Ile Asn Ser Arg Ile Thr Gly Leu Ile Leu Ala Ile Met
485 490 495

Ala Ile Phe Ile Ile Thr Val Thr Ile Ile Trp Ile Ile Tyr Lys Arg
500 505 510

Cys Arg Asn Lys Asp Asn Lys Phe Ser Thr Ser Ile Glu Pro Leu Tyr

515

520

525

Ile Pro Pro Ser Tyr Asn Ser Pro His Ser Val Val Lys Ser Ile
 530 535 540

<210> 13
 <211> 534
 <212> PRT
 <213> Avian paramyxovirus 2

<220>
 <221> MISC_FEATURE
 <223> fusion protein

<400> 13

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

Asp Asn Ser Val Leu Ala Pro Val Gly Ile Ala Ser Ala Gln Glu Trp
 20 25 30

Gln Leu Ala Ala Tyr Thr Asn Thr Leu Ser Gly Thr Ile Ala Val Arg
 35 40 45

Phe Val Pro Val Leu Pro Gly Asn Leu Ser Thr Cys Ala Gln Ala Thr
 50 55 60

Leu Ala Glu Tyr Asn Lys Thr Val Thr Asn Ile Leu Gly Pro Leu Lys
 65 70 75 80

Glu Asn Leu Glu Thr Leu Leu Ser Glu Pro Thr Lys Thr Ala Ala Arg
 85 90 95

Phe Val Gly Ala Ile Ile Gly Thr Val Ala Leu Gly Val Ala Thr Ser
 100 105 110

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

Arg Asn Ile Trp Arg Leu Lys Glu Ser Ile Arg Lys Thr Asn Glu Ala
130 135 140

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

Lys Val Gln Lys Phe Ile Asn Glu Asp Ile Ile Pro Gln Ile Lys Glu
165 170 175

Ile Asp Cys Gln Val Val Ala Asn Lys Leu Gly Val Tyr Leu Ser Leu
180 185 190

Tyr Leu Thr Glu Leu Thr Thr Ile Phe Gly Ala Gln Ile Thr Asn Pro
195 200 205

Ala Leu Thr Pro Leu Ser Tyr Gln Ala Leu Tyr Asn Leu Cys Gly Gly
210 215 220

Asp Met Gly Lys Leu Thr Glu Leu Ile Gly Val Lys Ala Lys Asp Ile
225 230 235 240

Asn Ser Leu Tyr Glu Ala Asn Leu Ile Thr Gly Gln Val Ile Gly Tyr
245 250 255

Asp Ser Glu Ser Gln Ile Ile Leu Ile Gln Val Ser Tyr Pro Ser Val
260 265 270

Ser Glu Val Thr Gly Val Arg Ala Thr Glu Leu Val Thr Val Ser Val
275 280 285

Thr Thr Pro Lys Gly Glu Gly Arg Ala Ile Ala Pro Lys Tyr Val Ala
290 295 300

Gln Ser Arg Val Val Thr Glu Glu Leu Asp Thr Ser Thr Cys Arg Phe
305 310 315 320

Ser Lys Thr Thr Leu Tyr Cys Arg Ser Ile Ile Thr Arg Pro Leu Pro
325 330 335

Pro Leu Ile Ala Asn Cys Leu Asn Gly Leu Tyr Gln Asp Cys Gln Tyr
340 345 350

Thr Thr Glu Ile Gly Ala Leu Ser Ser Arg Phe Ile Thr Val Asn Gly
355 360 365

Gly Ile Ile Ala Asn Cys Arg Ala Thr Ile Cys Lys Cys Val Asn Pro
370 375 380

Pro Lys Ile Ile Val Gln Ser Asp Ala Ser Ser Leu Thr Val Ile Asp
385 390 395 400

Ser Ala Ile Cys Lys Asp Val Val Leu Asp Asn Val Gln Leu Arg Leu
405 410 415

Glu Gly Lys Leu Ser Ala Gln Tyr Phe Thr Asn Ile Thr Ile Asp Leu
420 425 430

Ser Gln Ile Thr Thr Ser Gly Ser Leu Asp Ile Ser Ser Glu Ile Gly
435 440 445

Ser Ile Asn Asn Thr Val Asn Lys Val Glu Glu Leu Ile Ala Glu Ser
450 455 460

Asn Ala Trp Leu Gln Ala Val Asn Pro His Leu Val Asn Asn Thr Ser
465 470 475 480

Ile Ile Val Leu Cys Val Leu Ala Ala Ile Phe Val Val Trp Leu Val
485 490 495

Ala Leu Thr Gly Cys Leu Ala Tyr Tyr Ile Lys Lys Ser Ser Ala Thr
500 505 510

Arg Met Val Gly Ile Gly Ser Ser Pro Ala Gly Asn Pro Tyr Val Ala
515 520 525

Gln Ser Ala Thr Lys Met
530

<210> 14
<211> 555
<212> PRT
<213> Avian paramyxovirus 6

<220>
<221> MISC_FEATURE
<223> fusion protein

<400> 14

Met Gly Ala Arg Leu Gly Pro Leu Ala Met Ala Pro Gly Arg Tyr Val
1 5 10 15

Ile Ile Phe Asn Leu Ile Leu Leu His Arg Val Val Ser Leu Asp Asn
20 25 30

Ser Arg Leu Leu Gln Gln Gly Ile Met Ser Ala Thr Glu Arg Glu Ile
35 40 45

Lys Val Tyr Thr Asn Ser Ile Thr Gly Ser Ile Ala Val Arg Leu Ile
50 55 60

Pro Asn Leu Pro Gln Glu Val Leu Lys Cys Ser Ala Gly Gln Ile Lys
65 70 75 80

Ser Tyr Asn Asp Thr Leu Asn Arg Ile Phe Thr Pro Ile Lys Ala Asn
85 90 95

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

Pro Ala Pro Glu Pro Arg Leu Ile Gly Ala Ile Ile Gly Thr Ala Ala

115

120

125

Leu Gly Leu Ala Thr Ala Ala Gln Val Thr Ala Ala Leu Ala Leu Asn
 130 135 140

Gln Ala Gln Asp Asn Ala Lys Ala Ile Leu Asn Leu Lys Glu Ser Ile
 145 150 155 160

Thr Lys Thr Asn Glu Ala Val Leu Glu Leu Lys Asp Ala Thr Gly Gln
 165 170 175

Ile Ala Ile Ala Leu Asp Lys Thr Gln Arg Phe Ile Asn Asp Asn Ile
 180 185 190

Leu Pro Ala Ile Asn Asn Leu Thr Cys Glu Val Ala Gly Ala Lys Val
 195 200 205

Gly Val Glu Leu Ser Leu Tyr Leu Thr Glu Leu Ser Thr Val Phe Gly
 210 215 220

Ser Gln Ile Thr Asn Pro Ala Leu Ser Thr Leu Ser Ile Gln Ala Leu
 225 230 235 240

Met Ser Leu Cys Gly Asn Asp Phe Asn Tyr Leu Leu Asn Leu Met Gly
 245 250 255

Ala Lys His Ser Asp Leu Gly Ala Leu Tyr Glu Ala Asn Leu Ile Asn
 260 265 270

Gly Arg Ile Ile Gln Tyr Asp Gln Ala Ser Gln Ile Met Val Ile Gln
 275 280 285

Val Ser Val Pro Ser Ile Ser Ser Ile Ser Gly Leu Arg Leu Thr Glu
 290 295 300

Leu Phe Thr Leu Ser Ile Glu Thr Pro Val Gly Glu Gly Lys Ala Val
 305 310 315 320

Val Pro Gln Phe Val Val Glu Ser Gly Gln Leu Leu Glu Glu Ile Asp
325 330 335

Thr Gln Ala Cys Thr Leu Thr Asp Thr Thr Ala Tyr Cys Thr Ile Val
340 345 350

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

Glu Ser Arg Cys Gln Tyr Thr Thr Gly Ile Gly Met Leu Glu Ser Arg
370 375 380

Phe Gly Val Phe Asp Gly Leu Val Ile Ala Asn Cys Lys Ala Thr Ile
385 390 395 400

Cys Arg Cys Leu Ala Pro Glu Met Ile Ile Thr Gln Asn Lys Gly Leu
405 410 415

Pro Leu Thr Val Ile Ser Gln Glu Thr Cys Lys Arg Ile Leu Ile Asp
420 425 430

Gly Val Thr Leu Gln Ile Glu Ala Gln Val Ser Gly Ser Tyr Ser Arg
435 440 445

Asn Ile Thr Val Gly Asn Ser Gln Ile Ala Pro Ser Gly Pro Leu Asp
450 455 460

Ile Ser Ser Glu Leu Gly Lys Val Asn Gln Ser Leu Ser Asn Val Glu
465 470 475 480

Asp Leu Ile Asp Gln Ser Asn Gln Leu Leu Asn Arg Val Asn Pro Asn
485 490 495

Ile Val Asn Asn Thr Ala Ile Ile Val Thr Ile Val Leu Leu Val Leu
500 505 510

Leu Val Leu Trp Cys Leu Ala Leu Thr Ile Ser Ile Leu Tyr Val Ser
515 520 525

Lys His Ala Val Arg Met Ile Lys Thr Val Pro Asn Pro Tyr Val Met
530 535 540

Gln Ala Lys Ser Pro Gly Ser Ala Thr Gln Phe
545 550 555

<210> 15
<211> 545
<212> PRT
<213> Fer-de-Lance paramyxovirus

<220>
<221> MISC_FEATURE
<223> fusion protein F

<400> 15

Met Thr Arg Ile Thr Ile Leu Gln Ile Ile Leu Thr Leu Thr Leu Pro
1 5 10 15

Val Met Cys Gln Val Ser Phe Asp Asn Leu Glu Gln Val Gly Val Met
20 25 30

Phe Asp Lys Pro Lys Phe Leu Lys Ile Thr Gly Pro Ala Ser Thr Ala
35 40 45

Thr Met Ile Ile Lys Leu Ile Pro Thr Leu Gly Thr Met Glu Ser Cys
50 55 60

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

Val Pro Leu Arg Asp Thr Ile Asn Lys Leu Ser Thr Asp Ile Thr Val
85 90 95

Val Glu Gly Thr Ser Asn Ile Ser Asn Lys Arg Glu Lys Arg Phe Val
100 105 110

Gly Ile Ala Ile Ala Val Gly Ala Val Ala Leu Ala Thr Ser Ala Gln
115 120 125

Ile Thr Ala Gly Ile Ala Leu Ser Asn Thr Ile Lys Asn Ala Glu Ala
130 135 140

Ile Glu Ser Ile Lys Ser Ser Ile Gln Ala Ser Asn Gln Ala Ile Gln
145 150 155 160

Lys Val Ile Asp Ala Gln Gly Arg Thr Val Thr Val Ile Asn Gly Ile
165 170 175

Gln Asp His Ile Asn Ser Val Ile Asn Pro Ala Leu Asn Gln Leu Gly
180 185 190

Cys Asp Val Ala Lys Asn Thr Leu Ala Ile Ser Leu Thr Gln Tyr Phe
195 200 205

Ser Lys Leu Ser Leu Leu Phe Gly Pro Asn Leu Arg Asn Pro Val Glu
210 215 220

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

Asn Ala Val Val Ser Gln Leu Gly Tyr Thr Gln Ser Asp Leu Leu Asp
245 250 255

Leu Leu Ser Thr Glu Ser Ile Val Gly Thr Val Thr Ala Ile Asp Met
260 265 270

Val Asn Tyr Met Ile Gln Ile Glu Met Ser Phe Pro Gln Tyr Ile Thr
275 280 285

Ile Pro Asp Thr Lys Val Leu Glu Gly His Lys Ile Thr Phe Asn Asp

290

295

300

Lys Gly Ser Glu Trp Gln Thr Gln Val Pro Ser Thr Ile Ala Val Arg
 305 310 315 320

Asp Ile Leu Ile Ala Gly Val Asp Pro Asp Gly Cys Ser Ile Thr Ser
 325 330 335

Thr Ser Tyr Ile Cys Lys Asn Asp Pro Thr Tyr Ala Met Ser Glu Val
 340 345 350

Leu Thr Asn Cys Phe Arg Gly Asn Thr Gln Glu Cys Pro Arg Ala Arg
 355 360 365

Ile Thr Ser Thr Phe Ala Thr Arg Phe Ala Ile Ala Arg Ser Thr Val
 370 375 380

Ile Ala Asn Cys Val Ala Ala Val Cys Leu Cys Gly Asp Pro Gly Ile
 385 390 395 400

Pro Val Val Gln Lys Ala Glu Val Thr Leu Thr Ala Met Thr Leu Asp
 405 410 415

Gln Cys Ser Leu Ile Thr Val Asp Gly Leu Gln Ile Lys Pro Ser Lys
 420 425 430

Ser Ile Ala Asn Val Thr Ala Asn Phe Gly Asn Ile Thr Leu Gly Pro
 435 440 445

Val Val Ser Val Gly Asp Leu Asp Leu Ser Ala Glu Leu Thr Lys Val
 450 455 460

Gln Ser Asp Leu Lys Glu Ala Gln Asp Lys Leu Asp Glu Ser Asn Ala
 465 470 475 480

Ile Leu Gln Gly Ile Asn Asn Lys Ile Leu Thr Ala Pro Thr Ser Ile
 485 490 495

Ala Leu Ile Val Val Ser Val Val Val Ile Leu Leu Ile Ile Gly Met
500 505 510

Ile Ser Trp Leu Val Trp Leu Thr Lys Ala Val Arg Arg Ser Asn Thr
515 520 525

Arg Ser Glu Arg Val Thr Pro Ser Ala Tyr Asn Asn Leu Gly Phe Ile
530 535 540

Lys
545

<210> 16
<211> 566
<212> PRT
<213> Avian paramyxovirus 4

<220>
<221> MISC_FEATURE
<223> fusion protein

<400> 16

Met Arg Leu Ser Arg Thr Ile Leu Thr Leu Ile Leu Gly Thr Leu Thr
1 5 10 15

Gly Tyr Leu Met Gly Ala His Ser Thr Asn Val Asn Glu Gly Pro Lys
20 25 30

Ser Glu Gly Ile Arg Gly Asp Leu Ile Pro Gly Ala Gly Ile Phe Val
35 40 45

Thr Gln Val Arg Gln Leu Gln Ile Tyr Gln Gln Ser Gly Tyr His Asp
50 55 60

Leu Val Ile Arg Leu Leu Pro Leu Leu Pro Ala Glu Leu Asn Asp Cys
65 70 75 80

Gln Arg Glu Val Val Thr Glu Tyr Asn Asn Thr Val Ser Gln Leu Leu
85 90 95

Gln Pro Ile Lys Thr Asn Leu Asp Thr Leu Leu Ala Asp Gly Gly Thr
100 105 110

Arg Asp Ala Asp Ile Gln Pro Arg Phe Ile Gly Ala Ile Ile Ala Thr
115 120 125

Gly Ala Leu Ala Val Ala Thr Val Ala Glu Val Thr Ala Ala Gln Ala
130 135 140

Leu Ser Gln Ser Lys Thr Asn Ala Gln Asn Ile Leu Lys Leu Arg Asp
145 150 155 160

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

Glu Ala Thr Ala Thr Val Leu Ser Lys Leu Gln Thr Glu Leu Asn Glu
180 185 190

Asn Ile Ile Pro Ser Leu Asn Asn Leu Ser Cys Ala Ala Met Gly Asn
195 200 205

Arg Leu Gly Val Ser Leu Ser Leu Tyr Leu Thr Leu Met Thr Thr Leu
210 215 220

Phe Gly Asp Gln Ile Thr Asn Pro Val Leu Thr Pro Ile Ser Tyr Ser
225 230 235 240

Thr Leu Ser Ala Met Ala Gly Gly His Ile Gly Pro Val Met Ser Lys
245 250 255

Ile Leu Ala Gly Ser Val Thr Ser Gln Leu Gly Ala Glu Gln Leu Ile
260 265 270

Ala Ser Gly Leu Ile Gln Ser Gln Val Val Gly Tyr Asp Ser Gln Tyr
275 280 285

Gln Leu Leu Val Ile Arg Val Asn Leu Val Arg Ile Gln Glu Val Gln
290 295 300

Asn Thr Arg Val Val Ser Leu Arg Thr Leu Ala Val Asn Arg Asp Gly
305 310 315 320

Gly Leu Tyr Arg Ala Gln Val Pro Pro Glu Val Val Glu Arg Ser Gly
325 330 335

Ile Ala Glu Arg Phe Tyr Ala Asp Asp Cys Val Leu Thr Thr Thr Asp
340 345 350

Tyr Ile Cys Ser Ser Ile Arg Ser Ser Arg Leu Asn Pro Glu Leu Val
355 360 365

Lys Cys Leu Ser Gly Ala Leu Asp Ser Cys Thr Phe Glu Arg Glu Ser
370 375 380

Ala Leu Leu Ser Thr Pro Phe Phe Val Tyr Asn Lys Ala Val Val Ala
385 390 395 400

Asn Cys Lys Ala Ala Thr Cys Arg Cys Asn Lys Pro Pro Ser Ile Ile
405 410 415

Ala Gln Tyr Ser Ala Ser Ala Leu Val Thr Ile Thr Thr Asp Thr Cys
420 425 430

Ala Asp Leu Glu Ile Glu Gly Tyr Arg Phe Asn Ile Gln Thr Glu Ser
435 440 445

Asn Ser Trp Val Ala Pro Asn Phe Thr Val Ser Thr Ser Gln Ile Val
450 455 460

Ser Val Asp Pro Ile Asp Ile Ser Ser Asp Ile Ala Lys Ile Asn Ser

465 470 475 480

Ser Ile Glu Ala Ala Arg Glu Gln Leu Glu Leu Ser Asn Gln Ile Leu
485 490 495

Ser Arg Ile Asn Pro Arg Ile Val Asn Asp Glu Ser Leu Ile Ala Ile
500 505 510

Ile Val Thr Ile Val Val Leu Ser Leu Leu Val Ile Gly Leu Ile Val
515 520 525

Val Leu Gly Val Met Tyr Lys Asn Leu Lys Lys Val Gln Arg Ala Gln
530 535 540

Ala Ala Met Met Met Gln Gln Met Ser Ser Ser Gln Pro Val Thr Thr
545 550 555 560

Lys Leu Gly Thr Pro Phe
565

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<210> 17
<211> 551
<212> PRT
<213> Human parainfluenza virus 2
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<220>
<221> MISC_FEATURE
<223> fusion protein
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<400> 17

Met His His Leu His Pro Met Ile Val Cys Ile Phe Val Met Tyr Thr
1 5 10 15

Gly Ile Val Gly Ser Asp Ala Ile Ala Gly Asp Gln Leu Leu Asn Ile
20 25 30

Gly Val Ile Gln Ser Lys Ile Arg Ser Leu Met Tyr Tyr Thr Asp Gly
35 40 45

Gly Ala Ser Phe Ile Val Val Lys Leu Leu Pro Asn Leu Pro Pro Ser
50 55 60

Asn Gly Thr Cys Asn Ile Thr Ser Leu Asp Ala Tyr Asn Val Thr Leu
65 70 75 80

Phe Lys Leu Leu Thr Pro Leu Ile Glu Asn Leu Ser Lys Ile Ser Thr
85 90 95

Val Thr Asp Thr Lys Thr Arg Gln Lys Arg Phe Ala Gly Val Val Val
100 105 110

Gly Leu Ala Ala Leu Gly Val Ala Thr Ala Ala Gln Ile Thr Ala Ala
115 120 125

Val Ala Ile Val Lys Ala Asn Ala Asn Ala Ala Ala Ile Asn Asn Leu
130 135 140

Ala Ser Ser Ile Gln Ser Thr Asn Lys Ala Val Ser Asp Val Ile Asp
145 150 155 160

Ala Ser Arg Thr Ile Ala Thr Ala Val Gln Ala Ile Gln Asp Arg Ile
165 170 175

Asn Gly Ala Ile Val Asn Gly Ile Thr Ser Ala Ser Cys Arg Ala His
180 185 190

Asp Ala Leu Ile Gly Ser Ile Leu Asn Leu Tyr Leu Thr Glu Leu Thr
195 200 205

Thr Ile Phe His Asn Gln Ile Thr Asn Pro Ala Leu Thr Pro Leu Ser
210 215 220

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

Glu Ser Lys Leu Asn Thr Asn Phe Asn Thr Ala Glu Leu Leu Ser Ser
245 250 255

Gly Leu Leu Thr Gly Gln Ile Ile Ser Ile Ser Pro Met Tyr Met Gln
260 265 270

Met Leu Ile Gln Ile Asn Val Pro Thr Phe Ile Met Gln Pro Gly Ala
275 280 285

Lys Val Ile Asp Leu Ile Ala Ile Ser Ala Asn His Lys Leu Gln Glu
290 295 300

Val Val Val Gln Val Pro Asn Arg Ile Leu Glu Tyr Ala Asn Glu Leu
305 310 315 320

Gln Asn Tyr Pro Ala Asn Asp Cys Val Val Thr Pro Asn Ser Val Phe
325 330 335

Cys Arg Tyr Asn Glu Gly Ser Pro Ile Pro Glu Ser Gln Tyr Gln Cys
340 345 350

Leu Arg Gly Asn Leu Asn Ser Cys Thr Phe Thr Pro Ile Ile Gly Asn
355 360 365

Phe Leu Lys Arg Phe Ala Phe Ala Asn Gly Val Leu Tyr Ala Asn Cys
370 375 380

Lys Ser Leu Leu Cys Arg Cys Ala Asp Pro Pro His Val Val Ser Gln
385 390 395 400

Asp Asp Thr Gln Gly Ile Ser Ile Ile Asp Ile Lys Arg Cys Ser Glu
405 410 415

Met Met Leu Asp Thr Phe Ser Phe Arg Ile Thr Ser Thr Phe Asn Ala
420 425 430

Thr Tyr Val Thr Asp Phe Ser Met Ile Asn Ala Asn Ile Val His Leu
435 440 445

Ser Pro Leu Asp Leu Ser Asn Gln Ile Asn Ser Ile Asn Lys Ser Leu
450 455 460

Lys Ser Ala Glu Asp Trp Ile Ala Asp Ser Asn Phe Phe Ala Asn Gln
465 470 475 480

Ala Arg Thr Ala Lys Thr Leu Tyr Ser Leu Ser Ala Ile Ala Leu Ile
485 490 495

Leu Ser Val Ile Thr Leu Val Val Val Gly Leu Leu Ile Ala Tyr Ile
500 505 510

Ile Lys Leu Val Ser Gln Ile His Gln Phe Arg Ser Leu Ala Ala Thr
515 520 525

Thr Met Phe His Arg Glu Asn Pro Ala Phe Phe Ser Lys Asn Asn His
530 535 540

Gly Asn Ile Tyr Gly Ile Ser
545 550

<210> 18
<211> 541
<212> PRT
<213> Porcine rubulavirus

<220>
<221> MISC_FEATURE
<223> fusion protein

<400> 18

Met Pro Gln Gln Gln Val Ala His Thr Cys Val Met Leu Trp Gly Ile
1 5 10 15

Ile Ser Thr Val Ser Gly Ile Asn Thr Glu Ala Leu Ser Gln Tyr Gly

20

25

30

Val Val Val Thr Asn Val Arg Gln Leu Thr Tyr Tyr Thr Gln Ala Gly
 35 40 45

Ser Thr Tyr Leu Ala Val Arg Leu Leu Pro Ser Leu Ala Ser Pro Asp
 50 55 60

Gln Ser Cys Ala Leu His Ser Ile Ile Asn Tyr Asn Ala Thr Leu Gln
 65 70 75 80

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

Leu Arg Glu Gln His Arg Lys Lys Arg Phe Ala Gly Val Ala Ile Gly
 100 105 110

Leu Thr Ala Leu Gly Val Ala Thr Ala Ala Gln Ala Thr Ala Ala Val
 115 120 125

Ala Leu Val Arg Ala Asn Lys Asn Ala Glu Lys Val Glu Gln Leu Ser
 130 135 140

Gln Ala Leu Gly Glu Thr Asn Ala Ala Ile Ser Asp Leu Ile Asp Ala
 145 150 155 160

Thr Lys Asn Leu Gly Phe Ala Val Gln Ala Ile Gln Asn Gln Ile Asn
 165 170 175

Thr Ala Ile Leu Pro Gln Ile His Asn Leu Ser Cys Gln Val Ile Asp
 180 185 190

Ala Gln Leu Gly Asn Ile Leu Ser Leu Tyr Leu Thr Glu Leu Thr Thr
 195 200 205

Val Phe Gln Pro Gln Leu Thr Asn Pro Ala Leu Ser Pro Leu Thr Ile
 210 215 220

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

Glu Lys Leu Lys Ser Asn Ile Pro Leu Gly Asp Leu Met Ser Ser Gly
 245 250 255

Leu Leu Lys Gly Gln Leu Val Gly Leu Asn Leu Gln Asn Met Leu Met
 260 265 270

Ile Ile Glu Leu Tyr Ile Pro Thr Leu Ser Thr His Ser Thr Ala Lys
 275 280 285

Val Leu Asp Leu Val Thr Ile Ser Ser His Val Asn Gly Arg Glu Val
 290 295 300

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

Gly Tyr Gly Gly Ser Glu Cys Ala Leu Thr Met Ser His Ile Leu Cys
 325 330 335

Pro Phe Asn Asp Ala Arg Val Leu Ser Thr Asp Met Lys Tyr Cys Leu
 340 345 350

Gln Gly Asn Ile Thr His Cys Ile Phe Ser Pro Val Val Gly Ser Phe
 355 360 365

Leu Arg Arg Phe Ala Leu Val Asn Gly Val Val Ile Ala Asn Cys Ala
 370 375 380

Asp Met Ser Cys Val Cys Phe Asp Pro Gln Glu Ile Ile Tyr Gln Asn
 385 390 395 400

Phe Gln Glu Pro Thr Thr Val Ile Asp Ile Lys Lys Cys Gly Lys Val
 405 410 415

Gln Leu Asp Thr Leu Thr Phe Thr Ile Ser Thr Phe Ala Asn Arg Thr
420 425 430

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

Pro Leu Asp Ile Ser Gly Asn Leu Ile Ala Val Asn Asn Ser Leu Ser
450 455 460

Ser Ala Leu Asn His Leu Ala Thr Ser Glu Ile Leu Arg Asn Glu Gln
465 470 475 480

Ile Trp Thr Ser Ser Leu Gly Ile Ser Thr Ile Val Ala Leu Val Ile
485 490 495

Ile Gly Ile Leu Ile Ile Cys Leu Val Val Thr Trp Ala Ala Leu Trp
500 505 510

Ala Leu Leu Lys Glu Val Arg Gly Leu Asn Ser Ala Val Asn Ser Gln
515 520 525

Leu Ser Ser Tyr Val Met Gly Asp Lys Phe Ile Arg Tyr
530 535 540

<210> 19
<211> 551
<212> PRT
<213> Parainfluenza virus 5

<220>
<221> MISC_FEATURE
<223> fusion protein

<400> 19

Met Gly Thr Arg Ile Gln Phe Leu Met Val Ser Cys Leu Leu Ala Gly
1 5 10 15

Thr Gly Ser Leu Asp Pro Ala Ala Leu Met Gln Ile Gly Val Ile Pro
20 25 30

Thr Asn Val Arg Gln Leu Met Tyr Tyr Thr Glu Ala Ser Ser Ala Phe
35 40 45

Ile Val Val Lys Leu Met Pro Thr Ile Asp Ser Pro Ile Ser Gly Cys
50 55 60

Asn Ile Thr Ser Ile Ser Ser Tyr Asn Ala Thr Met Thr Lys Leu Leu
65 70 75 80

Gln Pro Ile Gly Glu Asn Leu Glu Thr Ile Arg Tyr Gln Leu Ile Pro
85 90 95

Thr Arg Arg Arg Arg Arg Phe Val Gly Val Val Ile Gly Leu Ala Ala
100 105 110

Leu Gly Val Ala Thr Ala Ala Gln Val Thr Ala Ala Val Ala Leu Val
115 120 125

Lys Ala Asn Lys Asn Ala Ala Ala Ile Leu Asn Leu Lys Asn Ala Ile
130 135 140

Gln Lys Thr Asn Ala Ala Val Ala Asp Val Val Gln Ala Thr Gln Ser
145 150 155 160

Leu Gly Thr Ala Val Gln Ala Val Gln Asp His Ile Asn Ser Val Val
165 170 175

Ser Pro Ala Ile Thr Ala Ala Asn Cys Lys Ala Gln Asp Ala Ile Ile
180 185 190

Gly Ser Ile Leu Asn Leu Tyr Leu Thr Glu Leu Thr Thr Ile Phe His
195 200 205

Asn Gln Ile Thr Asn Pro Ala Leu Ser Pro Ile Thr Ile Gln Ala Leu

210

215

220

Arg Ile Leu Leu Gly Ser Thr Leu Pro Thr Val Val Arg Lys Ser Phe
 225 230 235 240

Asn Thr Gln Ile Ser Ala Ala Glu Leu Leu Ser Ser Gly Leu Leu Thr
 245 250 255

Gly Gln Ile Val Gly Leu Asp Leu Thr Tyr Met Gln Met Val Ile Lys
 260 265 270

Ile Glu Leu Pro Thr Leu Thr Val Gln Pro Ala Thr Gln Ile Ile Asp
 275 280 285

Leu Val Thr Ile Ser Ala Phe Ile Asn Asn Arg Glu Val Met Ala Gln
 290 295 300

Leu Pro Thr Arg Ile Ile Val Thr Gly Ser Leu Ile Gln Ala Tyr Pro
 305 310 315 320

Ala Ser Gln Cys Thr Ile Thr Pro Asn Thr Val Tyr Cys Arg Tyr Asn
 325 330 335

Asp Ala Gln Val Leu Ser Asp Asp Thr Met Ala Cys Leu Gln Gly Asn
 340 345 350

Leu Thr Arg Cys Thr Phe Ser Pro Val Val Gly Ser Phe Leu Thr Arg
 355 360 365

Phe Val Leu Phe Asp Gly Ile Val Tyr Ala Asn Cys Arg Ser Met Leu
 370 375 380

Cys Lys Cys Met Gln Pro Ala Ala Val Ile Leu Gln Pro Ser Ser Ser
 385 390 395 400

Pro Val Thr Val Ile Asp Met His Lys Cys Val Ser Leu Gln Leu Asp
 405 410 415

Asn Leu Arg Phe Thr Ile Thr Gln Leu Ala Asn Ile Thr Tyr Asn Ser
 420 425 430

Thr Ile Lys Leu Glu Thr Ser Gln Ile Leu Pro Ile Asp Pro Leu Asp
 435 440 445

Ile Ser Gln Asn Leu Ala Ala Val Asn Lys Ser Leu Ser Asp Ala Leu
 450 455 460

Gln His Leu Ala Gln Ser Asp Thr Tyr Leu Ser Ala Ile Thr Ser Ala
 465 470 475 480

Thr Thr Thr Ser Val Leu Ser Ile Ile Ala Ile Cys Leu Gly Ser Leu
 485 490 495

Gly Leu Ile Leu Ile Ile Leu Ile Ser Val Val Val Trp Lys Leu Leu
 500 505 510

Thr Ile Val Ala Ala Asn Arg Asn Arg Met Glu Asn Phe Val Tyr His
 515 520 525

Asn Ser Ala Phe His His Ser Arg Ser Asp Leu Ser Glu Lys Asn Gln
 530 535 540

Pro Ala Thr Leu Gly Thr Arg
 545 550

<210> 20
 <211> 537
 <212> PRT
 <213> Murine pneumonia virus

<220>
 <221> MISC_FEATURE
 <223> fusion glycoprotein precursor

<400> 20

Met Ile Pro Gly Arg Ile Phe Leu Val Leu Leu Val Ile Phe Asn Thr
1 5 10 15

Lys Pro Ile His Pro Asn Thr Leu Thr Glu Lys Phe Tyr Glu Ser Thr
20 25 30

Cys Ser Val Glu Thr Ala Gly Tyr Lys Ser Ala Leu Arg Thr Gly Trp
35 40 45

His Met Thr Val Met Ser Ile Lys Leu Ser Gln Ile Asn Ile Glu Ser
50 55 60

Cys Lys Ser Ser Asn Ser Leu Leu Ala His Glu Leu Ala Ile Tyr Ser
65 70 75 80

Ser Ala Val Asp Glu Leu Arg Thr Leu Ser Ser Asn Ala Leu Lys Ser
85 90 95

Lys Arg Lys Lys Arg Phe Leu Gly Leu Ile Leu Gly Leu Gly Ala Ala
100 105 110

Val Thr Ala Gly Val Ala Leu Ala Lys Thr Val Gln Leu Glu Ser Glu
115 120 125

Ile Ala Leu Ile Arg Asp Ala Val Arg Asn Thr Asn Glu Ala Val Val
130 135 140

Ser Leu Thr Asn Gly Met Ser Val Leu Ala Lys Val Val Asp Asp Leu
145 150 155 160

Lys Asn Phe Ile Ser Lys Glu Leu Leu Pro Lys Ile Asn Arg Val Ser
165 170 175

Cys Asp Val His Asp Ile Thr Ala Val Ile Arg Phe Gln Gln Leu Asn
180 185 190

Lys Arg Leu Leu Glu Val Ser Arg Glu Phe Ser Ser Asn Ala Gly Leu
195 200 205

Thr His Thr Val Ser Ser Phe Met Leu Thr Asp Arg Glu Leu Thr Ser
210 215 220

Ile Val Gly Gly Met Ala Val Ser Ala Gly Gln Lys Glu Ile Met Leu
225 230 235 240

Ser Ser Lys Ala Ile Met Arg Arg Asn Gly Leu Ala Ile Leu Ser Ser
245 250 255

Val Asn Ala Asp Thr Leu Val Tyr Val Ile Gln Leu Pro Leu Phe Gly
260 265 270

Val Met Asp Thr Asp Cys Trp Val Ile Arg Ser Ser Ile Asp Cys His
275 280 285

Asn Ile Ala Asp Lys Tyr Ala Cys Leu Ala Arg Ala Asp Asn Gly Trp
290 295 300

Tyr Cys His Asn Ala Gly Ser Leu Ser Tyr Phe Pro Ser Pro Thr Asp
305 310 315 320

Cys Glu Ile His Asn Gly Tyr Ala Phe Cys Asp Thr Leu Lys Ser Leu
325 330 335

Thr Val Pro Val Thr Ser Arg Glu Cys Asn Ser Asn Met Tyr Thr Thr
340 345 350

Asn Tyr Asp Cys Lys Ile Ser Thr Ser Lys Thr Tyr Val Ser Thr Ala
355 360 365

Val Leu Thr Thr Met Gly Cys Leu Val Ser Cys Tyr Gly His Asn Ser
370 375 380

Cys Thr Val Ile Asn Asn Asp Lys Gly Ile Ile Arg Thr Leu Pro Asp

385 390 395 400

Gly Cys His Tyr Ile Ser Asn Lys Gly Val Asp Arg Val Gln Val Gly
405 410 415

Asn Thr Val Tyr Tyr Leu Ser Lys Glu Val Gly Lys Ser Ile Val Val
420 425 430

Arg Gly Glu Pro Leu Val Leu Lys Tyr Asp Pro Leu Ser Phe Pro Asp
435 440 445

Asp Lys Phe Asp Val Ala Ile Arg Asp Val Glu His Ser Ile Asn Gln
450 455 460

Thr Arg Thr Phe Leu Lys Ala Ser Asp Gln Leu Leu Asp Leu Ser Glu
465 470 475 480

Asn Arg Glu Asn Lys Asn Leu Asn Lys Ser Tyr Ile Leu Thr Thr Leu
485 490 495

Leu Phe Val Val Met Leu Ile Ile Ile Met Ala Val Ile Gly Phe Ile
500 505 510

Leu Tyr Lys Val Leu Lys Met Ile Arg Asp Asn Lys Leu Lys Ser Lys
515 520 525

Ser Thr Pro Gly Leu Thr Val Leu Ser
530 535

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<210> 21
<211> 543
<212> PRT
<213> Human parainfluenza virus 4a
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<220>
<221> MISC_FEATURE
<223> fusion protein
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<400> 21

Met Gly Val Lys Gly Leu Ser Leu Ile Met Ile Gly Leu Leu Ile Ser
1 5 10 15

Pro Ile Thr Asn Leu Asp Ile Thr His Leu Met Asn Leu Gly Thr Val
20 25 30

Pro Thr Ala Ile Arg Ser Leu Val Tyr Tyr Thr Tyr Thr Lys Pro Ser
35 40 45

Tyr Leu Thr Val Asp Leu Ile Pro Asn Leu Lys Asn Leu Asp Gln Asn
50 55 60

Cys Asn Tyr Ser Ser Leu Asn Tyr Tyr Asn Lys Thr Ala Leu Ser Leu
65 70 75 80

Ile Gln Pro Ile Ala Asp Asn Ile Asn Arg Leu Thr Lys Pro Ile Thr
85 90 95

Ser Ser Glu Ile Gln Ser Arg Phe Phe Gly Ala Val Ile Gly Thr Ile
100 105 110

Ala Leu Gly Val Ala Thr Ala Ala Gln Val Thr Ala Ala Ile Gly Leu
115 120 125

Ala Lys Ala Gln Glu Asn Ala Lys Leu Ile Leu Thr Leu Lys Lys Ala
130 135 140

Ala Thr Glu Thr Asn Glu Ala Val Arg Asp Leu Ala Asn Ser Asn Lys
145 150 155 160

Ile Val Val Lys Met Ile Ser Ala Ile Gln Asn Gln Ile Asn Thr Ile
165 170 175

Ile Gln Pro Ala Ile Asp Gln Ile Asn Cys Gln Ile Lys Asp Leu Gln
180 185 190

Val Ala Asn Ile Leu Asn Leu Tyr Leu Thr Glu Ile Thr Thr Val Phe
195 200 205

His Asn Gln Leu Thr Asn Pro Ala Leu Glu Ser Ile Ser Ile Gln Ala
210 215 220

Leu Lys Ser Leu Leu Gly Pro Thr Leu Pro Glu Val Leu Ser Lys Leu
225 230 235 240

Asp Leu Asn Asn Ile Ser Ala Ala Ser Val Met Ala Ser Gly Leu Ile
245 250 255

Lys Gly Gln Ile Ile Ala Val Asp Ile Pro Thr Met Thr Leu Val Leu
260 265 270

Met Val Gln Ile Pro Ser Ile Ser Pro Leu Arg Gln Ala Lys Ile Ile
275 280 285

Asp Leu Thr Ser Ile Thr Ile His Thr Asn Ser Gln Glu Val Gln Ala
290 295 300

Val Val Pro Ala Arg Phe Leu Glu Ile Gly Ser Glu Ile Leu Gly Phe
305 310 315 320

Asp Gly Ser Val Cys Gln Ile Thr Lys Asp Thr Ile Phe Cys Pro Tyr
325 330 335

Asn Asp Ala Tyr Glu Leu Pro Ile Gln Gln Lys Arg Cys Leu Gln Gly
340 345 350

Gln Thr Arg Asp Cys Val Phe Thr Pro Val Ala Gly Thr Phe Pro Arg
355 360 365

Arg Phe Leu Thr Thr Tyr Gly Thr Ile Val Ala Asn Cys Arg Asp Leu
370 375 380

Val Cys Ser Cys Leu Arg Pro Pro Gln Ile Ile Tyr Gln Pro Asp Glu
 385 390 395 400

Asn Pro Val Thr Ile Ile Asp Lys Asp Leu Cys Thr Thr Leu Thr Leu
 405 410 415

Asp Ser Ile Thr Ile Glu Ile Gln Lys Ser Ile Asn Ser Thr Phe Arg
 420 425 430

Arg Glu Val Val Leu Glu Ser Thr Gln Val Arg Ser Leu Thr Pro Leu
 435 440 445

Asp Leu Ser Thr Asp Leu Asn Gln Tyr Asn Gln Leu Leu Lys Ser Ala
 450 455 460

Glu Asp His Ile Gln Arg Ser Thr Asp Tyr Leu Asn Ser Ile Asn Pro
 465 470 475 480

Ser Ile Val Asn Asn Asn Ala Ile Ile Ile Leu Ile Ile Leu Cys Ile
 485 490 495

Leu Leu Ile Leu Thr Val Thr Ile Cys Ile Ile Trp Leu Lys Tyr Leu
 500 505 510

Thr Lys Glu Val Lys Asn Val Ala Arg Asn Gln Arg Leu Asn Arg Asp
 515 520 525

Ala Asp Leu Phe Tyr Lys Ile Pro Ser Gln Ile Pro Val Pro Arg
 530 535 540

<210> 22
 <211> 538
 <212> PRT
 <213> Tioman virus

<220>
 <221> MISC_FEATURE
 <223> fusion protein

<400> 22

Met Arg Ile Ala Leu Thr Ala Val Ile Val Ser Ile His Phe Asp Leu
1 5 10 15

Ala Phe Pro Met Asn Lys Asn Ser Leu Leu Ser Val Gly Leu Val His
20 25 30

Lys Ser Val Lys Asn Leu Tyr Phe Tyr Ser Gln Gly Ser Pro Ser Tyr
35 40 45

Ile Val Val Lys Leu Val Pro Thr Leu Gly Asn Val Pro Gly Asn Cys
50 55 60

Thr Leu Asn Ser Leu Val Arg Tyr Lys Ser Thr Val Ser Ser Leu Leu
65 70 75 80

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

Ser Arg Gly Gly Arg Arg Arg Arg Phe Ala Gly Val Ala Ile Gly Leu
100 105 110

Ala Ala Leu Gly Val Ala Ala Ala Ala Gln Ala Thr Ala Ala Val Ala
115 120 125

Leu Val Glu Ala Arg Gln Asn Ala Ala Gln Ile Gln Ser Leu Ser Glu
130 135 140

Ala Ile Gln Asn Thr Asn Leu Ala Val Asn Glu Leu Lys Thr Ala Ile
145 150 155 160

Gly Ala Ser Ala Thr Ala Ile Gln Ala Ile Gln Thr Gln Ile Asn Glu
165 170 175

Val Ile Asn Pro Ala Ile Asn Arg Leu Ser Cys Glu Ile Leu Asp Ala
180 185 190

Gln Leu Ala Ser Met Leu Asn Leu Tyr Leu Ile His Leu Thr Thr Val
195 200 205

Phe Gln Asn Gln Leu Thr Asn Pro Ala Leu Thr Pro Leu Ser Ile Gln
210 215 220

Ser Leu Gln Ser Leu Leu Gln Gly Thr Ser Ser Val Leu Thr Asn Ile
225 230 235 240

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

Ile Thr Gly Gln Val Val Gly Leu Asn Met Thr Ser Leu Gln Ile Val
260 265 270

Ile Ala Ala Tyr Val Pro Ser Val Ala Lys Leu Ser Asn Ala Val Val
275 280 285

His Asn Phe Ile Arg Ile Thr Thr Ser Val Asn Gly Thr Glu Val Ile
290 295 300

Ile Gln Ser Pro Thr Ile Ile Met Glu Gln Asn Glu Val Met Tyr Asp
305 310 315 320

Leu Lys Thr Gly His Cys Thr Glu Ser Asp Leu Asn Ile Tyr Cys Pro
325 330 335

Tyr Val Asp Ala Gln Leu Leu Ser Pro Gly Met Thr Asn Cys Ile Asn
340 345 350

Gly Arg Leu Asn Asp Cys Thr Phe Ser Lys Val Val Gly Ser Phe Pro
355 360 365

Thr Arg Phe Ala Ala Val Glu Gly Ala Ile Leu Ala Asn Cys Lys Tyr
370 375 380

Leu Gln Cys Asn Cys Leu Thr Pro Pro Tyr Ile Ile Thr Pro Leu Asn
 385 390 395 400

Gly Glu Met Ile Ser Met Ile Asp Leu Ser Lys Cys Gln Arg Leu Asp
 405 410 415

Leu Gly Thr Ile Val Phe Asp Ile Asn Asn Pro Val Asn Val Thr Phe
 420 425 430

Asn Gly Asn Tyr Arg Ala Asp Val Gly Gln Met Ile Val Thr Asn Pro
 435 440 445

Leu Asp Ile Ser Ala Glu Leu Asn Gln Ile Asn Thr Ser Leu Ser Asn
 450 455 460

Ala Gln Gly Phe Leu Ser Lys Ser Asp Ala Trp Leu His Val Ser Gln
 465 470 475 480

Trp Val Thr Asn Ser Gly Thr Ile Phe Ile Ile Leu Ile Ile Gly Leu
 485 490 495

Ile Val Gly Ile Val Tyr Met Ile Ile Asn Thr Tyr Val Val Val Gln
 500 505 510

Ile Ile Lys Glu Ile Asn Arg Met Arg Thr Ser Asp Arg Ala His Leu
 515 520 525

Leu Lys Gly Ser Ile Ser Ser Ile Ser Thr
 530 535

<210> 23
 <211> 543
 <212> PRT
 <213> Avian paramyxovirus 8

<220>
 <221> MISC_FEATURE

<223> fusion protein

<400> 23

Met Gly Gln Ile Ser Val Tyr Leu Ile Asn Ser Val Leu Leu Leu Leu
1 5 10 15

Val Tyr Pro Val Asn Ser Ile Asp Asn Thr Leu Ile Ala Pro Ile Gly
20 25 30

Val Ala Ser Ala Asn Glu Trp Gln Leu Ala Ala Tyr Thr Thr Ser Leu
35 40 45

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

Thr Thr Cys Leu Arg Glu Thr Ile Thr Thr Tyr Asn Asn Thr Val Asn
65 70 75 80

Asn Ile Leu Gly Pro Leu Lys Ser Asn Leu Asp Ala Leu Leu Ser Ser
85 90 95

Glu Thr Tyr Pro Gln Thr Arg Leu Ile Gly Ala Val Ile Gly Ser Ile
100 105 110

Ala Leu Gly Val Ala Thr Ser Ala Gln Ile Thr Ala Ala Val Ala Leu
115 120 125

Lys Gln Ala Gln Asp Asn Ala Arg Asn Ile Leu Ala Leu Lys Glu Ala
130 135 140

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

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

Ile Leu Pro Ser Ile Asn Gln Leu Ser Cys Glu Val Thr Ala Asn Lys

180

185

190

Leu Gly Val Tyr Leu Ser Leu Tyr Leu Thr Glu Leu Thr Thr Ile Phe
 195 200 205

Gly Ala Gln Leu Thr Asn Pro Ala Leu Thr Ser Leu Ser Tyr Gln Ala
 210 215 220

Leu Tyr Asn Leu Cys Gly Gly Asn Met Ala Met Leu Thr Gln Lys Ile
 225 230 235 240

Gly Ile Lys Gln Gln Asp Val Asn Ser Leu Tyr Glu Ala Gly Leu Ile
 245 250 255

Thr Gly Gln Val Ile Gly Tyr Asp Ser Gln Tyr Gln Leu Leu Val Ile
 260 265 270

Gln Val Asn Tyr Pro Ser Ile Ser Glu Val Thr Gly Val Arg Ala Thr
 275 280 285

Glu Leu Val Thr Val Ser Val Thr Thr Asp Lys Gly Glu Gly Lys Ala
 290 295 300

Ile Val Pro Gln Phe Val Ala Glu Ser Arg Val Thr Ile Glu Glu Leu
 305 310 315 320

Asp Val Ala Ser Cys Lys Phe Ser Ser Thr Thr Leu Tyr Cys Arg Gln
 325 330 335

Val Asn Thr Arg Ala Leu Pro Pro Leu Val Ala Ser Cys Leu Arg Gly
 340 345 350

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

Arg Tyr Ile Thr Leu Asp Gly Gly Val Leu Val Asn Cys Lys Ser Ile
 370 375 380

Val Cys Arg Cys Leu Asn Pro Ser Lys Ile Ile Ser Gln Asn Thr Asn
385 390 395 400

Ala Ala Val Thr Tyr Val Asp Ala Thr Ile Cys Lys Thr Ile Gln Leu
405 410 415

Asp Asp Ile Gln Leu Gln Leu Glu Gly Ser Leu Ser Ser Val Tyr Ala
420 425 430

Arg Asn Ile Ser Ile Glu Ile Ser Gln Val Thr Thr Ser Gly Ser Leu
435 440 445

Asp Ile Ser Ser Glu Ile Gly Asn Ile Asn Asn Thr Val Asn Arg Val
450 455 460

Glu Asp Leu Ile His Gln Ser Glu Glu Trp Leu Ala Lys Val Asn Pro
465 470 475 480

His Ile Val Asn Asn Thr Thr Leu Ile Val Leu Cys Val Leu Ser Ala
485 490 495

Leu Ala Val Ile Trp Leu Ala Val Leu Thr Ala Ile Ile Ile Tyr Leu
500 505 510

Arg Thr Lys Leu Lys Thr Ile Ser Ala Leu Ala Val Thr Asn Thr Ile
515 520 525

Gln Ser Asn Pro Tyr Val Asn Gln Thr Lys Arg Glu Ser Lys Phe
530 535 540

<210> 24
<211> 546
<212> PRT
<213> Tailam virus

<220>

<221> MISC_FEATURE

<223> fusion protein

<400> 24

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

Ser Asp Leu Ala Arg Ser Gln Leu Ala Leu Ser Glu Leu Thr Lys Ile
20 25 30

Gly Val Ile Pro Gly Arg Ser Tyr Asp Leu Lys Ile Ser Thr Gln Ala
35 40 45

Ser Tyr Gln Tyr Met Val Val Lys Leu Ile Pro Asn Leu Thr Gly Leu
50 55 60

Asn Asn Cys Thr Asn Gly Thr Ile Glu Ala Tyr Lys Lys Met Leu Asn
65 70 75 80

Arg Leu Leu Ser Pro Ile Asp Ala Ala Leu Arg Lys Met Lys Asp Ala
85 90 95

Val Asn Asp Lys Pro Pro Glu Ser Val Gly Asn Val Lys Phe Trp Gly
100 105 110

Ala Val Ile Gly Gly Val Ala Leu Gly Val Ala Thr Ser Ala Gln Ile
115 120 125

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

Leu Ala Leu Lys Asp Ser Ile Arg Gln Ser Asn Lys Ala Ile Gln Glu
145 150 155 160

Leu Gln Thr Ala Met Ser Thr Thr Val Val Val Leu Asn Ala Leu Gln
165 170 175

Asp Gln Ile Asn Asn Gln Leu Val Pro Ala Ile Asn Ser Leu Gly Cys
180 185 190

Gln Val Val Ala Asn Thr Leu Gly Leu Lys Leu Asn Gln Tyr Phe Ser
195 200 205

Glu Ile Ser Leu Val Phe Gly Pro Asn Leu Arg Asp Pro Thr Ser Glu
210 215 220

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

Ser Met Leu Ser Lys Leu Lys Tyr Asp Asp Ser Asp Phe Leu Asp Leu
245 250 255

Leu Glu Ser Asp Ser Ile Arg Gly Arg Ile Ile Asp Val Ser Leu Ser
260 265 270

Asp Tyr Leu Ile Thr Ile Gln Ile Glu Tyr Pro Ala Leu Leu Ser Ile
275 280 285

Lys Asp Ala Val Ile Gln Thr Phe Asn Leu Ile Ser Tyr Asn Thr Arg
290 295 300

Gly Thr Glu Trp Ile Ser Ile Phe Pro Lys Gln Leu Leu Val Arg Gly
305 310 315 320

Thr Tyr Ile Ser Asn Ile Asp Ile Ser Gln Cys Val Ile Ala Ala Thr
325 330 335

Ser Ile Ile Cys Lys Ser Asp Thr Ser Thr Pro Ile Ser Ser Ala Thr
340 345 350

Trp Ser Cys Ala Thr Gly Asn Ile Thr Asn Cys Ala Arg Thr Arg Val
355 360 365

Val Asn Ala His Val Pro Arg Phe Ala Leu Tyr Gly Gly Val Val Phe

370

375

380

Ala Asn Cys Ala Pro Val Val Cys Lys Cys Gln Asp Pro Leu Tyr Ser
 385 390 395 400

Ile Asn Gln Glu Pro Lys Val Thr Asn Val Met Val Asp Val Asp Ala
 405 410 415

Cys Lys Glu Met Tyr Leu Asp Gly Leu Tyr Ile Thr Leu Gly Lys Thr
 420 425 430

Gln Ile Ser Arg Ala Met Tyr Ala Glu Asp Val Ser Leu Gly Gly Pro
 435 440 445

Ile Ser Val Asp Pro Ile Asp Leu Gly Asn Glu Ile Asn Ser Ile Asn
 450 455 460

Ser Ala Ile Asn Arg Ser Glu Glu His Leu Asn His Ala Asn Glu Leu
 465 470 475 480

Leu Asp Lys Val Asn Pro Arg Ile Val Asn Val Lys Thr Phe Gly Val
 485 490 495

Met Ile Gly Leu Leu Val Leu Val Val Leu Trp Cys Val Ile Thr Leu
 500 505 510

Val Trp Leu Ile Cys Leu Thr Lys Gln Leu Ala Arg Thr Ala Tyr Ala
 515 520 525

Gly Ser Met Gly Ser Arg Ala Ser Thr Val Asn Ser Leu Ser Gly Phe
 530 535 540

Val Gly
 545

<210> 25

<211> 557

<212> PRT
<213> Porcine parainfluenza virus 1

<220>
<221> MISC_FEATURE
<223> fusion protein

<400> 25

Met Gln Val Thr Thr Leu Arg Pro Ala Ile Ile Leu Ser Ile Ala Leu
1 5 10 15

Leu Val Thr Gly Gln Val Pro Arg Asp Lys Leu Ala Asn Leu Gly Ile
20 25 30

Ile Ile Lys Asp Ser Lys Ala Leu Lys Ile Ala Gly Ser Tyr Glu Asn
35 40 45

Arg Tyr Ile Val Leu Ser Leu Val Pro Thr Ile Asp Asn Val Asn Gly
50 55 60

Cys Gly Ser Ile Gln Ile Ala Lys Tyr Lys Glu Met Leu Glu Arg Leu
65 70 75 80

Leu Ile Pro Ile Lys Asp Ala Leu Asp Leu Gln Glu Ser Leu Ile Val
85 90 95

Ile Asp Asn Glu Thr Val Asn Asn Asn Tyr Ser Pro Gln Tyr Arg Phe
100 105 110

Val Gly Ala Ile Ile Gly Thr Ile Ala Leu Gly Val Ala Thr Ala Ala
115 120 125

Gln Val Thr Ala Gly Val Ala Leu Met Glu Ala Arg Glu Ala Lys Arg
130 135 140

Asp Ile Ser Met Leu Lys Glu Ala Ile Glu Lys Thr Gln Asn Ser Ile
145 150 155 160

Glu Lys Leu Gln Asn Ser Ala Gly Glu Gln Ile Leu Ala Leu Lys Met
165 170 175

Leu Gln Asp Tyr Val Asn Gly Glu Ile Lys Pro Ala Ile Glu Glu Leu
180 185 190

Gly Cys Glu Thr Ala Ala Leu Lys Leu Gly Ile Ala Leu Thr Gln His
195 200 205

Tyr Thr Glu Leu Thr Asn Ala Phe Gly Ser Asn Leu Gly Ser Ile Gly
210 215 220

Glu Lys Ser Leu Thr Leu Gln Ala Leu Ser Ser Leu Tyr Lys Thr Asn
225 230 235 240

Ile Thr Asn Ile Leu Thr Ala Thr Asn Leu Gly Lys Thr Asp Ile Tyr
245 250 255

Asp Ile Ile Tyr Ala Glu Gln Val Lys Gly Arg Val Ile Asp Val Asp
260 265 270

Leu Lys Arg Tyr Met Val Thr Ile Ser Val Lys Ile Pro Ile Leu Ser
275 280 285

Glu Ile Pro Gly Val Leu Ile Tyr Glu Val Ser Ser Ile Ser Tyr Asn
290 295 300

Ile Asp Gly Ala Glu Trp Tyr Ala Ala Val Pro Asp His Ile Leu Ser
305 310 315 320

Lys Ser Ala Tyr Ile Gly Gly Ala Asp Ile Ser Asp Cys Ile Glu Ser
325 330 335

Arg Leu Thr Tyr Ile Cys Pro Gln Asp Pro Ala Gln Ile Ile Ala Asp
340 345 350

Asn Gln Gln Gln Cys Phe Phe Gly His Leu Asp Lys Cys Pro Ile Thr
355 360 365

Lys Val Ile Asp Asn Leu Val Pro Lys Phe Ala Phe Ile Asn Gly Gly
370 375 380

Val Val Ala Asn Cys Ile Ala Ser Thr Cys Thr Cys Gly Glu Glu Arg
385 390 395 400

Ile Gln Val Ser Gln Asp Arg Asn Lys Gly Val Thr Phe Leu Thr His
405 410 415

Asn Asn Cys Gly Leu Ile Gly Ile Asn Gly Ile Glu Phe His Ala Asn
420 425 430

Lys Lys Gly Ser Asp Ala Thr Trp Asn Val Ser Pro Ile Gly Val Gly
435 440 445

Pro Ala Val Ser Leu Arg Pro Val Asp Ile Ser Leu Gln Ile Val Ala
450 455 460

Ala Thr Asn Phe Leu Asn Ser Ser Arg Lys Asp Leu Met Lys Ala Lys
465 470 475 480

Glu Ile Leu Asn Gln Val Gly Asn Leu Lys Asp Leu Thr Thr Ile Thr
485 490 495

Ile Ile Asn Ile Val Ile Ile Ile Ile Leu Leu Ile Cys Val Ile Gly
500 505 510

Leu Gly Ile Leu Tyr His Gln Leu Arg Ser Ala Leu Gly Met Arg Asp
515 520 525

Lys Met Ser Val Leu Asn Asn Ser Ser Tyr Ser Leu Glu Pro Arg Thr
530 535 540

Ala Gln Val Gln Val Ile Lys Pro Thr Ser Phe Met Gly

545

550

555

<210> 26
 <211> 538
 <212> PRT
 <213> Avian metapneumovirus

<220>
 <221> MISC_FEATURE
 <223> F protein

<400> 26

Met Asp Val Arg Ile Cys Leu Leu Leu Phe Leu Ile Ser Asn Pro Ser
 1 5 10 15

Ser Cys Ile Gln Glu Thr Tyr Asn Glu Glu Ser Cys Ser Thr Val Thr
 20 25 30

Arg Gly Tyr Lys Ser Val Leu Arg Thr Gly Trp Tyr Thr Asn Val Phe
 35 40 45

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

Ser Leu Ile Asp Thr Glu Leu Val Leu Thr Lys Asn Ala Leu Arg Glu
 65 70 75 80

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

Ser Pro Arg Arg Arg Arg Phe Val Leu Gly Ala Ile Ala Leu Gly Val
 100 105 110

Ala Thr Ala Ala Ala Val Thr Ala Gly Val Ala Leu Ala Lys Thr Ile
 115 120 125

Arg Leu Glu Gly Glu Val Lys Ala Ile Lys Asn Ala Leu Arg Asn Thr
 130 135 140

Asn Glu Ala Val Ser Thr Leu Gly Asn Gly Val Arg Val Leu Ala Thr
145 150 155 160

Ala Val Asn Asp Leu Lys Glu Phe Ile Ser Lys Lys Leu Thr Pro Ala
165 170 175

Ile Asn Gln Asn Lys Cys Asn Ile Ala Asp Ile Lys Met Ala Ile Ser
180 185 190

Phe Gly Gln Asn Asn Arg Arg Phe Leu Asn Val Val Arg Gln Phe Ser
195 200 205

Asp Ser Ala Gly Ile Thr Ser Ala Val Ser Leu Asp Leu Met Thr Asp
210 215 220

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

Ile Ser Leu Met Leu Asn Asn Arg Ala Met Val Arg Arg Lys Gly Phe
245 250 255

Gly Ile Leu Ile Gly Val Tyr Asp Gly Thr Val Val Tyr Met Val Gln
260 265 270

Leu Pro Ile Phe Gly Val Ile Glu Thr Pro Cys Trp Arg Val Val Ala
275 280 285

Ala Pro Leu Cys Arg Lys Arg Arg Gly Asn Tyr Ala Cys Ile Leu Arg
290 295 300

Glu Asp Gln Gly Trp Tyr Cys Thr Asn Ala Gly Ser Thr Ala Tyr Tyr
305 310 315 320

Pro Asn Lys Asp Asp Cys Glu Val Arg Asp Asp Tyr Val Phe Cys Asp
325 330 335

Thr Ala Ala Gly Ile Asn Val Ala Leu Glu Val Asp Gln Cys Asn Tyr
340 345 350

Asn Ile Ser Thr Ser Lys Tyr Pro Cys Lys Val Ser Thr Gly Arg His
355 360 365

Pro Val Ser Met Val Ala Leu Thr Pro Leu Gly Gly Leu Val Ser Cys
370 375 380

Tyr Glu Ser Val Ser Cys Ser Ile Gly Ser Asn Lys Val Gly Ile Ile
385 390 395 400

Lys Gln Leu Gly Lys Gly Cys Thr His Ile Pro Asn Asn Glu Ala Asp
405 410 415

Thr Ile Thr Ile Asp Asn Thr Val Tyr Gln Leu Ser Lys Val Val Gly
420 425 430

Glu Gln Arg Thr Ile Lys Gly Ala Pro Val Val Asn Asn Phe Asn Pro
435 440 445

Ile Leu Phe Pro Val Asp Gln Phe Asn Val Ala Leu Asp Gln Val Phe
450 455 460

Glu Ser Ile Asp Arg Ser Gln Asp Leu Ile Asp Lys Ser Asn Asp Leu
465 470 475 480

Leu Gly Ala Asp Ala Lys Ser Lys Ala Gly Ile Ala Ile Ala Ile Val
485 490 495

Val Leu Val Ile Leu Gly Ile Phe Phe Leu Leu Ala Val Ile Tyr Tyr
500 505 510

Cys Ser Arg Val Arg Lys Thr Lys Pro Lys His Asp Tyr Pro Ala Thr
515 520 525

Thr Gly His Ser Ser Met Ala Tyr Val Ser
530 535

<210> 27
<211> 545
<212> PRT
<213> Avian paramyxovirus 13 goose/Kazakhstan/5751/2013

<220>
<221> MISC_FEATURE
<223> fusion protein

<400> 27

Met Ala Arg Phe Ser Trp Glu Ile Phe Arg Leu Ser Thr Ile Leu Leu
1 5 10 15

Ile Ala Gln Thr Cys Gln Gly Ser Ile Asp Gly Arg Leu Thr Leu Ala
20 25 30

Ala Gly Ile Val Pro Val Gly Asp Arg Pro Ile Ser Ile Tyr Thr Ser
35 40 45

Ser Gln Thr Gly Ile Ile Val Val Lys Leu Ile Pro Asn Leu Pro Asp
50 55 60

Asn Lys Lys Asp Cys Ala Lys Gln Ser Leu Gln Ser Tyr Asn Glu Thr
65 70 75 80

Leu Ser Arg Ile Leu Thr Pro Leu Ala Thr Ala Met Ser Ala Ile Arg
85 90 95

Gly Asn Ser Thr Thr Gln Val Arg Glu Asn Arg Leu Val Gly Ala Ile
100 105 110

Ile Gly Ser Val Ala Leu Gly Val Ala Thr Ala Ala Gln Ile Thr Ala
115 120 125

Ala Thr Ala Leu Ile Gln Ala Asn Gln Asn Ala Ala Asn Ile Ala Arg

130

135

140

Leu Ala Asn Ser Ile Ala Lys Thr Asn Glu Ala Val Thr Asp Leu Thr
 145 150 155 160

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

Val Asn Glu Gln Phe Asn Asn Thr Ala Val Ala Ile Asp Cys Leu Thr
 180 185 190

Leu Glu Ser Arg Leu Gly Ile Gln Leu Ser Leu Tyr Leu Thr Glu Leu
 195 200 205

Met Gly Val Phe Gly Asn Gln Leu Thr Ser Pro Ala Leu Thr Pro Ile
 210 215 220

Thr Ile Gln Ala Leu Tyr Asn Leu Ala Gly Gly Asn Leu Asn Ala Leu
 225 230 235 240

Leu Ser Arg Leu Gly Ala Ser Glu Thr Gln Leu Gly Ser Leu Ile Asn
 245 250 255

Ser Gly Leu Ile Lys Gly Met Pro Ile Met Tyr Asp Asp Ala Asn Lys
 260 265 270

Leu Leu Ala Val Gln Val Glu Leu Pro Ser Ile Gly Lys Leu Asn Gly
 275 280 285

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

Pro Ser Ser Pro Ile Ile Pro Ser Ala Val Ile Glu Ile Gly Gly Ala
 305 310 315 320

Met Glu Glu Leu Asp Leu Ser Pro Cys Ile Thr Thr Asp Leu Asp Met
 325 330 335

Phe Cys Thr Lys Ile Ile Ser Tyr Pro Leu Ser Gln Ser Thr Leu Ser
340 345 350

Cys Leu Asn Gly Asn Leu Ser Asp Cys Val Phe Ser Arg Ser Glu Gly
355 360 365

Val Leu Ser Thr Pro Tyr Met Thr Ile Lys Gly Lys Ile Val Ala Asn
370 375 380

Cys Lys Gln Val Ile Cys Arg Cys Met Asp Pro Pro Gln Ile Leu Ser
385 390 395 400

Gln Asn Tyr Gly Glu Ala Leu Leu Leu Ile Asp Glu Asn Thr Cys Arg
405 410 415

Ser Leu Glu Leu Ser Gly Val Ile Leu Lys Leu Ala Gly Thr Tyr Glu
420 425 430

Ser Glu Tyr Thr Arg Asn Leu Thr Val Asp Pro Ser Gln Val Ile Ile
435 440 445

Thr Gly Pro Leu Asp Ile Ser Ala Glu Leu Ser Lys Val Asn Gln Ser
450 455 460

Ile Asp Ser Ala Lys Glu Asn Ile Ala Glu Ser Asn Lys Phe Leu Ser
465 470 475 480

Gln Val Asn Val Lys Leu Leu Ser Ser Ser Ala Met Ile Thr Tyr Ile
485 490 495

Val Ala Thr Val Val Cys Leu Ile Ile Ala Ile Thr Gly Cys Val Ile
500 505 510

Gly Ile Tyr Thr Leu Thr Lys Leu Lys Ser Gln Gln Lys Thr Leu Leu
515 520 525

Trp Leu Gly Asn Asn Ala Glu Met His Gly Ser Arg Ser Lys Thr Ser
530 535 540

Phe
545

<210> 28
<211> 554
<212> PRT
<213> Menangle virus

<220>
<221> MISC_FEATURE
<223> fusion protein

<400> 28

Met Met Pro Arg Val Leu Gly Met Ile Val Leu Tyr Leu Thr His Ser
1 5 10 15

Gln Ile Leu Cys Ile Asn Arg Asn Thr Leu Tyr Gln Ile Gly Leu Ile
20 25 30

His Arg Ser Val Lys Lys Val Asn Phe Tyr Ser Gln Gly Ser Pro Ser
35 40 45

Tyr Ile Val Val Lys Leu Val Pro Thr Leu Ala Ala Ile Pro Pro Asn
50 55 60

Cys Ser Ile Lys Ser Leu Gln Arg Tyr Lys Glu Thr Val Thr Ser Leu
65 70 75 80

Val Gln Pro Ile Ser Asp Asn Leu Gly Tyr Leu Gln Asp Lys Leu Val
85 90 95

Thr Gly Gln Ser Arg Arg Arg Arg Arg Phe Ala Gly Val Ala Ile Gly
100 105 110

Leu Ala Ala Leu Gly Val Ala Ala Ala Ala Gln Ala Thr Ala Ala Val
115 120 125

Ala Leu Val Glu Thr Arg Glu Asn Ala Gly Lys Ile Gln Ala Leu Ser
130 135 140

Glu Ser Ile Gln Asn Thr Asn Gln Ala Val His Ser Leu Lys Thr Ala
145 150 155 160

Leu Gly Phe Ser Ala Thr Ala Ile Gln Ala Ile Gln Asn Gln Val Asn
165 170 175

Glu Val Ile Asn Pro Ala Ile Asn Lys Leu Ser Cys Glu Val Leu Asp
180 185 190

Ser Gln Leu Ala Ser Met Leu Asn Leu Tyr Leu Ile His Leu Thr Thr
195 200 205

Val Phe Gln Thr Gln Leu Thr Asn Pro Ala Leu Thr Pro Leu Ser Ile
210 215 220

Gln Ala Leu Thr Ser Val Leu Gln Gly Thr Ser Gly Val Leu Met Asn
225 230 235 240

Ser Thr Asn Ser Thr Leu Thr Gln Pro Ile Asp Leu Leu Ala Thr Gly
245 250 255

Leu Ile Thr Gly Gln Ile Ile Ser Val Asn Met Thr Ser Leu Gln Leu
260 265 270

Ile Ile Ala Thr Phe Met Pro Ser Ile Ala Glu Leu Pro Asn Ala Val
275 280 285

Leu His Ser Phe Phe Arg Ile Thr Thr Ser Val Asn Leu Thr Glu Val
290 295 300

Met Ile Gln Ser Pro Glu Phe Ile Met Glu Gln Asn Gly Val Phe Tyr

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

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

Tyr Val Leu Asp His Asp Lys Ala Pro Tyr Ser Pro Glu Ser Ser Ser
530 535 540

Pro His Arg Lys Ser Leu Lys Thr Val Ser
545 550

<210> 29
<211> 544
<212> PRT
<213> Avian paramyxovirus 5

<220>
<221> MISC_FEATURE
<223> fusion protein

<400> 29

Met Leu Gln Leu Pro Leu Thr Ile Leu Leu Ser Ile Leu Ser Ala His
1 5 10 15

Gln Ser Leu Cys Leu Asp Asn Ser Lys Leu Ile His Ala Gly Ile Met
20 25 30

Ser Thr Thr Glu Arg Glu Val Asn Val Tyr Ala Gln Ser Ile Thr Gly
35 40 45

Ser Ile Val Val Arg Leu Ile Pro Asn Ile Pro Ser Asn His Lys Ser
50 55 60

Cys Ala Thr Ser Gln Ile Lys Leu Tyr Asn Asp Thr Leu Thr Arg Leu
65 70 75 80

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

Gln Asp Gln Ser Gln Asn Ser Gly Lys Arg Lys Lys Arg Phe Val Gly
100 105 110

Ala Val Ile Gly Ala Ala Ala Leu Gly Leu Ala Thr Ala Ala Gln Val
115 120 125

Thr Ala Thr Val Ala Leu Asn Gln Ala Gln Glu Asn Ala Arg Asn Ile
130 135 140

Leu Arg Leu Lys Asn Ser Ile Gln Lys Thr Asn Glu Ala Val Met Glu
145 150 155 160

Leu Lys Asp Ala Val Gly Gln Thr Ala Val Ala Ile Asp Lys Thr Gln
165 170 175

Ala Phe Ile Asn Asn Gln Ile Leu Pro Ala Ile Ser Asn Leu Ser Cys
180 185 190

Glu Val Leu Gly Asn Lys Ile Gly Val Gln Leu Ser Leu Tyr Leu Thr
195 200 205

Glu Leu Thr Thr Val Phe Gly Asn Gln Leu Thr Asn Pro Ala Leu Thr
210 215 220

Thr Leu Ser Leu Gln Ala Leu Tyr Asn Leu Cys Gly Asp Asp Phe Asn
225 230 235 240

Tyr Leu Ile Asn Leu Leu Asn Ala Lys Asn Arg Asn Leu Ala Ser Leu
245 250 255

Tyr Glu Ala Asn Leu Ile Gln Gly Arg Ile Thr Gln Tyr Asp Ser Met
260 265 270

Asn Gln Leu Leu Ile Ile Gln Val Gln Ile Pro Ser Ile Ser Thr Val
275 280 285

Ser Gly Met Arg Val Thr Glu Leu Phe Thr Leu Ser Val Asp Thr Pro
290 295 300

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

Arg Ile Met Glu Glu Val Asp Leu Ser Ser Cys Ala Ile Thr Ser Thr
325 330 335

Ser Val Phe Cys Ser Ser Ile Ile Ser Arg Pro Leu Pro Leu Glu Thr
340 345 350

Ile Asn Cys Leu Asn Gly Asn Val Thr Gln Cys Gln Phe Thr Ala Asn
355 360 365

Thr Gly Thr Leu Glu Ser Arg Tyr Ala Val Ile Gly Gly Leu Val Ile
370 375 380

Ala Asn Cys Lys Ala Ile Val Cys Arg Cys Leu Asn Pro Pro Gly Val
385 390 395 400

Ile Ala Gln Asn Leu Gly Leu Pro Ile Thr Ile Ile Ser Ser Asn Thr
405 410 415

Cys Gln Arg Ile Asn Leu Glu Gln Ile Thr Leu Ser Leu Gly Asn Ser
420 425 430

Ile Leu Ser Thr Tyr Ser Ala Asn Leu Ser Gln Val Glu Met Asn Leu
435 440 445

Ala Pro Ser Asn Pro Leu Asp Ile Ser Val Glu Leu Asn Arg Val Asn
450 455 460

Thr Ser Leu Ser Lys Val Glu Ser Leu Ile Lys Glu Ser Asn Ser Ile
465 470 475 480

Leu Asp Ser Val Asn Pro Gln Ile Leu Asn Val Lys Thr Val Ile Ile

485

490

495

Leu Ala Val Ile Ile Gly Leu Ile Val Val Trp Cys Phe Ile Leu Thr
 500 505 510

Cys Leu Ile Val Arg Gly Phe Met Leu Leu Val Lys Gln Gln Lys Phe
 515 520 525

Lys Gly Leu Ser Val Gln Asn Asn Pro Tyr Val Ser Asn Asn Ser His
 530 535 540

<210> 30
 <211> 557
 <212> PRT
 <213> Cedar virus

<220>
 <221> MISC_FEATURE
 <223> fusion glycoprotein

<400> 30

Met Ser Asn Lys Arg Thr Thr Val Leu Ile Ile Ile Ser Tyr Thr Leu
 1 5 10 15

Phe Tyr Leu Asn Asn Ala Ala Ile Val Gly Phe Asp Phe Asp Lys Leu
 20 25 30

Asn Lys Ile Gly Val Val Gln Gly Arg Val Leu Asn Tyr Lys Ile Lys
 35 40 45

Gly Asp Pro Met Thr Lys Asp Leu Val Leu Lys Phe Ile Pro Asn Ile
 50 55 60

Val Asn Ile Thr Glu Cys Val Arg Glu Pro Leu Ser Arg Tyr Asn Glu
 65 70 75 80

Thr Val Arg Arg Leu Leu Leu Pro Ile His Asn Met Leu Gly Leu Tyr
 85 90 95

Leu Asn Asn Thr Asn Ala Lys Met Thr Gly Leu Met Ile Ala Gly Val
100 105 110

Ile Met Gly Gly Ile Ala Ile Gly Ile Ala Thr Ala Ala Gln Ile Thr
115 120 125

Ala Gly Phe Ala Leu Tyr Glu Ala Lys Lys Asn Thr Glu Asn Ile Gln
130 135 140

Lys Leu Thr Asp Ser Ile Met Lys Thr Gln Asp Ser Ile Asp Lys Leu
145 150 155 160

Thr Asp Ser Val Gly Thr Ser Ile Leu Ile Leu Asn Lys Leu Gln Thr
165 170 175

Tyr Ile Asn Asn Gln Leu Val Pro Asn Leu Glu Leu Leu Ser Cys Arg
180 185 190

Gln Asn Lys Ile Glu Phe Asp Leu Met Leu Thr Lys Tyr Leu Val Asp
195 200 205

Leu Met Thr Val Ile Gly Pro Asn Ile Asn Asn Pro Val Asn Lys Asp
210 215 220

Met Thr Ile Gln Ser Leu Ser Leu Leu Phe Asp Gly Asn Tyr Asp Ile
225 230 235 240

Met Met Ser Glu Leu Gly Tyr Thr Pro Gln Asp Phe Leu Asp Leu Ile
245 250 255

Glu Ser Lys Ser Ile Thr Gly Gln Ile Ile Tyr Val Asp Met Glu Asn
260 265 270

Leu Tyr Val Val Ile Arg Thr Tyr Leu Pro Thr Leu Ile Glu Val Pro
275 280 285

Asp Ala Gln Ile Tyr Glu Phe Asn Lys Ile Thr Met Ser Ser Asn Gly
290 295 300

Gly Glu Tyr Leu Ser Thr Ile Pro Asn Phe Ile Leu Ile Arg Gly Asn
305 310 315 320

Tyr Met Ser Asn Ile Asp Val Ala Thr Cys Tyr Met Thr Lys Ala Ser
325 330 335

Val Ile Cys Asn Gln Asp Tyr Ser Leu Pro Met Ser Gln Asn Leu Arg
340 345 350

Ser Cys Tyr Gln Gly Glu Thr Glu Tyr Cys Pro Val Glu Ala Val Ile
355 360 365

Ala Ser His Ser Pro Arg Phe Ala Leu Thr Asn Gly Val Ile Phe Ala
370 375 380

Asn Cys Ile Asn Thr Ile Cys Arg Cys Gln Asp Asn Gly Lys Thr Ile
385 390 395 400

Thr Gln Asn Ile Asn Gln Phe Val Ser Met Ile Asp Asn Ser Thr Cys
405 410 415

Asn Asp Val Met Val Asp Lys Phe Thr Ile Lys Val Gly Lys Tyr Met
420 425 430

Gly Arg Lys Asp Ile Asn Asn Ile Asn Ile Gln Ile Gly Pro Gln Ile
435 440 445

Ile Ile Asp Lys Val Asp Leu Ser Asn Glu Ile Asn Lys Met Asn Gln
450 455 460

Ser Leu Lys Asp Ser Ile Phe Tyr Leu Arg Glu Ala Lys Arg Ile Leu
465 470 475 480

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

Ile Ile Ile Ser Val Leu Ser Phe Ile Ile Leu Leu Ile Ile Ile Val
500 505 510

Tyr Leu Tyr Cys Lys Ser Lys His Ser Tyr Lys Tyr Asn Lys Phe Ile
515 520 525

Asp Asp Pro Asp Tyr Tyr Asn Asp Tyr Lys Arg Glu Arg Ile Asn Gly
530 535 540

Lys Ala Ser Lys Ser Asn Asn Ile Tyr Tyr Val Gly Asp
545 550 555

<210> 31
<211> 546
<212> PRT
<213> Rinderpest morbillivirus

<220>
<221> MISC_FEATURE
<223> F protein

<400> 31

Met Gly Ile Leu Phe Ala Ala Leu Leu Ala Met Thr Asn Pro His Leu
1 5 10 15

Ala Thr Gly Gln Ile His Trp Gly Asn Leu Ser Lys Ile Gly Val Val
20 25 30

Gly Thr Gly Ser Ala Ser Tyr Lys Val Met Thr Gln Ser Ser His Gln
35 40 45

Ser Leu Val Ile Lys Leu Met Pro Asn Val Thr Ala Ile Asp Asn Cys
50 55 60

Thr Lys Thr Glu Ile Met Glu Tyr Lys Arg Leu Leu Gly Thr Val Leu

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

Tyr Phe Ile Val Leu Ser Ile Ala Tyr Pro Ser Leu Ser Glu Ile Lys
275 280 285

Gly Val Ile Val His Arg Leu Glu Ser Val Ser Tyr Asn Ile Gly Ser
290 295 300

Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val Ala Thr Gln Gly Tyr
305 310 315 320

Leu Ile Ser Asn Phe Asp Asp Thr Pro Cys Ala Phe Thr Pro Glu Gly
325 330 335

Thr Ile Cys Ser Gln Asn Ala Leu Tyr Pro Met Ser Pro Leu Leu Gln
340 345 350

Glu Cys Phe Arg Gly Ser Thr Arg Ser Cys Ala Arg Thr Leu Val Ser
355 360 365

Gly Ser Ile Gly Asn Arg Phe Ile Leu Ser Lys Gly Asn Leu Ile Ala
370 375 380

Asn Cys Ala Ser Ile Leu Cys Lys Cys Tyr Thr Thr Gly Ser Ile Ile
385 390 395 400

Ser Gln Asp Pro Asp Lys Ile Leu Thr Tyr Ile Ala Ala Asp Gln Cys
405 410 415

Pro Val Val Glu Val Gly Gly Val Thr Ile Gln Val Gly Ser Arg Glu
420 425 430

Tyr Ser Asp Ala Val Tyr Leu His Glu Ile Asp Leu Gly Pro Pro Ile
435 440 445

Ser Leu Glu Lys Leu Asp Val Gly Thr Asn Leu Trp Asn Ala Val Thr
450 455 460

Lys Leu Glu Lys Ala Lys Asp Leu Leu Asp Ser Ser Asp Leu Ile Leu
 465 470 475 480

Glu Asn Ile Lys Gly Val Ser Val Thr Asn Thr Gly Tyr Ile Leu Val
 485 490 495

Gly Val Gly Leu Ile Ala Val Val Gly Ile Leu Ile Ile Thr Cys Cys
 500 505 510

Cys Lys Lys Arg Arg Ser Asp Asn Lys Val Ser Thr Met Val Leu Asn
 515 520 525

Pro Gly Leu Arg Pro Asp Leu Thr Gly Thr Ser Lys Ser Tyr Val Arg
 530 535 540

Ser Leu
 545

<210> 32
 <211> 536
 <212> PRT
 <213> Avian paramyxovirus 10

<220>
 <221> MISC_FEATURE
 <223> fusion protein

<400> 32

Met Thr Arg Thr Arg Leu Leu Phe Leu Leu Thr Cys Tyr Ile Pro Gly
 1 5 10 15

Ala Val Ser Leu Asp Asn Ser Ile Leu Ala Pro Ala Gly Ile Ile Ser
 20 25 30

Ala Ser Glu Arg Gln Ile Ala Ile Tyr Thr Gln Thr Leu Gln Gly Thr
 35 40 45

Ile Ala Leu Arg Phe Ile Pro Val Leu Pro Gln Asn Leu Ser Ser Cys
50 55 60

Ala Lys Asp Thr Leu Glu Ser Tyr Asn Ser Thr Val Ser Asn Leu Leu
65 70 75 80

Leu Pro Ile Ala Glu Asn Leu Asn Ala Leu Leu Lys Asp Ala Asp Lys
85 90 95

Pro Ser Gln Arg Ile Ile Gly Ala Ile Ile Gly Ser Val Ala Leu Gly
100 105 110

Val Ala Thr Thr Ala Gln Val Thr Ala Ala Leu Ala Met Thr Gln Ala
115 120 125

Gln Gln Asn Ala Arg Asn Ile Trp Lys Leu Lys Glu Ser Ile Lys Asn
130 135 140

Thr Asn Gln Ala Val Leu Glu Leu Lys Asp Gly Leu Gln Gln Ser Ala
145 150 155 160

Ile Ala Leu Asp Lys Val Gln Ser Phe Ile Asn Ser Glu Ile Leu Pro
165 170 175

Gln Ile Asn Gln Leu Gly Cys Glu Val Ala Ala Asn Lys Leu Gly Ile
180 185 190

Phe Leu Ser Leu Tyr Leu Thr Glu Ile Thr Thr Val Phe Lys Asn Gln
195 200 205

Ile Thr Asn Pro Ala Leu Ser Thr Leu Ser Tyr Gln Ala Leu Tyr Asn
210 215 220

Leu Cys Gly Gly Asn Met Ala Ala Leu Thr Lys Gln Ile Gly Ile Lys
225 230 235 240

Asp Thr Glu Ile Asn Ser Leu Tyr Glu Ala Glu Leu Ile Thr Gly Gln

245

250

255

Val Ile Gly Tyr Asp Ser Ala Asp Gln Ile Leu Leu Ile Gln Val Ser
 260 265 270

Tyr Pro Ser Val Ser Arg Val Gln Gly Val Arg Ala Val Glu Leu Leu
 275 280 285

Thr Val Ser Val Ala Thr Pro Lys Gly Glu Gly Lys Ala Ile Ala Pro
 290 295 300

Ser Phe Ile Ala Gln Ser Asn Ile Ile Ala Glu Glu Leu Asp Thr Gln
 305 310 315 320

Pro Cys Lys Phe Ser Lys Thr Thr Leu Tyr Cys Arg Gln Val Asn Thr
 325 330 335

Arg Thr Leu Pro Val Arg Val Ala Asn Cys Leu Lys Gly Lys Tyr Asn
 340 345 350

Asp Cys Gln Tyr Thr Thr Glu Ile Gly Ala Leu Ala Ser Arg Tyr Val
 355 360 365

Thr Ile Thr Asn Gly Val Val Ala Asn Cys Arg Ser Ile Ile Cys Arg
 370 375 380

Cys Leu Asp Pro Glu Gly Ile Val Ala Gln Asn Ser Asp Ala Ala Ile
 385 390 395 400

Thr Val Ile Asp Arg Ser Thr Cys Lys Leu Ile Gln Leu Gly Asp Ile
 405 410 415

Thr Leu Arg Leu Glu Gly Lys Leu Ser Ser Ser Tyr Ser Lys Asn Ile
 420 425 430

Thr Ile Asp Ile Ser Gln Val Thr Thr Ser Gly Ser Leu Asp Ile Ser
 435 440 445

Ser Glu Leu Gly Ser Ile Asn Asn Thr Ile Thr Lys Val Glu Asp Leu
 450 455 460

Ile Ser Lys Ser Asn Asp Trp Leu Ser Lys Val Asn Pro Thr Leu Ile
 465 470 475 480

Ser Asn Asp Thr Ile Ile Ala Leu Cys Val Ile Ala Gly Ile Val Val
 485 490 495

Ile Trp Leu Val Ile Ile Thr Ile Leu Ser Tyr Tyr Ile Leu Ile Lys
 500 505 510

Leu Lys Asn Val Ala Leu Leu Ser Thr Met Pro Lys Lys Asp Leu Asn
 515 520 525

Pro Tyr Val Asn Asn Thr Lys Phe
 530 535

<210> 33
 <211> 552
 <212> PRT
 <213> Dolphin morbillivirus

<220>
 <221> MISC_FEATURE
 <223> fusion protein

<400> 33

Met Ala Ala Ser Asn Gly Gly Val Met Tyr Gln Ser Phe Leu Thr Ile
 1 5 10 15

Ile Ile Leu Val Ile Met Thr Glu Gly Gln Ile His Trp Gly Asn Leu
 20 25 30

Ser Lys Ile Gly Ile Val Gly Thr Gly Ser Ala Ser Tyr Lys Val Met
 35 40 45

Thr Arg Pro Asn His Gln Tyr Leu Val Ile Lys Leu Met Pro Asn Val
50 55 60

Thr Met Ile Asp Asn Cys Thr Arg Thr Glu Val Thr Glu Tyr Arg Lys
65 70 75 80

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

Thr Lys Asn Ile Lys Pro Ile Gln Ser Leu Thr Thr Ser Arg Arg Ser
100 105 110

Lys Arg Phe Ala Gly Val Val Leu Ala Gly Val Ala Leu Gly Val Ala
115 120 125

Thr Ala Ala Gln Ile Thr Ala Gly Val Ala Leu His Gln Ser Ile Met
130 135 140

Asn Ser Gln Ser Ile Asp Asn Leu Arg Thr Ser Leu Glu Lys Ser Asn
145 150 155 160

Gln Ala Ile Glu Glu Ile Arg Gln Ala Ser Gln Glu Thr Val Leu Ala
165 170 175

Val Gln Gly Val Gln Asp Phe Ile Asn Asn Glu Leu Ile Pro Ser Met
180 185 190

His Gln Leu Ser Cys Glu Met Leu Gly Gln Lys Leu Gly Leu Lys Leu
195 200 205

Leu Arg Tyr Tyr Thr Glu Ile Leu Ser Ile Phe Gly Pro Ser Leu Arg
210 215 220

Asp Pro Val Ser Ala Glu Ile Ser Ile Gln Ala Leu Ser Tyr Ala Leu
225 230 235 240

Gly Gly Asp Ile Asn Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Ala
245 250 255

Asp Leu Leu Ala Ile Leu Glu Ser Arg Gly Ile Lys Ala Lys Val Thr
260 265 270

His Val Asp Leu Glu Gly Tyr Phe Ile Val Leu Ser Ile Ala Tyr Pro
275 280 285

Thr Leu Ser Glu Val Lys Gly Val Ile Val His Lys Leu Glu Ala Val
290 295 300

Ser Tyr Asn Leu Gly Ser Gln Glu Trp Tyr Thr Thr Leu Pro Lys Tyr
305 310 315 320

Val Ala Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys
325 330 335

Ala Phe Met Ser Glu Val Thr Ile Cys Ser Gln Asn Ala Leu Tyr Pro
340 345 350

Met Ser Pro Leu Leu Gln Gln Cys Leu Arg Gly Ser Thr Ala Ser Cys
355 360 365

Ala Arg Ser Leu Val Ser Gly Thr Ile Gly Asn Arg Phe Ile Leu Ser
370 375 380

Lys Gly Asn Leu Ile Ala Asn Cys Ala Ser Val Leu Cys Lys Cys Tyr
385 390 395 400

Ser Thr Gly Thr Ile Ile Ser Gln Asp Pro Asp Lys Leu Leu Thr Phe
405 410 415

Val Ala Ala Asp Lys Cys Pro Leu Val Glu Val Asp Gly Ile Thr Ile
420 425 430

Gln Val Gly Ser Arg Glu Tyr Pro Asp Ser Val Tyr Val Ser Arg Ile

435

440

445

Asp Leu Gly Pro Ala Ile Ser Leu Glu Lys Leu Asp Val Gly Thr Asn
 450 455 460

Leu Gly Ser Ala Leu Thr Lys Leu Asp Asn Ala Lys Asp Leu Leu Asp
 465 470 475 480

Ser Ser Asn Gln Ile Leu Glu Asn Val Arg Arg Ser Ser Phe Gly Gly
 485 490 495

Ala Met Tyr Ile Gly Ile Leu Val Cys Ala Gly Ala Leu Val Ile Leu
 500 505 510

Cys Val Leu Val Tyr Cys Cys Arg Arg His Cys Arg Lys Arg Val Gln
 515 520 525

Thr Pro Pro Lys Ala Thr Pro Gly Leu Lys Pro Asp Leu Thr Gly Thr
 530 535 540

Thr Lys Ser Tyr Val Arg Ser Leu
 545 550

<210> 34
 <211> 552
 <212> PRT
 <213> Mossman virus

<220>
 <221> MISC_FEATURE
 <223> fusion protein

<400> 34

Met Ser Asn Tyr Phe Pro Ala Arg Val Ile Ile Ile Val Ser Leu Ile
 1 5 10 15

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

Val Phe Lys Phe Lys Glu Tyr Asp Tyr Arg Val Ser Gly Asp Tyr Asn
35 40 45

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

Asn Cys Thr Ala Ser Leu Ile Asp Glu Tyr Arg His Val Ile Tyr Asn
65 70 75 80

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

Asp Pro Tyr Ala Gly Asn Lys Lys Phe Phe Gly Ala Val Ile Ala Gly
100 105 110

Val Ala Leu Gly Val Ala Thr Ala Ala Gln Val Thr Ala Gly Val Ala
115 120 125

Leu Tyr Glu Ala Arg Gln Asn Ala Ala Ala Ile Ala Glu Ile Lys Glu
130 135 140

Ser Leu His Tyr Thr His Lys Ala Ile Glu Ser Leu Gln Ile Ser Gln
145 150 155 160

Lys Gln Thr Val Val Ala Ile Gln Gly Ile Gln Asp Gln Ile Asn Thr
165 170 175

Asn Ile Ile Pro Gln Ile Asn Ala Leu Thr Cys Glu Ile Ala Asn Gln
180 185 190

Arg Leu Arg Leu Met Leu Leu Gln Tyr Tyr Thr Glu Met Leu Ser Ser
195 200 205

Phe Gly Pro Ile Ile Gln Asp Pro Leu Ser Gly His Ile Thr Val Gln
210 215 220

Ala Leu Ser Gln Ala Ala Gly Gly Asn Ile Thr Gly Leu Met Arg Glu
225 230 235 240

Leu Gly Tyr Ser Ser Lys Asp Leu Arg Tyr Ile Leu Ser Val Asn Gly
245 250 255

Ile Ser Ala Asn Ile Ile Asp Ala Asp Pro Glu Ile Gly Ser Ile Ile
260 265 270

Leu Arg Ile Arg Tyr Pro Ser Met Ile Lys Ile Pro Asp Val Ala Val
275 280 285

Met Glu Leu Ser Tyr Leu Ala Tyr His Ala Ala Gly Gly Asp Trp Leu
290 295 300

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

Leu Asp Ile Thr Ser Cys Thr Ile Gly Glu Asp Phe Leu Leu Cys Ser
325 330 335

Lys Asp Val Ser Ser Pro Met Ser Leu Ala Thr Gln Ser Cys Leu Arg
340 345 350

Gly Asp Thr Gln Met Cys Ser Arg Thr Ala Val Gln Asp Arg Glu Ala
355 360 365

Pro Arg Phe Leu Leu Leu Gln Gly Asn Leu Ile Val Asn Cys Met Ser
370 375 380

Val Asn Cys Lys Cys Glu Asp Pro Glu Glu Thr Ile Thr Gln Asp Pro
385 390 395 400

Ala Tyr Pro Leu Met Val Leu Gly Ser Asp Thr Cys Lys Ile His Tyr
405 410 415

Ile Asp Gly Ile Arg Ile Lys Leu Gly Lys Val Gln Leu Pro Pro Ile
420 425 430

Thr Val Leu Asn Thr Leu Ser Leu Gly Pro Ile Val Val Leu Asn Pro
435 440 445

Ile Asp Val Ser Asn Gln Leu Ser Leu Val Glu Thr Thr Val Lys Glu
450 455 460

Ser Glu Asp His Leu Lys Asn Ala Ile Gly Ala Leu Arg Ser Gln Ser
465 470 475 480

Arg Val Gly Gly Val Gly Ile Val Ala Ile Val Gly Leu Ile Ile Ala
485 490 495

Thr Val Ser Leu Val Val Leu Val Ile Ser Gly Cys Cys Leu Val Lys
500 505 510

Tyr Phe Ser Arg Thr Ala Thr Leu Glu Ser Ser Leu Thr Thr Ile Glu
515 520 525

His Gly Pro Thr Leu Ala Pro Lys Ser Gly Pro Ile Ile Pro Thr Tyr
530 535 540

Ile Asn Pro Val Tyr Arg His Asp
545 550

<210> 35
<211> 544
<212> PRT
<213> J-virus

<220>
<221> MISC_FEATURE
<223> fusion protein

<400> 35

Met Lys Pro Val Ala Leu Ile Tyr Leu Thr Ile Leu Ala Phe Thr Val

1	5	10	15
Lys Val Arg Ser Gln Leu Ala Leu Ser Asp Leu Thr Lys Ile Gly Ile	20	25	30
Ile Pro Ala Lys Ser Tyr Glu Leu Lys Ile Ser Thr Gln Ala Ala Gln	35	40	45
Gln Leu Met Val Ile Lys Leu Ile Pro Asn Val Asn Gly Leu Thr Asn	50	55	60
Cys Thr Ile Pro Val Met Asp Ser Tyr Lys Lys Met Leu Asp Arg Ile	65	70	75
Leu Lys Pro Ile Asp Asp Ala Leu Asn His Val Lys Asn Ala Ile Gln	85	90	95
Asp Lys Gln Gly Asp Gly Val Pro Gly Val Arg Phe Trp Gly Ala Ile	100	105	110
Ile Gly Gly Val Ala Leu Gly Val Ala Thr Ser Ala Gln Ile Thr Ala	115	120	125
Gly Val Ala Leu His Asn Ser Ile Gln Asn Ala Asn Ala Ile Leu Gln	130	135	140
Leu Lys Glu Ser Ile Arg Asn Ser Asn Lys Ala Ile Glu Glu Leu Gln	145	150	155
Ala Gly Leu Gln Ser Thr Val Leu Val Ile Asn Ala Leu Gln Asp Gln	165	170	175
Ile Asn Ser Gln Leu Val Pro Ala Ile Asn Thr Leu Gly Cys Ser Val	180	185	190
Ile Ala Asn Thr Leu Gly Leu Arg Leu Asn Gln Tyr Phe Ser Glu Ile	195	200	205

Ser Leu Val Phe Gly Pro Asn Leu Arg Asp Pro Thr Ser Gln Thr Leu
210 215 220

Ser Ile Gln Ala Ile Ala Lys Ala Phe Asn Gly Asp Phe Asp Ser Met
225 230 235 240

Met Lys Lys Met His Tyr Thr Asp Ser Asp Phe Leu Asp Leu Leu Glu
245 250 255

Ser Asp Ser Ile Arg Gly Arg Ile Ile Ser Val Ser Leu Glu Asp Tyr
260 265 270

Leu Ile Ile Ile Gln Ile Asp Tyr Pro Gly Leu Thr Thr Ile Pro Asn
275 280 285

Ser Val Val Gln Thr Phe Asn Leu Ile Thr Tyr Asn Tyr Lys Gly Thr
290 295 300

Glu Trp Glu Ser Ile Phe Pro Arg Glu Leu Leu Ile Arg Gly Ser Tyr
305 310 315 320

Ile Ser Asn Ile Asp Ile Ser Gln Cys Val Gly Thr Ser Lys Ser Met
325 330 335

Ile Cys Lys Ser Asp Thr Ser Thr Thr Ile Ser Pro Ala Thr Trp Ala
340 345 350

Cys Ala Thr Gly Asn Leu Thr Ser Cys Ala Arg Thr Arg Val Val Asn
355 360 365

Ser His Ser Thr Arg Phe Ala Leu Ser Gly Gly Val Leu Phe Ala Asn
370 375 380

Cys Ala Pro Ile Ala Cys Arg Cys Gln Asp Pro Gln Tyr Ser Ile Asn
385 390 395 400

Gln Glu Pro Lys Thr Thr Asn Val Met Val Thr Ser Glu Asp Cys Lys
405 410 415

Glu Leu Tyr Ile Asp Gly Phe Tyr Leu Thr Leu Gly Lys Lys Met Leu
420 425 430

Asp Arg Ala Met Tyr Ala Glu Asp Val Ala Leu Gly Gly Ser Val Ser
435 440 445

Val Asp Pro Ile Asp Ile Gly Asn Glu Leu Asn Ser Ile Asn Glu Ser
450 455 460

Ile Asn Lys Ser His Glu Tyr Leu Asp Lys Ala Asn Glu Leu Leu Glu
465 470 475 480

Gln Val Asn Pro Asn Ile Val Asn Val Ser Ser Phe Ser Phe Ile Leu
485 490 495

Val Ile Ser Ile Leu Leu Ile Ile Trp Phe Ile Val Thr Leu Val Trp
500 505 510

Leu Ile Tyr Leu Thr Lys His Met Asn Phe Ile Val Gly Lys Val Ala
515 520 525

Met Gly Ser Arg Ser Ser Thr Val Asn Ser Leu Ser Gly Phe Val Gly
530 535 540

<210> 36
<211> 537
<212> PRT
<213> Mapuera virus

<220>
<221> MISC_FEATURE
<223> fusion protein

<400> 36

Met Arg Ser Ser Leu Phe Leu Val Leu Thr Leu Leu Val Pro Phe Ala
1 5 10 15

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

Ser Val Arg Ser Leu Ala Tyr Phe Leu Glu Thr Asn Pro Thr Tyr Ile
35 40 45

Ser Val Arg Leu Met Pro Ala Ile Gln Thr Asp Ser Ser His Cys Ser
50 55 60

Tyr His Ser Ile Glu Asn Tyr Asn Leu Thr Leu Thr Lys Leu Leu Leu
65 70 75 80

Pro Leu Gln Glu Asn Leu His Gln Ile Thr Asp Ser Leu Ser Ser Arg
85 90 95

Arg Arg Lys Lys Arg Phe Ala Gly Val Ala Val Gly Leu Ala Ala Leu
100 105 110

Gly Val Ala Thr Ala Ala Gln Val Thr Ala Ala Ile Ala Val Val Lys
115 120 125

Ala Lys Glu Asn Ser Ala Lys Ile Ala Gln Leu Thr Ser Ala Ile Ser
130 135 140

Glu Thr Asn Arg Ala Val Gln Asp Leu Ile Glu Gly Ser Lys Gln Leu
145 150 155 160

Ala Val Ala Val Gln Ala Ile Gln Asp Gln Ile Asn Asn Val Ile Gln
165 170 175

Pro Gln Leu Thr Asn Leu Ser Cys Gln Val Ala Asp Ala Gln Val Gly
180 185 190

Thr Ile Leu Asn Met Tyr Leu Thr Glu Leu Thr Thr Val Phe His Pro

195

200

205

Gln Ile Thr Asn Ser Ala Leu Thr Pro Ile Thr Ile Gln Ala Leu Arg
 210 215 220

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

Thr Asp Val Pro Leu Gln Asp Leu Leu Thr Ser Gly Leu Leu Lys Gly
 245 250 255

Gln Ile Val Tyr Leu Asp Leu Gln Ser Met Ile Met Val Val Ser Val
 260 265 270

Ser Val Pro Thr Ile Ala Leu His Ser Met Ala Lys Val Tyr Thr Leu
 275 280 285

Lys Ala Ile Ser Ala His Val Asn Asn Ala Glu Val Gln Met Gln Val
 290 295 300

Pro Ser Arg Val Met Glu Leu Gly Ser Glu Ile Met Gly Tyr Asp Ile
 305 310 315 320

Asp Gln Cys Glu Glu Thr Ser Arg Tyr Leu Phe Cys Pro Tyr Asn Gly
 325 330 335

Gly Ser Ile Leu Ser Ala Thr Met Lys Met Cys Leu Asn Gly Asn Ile
 340 345 350

Ser Gln Cys Val Phe Thr Pro Ile Tyr Gly Ser Phe Leu Gln Arg Phe
 355 360 365

Val Leu Val Asp Gly Val Ile Val Ala Asn Cys Arg Asp Met Thr Cys
 370 375 380

Ala Cys Lys Ser Pro Ser Lys Ile Ile Thr Gln Pro Asp Ser Leu Pro
 385 390 395 400

Val Thr Ile Ile Asp Ser Thr Ser Cys Ser Asn Leu Val Leu Asp Thr
405 410 415

Leu Glu Leu Pro Ile Ile Ser Ile Asn Asn Ala Thr Tyr Arg Pro Val
420 425 430

Gln Tyr Val Gly Pro Asn Gln Ile Ile Phe Ser Gln Pro Leu Asp Leu
435 440 445

Leu Ser Gln Leu Gly Lys Ile Asn Ser Ser Leu Ser Asp Ala Ile Glu
450 455 460

His Leu Ala Lys Ser Asp Glu Ile Leu Glu Gln Ile Gln Trp Asp Ser
465 470 475 480

Pro Gln Gly Tyr Thr Leu Ile Ala Leu Thr Ser Val Leu Ala Phe Val
485 490 495

Val Val Ala Ile Val Gly Leu Leu Ile Ser Thr Arg Tyr Leu Ile Phe
500 505 510

Glu Ile Arg Arg Ile Asn Thr Thr Leu Thr Gln Gln Leu Ser Ser Tyr
515 520 525

Val Leu Ser Asn Lys Ile Ile Gln Tyr
530 535

<210> 37
<211> 566
<212> PRT
<213> Nariva virus

<220>
<221> MISC_FEATURE
<223> fusion protein

<400> 37

Met Ala Glu Gln Glu Lys Thr Pro Leu Arg Tyr Lys Ile Leu Leu Ile
1 5 10 15

Ile Ile Val Ile Asn His Tyr Asn Ile Thr Asn Val Phe Gly Gln Ile
20 25 30

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

Asp Tyr Arg Thr Thr Ser Asp Pro Thr Glu Gln Leu Leu Val Ile Asn
50 55 60

Met Leu Pro Asn Ile Ser Asn Ile Gln Asp Cys Ala Gln Gly Val Val
65 70 75 80

Asn Glu Tyr Lys His Leu Ile Ser Ser Leu Leu Thr Pro Ile Asn Asp
85 90 95

Thr Leu Asp Leu Ile Thr Ser Asn Ile Asn Pro Tyr Ser Gly Arg Asn
100 105 110

Lys Leu Phe Gly Glu Ile Ile Ala Gly Ala Ala Leu Thr Val Ala Thr
115 120 125

Ser Ala Gln Ile Thr Ala Gly Val Ala Leu Tyr Glu Ala Arg Gln Asn
130 135 140

Ala Lys Asp Ile Ala Ala Ile Lys Glu Ser Leu Gly Tyr Ala Tyr Lys
145 150 155 160

Ala Ile Asp Lys Leu Thr Thr Ala Thr Arg Glu Ile Thr Val Val Ile
165 170 175

Asn Glu Leu Gln Asp Gln Ile Asn Asn Arg Leu Ile Pro Arg Ile Asn
180 185 190

Asp Leu Ala Cys Glu Val Trp Ala Thr Arg Leu Gln Ala Met Leu Leu
195 200 205

Gln Tyr Tyr Ala Glu Ile Phe Ser Val Ile Gly Pro Asn Leu Gln Asp
210 215 220

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

Gly Asn Ile Lys Leu Met Val Asp Glu Leu Asn Tyr Ser Gly Gln Asp
245 250 255

Leu Ser Arg Leu Val Lys Val Gly Ala Ile Lys Gly Gln Ile Ile Asp
260 265 270

Ala Asp Pro Ser Leu Gly Val Val Ile Ile Lys Met Arg Tyr Pro Asn
275 280 285

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

Tyr Ser Ser Asp Gly Gln Asp Trp Ile Thr Thr Gly Pro Asn Tyr Ile
305 310 315 320

Val Thr Arg Gly Tyr Ser Ile Ala Asn Ile Gln Thr Ser Ser Cys Ser
325 330 335

Val Gly Asp Asp Phe Val Leu Cys Asp Arg Asp Met Thr Tyr Pro Met
340 345 350

Ser Gln Val Thr Gln Asp Cys Leu Arg Gly Asn Ile Ala Leu Cys Ser
355 360 365

Arg Met Val Val Arg Asp Arg Glu Ala Pro Arg Tyr Leu Ile Leu Gln
370 375 380

Gly Asn Met Val Ala Asn Cys Met Ser Ile Thr Cys Arg Cys Glu Glu

385 390 395 400

Pro Glu Ser Glu Ile Tyr Gln Ser Pro Asp Gln Pro Leu Thr Leu Leu
405 410 415

Thr Arg Asp Thr Cys Asp Thr His Val Val Asp Gly Ile Arg Ile Arg
420 425 430

Leu Gly Val Arg Lys Leu Pro Thr Ile Ser Val Ile Asn Asn Ile Thr
435 440 445

Leu Gly Pro Ile Ile Thr Thr Asp Pro Ile Asp Val Ser Asn Gln Leu
450 455 460

Asn Ala Val Val Ser Thr Ile Asp Gln Ser Ala Glu Leu Leu His Gln
465 470 475 480

Ala Gln Arg Val Leu Ser Glu Arg Ala Arg Gly Ala Arg Asp His Ile
485 490 495

Leu Ala Thr Ala Ala Ile Val Ile Cys Val Val Leu Ala Val Leu Ile
500 505 510

Leu Val Leu Leu Ile Gly Leu Val Tyr Leu Tyr Arg Thr Gln Asn Glu
515 520 525

Ile Leu Val Lys Thr Thr Met Leu Glu Gln Val Pro Thr Phe Ala Pro
530 535 540

Lys Ser Phe Pro Met Glu Ser Gln Ile Tyr Ser Gly Lys Thr Asn Lys
545 550 555 560

Gly Tyr Asp Pro Ala Glu
565

<210> 38
<211> 662

<212> PRT
<213> Bat Paramyxovirus Eid_hel/GH-M74a/GHA/2009

<220>
<221> MISC_FEATURE
<223> fusion protein

<400> 38

Met Lys Lys Lys Thr Asp Asn Pro Thr Ile Ser Lys Arg Gly His Asn
1 5 10 15

His Ser Arg Gly Ile Lys Ser Arg Ala Leu Leu Arg Glu Thr Asp Asn
20 25 30

Tyr Ser Asn Gly Leu Ile Val Glu Asn Leu Val Arg Asn Cys His His
35 40 45

Pro Ser Lys Asn Asn Leu Asn Tyr Thr Lys Thr Gln Lys Arg Asp Ser
50 55 60

Thr Ile Pro Tyr Arg Val Glu Glu Arg Lys Gly His Tyr Pro Lys Ile
65 70 75 80

Lys His Leu Ile Asp Lys Ser Tyr Lys His Ile Lys Arg Gly Lys Arg
85 90 95

Arg Asn Gly His Asn Gly Asn Ile Ile Thr Ile Ile Leu Leu Leu Ile
100 105 110

Leu Ile Leu Lys Thr Gln Met Ser Glu Gly Ala Ile His Tyr Glu Thr
115 120 125

Leu Ser Lys Ile Gly Leu Ile Lys Gly Ile Thr Arg Glu Tyr Lys Val
130 135 140

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

Val Thr Gly Leu Asn Lys Cys Thr Asn Ile Ser Met Glu Asn Tyr Lys
165 170 175

Glu Gln Leu Asp Lys Ile Leu Ile Pro Ile Asn Asn Ile Ile Glu Leu
180 185 190

Tyr Ala Asn Ser Thr Lys Ser Ala Pro Gly Asn Ala Arg Phe Ala Gly
195 200 205

Val Ile Ile Ala Gly Val Ala Leu Gly Val Ala Ala Ala Ala Gln Ile
210 215 220

Thr Ala Gly Ile Ala Leu His Glu Ala Arg Gln Asn Ala Glu Arg Ile
225 230 235 240

Asn Leu Leu Lys Asp Ser Ile Ser Ala Thr Asn Asn Ala Val Ala Glu
245 250 255

Leu Gln Glu Ala Thr Gly Gly Ile Val Asn Val Ile Thr Gly Met Gln
260 265 270

Asp Tyr Ile Asn Thr Asn Leu Val Pro Gln Ile Asp Lys Leu Gln Cys
275 280 285

Ser Gln Ile Lys Thr Ala Leu Asp Ile Ser Leu Ser Gln Tyr Tyr Ser
290 295 300

Glu Ile Leu Thr Val Phe Gly Pro Asn Leu Gln Asn Pro Val Thr Thr
305 310 315 320

Ser Met Ser Ile Gln Ala Ile Ser Gln Ser Phe Gly Gly Asn Ile Asp
325 330 335

Leu Leu Leu Asn Leu Leu Gly Tyr Thr Ala Asn Asp Leu Leu Asp Leu
340 345 350

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

His Tyr Phe Met Val Ile Arg Val Tyr Tyr Pro Ile Met Thr Thr Ile
370 375 380

Ser Asn Ala Tyr Val Gln Glu Leu Ile Lys Ile Ser Phe Asn Val Asp
385 390 395 400

Gly Ser Glu Trp Val Ser Leu Val Pro Ser Tyr Ile Leu Ile Arg Asn
405 410 415

Ser Tyr Leu Ser Asn Ile Asp Ile Ser Glu Cys Leu Ile Thr Lys Asn
420 425 430

Ser Val Ile Cys Arg His Asp Phe Ala Met Pro Met Ser Tyr Thr Leu
435 440 445

Lys Glu Cys Leu Thr Gly Asp Thr Glu Lys Cys Pro Arg Glu Ala Val
450 455 460

Val Thr Ser Tyr Val Pro Arg Phe Ala Ile Ser Gly Gly Val Ile Tyr
465 470 475 480

Ala Asn Cys Leu Ser Thr Thr Cys Gln Cys Tyr Gln Thr Gly Lys Val
485 490 495

Ile Ala Gln Asp Gly Ser Gln Thr Leu Met Met Ile Asp Asn Gln Thr
500 505 510

Cys Ser Ile Val Arg Ile Glu Glu Ile Leu Ile Ser Thr Gly Lys Tyr
515 520 525

Leu Gly Ser Gln Glu Tyr Asn Thr Met His Val Ser Val Gly Asn Pro
530 535 540

Val Phe Thr Asp Lys Leu Asp Ile Thr Ser Gln Ile Ser Asn Ile Asn

545 550 555 560

Gln Ser Ile Glu Gln Ser Lys Phe Tyr Leu Asp Lys Ser Lys Ala Ile
565 570 575

Leu Asp Lys Ile Asn Leu Asn Leu Ile Gly Ser Val Pro Ile Ser Ile
580 585 590

Leu Phe Ile Ile Ala Ile Leu Ser Leu Ile Leu Ser Ile Ile Thr Phe
595 600 605

Val Ile Val Met Ile Ile Val Arg Arg Tyr Asn Lys Tyr Thr Pro Leu
610 615 620

Ile Asn Ser Asp Pro Ser Ser Arg Arg Ser Thr Ile Gln Asp Val Tyr
625 630 635 640

Ile Ile Pro Asn Pro Gly Glu His Ser Ile Arg Ser Ala Ala Arg Ser
645 650 655

Ile Asp Arg Asp Arg Asp
660

<210> 39
<211> 539
<212> PRT
<213> Avian paramyxovirus 7

<220>
<221> MISC_FEATURE
<223> fusion protein

<400> 39

Met Arg Val Arg Pro Leu Ile Ile Ile Leu Val Leu Leu Val Leu Leu
1 5 10 15

Trp Leu Asn Ile Leu Pro Val Ile Gly Leu Asp Asn Ser Lys Ile Ala
20 25 30

Gln Ala Gly Ile Ile Ser Ala Gln Glu Tyr Ala Val Asn Val Tyr Ser
35 40 45

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

Pro His Asn Leu Ser Cys Phe Gln Asp Leu Ile Asn Thr Tyr Asn Thr
65 70 75 80

Thr Ile Gln Asn Ile Phe Ser Pro Ile Gln Asp Gln Ile Thr Ser Ile
85 90 95

Thr Ser Ala Ser Thr Leu Pro Ser Ser Arg Phe Ala Gly Leu Val Val
100 105 110

Gly Ala Ile Ala Leu Gly Val Ala Thr Ser Ala Gln Ile Thr Ala Ala
115 120 125

Val Ala Leu Thr Lys Ala Gln Gln Asn Ala Gln Glu Ile Ile Arg Leu
130 135 140

Arg Asp Ser Ile Gln Asn Thr Ile Asn Ala Val Asn Asp Ile Thr Val
145 150 155 160

Gly Leu Ser Ser Ile Gly Val Ala Leu Ser Lys Val Gln Asn Tyr Leu
165 170 175

Asn Asp Val Ile Asn Pro Ala Leu Gln Asn Leu Ser Cys Gln Val Ser
180 185 190

Ala Leu Asn Leu Gly Ile Gln Leu Asn Leu Tyr Leu Thr Glu Ile Thr
195 200 205

Thr Ile Phe Gly Pro Gln Ile Thr Asn Pro Ser Leu Thr Pro Leu Ser
210 215 220

Ile Gln Ala Leu Tyr Thr Leu Ala Gly Asp Asn Leu Met Gln Phe Leu
225 230 235 240

Thr Arg Tyr Gly Tyr Gly Glu Thr Ser Val Ser Ser Ile Leu Glu Ser
245 250 255

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

Ala Ile Leu Tyr Val Thr Leu Pro Ser Ile Ala Thr Leu Ser Gly Ser
275 280 285

Arg Val Thr Lys Leu Met Ser Val Ser Val Gln Thr Gly Val Gly Glu
290 295 300

Gly Ser Ala Ile Val Pro Ser Tyr Val Ile Gln Gln Gly Thr Val Ile
305 310 315 320

Glu Glu Phe Ile Pro Asp Ser Cys Ile Phe Thr Arg Ser Asp Val Tyr
325 330 335

Cys Thr Gln Leu Tyr Ser Lys Leu Leu Pro Asp Ser Ile Leu Gln Cys
340 345 350

Leu Gln Gly Ser Met Ala Asp Cys Gln Phe Thr Arg Ser Leu Gly Ser
355 360 365

Phe Ala Asn Arg Phe Met Thr Val Ala Gly Gly Val Ile Ala Asn Cys
370 375 380

Gln Thr Val Leu Cys Arg Cys Tyr Asn Pro Val Met Ile Ile Pro Gln
385 390 395 400

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

Leu Glu Leu Glu Gly Ile Arg Leu Thr Met Ala Asp Pro Val Phe Ala
420 425 430

Ser Tyr Ser Arg Asp Leu Ile Ile Asn Gly Asn Gln Phe Ala Pro Ser
435 440 445

Asp Ala Leu Asp Ile Ser Ser Glu Leu Gly Gln Leu Asn Asn Ser Ile
450 455 460

Ser Ser Ala Thr Asp Asn Leu Gln Lys Ala Gln Glu Ser Leu Asn Lys
465 470 475 480

Ser Ile Ile Pro Ala Ala Thr Ser Ser Trp Leu Ile Ile Leu Leu Phe
485 490 495

Val Leu Val Ser Ile Ser Leu Val Ile Gly Cys Ile Ser Ile Tyr Phe
500 505 510

Ile Tyr Lys His Ser Thr Thr Asn Arg Ser Arg Asn Leu Ser Ser Asp
515 520 525

Ile Ile Ser Asn Pro Tyr Ile Gln Lys Ala Asn
530 535

<210> 40

<211> 539

<212> PRT

<213> Tuhoko virus 2

<220>

<221> MISC_FEATURE

<223> fusion protein

<400> 40

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

Ile Ser Pro Ser His Gly Ile Asn Gln Pro Ala Leu Arg Arg Ile Gly

20

25

30

Ala Ile Val Ser Ser Val Lys Gln Leu Lys Phe Tyr Ser Lys Thr Lys
 35 40 45

Pro Asn Tyr Ile Ile Val Lys Leu Leu Pro Thr Ile Asn Leu Ser Lys
 50 55 60

Ser Asn Cys Asn Leu Thr Ser Ile Asn Arg Tyr Lys Glu Ser Val Ile
 65 70 75 80

Glu Ile Ile Lys Pro Leu Ala Asp Asn Ile Asp Asn Leu Asn Gln Lys
 85 90 95

Leu Leu Pro Lys Asn Arg Arg Lys Arg Met Ala Gly Val Ala Ile Gly
 100 105 110

Leu Ala Ala Leu Gly Val Ala Ala Ala Ala Gln Ala Thr Ala Ala Val
 115 120 125

Ala Leu Val Glu Ala Arg Lys Asn Thr Gln Met Ile Gln Ser Leu Ala
 130 135 140

Asp Ser Ile Gln Asp Thr Asn Ala Ala Val Gln Ala Val Asn Ile Gly
 145 150 155 160

Leu Gln Asn Ser Ala Val Ala Ile Gln Ala Ile Gln Asn Gln Ile Asn
 165 170 175

Asn Val Ile Asn Pro Ala Leu Asp Arg Leu Asn Cys Glu Val Leu Asp
 180 185 190

Ala Gln Ile Ala Ser Ile Leu Asn Leu Tyr Leu Ile Lys Ser Val Thr
 195 200 205

Ile Phe Gln Asn Gln Leu Thr Asn Pro Ala Leu Gln Gln Leu Ser Ile
 210 215 220

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

Phe Thr Ile Gly Asp Lys Phe Asp Gln His Asp Leu Leu Gly Ser Gly
245 250 255

Leu Ile Thr Gly Gln Val Val Gly Val Asn Leu Thr Asn Leu Gln Leu
260 265 270

Ile Ile Ala Ala Phe Ile Pro Ser Ile Ala Pro Leu Pro Gln Ala Tyr
275 280 285

Ile Ile Asp Leu Ile Ser Ile Thr Ile Ser Val Asn Asp Thr Glu Ala
290 295 300

Val Ile Gln Ile Pro Glu Arg Ile Met Glu His Gly Ser Ser Ile Tyr
305 310 315 320

Gln Phe Gly Gly Lys Gln Cys Val Tyr Gly Gln Phe Ser Ala Tyr Cys
325 330 335

Pro Phe Ser Asp Ala Val Leu Met Thr Gln Asp Leu Gln Leu Cys Met
340 345 350

Lys Gly Asn Ile Glu His Cys Ile Phe Ser Ser Val Leu Gly Ser Phe
355 360 365

Pro Asn Arg Phe Ala Ser Val Asp Gly Val Phe Tyr Ala Asn Cys Lys
370 375 380

Tyr Met Ser Cys Ala Cys Ser Asp Pro Leu Gln Val Ile His Gln Asp
385 390 395 400

Asp Ser Val Asn Leu Met Val Ile Asp Ser Ser Val Cys Arg Ser Leu
405 410 415

Thr Leu Gly His Val Thr Phe Pro Ile Ile Ala Phe Ser Asn Val Ser
420 425 430

Tyr Gln Met Lys Thr Asn Ile Ser Ile Glu Gln Met Ile Val Thr Ser
435 440 445

Pro Leu Asp Leu Ser Thr Glu Leu Lys Gln Ile Asn Asn Ser Val Asn
450 455 460

Ile Ala Asn Thr Phe Leu Asp Ser Ser Asn Arg Ala Leu Lys Thr Ser
465 470 475 480

Ile Phe Gly Thr Ser Ser Gln Ile Ile Leu Ile Val Leu Leu Ile Phe
485 490 495

Thr Cys Leu Leu Ile Leu Tyr Val Ile Phe Leu Thr Tyr Ile Ile Lys
500 505 510

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

Gly Ser Lys Leu Ser Phe Ile Asn Pro Asp Val
530 535

<210> 41
<211> 537
<212> PRT
<213> Tuhoko virus 3

<220>
<221> MISC_FEATURE
<223> fusion protein

<400> 41

Met Leu Trp Leu Thr Ile Leu Ile Ala Leu Val Gly Asn His Glu Ser
1 5 10 15

Thr Cys Met Asn Ile Asn Phe Leu Gln Ser Leu Gly Gln Ile Asn Ser
20 25 30

Gln Lys Arg Phe Leu Asn Phe Tyr Thr Gln Gln Pro Pro Ser Tyr Met
35 40 45

Val Ile Arg Leu Val Pro Thr Leu Gln Leu Ser Ala Asn Asn Cys Thr
50 55 60

Leu Gly Ser Ile Val Arg Tyr Arg Asn Ala Ile Lys Glu Leu Ile Gln
65 70 75 80

Pro Met Asp Glu Asn Leu Arg Trp Leu Ser Ser Asn Leu Ile Pro Gln
85 90 95

Arg Arg Gly Lys Arg Phe Ala Gly Val Ala Val Gly Leu Ala Ala Leu
100 105 110

Gly Val Ala Val Ala Ala Gln Ala Thr Ala Ala Val Ala Leu Val Glu
115 120 125

Ala Arg Ala Asn Ala Glu Lys Ile Ala Ser Met Ser Gln Ser Ile Gln
130 135 140

Glu Thr Asn Lys Ala Val Thr Ser Leu Ser Gln Ala Val Ser Ala Ser
145 150 155 160

Gly Ile Ala Ile Gln Ala Ile Gln Asn Glu Ile Asn Asn Val Ile His
165 170 175

Pro Ile Leu Asn Gln Val Gln Cys Asp Val Leu Asp Ala Arg Val Gly
180 185 190

Asn Ile Leu Asn Leu Tyr Leu Ile Lys Val Thr Thr Ile Phe Gln Asn
195 200 205

Gln Leu Thr Asn Pro Ala Leu Gln Arg Leu Ser Thr Gln Ala Leu Ser

210

215

220

Met Leu Met Gln Ser Thr Ser Ser Tyr Leu Arg Asn Leu Ser Ser Ser
 225 230 235 240

Glu Ser Ala Ile Asn Ala Asp Leu Ser Met Thr Asn Leu Ile Glu Ala
 245 250 255

Gln Ile Val Gly Ile Asn Met Thr Asn Leu Gln Leu Val Leu Ala Val
 260 265 270

Phe Ile Pro Ser Ile Ala Arg Leu Asn Gly Ala Leu Leu Tyr Asp Phe
 275 280 285

Ile Ser Ile Thr Ile Ser Ser Asn Gln Thr Glu Val Met Leu Gln Ile
 290 295 300

Pro His Arg Val Leu Glu Ile Gly Asn Ser Leu Tyr Thr Phe Glu Gly
 305 310 315 320

Thr Gln Cys Glu Met Thr Lys Leu Asn Ala Tyr Cys Leu Tyr Ser Asp
 325 330 335

Ala Ile Pro Val Thr Glu Ser Leu Arg Asp Cys Met Asn Gly Leu Phe
 340 345 350

Ser Gln Cys Gly Phe Val Arg Ile Ile Gly Ser Phe Ala Asn Arg Phe
 355 360 365

Ala Ser Val Asn Gly Val Ile Tyr Ala Asn Cys Lys His Leu Thr Cys
 370 375 380

Ser Cys Leu Gln Pro Asp Glu Ile Ile Thr Gln Asp Thr Asn Val Pro
 385 390 395 400

Leu Thr Ile Ile Asp Thr Lys Arg Cys Thr Lys Ile Ser Leu Gly His
 405 410 415

Leu Thr Phe Thr Ile Arg Glu Tyr Ala Asn Val Thr Tyr Ser Leu Arg
420 425 430

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

Ser Ser Gln Leu Thr Thr Ile Asn Asn Ser Leu Ala Asp Ala Thr Asn
450 455 460

His Ile Met Asn Ser Asp Arg Ile Leu Asp Arg Leu Asn Ser Gly Leu
465 470 475 480

Tyr Ser Lys Trp Val Ile Ile Phe Leu Ile Cys Ala Ser Ile Val Ser
485 490 495

Leu Ile Gly Leu Val Phe Leu Gly Phe Leu Ile Arg Gly Leu Ile Leu
500 505 510

Glu Leu Arg Ser Lys His Arg Ser Asn Leu Asn Lys Ala Ser Thr Tyr
515 520 525

Ser Ile Asp Ser Ser Ile Gly Leu Thr
530 535

<210> 42
<211> 545
<212> PRT
<213> Mojiang virus

<220>
<221> MISC_FEATURE
<223> fusion protein

<400> 42

Met Ala Leu Asn Lys Asn Met Phe Ser Ser Leu Phe Leu Gly Tyr Leu
1 5 10 15

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

Ser Lys Val Gly Val Ile Lys Gly Leu Thr Tyr Asn Tyr Lys Ile Lys
35 40 45

Gly Ser Pro Ser Thr Lys Leu Met Val Val Lys Leu Ile Pro Asn Ile
50 55 60

Asp Ser Val Lys Asn Cys Thr Gln Lys Gln Tyr Asp Glu Tyr Lys Asn
65 70 75 80

Leu Val Arg Lys Ala Leu Glu Pro Val Lys Met Ala Ile Asp Thr Met
85 90 95

Leu Asn Asn Val Lys Ser Gly Asn Asn Lys Tyr Arg Phe Ala Gly Ala
100 105 110

Ile Met Ala Gly Val Ala Leu Gly Val Ala Thr Ala Ala Thr Val Thr
115 120 125

Ala Gly Ile Ala Leu His Arg Ser Asn Glu Asn Ala Gln Ala Ile Ala
130 135 140

Asn Met Lys Ser Ala Ile Gln Asn Thr Asn Glu Ala Val Lys Gln Leu
145 150 155 160

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

Glu Ile Asn Asn Asn Ile Ile Pro Val Ile Asn Gln Leu Ser Cys Asp
180 185 190

Thr Ile Gly Leu Ser Val Gly Ile Arg Leu Thr Gln Tyr Tyr Ser Glu
195 200 205

Ile Ile Thr Ala Phe Gly Pro Ala Leu Gln Asn Pro Val Asn Thr Arg
210 215 220

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

Leu Leu Lys Ile Met Gly Tyr Thr Ser Gly Asp Leu Tyr Glu Ile Leu
245 250 255

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

Gly Tyr Ile Ala Leu Glu Ile Glu Phe Pro Asn Leu Thr Leu Val Pro
275 280 285

Asn Ala Val Val Gln Glu Leu Met Pro Ile Ser Tyr Asn Ile Asp Gly
290 295 300

Asp Glu Trp Val Thr Leu Val Pro Arg Phe Val Leu Thr Arg Thr Thr
305 310 315 320

Leu Leu Ser Asn Ile Asp Thr Ser Arg Cys Thr Ile Thr Asp Ser Ser
325 330 335

Val Ile Cys Asp Asn Asp Tyr Ala Leu Pro Met Ser His Glu Leu Ile
340 345 350

Gly Cys Leu Gln Gly Asp Thr Ser Lys Cys Ala Arg Glu Lys Val Val
355 360 365

Ser Ser Tyr Val Pro Lys Phe Ala Leu Ser Asp Gly Leu Val Tyr Ala
370 375 380

Asn Cys Leu Asn Thr Ile Cys Arg Cys Met Asp Thr Asp Thr Pro Ile
385 390 395 400

Ser Gln Ser Leu Gly Ala Thr Val Ser Leu Leu Asp Asn Lys Arg Cys

405

410

415

Ser Val Tyr Gln Val Gly Asp Val Leu Ile Ser Val Gly Ser Tyr Leu
 420 425 430

Gly Asp Gly Glu Tyr Asn Ala Asp Asn Val Glu Leu Gly Pro Pro Ile
 435 440 445

Val Ile Asp Lys Ile Asp Ile Gly Asn Gln Leu Ala Gly Ile Asn Gln
 450 455 460

Thr Leu Gln Glu Ala Glu Asp Tyr Ile Glu Lys Ser Glu Glu Phe Leu
 465 470 475 480

Lys Gly Val Asn Pro Ser Ile Ile Thr Leu Gly Ser Met Val Val Leu
 485 490 495

Tyr Ile Phe Met Ile Leu Ile Ala Ile Val Ser Val Ile Ala Leu Val
 500 505 510

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

Thr Tyr Thr Gln His Val Pro Ser Met Glu Asn Ile Asn Tyr Val Ser
 530 535 540

His
 545

<210> 43
 <211> 546
 <212> PRT
 <213> Avian paramyxovirus 12

<220>
 <221> MISC_FEATURE
 <223> fusion protein

<400> 43

Met Ala Ile Pro Val Pro Ser Ser Thr Ala Leu Met Ile Phe Asn Ile
1 5 10 15

Leu Val Ser Leu Ala Pro Ala Ser Ala Leu Asp Gly Arg Leu Leu Leu
20 25 30

Gly Ala Gly Ile Val Pro Thr Gly Asp Arg Gln Val Asn Val Tyr Thr
35 40 45

Ser Ser Gln Thr Gly Ile Ile Ala Leu Lys Leu Leu Pro Asn Leu Pro
50 55 60

Lys Asp Lys Glu Asn Cys Ala Glu Val Ser Ile Arg Ser Tyr Asn Glu
65 70 75 80

Thr Leu Thr Arg Ile Leu Thr Pro Leu Ala Gln Ser Met Ala Ala Ile
85 90 95

Arg Gly Asn Ser Thr Val Ser Thr Arg Gly Arg Glu Pro Arg Leu Val
100 105 110

Gly Ala Ile Ile Gly Gly Val Ala Leu Gly Val Ala Thr Ala Ala Gln
115 120 125

Ile Thr Ala Ala Thr Ala Leu Ile Gln Ala Asn Gln Asn Ala Glu Asn
130 135 140

Ile Ala Arg Leu Ala Lys Gly Leu Ala Ala Thr Asn Glu Ala Val Thr
145 150 155 160

Asp Leu Thr Lys Gly Val Gly Ser Leu Ala Ile Gly Val Gly Lys Leu
165 170 175

Gln Asp Tyr Val Asn Glu Gln Phe Asn Arg Thr Gly Glu Ala Ile Glu
180 185 190

Cys Leu Thr Ile Glu Ser Arg Val Gly Val Gln Leu Ser Leu Tyr Leu
195 200 205

Thr Glu Val Ile Gly Val Phe Gly Asp Gln Ile Thr Ser Pro Ala Leu
210 215 220

Ser Asp Ile Ser Ile Gln Ala Leu Tyr Asn Leu Ala Gly Gly Asn Leu
225 230 235 240

Asn Val Leu Leu Gln Lys Met Gly Ile Glu Gly Thr Gln Leu Gly Ser
245 250 255

Leu Ile Asn Ser Gly Leu Ile Lys Gly Arg Pro Ile Met Tyr Asp Asp
260 265 270

Gly Asn Lys Ile Leu Gly Ile Gln Val Thr Leu Pro Ser Val Gly Arg
275 280 285

Ile Asn Gly Ala Arg Ala Thr Leu Leu Glu Ala Ile Ala Val Ala Thr
290 295 300

Pro Lys Gly Asn Ala Ser Pro Leu Ile Pro Arg Ala Val Ile Ser Val
305 310 315 320

Gly Ser Leu Val Glu Glu Leu Asp Met Thr Pro Cys Val Leu Thr Pro
325 330 335

Thr Asp Ile Phe Cys Thr Arg Ile Leu Ser Tyr Pro Leu Ser Asp Ser
340 345 350

Leu Thr Thr Cys Leu Lys Gly Asn Leu Ser Ser Cys Val Phe Ser Arg
355 360 365

Thr Glu Gly Ala Leu Ser Thr Pro Tyr Val Ser Val His Gly Lys Ile
370 375 380

Val Ala Asn Cys Lys Ser Val Val Cys Arg Cys Val Glu Pro Gln Gln
 385 390 395 400

Ile Ile Ser Gln Asn Tyr Gly Glu Ala Leu Ser Leu Ile Asp Glu Ser
 405 410 415

Leu Cys Arg Ile Leu Glu Leu Asn Gly Val Ile Leu Lys Met Asp Gly
 420 425 430

Gln Phe Thr Ser Glu Tyr Thr Lys Asn Ile Thr Ile Asp Pro Val Gln
 435 440 445

Val Ile Ile Ser Gly Pro Ile Asp Ile Ser Ser Glu Leu Ser Gln Val
 450 455 460

Asn Gln Ser Leu Asp Ser Ala Leu Glu Asn Ile Lys Glu Ser Asn Ser
 465 470 475 480

Tyr Leu Ser Lys Val Asn Val Lys Leu Ile Ser Ser Ser Ala Met Ile
 485 490 495

Thr Tyr Ile Val Ile Thr Val Ile Cys Leu Ile Leu Thr Phe Val Ala
 500 505 510

Leu Val Leu Gly Ile Tyr Ser Tyr Thr Lys Ile Arg Ser Gln Gln Lys
 515 520 525

Thr Leu Ile Trp Met Gly Asn Asn Ile Ala Arg Ser Lys Glu Gly Asn
 530 535 540

Arg Phe
 545

<210> 44
 <211> 538
 <212> PRT
 <213> Avian paramyxovirus 3

<220>

<221> MISC_FEATURE

<223> fusion protein

<220>

<221> misc_feature

<222> (287)..(287)

<223> Xaa can be any naturally occurring amino acid

<400> 44

Met Ala Ser Pro Met Val Pro Leu Leu Ile Ile Thr Val Val Pro Ala
1 5 10 15

Leu Ile Ser Ser Gln Ser Ala Asn Ile Asp Lys Leu Ile Gln Ala Gly
20 25 30

Ile Ile Met Gly Ser Gly Lys Glu Leu His Ile Tyr Gln Glu Ser Gly
35 40 45

Ser Leu Asp Leu Tyr Leu Arg Leu Leu Pro Val Ile Pro Ser Asn Leu
50 55 60

Ser His Cys Gln Ser Glu Val Ile Thr Gln Tyr Asn Ser Thr Val Thr
65 70 75 80

Arg Leu Leu Ser Pro Ile Ala Lys Asn Leu Asn His Leu Leu Gln Pro
85 90 95

Arg Pro Ser Gly Arg Leu Phe Gly Ala Val Ile Gly Ser Ile Ala Leu
100 105 110

Gly Val Ala Thr Ser Ala Gln Ile Ser Ala Ala Ile Ala Leu Val Arg
115 120 125

Ala Gln Gln Asn Ala Asn Asp Ile Leu Ala Leu Lys Ala Ala Ile Gln
130 135 140

Ser Ser Asn Glu Ala Ile Lys Gln Leu Thr Tyr Gly Gln Glu Lys Gln

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

Thr Met Cys Lys Tyr Gln Gln Ser Arg Thr Gln Leu Ser Thr Pro Phe
355 360 365

Ile Thr Tyr Asn Gly Val Val Ile Ala Asn Cys Asp Leu Val Ser Cys
370 375 380

Arg Cys Ile Arg Pro Pro Met Ile Ile Thr Gln Val Lys Gly Tyr Pro
385 390 395 400

Leu Thr Ile Ile Asn Arg Asn Leu Cys Thr Glu Leu Ser Val Asp Asn
405 410 415

Leu Ile Leu Asn Ile Glu Thr Asn His Asn Phe Ser Leu Asn Pro Thr
420 425 430

Ile Ile Asp Ser Gln Ser Arg Leu Ile Ala Thr Ser Pro Leu Glu Ile
435 440 445

Asp Ala Leu Ile Gln Asp Ala Gln His His Ala Ala Ala Ala Leu Leu
450 455 460

Lys Val Glu Glu Ser Asn Ala His Leu Leu Arg Val Thr Gly Leu Gly
465 470 475 480

Ser Ser Ser Trp His Ile Ile Leu Ile Leu Thr Leu Leu Val Cys Thr
485 490 495

Ile Ala Trp Leu Ile Gly Leu Ser Ile Tyr Val Cys Arg Ile Lys Asn
500 505 510

Asp Asp Ser Thr Asp Lys Glu Pro Thr Thr Gln Ser Ser Asn Arg Gly
515 520 525

Ile Gly Val Gly Ser Ile Gln Tyr Met Thr
530 535

<210> 45
<211> 552
<212> PRT
<213> Salem virus

<220>
<221> MISC_FEATURE
<223> fusion protein

<400> 45

Met Asn Pro Leu Asn Gln Thr Leu Ile Ala Lys Val Leu Gly Phe Leu
1 5 10 15

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

Thr Arg Ile Gly Val His Gln Val Lys Gln Tyr Gly Tyr Lys Leu Ala
35 40 45

His Tyr Asn Ser His Gln Leu Leu Ile Arg Met Ile Pro Thr Val
50 55 60

Asn Gly Thr His Asn Cys Thr His Gln Val Ile Thr Arg Tyr Arg Glu
65 70 75 80

Met Val Arg Glu Ile Ile Thr Pro Ile Lys Gly Ala Leu Asp Ile Met
85 90 95

Lys Lys Ala Val Ser Pro Asp Leu Val Gly Ala Arg Ile Phe Gly Ala
100 105 110

Ile Val Ala Gly Ala Ala Leu Gly Ile Ala Thr Ser Ala Gln Ile Thr
115 120 125

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

Lys Leu Lys Glu Ala Val Ser Leu Thr Asn Glu Ala Val Glu Gln Leu
145 150 155 160

Gln Tyr Ser Gln Gly Lys Ser Ile Leu Ala Ile Gln Gly Ile Gln Asp
165 170 175

Phe Ile Asn Phe Asn Val Val Pro Leu Leu Glu Glu His Thr Cys Gly
180 185 190

Ile Ala Lys Leu His Leu Glu Met Ala Leu Met Glu Tyr Phe Gln Lys
195 200 205

Leu Ile Leu Val Phe Gly Pro Asn Leu Arg Asp Pro Ile Gly Ser Thr
210 215 220

Ile Gly Ile Gln Ala Leu Ala Thr Leu Phe Gln Asn Asn Met Phe Glu
225 230 235 240

Val Ser Leu Arg Leu Gly Tyr Ala Gly Asp Asp Leu Glu Asp Val Leu
245 250 255

Gln Ser Asn Ser Ile Arg Ala Asn Ile Ile Glu Ala Glu Pro Asp Ser
260 265 270

Gly Phe Ile Val Leu Ala Ile Arg Tyr Pro Thr Leu Thr Leu Val Glu
275 280 285

Asp Gln Val Ile Thr Glu Leu Ala His Ile Thr Phe Asn Asp Gly Pro
290 295 300

Gln Glu Trp Val Ala Thr Ile Pro Gln Phe Val Thr Tyr Arg Gly Leu
305 310 315 320

Val Leu Ala Asn Ile Asp Val Ser Thr Cys Thr Phe Thr Glu Arg Asn
325 330 335

Val Ile Cys Ala Arg Asp Gln Thr Tyr Pro Met Ile Ile Asp Leu Gln

340

345

350

Leu Cys Met Arg Gly Asn Ile Ala Lys Cys Gly Arg Thr Arg Val Thr
 355 360 365

Gly Ser Thr Ala Ser Arg Phe Leu Leu Lys Asp Gly Asn Met Tyr Ala
 370 375 380

Asn Cys Ile Ala Thr Met Cys Arg Cys Met Ser Ser Ser Ser Ile Ile
 385 390 395 400

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

Ser Glu Val Met Ile Asp Thr Ile Arg Ile Thr Leu Gly Glu Arg Lys
 420 425 430

His Pro Pro Ile Asp Tyr Gln Thr Thr Ile Thr Leu Gly Gln Pro Ile
 435 440 445

Ala Leu Ala Pro Leu Asp Val Gly Thr Glu Leu Ala Asn Ala Val Ser
 450 455 460

Tyr Leu Asn Lys Ser Lys Val Leu Leu Glu His Ser Asn Glu Val Leu
 465 470 475 480

Ser Ser Val Ser Thr Ala His Thr Ser Leu Thr Ala Thr Ile Val Leu
 485 490 495

Gly Ile Val Val Gly Gly Leu Ala Ile Leu Ile Val Val Met Phe Leu
 500 505 510

Phe Leu Glu Ala Gln Val Ile Lys Val Gln Arg Ala Met Met Leu Cys
 515 520 525

Pro Ile Thr Asn His Gly Tyr Leu Pro Asn Glu Asp Leu Leu Thr Arg
 530 535 540

Gly His Ser Ile Pro Thr Ile Gly
545 550

<210> 46
<211> 551
<212> PRT
<213> Avian paramyxovirus 9

<220>
<221> MISC_FEATURE
<223> fusion protein

<400> 46

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

Ala His Leu Cys Tyr Thr Thr Thr Leu Asp Gly Arg Lys Leu Leu Gly
20 25 30

Ala Gly Ile Val Ile Thr Glu Glu Lys Gln Val Arg Val Tyr Thr Ala
35 40 45

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

Asp Arg Tyr Ser Cys Met Glu Ser Thr Ile Glu Ser Tyr Asn Lys Thr
65 70 75 80

Val Tyr Asn Ile Leu Ala Pro Leu Gly Asp Ala Ile Arg Arg Ile Gln
85 90 95

Ala Ser Gly Val Ser Val Glu Arg Ile Arg Glu Gly Arg Ile Phe Gly
100 105 110

Ala Ile Leu Gly Gly Val Ala Leu Gly Val Ala Thr Ala Ala Gln Ile
115 120 125

Thr Ala Ala Ile Ala Leu Ile Gln Ala Asn Glu Asn Ala Lys Asn Ile
130 135 140

Leu Arg Ile Lys Asp Ser Ile Thr Lys Thr Asn Glu Ala Val Arg Asp
145 150 155 160

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

Asp Phe Val Asn Lys Glu Phe Asn Lys Thr Thr Glu Ala Ile Asn Cys
180 185 190

Val Gln Ala Ala Gln Gln Leu Gly Val Glu Leu Ser Leu Tyr Leu Thr
195 200 205

Glu Ile Thr Thr Val Phe Gly Pro Gln Ile Thr Ser Pro Ala Leu Ser
210 215 220

Lys Leu Thr Ile Gln Ala Leu Tyr Asn Leu Ala Gly Val Ser Leu Asp
225 230 235 240

Val Leu Leu Gly Arg Leu Gly Ala Asp Asn Ser Gln Leu Ser Ser Leu
245 250 255

Val Ser Ser Gly Leu Ile Thr Gly Gln Pro Ile Leu Tyr Asp Ser Glu
260 265 270

Ser Gln Ile Leu Ala Leu Gln Val Ser Leu Pro Ser Ile Ser Asp Leu
275 280 285

Arg Gly Val Arg Ala Thr Tyr Leu Asp Thr Leu Ala Val Asn Thr Ala
290 295 300

Ala Gly Leu Ala Ser Ala Met Ile Pro Lys Val Val Ile Gln Ser Asn
305 310 315 320

Asn Ile Val Glu Glu Leu Asp Thr Thr Ala Cys Ile Ala Ala Glu Ala
325 330 335

Asp Leu Tyr Cys Thr Arg Ile Thr Thr Phe Pro Ile Ala Ser Ala Val
340 345 350

Ser Ala Cys Ile Leu Gly Asp Val Ser Gln Cys Leu Tyr Ser Lys Thr
355 360 365

Asn Gly Val Leu Thr Thr Pro Tyr Val Ala Val Lys Gly Lys Ile Val
370 375 380

Ala Asn Cys Lys His Val Thr Cys Arg Cys Val Asp Pro Thr Ser Ile
385 390 395 400

Ile Ser Gln Asn Tyr Gly Glu Ala Ala Thr Leu Ile Asp Asp Gln Leu
405 410 415

Cys Lys Val Ile Asn Leu Asp Gly Val Ser Ile Gln Leu Ser Gly Thr
420 425 430

Phe Glu Ser Thr Tyr Val Arg Asn Val Ser Ile Ser Ala Asn Lys Val
435 440 445

Ile Val Ser Ser Ser Ile Asp Ile Ser Asn Glu Leu Glu Asn Val Asn
450 455 460

Ser Ser Leu Ser Ser Ala Leu Glu Lys Leu Asp Glu Ser Asp Ala Ala
465 470 475 480

Leu Ser Lys Val Asn Val His Leu Thr Ser Thr Ser Ala Met Ala Thr
485 490 495

Tyr Ile Val Leu Thr Val Ile Ala Leu Ile Leu Gly Phe Val Gly Leu
500 505 510

Gly Leu Gly Cys Phe Ala Met Ile Lys Val Lys Ser Gln Ala Lys Thr

515

520

525

Leu Leu Trp Leu Gly Ala His Ala Asp Arg Ser Tyr Ile Leu Gln Ser
 530 535 540

Lys Pro Ala Gln Ser Ser Thr
 545 550

<210> 47
 <211> 533
 <212> PRT
 <213> Achimota virus 1

<220>
 <221> MISC_FEATURE
 <223> fusion protein

<400> 47

Met Trp Ile Met Ile Ile Leu Ser Leu Phe Gln Ile Ile Pro Gly Val
 1 5 10 15

Thr Pro Ile Asn Ser Lys Val Leu Thr Gln Leu Gly Val Ile Thr Lys
 20 25 30

His Thr Arg Gln Leu Lys Phe Tyr Ser His Ser Thr Pro Ser Tyr Leu
 35 40 45

Val Val Lys Leu Val Pro Thr Ile Asn Thr Glu Ser Thr Val Cys Asn
 50 55 60

Phe Thr Ser Leu Ser Arg Tyr Lys Asp Ser Val Arg Glu Leu Ile Thr
 65 70 75 80

Pro Leu Ala Lys Asn Ile Asp Asn Leu Asn Ser Ile Leu Thr Ile Pro
 85 90 95

Lys Arg Arg Lys Arg Met Ala Gly Val Val Ile Gly Leu Ala Ala Leu
 100 105 110

Gly Val Ala Ala Ala Ala Gln Ala Thr Ala Ala Val Ala Leu Ile Glu
115 120 125

Ala Lys Lys Asn Thr Glu Gln Ile Gln Ala Leu Ser Glu Ser Ile Gln
130 135 140

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

Ala Ile Ala Val Gln Ala Ile Gln Asn Gln Ile Asn Asn Val Ile Asn
165 170 175

Pro Ala Leu Thr Ala Leu Asp Cys Gly Val Thr Asp Ala Gln Leu Gly
180 185 190

Asn Ile Leu Asn Leu Tyr Leu Ile Lys Thr Leu Thr Val Phe Gln Lys
195 200 205

Gln Ile Thr Asn Pro Ala Leu Gln Pro Leu Ser Ile Gln Ala Leu Asn
210 215 220

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

Asp Glu Ile Glu His Thr Asp Leu Leu Thr Ser Gly Leu Ile Thr Gly
245 250 255

Gln Val Val Gly Val Asn Leu Thr Asn Leu Gln Leu Ile Ile Ala Ala
260 265 270

Phe Ile Pro Ser Ile Ala Pro Leu Asn Gln Ala Tyr Ile Leu Asp Phe
275 280 285

Ile Arg Ile Thr Val Asn Ile Asn Asn Ser Glu Ser Met Ile Gln Ile
290 295 300

Pro Glu Arg Ile Met Glu His Gly Ile Ser Leu Tyr Gln Phe Gly Gly
305 310 315 320

Asp Gln Cys Thr Phe Ser Asp Trp Ser Ala Tyr Cys Pro Tyr Ser Asp
325 330 335

Ala Thr Leu Met Ala Pro Gly Leu Gln Asn Cys Phe Arg Gly Gln Ala
340 345 350

Ala Asp Cys Val Phe Ser Thr Val Met Gly Ser Phe Pro Asn Arg Phe
355 360 365

Val Ser Val Gln Gly Val Phe Tyr Val Asn Cys Lys Phe Ile Arg Cys
370 375 380

Ala Cys Thr Gln Pro Gln Arg Leu Ile Thr Gln Asp Asp Ser Leu Ser
385 390 395 400

Leu Thr Gln Ile Asp Ala Lys Thr Cys Arg Met Leu Thr Leu Gly Phe
405 410 415

Val Gln Phe Ser Ile Asn Glu Tyr Ala Asn Val Thr Tyr Ser Phe Lys
420 425 430

Asn Asn Val Thr Ala Gly Gln Leu Ile Met Thr Asn Pro Ile Asp Leu
435 440 445

Ser Thr Glu Ile Lys Gln Met Asn Asp Ser Val Asp Glu Ala Ala Arg
450 455 460

Tyr Ile Glu Lys Ser Asn Ala Ala Leu Asn Lys Leu Met Tyr Gly Gly
465 470 475 480

Arg Ser Asp Ile Val Thr Thr Val Leu Leu Val Gly Phe Ile Leu Leu
485 490 495

Val Val Tyr Val Ile Phe Val Thr Tyr Ile Leu Lys Ile Leu Met Lys
500 505 510

Glu Val Ala Arg Leu Arg Asn Ser Asn His Pro Asp Leu Ile Lys Pro
515 520 525

Tyr Asn Tyr Pro Met
530

<210> 48
<211> 531
<212> PRT
<213> Achimota virus 2

<220>
<221> MISC_FEATURE
<223> fusion protein

<400> 48

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

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

Val Ile Val Lys Ser Ile Lys Gly Leu Asn Phe Tyr Ser Arg Gly Gln
35 40 45

Ala Asn Tyr Ile Ile Val Lys Leu Ile Pro Asn Val Asn Val Thr Asp
50 55 60

Thr Asp Cys Asp Ile Gly Ser Ile Lys Arg Tyr Asn Glu Thr Val Tyr
65 70 75 80

Ser Leu Ile Lys Pro Leu Ala Asp Asn Ile Asp Tyr Leu Arg Thr Gln
85 90 95

Phe Ala Pro Thr Lys Arg Lys Lys Arg Phe Ala Gly Val Ala Ile Gly

100

105

110

Leu Thr Ala Leu Gly Val Ala Thr Ala Ala Gln Val Thr Ala Ala Val
 115 120 125

Ala Leu Val Lys Ala Gln Glu Asn Ala Arg Lys Leu Asp Ala Leu Ala
 130 135 140

Asp Ser Ile Gln Ala Thr Asn Glu Ala Val Gln Asp Leu Ser Thr Gly
 145 150 155 160

Leu Gln Ala Gly Ala Ile Ala Ile Gln Ala Ile Gln Ser Glu Ile Asn
 165 170 175

His Val Ile Asn Pro Ala Leu Glu Arg Leu Ser Cys Glu Ile Ile Asp
 180 185 190

Thr Arg Val Ala Ser Ile Leu Asn Leu Tyr Leu Ile Arg Leu Thr Thr
 195 200 205

Val Phe His Arg Gln Leu Val Asn Pro Ala Leu Thr Pro Leu Ser Ile
 210 215 220

Gln Ala Leu Asn His Leu Leu Gln Gly Glu Thr Glu Gly Leu Val Lys
 225 230 235 240

Asn Glu Ser Lys Met Thr Asp Ser Lys Ile Asp Leu Leu Met Ser Gly
 245 250 255

Leu Ile Thr Gly Gln Val Val Gly Val Asn Ile Lys His Met Gln Leu
 260 265 270

Met Ile Ala Val Phe Val Pro Thr Thr Ala Gln Leu Pro Asn Ala Tyr
 275 280 285

Val Ile Asn Leu Leu Thr Ile Thr Ala Asn Ile Asn Asn Ser Glu Val
 290 295 300

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

Gln Phe Arg Gly Lys Asp Cys Val Ser Ser Pro Asn His Met Tyr Cys
325 330 335

Pro Tyr Ser Asp Ala Ser Ile Leu Ser Pro Glu Leu Gln Leu Cys Leu
340 345 350

Gln Gly Arg Leu Glu Met Cys Leu Phe Thr Gln Val Val Gly Ser Phe
355 360 365

Pro Thr Arg Phe Ala Ser Asp Lys Gly Ile Val Tyr Ala Asn Cys Arg
370 375 380

His Leu Gln Cys Ala Cys Ser Glu Pro Glu Gly Ile Ile Tyr Gln Asp
385 390 395 400

Asp Thr Ser Ala Ile Thr Gln Ile Asp Ala Ser Lys Cys Ser Thr Leu
405 410 415

Lys Leu Asp Met Leu Thr Phe Lys Leu Ser Thr Tyr Ala Asn Lys Thr
420 425 430

Phe Asp Ala Ser Phe Ser Val Gly Lys Asp Gln Met Leu Val Thr Asn
435 440 445

Leu Leu Asp Leu Ser Ala Glu Leu Lys Thr Met Asn Ala Ser Val Ala
450 455 460

His Ala Asn Lys Leu Ile Asp Lys Ser Asn Leu Leu Ile Gln Ser Asn
465 470 475 480

Ala Leu Ile Gly His Ser Asn Thr Ile Phe Ile Val Val Ile Val Ile
485 490 495

Leu Ala Val Met Val Leu Tyr Leu Ile Ile Val Thr Tyr Ile Ile Lys
500 505 510

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

Ile Asp Lys
530

<210> 49
<211> 532
<212> PRT
<213> Tuhoko virus 1

<220>
<221> MISC_FEATURE
<223> fusion protein

<400> 49

Met Val Thr Ile Ile Lys Pro Leu Ile Leu Leu Val Thr Val Ile Leu
1 5 10 15

Gln Ile Ser Gly His Ile Asp Thr Thr Ala Leu Thr Ser Ile Gly Ala
20 25 30

Val Ile Ala Ser Ser Lys Glu Ile Met Tyr Tyr Ala Gln Ser Thr Pro
35 40 45

Asn Tyr Ile Val Ile Lys Leu Ile Pro Asn Leu Pro Asn Ile Pro Ser
50 55 60

Gln Cys Asn Phe Ser Ser Ile Ala Tyr Tyr Asn Lys Thr Leu Leu Asp
65 70 75 80

Leu Phe Thr Pro Ile Ser Asp Asn Ile Asn Met Leu His Gln Arg Leu
85 90 95

Ser Asn Thr Gly Arg Asn Arg Arg Phe Ala Gly Val Ala Ile Gly Leu
100 105 110

Ala Ala Leu Gly Val Ala Thr Ala Ala Gln Val Thr Ala Ala Phe Ala
115 120 125

Leu Val Glu Ala Lys Ser Asn Thr Ala Lys Ile Ala Gln Ile Gly Gln
130 135 140

Ala Ile Gln Asn Thr Asn Ala Ala Ile Asn Ser Leu Asn Ala Gly Ile
145 150 155 160

Gly Gly Ala Val Thr Ala Ile Gln Ala Ile Gln Thr Gln Ile Asn Gly
165 170 175

Ile Ile Thr Asp Gln Ile Asn Ala Ala Thr Cys Thr Ala Leu Asp Ala
180 185 190

Gln Ile Gly Thr Leu Leu Asn Met Tyr Leu Leu Gln Leu Thr Thr Thr
195 200 205

Phe Gln Pro Gln Ile Gln Asn Pro Ala Leu Gln Pro Leu Ser Ile Gln
210 215 220

Ala Leu His Arg Ile Met Gln Gly Thr Ser Ile Val Leu Ser Asn Leu
225 230 235 240

Thr Asp Ser Ser Lys Tyr Gly Leu Asn Asp Ala Leu Ser Ala Gly Leu
245 250 255

Ile Thr Gly Gln Ile Val Ser Val Asp Leu Arg Leu Met Gln Ile Thr
260 265 270

Ile Ala Ala Asn Val Pro Thr Leu Ser Arg Leu Glu Asn Ala Ile Ala
275 280 285

His Asp Ile Met Arg Ile Thr Thr Asn Val Asn Asn Thr Glu Val Ile

290

295

300

Val Gln Leu Pro Glu Thr Ile Met Glu His Ala Gly Arg Leu Tyr Gln
 305 310 315 320

Phe Asn Lys Asp His Cys Leu Ser Ser Thr Gln Arg Phe Phe Cys Pro
 325 330 335

Tyr Ser Asp Ala Lys Leu Leu Thr Ser Lys Ile Ser Ser Cys Leu Ser
 340 345 350

Gly Ile Arg Gly Asp Cys Ile Phe Ser Pro Val Val Gly Asn Phe Ala
 355 360 365

Thr Arg Phe Ile Ser Val Lys Gly Val Ile Ile Ala Asn Cys Lys Phe
 370 375 380

Ile Arg Cys Thr Cys Leu Gln Pro Glu Gly Ile Ile Ser Gln Leu Asp
 385 390 395 400

Asp His Thr Leu Thr Val Ile Asp Leu Lys Leu Cys Asn Lys Leu Asp
 405 410 415

Leu Gly Leu Ile Gln Phe Asp Leu Gln Val Leu Ser Asn Ile Ser Tyr
 420 425 430

Glu Met Thr Leu Asn Thr Ser Gln Asn Gln Leu Ile Leu Thr Asp Pro
 435 440 445

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

Ala Ala Asn Phe Ile Glu Lys Ser Asn Ser Leu Leu Asn Ser Ser Thr
 465 470 475 480

Tyr Glu Phe Asn Arg Ser Val Ala Leu Leu Val Ala Leu Ile Leu Leu
 485 490 495

Ser Leu Thr Ile Leu Tyr Val Ile Val Leu Thr Cys Val Val Lys Leu
500 505 510

Leu Val His Glu Val Ser Lys Asn Arg Arg His Ile Gln Asp Leu Glu
515 520 525

Ser His His Lys
530

<210> 50
<211> 631
<212> PRT
<213> Phocine distemper virus

<220>
<221> MISC_FEATURE
<223> fusion protein

<400> 50

Met Thr Arg Val Lys Lys Leu Pro Val Pro Thr Asn Pro Pro Met His
1 5 10 15

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

Ile Ser Ile Thr Asp Asp Thr Ser Ser Gln Leu Thr Asn Phe Leu Tyr
35 40 45

His Lys Tyr His Lys Thr Thr Ile Asn His Leu Ser Arg Thr Ile Ser
50 55 60

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

Leu Ser Thr Tyr Gln Ile Arg Ser Ala Leu Trp Trp Ile Ala Met Val
85 90 95

Ile Leu Val His Cys Val Met Gly Gln Ile His Trp Thr Asn Leu Ser
100 105 110

Thr Ile Gly Ile Ile Gly Thr Asp Ser Ser His Tyr Lys Ile Met Thr
115 120 125

Arg Ser Ser His Gln Tyr Leu Val Leu Lys Leu Met Pro Asn Val Ser
130 135 140

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

Leu Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr
165 170 175

Lys Asn Val Lys Ser Leu Gln Ser Leu Gly Ser Gly Arg Arg Gln Arg
180 185 190

Arg Phe Ala Gly Val Val Ile Ala Gly Ala Ala Leu Gly Val Ala Thr
195 200 205

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

Ala Gln Ala Ile Gln Ser Leu Arg Ala Ser Leu Glu Gln Ser Asn Lys
225 230 235 240

Ala Ile Asp Glu Val Arg Gln Ala Ser Gln Asn Ile Ile Ile Ala Val
245 250 255

Gln Gly Val Gln Asp Tyr Val Asn Asn Glu Ile Val Pro Ala Leu Gln
260 265 270

His Met Ser Cys Glu Leu Ile Gly Gln Arg Leu Gly Leu Lys Leu Leu
275 280 285

Arg Tyr Tyr Thr Glu Leu Leu Ser Val Phe Gly Pro Ser Leu Arg Asp
290 295 300

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

Gly Glu Ile His Lys Ile Leu Glu Lys Leu Gly Tyr Ser Gly Asn Asp
325 330 335

Met Val Ala Ile Leu Glu Thr Lys Gly Ile Arg Ala Lys Ile Thr His
340 345 350

Val Asp Leu Ser Gly Lys Phe Ile Val Leu Ser Ile Ser Tyr Pro Thr
355 360 365

Leu Ser Glu Val Lys Gly Val Val Val His Arg Leu Glu Ala Val Ser
370 375 380

Tyr Asn Ile Gly Ser Gln Glu Trp Tyr Thr Thr Val Pro Arg Tyr Val
385 390 395 400

Ala Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu Ser Ser Cys Val
405 410 415

Phe Val Ser Glu Ser Ala Ile Cys Ser Gln Asn Ser Leu Tyr Pro Met
420 425 430

Ser Pro Ile Leu Gln Gln Cys Leu Arg Gly Glu Thr Ala Ser Cys Ala
435 440 445

Arg Thr Leu Val Ser Gly Thr Leu Gly Asn Lys Phe Ile Leu Ser Lys
450 455 460

Gly Asn Ile Ile Ala Asn Cys Ala Ser Ile Leu Cys Lys Cys His Ser
465 470 475 480

Thr Ser Lys Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile

485

490

495

Ala Ser Asp Thr Cys Ser Leu Val Glu Ile Asp Gly Val Thr Ile Gln
 500 505 510

Val Gly Ser Arg Gln Tyr Pro Asp Val Val Tyr Ala Ser Lys Val Ile
 515 520 525

Leu Gly Pro Ala Ile Ser Leu Glu Arg Leu Asp Val Gly Thr Asn Leu
 530 535 540

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

Ser Asp Gln Ile Leu Asp Thr Val Lys Asn Ser Tyr Leu Ser Leu Gly
 565 570 575

Thr Leu Ile Ala Leu Pro Val Ser Ile Gly Leu Gly Leu Ile Leu Leu
 580 585 590

Leu Leu Ile Cys Cys Cys Lys Lys Arg Tyr Gln His Leu Phe Ser Gln
 595 600 605

Ser Thr Lys Val Ala Pro Val Phe Lys Pro Asp Leu Thr Gly Thr Ser
 610 615 620

Lys Ser Tyr Val Arg Ser Leu
 625 630

<210> 51
 <211> 541
 <212> PRT
 <213> Caprine parainfluenza virus 3

<220>
 <221> MISC_FEATURE
 <223> fusion protein

<400> 51

Met Ile Lys Lys Ile Ile Cys Ile Phe Ser Met Pro Ile Leu Leu Ser
1 5 10 15

Phe Cys Gln Val Asp Ile Ile Lys Leu Gln Arg Val Gly Ile Leu Val
20 25 30

Ser Lys Pro Lys Ser Ile Lys Ile Ser Gln Asn Phe Glu Thr Arg Tyr
35 40 45

Leu Val Leu Asn Leu Ile Pro Asn Ile Glu Asn Ala Gln Ser Cys Gly
50 55 60

Asp Gln Gln Ile Lys Gln Tyr Lys Lys Leu Leu Asp Arg Leu Ile Ile
65 70 75 80

Pro Leu Tyr Asp Gly Leu Arg Leu Gln Gln Asp Ile Ile Val Val Asp
85 90 95

Asn Asn Leu Lys Asn Asn Thr Asn His Arg Ala Lys Arg Phe Phe Gly
100 105 110

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

Thr Ala Ala Val Ala Leu Val Glu Ala Lys Gln Ala Arg Ser Asp Ile
130 135 140

Glu Arg Val Lys Asn Ala Val Arg Asp Thr Asn Lys Ala Val Gln Ser
145 150 155 160

Ile Gln Gly Ser Val Gly Asn Leu Ile Val Ala Val Lys Ser Val Gln
165 170 175

Asp Tyr Val Asn Asn Glu Ile Val Pro Ser Ile Lys Arg Leu Gly Cys
180 185 190

Glu Ala Ala Gly Leu Gln Leu Gly Ile Ala Leu Thr Gln His Tyr Ser
195 200 205

Glu Leu Thr Asn Ile Phe Gly Asp Asn Ile Gly Thr Leu Lys Glu Lys
210 215 220

Gly Ile Lys Leu Gln Gly Ile Ala Ser Leu Tyr His Thr Asn Ile Thr
225 230 235 240

Glu Ile Phe Thr Thr Ser Thr Val Asp Gln Tyr Asp Ile Tyr Asp Leu
245 250 255

Leu Phe Thr Glu Ser Ile Lys Met Arg Val Ile Asp Val Asp Leu Asn
260 265 270

Asp Tyr Ser Ile Thr Leu Gln Val Arg Leu Pro Leu Leu Thr Lys Ile
275 280 285

Ser Asp Ala Gln Ile Tyr Asn Val Asp Ser Val Ser Tyr Asn Ile Gly
290 295 300

Gly Thr Glu Trp Tyr Ile Pro Leu Pro Arg Asn Ile Met Thr Lys Gly
305 310 315 320

Ala Phe Leu Gly Gly Ala Asn Leu Gln Asp Cys Ile Glu Ser Phe Ser
325 330 335

Asp Tyr Ile Cys Pro Ser Asp Pro Gly Phe Ile Leu Asn Arg Asp Ile
340 345 350

Glu Asn Cys Leu Ser Gly Asn Ile Thr Gln Cys Pro Lys Thr Leu Val
355 360 365

Ile Ser Asp Ile Val Pro Arg Tyr Ala Phe Val Asp Gly Gly Val Ile
370 375 380

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

Ile Asn Gln Ala Pro Asp Gln Gly Ile Lys Ile Ile Thr Tyr Lys Asp
 405 410 415

Cys Gln Thr Ile Gly Ile Asn Gly Met Leu Phe Lys Thr Asn Gln Glu
 420 425 430

Gly Thr Leu Ala Ala Tyr Thr Pro Val Asp Ile Thr Leu Asn Asn Ser
 435 440 445

Val Asn Leu Asp Pro Ile Asp Leu Ser Ile Glu Leu Asn Arg Ala Arg
 450 455 460

Ser Asp Leu Ala Glu Ser Lys Glu Trp Ile Lys Arg Ser Glu Ala Lys
 465 470 475 480

Leu Asp Ser Val Gly Ser Trp Tyr Gln Ser Ser Thr Thr Glu Ile Ile
 485 490 495

Gln Ile Val Met Ile Ile Val Leu Phe Ile Ile Asn Ile Ile Val Leu
 500 505 510

Ile Val Leu Ile Lys Tyr Ser Arg Ser Gln Asn Gln Ser Met Asn Asn
 515 520 525

His Met Asn Glu Pro Tyr Ile Leu Thr Asn Lys Val Gln
 530 535 540

<210> 52
 <211> 553
 <212> PRT
 <213> Tupaia paramyxovirus

<220>
 <221> MISC_FEATURE
 <223> fusion protein

<400> 52

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

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

Ala Ser Ile Gly Val Val Asp Ala Gly Lys Tyr Asn Tyr Lys Leu Met
35 40 45

Thr Thr Gly Ser Glu Lys Leu Met Val Ile Lys Leu Val Pro Asn Ile
50 55 60

Thr Tyr Ala Thr Asn Cys Asn Leu Thr Ala His Thr Ala Tyr Thr Lys
65 70 75 80

Met Ile Glu Arg Leu Leu Thr Pro Ile Asn Gln Ser Leu Tyr Glu Met
85 90 95

Arg Ser Val Ile Thr Glu Arg Asp Gly Gly Thr Ile Phe Trp Gly Ala
100 105 110

Ile Ile Ala Gly Ala Ala Leu Gly Val Ala Thr Ala Ala Ala Ile Thr
115 120 125

Ala Gly Val Ala Leu His Arg Ala Glu Gln Asn Ala Arg Asn Ile Ala
130 135 140

Ala Leu Lys Asp Ala Leu Arg Asn Ser Asn Glu Ala Ile Gln His Leu
145 150 155 160

Lys Asp Ala Gln Gly His Thr Val Leu Ala Ile Gln Gly Leu Gln Glu
165 170 175

Gln Ile Asn Asn Asn Ile Ile Pro Lys Leu Lys Glu Ser His Cys Leu
180 185 190

Gly Val Asn Asn Gln Leu Gly Leu Leu Leu Asn Gln Tyr Tyr Ser Glu
195 200 205

Ile Leu Thr Val Phe Gly Pro Asn Leu Gln Asn Pro Val Ser Ala Ser
210 215 220

Leu Thr Ile Gln Ala Ile Ala Lys Ala Phe Asn Gly Asp Phe Asn Ser
225 230 235 240

Leu Met Thr Asn Leu Asn Tyr Asp Pro Thr Asp Leu Leu Asp Ile Leu
245 250 255

Glu Ser Asn Ser Ile Asn Gly Arg Ile Ile Asp Val Asn Leu Asn Glu
260 265 270

Lys Tyr Ile Ala Leu Ser Ile Glu Ile Pro Asn Phe Ile Thr Leu Thr
275 280 285

Asp Ala Lys Ile Gln Thr Phe Asn Arg Ile Thr Tyr Gly Tyr Gly Ser
290 295 300

Asn Glu Trp Leu Thr Leu Ile Pro Asp Asn Ile Leu Glu Tyr Gly Asn
305 310 315 320

Leu Ile Ser Asn Val Asp Leu Thr Ser Cys Val Lys Thr Lys Ser Ser
325 330 335

Tyr Ile Cys Asn Gln Asp Thr Ser Tyr Pro Ile Ser Ser Glu Leu Thr
340 345 350

Arg Cys Leu Arg Gly Asp Thr Ser Ser Cys Pro Arg Thr Pro Val Val
355 360 365

Asn Ser Arg Ala Pro Thr Phe Ala Leu Ser Gly Gly His Ile Tyr Ala
370 375 380

Asn Cys Ala Lys Ala Ala Cys Arg Cys Glu Lys Pro Pro Met Ala Ile
 385 390 395 400

Val Gln Pro Ala Thr Ser Thr Leu Thr Phe Leu Thr Glu Lys Glu Cys
 405 410 415

Gln Glu Val Val Ile Asp Gln Ile Asn Ile Gln Leu Ala Pro Asn Arg
 420 425 430

Leu Asn Lys Thr Ile Ile Thr Asp Gly Ile Asp Leu Gly Pro Glu Val
 435 440 445

Ile Ile Asn Pro Ile Asp Val Ser Ala Glu Leu Gly Asn Ile Glu Leu
 450 455 460

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

Asp Ser Met Ile Thr Glu Val Thr Pro Asp Lys Leu Leu Ile Ala Met
 485 490 495

Ile Val Val Phe Gly Ile Leu Leu Leu Trp Leu Phe Gly Val Ser Tyr
 500 505 510

Tyr Ala Phe Lys Ile Trp Ser Lys Leu His Phe Leu Asp Ser Tyr Val
 515 520 525

Tyr Ser Leu Arg Asn Pro Ser His His Arg Ser Asn Gly His Gln Asn
 530 535 540

His Ser Phe Ser Thr Asp Ile Ser Gly
 545 550

<210> 53
 <211> 543
 <212> PRT
 <213> Avian paramyxovirus 3

<220>

<221> MISC_FEATURE

<223> fusion protein

<400> 53

Met Gln Pro Gly Ser Ala Leu His Leu Pro His Leu Tyr Ile Ile Ile
1 5 10 15

Ala Leu Val Ser Asp Gly Thr Leu Gly Gln Thr Ala Lys Ile Asp Arg
20 25 30

Leu Ile Gln Ala Gly Ile Val Leu Gly Ser Gly Lys Glu Leu His Ile
35 40 45

Ser Gln Asp Ser Gly Thr Leu Asp Leu Phe Val Arg Leu Leu Pro Val
50 55 60

Leu Pro Ser Asn Leu Ser His Cys Gln Leu Glu Ala Ile Thr Gln Tyr
65 70 75 80

Asn Lys Thr Val Thr Arg Leu Leu Ala Pro Ile Gly Lys Asn Leu Glu
85 90 95

Gln Val Leu Gln Ala Arg Pro Arg Gly Arg Leu Phe Gly Pro Ile Ile
100 105 110

Gly Ser Ile Ala Leu Gly Val Ala Thr Ser Ala Gln Ile Thr Ala Ala
115 120 125

Ile Ala Leu Val Arg Ala Gln Gln Asn Ala Asn Asp Ile Leu Ala Leu
130 135 140

Lys Asn Ala Leu Gln Ser Ser Asn Glu Ala Ile Arg Gln Leu Thr Tyr
145 150 155 160

Gly Gln Asp Lys Gln Leu Leu Ala Ile Ser Lys Ile Gln Lys Ala Val

165

170

175

Asn Glu Gln Ile Leu Pro Ala Leu Asp Gln Leu Asp Cys Ala Val Leu
 180 185 190

Gly Thr Lys Leu Ala Val Gln Leu Asn Leu Tyr Leu Ile Glu Met Thr
 195 200 205

Thr Ile Phe Gly Glu Gln Ile Asn Asn Pro Val Leu Ala Thr Ile Pro
 210 215 220

Leu Ser Tyr Ile Leu Arg Leu Thr Gly Ala Glu Leu Asn Asn Val Leu
 225 230 235 240

Met Lys Gln Ala Arg Ser Ser Leu Ser Leu Val Gln Leu Val Ser Lys
 245 250 255

Gly Leu Leu Ser Gly Gln Val Ile Gly Tyr Asp Pro Ser Val Gln Gly
 260 265 270

Leu Ile Ile Arg Val Asn Leu Met Arg Thr Gln Lys Ile Asp Arg Ala
 275 280 285

Leu Val Tyr Gln Pro Tyr Val Leu Pro Ile Thr Leu Asn Ser Asn Ile
 290 295 300

Val Thr Pro Ile Ala Pro Glu Cys Val Ile Gln Lys Gly Thr Ile Ile
 305 310 315 320

Glu Gly Met Ser Arg Lys Asp Cys Thr Glu Leu Glu Gln Asp Ile Ile
 325 330 335

Cys Arg Thr Val Thr Thr Tyr Thr Leu Ala Arg Asp Thr Arg Leu Cys
 340 345 350

Leu Gln Gly Asn Ile Ser Ser Cys Arg Tyr Gln Gln Ser Gly Thr Gln
 355 360 365

Leu His Thr Pro Phe Ile Thr Tyr Asn Gly Ala Val Ile Ala Asn Cys
370 375 380

Asp Leu Val Ser Cys Arg Cys Leu Arg Pro Pro Met Ile Ile Thr Gln
385 390 395 400

Val Lys Gly Tyr Pro Leu Thr Ile Ile Thr Arg Ser Val Cys Gln Glu
405 410 415

Leu Ser Val Asp Asn Leu Val Leu Asn Ile Glu Thr His His Asn Phe
420 425 430

Ser Leu Asn Pro Thr Ile Ile Asp Pro Leu Thr Arg Val Ile Ala Thr
435 440 445

Thr Pro Leu Glu Ile Asp Ser Leu Ile Gln Glu Ala Gln Asp His Ala
450 455 460

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

Val Thr Gly Gly Asn Tyr Ser Asn Trp Tyr Ile Val Leu Val Ile Val
485 490 495

Leu Leu Phe Gly Asn Leu Gly Trp Ser Leu Leu Leu Thr Val Leu Leu
500 505 510

Cys Arg Ser Arg Lys Gln Gln Arg Arg Tyr Gln Gln Asp Asp Ser Val
515 520 525

Gly Ser Glu Arg Gly Val Gly Val Gly Thr Ile Gln Tyr Met Ser
530 535 540

<210> 54
<211> 541
<212> PRT

<213> Avian paramyxovirus 14

<220>

<221> MISC_FEATURE

<223> fusion protein

<400> 54

Met Glu Lys Gly Thr Val Leu Phe Leu Ala Ala Leu Thr Leu Tyr Asn
1 5 10 15

Val Lys Ala Leu Asp Asn Thr Lys Leu Leu Gly Ala Gly Ile Ala Ser
20 25 30

Gly Lys Glu His Glu Leu Lys Ile Tyr Gln Ser Ser Val Asn Gly Tyr
35 40 45

Ile Ala Val Lys Leu Ile Pro Phe Leu Pro Ser Thr Lys Arg Glu Cys
50 55 60

Tyr Asn Glu Gln Leu Lys Asn Tyr Asn Ala Thr Ile Asn Arg Leu Met
65 70 75 80

Gly Pro Ile Asn Asp Asn Ile Lys Leu Val Leu Ser Gly Val Lys Thr
85 90 95

Arg Thr Arg Glu Gly Lys Leu Ile Gly Ala Ile Ile Gly Thr Ala Ala
100 105 110

Leu Gly Leu Ala Thr Ala Ala Gln Val Thr Ala Ala Ile Ala Leu Glu
115 120 125

Gln Ala Gln Asp Asn Ala Arg Ala Ile Leu Thr Leu Lys Glu Ser Ile
130 135 140

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

Val Ser Ile Ala Leu Ser Lys Thr Gln Asp Tyr Ile Asn Thr Gln Ile
165 170 175

Met Pro Ala Leu Ser Asn Leu Ser Cys Glu Ile Val Gly Leu Lys Ile
180 185 190

Gly Ile Gln Leu Ser Gln Tyr Leu Thr Glu Val Thr Ala Val Phe Gly
195 200 205

Asn Gln Ile Thr Asn Pro Ala Leu Gln Pro Leu Ser Met Gln Ala Leu
210 215 220

Tyr Gln Leu Cys Gly Gly Asp Phe Ser Leu Leu Leu Asp Lys Ile Gly
225 230 235 240

Ala Asp Arg Asn Glu Leu Glu Ser Leu Tyr Glu Ala Asn Leu Val Thr
245 250 255

Gly Arg Ile Val Gln Tyr Asp Thr Ala Asp Gln Leu Val Ile Ile Gln
260 265 270

Val Ser Ile Pro Ser Val Ser Thr Leu Ser Gly Tyr Arg Val Thr Glu
275 280 285

Leu Gln Ser Ile Ser Val Asp Met Asp His Gly Glu Gly Lys Ala Val
290 295 300

Ile Pro Arg Tyr Ile Val Thr Ser Gly Arg Val Ile Glu Glu Met Asp
305 310 315 320

Ile Ser Pro Cys Val Leu Thr Ala Thr Ala Val Tyr Cys Asn Arg Leu
325 330 335

Leu Thr Thr Ser Leu Pro Glu Ser Val Leu Lys Cys Leu Asp Gly Asp
340 345 350

His Ser Ser Cys Thr Tyr Thr Ser Asn Ser Gly Val Leu Glu Thr Arg

355

360

365

Tyr Ile Ala Phe Asp Gly Met Leu Ile Ala Asn Cys Arg Ser Ile Val
 370 375 380

Cys Lys Cys Leu Asp Pro Pro Tyr Ile Ile Pro Gln Asn Lys Gly Lys
 385 390 395 400

Pro Leu Thr Ile Ile Ser Lys Glu Val Cys Lys Lys Val Thr Leu Asp
 405 410 415

Gly Ile Thr Leu Leu Ile Asp Ala Glu Phe Thr Gly Glu Tyr Gly Leu
 420 425 430

Asn Ile Thr Ile Gly Pro Asp Gln Phe Ala Pro Ser Gly Ala Leu Asp
 435 440 445

Ile Ser Thr Glu Leu Gly Lys Leu Asn Asn Ser Ile Asn Lys Ala Glu
 450 455 460

Asp Tyr Ile Asp Lys Ser Asn Glu Leu Leu Asn Arg Val Asn Val Asp
 465 470 475 480

Ile Val Asn Asp Thr Ala Val Ile Val Leu Cys Val Met Ser Ala Leu
 485 490 495

Val Val Val Trp Cys Ile Gly Leu Thr Val Gly Leu Ile Tyr Val Ser
 500 505 510

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

Pro Tyr Val Ser Ser Gly Lys His Ala Lys Asn Ser Ser
 530 535 540

<210> 55

<211> 551

<212> PRT
<213> Avian paramyxovirus UPO216

<220>
<221> MISC_FEATURE
<223> fusion protein

<400> 55

Met Ile Phe Thr Met Tyr His Val Thr Val Leu Leu Leu Leu Ser Leu
1 5 10 15

Leu Thr Leu Pro Leu Gly Ile Gln Leu Ala Arg Ala Ser Ile Asp Gly
20 25 30

Arg Gln Leu Ala Ala Ala Gly Ile Val Val Thr Gly Glu Lys Ala Ile
35 40 45

Asn Leu Tyr Thr Ser Ser Gln Thr Gly Thr Ile Val Val Lys Leu Leu
50 55 60

Pro Asn Val Pro Gln Gly Arg Glu Ala Cys Met Arg Asp Pro Leu Thr
65 70 75 80

Ser Tyr Asn Lys Thr Leu Thr Ser Leu Leu Ser Pro Leu Gly Glu Ala
85 90 95

Ile Arg Arg Ile His Glu Ser Thr Thr Glu Thr Ala Gly Leu Val Gln
100 105 110

Ala Arg Leu Val Gly Ala Ile Ile Gly Ser Val Ala Leu Gly Val Ala
115 120 125

Thr Ser Ala Gln Ile Thr Ala Ala Ala Ala Leu Ile Gln Ala Asn Lys
130 135 140

Asn Ala Glu Asn Ile Leu Lys Leu Lys Gln Ser Ile Ala Ala Thr Asn
145 150 155 160

Glu Ala Val His Glu Val Thr Asp Gly Leu Ser Gln Leu Ala Val Ala
165 170 175

Val Gly Lys Met Gln Asp Phe Ile Asn Thr Gln Phe Asn Asn Thr Ala
180 185 190

Gln Glu Ile Asp Cys Ile Arg Ile Ser Gln Gln Leu Gly Val Glu Leu
195 200 205

Asn Leu Tyr Leu Thr Glu Leu Thr Thr Val Phe Gly Pro Gln Ile Thr
210 215 220

Ser Pro Ala Leu Ser Pro Leu Ser Ile Gln Ala Leu Tyr Asn Leu Ala
225 230 235 240

Gly Gly Asn Leu Asp Val Leu Leu Ser Lys Ile Gly Val Gly Asn Asn
245 250 255

Gln Leu Ser Ala Leu Ile Ser Ser Gly Leu Ile Ser Gly Ser Pro Ile
260 265 270

Leu Tyr Asp Ser Gln Thr Gln Leu Leu Gly Ile Gln Val Thr Leu Pro
275 280 285

Ser Val Ser Ser Leu Asn Asn Met Arg Ala Ile Phe Leu Glu Thr Leu
290 295 300

Ser Val Ser Thr Asp Lys Gly Phe Ala Ala Ala Leu Ile Pro Lys Val
305 310 315 320

Val Thr Thr Val Gly Thr Val Thr Glu Glu Leu Asp Thr Ser Tyr Cys
325 330 335

Ile Glu Thr Asp Ile Asp Leu Phe Cys Thr Arg Ile Val Thr Phe Pro
340 345 350

Met Ser Pro Gly Ile Tyr Ala Cys Leu Asn Gly Asn Thr Ser Glu Cys
355 360 365

Met Tyr Ser Lys Thr Gln Gly Ala Leu Thr Thr Pro Tyr Met Ser Val
370 375 380

Lys Gly Ser Ile Val Ala Asn Cys Lys Met Thr Thr Cys Arg Cys Ala
385 390 395 400

Asp Pro Ala Ser Ile Ile Ser Gln Asn Tyr Gly Glu Ala Val Ser Leu
405 410 415

Ile Asp Ser Ser Val Cys Arg Val Ile Thr Leu Asp Gly Val Thr Leu
420 425 430

Arg Leu Ser Gly Ser Phe Asp Ser Thr Tyr Gln Lys Asn Ile Thr Ile
435 440 445

Arg Asp Ser Gln Val Ile Ile Thr Gly Ser Leu Asp Ile Ser Thr Glu
450 455 460

Leu Gly Asn Val Asn Asn Ser Ile Asn Asn Ala Leu Asp Lys Ile Glu
465 470 475 480

Glu Ser Asn Gln Ile Leu Glu Ser Val Asn Val Ser Leu Thr Ser Thr
485 490 495

Asn Ala Leu Ile Val Tyr Ile Ile Cys Thr Ala Leu Ala Leu Ile Cys
500 505 510

Gly Ile Thr Gly Leu Ile Leu Ser Cys Tyr Ile Met Tyr Lys Met Arg
515 520 525

Ser Gln Gln Lys Thr Leu Met Trp Leu Gly Asn Asn Thr Leu Asp Gln
530 535 540

Met Arg Ala Gln Thr Lys Met

545

550

<210> 56
 <211> 552
 <212> PRT
 <213> Atlantic salmon paramyxovirus

<220>
 <221> MISC_FEATURE
 <223> fusion protein

<400> 56

Met Asp Gly Pro Lys Phe Arg Phe Val Leu Leu Ile Leu Leu Thr Ala
 1 5 10 15

Pro Ala Arg Gly Gln Val Asp Tyr Asp Lys Leu Leu Lys Val Gly Ile
 20 25 30

Phe Glu Lys Gly Thr Ala Asn Leu Lys Ile Ser Val Ser Ser Gln Gln
 35 40 45

Arg Tyr Met Val Ile Lys Met Met Pro Asn Leu Gly Pro Met Asn Gln
 50 55 60

Cys Gly Ile Lys Glu Val Asn Leu Tyr Lys Glu Ser Ile Leu Arg Leu
 65 70 75 80

Ile Thr Pro Ile Ser Thr Thr Leu Asn Tyr Ile Lys Ser Glu Ile Gln
 85 90 95

Val Glu Arg Glu Val Ala Leu Gln Pro Asn Gly Thr Ile Val Arg Phe
 100 105 110

Phe Gly Leu Ile Val Ala Ala Gly Ala Leu Thr Leu Ala Thr Ser Ala
 115 120 125

Gln Ile Thr Ala Gly Ile Ala Leu His Asn Ser Leu Glu Asn Ala Lys
 130 135 140

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

Gln Lys Ile Gln Asp Ala Thr Ala Gly Thr Val Ile Ala Leu Asn Ala
165 170 175

Leu Gln Asp Gln Val Asn Thr Asn Ile Ile Pro Ala Ile Asn Thr Leu
180 185 190

Gly Cys Thr Ala Ala Gly Asn Thr Leu Gly Ile Ala Leu Thr Arg Tyr
195 200 205

Tyr Ser Glu Leu Ile Met Ile Phe Gly Pro Ser Leu Gly Asn Pro Val
210 215 220

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

Leu His Gly Met Ile Arg Glu Tyr Gly Tyr Thr Pro Ser Asp Ile Glu
245 250 255

Asp Ile Leu Arg Thr Asn Ser Val Thr Gly Arg Val Ile Asp Val Asp
260 265 270

Leu Val Gly Met Asn Ile Val Leu Glu Ile Asn Leu Pro Thr Leu Tyr
275 280 285

Thr Leu Arg Asp Thr Lys Ile Val Asn Leu Gly Lys Ile Thr Tyr Asn
290 295 300

Val Asp Gly Ser Glu Trp Gln Thr Leu Val Pro Glu Trp Leu Ala Ile
305 310 315 320

Arg Asn Thr Leu Met Gly Gly Val Asp Leu Ser Arg Cys Val Val Ser
325 330 335

Ser Arg Asp Leu Ile Cys Lys Gln Asp Pro Val Phe Ser Leu Asp Thr
340 345 350

Ser Ile Ile Ser Cys Leu Asn Gly Asn Thr Glu Ser Cys Pro Arg Asn
355 360 365

Arg Val Val Asn Ser Val Ala Pro Arg Tyr Ala Val Ile Arg Gly Asn
370 375 380

Ile Leu Ala Asn Cys Ile Ser Thr Thr Cys Leu Cys Gly Asp Pro Gly
385 390 395 400

Val Pro Ile Ile Gln Lys Gly Asp Asn Thr Leu Thr Ala Met Ser Ile
405 410 415

Asn Asp Cys Lys Leu Val Gly Val Asp Gly Tyr Val Phe Arg Pro Gly
420 425 430

Pro Lys Ala Val Asn Val Thr Phe Asn Leu Pro His Leu Asn Leu Gly
435 440 445

Pro Glu Val Asn Val Asn Pro Val Asp Ile Ser Gly Ala Leu Gly Lys
450 455 460

Val Glu Gln Asp Leu Ala Ser Ser Arg Asp His Leu Ala Lys Ser Glu
465 470 475 480

Lys Ile Leu Ser Gly Ile Asn Pro Asn Ile Ile Asn Thr Glu Met Val
485 490 495

Leu Val Ala Val Ile Leu Ser Leu Val Cys Ala Met Val Val Ile Gly
500 505 510

Ile Val Cys Trp Leu Ser Ile Leu Thr Lys Trp Val Arg Ser Cys Arg
515 520 525

Ala Asp Cys Arg Arg Pro Asn Lys Gly Pro Asp Leu Gly Pro Ile Met
530 535 540

Ser Ser Gln Asp Asn Leu Ser Phe
545 550

<210> 57
<211> 321
<212> PRT
<213> Human respiratory syncytial virus

<220>
<221> MISC_FEATURE
<223> attachment glycoprotein

<400> 57

Met Ser Lys Thr Lys Asp Gln Arg Thr Ala Lys Thr Leu Glu Arg Thr
1 5 10 15

Trp Asp Thr Leu Asn His Leu Leu Phe Ile Ser Ser Cys Leu Tyr Lys
20 25 30

Leu Asn Leu Lys Ser Ile Ala Gln Ile Thr Leu Ser Ile Leu Ala Met
35 40 45

Ile Ile Ser Thr Ser Leu Ile Ile Ala Ala Ile Ile Phe Ile Ala Ser
50 55 60

Ala Asn His Lys Val Thr Leu Thr Thr Ala Ile Ile Gln Asp Ala Thr
65 70 75 80

Asn Gln Ile Lys Asn Thr Thr Pro Thr Tyr Leu Thr Gln Asn Pro Gln
85 90 95

Leu Gly Ile Ser Phe Ser Asn Leu Ser Gly Thr Thr Leu Gln Ser Thr
100 105 110

Thr Ile Leu Ala Ser Thr Thr Pro Ser Ala Glu Ser Thr Pro Gln Ser

115

120

125

Thr Thr Val Lys Ile Ile Asn Thr Thr Thr Thr Gln Ile Leu Pro Ser
 130 135 140

Lys Pro Thr Thr Lys Gln Arg Gln Asn Lys Pro Gln Asn Lys Pro Asn
 145 150 155 160

Asn Asp Phe His Phe Glu Val Phe Asn Phe Val Pro Cys Ser Ile Cys
 165 170 175

Ser Asn Asn Pro Thr Cys Trp Ala Ile Cys Lys Arg Ile Pro Asn Lys
 180 185 190

Lys Pro Gly Lys Lys Thr Thr Thr Lys Pro Thr Lys Lys Pro Thr Leu
 195 200 205

Lys Thr Thr Lys Lys Asp Pro Lys Pro Gln Thr Thr Lys Pro Lys Glu
 210 215 220

Ala Leu Thr Thr Lys Pro Thr Gly Lys Pro Thr Ile Asn Thr Thr Lys
 225 230 235 240

Thr Asn Ile Arg Thr Thr Leu Leu Thr Ser Asn Thr Lys Gly Asn Pro
 245 250 255

Glu His Thr Ser Gln Glu Glu Thr Leu His Ser Thr Thr Ser Glu Gly
 260 265 270

Tyr Leu Ser Pro Ser Gln Val Tyr Thr Thr Ser Gly Gln Glu Glu Thr
 275 280 285

Leu His Ser Thr Thr Ser Glu Gly Tyr Leu Ser Pro Ser Gln Val Tyr
 290 295 300

Thr Thr Ser Glu Tyr Leu Ser Gln Ser Leu Ser Ser Ser Asn Thr Thr
 305 310 315 320

Lys

<210> 58
<211> 616
<212> PRT
<213> Newcastle disease virus

<220>
<221> MISC_FEATURE
<223> hemagglutinin-neuraminidase protein

<400> 58

Met Glu Arg Gly Val Ser Gln Val Ala Leu Glu Asn Asp Glu Arg Glu
1 5 10 15

Ala Lys Asn Thr Trp Arg Leu Val Phe Arg Val Thr Val Leu Phe Leu
20 25 30

Thr Ile Val Thr Leu Ala Ile Ser Ala Ala Ala Leu Ala Phe Ser Met
35 40 45

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

Lys Val Glu Asp Lys Ile Thr Ser Ala Leu Gly Ala Ser Gln Asp Val
65 70 75 80

Met Asp Arg Ile Tyr Lys Gln Val Ala Leu Glu Ser Pro Leu Ala Leu
85 90 95

Leu Asn Thr Glu Ser Thr Ile Met Asn Ala Leu Thr Ser Leu Ser Tyr
100 105 110

Gln Ile Asn Gly Ala Ala Asn Ala Ser Gly Cys Gly Ala Pro Val Pro
115 120 125

Asp Pro Asp Tyr Ile Gly Gly Ile Gly Lys Glu Leu Ile Val Asp Asp
130 135 140

Thr Ser Asp Val Thr Ser Phe Tyr Pro Ser Ala Phe Gln Glu His Leu
145 150 155 160

Asn Phe Ile Pro Ala Pro Thr Thr Gly Ser Gly Cys Thr Arg Ile Pro
165 170 175

Ser Phe Asp Met Ser Ala Thr His Tyr Cys Tyr Thr His Asn Val Ile
180 185 190

Leu Ser Gly Cys Arg Asp His Ser His Ser His Gln Tyr Leu Ala Leu
195 200 205

Gly Val Leu Arg Thr Ser Ala Thr Gly Arg Val Phe Phe Ser Thr Leu
210 215 220

Arg Ser Ile Asn Leu Asp Asp Thr Gln Asn Arg Lys Ser Cys Ser Val
225 230 235 240

Ser Ala Thr Pro Leu Gly Cys Asp Met Leu Cys Ser Lys Val Thr Glu
245 250 255

Thr Glu Glu Glu Asp Tyr Gln Ser Thr Asp Pro Thr Leu Met Val His
260 265 270

Gly Arg Leu Gly Phe Asp Gly Gln Tyr His Glu Arg Asp Leu Asp Val
275 280 285

His Thr Leu Phe Gly Asp Trp Val Ala Asn Tyr Pro Gly Val Gly Gly
290 295 300

Gly Ser Phe Ile Asn Asn Arg Val Trp Phe Pro Val Tyr Gly Gly Leu
305 310 315 320

Lys Pro Gly Ser Pro Thr Asp Lys Arg Gln Glu Gly Gln Tyr Ala Ile
325 330 335

Tyr Lys Arg Tyr Asn Asp Thr Cys Pro Asp Asp Gln Glu Tyr Gln Val
340 345 350

Arg Met Ala Lys Ser Ala Tyr Lys Pro Asn Arg Phe Gly Gly Lys Arg
355 360 365

Val Gln Gln Ala Ile Leu Ser Ile Gly Val Ser Thr Thr Leu Ala Asp
370 375 380

Asp Pro Val Leu Thr Val Thr Ser Asn Thr Ile Thr Leu Met Gly Ala
385 390 395 400

Glu Gly Arg Val Met Thr Val Gly Thr Ser His Tyr Leu Tyr Gln Arg
405 410 415

Gly Ser Ser Tyr Tyr Ser Pro Ala Ile Leu Tyr Pro Leu Thr Ile Ala
420 425 430

Asn Lys Thr Ala Thr Leu Gln Asp Pro Tyr Lys Phe Asn Ala Phe Thr
435 440 445

Arg Pro Gly Ser Val Pro Cys Gln Ala Ser Ala Arg Cys Pro Asn Ser
450 455 460

Cys Val Thr Gly Val Tyr Thr Asp Pro Tyr Pro Ile Val Phe His Lys
465 470 475 480

Asn His Thr Leu Arg Gly Val Phe Gly Thr Met Leu Asp Asp Glu Gln
485 490 495

Ala Arg Leu Asn Pro Val Ser Ala Val Phe Asp Ser Ile Ala Arg Ser
500 505 510

Arg Val Thr Arg Val Ser Ser Ser Ser Thr Lys Ala Ala Tyr Thr Thr

515

520

525

Ser Thr Cys Phe Lys Val Val Lys Thr Gly Lys Val Tyr Cys Leu Ser
 530 535 540

Ile Ala Glu Ile Ser Asn Thr Leu Phe Gly Glu Phe Arg Ile Val Pro
 545 550 555 560

Leu Leu Val Glu Ile Leu Arg Asp Glu Gly Arg Ser Glu Ala Arg Ser
 565 570 575

Ala Leu Thr Thr Gln Gly His Pro Gly Trp Asn Asp Glu Val Val Asp
 580 585 590

Pro Ile Phe Cys Ala Val Thr Asn Gln Thr Asp His Arg Gln Lys Leu
 595 600 605

Glu Glu Tyr Ala Gln Ser Trp Pro
 610 615

<210> 59
 <211> 316
 <212> PRT
 <213> Human respiratory syncytial virus

<220>
 <221> MISC_FEATURE
 <223> receptor-binding glycoprotein

<400> 59

Met Ser Lys Asn Lys Asn Gln Arg Thr Ala Arg Thr Leu Glu Lys Thr
 1 5 10 15

Trp Asp Thr Leu Asn His Leu Ile Val Ile Ser Ser Cys Leu Tyr Lys
 20 25 30

Leu Asn Leu Lys Ser Ile Ala Gln Ile Ala Leu Ser Val Leu Ala Met
 35 40 45

Ile Ile Ser Thr Ser Leu Ile Ile Ala Ala Ile Ile Phe Ile Ile Ser
50 55 60

Ala Asn His Lys Val Thr Leu Thr Thr Val Thr Val Gln Thr Ile Lys
65 70 75 80

Asn His Thr Glu Lys Asn Ile Thr Thr Tyr Leu Thr Gln Val Ser Pro
85 90 95

Glu Arg Val Ser Pro Ser Lys Gln Pro Thr Thr Thr Pro Pro Ile His
100 105 110

Thr Asn Ser Ala Thr Ile Ser Pro Asn Thr Lys Ser Glu Thr His His
115 120 125

Thr Thr Ala Gln Thr Lys Gly Arg Thr Thr Thr Pro Thr Gln Asn Asn
130 135 140

Lys Pro Ser Thr Lys Pro Arg Pro Lys Asn Pro Pro Lys Lys Pro Lys
145 150 155 160

Asp Asp Tyr His Phe Glu Val Phe Asn Phe Val Pro Cys Ser Ile Cys
165 170 175

Gly Asn Asn Gln Leu Cys Lys Ser Ile Cys Lys Thr Ile Pro Asn Asn
180 185 190

Lys Pro Lys Lys Lys Pro Thr Thr Lys Pro Thr Asn Lys Pro Pro Thr
195 200 205

Lys Thr Thr Asn Lys Arg Asp Pro Lys Thr Pro Ala Lys Thr Leu Lys
210 215 220

Lys Glu Thr Thr Ile Asn Pro Thr Thr Lys Lys Pro Thr Pro Lys Thr
225 230 235 240

Thr Glu Arg Asp Thr Ser Thr Pro Gln Ser Thr Val Leu Asp Thr Thr
245 250 255

Thr Ser Lys His Thr Glu Arg Asp Thr Ser Thr Pro Gln Ser Thr Val
260 265 270

Leu Asp Thr Thr Thr Ser Lys His Thr Ile Gln Gln Gln Ser Leu His
275 280 285

Ser Ile Thr Pro Glu Asn Thr Pro Asn Ser Thr Gln Thr Pro Thr Ala
290 295 300

Ser Glu Pro Ser Thr Ser Asn Ser Thr Gln Lys Leu
305 310 315

<210> 60
<211> 621
<212> PRT
<213> Measles virus

<220>
<221> MISC_FEATURE
<223> Hemagglutinin

<400> 60

Met Ser Pro His Arg Asp Arg Ile Asn Ala Phe Tyr Arg Asp Asn Pro
1 5 10 15

His Pro Lys Gly Ser Arg Ile Val Ile Asn Arg Glu His Leu Met Ile
20 25 30

Asp Arg Pro Tyr Val Leu Leu Ala Val Leu Phe Val Met Phe Leu Ser
35 40 45

Leu Ile Gly Leu Leu Ala Ile Ala Gly Ile Arg Leu His Arg Ala Ala
50 55 60

Ile Tyr Thr Ala Glu Ile His Lys Ser Leu Ser Thr Asn Leu Asp Val
65 70 75 80

Thr Asn Ser Ile Glu His Gln Val Lys Asp Val Leu Thr Pro Leu Phe
85 90 95

Lys Ile Ile Gly Asp Glu Val Gly Leu Arg Thr Pro Gln Arg Phe Thr
100 105 110

Asp Leu Val Lys Phe Ile Ser Asp Lys Ile Lys Phe Leu Asn Pro Asp
115 120 125

Arg Glu Tyr Asp Phe Arg Asp Leu Thr Trp Cys Ile Asn Pro Pro Glu
130 135 140

Arg Ile Lys Leu Asp Tyr Asp Gln Tyr Cys Ala Asp Val Ala Ala Glu
145 150 155 160

Glu Leu Met Asn Ala Leu Val Asn Ser Thr Leu Leu Glu Ala Arg Ala
165 170 175

Thr Asn Gln Phe Leu Ala Val Ser Lys Gly Asn Cys Ser Gly Pro Thr
180 185 190

Thr Ile Arg Gly Gln Phe Ser Asn Met Ser Leu Ser Leu Leu Asp Leu
195 200 205

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

Gln Gly Met Tyr Gly Gly Thr Tyr Leu Val Gly Lys Pro Asn Leu Ser
225 230 235 240

Ser Lys Gly Ser Glu Leu Ser Gln Leu Ser Met His Arg Val Phe Glu
245 250 255

Val Gly Val Ile Arg Asn Pro Gly Leu Gly Ala Pro Val Phe His Met

260

265

270

Thr Asn Tyr Phe Glu Gln Pro Val Ser Asn Asp Phe Ser Asn Cys Met
 275 280 285

Val Ala Leu Gly Glu Leu Arg Phe Ala Ala Leu Cys His Arg Glu Asp
 290 295 300

Ser Val Thr Val Pro Tyr Gln Gly Ser Gly Lys Gly Val Ser Phe Gln
 305 310 315 320

Leu Val Lys Leu Gly Val Trp Lys Ser Pro Thr Asp Met Gln Ser Trp
 325 330 335

Val Pro Leu Ser Thr Asp Asp Pro Val Ile Asp Arg Leu Tyr Leu Ser
 340 345 350

Ser His Arg Gly Val Ile Ala Asp Asn Gln Ala Lys Trp Ala Val Pro
 355 360 365

Thr Thr Arg Thr Asp Asp Lys Leu Arg Met Glu Thr Cys Phe Gln Gln
 370 375 380

Ala Cys Lys Gly Lys Asn Gln Ala Leu Cys Glu Asn Pro Glu Trp Ala
 385 390 395 400

Pro Leu Lys Asp Asn Arg Ile Pro Ser Tyr Gly Val Leu Ser Val Asn
 405 410 415

Leu Ser Leu Thr Val Glu Leu Lys Ile Lys Ile Ala Ser Gly Phe Gly
 420 425 430

Pro Leu Ile Thr His Gly Ser Gly Met Asp Leu Tyr Lys Thr Asn His
 435 440 445

Asp Asn Val Tyr Trp Leu Thr Ile Pro Pro Met Lys Asn Leu Ala Leu
 450 455 460

Gly Val Ile Asn Thr Leu Glu Trp Ile Pro Arg Phe Lys Val Ser Pro
 465 470 475 480

Asn Leu Phe Thr Val Pro Ile Lys Glu Ala Gly Glu Asp Cys His Ala
 485 490 495

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

Asn Leu Val Ile Leu Pro Gly Gln Asp Leu Gln Tyr Val Leu Ala Thr
 515 520 525

Tyr Asp Thr Ser Arg Val Glu His Ala Val Val Tyr Tyr Val Tyr Ser
 530 535 540

Pro Ser Arg Ser Phe Ser Tyr Phe Tyr Pro Phe Arg Leu Pro Ile Lys
 545 550 555 560

Gly Val Pro Ile Glu Leu Gln Val Glu Cys Phe Thr Trp Asp Gln Lys
 565 570 575

Leu Trp Cys Arg His Phe Cys Val Leu Ala Asp Ser Glu Ser Gly Gly
 580 585 590

His Ile Thr His Ser Gly Met Val Gly Met Gly Val Ser Cys Thr Val
 595 600 605

Thr Arg Glu Asp Gly Thr Asn Arg Arg Gln Gly Cys Gln
 610 615 620

<210> 61
 <211> 582
 <212> PRT
 <213> Mumps virus

<220>

<221> MISC_FEATURE

<223> hemagglutinin-neuraminidase

<400> 61

Met Glu Pro Ser Lys Leu Phe Thr Met Ser Asp Asn Ala Thr Phe Ala
1 5 10 15

Pro Gly Pro Val Ile Asn Ala Ala Asp Lys Lys Thr Phe Arg Thr Cys
20 25 30

Phe Arg Ile Leu Val Leu Ser Val Gln Ala Val Thr Leu Ile Leu Val
35 40 45

Ile Val Thr Leu Gly Glu Leu Val Arg Met Ile Asn Asp Gln Gly Leu
50 55 60

Ser Asn Gln Leu Ser Ser Ile Ala Asp Lys Ile Arg Glu Ser Ala Thr
65 70 75 80

Met Ile Ala Ser Ala Val Gly Val Met Asn Gln Val Ile His Gly Val
85 90 95

Thr Val Ser Leu Pro Leu Gln Ile Glu Gly Asn Gln Asn Gln Leu Leu
100 105 110

Ser Thr Leu Ala Thr Ile Cys Thr Gly Lys Lys Gln Val Ser Asn Cys
115 120 125

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

Asn Lys Phe Ile Ile Glu Asp Tyr Ala Thr His Asp Phe Ser Ile Gly
145 150 155 160

His Pro Leu Asn Met Pro Ser Phe Ile Pro Thr Ala Thr Ser Pro Asn
165 170 175

Gly Cys Thr Arg Ile Pro Ser Phe Ser Leu Gly Lys Thr His Trp Cys
180 185 190

Tyr Thr His Asn Val Ile Asn Ala Asn Cys Lys Asp His Thr Ser Ser
195 200 205

Asn Gln Tyr Ile Ser Met Gly Ile Leu Val Gln Thr Ala Ser Gly Tyr
210 215 220

Pro Met Phe Lys Thr Leu Lys Ile Gln Tyr Leu Ser Asp Gly Leu Asn
225 230 235 240

Arg Lys Ser Cys Ser Ile Ala Thr Val Pro Asp Gly Cys Ala Met Tyr
245 250 255

Cys Tyr Val Ser Thr Gln Leu Glu Thr Asp Asp Tyr Ala Gly Ser Ser
260 265 270

Pro Pro Thr Gln Lys Leu Thr Leu Leu Phe Tyr Asn Asp Thr Val Thr
275 280 285

Glu Arg Thr Ile Ser Pro Thr Gly Leu Glu Gly Asn Trp Ala Thr Leu
290 295 300

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

Pro Ala Tyr Gly Gly Val Leu Pro Asn Ser Ser Leu Gly Val Lys Ser
325 330 335

Ala Arg Glu Phe Phe Arg Pro Val Asn Pro Tyr Asn Pro Cys Ser Gly
340 345 350

Pro Gln Gln Asp Leu Asp Gln Arg Ala Leu Arg Ser Tyr Phe Pro Ser
355 360 365

Tyr Phe Ser Asn Arg Arg Val Gln Ser Ala Phe Leu Val Cys Ala Trp

370

375

380

Asn Gln Ile Leu Val Thr Asn Cys Glu Leu Val Val Pro Ser Asn Asn
 385 390 395 400

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

Leu Leu Tyr Tyr Gln Arg Ser Thr Ser Trp Trp Pro Tyr Glu Leu Leu
 420 425 430

Tyr Glu Ile Ser Phe Thr Phe Thr Asn Ser Gly Gln Ser Ser Val Asn
 435 440 445

Met Ser Trp Ile Pro Ile Tyr Ser Phe Thr Arg Pro Gly Ser Gly Asn
 450 455 460

Cys Ser Gly Glu Asn Val Cys Pro Thr Ala Cys Val Ser Gly Val Tyr
 465 470 475 480

Leu Asp Pro Trp Pro Leu Thr Pro Tyr Ser His Gln Ser Gly Ile Asn
 485 490 495

Arg Asn Phe Tyr Phe Thr Gly Ala Leu Leu Asn Ser Ser Thr Thr Arg
 500 505 510

Val Asn Pro Thr Leu Tyr Val Ser Ala Leu Asn Asn Leu Lys Val Leu
 515 520 525

Ala Pro Tyr Gly Asn Gln Gly Leu Phe Ala Ser Tyr Thr Thr Thr Thr
 530 535 540

Cys Phe Gln Asp Thr Gly Asp Ala Ser Val Tyr Cys Val Tyr Ile Met
 545 550 555 560

Glu Leu Ala Ser Asn Ile Val Gly Glu Phe Gln Ile Leu Pro Val Leu
 565 570 575

Thr Arg Leu Thr Ile Thr
580

<210> 62
<211> 572
<212> PRT
<213> Human respirovirus 3

<220>
<221> MISC_FEATURE
<223> hemagglutinin-neuraminidase

<400> 62

Met Glu Tyr Trp Lys His Thr Asn His Gly Lys Asp Ala Gly Asn Glu
1 5 10 15

Leu Glu Thr Ala Thr Ala Thr His Gly Asn Arg Leu Thr Asn Lys Ile
20 25 30

Thr Tyr Ile Leu Trp Thr Ile Thr Leu Val Leu Leu Ser Ile Val Phe
35 40 45

Ile Ile Val Leu Ile Asn Ser Ile Lys Ser Glu Lys Ala His Glu Ser
50 55 60

Leu Leu Gln Asp Ile Asn Asn Glu Phe Met Glu Val Thr Glu Lys Ile
65 70 75 80

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

Thr Arg Leu Leu Thr Ile Gln Ser His Val Gln Asn Tyr Ile Pro Ile
100 105 110

Ser Leu Thr Gln Gln Ile Ser Asp Leu Arg Lys Phe Ile Ser Glu Ile
115 120 125

Thr Ile Arg Asn Asp Asn Gln Glu Val Pro Pro Gln Arg Ile Thr His
130 135 140

Asp Val Gly Ile Lys Pro Leu Asn Pro Asp Asp Phe Trp Arg Cys Thr
145 150 155 160

Ser Gly Leu Pro Ser Leu Met Arg Thr Pro Lys Ile Arg Leu Met Pro
165 170 175

Gly Pro Gly Leu Leu Ala Met Pro Thr Thr Val Asp Gly Cys Val Arg
180 185 190

Thr Pro Ser Leu Val Ile Asn Asp Leu Ile Tyr Ala Tyr Thr Ser Asn
195 200 205

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

Gln Ile Gly Ile Ile Thr Val Asn Ser Asp Leu Val Pro Asp Leu Asn
225 230 235 240

Pro Arg Ile Ser His Thr Phe Asn Ile Asn Asp Asn Arg Lys Ser Cys
245 250 255

Ser Leu Ala Leu Leu Asn Thr Asp Val Tyr Gln Leu Cys Ser Thr Pro
260 265 270

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

Val Leu Asp Ile Val Asn Tyr Asp Gly Ser Ile Ser Thr Thr Arg Phe
290 295 300

Lys Asn Asn Asn Ile Ser Phe Asp Gln Pro Tyr Ala Ala Leu Tyr Pro
305 310 315 320

Ser Val Gly Pro Gly Ile Tyr Tyr Lys Gly Lys Ile Ile Phe Leu Gly
325 330 335

Tyr Gly Gly Leu Glu His Pro Ile Asn Glu Asn Ala Ile Cys Asn Thr
340 345 350

Thr Gly Cys Pro Gly Lys Thr Gln Arg Asp Cys Asn Gln Ala Ser His
355 360 365

Ser Pro Trp Phe Ser Asp Arg Arg Met Val Asn Ser Ile Ile Val Val
370 375 380

Asp Lys Gly Leu Asn Ser Val Pro Lys Leu Lys Val Trp Thr Ile Ser
385 390 395 400

Met Arg Gln Asn Tyr Trp Gly Ser Glu Gly Arg Leu Leu Leu Leu Gly
405 410 415

Asn Lys Ile Tyr Ile Tyr Thr Arg Ser Thr Ser Trp His Ser Lys Leu
420 425 430

Gln Leu Gly Ile Ile Asp Ile Thr Asp Tyr Ser Asp Ile Arg Ile Lys
435 440 445

Trp Thr Trp His Asn Val Leu Ser Arg Pro Gly Asn Asn Glu Cys Pro
450 455 460

Trp Gly His Ser Cys Pro Asp Gly Cys Ile Thr Gly Val Tyr Thr Asp
465 470 475 480

Ala Tyr Pro Leu Asn Pro Thr Gly Ser Ile Val Ser Ser Val Ile Leu
485 490 495

Asp Ser Gln Lys Ser Arg Val Asn Pro Val Ile Thr Tyr Ser Thr Ala
500 505 510

Thr Glu Arg Val Asn Glu Leu Ala Ile Arg Asn Lys Thr Leu Ser Ala

515

520

525

Gly Tyr Thr Thr Thr Ser Cys Ile Thr His Tyr Asn Lys Gly Tyr Cys
 530 535 540

Phe His Ile Val Glu Ile Asn His Lys Ser Leu Asn Thr Phe Gln Pro
 545 550 555 560

Met Leu Phe Lys Thr Glu Ile Pro Lys Ser Cys Ser
 565 570

<210> 63
 <211> 220
 <212> PRT
 <213> Human metapneumovirus

<220>
 <221> MISC_FEATURE
 <223> attachment glycoprotein G

<400> 63

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

Arg Val Lys Asn Arg Val Ala Arg Ser Lys Cys Phe Lys Asn Ala Ser
 20 25 30

Leu Ile Leu Ile Gly Ile Thr Thr Leu Ser Ile Ala Leu Asn Ile Tyr
 35 40 45

Leu Ile Ile Asn Tyr Thr Ile Gln Lys Thr Thr Ser Glu Ser Glu His
 50 55 60

His Thr Ser Ser Pro Pro Thr Glu Ser Asn Lys Glu Thr Ser Thr Ile
 65 70 75 80

Pro Ile Asp Asn Pro Asp Ile Thr Pro Asn Ser Gln His Pro Thr Gln
 85 90 95

Gln Ser Thr Glu Ser Leu Thr Leu Tyr Pro Ala Ser Ser Met Ser Pro
100 105 110

Ser Glu Thr Glu Pro Ala Ser Thr Pro Gly Ile Thr Asn Arg Leu Ser
115 120 125

Leu Ala Asp Arg Ser Thr Thr Gln Pro Ser Glu Ser Arg Thr Lys Thr
130 135 140

Asn Ser Thr Val His Lys Lys Asn Lys Lys Asn Ile Ser Ser Thr Ile
145 150 155 160

Ser Arg Thr Gln Ser Pro Pro Arg Thr Thr Ala Lys Ala Val Ser Arg
165 170 175

Thr Thr Ala Leu Arg Met Ser Ser Thr Gly Glu Arg Pro Thr Thr Thr
180 185 190

Ser Val Gln Ser Asp Ser Ser Thr Thr Ala Gln Asn His Glu Glu Thr
195 200 205

Gly Pro Ala Asn Pro Gln Ala Ser Val Ser Thr Met
210 215 220

<210> 64
<211> 607
<212> PRT
<213> Canine distemper virus

<220>
<221> MISC_FEATURE
<223> hemagglutinin

<400> 64

Met Leu Ser Tyr Gln Asp Lys Val Gly Ala Phe Tyr Lys Asp Asn Ala
1 5 10 15

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

Arg Arg Pro Pro Tyr Leu Leu Phe Val Leu Leu Ile Leu Leu Val Gly
35 40 45

Ile Leu Ala Leu Leu Ala Ile Ala Gly Val Arg Phe Arg Gln Val Ser
50 55 60

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

Ser Glu Ala Val His His Gln Val Met Asp Val Leu Thr Pro Leu Phe
85 90 95

Lys Ile Ile Gly Asp Glu Ile Gly Leu Arg Leu Pro Gln Lys Leu Asn
100 105 110

Glu Ile Lys Gln Phe Ile Leu Gln Lys Thr Asn Phe Phe Asn Pro Asn
115 120 125

Arg Glu Phe Asp Phe Arg Asp Leu His Trp Cys Ile Asn Pro Pro Ser
130 135 140

Lys Ile Lys Val Asn Phe Thr Asn Tyr Cys Asp Ala Ile Gly Val Arg
145 150 155 160

Lys Ser Ile Ala Ser Ala Ala Asn Pro Ile Leu Leu Ser Ala Leu Ser
165 170 175

Gly Gly Arg Gly Asp Ile Phe Pro Pro Tyr Arg Cys Ser Gly Ala Thr
180 185 190

Thr Ser Val Gly Arg Val Phe Pro Leu Ser Val Ser Leu Ser Met Ser
195 200 205

Leu Ile Ser Lys Thr Ser Glu Ile Ile Ser Met Leu Thr Ala Ile Ser
210 215 220

Asp Gly Val Tyr Gly Lys Thr Tyr Leu Leu Val Pro Asp Tyr Ile Glu
225 230 235 240

Arg Glu Phe Asp Thr Gln Lys Ile Arg Val Phe Glu Ile Gly Phe Ile
245 250 255

Lys Arg Trp Leu Asn Asp Met Pro Leu Leu Gln Thr Thr Asn Tyr Met
260 265 270

Val Leu Pro Glu Asn Ser Lys Ala Lys Val Cys Thr Ile Ala Val Gly
275 280 285

Glu Leu Thr Leu Ala Ser Leu Cys Val Asp Glu Ser Thr Val Leu Leu
290 295 300

Tyr His Asp Ser Asn Gly Ser Gln Asp Ser Ile Leu Val Val Thr Leu
305 310 315 320

Gly Ile Phe Gly Ala Thr Pro Met Asn Gln Val Glu Glu Val Ile Pro
325 330 335

Val Ala His Pro Ser Val Glu Arg Ile His Ile Thr Asn His Arg Gly
340 345 350

Phe Ile Lys Asp Ser Val Ala Thr Trp Met Val Pro Ala Leu Val Ser
355 360 365

Glu Gln Gln Glu Gly Gln Lys Asn Cys Leu Glu Ser Ala Cys Gln Arg
370 375 380

Lys Ser Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Gly
385 390 395 400

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

405

410

415

Ile Asp Leu Gln Leu Asn Ile Ser Phe Thr Tyr Gly Pro Val Ile Leu
 420 425 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Asn Pro Leu Leu Asp Ser Gly
 435 440 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
 450 455 460

Lys Ala Ser Arg Gly Asp Gln Phe Thr Val Thr Pro His Val Leu Thr
 465 470 475 480

Phe Ala Pro Arg Glu Ser Ser Gly Asn Cys Tyr Leu Pro Ile Gln Thr
 485 490 495

Ser Gln Ile Met Asp Lys Asp Val Leu Thr Glu Ser Asn Leu Val Val
 500 505 510

Leu Pro Thr Gln Asn Phe Arg Tyr Val Val Ala Thr Tyr Asp Ile Ser
 515 520 525

Arg Glu Asn His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ile Arg Thr
 530 535 540

Ile Ser Tyr Thr Tyr Pro Phe Arg Leu Thr Thr Lys Gly Arg Pro Asp
 545 550 555 560

Phe Leu Arg Ile Glu Cys Phe Val Trp Asp Asp Asp Leu Trp Cys His
 565 570 575

Gln Phe Tyr Arg Phe Glu Ser Asp Ile Thr Asn Ser Thr Thr Ser Val
 580 585 590

Glu Asp Leu Val Arg Ile Arg Phe Ser Cys Asn Arg Ser Lys Pro
 595 600 605

<210> 65
 <211> 609
 <212> PRT
 <213> Peste-des-petits-ruminants virus

<220>
 <221> MISC_FEATURE
 <223> haemagglutinin

<400> 65

Met Ser Ala Gln Arg Glu Arg Ile Asn Ala Phe Tyr Lys Asp Asn Pro
 1 5 10 15

His Asn Lys Asn His Arg Val Ile Leu Asp Arg Glu Arg Leu Val Ile
 20 25 30

Glu Arg Pro Tyr Ile Leu Leu Gly Val Leu Leu Val Met Phe Leu Ser
 35 40 45

Leu Ile Gly Leu Leu Ala Ile Ala Gly Ile Arg Leu His Arg Ala Thr
 50 55 60

Val Gly Thr Ser Glu Ile Gln Ser Arg Leu Asn Thr Asn Ile Glu Leu
 65 70 75 80

Thr Glu Ser Ile Asp His Gln Thr Lys Asp Val Leu Thr Pro Leu Phe
 85 90 95

Lys Ile Ile Gly Asp Glu Val Gly Ile Arg Ile Pro Gln Lys Phe Ser
 100 105 110

Asp Leu Val Lys Phe Ile Ser Asp Lys Ile Lys Phe Leu Asn Pro Asp
 115 120 125

Arg Glu Tyr Asp Phe Arg Asp Leu Arg Trp Cys Met Asn Pro Pro Glu
 130 135 140

Arg Val Lys Ile Asn Phe Asp Gln Phe Cys Glu Tyr Lys Ala Ala Val
145 150 155 160

Lys Ser Ile Glu His Ile Phe Glu Ser Pro Leu Asn Lys Ser Lys Lys
165 170 175

Leu Gln Ser Leu Thr Leu Gly Pro Gly Thr Gly Cys Leu Gly Arg Thr
180 185 190

Val Thr Arg Ala His Phe Ser Glu Leu Thr Leu Thr Leu Met Asp Leu
195 200 205

Asp Leu Glu Met Lys His Asn Val Ser Ser Val Phe Thr Val Val Glu
210 215 220

Glu Gly Leu Phe Gly Arg Thr Tyr Thr Val Trp Arg Ser Asp Ala Arg
225 230 235 240

Asp Pro Ser Thr Asp Leu Gly Ile Gly His Phe Leu Arg Val Phe Glu
245 250 255

Ile Gly Leu Val Arg Asp Leu Gly Leu Gly Pro Pro Val Phe His Met
260 265 270

Thr Asn Tyr Leu Thr Val Asn Met Ser Asp Asp Tyr Arg Arg Cys Leu
275 280 285

Leu Ala Val Gly Glu Leu Lys Leu Thr Ala Leu Cys Ser Ser Ser Glu
290 295 300

Thr Val Thr Leu Gly Glu Arg Gly Val Pro Lys Arg Glu Pro Leu Val
305 310 315 320

Val Val Ile Leu Asn Leu Ala Gly Pro Thr Leu Gly Gly Glu Leu Tyr
325 330 335

Ser Val Leu Pro Thr Ser Asp Leu Met Val Glu Lys Leu Tyr Leu Ser
340 345 350

Ser His Arg Gly Ile Ile Lys Asp Asp Glu Ala Asn Trp Val Val Pro
355 360 365

Ser Thr Asp Val Arg Asp Leu Gln Asn Lys Gly Glu Cys Leu Val Glu
370 375 380

Ala Cys Lys Thr Arg Pro Pro Ser Phe Cys Asn Gly Thr Gly Ser Gly
385 390 395 400

Pro Trp Ser Glu Gly Arg Ile Pro Ala Tyr Gly Val Ile Arg Val Ser
405 410 415

Leu Asp Leu Ala Ser Asp Pro Gly Val Val Ile Thr Ser Val Phe Gly
420 425 430

Pro Leu Ile Pro His Leu Ser Gly Met Asp Leu Tyr Asn Asn Pro Phe
435 440 445

Ser Arg Ala Val Trp Leu Ala Val Pro Pro Tyr Glu Gln Ser Phe Leu
450 455 460

Gly Met Ile Asn Thr Ile Gly Phe Pro Asn Arg Ala Glu Val Met Pro
465 470 475 480

His Ile Leu Thr Thr Glu Ile Arg Gly Pro Arg Gly Arg Cys His Val
485 490 495

Pro Ile Glu Leu Ser Arg Arg Val Asp Asp Asp Ile Lys Ile Gly Ser
500 505 510

Asn Met Val Ile Leu Pro Thr Ile Asp Leu Arg Tyr Ile Thr Ala Thr
515 520 525

Tyr Asp Val Ser Arg Ser Glu His Ala Ile Val Tyr Tyr Ile Tyr Asp

530

535

540

Thr Gly Arg Ser Ser Ser Tyr Phe Tyr Pro Val Arg Leu Asn Phe Lys
 545 550 555 560

Gly Asn Pro Leu Ser Leu Arg Ile Glu Cys Phe Pro Trp Arg His Lys
 565 570 575

Val Trp Cys Tyr His Asp Cys Leu Ile Tyr Asn Thr Ile Thr Asp Glu
 580 585 590

Glu Val His Thr Arg Gly Leu Thr Gly Ile Glu Val Thr Cys Asn Pro
 595 600 605

Val

<210> 66
 <211> 575
 <212> PRT
 <213> Sendai virus

<220>
 <221> MISC_FEATURE
 <223> hemagglutinin-neuraminidase protein

<400> 66

Met Asp Gly Asp Arg Ser Lys Arg Asp Ser Tyr Trp Ser Thr Ser Pro
 1 5 10 15

Gly Gly Ser Thr Thr Lys Leu Val Ser Asp Ser Glu Arg Ser Gly Lys
 20 25 30

Val Asp Thr Trp Leu Leu Ile Leu Ala Phe Thr Gln Trp Ala Leu Ser
 35 40 45

Ile Ala Thr Val Ile Ile Cys Ile Val Ile Ala Ala Arg Gln Gly Tyr
 50 55 60

Ser Met Glu Arg Tyr Ser Met Thr Val Glu Ala Leu Asn Thr Ser Asn
65 70 75 80

Lys Glu Val Lys Glu Ser Leu Thr Ser Leu Ile Arg Gln Glu Val Ile
85 90 95

Thr Arg Ala Ala Asn Ile Gln Ser Ser Val Gln Thr Gly Ile Pro Val
100 105 110

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

Cys Asn Arg Gln Glu Leu Thr Gln Leu Cys Asp Ser Thr Ile Ala Val
130 135 140

His His Ala Glu Gly Ile Ala Pro Leu Glu Pro His Ser Phe Trp Arg
145 150 155 160

Cys Pro Ala Gly Glu Pro Tyr Leu Ser Ser Asp Pro Glu Val Ser Leu
165 170 175

Leu Pro Gly Pro Ser Leu Leu Ser Gly Ser Thr Thr Ile Ser Gly Cys
180 185 190

Val Arg Leu Pro Ser Leu Ser Ile Gly Glu Ala Ile Tyr Ala Tyr Ser
195 200 205

Ser Asn Leu Ile Thr Gln Gly Cys Ala Asp Ile Gly Lys Ser Tyr Gln
210 215 220

Val Leu Gln Leu Gly Tyr Ile Ser Leu Asn Ser Asp Met Phe Pro Asp
225 230 235 240

Leu Asn Pro Val Val Ser His Thr Tyr Asp Ile Asn Asp Asn Arg Lys
245 250 255

Ser Cys Ser Val Val Ala Thr Gly Thr Arg Gly Tyr Gln Leu Cys Ser
260 265 270

Met Pro Ile Val Asp Glu Arg Thr Asp Tyr Ser Ser Asp Gly Ile Glu
275 280 285

Asp Leu Val Leu Asp Ile Leu Asp Leu Lys Gly Arg Thr Lys Ser His
290 295 300

Arg Tyr Ser Asn Ser Glu Ile Asp Leu Asp His Pro Phe Ser Ala Leu
305 310 315 320

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

Leu Gly Tyr Gly Gly Leu Thr Thr Pro Leu Gln Gly Asp Thr Lys Cys
340 345 350

Arg Ile Gln Gly Cys Gln Gln Val Ser Gln Asp Thr Cys Asn Glu Ala
355 360 365

Leu Lys Ile Thr Trp Leu Gly Gly Lys Gln Val Val Ser Val Leu Ile
370 375 380

Gln Val Asn Asp Tyr Leu Ser Glu Arg Pro Arg Ile Arg Val Thr Thr
385 390 395 400

Ile Pro Ile Thr Gln Asn Tyr Leu Gly Ala Glu Gly Arg Leu Leu Lys
405 410 415

Leu Gly Asp Gln Val Tyr Ile Tyr Thr Arg Ser Ser Gly Trp His Ser
420 425 430

Gln Leu Gln Ile Gly Val Leu Asp Val Ser His Pro Leu Thr Ile Ser
435 440 445

Trp Thr Pro His Glu Ala Leu Ser Arg Pro Gly Asn Glu Asp Cys Asn
450 455 460

Trp Tyr Asn Thr Cys Pro Lys Glu Cys Ile Ser Gly Val Tyr Thr Asp
465 470 475 480

Ala Tyr Pro Leu Ser Pro Asp Ala Ala Asn Val Ala Thr Val Thr Leu
485 490 495

Tyr Ala Asn Thr Ser Arg Val Asn Pro Thr Ile Met Tyr Ser Asn Thr
500 505 510

Thr Asn Ile Ile Asn Met Leu Arg Ile Lys Asp Val Gln Leu Glu Ala
515 520 525

Ala Tyr Thr Thr Thr Ser Cys Ile Thr His Phe Gly Lys Gly Tyr Cys
530 535 540

Phe His Ile Ile Glu Ile Asn Gln Lys Ser Leu Asn Thr Leu Gln Pro
545 550 555 560

Met Leu Phe Lys Thr Ser Ile Pro Lys Leu Cys Lys Ala Glu Ser
565 570 575

<210> 67
<211> 575
<212> PRT
<213> Human parainfluenza virus 1 strain Washington/1964

<220>
<221> MISC_FEATURE
<223> HN glycoprotein

<400> 67

Met Ala Glu Lys Gly Lys Thr Asn Ser Ser Tyr Trp Ser Thr Thr Arg
1 5 10 15

Asn Asp Asn Ser Thr Val Asn Thr His Ile Asn Thr Pro Ala Gly Arg

20

25

30

Thr His Ile Trp Leu Leu Ile Ala Thr Thr Met His Thr Val Leu Ser
 35 40 45

Phe Ile Ile Met Ile Leu Cys Ile Asp Leu Ile Ile Lys Gln Asp Thr
 50 55 60

Cys Met Lys Thr Asn Ile Met Thr Val Ser Ser Met Asn Glu Ser Ala
 65 70 75 80

Lys Ile Ile Lys Glu Thr Ile Thr Glu Leu Ile Arg Gln Glu Val Ile
 85 90 95

Ser Arg Thr Ile Asn Ile Gln Ser Ser Val Gln Ser Gly Ile Pro Ile
 100 105 110

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

Cys Asn Arg Gln Glu Leu Ala Gln Ile Cys Glu Asn Thr Ile Ala Ile
 130 135 140

His His Ala Asp Gly Ile Ser Pro Leu Asp Pro His Asp Phe Trp Arg
 145 150 155 160

Cys Pro Val Gly Glu Pro Leu Leu Ser Asn Asn Pro Asn Ile Ser Leu
 165 170 175

Leu Pro Gly Pro Ser Leu Leu Ser Gly Ser Thr Thr Ile Ser Gly Cys
 180 185 190

Val Arg Leu Pro Ser Leu Ser Ile Gly Asp Ala Ile Tyr Ala Tyr Ser
 195 200 205

Ser Asn Leu Ile Thr Gln Gly Cys Ala Asp Ile Gly Lys Ser Tyr Gln
 210 215 220

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

Leu Asn Pro Val Ile Ser His Thr Tyr Asp Ile Asn Asp Asn Arg Lys
 245 250 255

Ser Cys Ser Val Ile Ala Ala Gly Thr Arg Gly Tyr Gln Leu Cys Ser
 260 265 270

Leu Pro Thr Val Asn Glu Thr Thr Asp Tyr Ser Ser Glu Gly Ile Glu
 275 280 285

Asp Leu Val Phe Asp Ile Leu Asp Leu Lys Gly Lys Thr Lys Ser His
 290 295 300

Arg Tyr Lys Asn Glu Asp Ile Thr Phe Asp His Pro Phe Ser Ala Met
 305 310 315 320

Tyr Pro Ser Val Gly Ser Gly Ile Lys Ile Glu Asn Thr Leu Ile Phe
 325 330 335

Leu Gly Tyr Gly Gly Leu Thr Thr Pro Leu Gln Gly Asp Thr Lys Cys
 340 345 350

Val Ile Asn Arg Cys Thr Asn Val Asn Gln Ser Val Cys Asn Asp Ala
 355 360 365

Leu Lys Ile Thr Trp Leu Lys Lys Arg Gln Val Val Asn Val Leu Ile
 370 375 380

Arg Ile Asn Asn Tyr Leu Ser Asp Arg Pro Lys Ile Val Val Glu Thr
 385 390 395 400

Ile Pro Ile Thr Gln Asn Tyr Leu Gly Ala Glu Gly Arg Leu Leu Lys
 405 410 415

Leu Gly Lys Lys Ile Tyr Ile Tyr Thr Arg Ser Ser Gly Trp His Ser
420 425 430

Asn Leu Gln Ile Gly Ser Leu Asp Ile Asn Asn Pro Met Thr Ile Lys
435 440 445

Trp Ala Pro His Glu Val Leu Ser Arg Pro Gly Asn Gln Asp Cys Asn
450 455 460

Trp Tyr Asn Arg Cys Pro Arg Glu Cys Ile Ser Gly Val Tyr Thr Asp
465 470 475 480

Ala Tyr Pro Leu Ser Pro Asp Ala Val Asn Val Ala Thr Thr Thr Leu
485 490 495

Tyr Ala Asn Thr Ser Arg Val Asn Pro Thr Ile Met Tyr Ser Asn Thr
500 505 510

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

Ala Tyr Thr Thr Thr Ser Cys Ile Thr His Phe Gly Lys Gly Tyr Cys
530 535 540

Phe His Ile Val Glu Ile Asn Gln Ala Ser Leu Asn Thr Leu Gln Pro
545 550 555 560

Met Leu Phe Lys Thr Ser Ile Pro Lys Ile Cys Lys Ile Thr Ser
565 570 575

<210> 68
<211> 240
<212> PRT
<213> Human metapneumovirus

<220>
<221> MISC_FEATURE

<223> attachment glycoprotein G

<400> 68

Met Glu Val Arg Val Glu Asn Ile Arg Ala Ile Asp Met Phe Lys Ala
1 5 10 15

Lys Met Lys Asn Arg Ile Arg Ser Ser Lys Cys Tyr Arg Asn Ala Thr
20 25 30

Leu Ile Leu Ile Gly Leu Thr Ala Leu Ser Met Ala Leu Asn Ile Phe
35 40 45

Leu Ile Ile Asp Tyr Ala Thr Leu Lys Asn Met Thr Lys Val Glu His
50 55 60

Cys Val Asn Met Pro Pro Val Glu Pro Ser Lys Lys Ser Pro Met Thr
65 70 75 80

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

Leu Thr Thr Glu Asp Ser Thr Ser Leu Ala Ala Thr Ser Glu Asn His
100 105 110

Leu His Thr Glu Thr Thr Pro Thr Ser Asp Ala Thr Ile Ser Gln Gln
115 120 125

Ala Thr Asp Glu His Thr Thr Leu Leu Arg Pro Ile Asn Arg Gln Thr
130 135 140

Thr Gln Thr Thr Thr Glu Lys Lys Pro Thr Gly Ala Thr Thr Lys Lys
145 150 155 160

Asp Lys Glu Lys Glu Thr Thr Thr Arg Thr Thr Ser Thr Ala Ala Thr
165 170 175

Gln Thr Leu Asn Thr Thr Asn Gln Thr Ser Asn Gly Arg Glu Ala Thr

180

185

190

Thr Thr Ser Ala Arg Ser Arg Asn Gly Ala Thr Thr Gln Asn Ser Asp
 195 200 205

Gln Thr Ile Gln Ala Ala Asp Pro Ser Ser Lys Pro Tyr His Thr Gln
 210 215 220

Thr Asn Thr Thr Thr Ala His Asn Thr Asp Thr Ser Ser Leu Ser Ser
 225 230 235 240

<210> 69
 <211> 604
 <212> PRT
 <213> Hendra virus

<220>
 <221> MISC_FEATURE
 <223> glycoprotein

<400> 69

Met Met Ala Asp Ser Lys Leu Val Ser Leu Asn Asn Asn Leu Ser Gly
 1 5 10 15

Lys Ile Lys Asp Gln Gly Lys Val Ile Lys Asn Tyr Tyr Gly Thr Met
 20 25 30

Asp Ile Lys Lys Ile Asn Asp Gly Leu Leu Asp Ser Lys Ile Leu Gly
 35 40 45

Ala Phe Asn Thr Val Ile Ala Leu Leu Gly Ser Ile Ile Ile Ile Val
 50 55 60

Met Asn Ile Met Ile Ile Gln Asn Tyr Thr Arg Thr Thr Asp Asn Gln
 65 70 75 80

Ala Leu Ile Lys Glu Ser Leu Gln Ser Val Gln Gln Gln Ile Lys Ala
 85 90 95

Leu Thr Asp Lys Ile Gly Thr Glu Ile Gly Pro Lys Val Ser Leu Ile
100 105 110

Asp Thr Ser Ser Thr Ile Thr Ile Pro Ala Asn Ile Gly Leu Leu Gly
115 120 125

Ser Lys Ile Ser Gln Ser Thr Ser Ser Ile Asn Glu Asn Val Asn Asp
130 135 140

Lys Cys Lys Phe Thr Leu Pro Pro Leu Lys Ile His Glu Cys Asn Ile
145 150 155 160

Ser Cys Pro Asn Pro Leu Pro Phe Arg Glu Tyr Arg Pro Ile Ser Gln
165 170 175

Gly Val Ser Asp Leu Val Gly Leu Pro Asn Gln Ile Cys Leu Gln Lys
180 185 190

Thr Thr Ser Thr Ile Leu Lys Pro Arg Leu Ile Ser Tyr Thr Leu Pro
195 200 205

Ile Asn Thr Arg Glu Gly Val Cys Ile Thr Asp Pro Leu Leu Ala Val
210 215 220

Asp Asn Gly Phe Phe Ala Tyr Ser His Leu Glu Lys Ile Gly Ser Cys
225 230 235 240

Thr Arg Gly Ile Ala Lys Gln Arg Ile Ile Gly Val Gly Glu Val Leu
245 250 255

Asp Arg Gly Asp Lys Val Pro Ser Met Phe Met Thr Asn Val Trp Thr
260 265 270

Pro Pro Asn Pro Ser Thr Ile His His Cys Ser Ser Thr Tyr His Glu
275 280 285

Asp Phe Tyr Tyr Thr Leu Cys Ala Val Ser His Val Gly Asp Pro Ile
290 295 300

Leu Asn Ser Thr Ser Trp Thr Glu Ser Leu Ser Leu Ile Arg Leu Ala
305 310 315 320

Val Arg Pro Lys Ser Asp Ser Gly Asp Tyr Asn Gln Lys Tyr Ile Ala
325 330 335

Ile Thr Lys Val Glu Arg Gly Lys Tyr Asp Lys Val Met Pro Tyr Gly
340 345 350

Pro Ser Gly Ile Lys Gln Gly Asp Thr Leu Tyr Phe Pro Ala Val Gly
355 360 365

Phe Leu Pro Arg Thr Glu Phe Gln Tyr Asn Asp Ser Asn Cys Pro Ile
370 375 380

Ile His Cys Lys Tyr Ser Lys Ala Glu Asn Cys Arg Leu Ser Met Gly
385 390 395 400

Val Asn Ser Lys Ser His Tyr Ile Leu Arg Ser Gly Leu Leu Lys Tyr
405 410 415

Asn Leu Ser Leu Gly Gly Asp Ile Ile Leu Gln Phe Ile Glu Ile Ala
420 425 430

Asp Asn Arg Leu Thr Ile Gly Ser Pro Ser Lys Ile Tyr Asn Ser Leu
435 440 445

Gly Gln Pro Val Phe Tyr Gln Ala Ser Tyr Ser Trp Asp Thr Met Ile
450 455 460

Lys Leu Gly Asp Val Asp Thr Val Asp Pro Leu Arg Val Gln Trp Arg
465 470 475 480

Asn Asn Ser Val Ile Ser Arg Pro Gly Gln Ser Gln Cys Pro Arg Phe
485 490 495

Asn Val Cys Pro Glu Val Cys Trp Glu Gly Thr Tyr Asn Asp Ala Phe
500 505 510

Leu Ile Asp Arg Leu Asn Trp Val Ser Ala Gly Val Tyr Leu Asn Ser
515 520 525

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

Ile Leu Tyr Gln Val Pro Leu Ala Glu Asp Asp Thr Asn Ala Gln Lys
545 550 555 560

Thr Ile Thr Asp Cys Phe Leu Leu Glu Asn Val Ile Trp Cys Ile Ser
565 570 575

Leu Val Glu Ile Tyr Asp Thr Gly Asp Ser Val Ile Arg Pro Lys Leu
580 585 590

Phe Ala Val Lys Ile Pro Ala Gln Cys Ser Glu Ser
595 600

<210> 70
<211> 602
<212> PRT
<213> Nipah virus

<220>
<221> MISC_FEATURE
<223> attachment glycoprotein

<400> 70

Met Pro Ala Glu Asn Lys Lys Val Arg Phe Glu Asn Thr Thr Ser Asp
1 5 10 15

Lys Gly Lys Ile Pro Ser Lys Val Ile Lys Ser Tyr Tyr Gly Thr Met

20

25

30

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

Ala Phe Asn Thr Val Ile Ala Leu Leu Gly Ser Ile Val Ile Ile Val
 50 55 60

Met Asn Ile Met Ile Ile Gln Asn Tyr Thr Arg Ser Thr Asp Asn Gln
 65 70 75 80

Ala Val Ile Lys Asp Ala Leu Gln Gly Ile Gln Gln Gln Ile Lys Gly
 85 90 95

Leu Ala Asp Lys Ile Gly Thr Glu Ile Gly Pro Lys Val Ser Leu Ile
 100 105 110

Asp Thr Ser Ser Thr Ile Thr Ile Pro Ala Asn Ile Gly Leu Leu Gly
 115 120 125

Ser Lys Ile Ser Gln Ser Thr Ala Ser Ile Asn Glu Asn Val Asn Glu
 130 135 140

Lys Cys Lys Phe Thr Leu Pro Pro Leu Lys Ile His Glu Cys Asn Ile
 145 150 155 160

Ser Cys Pro Asn Pro Leu Pro Phe Arg Glu Tyr Arg Pro Gln Thr Glu
 165 170 175

Gly Val Ser Asn Leu Val Gly Leu Pro Asn Asn Ile Cys Leu Gln Lys
 180 185 190

Thr Ser Asn Gln Ile Leu Lys Pro Lys Leu Ile Ser Tyr Thr Leu Pro
 195 200 205

Val Val Gly Gln Ser Gly Thr Cys Ile Thr Asp Pro Leu Leu Ala Met
 210 215 220

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

Ser Arg Gly Val Ser Lys Gln Arg Ile Ile Gly Val Gly Glu Val Leu
245 250 255

Asp Arg Gly Asp Glu Val Pro Ser Leu Phe Met Thr Asn Val Trp Thr
260 265 270

Pro Pro Asn Pro Asn Thr Val Tyr His Cys Ser Ala Val Tyr Asn Asn
275 280 285

Glu Phe Tyr Tyr Val Leu Cys Ala Val Ser Thr Val Gly Asp Pro Ile
290 295 300

Leu Asn Ser Thr Tyr Trp Ser Gly Ser Leu Met Met Thr Arg Leu Ala
305 310 315 320

Val Lys Pro Lys Ser Asn Gly Gly Gly Tyr Asn Gln His Gln Leu Ala
325 330 335

Leu Arg Ser Ile Glu Lys Gly Arg Tyr Asp Lys Val Met Pro Tyr Gly
340 345 350

Pro Ser Gly Ile Lys Gln Gly Asp Thr Leu Tyr Phe Pro Ala Val Gly
355 360 365

Phe Leu Val Arg Thr Glu Phe Lys Tyr Asn Asp Ser Asn Cys Pro Ile
370 375 380

Thr Lys Cys Gln Tyr Ser Lys Pro Glu Asn Cys Arg Leu Ser Met Gly
385 390 395 400

Ile Arg Pro Asn Ser His Tyr Ile Leu Arg Ser Gly Leu Leu Lys Tyr
405 410 415

Asn Leu Ser Asp Gly Glu Asn Pro Lys Val Val Phe Ile Glu Ile Ser
420 425 430

Asp Gln Arg Leu Ser Ile Gly Ser Pro Ser Lys Ile Tyr Asp Ser Leu
435 440 445

Gly Gln Pro Val Phe Tyr Gln Ala Ser Phe Ser Trp Asp Thr Met Ile
450 455 460

Lys Phe Gly Asp Val Leu Thr Val Asn Pro Leu Val Val Asn Trp Arg
465 470 475 480

Asn Asn Thr Val Ile Ser Arg Pro Gly Gln Ser Gln Cys Pro Arg Phe
485 490 495

Asn Thr Cys Pro Glu Ile Cys Trp Glu Gly Val Tyr Asn Asp Ala Phe
500 505 510

Leu Ile Asp Arg Ile Asn Trp Ile Ser Ala Gly Val Phe Leu Asp Ser
515 520 525

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

Ile Leu Tyr Arg Ala Gln Leu Ala Ser Glu Asp Thr Asn Ala Gln Lys
545 550 555 560

Thr Ile Thr Asn Cys Phe Leu Leu Lys Asn Lys Ile Trp Cys Ile Ser
565 570 575

Leu Val Glu Ile Tyr Asp Thr Gly Asp Asn Val Ile Arg Pro Lys Leu
580 585 590

Phe Ala Val Lys Ile Pro Glu Gln Cys Thr
595 600

<210> 71
<211> 572
<212> PRT
<213> Swine parainfluenza virus 3

<220>
<221> MISC_FEATURE
<223> hemagglutinin-neuraminidase HN

<400> 71

Met Glu Tyr Trp Lys His Thr Asn Ser Thr Lys Asp Thr Asn Asn Glu
1 5 10 15

Leu Gly Thr Thr Arg Asp Arg His Ser Ser Lys Ala Thr Asn Ile Ile
20 25 30

Met Tyr Ile Phe Trp Thr Thr Thr Ser Thr Ile Leu Ser Val Ile Phe
35 40 45

Ile Met Ile Leu Ile Asn Leu Ile Gln Glu Asn Asn His Asn Lys Leu
50 55 60

Met Leu Gln Glu Ile Lys Lys Glu Phe Ala Val Ile Asp Thr Lys Ile
65 70 75 80

Gln Lys Thr Ser Asp Asp Ile Ser Thr Ser Ile Gln Ser Gly Ile Asn
85 90 95

Thr Arg Leu Leu Thr Ile Gln Ser His Val Gln Asn Tyr Ile Pro Leu
100 105 110

Ser Leu Thr Gln Gln Met Ser Asp Leu Arg Lys Phe Ile Asn Asp Leu
115 120 125

Thr Thr Lys Arg Glu His Gln Glu Val Pro Ile Gln Arg Met Thr His
130 135 140

Asp Ser Gly Ile Glu Pro Leu Asn Pro Asp Lys Phe Trp Arg Cys Thr

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

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

Ser Pro Trp Phe Ser Asn Arg Arg Met Val Asn Ser Ile Ile Val Val
370 375 380

Asp Lys Ser Ile Asp Thr Thr Phe Ser Leu Arg Val Trp Thr Ile Pro
385 390 395 400

Met Arg Gln Asn Tyr Trp Gly Ser Glu Gly Arg Leu Leu Leu Leu Gly
405 410 415

Asp Arg Ile Tyr Ile Tyr Thr Arg Ser Thr Ser Trp His Ser Lys Leu
420 425 430

Gln Leu Gly Val Ile Asp Ile Ser Asp Tyr Asn Asn Ile Arg Ile Asn
435 440 445

Trp Thr Trp His Asn Val Leu Ser Arg Pro Gly Asn Asp Glu Cys Pro
450 455 460

Trp Gly His Ser Cys Pro Asp Gly Cys Ile Thr Gly Val Tyr Thr Asp
465 470 475 480

Ala Tyr Pro Leu Asn Pro Ser Gly Ser Val Val Ser Ser Val Ile Leu
485 490 495

Asp Ser Gln Lys Ser Arg Glu Asn Pro Ile Ile Thr Tyr Ser Thr Ala
500 505 510

Thr Asn Arg Val Asn Glu Leu Ala Ile Tyr Asn Arg Thr Leu Pro Ala
515 520 525

Ala Tyr Thr Thr Thr Asn Cys Ile Thr His Tyr Asp Lys Gly Tyr Cys
530 535 540

Phe His Ile Val Glu Ile Asn His Arg Ser Leu Asn Thr Phe Gln Pro
 545 550 555 560

Met Leu Phe Lys Thr Glu Val Pro Lys Asn Cys Ser
 565 570

<210> 72
 <211> 231
 <212> PRT
 <213> Human metapneumovirus

<220>
 <221> MISC_FEATURE
 <223> attachment glycoprotein G

<400> 72

Met Glu Val Arg Val Glu Asn Ile Arg Ala Ile Asp Met Phe Lys Ala
 1 5 10 15

Lys Ile Lys Asn Arg Ile Arg Ser Ser Arg Cys Tyr Arg Asn Ala Thr
 20 25 30

Leu Ile Leu Ile Gly Leu Thr Ala Leu Ser Met Ala Leu Asn Ile Phe
 35 40 45

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

Cys Ala Asn Met Pro Ser Ala Glu Pro Ser Lys Lys Thr Pro Met Thr
 65 70 75 80

Ser Thr Ala Gly Pro Ser Thr Lys Pro Asn Pro Gln Gln Ala Thr Gln
 85 90 95

Trp Thr Thr Glu Asn Ser Thr Ser Pro Ala Ala Thr Leu Glu Gly His
 100 105 110

Pro Tyr Thr Gly Thr Thr Gln Thr Pro Asp Thr Thr Ala Pro Gln Gln
115 120 125

Thr Thr Asp Lys His Thr Ala Leu Pro Lys Ser Thr Asn Glu Gln Ile
130 135 140

Thr Gln Thr Thr Thr Glu Lys Lys Thr Thr Arg Ala Thr Thr Gln Lys
145 150 155 160

Arg Glu Lys Arg Lys Glu Asn Thr Asn Gln Thr Thr Ser Thr Ala Ala
165 170 175

Thr Gln Thr Thr Asn Thr Thr Asn Gln Thr Arg Asn Ala Ser Glu Thr
180 185 190

Ile Thr Thr Ser Asp Gly Pro Arg Ile Asp Thr Thr Thr Gln Ser Ser
195 200 205

Glu Gln Thr Ala Arg Ala Thr Glu Pro Gly Ser Ser Pro Tyr His Ala
210 215 220

Arg Arg Gly Ala Gly Pro Arg
225 230

<210> 73
<211> 595
<212> PRT
<213> Feline morbillivirus

<220>
<221> MISC_FEATURE
<223> hemagglutinin protein

<400> 73

Met Lys Asn Ile Asn Ile Lys Tyr Tyr Lys Asp Ser Asn Arg Tyr Leu
1 5 10 15

Gly Lys Ile Leu Asp Glu His Lys Ile Val Asn Ser Gln Leu Tyr Ser

20

25

30

Leu Ser Ile Lys Val Ile Thr Ile Ile Ala Ile Ile Val Ser Leu Ile
 35 40 45

Ala Thr Ile Met Thr Ile Ile Asn Ala Thr Ser Gly Arg Thr Thr Leu
 50 55 60

Asn Ser Asn Thr Asp Ile Leu Leu Asn Gln Arg Asp Glu Ile His Ser
 65 70 75 80

Ile His Glu Met Ile Phe Asp Arg Val Tyr Pro Leu Ile Thr Ala Met
 85 90 95

Ser Thr Glu Leu Gly Leu His Ile Pro Thr Leu Leu Asp Glu Leu Thr
 100 105 110

Lys Ala Ile Asp Gln Lys Ile Lys Ile Met Asn Pro Pro Val Asp Thr
 115 120 125

Val Thr Ser Asp Leu Ser Trp Cys Ile Lys Pro Pro Asn Gly Ile Ile
 130 135 140

Ile Asp Pro Lys Gly Tyr Cys Glu Ser Met Glu Leu Ser Lys Thr Tyr
 145 150 155 160

Lys Leu Leu Leu Asp Gln Leu Asp Val Ser Arg Lys Lys Ser Leu Thr
 165 170 175

Ile Asn Arg Lys Asn Ile Asn Gln Cys Gln Leu Val Asp Asp Ser Glu
 180 185 190

Ile Ile Phe Ala Thr Val Asn Ile Gln Ser Thr Pro Arg Phe Leu Asn
 195 200 205

Phe Gly His Thr Val Ser Asn Gln Arg Ile Thr Phe Gly Gln Gly Thr
 210 215 220

Tyr Ser Ser Thr Tyr Ile Leu Thr Ile Gln Glu Asp Gly Ile Thr Asp
225 230 235 240

Val Gln Tyr Arg Val Phe Glu Ile Gly Tyr Ile Ser Asp Gln Phe Gly
245 250 255

Val Phe Pro Ser Leu Ile Val Ser Arg Val Leu Pro Ile Arg Met Val
260 265 270

Leu Gly Met Glu Ser Cys Thr Leu Thr Ser Asp Arg Gln Gly Gly Tyr
275 280 285

Phe Leu Cys Met Asn Thr Leu Thr Arg Ser Ile Tyr Asp Tyr Val Asn
290 295 300

Ile Arg Asp Leu Lys Ser Leu Tyr Ile Thr Leu Pro His Tyr Gly Lys
305 310 315 320

Val Asn Tyr Thr Tyr Phe Asn Phe Gly Lys Ile Arg Ser Pro His Glu
325 330 335

Ile Asp Lys Leu Trp Leu Thr Ser Asp Arg Gly Gln Ile Ile Ser Gly
340 345 350

Tyr Phe Ala Ala Phe Val Thr Ile Thr Ile Arg Asn Tyr Asn Asn Tyr
355 360 365

Pro Tyr Lys Cys Leu Asn Asn Pro Cys Phe Asp Asn Ser Glu Asn Tyr
370 375 380

Cys Arg Gly Trp Tyr Lys Asn Ile Thr Gly Thr Asp Asp Val Pro Ile
385 390 395 400

Leu Ala Tyr Leu Leu Val Glu Met Tyr Asp Glu Glu Gly Pro Leu Ile
405 410 415

Thr Leu Val Ala Ile Pro Pro Tyr Asn Tyr Thr Ala Pro Ser His Asn
420 425 430

Ser Leu Tyr Tyr Asp Asp Lys Ile Asn Lys Leu Ile Met Thr Thr Ser
435 440 445

His Ile Gly Tyr Ile Gln Ile Asn Glu Val His Glu Val Ile Val Gly
450 455 460

Asp Asn Leu Lys Ala Ile Leu Leu Asn Arg Leu Ser Asp Glu His Pro
465 470 475 480

Asn Leu Thr Ala Cys Arg Leu Asn Gln Gly Ile Lys Glu Gln Tyr Lys
485 490 495

Ser Asp Gly Met Ile Ile Ser Asn Ser Ala Leu Ile Asp Ile Gln Glu
500 505 510

Arg Met Tyr Ile Thr Val Lys Ala Ile Pro Pro Val Gly Asn Tyr Asn
515 520 525

Phe Thr Val Glu Leu His Ser Arg Ser Asn Thr Ser Tyr Ile Leu Leu
530 535 540

Pro Lys Gln Phe Asn Ala Lys Tyr Asp Lys Leu His Leu Glu Cys Phe
545 550 555 560

Asn Trp Asp Lys Ser Trp Trp Cys Ala Leu Ile Pro Gln Phe Ser Leu
565 570 575

Ser Trp Asn Glu Ser Leu Ser Val Asp Thr Ala Ile Phe Asn Leu Ile
580 585 590

Asn Cys Lys
595

<210> 74
<211> 613
<212> PRT
<213> Avian paramyxovirus 6

<220>
<221> MISC_FEATURE
<223> hemagglutinin-neuraminidase

<400> 74

Met Ala Ser Pro Ser Glu Leu Asn Arg Ser Gln Ala Thr Leu Tyr Glu
1 5 10 15

Gly Asp Pro Asn Ser Lys Arg Thr Trp Arg Thr Val Tyr Arg Ala Ser
20 25 30

Thr Leu Ile Leu Asp Leu Ala Ile Leu Cys Val Ser Ile Val Ala Ile
35 40 45

Val Arg Met Ser Thr Leu Thr Pro Ser Asp Val Thr Asp Ser Ile Ser
50 55 60

Ser Ser Ile Thr Ser Leu Ser Asp Thr Tyr Gln Ser Val Trp Ser Asp
65 70 75 80

Thr His Gln Lys Val Asn Ser Ile Phe Lys Glu Val Gly Ile Ser Ile
85 90 95

Pro Val Thr Leu Asp Lys Met Gln Val Glu Met Gly Thr Ala Val Asn
100 105 110

Ile Ile Thr Asp Ala Val Arg Gln Leu Gln Gly Val Asn Gly Ser Ala
115 120 125

Gly Phe Ser Ile Thr Asn Ser Pro Glu Tyr Ser Gly Gly Ile Asp Ala
130 135 140

Leu Ile Tyr Pro Gln Lys Ser Leu Asn Gly Lys Ser Leu Ala Ile Ser

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

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

Lys Ile Ala Gly Ser Leu Trp Ala Gln Gly Ile Val Ile Cys Asn Leu
370 375 380

Thr Thr Leu Ala Asp Cys Lys Ile Ala Val Ala Asn Thr Ser Thr Met
385 390 395 400

Met Met Ala Ala Glu Gly Arg Leu Gln Leu Val Gln Asp Lys Val Val
405 410 415

Leu Tyr Gln Arg Ser Ser Ser Trp Trp Pro Val Leu Ile Tyr Tyr Asp
420 425 430

Ile Leu Val Ser Glu Leu Val Asn Ala Arg His Leu Asp Ile Val Asn
435 440 445

Trp Val Pro Tyr Pro Gln Ser Lys Phe Pro Arg Pro Thr Trp Thr Lys
450 455 460

Gly Leu Cys Glu Lys Pro Ser Ile Cys Pro Ala Val Cys Val Thr Gly
465 470 475 480

Val Tyr Gln Asp Val Trp Val Val Ser Val Gly Asp Phe Ser Asn Glu
485 490 495

Thr Val Val Ile Gly Gly Tyr Leu Glu Ala Ala Ser Glu Arg Lys Asp
500 505 510

Pro Trp Ile Ala Ala Ala Asn Gln Tyr Asn Trp Leu Thr Arg Arg Gln
515 520 525

Leu Phe Thr Ala Gln Thr Glu Ala Ala Tyr Ser Ser Thr Thr Cys Phe
530 535 540

Arg Asn Thr His Gln Asp Lys Val Phe Cys Leu Thr Ile Met Glu Val
 545 550 555 560

Thr Asp Asn Leu Leu Gly Asp Trp Arg Ile Ala Pro Leu Leu Tyr Glu
 565 570 575

Val Thr Val Val Asp Arg Gln Gln Ser Ser Arg Lys Ala Val Ala Met
 580 585 590

Ser Glu Ala His Arg Thr Arg Phe Lys Tyr Tyr Ser Pro Glu Asn Lys
 595 600 605

Phe Thr Pro Gln His
 610

<210> 75
 <211> 564
 <212> PRT
 <213> Fer-de-Lance paramyxovirus

<220>
 <221> MISC_FEATURE
 <223> hemagglutinin-neuraminidase protein HN

<400> 75

Met Asp Pro Lys Ser Tyr Tyr Cys Asn Glu Asp Leu Arg Ser Asp Gly
 1 5 10 15

Gly Glu Lys Ser Pro Gly Gly Asp Leu Tyr Lys Gly Ile Ile Leu Val
 20 25 30

Ser Thr Val Ile Ser Leu Ile Ile Ala Ile Ile Ser Leu Ala Phe Ile
 35 40 45

Ile Asp Asn Lys Ile Asn Ile Gln Ser Leu Asp Pro Leu Arg Gly Leu
 50 55 60

Glu Asp Ser Tyr Leu Val Pro Ile Lys Asp Lys Ser Glu Ser Ile Ser
65 70 75 80

Gln Asp Ile Gln Glu Gly Ile Phe Pro Arg Leu Asn Leu Ile Thr Ala
85 90 95

Ala Thr Thr Thr Thr Ile Pro Arg Ser Ile Ala Ile Gln Thr Lys Asp
100 105 110

Leu Ser Asp Leu Ile Met Asn Arg Cys Tyr Pro Ser Val Val Asn Asn
115 120 125

Asp Thr Ser Cys Asp Val Leu Ala Gly Ala Ile His Ser Asn Leu Phe
130 135 140

Ser Gln Leu Asp Pro Ser Thr Tyr Trp Thr Cys Ser Ser Gly Thr Pro
145 150 155 160

Thr Met Asn Gln Thr Val Lys Leu Leu Pro Asp Asn Ser Gln Ile Pro
165 170 175

Gly Ser Thr Tyr Ser Thr Gly Cys Val Arg Ile Pro Thr Phe Ser Leu
180 185 190

Gly Ser Met Ile Tyr Ser Tyr Ser His Asn Val Ile Tyr Glu Gly Cys
195 200 205

Asn Asp His Ser Lys Ser Ser Gln Tyr Trp Gln Leu Gly Tyr Ile Ser
210 215 220

Thr Ser Lys Thr Gly Glu Pro Leu Gln Gln Val Ser Arg Thr Leu Thr
225 230 235 240

Leu Asn Asn Gly Leu Asn Arg Lys Ser Cys Ser Thr Val Ala Gln Gly
245 250 255

Arg Gly Ala Tyr Leu Leu Cys Thr Asn Val Val Glu Asp Glu Arg Thr

260

265

270

Asp Tyr Ser Thr Glu Gly Ile Gln Asp Leu Thr Leu Asp Tyr Ile Asp
 275 280 285

Ile Phe Gly Ala Glu Arg Ser Tyr Arg Tyr Thr Asn Asn Glu Val Asp
 290 295 300

Leu Asp Arg Pro Tyr Ala Ala Leu Tyr Pro Ser Val Gly Ser Gly Thr
 305 310 315 320

Val Tyr Asn Asp Arg Ile Leu Phe Leu Gly Tyr Gly Gly Leu Met Thr
 325 330 335

Pro Tyr Gly Asp Gln Ala Met Cys Gln Ala Pro Glu Cys Thr Ser Ala
 340 345 350

Thr Gln Glu Gly Cys Asn Ser Asn Gln Leu Ile Gly Tyr Phe Ser Gly
 355 360 365

Arg Gln Ile Val Asn Cys Ile Ile Glu Ile Ile Thr Val Gly Thr Glu
 370 375 380

Lys Pro Ile Ile Arg Val Arg Thr Ile Pro Asn Ser Gln Val Trp Leu
 385 390 395 400

Gly Ala Glu Gly Arg Ile Gln Thr Leu Gly Gly Val Leu Tyr Leu Tyr
 405 410 415

Ile Arg Ser Ser Gly Trp His Ala Leu Ala Gln Thr Gly Ile Ile Leu
 420 425 430

Thr Leu Asp Pro Ile Arg Ile Ser Trp Ile Val Asn Thr Gly Tyr Ser
 435 440 445

Arg Pro Gly Asn Gly Pro Cys Ser Ala Ser Ser Arg Cys Pro Ala Gln
 450 455 460

Cys Ile Thr Gly Val Tyr Thr Asp Ile Phe Pro Leu Ser Gln Asn Tyr
 465 470 475 480

Gly Tyr Leu Ala Thr Val Thr Leu Leu Ser Gly Val Asp Arg Val Asn
 485 490 495

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

Leu Thr Ser Ser Ser Gln Val Ala Ala Tyr Thr Thr Thr Thr Cys Phe
 515 520 525

Thr Phe Asn Gln Lys Gly Tyr Cys Tyr His Ile Ile Glu Leu Ser Pro
 530 535 540

Ala Thr Leu Gly Ile Phe Gln Pro Val Leu Val Val Thr Glu Ile Pro
 545 550 555 560

Lys Ile Cys Ser

<210> 76
 <211> 569
 <212> PRT
 <213> Avian paramyxovirus 4

<220>
 <221> MISC_FEATURE
 <223> hemagglutinin-neuraminidase

<400> 76

Met Gln Gly Asn Met Glu Gly Ser Arg Asp Asn Leu Thr Val Asp Asp
 1 5 10 15

Glu Leu Lys Thr Thr Trp Arg Leu Ala Tyr Arg Val Val Ser Leu Leu
 20 25 30

Leu Met Val Ser Ala Leu Ile Ile Ser Ile Val Ile Leu Thr Arg Asp
35 40 45

Asn Ser Gln Ser Ile Ile Thr Ala Ile Asn Gln Ser Ser Asp Ala Asp
50 55 60

Ser Lys Trp Gln Thr Gly Ile Glu Gly Lys Ile Thr Ser Ile Met Thr
65 70 75 80

Asp Thr Leu Asp Thr Arg Asn Ala Ala Leu Leu His Ile Pro Leu Gln
85 90 95

Leu Asn Thr Leu Glu Ala Asn Leu Leu Ser Ala Leu Gly Gly Asn Thr
100 105 110

Gly Ile Gly Pro Gly Asp Leu Glu His Cys Arg Tyr Pro Val His Asp
115 120 125

Thr Ala Tyr Leu His Gly Val Asn Arg Leu Leu Ile Asn Gln Thr Ala
130 135 140

Asp Tyr Thr Ala Glu Gly Pro Leu Asp His Val Asn Phe Ile Pro Ala
145 150 155 160

Pro Val Thr Thr Thr Gly Cys Thr Arg Ile Pro Ser Phe Ser Val Ser
165 170 175

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

Asp His Ser Gly Ser Asn Gln Tyr Ile Ser Met Gly Val Ile Lys Arg
195 200 205

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

Thr Asp Gly Leu Asn Arg Lys Ser Cys Ser Val Ala Ala Gly Ser Gly
225 230 235 240

His Cys Tyr Leu Leu Cys Ser Leu Val Ser Glu Pro Glu Pro Asp Asp
245 250 255

Tyr Val Ser Pro Asp Pro Thr Pro Met Arg Leu Gly Val Leu Thr Trp
260 265 270

Asp Gly Ser Tyr Thr Glu Gln Ala Val Pro Glu Arg Ile Phe Lys Asn
275 280 285

Ile Trp Ser Ala Asn Tyr Pro Gly Val Gly Ser Gly Ala Ile Val Gly
290 295 300

Asn Lys Val Leu Phe Pro Phe Tyr Gly Gly Val Arg Asn Gly Ser Thr
305 310 315 320

Pro Glu Val Met Asn Arg Gly Arg Tyr Tyr Tyr Ile Gln Asp Pro Asn
325 330 335

Asp Tyr Cys Pro Asp Pro Leu Gln Asp Gln Ile Leu Arg Ala Glu Gln
340 345 350

Ser Tyr Tyr Pro Thr Arg Phe Gly Arg Arg Met Val Met Gln Gly Val
355 360 365

Leu Ala Cys Pro Val Ser Asn Asn Ser Thr Ile Ala Ser Gln Cys Gln
370 375 380

Ser Tyr Tyr Phe Asn Asn Ser Leu Gly Phe Ile Gly Ala Glu Ser Arg
385 390 395 400

Ile Tyr Tyr Leu Asn Gly Asn Ile Tyr Leu Tyr Gln Arg Ser Ser Ser
405 410 415

Trp Trp Pro His Pro Gln Ile Tyr Leu Leu Asp Ser Arg Ile Ala Ser

420

425

430

Pro Gly Thr Gln Asn Ile Asp Ser Gly Val Asn Leu Lys Met Leu Asn
 435 440 445

Val Thr Val Ile Thr Arg Pro Ser Ser Gly Phe Cys Asn Ser Gln Ser
 450 455 460

Arg Cys Pro Asn Asp Cys Leu Phe Gly Val Tyr Ser Asp Ile Trp Pro
 465 470 475 480

Leu Ser Leu Thr Ser Asp Ser Ile Phe Ala Phe Thr Met Tyr Leu Gln
 485 490 495

Gly Lys Thr Thr Arg Ile Asp Pro Ala Trp Ala Leu Phe Ser Asn His
 500 505 510

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

Tyr Ser Thr Thr Thr Cys Phe Ser Asp Thr Ile Gln Asn Gln Val Tyr
 530 535 540

Cys Leu Ser Ile Leu Glu Val Arg Ser Glu Leu Leu Gly Ala Phe Lys
 545 550 555 560

Ile Val Pro Phe Leu Tyr Arg Val Leu
 565

<210> 77

<211> 571

<212> PRT

<213> Human parainfluenza virus 2

<220>

<221> MISC_FEATURE

<223> hemagglutinin-neuraminidase protein

<400> 77

Met Glu Asp Tyr Ser Asn Leu Ser Leu Lys Ser Ile Pro Lys Arg Thr
1 5 10 15

Cys Arg Ile Ile Phe Arg Thr Ala Thr Ile Leu Gly Ile Cys Thr Leu
20 25 30

Ile Val Leu Cys Ser Ser Ile Leu His Glu Ile Ile His Leu Asp Val
35 40 45

Ser Ser Gly Leu Met Asp Ser Asp Asp Ser Gln Gln Gly Ile Ile Gln
50 55 60

Pro Ile Ile Glu Ser Leu Lys Ser Leu Ile Ala Leu Ala Asn Gln Ile
65 70 75 80

Leu Tyr Asn Val Ala Ile Ile Ile Pro Leu Lys Ile Asp Ser Ile Glu
85 90 95

Thr Val Ile Phe Ser Ala Leu Lys Asp Met His Thr Gly Ser Met Ser
100 105 110

Asn Thr Asn Cys Thr Pro Gly Asn Leu Leu Leu His Asp Ala Ala Tyr
115 120 125

Ile Asn Gly Ile Asn Lys Phe Leu Val Leu Lys Ser Tyr Asn Gly Thr
130 135 140

Pro Lys Tyr Gly Pro Leu Leu Asn Ile Pro Ser Phe Ile Pro Ser Ala
145 150 155 160

Thr Ser Pro Asn Gly Cys Thr Arg Ile Pro Ser Phe Ser Leu Ile Lys
165 170 175

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

Phe Thr Thr Ser Asn Gln Tyr Leu Ala Met Gly Ile Ile Gln Gln Ser
195 200 205

Ala Ala Ala Phe Pro Ile Phe Arg Thr Met Lys Thr Ile Tyr Leu Ser
210 215 220

Asp Gly Ile Asn Arg Lys Ser Cys Ser Val Thr Ala Ile Pro Gly Gly
225 230 235 240

Cys Val Leu Tyr Cys Tyr Val Ala Thr Arg Ser Glu Lys Glu Asp Tyr
245 250 255

Ala Thr Thr Asp Leu Ala Glu Leu Arg Leu Ala Phe Tyr Tyr Tyr Asn
260 265 270

Asp Thr Phe Ile Glu Arg Val Ile Ser Leu Pro Asn Thr Thr Gly Gln
275 280 285

Trp Ala Thr Ile Asn Pro Ala Val Gly Ser Gly Ile Tyr His Leu Gly
290 295 300

Phe Ile Leu Phe Pro Val Tyr Gly Gly Leu Ile Ser Gly Thr Pro Ser
305 310 315 320

Tyr Asn Lys Gln Ser Ser Arg Tyr Phe Ile Pro Lys His Pro Asn Ile
325 330 335

Thr Cys Ala Gly Asn Ser Ser Glu Gln Ala Ala Ala Ala Arg Ser Ser
340 345 350

Tyr Val Ile Arg Tyr His Ser Asn Arg Leu Ile Gln Ser Ala Val Leu
355 360 365

Ile Cys Pro Leu Ser Asp Met His Thr Ala Arg Cys Asn Leu Val Met
370 375 380

Phe Asn Asn Ser Gln Val Met Met Gly Ala Glu Gly Arg Leu Tyr Val
385 390 395 400

Ile Asp Asn Asn Leu Tyr Tyr Tyr Gln Arg Ser Ser Ser Trp Trp Ser
405 410 415

Ala Ser Leu Phe Tyr Arg Ile Asn Thr Asp Phe Ser Lys Gly Ile Pro
420 425 430

Pro Ile Ile Glu Ala Gln Trp Val Pro Ser Tyr Gln Val Pro Arg Pro
435 440 445

Gly Val Met Pro Cys Asn Ala Thr Ser Phe Cys Pro Ala Asn Cys Ile
450 455 460

Thr Gly Val Tyr Ala Asp Val Trp Pro Leu Asn Asp Pro Glu Pro Thr
465 470 475 480

Ser Gln Asn Ala Leu Asn Pro Asn Tyr Arg Phe Ala Gly Ala Phe Leu
485 490 495

Arg Asn Glu Ser Asn Arg Thr Asn Pro Thr Phe Tyr Thr Ala Ser Ala
500 505 510

Ser Ala Leu Leu Asn Thr Thr Gly Phe Asn Asn Thr Asn His Lys Ala
515 520 525

Ala Tyr Thr Ser Ser Thr Cys Phe Lys Asn Thr Gly Thr Gln Lys Ile
530 535 540

Tyr Cys Leu Ile Ile Ile Glu Met Gly Ser Ser Leu Leu Gly Glu Phe
545 550 555 560

Gln Ile Ile Pro Phe Leu Arg Glu Leu Ile Pro
565 570

<210> 78

<211> 565
<212> PRT
<213> Parainfluenza virus 5

<220>
<221> MISC_FEATURE
<223> hemagglutinin-neuraminidase protein

<400> 78

Met Val Ala Glu Asp Ala Pro Val Arg Ala Thr Cys Arg Val Leu Phe
1 5 10 15

Arg Thr Thr Thr Leu Ile Phe Leu Cys Thr Leu Leu Ala Leu Ser Ile
20 25 30

Ser Ile Leu Tyr Glu Ser Leu Ile Thr Gln Lys Gln Ile Met Ser Gln
35 40 45

Ala Gly Ser Thr Gly Ser Asn Ser Gly Leu Gly Ser Ile Thr Asp Leu
50 55 60

Leu Asn Asn Ile Leu Ser Val Ala Asn Gln Ile Ile Tyr Asn Ser Ala
65 70 75 80

Val Ala Leu Pro Leu Gln Leu Asp Thr Leu Glu Ser Thr Leu Leu Thr
85 90 95

Ala Ile Lys Ser Leu Gln Thr Ser Asp Lys Leu Glu Gln Asn Cys Ser
100 105 110

Trp Ser Ala Ala Leu Ile Asn Asp Asn Arg Tyr Ile Asn Gly Ile Asn
115 120 125

Gln Phe Tyr Phe Ser Ile Ala Glu Gly Arg Asn Leu Thr Leu Gly Pro
130 135 140

Leu Leu Asn Met Pro Ser Phe Ile Pro Thr Ala Thr Thr Pro Glu Gly
145 150 155 160

Cys Thr Arg Ile Pro Ser Phe Ser Leu Thr Lys Thr His Trp Cys Tyr
165 170 175

Thr His Asn Val Ile Leu Asn Gly Cys Gln Asp His Val Ser Ser Asn
180 185 190

Gln Phe Val Ser Met Gly Ile Ile Glu Pro Thr Ser Ala Gly Phe Pro
195 200 205

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

Lys Ser Cys Ser Ile Ser Thr Val Pro Gly Gly Cys Met Met Tyr Cys
225 230 235 240

Phe Val Ser Thr Gln Pro Glu Arg Asp Asp Tyr Phe Ser Ala Ala Pro
245 250 255

Pro Glu Gln Arg Ile Ile Ile Met Tyr Tyr Asn Asp Thr Ile Val Glu
260 265 270

Arg Ile Ile Asn Pro Pro Gly Val Leu Asp Val Trp Ala Thr Leu Asn
275 280 285

Pro Gly Thr Gly Ser Gly Val Tyr Tyr Leu Gly Trp Val Leu Phe Pro
290 295 300

Ile Tyr Gly Gly Val Ile Lys Gly Thr Ser Leu Trp Asn Asn Gln Ala
305 310 315 320

Asn Lys Tyr Phe Ile Pro Gln Met Val Ala Ala Leu Cys Ser Gln Asn
325 330 335

Gln Ala Thr Gln Val Gln Asn Ala Lys Ser Ser Tyr Tyr Ser Ser Trp
340 345 350

Phe Gly Asn Arg Met Ile Gln Ser Gly Ile Leu Ala Cys Pro Leu Arg
355 360 365

Gln Asp Leu Thr Asn Glu Cys Leu Val Leu Pro Phe Ser Asn Asp Gln
370 375 380

Val Leu Met Gly Ala Glu Gly Arg Leu Tyr Met Tyr Gly Asp Ser Val
385 390 395 400

Tyr Tyr Tyr Gln Arg Ser Asn Ser Trp Trp Pro Met Thr Met Leu Tyr
405 410 415

Lys Val Thr Ile Thr Phe Thr Asn Gly Gln Pro Ser Ala Ile Ser Ala
420 425 430

Gln Asn Val Pro Thr Gln Gln Val Pro Arg Pro Gly Thr Gly Asp Cys
435 440 445

Ser Ala Thr Asn Arg Cys Pro Gly Phe Cys Leu Thr Gly Val Tyr Ala
450 455 460

Asp Ala Trp Leu Leu Thr Asn Pro Ser Ser Thr Ser Thr Phe Gly Ser
465 470 475 480

Glu Ala Thr Phe Thr Gly Ser Tyr Leu Asn Thr Ala Thr Gln Arg Ile
485 490 495

Asn Pro Thr Met Tyr Ile Ala Asn Asn Thr Gln Ile Ile Ser Ser Gln
500 505 510

Gln Phe Gly Ser Ser Gly Gln Glu Ala Ala Tyr Gly His Thr Thr Cys
515 520 525

Phe Arg Asp Thr Gly Ser Val Met Val Tyr Cys Ile Tyr Ile Ile Glu
530 535 540

Leu Ser Ser Ser Leu Leu Gly Gln Phe Gln Ile Val Pro Phe Ile Arg
 545 550 555 560

Gln Val Thr Leu Ser
 565

<210> 79
 <211> 576
 <212> PRT
 <213> Porcine rubulavirus

<220>
 <221> MISC_FEATURE
 <223> attachment protein

<400> 79

Met Ser Gln Leu Gly Thr Asp Gln Ile Met His Leu Ala Gln Pro Ala
 1 5 10 15

Ile Ala Arg Arg Thr Trp Arg Leu Cys Phe Arg Ile Phe Ala Leu Phe
 20 25 30

Ile Leu Ile Ala Ile Val Ile Thr Gln Ile Phe Met Leu Thr Phe Asp
 35 40 45

His Thr Leu Leu Thr Thr Thr Gln Phe Leu Thr Ser Ile Gly Asn Leu
 50 55 60

Gln Ser Thr Ile Thr Ser Trp Thr Pro Asp Val Gln Ala Met Leu Ser
 65 70 75 80

Ile Ser Asn Gln Leu Ile Tyr Thr Thr Ser Ile Thr Leu Pro Leu Lys
 85 90 95

Ile Ser Thr Thr Glu Met Ser Ile Leu Thr Ala Ile Arg Asp His Cys
 100 105 110

His Cys Pro Asp Cys Ser Ser Ala Cys Pro Thr Arg Gln Met Leu Leu

115

120

125

Asn Asp Pro Arg Tyr Met Ser Gly Val Asn Gln Phe Ile Gly Ala Pro
 130 135 140

Thr Glu Ser Ile Asn Ile Thr Phe Gly Pro Leu Phe Gly Ile Pro Ser
 145 150 155 160

Phe Ile Pro Thr Ser Thr Thr Thr Gln Gly Cys Thr Arg Ile Pro Ser
 165 170 175

Phe Ala Leu Gly Pro Ser His Trp Cys Tyr Thr His Asn Phe Ile Thr
 180 185 190

Ala Gly Cys Ala Asp Gly Gly His Ser Asn Gln Tyr Leu Ala Met Gly
 195 200 205

Thr Ile Gln Ser Ala Ser Asp Gly Ser Pro Leu Leu Ile Thr Ala Arg
 210 215 220

Ser Tyr Tyr Leu Ser Asp Gly Val Asn Arg Lys Ser Cys Ser Ile Ala
 225 230 235 240

Val Val Pro Gly Gly Cys Ala Met Tyr Cys Tyr Val Ala Thr Arg Ser
 245 250 255

Glu Thr Asp Tyr Tyr Ala Gly Asn Ser Pro Pro Gln Gln Leu Leu Thr
 260 265 270

Leu Val Phe Ser Asn Asp Thr Ile Ile Glu Arg Thr Ile His Pro Thr
 275 280 285

Gly Leu Ala Asn Gly Trp Val Met Leu Val Pro Gly Val Gly Ser Gly
 290 295 300

Thr Leu Tyr Asn Glu Tyr Leu Leu Phe Pro Ala Tyr Gly Gly Met Gln
 305 310 315 320

Gln Ile Leu Ala Asn Gln Ser Gly Glu Ile Asn Gln Phe Phe Thr Pro
325 330 335

Tyr Asn Ala Thr Val Arg Cys Ala Met Ala Gln Pro Gln Phe Ser Gln
340 345 350

Arg Ala Ala Ala Ser Tyr Tyr Pro Arg Tyr Phe Ser Asn Arg Trp Ile
355 360 365

Arg Ser Ala Ile Val Ala Cys Pro Tyr Arg Ala Ile Tyr Gln Thr Gln
370 375 380

Cys Thr Leu Ile Pro Leu Pro Asn Arg Met Val Met Met Gly Ser Glu
385 390 395 400

Gly Arg Ile Phe Thr Leu Gly Asp Arg Leu Phe Tyr Tyr Gln Arg Ser
405 410 415

Ser Ser Trp Trp Pro Tyr Pro Leu Leu Tyr Gln Val Gly Leu Asn Phe
420 425 430

Leu Thr Thr Pro Pro Ser Val Ser Ser Met Thr Gln Val Pro Leu Glu
435 440 445

His Leu Ala Arg Pro Gly Lys Gly Gly Cys Pro Gly Asn Ser His Cys
450 455 460

Pro Ala Thr Cys Val Thr Gly Val Tyr Ala Asp Val Trp Pro Leu Thr
465 470 475 480

Asp Pro Arg Ser Gly Val Gly Gly Thr Ser Leu Val Ala Ala Gly Gly
485 490 495

Leu Asp Ser Thr Ser Glu Arg Met Ala Pro Val Asn Tyr Leu Ala Ile
500 505 510

Gly Glu Ser Leu Leu Ser Lys Thr Tyr Leu Leu Ser Lys Thr Gln Pro
515 520 525

Ala Ala Tyr Thr Thr Thr Thr Cys Phe Arg Asp Thr Asp Thr Gly Lys
530 535 540

Ile Tyr Cys Ile Thr Ile Ala Glu Leu Gly Lys Val Leu Leu Gly Glu
545 550 555 560

Phe Gln Ile Val Pro Phe Leu Arg Glu Ile Lys Ile Gln Ser Arg Tyr
565 570 575

<210> 80
<211> 580
<212> PRT
<213> Avian paramyxovirus 2

<220>
<221> MISC_FEATURE
<223> hemagglutinin-neuraminidase

<400> 80

Met Asp Phe Pro Ser Arg Glu Asn Leu Ala Ala Gly Asp Ile Ser Gly
1 5 10 15

Arg Lys Thr Trp Arg Leu Leu Phe Arg Ile Leu Thr Leu Ser Ile Gly
20 25 30

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

Leu Asp Asn Met Ala Ser Asn Thr Trp Thr Thr Thr Glu Ala Asp Arg
50 55 60

Val Ile Ser Ser Ile Thr Thr Pro Leu Lys Val Pro Val Asn Gln Ile
65 70 75 80

Asn Asp Met Phe Arg Ile Val Ala Leu Asp Leu Pro Leu Gln Met Thr
85 90 95

Ser Leu Gln Lys Glu Ile Thr Ser Gln Val Gly Phe Leu Ala Glu Ser
100 105 110

Ile Asn Asn Val Leu Ser Lys Asn Gly Ser Ala Gly Leu Val Leu Val
115 120 125

Asn Asp Pro Glu Tyr Ala Gly Gly Ile Ala Val Ser Leu Tyr Gln Gly
130 135 140

Asp Ala Ser Ala Gly Leu Asn Phe Gln Pro Ile Ser Leu Ile Glu His
145 150 155 160

Pro Ser Phe Val Pro Gly Pro Thr Thr Ala Lys Gly Cys Ile Arg Ile
165 170 175

Pro Thr Phe His Met Gly Pro Ser His Trp Cys Tyr Ser His Asn Ile
180 185 190

Ile Ala Ser Gly Cys Gln Asp Ala Ser His Ser Ser Met Tyr Ile Ser
195 200 205

Leu Gly Val Leu Lys Ala Ser Gln Thr Gly Ser Pro Ile Phe Leu Thr
210 215 220

Thr Ala Ser His Leu Val Asp Asp Asn Ile Asn Arg Lys Ser Cys Ser
225 230 235 240

Ile Val Ala Ser Lys Tyr Gly Cys Asp Ile Leu Cys Ser Ile Val Ile
245 250 255

Glu Thr Glu Asn Glu Asp Tyr Arg Ser Asp Pro Ala Thr Ser Met Ile
260 265 270

Ile Gly Arg Leu Phe Phe Asn Gly Ser Tyr Thr Glu Ser Lys Ile Asn

275

280

285

Thr Gly Ser Ile Phe Ser Leu Phe Ser Ala Asn Tyr Pro Ala Val Gly
 290 295 300

Ser Gly Ile Val Val Gly Asp Glu Ala Ala Phe Pro Ile Tyr Gly Gly
 305 310 315 320

Val Lys Gln Asn Thr Trp Leu Phe Asn Gln Leu Lys Asp Phe Gly Tyr
 325 330 335

Phe Thr His Asn Asp Val Tyr Lys Cys Asn Arg Thr Asp Ile Gln Gln
 340 345 350

Thr Ile Leu Asp Ala Tyr Arg Pro Pro Lys Ile Ser Gly Arg Leu Trp
 355 360 365

Val Gln Gly Ile Leu Leu Cys Pro Val Ser Leu Arg Pro Asp Pro Gly
 370 375 380

Cys Arg Leu Lys Val Phe Asn Thr Ser Asn Val Met Met Gly Ala Glu
 385 390 395 400

Ala Arg Leu Ile Gln Val Gly Ser Thr Val Tyr Leu Tyr Gln Arg Ser
 405 410 415

Ser Ser Trp Trp Val Val Gly Leu Thr Tyr Lys Leu Asp Val Ser Glu
 420 425 430

Ile Thr Ser Gln Thr Gly Asn Thr Leu Asn His Val Asp Pro Ile Ala
 435 440 445

His Thr Lys Phe Pro Arg Pro Ser Phe Arg Arg Asp Ala Cys Ala Arg
 450 455 460

Pro Asn Ile Cys Pro Ala Val Cys Val Ser Gly Val Tyr Gln Asp Ile
 465 470 475 480

Trp Pro Ile Ser Thr Ala Thr Asn Asn Ser Asn Ile Val Trp Val Gly
485 490 495

Gln Tyr Leu Glu Ala Phe Tyr Ser Arg Lys Asp Pro Arg Ile Gly Ile
500 505 510

Ala Thr Gln Tyr Glu Trp Lys Val Thr Asn Gln Leu Phe Asn Ser Asn
515 520 525

Thr Glu Gly Gly Tyr Ser Thr Thr Thr Cys Phe Arg Asn Thr Lys Arg
530 535 540

Asp Lys Ala Tyr Cys Val Val Ile Ser Glu Tyr Ala Asp Gly Val Phe
545 550 555 560

Gly Ser Tyr Arg Ile Val Pro Gln Leu Ile Glu Ile Arg Thr Thr Thr
565 570 575

Gly Lys Ser Glu
580

<210> 81
<211> 236
<212> PRT
<213> Human metapneumovirus

<220>
<221> MISC_FEATURE
<223> attachment glycoprotein G

<400> 81

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

Arg Val Lys Asn Arg Val Ala Arg Ser Lys Cys Phe Lys Asn Ala Ser
20 25 30

Leu Ile Leu Ile Gly Ile Thr Thr Leu Ser Ile Ala Leu Asn Ile Tyr
35 40 45

Leu Ile Ile Asn Tyr Thr Met Gln Glu Asn Thr Ser Glu Ser Glu His
50 55 60

His Thr Ser Ser Ser Pro Met Glu Ser Ser Arg Glu Thr Pro Thr Val
65 70 75 80

Pro Ile Asp Asn Ser Asp Thr Asn Pro Ser Ser Gln Tyr Pro Thr Gln
85 90 95

Gln Ser Thr Glu Gly Ser Thr Leu Tyr Phe Ala Ala Ser Ala Ser Ser
100 105 110

Pro Glu Thr Glu Pro Thr Ser Thr Pro Asp Thr Thr Ser Arg Pro Pro
115 120 125

Phe Val Asp Thr His Thr Thr Pro Pro Ser Ala Ser Arg Thr Lys Thr
130 135 140

Ser Pro Ala Val His Thr Lys Asn Asn Pro Arg Ile Ser Ser Arg Thr
145 150 155 160

His Ser Pro Pro Trp Ala Met Thr Arg Thr Val Arg Arg Thr Thr Thr
165 170 175

Leu Arg Thr Ser Ser Ile Arg Lys Arg Ser Ser Thr Ala Ser Val Gln
180 185 190

Pro Asp Ser Ser Ala Thr Thr His Lys His Glu Glu Ala Ser Pro Val
195 200 205

Ser Pro Gln Thr Ser Ala Ser Thr Thr Arg Pro Gln Arg Lys Ser Met
210 215 220

Glu Ala Ser Thr Ser Thr Thr Tyr Asn Gln Thr Ser
225 230 235

<210> 82
<211> 414
<212> PRT
<213> Canine pneumovirus

<220>
<221> MISC_FEATURE
<223> attachment protein

<400> 82

Met Arg Pro Ala Glu Gln Leu Ile Gln Glu Asn Tyr Lys Leu Thr Ser
1 5 10 15

Leu Ser Met Gly Arg Asn Phe Glu Val Ser Gly Ser Thr Thr Asn Leu
20 25 30

Asn Phe Glu Arg Thr Gln Tyr Pro Asp Thr Phe Arg Ala Val Val Lys
35 40 45

Val Asn Gln Met Cys Lys Leu Ile Ala Gly Val Leu Thr Ser Ala Ala
50 55 60

Val Ala Val Cys Val Gly Val Ile Met Tyr Ser Val Phe Thr Ser Asn
65 70 75 80

His Lys Ala Asn Ser Met Gln Asn Ala Thr Ile Arg Asn Ser Thr Ser
85 90 95

Ala Pro Pro Gln Pro Thr Ala Gly Pro Pro Thr Thr Glu Gln Gly Thr
100 105 110

Thr Pro Lys Phe Thr Lys Pro Pro Thr Lys Thr Thr Thr His His Glu
115 120 125

Ile Thr Glu Pro Ala Lys Met Val Thr Pro Ser Glu Asp Pro Tyr Gln

130

135

140

Cys Ser Ser Asn Gly Tyr Leu Asp Arg Pro Asp Leu Pro Glu Asp Phe
 145 150 155 160

Lys Leu Val Leu Asp Val Ile Cys Lys Pro Pro Gly Pro Glu His His
 165 170 175

Ser Thr Asn Cys Tyr Glu Lys Arg Glu Ile Asn Leu Gly Ser Val Cys
 180 185 190

Pro Asp Leu Val Thr Met Lys Ala Asn Met Gly Leu Asn Asn Gly Gly
 195 200 205

Gly Glu Glu Ala Ala Pro Tyr Ile Glu Val Ile Thr Leu Ser Thr Tyr
 210 215 220

Ser Asn Lys Arg Ala Met Cys Val His Asn Gly Cys Asp Gln Gly Phe
 225 230 235 240

Cys Phe Phe Leu Ser Gly Leu Ser Thr Asp Gln Lys Arg Ala Val Leu
 245 250 255

Glu Leu Gly Gly Gln Gln Ala Ile Met Glu Leu His Tyr Asp Ser Tyr
 260 265 270

Trp Lys His Tyr Trp Ser Asn Ser Asn Cys Val Val Pro Arg Thr Asn
 275 280 285

Cys Asn Leu Thr Asp Gln Thr Val Ile Leu Phe Pro Ser Phe Asn Asn
 290 295 300

Lys Asn Gln Ser Gln Cys Thr Thr Cys Ala Asp Ser Ala Gly Leu Asp
 305 310 315 320

Asn Lys Phe Tyr Leu Thr Cys Asp Gly Leu Ser Arg Asn Leu Pro Leu
 325 330 335

Val Gly Leu Pro Ser Leu Ser Pro Gln Ala His Lys Ala Ala Leu Lys
 340 345 350

Gln Ser Thr Gly Thr Thr Thr Ala Pro Thr Pro Glu Thr Arg Asn Pro
 355 360 365

Thr Pro Ala Pro Arg Arg Ser Lys Pro Leu Ser Arg Lys Lys Arg Ala
 370 375 380

Leu Cys Gly Val Asp Ser Ser Arg Glu Pro Lys Pro Thr Met Pro Tyr
 385 390 395 400

Trp Cys Pro Met Leu Gln Leu Phe Pro Arg Arg Ser Asn Ser
 405 410

<210> 83
 <211> 228
 <212> PRT
 <213> Respiratory syncytial virus type A

<220>
 <221> MISC_FEATURE
 <223> truncated attachment glycoprotein

<400> 83

Met Ser Lys Thr Lys Asp Gln Arg Ala Ala Lys Thr Leu Glu Lys Thr
 1 5 10 15

Trp Asp Thr Leu Asn His Leu Leu Phe Ile Ser Ser Cys Leu Tyr Lys
 20 25 30

Ser Asn Leu Lys Ser Ile Ala Gln Ile Thr Leu Ser Ile Leu Ala Met
 35 40 45

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

Ala Asn Asn Lys Val Thr Pro Thr Thr Ala Ile Ile Gln Asp Ala Thr
65 70 75 80

Ser Gln Ile Lys Asn Thr Thr Pro Thr His Leu Thr Gln Asn Pro Gln
85 90 95

Pro Gly Ile Ser Phe Phe Asn Leu Ser Gly Thr Ile Ser Gln Thr Thr
100 105 110

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

Thr Thr Val Lys Thr Lys Asn Thr Thr Thr Thr Gln Ile Gln Pro Ser
130 135 140

Lys Leu Thr Thr Lys Gln Arg Gln Asn Lys Pro Pro Asn Lys Pro Asn
145 150 155 160

Asp Asp Phe His Phe Glu Val Phe Asn Phe Val Pro Cys Ser Ile Cys
165 170 175

Ser Asn Asn Pro Thr Cys Trp Ala Ile Cys Lys Arg Ile Pro Ser Lys
180 185 190

Lys Pro Gly Lys Lys Thr Thr Thr Lys Pro Thr Lys Lys Gln Thr Ile
195 200 205

Lys Thr Thr Lys Lys Asp Leu Lys Pro Gln Thr Thr Lys Pro Lys Glu
210 215 220

Ala Pro Thr Thr
225

<210> 84
<211> 577
<212> PRT
<213> Avian paramyxovirus 8

<220>

<221> MISC_FEATURE

<223> hemagglutinin-neuraminidase protein

<400> 84

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

Arg Lys Thr Thr Trp Arg Ala Ile Phe Arg Trp Ser Val Leu Leu Ile
20 25 30

Thr Thr Gly Cys Leu Ala Leu Ser Ile Val Ser Ile Val Gln Ile Gly
35 40 45

Asn Leu Lys Ile Pro Ser Val Gly Asp Leu Ala Asp Glu Val Val Thr
50 55 60

Pro Leu Lys Thr Thr Leu Ser Asp Thr Leu Arg Asn Pro Ile Asn Gln
65 70 75 80

Ile Asn Asp Ile Phe Arg Ile Val Ala Leu Asp Ile Pro Leu Gln Val
85 90 95

Thr Ser Ile Gln Lys Asp Leu Ala Ser Gln Phe Ser Met Leu Ile Asp
100 105 110

Ser Leu Asn Ala Ile Lys Leu Gly Asn Gly Thr Asn Leu Ile Ile Pro
115 120 125

Thr Ser Asp Lys Glu Tyr Ala Gly Gly Ile Gly Asn Pro Val Phe Thr
130 135 140

Val Asp Ala Gly Gly Ser Ile Gly Phe Lys Gln Phe Ser Leu Ile Glu
145 150 155 160

His Pro Ser Phe Ile Ala Gly Pro Thr Thr Thr Arg Gly Cys Thr Arg

165

170

175

Ile Pro Thr Phe His Met Ser Glu Ser His Trp Cys Tyr Ser His Asn
 180 185 190

Ile Ile Ala Ala Gly Cys Gln Asp Ala Ser Ala Ser Ser Met Tyr Ile
 195 200 205

Ser Met Gly Val Leu His Val Ser Ser Ser Gly Thr Pro Ile Phe Leu
 210 215 220

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

Ser Ile Val Ala Thr Gln Phe Gly Cys Asp Ile Leu Cys Ser Ile Val
 245 250 255

Ile Glu Lys Glu Gly Asp Asp Tyr Trp Ser Asp Thr Pro Thr Pro Met
 260 265 270

Arg His Gly Arg Phe Ser Phe Asn Gly Ser Phe Val Glu Thr Glu Leu
 275 280 285

Pro Val Ser Ser Met Phe Ser Ser Phe Ser Ala Asn Tyr Pro Ala Val
 290 295 300

Gly Ser Gly Glu Ile Val Lys Asp Arg Ile Leu Phe Pro Ile Tyr Gly
 305 310 315 320

Gly Ile Lys Gln Thr Ser Pro Glu Phe Thr Glu Leu Val Lys Tyr Gly
 325 330 335

Leu Phe Val Ser Thr Pro Thr Thr Val Cys Gln Ser Ser Trp Thr Tyr
 340 345 350

Asp Gln Val Lys Ala Ala Tyr Arg Pro Asp Tyr Ile Ser Gly Arg Phe
 355 360 365

Trp Ala Gln Val Ile Leu Ser Cys Ala Leu Asp Ala Val Asp Leu Ser
370 375 380

Ser Cys Ile Val Lys Ile Met Asn Ser Ser Thr Val Met Met Ala Ala
385 390 395 400

Glu Gly Arg Ile Ile Lys Ile Gly Ile Asp Tyr Phe Tyr Tyr Gln Arg
405 410 415

Ser Ser Ser Trp Trp Pro Leu Ala Phe Val Thr Lys Leu Asp Pro Gln
420 425 430

Glu Leu Ala Asp Thr Asn Ser Ile Trp Leu Thr Asn Ser Ile Pro Ile
435 440 445

Pro Gln Ser Lys Phe Pro Arg Pro Ser Tyr Ser Glu Asn Tyr Cys Thr
450 455 460

Lys Pro Ala Val Cys Pro Ala Thr Cys Val Thr Gly Val Tyr Ser Asp
465 470 475 480

Ile Trp Pro Leu Thr Ser Ser Ser Ser Leu Pro Ser Ile Ile Trp Ile
485 490 495

Gly Gln Tyr Leu Asp Ala Pro Val Gly Arg Thr Tyr Pro Arg Phe Gly
500 505 510

Ile Ala Asn Gln Ser His Trp Tyr Leu Gln Glu Asp Ile Leu Pro Thr
515 520 525

Ser Thr Ala Ser Ala Tyr Ser Thr Thr Thr Cys Phe Lys Asn Thr Ala
530 535 540

Arg Asn Arg Val Phe Cys Val Thr Ile Ala Glu Phe Ala Asp Gly Leu
545 550 555 560

Phe Gly Glu Tyr Arg Ile Thr Pro Gln Leu Tyr Glu Leu Val Arg Asn
565 570 575

Asn

<210> 85
<211> 576
<212> PRT
<213> Porcine parainfluenza virus 1

<220>
<221> MISC_FEATURE
<223> haemagglutinin protein

<400> 85

Met Glu Glu Thr Lys Val Lys Thr Ser Glu Tyr Trp Ala Arg Ser Pro
1 5 10 15

Gln Ile His Ala Thr Asn His Pro Asn Val Gln Asn Arg Glu Lys Ile
20 25 30

Lys Glu Ile Leu Thr Ile Leu Ile Ser Phe Ile Ser Ser Leu Ser Leu
35 40 45

Val Leu Val Ile Ala Val Leu Ile Met Gln Ser Leu His Asn Gly Thr
50 55 60

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

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

Thr Arg Ile Ile Asn Thr Gln Ser Ser Val Gln Val Ala Leu Pro Ile
100 105 110

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

Ser Lys Val His Gln Asn Ser Pro Thr Cys Ser Gly Val Ala Ala Leu
130 135 140

Thr His Val Glu Gly Ile Lys Pro Leu Asp Pro Asp Asp Tyr Trp Arg
145 150 155 160

Cys Pro Ser Gly Glu Pro Tyr Leu Glu Asp Glu Leu Thr Leu Ser Leu
165 170 175

Ile Pro Gly Pro Ser Met Leu Ala Gly Thr Ser Thr Ile Asp Gly Cys
180 185 190

Val Arg Leu Pro Ser Leu Ala Ile Gly Lys Ser Leu Tyr Ala Tyr Ser
195 200 205

Ser Asn Leu Ile Thr Lys Gly Cys Gln Asp Ile Gly Lys Ser Tyr Gln
210 215 220

Val Leu Gln Leu Gly Ile Ile Thr Leu Asn Ser Asp Leu His Pro Asp
225 230 235 240

Leu Asn Pro Ile Ile Ser His Thr Tyr Asp Ile Asn Asp Asn Arg Lys
245 250 255

Ser Cys Ser Val Ala Val Ser Glu Thr Lys Gly Tyr Gln Leu Cys Ser
260 265 270

Met Pro Arg Val Asn Glu Lys Thr Asp Tyr Thr Ser Asp Gly Ile Glu
275 280 285

Asp Ile Val Phe Asp Val Leu Asp Leu Lys Gly Ser Ser Arg Ser Phe
290 295 300

Lys Phe Ser Asn Asn Asp Ile Asn Phe Asp His Pro Phe Ser Ala Leu

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

Asp Arg Val Tyr Asn Met Leu Arg Leu Arg Asn Thr Glu Leu Glu Ala
515 520 525

Ala Tyr Thr Thr Thr Ser Cys Ile Val His Phe Asp Arg Gly Tyr Cys
530 535 540

Phe His Ile Ile Glu Ile Asn Gln Lys Glu Leu Asn Thr Leu Gln Pro
545 550 555 560

Met Leu Phe Lys Thr Ala Ile Pro Lys Ala Cys Arg Ile Ser Asn Leu
565 570 575

<210> 86
<211> 579
<212> PRT
<213> Human parainfluenza virus 4b

<220>
<221> MISC_FEATURE
<223> hemagglutinin-neuraminidase protein

<400> 86

Met Gln Asp Ser Arg Gly Asn Thr Gln Ile Phe Ser Gln Ala Asn Ser
1 5 10 15

Met Val Lys Arg Thr Trp Arg Leu Leu Phe Arg Ile Val Thr Leu Ile
20 25 30

Leu Leu Ile Ser Ile Phe Val Leu Ser Leu Ile Ile Val Leu Gln Ser
35 40 45

Thr Pro Gly Asn Leu Gln Ser Asp Val Asp Ile Ile Arg Lys Glu Leu
50 55 60

Asp Glu Leu Met Glu Asn Phe Glu Thr Thr Ser Lys Ser Leu Leu Ser
65 70 75 80

Val Ala Asn Gln Ile Thr Tyr Asp Val Ser Val Leu Thr Pro Ile Arg
85 90 95

Gln Glu Ala Thr Glu Thr Asn Ile Ile Ala Lys Ile Lys Asp His Cys
100 105 110

Lys Asp Arg Val Val Lys Gly Glu Ser Thr Cys Thr Leu Gly His Lys
115 120 125

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

Thr Tyr Arg Asp Asn Val Gln Ile Arg Leu Asn Pro Leu Leu Asp Tyr
145 150 155 160

Pro Asn Phe Ile Pro Thr Ala Thr Thr Pro His Gly Cys Ile Arg Ile
165 170 175

Pro Ser Phe Ser Leu Ser Gln Thr His Trp Cys Tyr Thr His Asn Thr
180 185 190

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

Leu Gly Thr Leu Gln Thr Leu Glu Asn Gly Asp Pro Tyr Phe Lys Val
210 215 220

Glu Tyr Ser His Tyr Leu Asn Asp Arg Lys Asn Arg Lys Ser Cys Ser
225 230 235 240

Val Val Ala Val Leu Asp Gly Cys Leu Leu Tyr Cys Val Ile Met Thr
245 250 255

Lys Asn Glu Thr Glu Asn Phe Lys Asp Pro Gln Leu Ala Thr Gln Leu
260 265 270

Leu Thr Tyr Ile Ser Tyr Asn Gly Thr Ile Lys Glu Arg Ile Ile Asn
275 280 285

Pro Pro Gly Ser Ser Arg Asp Trp Val His Ile Ser Pro Gly Val Gly
290 295 300

Ser Gly Ile Leu Tyr Ser Asn Tyr Ile Ile Phe Pro Leu Tyr Gly Gly
305 310 315 320

Leu Met Glu Asn Ser Met Ile Tyr Asn Asn Gln Ser Gly Lys Tyr Phe
325 330 335

Phe Pro Asn Ser Thr Lys Leu Pro Cys Ser Asn Lys Thr Ser Glu Lys
340 345 350

Ile Thr Gly Ala Lys Asp Ser Tyr Thr Ile Thr Tyr Phe Ser Lys Arg
355 360 365

Leu Ile Gln Ser Ala Phe Leu Ile Cys Asp Leu Arg Gln Phe Leu Ser
370 375 380

Glu Asp Cys Glu Ile Leu Ile Pro Ser Asn Asp His Met Leu Val Gly
385 390 395 400

Ala Glu Gly Arg Leu Tyr Asn Ile Glu Asn Asn Ile Phe Tyr Tyr Gln
405 410 415

Arg Gly Ser Ser Trp Trp Pro Tyr Pro Ser Leu Tyr Arg Ile Lys Leu
420 425 430

Asn Ser Asn Lys Lys Tyr Pro Arg Ile Ile Glu Ile Lys Phe Thr Lys
435 440 445

Ile Glu Ile Ala Pro Arg Pro Gly Asn Lys Asp Cys Pro Gly Asn Lys
450 455 460

Ala Cys Pro Lys Glu Cys Ile Thr Gly Val Tyr Gln Asp Ile Trp Pro

465 470 475 480

Leu Ser Tyr Pro Asn Thr Ala Phe Pro His Lys Lys Arg Ala Tyr Tyr
485 490 495

Thr Gly Phe Tyr Leu Asn Asn Ser Leu Ala Arg Arg Asn Pro Thr Phe
500 505 510

Tyr Thr Ala Asp Asn Leu Asp Tyr His Gln Gln Glu Arg Leu Gly Lys
515 520 525

Phe Asn Leu Thr Ala Gly Tyr Ser Thr Thr Thr Cys Phe Lys Gln Thr
530 535 540

Thr Thr Ala Arg Leu Tyr Cys Leu Tyr Ile Leu Glu Val Gly Asp Ser
545 550 555 560

Val Ile Gly Asp Phe Gln Ile Phe Pro Phe Leu Arg Ser Ile Asp Gln
565 570 575

Ala Ile Thr

<210> 87
<211> 582
<212> PRT
<213> Avian paramyxovirus 2

<220>
<221> MISC_FEATURE
<223> hemagglutinin-neuraminidase

<400> 87

Met Asp Ala Leu Ser Arg Glu Asn Leu Thr Glu Ile Ser Gln Gly Gly
1 5 10 15

Arg Arg Thr Trp Arg Met Leu Phe Arg Ile Leu Thr Leu Val Leu Thr
20 25 30

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

Ile Asp Thr Ser Lys Val Gln Thr Trp Thr Thr Thr Glu Ser Asp Arg
50 55 60

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

Asn Asp Met Phe Arg Ile Val Ala Leu Asp Leu Pro Leu Gln Met Thr
85 90 95

Thr Leu Gln Lys Glu Ile Ala Ser Gln Val Gly Phe Leu Ala Glu Ser
100 105 110

Ile Asn Asn Phe Leu Ser Lys Asn Gly Ser Ala Gly Ser Val Leu Val
115 120 125

Asn Asp Pro Glu Tyr Ala Gly Gly Ile Gly Thr Ser Leu Phe His Gly
130 135 140

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

Pro Ser Phe Ile Pro Gly Pro Thr Thr Ala Lys Gly Cys Ile Arg Ile
165 170 175

Pro Thr Phe His Met Ser Ala Ser His Trp Cys Tyr Ser His Asn Ile
180 185 190

Ile Ala Ser Gly Cys Gln Asp Ala Gly His Ser Ser Met Tyr Ile Ser
195 200 205

Met Gly Val Leu Lys Ala Thr Gln Ala Gly Ser Pro Ser Phe Leu Thr
210 215 220

Thr Ala Ser Gln Leu Val Asp Asp Lys Leu Asn Arg Lys Ser Cys Ser
225 230 235 240

Ile Ile Ser Thr Thr Tyr Gly Cys Asp Ile Leu Cys Ser Leu Val Val
245 250 255

Glu Asn Glu Asp Ala Asp Tyr Arg Ser Asp Pro Pro Thr Asp Met Ile
260 265 270

Leu Gly Arg Leu Phe Phe Asn Gly Thr Tyr Ser Glu Ser Lys Leu Asn
275 280 285

Thr Ser Ala Ile Phe Gln Leu Phe Ser Ala Asn Tyr Pro Ala Val Gly
290 295 300

Ser Gly Ile Val Leu Gly Asp Glu Ile Ala Phe Pro Val Tyr Gly Gly
305 310 315 320

Val Lys Gln Asn Thr Trp Leu Phe Asn Gln Leu Lys Asp Tyr Gly Tyr
325 330 335

Phe Ala His Asn Asn Val Tyr Lys Cys Asn Asn Ser Asn Ile His Gln
340 345 350

Thr Val Leu Asn Ala Tyr Arg Pro Pro Lys Ile Ser Gly Arg Leu Trp
355 360 365

Ser Gln Val Val Leu Ile Cys Pro Met Arg Leu Phe Ile Asn Thr Asp
370 375 380

Cys Arg Ile Lys Val Phe Asn Thr Ser Thr Val Met Met Gly Ala Glu
385 390 395 400

Ala Arg Leu Ile Gln Val Gly Ser Asp Ile Tyr Leu Tyr Gln Arg Ser
405 410 415

Ser Ser Trp Trp Val Val Gly Leu Thr Tyr Lys Leu Asp Phe Gln Glu
420 425 430

Leu Ser Ser Lys Thr Gly Asn Ile Leu Asn Asn Val Ser Pro Ile Ala
435 440 445

His Ala Lys Phe Pro Arg Pro Ser Tyr Ser Arg Asp Ala Cys Ala Arg
450 455 460

Pro Asn Ile Cys Pro Ala Val Cys Val Ser Gly Val Tyr Gln Asp Ile
465 470 475 480

Trp Pro Ile Ser Thr Ala His Asn Leu Ser Gln Val Val Trp Val Gly
485 490 495

Gln Tyr Leu Glu Ala Phe Tyr Ala Arg Lys Asp Pro Trp Ile Gly Ile
500 505 510

Ala Thr Gln Tyr Asp Trp Lys Lys Asn Val Arg Leu Phe Asn Ala Asn
515 520 525

Thr Glu Gly Gly Tyr Ser Thr Thr Thr Cys Phe Arg Asn Thr Lys Arg
530 535 540

Asp Lys Ala Phe Cys Val Ile Ile Ser Glu Tyr Ala Asp Gly Val Phe
545 550 555 560

Gly Ser Tyr Arg Ile Val Pro Gln Leu Ile Glu Ile Arg Thr Thr Ser
565 570 575

Lys Lys Gly Leu Pro Ser
580

<210> 88

<211> 610

<212> PRT

<213> Avian paramyxovirus goose/Shimane/67/2000

<220>

<221> MISC_FEATURE

<223> hemagglutinin-neuraminidase

<400> 88

Met Gln Pro Gly Ile Ser Glu Val Ser Phe Val Asn Asp Glu Arg Ser
1 5 10 15

Glu Arg Gly Thr Trp Arg Leu Leu Phe Arg Ile Leu Thr Ile Val Leu
20 25 30

Cys Leu Thr Ser Ile Gly Ile Gly Ile Pro Ala Leu Ile Tyr Ser Lys
35 40 45

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

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

Glu Gln Lys Ile Tyr Arg Gln Val Ile Leu Glu Ala Pro Val Ser Gln
85 90 95

Leu Asn Met Glu Ser Asn Ile Leu Ser Ala Ile Thr Ser Leu Ser Tyr
100 105 110

Gln Ile Asp Gly Thr Ser Asn Ser Ser Gly Cys Gly Ser Pro Met His
115 120 125

Asp Gln Asp Phe Val Gly Gly Ile Asn Lys Glu Ile Trp Thr Thr Asp
130 135 140

Asn Val Asn Leu Gly Glu Ile Thr Leu Thr Pro Phe Leu Glu His Leu
145 150 155 160

Asn Phe Ile Pro Ala Pro Thr Thr Gly Asn Gly Cys Thr Arg Ile Pro
165 170 175

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

Leu Ser Gly Cys Gln Asp Tyr Ser Ser Ser Phe Gln Tyr Ile Ala Leu
195 200 205

Gly Val Leu Lys Ile Ser Ala Thr Gly His Val Phe Leu Ser Thr Met
210 215 220

Arg Ser Ile Asn Leu Asp Asp Glu Arg Asn Arg Lys Ser Cys Ser Ile
225 230 235 240

Ser Ala Thr Ser Ile Gly Cys Asp Ile Ile Cys Ser Leu Val Thr Glu
245 250 255

Arg Glu Val Asp Asp Tyr Asn Ser Pro Ala Ala Thr Pro Met Ile His
260 265 270

Gly Arg Leu Asp Phe Ser Gly Lys Tyr Asn Glu Val Asp Leu Asn Val
275 280 285

Gly Gln Leu Phe Gly Asp Trp Ser Ala Asn Tyr Pro Gly Val Gly Gly
290 295 300

Gly Ser Phe Leu Asn Gly Arg Val Trp Phe Pro Ile Tyr Gly Gly Val
305 310 315 320

Lys Glu Gly Thr Pro Thr Phe Lys Glu Asn Asp Gly Arg Tyr Ala Ile
325 330 335

Tyr Thr Arg Tyr Asn Asp Thr Cys Pro Asp Ser Glu Ser Glu Gln Val
340 345 350

Ser Arg Ala Lys Ser Ser Tyr Arg Pro Ser Tyr Phe Gly Gly Lys Leu
355 360 365

Val Gln Gln Ala Val Leu Ser Ile Lys Ile Asp Asp Thr Leu Gly Leu
370 375 380

Asp Pro Val Leu Thr Ile Ser Asn Asn Ser Ile Thr Leu Met Gly Ala
385 390 395 400

Glu Ser Arg Val Leu Gln Ile Glu Glu Lys Leu Tyr Phe Tyr Gln Arg
405 410 415

Gly Thr Ser Trp Phe Pro Ser Leu Ile Met Tyr Pro Leu Thr Val Asp
420 425 430

Asp Lys Met Val Arg Phe Glu Pro Pro Thr Ile Phe Asp Gln Phe Thr
435 440 445

Arg Pro Gly Asn His Pro Cys Ser Ala Asp Ser Arg Cys Pro Asn Ala
450 455 460

Cys Val Thr Gly Val Tyr Thr Asp Gly Tyr Pro Ile Val Phe His Asn
465 470 475 480

Asn His Ser Ile Ala Ala Val Tyr Gly Met Gln Leu Asn Asp Val Thr
485 490 495

Asn Arg Leu Asn Pro Arg Ser Ala Val Trp Tyr Gly Val Ser Met Ser
500 505 510

Asn Val Ile Arg Val Ser Ser Ser Thr Thr Lys Ala Ala Tyr Thr Thr
515 520 525

Ser Thr Cys Phe Lys Val Lys Lys Thr Gln Arg Val Tyr Cys Leu Ser
530 535 540

Ile Gly Glu Ile Gly Asn Thr Leu Phe Gly Glu Phe Arg Ile Val Pro
545 550 555 560

Leu Leu Leu Glu Val Tyr Ser Glu Lys Gly Lys Ser Leu Lys Ser Ser
565 570 575

Phe Asp Gly Trp Glu Asp Ile Ser Ile Asn Asn Pro Leu Arg Pro Leu
580 585 590

Asp Asn His Arg Val Asp Pro Ile Leu Ile Ser Asn Tyr Thr Ser Ser
595 600 605

Trp Pro
610

<210> 89
<211> 257
<212> PRT
<213> Bovine respiratory syncytial virus

<220>
<221> MISC_FEATURE
<223> attachment glycoprotein

<400> 89

Met Ser Asn His Thr His His Leu Lys Phe Lys Thr Leu Lys Arg Ala
1 5 10 15

Trp Lys Ala Ser Lys Tyr Phe Ile Val Gly Leu Ser Cys Leu Tyr Lys
20 25 30

Phe Asn Leu Lys Ser Leu Val Gln Thr Ala Leu Thr Thr Leu Ala Met
35 40 45

Ile Thr Leu Thr Ser Leu Val Ile Thr Ala Ile Ile Tyr Ile Ser Val
50 55 60

Gly Asn Ala Lys Ala Lys Pro Thr Ser Lys Pro Thr Ile Gln Gln Thr
65 70 75 80

Gln Gln Pro Gln Asn His Thr Ser Pro Phe Phe Thr Glu His Asn Tyr

85

90

95

Lys Ser Thr His Thr Ser Ile Gln Ser Thr Thr Leu Ser Gln Leu Pro
 100 105 110

Asn Thr Asp Thr Thr Arg Glu Thr Thr Tyr Ser His Ser Ile Asn Glu
 115 120 125

Thr Gln Asn Arg Lys Ile Lys Ser Gln Ser Thr Leu Pro Ala Thr Arg
 130 135 140

Lys Pro Pro Ile Asn Pro Ser Gly Ser Asn Pro Pro Glu Asn His Gln
 145 150 155 160

Asp His Asn Asn Ser Gln Thr Leu Pro Tyr Val Pro Cys Ser Thr Cys
 165 170 175

Glu Gly Asn Leu Ala Cys Leu Ser Leu Cys Gln Ile Gly Pro Glu Arg
 180 185 190

Ala Pro Ser Arg Ala Pro Thr Ile Thr Leu Lys Lys Thr Pro Lys Pro
 195 200 205

Lys Thr Thr Lys Lys Pro Thr Lys Thr Thr Ile His His Arg Thr Ser
 210 215 220

Pro Glu Ala Lys Leu Gln Pro Lys Asn Asn Thr Ala Ala Pro Gln Gln
 225 230 235 240

Gly Ile Leu Ser Ser Pro Glu His His Thr Asn Gln Ser Thr Thr Gln
 245 250 255

Ile

<210> 90

<211> 595

<212> PRT

<213> Menangle virus

<220>

<221> MISC_FEATURE

<223> attachment protein

<400> 90

Met Trp Asn Ser Ile Pro Gln Leu Val Ser Asp His Glu Glu Ala Lys
1 5 10 15

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

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

Ile Ile Leu Ser Leu Val Ile Leu Val Leu Gly Val Thr Ser Thr Met
50 55 60

Phe Ser Ala Lys Tyr Ser Gly Gly Cys Ala Thr Asn Ser Gln Leu Leu
65 70 75 80

Gly Val Ser Asn Leu Ile Asn Gln Ile Gln Lys Ser Ile Asp Ser Leu
85 90 95

Ile Ser Glu Val Asn Gln Val Ser Ile Thr Thr Ala Val Thr Leu Pro
100 105 110

Ile Lys Ile Met Asp Phe Gly Lys Ser Val Thr Asp Gln Val Thr Gln
115 120 125

Met Ile Arg Gln Cys Asn Thr Val Cys Lys Gly Pro Gly Gln Lys Pro
130 135 140

Gly Ser Gln Asn Val Arg Ile Met Pro Ser Asn Asn Leu Ser Thr Phe
145 150 155 160

Gln Asn Ile Asn Met Ser Ala Arg Gly Ile Ala Tyr Gln Asp Val Pro
165 170 175

Leu Thr Phe Val Arg Pro Ile Lys Asn Pro Gln Ser Cys Ser Arg Phe
180 185 190

Pro Ser Tyr Ser Val Ser Phe Gly Val His Cys Phe Ala Asn Ala Val
195 200 205

Thr Asp Gln Thr Cys Glu Leu Asn Gln Asn Thr Phe Tyr Arg Val Val
210 215 220

Leu Ser Val Ser Lys Gly Asn Ile Ser Asp Pro Ser Ser Leu Glu Thr
225 230 235 240

Lys Ala Glu Thr Arg Thr Pro Lys Gly Thr Pro Val Arg Thr Cys Ser
245 250 255

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

Val Pro Glu Ser Glu Glu Met Lys Thr Ile Gly Phe Ser Gln Met Phe
275 280 285

Ile Leu Tyr Leu Ser Met Asp Ser Lys Arg Ile Ile Tyr Asp Asn Ile
290 295 300

Val Ser Ser Thr Ser Ala Ile Trp Ser Gly Leu Tyr Pro Gly Glu Gly
305 310 315 320

Ala Gly Ile Trp His Met Gly Gln Leu Phe Phe Pro Leu Trp Gly Gly
325 330 335

Ile Pro Phe Leu Thr Pro Leu Gly Gln Lys Ile Leu Asn Ser Thr Leu
340 345 350

Asp Ile Pro Glu Val Gly Ser Lys Cys Lys Ser Asp Leu Thr Ser Asn
355 360 365

Pro Ala Lys Thr Lys Asp Met Leu Phe Ser Pro Tyr Tyr Gly Glu Asn
370 375 380

Val Met Val Phe Gly Phe Leu Thr Cys Tyr Leu Leu Ser Asn Val Pro
385 390 395 400

Thr Asn Cys His Ala Asp Tyr Leu Asn Ser Thr Val Leu Gly Phe Gly
405 410 415

Ser Lys Ala Gln Phe Tyr Asp Tyr Arg Gly Ile Val Tyr Met Tyr Ile
420 425 430

Gln Ser Ala Gly Trp Tyr Pro Phe Thr Gln Ile Phe Arg Ile Thr Leu
435 440 445

Gln Leu Lys Gln Asn Arg Leu Gln Ala Lys Ser Ile Lys Arg Ile Glu
450 455 460

Val Thr Ser Thr Thr Arg Pro Gly Asn Arg Glu Cys Ser Val Leu Arg
465 470 475 480

Asn Cys Pro Tyr Ile Cys Ala Thr Gly Leu Phe Gln Val Pro Trp Ile
485 490 495

Val Asn Ser Asp Ala Ile Thr Ser Lys Glu Val Asp Asn Met Val Phe
500 505 510

Val Gln Ala Trp Ala Ala Asp Phe Thr Glu Phe Arg Lys Gly Ile Leu
515 520 525

Ser Leu Cys Ser Gln Val Ser Cys Pro Ile Asn Asp Leu Leu Ser Lys
530 535 540

Asp Asn Ser Tyr Met Arg Asp Thr Thr Thr Tyr Cys Phe Pro Gln Thr

545 550 555 560

Val Pro Asn Ile Leu Ser Cys Thr Ser Phe Val Glu Trp Gly Gly Asp
565 570 575

Ser Gly Asn Pro Ile Asn Ile Leu Glu Ile His Tyr Glu Val Ile Phe
580 585 590

Val Ala Ser
595

<210> 91
<211> 574
<212> PRT
<213> Avian paramyxovirus 5

<220>
<221> MISC_FEATURE
<223> hemagglutinin neuraminidase protein

<400> 91

Met Asp Lys Ser Tyr Tyr Thr Glu Pro Glu Asp Gln Arg Gly Asn Ser
1 5 10 15

Arg Thr Trp Arg Leu Leu Phe Arg Leu Ile Val Leu Thr Leu Leu Cys
20 25 30

Leu Ile Ala Cys Thr Ser Val Ser Gln Leu Phe Tyr Pro Trp Leu Pro
35 40 45

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

Ser Asn Gly Leu Lys Lys Glu Ile Leu Asn Gln Asn Ile Lys Glu Asp
65 70 75 80

Leu Ile Tyr Arg Glu Val Ala Ile Asn Ile Pro Leu Thr Leu Asp Arg
85 90 95

Val Thr Val Glu Val Gly Thr Ala Val Asn Gln Ile Thr Asp Ala Leu
100 105 110

Arg Gln Leu Gln Ser Val Asn Gly Ser Ala Ala Phe Ala Leu Ser Asn
115 120 125

Ser Pro Asp Tyr Ser Gly Gly Ile Glu His Leu Val Phe Gln Arg Asn
130 135 140

Thr Leu Ile Asn Arg Ser Val Ser Val Ser Asp Leu Ile Glu His Pro
145 150 155 160

Ser Phe Ile Pro Thr Pro Thr Thr Gln His Gly Cys Thr Arg Ile Pro
165 170 175

Thr Phe His Leu Gly Thr Arg His Trp Cys Tyr Ser His Asn Ile Ile
180 185 190

Gly Gln Gly Cys Ala Asp Ser Gly Ala Ser Met Met Tyr Ile Ser Met
195 200 205

Gly Ala Leu Gly Val Ser Ser Leu Gly Thr Pro Thr Phe Thr Thr Ser
210 215 220

Ala Thr Ser Ile Leu Ser Asp Ser Leu Asn Arg Lys Ser Cys Ser Ile
225 230 235 240

Val Ala Thr Thr Glu Gly Cys Asp Val Leu Cys Ser Ile Val Thr Gln
245 250 255

Thr Glu Asp Gln Asp Tyr Ala Asp His Thr Pro Thr Pro Met Ile His
260 265 270

Gly Arg Leu Trp Phe Asn Gly Thr Tyr Thr Glu Arg Ser Leu Ser Gln
275 280 285

Ser Leu Phe Leu Gly Thr Trp Ala Ala Gln Tyr Pro Ala Val Gly Ser
290 295 300

Gly Ile Met Thr Pro Gly Arg Val Ile Phe Pro Phe Tyr Gly Gly Val
305 310 315 320

Ile Pro Asn Ser Pro Leu Phe Leu Asp Leu Glu Arg Phe Ala Leu Phe
325 330 335

Thr His Asn Gly Asp Leu Glu Cys Arg Asn Leu Thr Gln Tyr Gln Lys
340 345 350

Glu Ala Ile Tyr Ser Ala Tyr Lys Pro Pro Lys Ile Arg Gly Ser Leu
355 360 365

Trp Ala Gln Gly Phe Ile Val Cys Ser Val Gly Asp Met Gly Asn Cys
370 375 380

Ser Leu Lys Val Ile Asn Thr Ser Thr Val Met Met Gly Ala Glu Gly
385 390 395 400

Arg Leu Gln Leu Val Gly Asp Ser Val Met Tyr Tyr Gln Arg Ser Ser
405 410 415

Ser Trp Trp Pro Val Gly Ile Leu Tyr Arg Leu Ser Leu Val Asp Ile
420 425 430

Ile Ala Arg Asp Ile Gln Val Val Ile Asn Ser Glu Pro Leu Pro Leu
435 440 445

Ser Lys Phe Pro Arg Pro Thr Trp Thr Pro Gly Val Cys Gln Lys Pro
450 455 460

Asn Val Cys Pro Ala Val Cys Val Thr Gly Val Tyr Gln Asp Leu Trp
465 470 475 480

Ala Ile Ser Ala Gly Glu Thr Leu Ser Glu Met Thr Phe Phe Gly Gly
485 490 495

Tyr Leu Glu Ala Ser Thr Gln Arg Lys Asp Pro Trp Ile Gly Val Ala
500 505 510

Asn Gln Tyr Ser Trp Phe Met Arg Arg Arg Leu Phe Lys Thr Ser Thr
515 520 525

Glu Ala Ala Tyr Ser Ser Ser Thr Cys Phe Arg Asn Thr Arg Leu Asp
530 535 540

Arg Asn Phe Cys Leu Leu Ile Phe Glu Leu Thr Asp Asn Leu Leu Gly
545 550 555 560

Asp Trp Arg Ile Val Pro Leu Leu Phe Glu Leu Thr Ile Val
565 570

<210> 92
<211> 622
<212> PRT
<213> Cedar virus

<220>
<221> MISC_FEATURE
<223> attachment glycoprotein

<400> 92

Met Leu Ser Gln Leu Gln Lys Asn Tyr Leu Asp Asn Ser Asn Gln Gln
1 5 10 15

Gly Asp Lys Met Asn Asn Pro Asp Lys Lys Leu Ser Val Asn Phe Asn
20 25 30

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

Val Lys Asn Lys Asn Tyr Asn Val Ser Asn Leu Leu Asn Glu Ser Leu

50

55

60

His Asp Ile Lys Phe Cys Ile Tyr Cys Ile Phe Ser Leu Leu Ile Ile
65 70 75 80

Ile Thr Ile Ile Asn Ile Ile Thr Ile Ser Ile Val Ile Thr Arg Leu
85 90 95

Lys Val His Glu Glu Asn Asn Gly Met Glu Ser Pro Asn Leu Gln Ser
100 105 110

Ile Gln Asp Ser Leu Ser Ser Leu Thr Asn Met Ile Asn Thr Glu Ile
115 120 125

Thr Pro Arg Ile Gly Ile Leu Val Thr Ala Thr Ser Val Thr Leu Ser
130 135 140

Ser Ser Ile Asn Tyr Val Gly Thr Lys Thr Asn Gln Leu Val Asn Glu
145 150 155 160

Leu Lys Asp Tyr Ile Thr Lys Ser Cys Gly Phe Lys Val Pro Glu Leu
165 170 175

Lys Leu His Glu Cys Asn Ile Ser Cys Ala Asp Pro Lys Ile Ser Lys
180 185 190

Ser Ala Met Tyr Ser Thr Asn Ala Tyr Ala Glu Leu Ala Gly Pro Pro
195 200 205

Lys Ile Phe Cys Lys Ser Val Ser Lys Asp Pro Asp Phe Arg Leu Lys
210 215 220

Gln Ile Asp Tyr Val Ile Pro Val Gln Gln Asp Arg Ser Ile Cys Met
225 230 235 240

Asn Asn Pro Leu Leu Asp Ile Ser Asp Gly Phe Phe Thr Tyr Ile His
245 250 255

Tyr Glu Gly Ile Asn Ser Cys Lys Lys Ser Asp Ser Phe Lys Val Leu
260 265 270

Leu Ser His Gly Glu Ile Val Asp Arg Gly Asp Tyr Arg Pro Ser Leu
275 280 285

Tyr Leu Leu Ser Ser His Tyr His Pro Tyr Ser Met Gln Val Ile Asn
290 295 300

Cys Val Pro Val Thr Cys Asn Gln Ser Ser Phe Val Phe Cys His Ile
305 310 315 320

Ser Asn Asn Thr Lys Thr Leu Asp Asn Ser Asp Tyr Ser Ser Asp Glu
325 330 335

Tyr Tyr Ile Thr Tyr Phe Asn Gly Ile Asp Arg Pro Lys Thr Lys Lys
340 345 350

Ile Pro Ile Asn Asn Met Thr Ala Asp Asn Arg Tyr Ile His Phe Thr
355 360 365

Phe Ser Gly Gly Gly Gly Val Cys Leu Gly Glu Glu Phe Ile Ile Pro
370 375 380

Val Thr Thr Val Ile Asn Thr Asp Val Phe Thr His Asp Tyr Cys Glu
385 390 395 400

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

Ser Glu Ser Leu Arg Ser Pro Thr Asn Ser Ser Arg Tyr Asn Leu Asn
420 425 430

Gly Ile Met Ile Ile Ser Gln Asn Asn Met Thr Asp Phe Lys Ile Gln
435 440 445

Leu Asn Gly Ile Thr Tyr Asn Lys Leu Ser Phe Gly Ser Pro Gly Arg
450 455 460

Leu Ser Lys Thr Leu Gly Gln Val Leu Tyr Tyr Gln Ser Ser Met Ser
465 470 475 480

Trp Asp Thr Tyr Leu Lys Ala Gly Phe Val Glu Lys Trp Lys Pro Phe
485 490 495

Thr Pro Asn Trp Met Asn Asn Thr Val Ile Ser Arg Pro Asn Gln Gly
500 505 510

Asn Cys Pro Arg Tyr His Lys Cys Pro Glu Ile Cys Tyr Gly Gly Thr
515 520 525

Tyr Asn Asp Ile Ala Pro Leu Asp Leu Gly Lys Asp Met Tyr Val Ser
530 535 540

Val Ile Leu Asp Ser Asp Gln Leu Ala Glu Asn Pro Glu Ile Thr Val
545 550 555 560

Phe Asn Ser Thr Thr Ile Leu Tyr Lys Glu Arg Val Ser Lys Asp Glu
565 570 575

Leu Asn Thr Arg Ser Thr Thr Thr Ser Cys Phe Leu Phe Leu Asp Glu
580 585 590

Pro Trp Cys Ile Ser Val Leu Glu Thr Asn Arg Phe Asn Gly Lys Ser
595 600 605

Ile Arg Pro Glu Ile Tyr Ser Tyr Lys Ile Pro Lys Tyr Cys
610 615 620

<210> 93
<211> 595
<212> PRT
<213> Tevlot virus

<220>

<221> MISC_FEATURE

<223> attachment protein

<400> 93

Met Trp Ser Thr Gln Ala Ser Lys His Pro Ala Met Val Asn Ser Ala
1 5 10 15

Thr Asn Leu Val Asp Ile Pro Leu Asp His Pro Ser Ser Ala Gln Phe
20 25 30

Pro Ile Asn Arg Lys Arg Thr Gly Arg Leu Ile Tyr Arg Leu Phe Ser
35 40 45

Ile Leu Cys Asn Leu Ile Leu Ile Ser Ile Leu Ile Ser Leu Val Val
50 55 60

Ile Trp Ser Arg Ser Ser Arg Asp Cys Ala Lys Ser Asp Gly Leu Ser
65 70 75 80

Ser Val Asp Asn Gln Leu Ser Ser Leu Ser Arg Ser Ile Asn Ser Leu
85 90 95

Ile Thr Glu Val Asn Gln Ile Ser Val Thr Thr Ala Ile Asn Leu Pro
100 105 110

Ile Lys Leu Ser Glu Phe Gly Lys Ser Val Val Asp Gln Val Thr Gln
115 120 125

Met Ile Arg Gln Cys Asn Ala Ala Cys Lys Gly Pro Gly Glu Lys Pro
130 135 140

Gly Ile Gln Asn Val Arg Ile Asn Ile Pro Asn Asn Phe Ser Thr Tyr
145 150 155 160

Ser Glu Leu Asn Arg Thr Ala Asn Ser Leu Asn Phe Gln Ser Arg Thr

165

170

175

Ala Leu Phe Ala Arg Pro Asn Pro Tyr Pro Lys Thr Cys Ser Arg Phe
 180 185 190

Pro Ser Tyr Ser Val Tyr Phe Gly Ile His Cys Phe Ser His Ala Val
 195 200 205

Thr Asp Ser Ser Cys Glu Leu Ser Asp Ser Thr Tyr Tyr Arg Leu Val
 210 215 220

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

Ile Gly Glu Thr Thr Thr Pro Val Arg Val Gln Thr Arg Gly Cys Ser
 245 250 255

Val Val Ser Ser Ile Tyr Gly Cys Tyr Leu Leu Cys Ser Lys Ser Asn
 260 265 270

Gln Asp Tyr Gln Asp Asp Phe Arg Glu Gln Gly Phe His Gln Met Phe
 275 280 285

Ile Leu Phe Leu Ser Arg Glu Leu Lys Thr Thr Phe Phe Asp Asp Met
 290 295 300

Val Ser Ser Thr Thr Val Thr Trp Asn Gly Leu Tyr Pro Gly Glu Gly
 305 310 315 320

Ser Gly Ile Trp His Met Gly His Leu Val Phe Pro Leu Trp Gly Gly
 325 330 335

Ile Arg Phe Gly Thr His Ala Ser Glu Gly Ile Leu Asn Ser Thr Leu
 340 345 350

Glu Leu Pro Pro Val Gly Pro Ser Cys Lys Arg Ser Leu Ala Asp Asn
 355 360 365

Gly Leu Ile Asn Lys Asp Val Leu Phe Ser Pro Tyr Phe Gly Asp Ser
370 375 380

Val Met Val Phe Ala Tyr Leu Ser Cys Tyr Met Leu Ser Asn Val Pro
385 390 395 400

Thr His Cys Gln Val Glu Thr Met Asn Ser Ser Val Leu Gly Phe Gly
405 410 415

Ser Arg Ala Gln Phe Tyr Asp Leu Lys Gly Ile Val Tyr Leu Tyr Ile
420 425 430

Gln Ser Ala Gly Trp Phe Ser Tyr Thr Gln Leu Phe Arg Leu Ser Leu
435 440 445

Gln Ser Lys Gly Tyr Lys Leu Ser Val Lys Gln Ile Lys Arg Ile Pro
450 455 460

Ile Ser Ser Thr Ser Arg Pro Gly Thr Glu Pro Cys Asp Ile Ile His
465 470 475 480

Asn Cys Pro Tyr Thr Cys Ala Thr Gly Leu Phe Gln Ala Pro Trp Ile
485 490 495

Val Asn Gly Asp Ser Ile Arg Asp Arg Asp Val Arg Asn Met Ala Phe
500 505 510

Val Gln Ala Trp Ser Gly Ala Ile Asn Thr Phe Gln Arg Pro Phe Met
515 520 525

Ser Ile Cys Ser Gln Tyr Ser Cys Pro Leu Ser Glu Leu Leu Asp Ser
530 535 540

Glu Ser Ser Ile Met Arg Ser Thr Thr Thr Tyr Cys Phe Pro Ser Leu
545 550 555 560

Thr Glu Ser Ile Leu Gln Cys Val Ser Phe Ile Glu Trp Gly Gly Pro
565 570 575

Val Gly Asn Pro Ile Ser Ile Asn Glu Val Tyr Ser Ser Ile Ser Phe
580 585 590

Arg Pro Asp
595

<210> 94
<211> 632
<212> PRT
<213> Mossman virus

<220>
<221> MISC_FEATURE
<223> attachment glycoprotein

<400> 94

Met Val Asp Pro Pro Ala Val Ser Tyr Tyr Thr Gly Thr Gly Arg Asn
1 5 10 15

Asp Arg Val Lys Val Val Thr Thr Gln Ser Thr Asn Pro Tyr Trp Ala
20 25 30

His Asn Pro Asn Gln Gly Leu Arg Arg Leu Ile Asp Met Val Val Asn
35 40 45

Val Ile Met Val Thr Gly Val Ile Phe Ala Leu Ile Asn Ile Ile Leu
50 55 60

Gly Ile Val Ile Ile Ser Gln Ser Ala Gly Ser Arg Gln Asp Thr Ser
65 70 75 80

Lys Ser Leu Asp Ile Ile Gln His Val Asp Ser Ser Val Ala Ile Thr
85 90 95

Lys Gln Ile Val Met Glu Asn Leu Glu Pro Lys Ile Arg Ser Ile Leu
100 105 110

Asp Ser Val Ser Phe Gln Ile Pro Lys Leu Leu Ser Ser Leu Leu Gly
115 120 125

Pro Gly Lys Thr Asp Pro Pro Ile Ala Leu Pro Thr Lys Ala Ser Thr
130 135 140

Pro Val Ile Pro Thr Glu Tyr Pro Ser Leu Asn Thr Thr Thr Cys Leu
145 150 155 160

Arg Ile Glu Glu Ser Val Thr Gln Asn Ala Ala Ala Leu Phe Asn Ile
165 170 175

Ser Phe Asp Leu Lys Thr Val Met Tyr Glu Leu Val Thr Arg Thr Gly
180 185 190

Gly Cys Val Thr Leu Pro Ser Tyr Ser Glu Leu Tyr Thr Arg Val Arg
195 200 205

Thr Phe Ser Thr Ala Ile Arg Asn Pro Lys Thr Cys Gln Arg Ala Gly
210 215 220

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

Gly Ile Leu Ile Asn Ser Cys Val Arg Gln Pro Val Ile Ala Thr Gly
245 250 255

Asp Gly Ile Tyr Ala Leu Thr Tyr Leu Thr Met Arg Gly Thr Cys Gln
260 265 270

Asp His Arg His Ala Val Arg His Phe Glu Ile Gly Leu Val Arg Arg
275 280 285

Asp Ala Trp Trp Asp Pro Val Leu Thr Pro Ile His His Phe Thr Glu

290

295

300

Pro Gly Thr Pro Val Phe Asp Gly Cys Ser Leu Thr Val Gln Asn Gln
 305 310 315 320

Thr Ala Leu Ala Leu Cys Thr Leu Thr Thr Asp Gly Pro Glu Thr Asp
 325 330 335

Ile His Asn Gly Ala Ser Leu Gly Leu Ala Leu Val His Phe Asn Ile
 340 345 350

Arg Gly Glu Phe Ser Lys His Lys Val Asp Pro Arg Asn Ile Asp Thr
 355 360 365

Gln Asn Gln Gly Leu His Leu Val Thr Thr Ala Gly Lys Ser Ala Val
 370 375 380

Lys Lys Gly Ile Leu Tyr Ser Phe Gly Tyr Met Val Thr Arg Ser Pro
 385 390 395 400

Glu Pro Gly Asp Ser Lys Cys Val Thr Glu Glu Cys Asn Gln Asn Asn
 405 410 415

Gln Glu Lys Cys Asn Ala Tyr Ser Lys Thr Thr Leu Asp Pro Asp Lys
 420 425 430

Pro Arg Ser Met Ile Ile Phe Gln Ile Asp Val Gly Ala Glu Tyr Phe
 435 440 445

Thr Val Asp Lys Val Val Val Val Pro Arg Thr Gln Tyr Tyr Gln Leu
 450 455 460

Thr Ser Gly Asp Leu Phe Tyr Thr Gly Glu Glu Asn Asp Leu Leu Tyr
 465 470 475 480

Gln Leu His Asn Lys Gly Trp Tyr Asn Lys Pro Ile Arg Gly Arg Val
 485 490 495

Thr Phe Asp Gly Gln Val Thr Leu His Glu His Ser Arg Thr Tyr Asp
500 505 510

Ser Leu Ser Asn Gln Arg Ala Cys Asn Pro Arg Leu Gly Cys Pro Ser
515 520 525

Thr Cys Glu Leu Thr Ser Met Ala Ser Tyr Phe Pro Leu Asp Lys Asp
530 535 540

Phe Lys Ala Ala Val Gly Val Ile Ala Leu Arg Asn Gly Met Thr Pro
545 550 555 560

Ile Ile Thr Tyr Ser Thr Asp Asp Trp Arg Asn His Trp Lys Tyr Ile
565 570 575

Lys Asn Ala Asp Leu Glu Phe Ser Glu Ser Ser Leu Ser Cys Tyr Ser
580 585 590

Pro Asn Pro Pro Leu Asp Asp Tyr Val Leu Cys Thr Ala Val Ile Thr
595 600 605

Ala Lys Val Met Ser Asn Thr Asn Pro Gln Leu Leu Ala Thr Ser Trp
610 615 620

Tyr Gln Tyr Asp Lys Cys His Thr
625 630

<210> 95
<211> 709
<212> PRT
<213> J-virus

<220>
<221> MISC_FEATURE
<223> attachment glycoprotein

<400> 95

Met Asn Pro Val Ala Met Ser Asn Phe Tyr Gly Ile Asn Gln Ala Asp
1 5 10 15

His Leu Arg Glu Lys Gly Asp Gln Pro Glu Lys Gly Pro Ser Val Leu
20 25 30

Thr Tyr Val Ser Leu Ile Thr Gly Leu Leu Ser Leu Phe Thr Ile Ile
35 40 45

Ala Leu Asn Val Thr Asn Ile Ile Tyr Leu Thr Gly Ser Gly Gly Thr
50 55 60

Met Ala Thr Ile Lys Asp Asn Gln Gln Ser Met Ser Gly Ser Met Arg
65 70 75 80

Asp Ile Ser Gly Met Leu Val Glu Asp Leu Lys Pro Lys Thr Asp Leu
85 90 95

Ile Asn Ser Met Val Ser Tyr Thr Ile Pro Ser Gln Ile Ser Ala Met
100 105 110

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

Met Phe Asn Asn Thr Ile Cys Pro Ile Ala Glu His Pro Val His Thr
130 135 140

Ser Tyr Phe Glu Glu Val Gly Ile Glu Ala Ile Ser Met Cys Thr Gly
145 150 155 160

Thr Asn Arg Lys Leu Val Val Asn Gln Gly Ile Asn Phe Val Glu Tyr
165 170 175

Pro Ser Phe Ile Pro Gly Ser Thr Lys Pro Gly Gly Cys Val Arg Leu
180 185 190

Pro Ser Phe Ser Leu Gly Leu Glu Val Phe Ala Tyr Ala His Ala Ile
195 200 205

Thr Gln Asp Asp Cys Thr Ser Ser Ser Thr Pro Asp Tyr Tyr Phe Ser
210 215 220

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

Leu Ala Glu Trp Phe Leu Asp Asp Lys Met Asn Arg Arg Ser Cys Ser
245 250 255

Val Thr Ala Ala Gly Lys Gly Gly Trp Leu Gly Cys Ser Ile Leu Val
260 265 270

Gly Ser Phe Thr Asp Glu Leu Thr Ser Pro Glu Val Asn Arg Ile Ser
275 280 285

Leu Ser Tyr Met Asp Thr Phe Gly Lys Lys Lys Asp Trp Leu Tyr Thr
290 295 300

Gly Ser Glu Val Arg Ala Asp Gln Ser Trp Ser Ala Leu Phe Phe Ser
305 310 315 320

Val Gly Ser Gly Val Val Ile Gly Asp Thr Val Tyr Phe Leu Val Trp
325 330 335

Gly Gly Leu Asn His Pro Ile Asn Val Asp Ala Met Cys Arg Ala Pro
340 345 350

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

Gln Glu Trp Gly Gly Asn Gln Ile Val Asn Gly Ile Leu His Phe Lys
370 375 380

His Asp Thr Asn Glu Lys Pro Thr Leu His Val Arg Thr Leu Ser Pro

385 390 395 400

Asp Asn Asn Trp Met Gly Ala Glu Gly Arg Leu Phe His Phe His Asn
405 410 415

Ser Gly Lys Thr Phe Ile Tyr Thr Arg Ser Ser Thr Trp His Thr Leu
420 425 430

Pro Gln Val Gly Ile Leu Thr Leu Gly Trp Pro Leu Ser Val Gln Trp
435 440 445

Val Asp Ile Thr Ser Ile Ser Arg Pro Gly Gln Ser Pro Cys Glu Tyr
450 455 460

Asp Asn Arg Cys Pro His Gln Cys Val Thr Gly Val Tyr Thr Asp Leu
465 470 475 480

Phe Pro Leu Gly Val Ser Tyr Glu Tyr Ser Val Thr Ala Tyr Leu Asp
485 490 495

Gln Val Gln Ser Arg Met Asn Pro Lys Ile Ala Leu Val Gly Ala Gln
500 505 510

Glu Lys Ile Tyr Glu Lys Thr Ile Thr Thr Asn Thr Gln His Ala Asp
515 520 525

Tyr Thr Thr Thr Ser Cys Phe Ala Tyr Lys Leu Arg Val Trp Cys Val
530 535 540

Ser Ile Val Glu Met Ser Pro Gly Val Ile Thr Thr Arg Gln Pro Val
545 550 555 560

Pro Phe Leu Tyr His Leu Asn Leu Gly Cys Gln Asp Thr Ser Thr Gly
565 570 575

Ser Leu Thr Pro Leu Asp Ala His Gly Gly Thr Tyr Leu Asn Thr Asp
580 585 590

Pro Val Gly Asn Lys Val Asp Cys Tyr Phe Val Leu His Glu Gly Gln
595 600 605

Ile Tyr Phe Gly Met Ser Val Gly Pro Ile Asn Tyr Thr Tyr Ser Ile
610 615 620

Val Gly Arg Ser Arg Glu Ile Gly Ala Asn Met Asn Val Ser Leu Asn
625 630 635 640

Gln Leu Cys His Ser Val Tyr Thr Glu Phe Leu Lys Glu Lys Glu His
645 650 655

Pro Gly Thr Arg Asn Asn Ile Asp Val Glu Gly Trp Leu Leu Lys Arg
660 665 670

Ile Glu Thr Leu Asn Gly Thr Lys Ile Phe Gly Leu Asp Asp Leu Glu
675 680 685

Gly Ser Gly Pro Gly His Gln Ser Gly Pro Glu Asp Pro Ser Ile Ala
690 695 700

Pro Ile Gly His Asn
705

<210> 96
<211> 264
<212> PRT
<213> Avian metapneumovirus

<220>
<221> MISC_FEATURE
<223> attachment glycoprotein

<400> 96

Met Glu Val Lys Val Glu Asn Val Gly Lys Ser Gln Glu Leu Lys Val
1 5 10 15

Lys Val Lys Asn Phe Ile Lys Arg Ser Asp Cys Lys Lys Lys Leu Phe
20 25 30

Ala Leu Ile Leu Gly Leu Val Ser Phe Glu Leu Thr Met Asn Ile Met
35 40 45

Leu Ser Val Met Tyr Val Glu Ser Asn Glu Ala Leu Ser Leu Cys Arg
50 55 60

Ile Gln Gly Thr Pro Ala Pro Arg Asp Asn Lys Thr Asn Thr Glu Asn
65 70 75 80

Ala Thr Lys Glu Thr Thr Leu His Thr Thr Thr Thr Thr Arg Asp Pro
85 90 95

Glu Val Arg Glu Thr Lys Thr Thr Lys Pro Gln Ala Asn Glu Gly Ala
100 105 110

Thr Asn Pro Ser Arg Asn Leu Thr Thr Lys Gly Asp Lys His Gln Thr
115 120 125

Thr Arg Ala Thr Thr Glu Ala Glu Leu Glu Lys Gln Ser Lys Gln Thr
130 135 140

Thr Glu Pro Gly Thr Ser Thr Gln Lys His Thr Pro Ala Arg Pro Ser
145 150 155 160

Ser Lys Ser Pro Thr Thr Thr Gln Ala Thr Ala Gln Pro Thr Thr Pro
165 170 175

Thr Ala Pro Lys Ala Ser Thr Ala Pro Lys Asn Arg Gln Ala Thr Thr
180 185 190

Lys Lys Thr Glu Thr Asp Thr Thr Thr Ala Ser Arg Ala Arg Asn Thr
195 200 205

Asn Asn Pro Thr Glu Thr Ala Thr Thr Thr Pro Lys Ala Thr Thr Glu
 210 215 220

Thr Gly Lys Gly Lys Glu Gly Pro Thr Gln His Thr Thr Lys Glu Gln
 225 230 235 240

Pro Glu Thr Thr Ala Arg Glu Thr Thr Thr Pro Gln Pro Arg Arg Thr
 245 250 255

Ala Gly Ala Ser Pro Arg Ala Ser
 260

<210> 97
 <211> 391
 <212> PRT
 <213> Avian metapneumovirus

<220>
 <221> MISC_FEATURE
 <223> attachment protein

<400> 97

Met Gly Ser Lys Leu Tyr Met Val Gln Gly Thr Ser Ala Tyr Gln Thr
 1 5 10 15

Ala Val Gly Phe Trp Leu Asp Ile Gly Arg Arg Tyr Ile Leu Ala Ile
 20 25 30

Val Leu Ser Ala Phe Gly Leu Thr Cys Thr Val Thr Ile Ala Leu Thr
 35 40 45

Val Ser Val Ile Val Glu Gln Ser Val Leu Glu Glu Cys Arg Asn Tyr
 50 55 60

Asn Gly Gly Asp Arg Asp Trp Trp Ser Thr Thr Gln Glu Gln Pro Thr
 65 70 75 80

Thr Ala Pro Ser Ala Thr Pro Ala Gly Asn Tyr Gly Gly Leu Gln Thr

85

90

95

Ala Arg Thr Arg Lys Ser Glu Ser Cys Leu His Val Gln Ile Ser Tyr
 100 105 110

Gly Asp Met Tyr Ser Arg Ser Asp Thr Val Leu Gly Gly Phe Asp Cys
 115 120 125

Met Gly Leu Leu Val Leu Cys Lys Ser Gly Pro Ile Cys Gln Arg Asp
 130 135 140

Asn Gln Val Asp Pro Thr Ala Leu Cys His Cys Arg Val Asp Leu Ser
 145 150 155 160

Ser Val Asp Cys Cys Lys Val Asn Lys Ile Ser Thr Asn Ser Ser Thr
 165 170 175

Thr Ser Glu Pro Gln Lys Thr Asn Pro Ala Trp Pro Ser Gln Asp Asn
 180 185 190

Thr Asp Ser Asp Pro Asn Pro Gln Gly Ile Thr Thr Ser Thr Ala Thr
 195 200 205

Leu Leu Ser Thr Ser Leu Gly Leu Met Leu Thr Ser Lys Thr Gly Thr
 210 215 220

His Lys Ser Gly Pro Pro Gln Ala Leu Pro Gly Ser Asn Thr Asn Gly
 225 230 235 240

Lys Thr Thr Thr Asp Arg Glu Leu Gly Ser Thr Asn Gln Pro Asn Ser
 245 250 255

Thr Thr Asn Gly Gln His Asn Lys His Thr Gln Arg Met Thr Leu Pro
 260 265 270

Pro Ser Tyr Asp Asn Thr Arg Thr Ile Leu Gln His Thr Thr Pro Trp
 275 280 285

Glu Lys Thr Phe Ser Thr Tyr Lys Pro Thr His Ser Pro Thr Asn Glu
 290 295 300

Ser Asp Gln Ser Leu Pro Thr Thr Gln Asn Ser Ile Asn Cys Glu His
 305 310 315 320

Phe Asp Pro Gln Gly Lys Glu Lys Ile Cys Tyr Arg Val Gly Ser Tyr
 325 330 335

Asn Ser Asn Ile Thr Lys Gln Cys Arg Ile Asp Val Pro Leu Cys Ser
 340 345 350

Thr Tyr Asn Thr Val Cys Met Lys Thr Tyr Tyr Thr Glu Pro Phe Asn
 355 360 365

Cys Trp Arg Arg Ile Trp Arg Cys Leu Cys Asp Asp Gly Val Gly Leu
 370 375 380

Val Glu Trp Cys Cys Thr Ser
 385 390

<210> 98
 <211> 1052
 <212> PRT
 <213> Tailam virus

<220>
 <221> MISC_FEATURE
 <223> attachment glycoprotein

<400> 98

Met Ser Gln Leu Ala Ala His Asn Leu Ala Met Ser Asn Phe Tyr Gly
 1 5 10 15

Ile His Gln Gly Gly Gln Ser Thr Ser Gln Lys Glu Glu Glu Gln Pro
 20 25 30

Val Gln Gly Val Ile Arg Tyr Ala Ser Met Ile Val Gly Leu Leu Ser
 35 40 45

Leu Phe Thr Ile Ile Ala Leu Asn Val Thr Asn Ile Ile Tyr Met Thr
 50 55 60

Glu Ser Gly Gly Thr Met Gln Ser Ile Lys Asn Ala Gln Gly Ser Ile
 65 70 75 80

Asp Gly Ser Met Lys Asp Leu Ser Gly Thr Ile Met Glu Asp Ile Lys
 85 90 95

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

Gln Leu Ser Met Ile His Gln Ile Ile Lys Asn Asp Val Leu Lys Gln
 115 120 125

Cys Thr Pro Ser Phe Met Phe Asn Asn Thr Ile Cys Pro Leu Ala Glu
 130 135 140

Asn Pro Thr His Ser Arg Tyr Phe Glu Glu Val Asn Leu Asp Ser Ile
 145 150 155 160

Ser Glu Cys Ser Gly Asn Glu Met Ser Leu Glu Leu Gly Thr Glu Pro
 165 170 175

Glu Phe Ile Glu Tyr Pro Ser Phe Ala Pro Gly Ser Thr Lys Pro Gly
 180 185 190

Ser Cys Val Arg Leu Pro Ser Phe Ser Leu Ser Ser Thr Val Phe Ala
 195 200 205

Tyr Thr His Thr Ile Met Gly His Gly Cys Ser Glu Leu Asp Val Gly
 210 215 220

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

Pro Gln Phe Glu Thr Ile Ser Ser Trp Phe Ile Asn Asp Lys Ile Asn
245 250 255

Arg Arg Ser Cys Thr Val Ala Ala Gly Val Met Glu Thr Trp Met Gly
260 265 270

Cys Val Ile Met Thr Glu Thr Phe Tyr Asp Asp Leu Asp Ser Leu Asp
275 280 285

Thr Gly Lys Ile Thr Ile Ser Tyr Leu Asp Val Phe Gly Arg Lys Lys
290 295 300

Glu Trp Ile Tyr Thr Arg Ser Glu Ile Leu Tyr Asp Tyr Thr Tyr Thr
305 310 315 320

Ser Val Tyr Phe Ser Ile Gly Ser Gly Val Val Val Gly Asp Thr Val
325 330 335

Tyr Phe Leu Leu Trp Gly Ser Leu Ser Ser Pro Ile Glu Glu Thr Ala
340 345 350

Tyr Cys Tyr Ala Pro Gly Cys Ser Asn Tyr Asn Gln Arg Met Cys Asn
355 360 365

Glu Ala Gln Arg Pro Ala Lys Phe Gly His Arg Gln Met Ala Asn Ala
370 375 380

Ile Leu Arg Phe Lys Thr Asn Ser Met Gly Lys Pro Ser Ile Ser Val
385 390 395 400

Arg Thr Leu Ser Pro Thr Val Ile Pro Phe Gly Thr Glu Gly Arg Leu
405 410 415

Ile Tyr Ser Asp Phe Thr Lys Ile Ile Tyr Leu Tyr Leu Arg Ser Thr

420

425

430

Ser Trp Tyr Val Leu Pro Leu Thr Gly Leu Leu Ile Leu Gly Pro Pro
 435 440 445

Val Ser Ile Ser Trp Val Thr Gln Glu Ala Val Ser Arg Pro Gly Glu
 450 455 460

Tyr Pro Cys Gly Ala Ser Asn Arg Cys Pro Lys Asp Cys Ile Thr Gly
 465 470 475 480

Val Tyr Thr Asp Leu Phe Pro Leu Gly Ala Arg Tyr Glu Tyr Ala Val
 485 490 495

Thr Val Tyr Leu Asn Ala Glu Thr Tyr Arg Val Asn Pro Thr Leu Ala
 500 505 510

Leu Ile Asp Arg Ser Lys Ile Ile Ala Arg Lys Lys Ile Thr Thr Glu
 515 520 525

Ser Gln Lys Ala Gly Tyr Thr Thr Thr Thr Cys Phe Val Phe Lys Leu
 530 535 540

Arg Ile Trp Cys Met Ser Val Val Glu Leu Ala Pro Ala Thr Met Thr
 545 550 555 560

Ala Phe Glu Pro Val Pro Phe Leu Tyr Gln Leu Asp Leu Thr Cys Lys
 565 570 575

Arg Asn Asn Gly Thr Thr Ala Met Gln Phe Ser Gly Gln Asp Gly Met
 580 585 590

Tyr Lys Ser Gly Arg Tyr Lys Ser Pro Arg Asn Glu Cys Phe Phe Glu
 595 600 605

Lys Val Ser Asn Lys Tyr Tyr Phe Val Val Ser Thr Pro Glu Gly Ile
 610 615 620

Gln Pro Tyr Glu Val Arg Asp Leu Thr Pro Glu Arg Val Ser His Val
625 630 635 640

Ile Met Tyr Ile Ser Asp Val Cys Ala Pro Ala Leu Ser Ala Phe Lys
645 650 655

Lys Leu Ile Pro Ala Met Arg Pro Ile Thr Thr Leu Thr Ile Gly Asn
660 665 670

Trp Gln Phe Arg Pro Val Asp Ile Ser Gly Gly Leu Arg Val Asn Ile
675 680 685

Tyr Arg Asn Leu Thr Arg Tyr Gly Asp Leu Ser Met Ser Ala Pro Glu
690 695 700

Asp Pro Gly Thr Asp Thr Phe Pro Gly Thr His Ala Pro Ser Lys Gly
705 710 715 720

His Glu Glu Val Gly His Tyr Thr Leu Pro Asn Glu Lys Leu Ser Glu
725 730 735

Val Thr Thr Ala Ala Val Lys Thr Lys Glu Ser Leu Asn Leu Ile Pro
740 745 750

Asp Thr Lys Asp Thr Arg Gly Glu Glu Glu Asn Gly Ser Gly Leu Asn
755 760 765

Glu Ile Ile Thr Gly His Thr Thr Pro Gly His Ile Lys Thr His Pro
770 775 780

Ala Glu Thr Lys Val Thr Lys His Thr Val Ile Ile Pro Gln Ile Glu
785 790 795 800

Glu Asp Gly Ser Gly Ala Thr Thr Ser Thr Glu Leu Gln Asp Glu Thr
805 810 815

Gly Tyr His Thr Glu Asp Tyr Asn Thr Thr Asn Thr Asn Gly Ser Leu
820 825 830

Thr Ala Pro Asn Glu Arg Asn Asn Tyr Thr Ser Gly Asp His Thr Val
835 840 845

Ser Gly Glu Asp Ile Thr His Thr Ile Thr Val Ser Asp Arg Thr Lys
850 855 860

Thr Thr Gln Thr Leu Pro Thr Asp Asn Thr Phe Asn Gln Thr Pro Thr
865 870 875 880

Lys Ile Gln Glu Gly Ser Pro Lys Ser Glu Ser Thr Pro Lys Asp Tyr
885 890 895

Thr Ala Ile Glu Ser Glu Asp Ser His Phe Thr Asp Pro Thr Leu Ile
900 905 910

Arg Ser Thr Pro Glu Gly Thr Ile Val Gln Val Ile Gly Asp Gln Phe
915 920 925

His Ser Ala Val Thr Gln Leu Gly Glu Ser Asn Ala Ile Gly Asn Ser
930 935 940

Glu Pro Ile Asp Gln Gly Asn Asn Leu Ile Pro Thr Thr Asp Arg Gly
945 950 955 960

Thr Met Asp Asn Thr Ser Ser Gln Ser His Ser Ser Thr Thr Ser Thr
965 970 975

Gln Gly Ser His Ser Ala Gly His Gly Ser Gln Ser Asn Met Asn Leu
980 985 990

Thr Ala Leu Ala Asp Thr Asp Ser Val Thr Asp Gln Ser Thr Ser Thr
995 1000 1005

Gln Glu Ile Asp His Glu His Glu Asn Val Ser Ser Ile Leu Asn
1010 1015 1020

Pro Leu Ser Arg His Thr Arg Val Met Arg Asp Thr Val Gln Glu
1025 1030 1035

Ala Leu Thr Gly Ala Trp Gly Phe Ile Arg Gly Met Ile Pro
1040 1045 1050

<210> 99
<211> 242
<212> PRT
<213> Human metapneumovirus

<220>
<221> MISC_FEATURE
<223> attachment glycoprotein G

<400> 99

Met Glu Val Arg Val Glu Asn Ile Arg Ala Ile Asp Met Phe Lys Ala
1 5 10 15

Lys Ile Lys Asn Arg Ile Arg Asn Ser Arg Cys Tyr Arg Asn Ala Thr
20 25 30

Leu Ile Leu Ile Gly Leu Thr Ala Leu Ser Met Ala Leu Asn Ile Phe
35 40 45

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

Cys Ala Asn Met Pro Ser Ala Glu Pro Ser Lys Lys Thr Pro Met Thr
65 70 75 80

Ser Ile Ala Gly Pro Ser Thr Lys Pro Asn Pro Gln Gln Ala Thr Gln
85 90 95

Trp Thr Thr Glu Asn Ser Thr Ser Pro Ala Ala Thr Leu Glu Gly His

100	105	110
Pro Tyr Thr Gly Thr Thr Gln Thr Pro Asp Thr Thr Ala Pro Gln Gln		
115	120	125
Thr Thr Asp Lys His Thr Ala Leu Pro Lys Ser Thr Asn Glu Gln Ile		
130	135	140
Thr Gln Thr Thr Thr Glu Lys Lys Thr Thr Arg Ala Thr Thr Gln Lys		
145	150	155
Arg Lys Lys Glu Lys Lys Thr Gln Thr Lys Pro Gln Val Gln Leu Gln		
165	170	175
Pro Lys Gln Pro Thr Pro Pro Thr Lys Ser Glu Met Gln Val Arg Gln		
180	185	190
Ser Gln His Pro Thr Asp Pro Glu Leu Thr Pro Leu Pro Lys Ala Val		
195	200	205
Asn Arg Gln Pro Gly Gln Gln Asn Gln Ala Pro His His Ile Met His		
210	215	220
Gly Glu Val Gln Asp Pro Gly Glu Arg Asn Thr Gln Val Ser His Pro		
225	230	235
		240
Ser Ser		

<210> 100
 <211> 585
 <212> PRT
 <213> Avian metapneumovirus type C

<220>
 <221> MISC_FEATURE
 <223> attachment glycoprotein

<400> 100

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

Lys Val Lys Asn Phe Ile Lys Arg Ser Asp Cys Lys Lys Lys Leu Phe
20 25 30

Ala Leu Ile Leu Gly Leu Ile Ser Phe Asp Ile Thr Met Asn Ile Met
35 40 45

Leu Ser Val Met Tyr Val Glu Ser Asn Glu Ala Leu Ser Ser Cys Arg
50 55 60

Val Gln Gly Thr Pro Ala Pro Arg Asp Asn Arg Thr Asn Thr Glu Asn
65 70 75 80

Thr Ala Lys Glu Thr Thr Leu His Thr Met Thr Thr Thr Arg Asn Thr
85 90 95

Glu Ala Gly Gly Thr Lys Thr Thr Lys Pro Gln Ala Asp Glu Arg Ala
100 105 110

Thr Ser Pro Ser Lys Asn Pro Thr Ile Gly Ala Asp Lys His Lys Thr
115 120 125

Thr Arg Ala Thr Thr Glu Ala Glu Gln Glu Lys Gln Ser Lys Gln Thr
130 135 140

Thr Glu Pro Gly Thr Ser Thr Pro Lys His Ile Pro Ala Arg Pro Ser
145 150 155 160

Ser Lys Ser Pro Ala Thr Thr Lys Thr Thr Thr Gln Pro Thr Thr Pro
165 170 175

Thr Val Ala Lys Gly Gly Thr Ala Pro Lys Asn Arg Gln Thr Thr Thr
180 185 190

Lys Lys Thr Glu Ala Asp Thr Pro Thr Thr Ser Arg Ala Lys Gln Thr
195 200 205

Asn Lys Pro Thr Gly Thr Glu Thr Thr Pro Pro Arg Ala Thr Thr Glu
210 215 220

Thr Asp Lys Asp Lys Glu Gly Pro Thr Gln His Thr Thr Lys Glu Gln
225 230 235 240

Pro Glu Thr Thr Ala Gly Gly Thr Thr Thr Pro Gln Pro Arg Arg Thr
245 250 255

Thr Ser Arg Pro Ala Pro Thr Thr Asn Thr Lys Glu Gly Ala Glu Thr
260 265 270

Thr Gly Thr Arg Thr Thr Lys Ser Thr Gln Thr Ser Ala Ser Pro Pro
275 280 285

Arg Pro Thr Arg Ser Thr Pro Ser Lys Thr Ala Thr Gly Thr Asn Lys
290 295 300

Arg Ala Thr Thr Thr Lys Gly Pro Asn Thr Ala Ser Thr Asp Arg Arg
305 310 315 320

Gln Gln Thr Arg Thr Thr Pro Lys Gln Asp Gln Gln Thr Gln Thr Lys
325 330 335

Ala Lys Thr Thr Thr Asn Lys Ala His Ala Lys Ala Ala Thr Thr Pro
340 345 350

Glu His Asn Thr Asp Thr Thr Asp Ser Met Lys Glu Asn Ser Lys Glu
355 360 365

Asp Lys Thr Thr Arg Asp Pro Ser Ser Lys Ala Thr Thr Lys Gln Glu
370 375 380

Asn Thr Ser Lys Gly Thr Thr Ala Thr Asn Leu Gly Asn Asn Thr Glu
385 390 395 400

Ala Gly Ala Arg Thr Pro Pro Thr Thr Thr Pro Thr Arg His Thr Thr
405 410 415

Glu Pro Ala Thr Ser Thr Ala Gly Gly His Thr Lys Ala Arg Thr Thr
420 425 430

Arg Trp Lys Ser Thr Ala Ala Arg Gln Pro Thr Arg Asn Asn Thr Thr
435 440 445

Ala Asp Thr Lys Thr Ala Gln Ser Lys Gln Thr Thr Pro Ala Gln Leu
450 455 460

Gly Asn Asn Thr Thr Pro Glu Asn Thr Thr Pro Pro Asp Asn Lys Ser
465 470 475 480

Asn Ser Gln Thr Asn Val Ala Pro Thr Glu Glu Ile Glu Ile Gly Ser
485 490 495

Ser Leu Trp Arg Arg Arg Tyr Val Tyr Gly Pro Cys Arg Glu Asn Ala
500 505 510

Leu Glu His Pro Met Asn Pro Cys Leu Lys Asp Asn Thr Thr Trp Ile
515 520 525

Tyr Leu Asp Asn Gly Arg Asn Leu Pro Ala Gly Tyr Tyr Asp Ser Lys
530 535 540

Thr Asp Lys Ile Ile Cys Tyr Gly Ile Tyr Arg Gly Asn Ser Tyr Cys
545 550 555 560

Tyr Gly Arg Ile Glu Cys Thr Cys Lys Asn Gly Thr Gly Leu Leu Ser
565 570 575

Tyr Cys Cys Asn Ser Tyr Asn Trp Ser

580

585

<210> 101
 <211> 609
 <212> PRT
 <213> Rinderpest morbillivirus

<220>
 <221> MISC_FEATURE
 <223> H protein

<400> 101

Met Ser Ser Pro Arg Asp Arg Val Asn Ala Phe Tyr Lys Asp Asn Leu
 1 5 10 15

Gln Phe Lys Asn Thr Arg Val Val Leu Asn Lys Glu Gln Leu Leu Ile
 20 25 30

Glu Arg Pro Tyr Met Leu Leu Ala Val Leu Phe Val Met Phe Leu Ser
 35 40 45

Leu Val Gly Leu Leu Ala Ile Ala Gly Ile Arg Leu His Arg Ala Ala
 50 55 60

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

Thr Lys Ser Ile Glu Tyr Gln Val Lys Asp Val Leu Thr Pro Leu Phe
 85 90 95

Lys Ile Ile Gly Asp Glu Val Gly Leu Arg Thr Pro Gln Arg Phe Thr
 100 105 110

Asp Leu Thr Lys Phe Ile Ser Asp Lys Ile Lys Phe Leu Asn Pro Asp
 115 120 125

Lys Glu Tyr Asp Phe Arg Asp Ile Asn Trp Cys Ile Ser Pro Pro Glu
 130 135 140

Arg Ile Lys Ile Asn Tyr Asp Gln Tyr Cys Ala His Thr Ala Ala Glu
145 150 155 160

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

Leu Arg Thr Ser Leu Val Asn Leu Gly Arg Ser Cys Thr Gly Ser Thr
180 185 190

Thr Thr Lys Gly Gln Phe Ser Asn Met Ser Leu Ala Leu Ser Gly Ile
195 200 205

Tyr Ser Gly Arg Gly Tyr Asn Ile Ser Ser Met Ile Thr Ile Thr Glu
210 215 220

Lys Gly Met Tyr Gly Ser Thr Tyr Leu Val Gly Lys His Asn Gln Gly
225 230 235 240

Ala Arg Arg Pro Ser Thr Ala Trp Gln Arg Asp Tyr Arg Val Phe Glu
245 250 255

Val Gly Ile Ile Arg Glu Leu Gly Val Gly Thr Pro Val Phe His Met
260 265 270

Thr Asn Tyr Leu Glu Leu Pro Arg Gln Pro Glu Leu Glu Ile Cys Met
275 280 285

Leu Ala Leu Gly Glu Phe Lys Leu Ala Ala Leu Cys Leu Ala Asp Asn
290 295 300

Ser Val Ala Leu His Tyr Gly Gly Leu Arg Asp Asp His Lys Ile Arg
305 310 315 320

Phe Val Lys Leu Gly Val Trp Pro Ser Pro Ala Asp Ser Asp Thr Leu
325 330 335

Ala Thr Leu Ser Ala Val Asp Pro Thr Leu Asp Gly Leu Tyr Ile Thr
340 345 350

Thr His Arg Gly Ile Ile Ala Ala Gly Lys Ala Val Trp Ala Val Pro
355 360 365

Val Thr Arg Thr Asp Asp Gln Arg Lys Met Gly Gln Cys Arg Arg Glu
370 375 380

Ala Cys Arg Glu Lys Pro Pro Pro Phe Cys Asn Ser Thr Asp Trp Glu
385 390 395 400

Pro Leu Glu Ala Gly Arg Ile Pro Ala Tyr Gly Ile Leu Thr Ile Arg
405 410 415

Leu Gly Leu Ala Asp Lys Pro Glu Ile Asp Ile Ile Ser Glu Phe Gly
420 425 430

Pro Leu Ile Thr His Asp Ser Gly Met Asp Leu Tyr Thr Pro Leu Asp
435 440 445

Gly Asn Glu Tyr Trp Leu Thr Ile Pro Pro Leu Gln Asn Ser Ala Leu
450 455 460

Gly Thr Val Asn Thr Leu Val Leu Glu Pro Ser Leu Lys Ile Ser Pro
465 470 475 480

Asn Ile Leu Thr Leu Pro Ile Arg Ser Gly Gly Gly Asp Cys Tyr Thr
485 490 495

Pro Thr Tyr Leu Ser Asp Leu Ala Asp Asp Asp Val Lys Leu Ser Ser
500 505 510

Asn Leu Val Ile Leu Pro Ser Arg Asn Leu Gln Tyr Val Ser Ala Thr
515 520 525

Tyr Asp Thr Ser Arg Val Glu His Ala Ile Val Tyr Tyr Ile Tyr Ser
530 535 540

Thr Gly Arg Leu Ser Ser Tyr Tyr Tyr Pro Val Lys Leu Pro Ile Lys
545 550 555 560

Gly Asp Pro Val Ser Leu Gln Ile Gly Cys Phe Pro Trp Gly Leu Lys
565 570 575

Leu Trp Cys His His Phe Cys Ser Val Ile Asp Ser Gly Thr Gly Lys
580 585 590

Gln Val Thr His Thr Gly Ala Val Gly Ile Glu Ile Thr Cys Asn Ser
595 600 605

Arg

<210> 102
<211> 575
<212> PRT
<213> Avian paramyxovirus 10

<220>
<221> MISC_FEATURE
<223> hemagglutinin-neuraminidase

<400> 102

Met Asp Ser Ser Gln Met Asn Ile Leu Asp Ala Met Asp Arg Glu Ser
1 5 10 15

Ser Lys Arg Thr Trp Arg Gly Val Phe Arg Val Thr Thr Ile Ile Met
20 25 30

Val Val Thr Cys Val Val Leu Ser Ala Ile Thr Leu Ser Lys Val Ala
35 40 45

His Pro Gln Gly Phe Asp Thr Asn Glu Leu Gly Asn Gly Ile Val Asp

50

55

60

Arg Val Ser Asp Lys Ile Thr Glu Ala Leu Thr Val Pro Asn Asn Gln
65 70 75 80

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

Ser Ser Ser Gln Gln Ala Ile Ala Gly Gln Ile Gly Met Leu Ala Glu
100 105 110

Ser Ile Asn Ser Ile Leu Ser Gln Asn Gly Ser Ala Ser Thr Ile Leu
115 120 125

Ser Ser Ser Pro Glu Tyr Ala Gly Gly Ile Gly Val Pro Leu Phe Ser
130 135 140

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

His Pro Ser Phe Ile Pro Gly Pro Thr Thr Ile Gly Gly Cys Thr Arg
165 170 175

Ile Pro Thr Phe His Met Ala Ser Ser His Trp Cys Tyr Ser His Asn
180 185 190

Ile Ile Glu Lys Gly Cys Lys Asp Ser Gly Ile Ser Ser Met Tyr Ile
195 200 205

Ser Leu Gly Val Leu Gln Val Leu Lys Lys Gly Thr Pro Val Phe Leu
210 215 220

Val Thr Ala Ser Ala Val Leu Ser Asp Asp Arg Asn Arg Lys Ser Cys
225 230 235 240

Ser Ile Ile Ser Ser Arg Phe Gly Cys Glu Ile Leu Cys Ser Leu Val
245 250 255

Thr Glu Ala Glu Ser Asp Asp Tyr Lys Ser Asp Thr Pro Thr Gly Met
260 265 270

Val His Gly Arg Leu Tyr Phe Asn Gly Thr Tyr Arg Glu Gly Leu Val
275 280 285

Asp Thr Glu Thr Ile Phe Arg Asp Phe Ser Ala Asn Tyr Pro Gly Val
290 295 300

Gly Ser Gly Glu Ile Val Glu Gly His Ile His Phe Pro Ile Tyr Gly
305 310 315 320

Gly Val Lys Gln Asn Thr Gly Leu Tyr Asn Ser Leu Thr Pro Tyr Trp
325 330 335

Leu Asp Ala Lys Asn Lys Tyr Asp Tyr Cys Lys Leu Pro Tyr Thr Asn
340 345 350

Gln Thr Ile Gln Asn Ser Tyr Lys Pro Pro Phe Ile His Gly Arg Phe
355 360 365

Trp Ala Gln Gly Ile Leu Ser Cys Glu Leu Asp Leu Phe Asn Leu Gly
370 375 380

Asn Cys Asn Leu Lys Ile Ile Arg Ser Asp Lys Val Met Met Gly Ala
385 390 395 400

Glu Ser Arg Leu Met Leu Val Gly Ser Lys Leu Leu Met Tyr Gln Arg
405 410 415

Ala Ser Ser Trp Trp Pro Leu Gly Ile Thr Gln Glu Ile Asp Ile Ala
420 425 430

Glu Leu His Ser Ser Asn Thr Thr Ile Leu Arg Glu Val Lys Pro Ile
435 440 445

Leu Ser Ser Lys Phe Pro Arg Pro Ser Tyr Gln Pro Asn Tyr Cys Thr
450 455 460

Lys Pro Ser Val Cys Pro Ala Val Cys Val Thr Gly Val Tyr Thr Asp
465 470 475 480

Met Trp Pro Ile Ser Ile Thr Gly Asn Ile Ser Asp Tyr Ala Trp Ile
485 490 495

Ser His Tyr Leu Asp Ala Pro Thr Ser Arg Gln Gln Pro Arg Ile Gly
500 505 510

Ile Ala Asn Gln Tyr Phe Trp Ile His Gln Thr Thr Ile Phe Pro Thr
515 520 525

Asn Thr Gln Ser Ser Tyr Ser Thr Thr Thr Cys Phe Arg Asn Gln Val
530 535 540

Arg Ser Arg Met Phe Cys Leu Ser Ile Ala Glu Phe Ala Asp Gly Val
545 550 555 560

Phe Gly Glu Phe Arg Ile Val Pro Leu Leu Tyr Glu Leu Arg Val
565 570 575

<210> 103
<211> 593
<212> PRT
<213> Tioman virus

<220>
<221> MISC_FEATURE
<223> attachment protein

<400> 103

Met Trp Ala Thr Ser Glu Ser Lys Ala Pro Ile Pro Ala Asn Ser Thr
1 5 10 15

Leu Asn Leu Val Asp Val Pro Leu Asp Glu Pro Gln Thr Ile Thr Lys
20 25 30

His Arg Lys Gln Lys Arg Thr Gly Arg Leu Val Phe Arg Leu Leu Ser
35 40 45

Leu Val Leu Ser Leu Met Thr Val Ile Leu Val Leu Val Ile Leu Ala
50 55 60

Ser Trp Ser Gln Lys Ile Asn Ala Cys Ala Thr Lys Glu Gly Phe Asn
65 70 75 80

Ser Leu Asp Leu Gln Ile Ser Gly Leu Val Lys Ser Ile Asn Ser Leu
85 90 95

Ile Thr Glu Val Asn Gln Ile Ser Ile Thr Thr Ala Ile Asn Leu Pro
100 105 110

Ile Lys Leu Ser Asp Phe Gly Lys Ser Ile Val Asp Gln Val Thr Gln
115 120 125

Met Ile Arg Gln Cys Asn Ala Val Cys Lys Gly Pro Gly Glu Lys Pro
130 135 140

Gly Ile Gln Asn Ile Arg Ile Asn Ile Pro Asn Asn Phe Ser Thr Tyr
145 150 155 160

Leu Glu Leu Asn Asn Thr Val Lys Ser Ile Glu Leu Gln Arg Arg Pro
165 170 175

Ala Leu Leu Ala Arg Pro Asn Pro Ile Pro Lys Ser Cys Ser Arg Phe
180 185 190

Pro Ser Tyr Ser Val Asn Phe Gly Ile His Cys Phe Ala His Ala Ile
195 200 205

Thr Asp Gln Ser Cys Glu Leu Ser Asp Lys Thr Tyr Tyr Arg Leu Ala

210

215

220

Ile Gly Ile Ser Asp Lys Asn Leu Ser Asp Pro Ser Asp Val Lys Tyr
 225 230 235 240

Ile Gly Glu Ala Phe Thr Pro Met Gly Leu Gln Ala Arg Gly Cys Ser
 245 250 255

Val Ile Ser Ser Ile Tyr Gly Cys Tyr Leu Leu Cys Ser Lys Ser Asn
 260 265 270

Gln Gly Tyr Glu Ala Asp Phe Gln Thr Gln Gly Phe His Gln Met Tyr
 275 280 285

Ile Leu Phe Leu Ser Arg Asp Leu Lys Thr Thr Leu Phe Asn Asp Met
 290 295 300

Ile Ser Ser Thr Thr Val Val Trp Asn Gly Leu Tyr Pro Gly Glu Gly
 305 310 315 320

Ala Gly Ile Trp His Met Gly Tyr Leu Ile Phe Pro Leu Trp Gly Gly
 325 330 335

Ile Lys Ile Gly Thr Pro Ala Ser Thr Ser Ile Leu Asn Ser Thr Leu
 340 345 350

Asp Leu Pro Leu Val Gly Pro Ser Cys Lys Ser Thr Leu Glu Glu Asn
 355 360 365

Asn Leu Ile Asn Lys Asp Val Leu Phe Ser Pro Tyr Phe Gly Glu Ser
 370 375 380

Val Met Val Phe Gly Phe Leu Ser Cys Tyr Met Leu Ser Asn Val Pro
 385 390 395 400

Thr His Cys Gln Val Glu Val Leu Asn Ser Ser Val Leu Gly Phe Gly
 405 410 415

Ser Arg Ser Gln Leu Met Asp Leu Lys Gly Ile Val Tyr Leu Tyr Ile
420 425 430

Gln Ser Ala Gly Trp Tyr Ser Tyr Thr Gln Leu Phe Arg Leu Ser Leu
435 440 445

Gln Ser Arg Gly Tyr Lys Leu Thr Val Lys Gln Ile Arg Arg Ile Pro
450 455 460

Ile Ser Ser Thr Thr Arg Pro Gly Thr Ala Pro Cys Asp Val Val His
465 470 475 480

Asn Cys Pro Tyr Thr Cys Ala Thr Gly Leu Phe Gln Ala Pro Trp Ile
485 490 495

Val Asn Gly Asp Ser Ile Leu Asp Arg Asp Val Arg Asn Leu Val Phe
500 505 510

Val Gln Ala Trp Ser Gly Asn Phe Asn Thr Phe Gln Lys Gly Leu Ile
515 520 525

Ser Ile Cys Asn Gln Tyr Thr Cys Pro Leu Thr Thr Leu Leu Asp Asn
530 535 540

Asp Asn Ser Ile Met Arg Ser Thr Thr Thr Tyr Cys Tyr Pro Ser Leu
545 550 555 560

Ser Glu Tyr Asn Leu Gln Cys Gln Ser Phe Ile Glu Trp Gly Gly Pro
565 570 575

Val Gly Asn Pro Ile Gly Ile Leu Glu Val His Tyr Ile Ile Lys Phe
580 585 590

Lys

<210> 104
 <211> 604
 <212> PRT
 <213> Dolphin morbillivirus

<220>
 <221> MISC_FEATURE
 <223> haemagglutinin protein

<400> 104

Met Ser Ser Pro Arg Asp Lys Val Asp Ala Phe Tyr Lys Asp Ile Pro
 1 5 10 15

Arg Pro Arg Asn Asn Arg Val Leu Leu Asp Asn Glu Arg Val Ile Ile
 20 25 30

Glu Arg Pro Leu Ile Leu Val Gly Val Leu Ala Val Met Phe Leu Ser
 35 40 45

Leu Val Gly Leu Leu Ala Ile Ala Gly Val Arg Leu Gln Lys Ala Thr
 50 55 60

Thr Asn Ser Ile Glu Val Asn Arg Lys Leu Ser Thr Asn Leu Glu Thr
 65 70 75 80

Thr Val Ser Ile Glu His His Val Lys Asp Val Leu Thr Pro Leu Phe
 85 90 95

Lys Ile Ile Gly Asp Glu Val Gly Leu Arg Met Pro Gln Lys Leu Thr
 100 105 110

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

Arg Glu Tyr Asp Phe Asn Asp Leu His Trp Cys Val Asn Pro Pro Asp
 130 135 140

Gln Val Lys Ile Asp Tyr Ala Gln Tyr Cys Asn His Ile Ala Ala Glu
145 150 155 160

Glu Leu Ile Val Thr Lys Phe Lys Glu Leu Met Asn His Ser Leu Asp
165 170 175

Met Ser Lys Gly Arg Ile Phe Pro Pro Lys Asn Cys Ser Gly Ser Val
180 185 190

Ile Thr Arg Gly Gln Thr Ile Lys Pro Gly Leu Thr Leu Val Asn Ile
195 200 205

Tyr Thr Thr Arg Asn Phe Glu Val Ser Phe Met Val Thr Val Ile Ser
210 215 220

Gly Gly Met Tyr Gly Lys Thr Tyr Phe Leu Lys Pro Pro Glu Pro Asp
225 230 235 240

Asp Pro Phe Glu Phe Gln Ala Phe Arg Ile Phe Glu Val Gly Leu Val
245 250 255

Arg Asp Val Gly Ser Arg Glu Pro Val Leu Gln Met Thr Asn Phe Met
260 265 270

Val Ile Asp Glu Asp Glu Gly Leu Asn Phe Cys Leu Leu Ser Val Gly
275 280 285

Glu Leu Arg Leu Ala Ala Val Cys Val Arg Gly Arg Pro Val Val Thr
290 295 300

Lys Asp Ile Gly Gly Tyr Lys Asp Glu Pro Phe Lys Val Val Thr Leu
305 310 315 320

Gly Ile Ile Gly Gly Gly Leu Ser Asn Gln Lys Thr Glu Ile Tyr Pro
325 330 335

Thr Ile Asp Ser Ser Ile Glu Lys Leu Tyr Ile Thr Ser His Arg Gly

340

345

350

Ile Ile Arg Asn Ser Lys Ala Arg Trp Ser Val Pro Ala Ile Arg Ser
 355 360 365

Asp Asp Lys Asp Lys Met Glu Lys Cys Thr Gln Ala Leu Cys Lys Ser
 370 375 380

Arg Pro Pro Pro Ser Cys Asn Ser Ser Asp Trp Glu Pro Leu Thr Ser
 385 390 395 400

Asn Arg Ile Pro Ala Tyr Ala Tyr Ile Ala Leu Glu Ile Lys Glu Asp
 405 410 415

Ser Gly Leu Glu Leu Asp Ile Thr Ser Asn Tyr Gly Pro Leu Ile Ile
 420 425 430

His Gly Ala Gly Met Asp Ile Tyr Glu Gly Pro Ser Ser Asn Gln Asp
 435 440 445

Trp Leu Ala Ile Pro Pro Leu Ser Gln Ser Val Leu Gly Val Ile Asn
 450 455 460

Lys Val Asp Phe Thr Ala Gly Phe Asp Ile Lys Pro His Thr Leu Thr
 465 470 475 480

Thr Ala Val Asp Tyr Glu Ser Gly Lys Cys Tyr Val Pro Val Glu Leu
 485 490 495

Ser Gly Ala Lys Asp Gln Asp Leu Lys Leu Glu Ser Asn Leu Val Val
 500 505 510

Leu Pro Thr Lys Asp Phe Gly Tyr Val Thr Ala Thr Tyr Asp Thr Ser
 515 520 525

Arg Ser Glu His Ala Ile Val Tyr Tyr Val Tyr Asp Thr Ala Arg Ser
 530 535 540

Ser Ser Tyr Phe Phe Pro Phe Arg Ile Lys Ala Arg Gly Glu Pro Ile
545 550 555 560

Tyr Leu Arg Ile Glu Cys Phe Pro Trp Ser Arg Gln Leu Trp Cys His
565 570 575

His Tyr Cys Met Ile Asn Ser Thr Val Ser Asn Glu Ile Val Val Val
580 585 590

Asp Asn Leu Val Ser Ile Asn Met Ser Cys Ser Arg
595 600

<210> 105
<211> 734
<212> PRT
<213> Beilong virus

<220>
<221> MISC_FEATURE
<223> attachment glycoprotein

<400> 105

Met Ser Gln Leu Ala Ala His Asn Leu Ala Met Ser Asn Phe Tyr Gly
1 5 10 15

Thr His Gln Gly Asp Leu Ser Gly Ser Gln Lys Gly Glu Glu Gln Gln
20 25 30

Val Gln Gly Val Ile Arg Tyr Val Ser Met Ile Val Ser Leu Leu Ser
35 40 45

Leu Phe Thr Ile Ile Ala Leu Asn Val Thr Asn Ile Ile Tyr Met Thr
50 55 60

Glu Ser Gly Gly Thr Met Gln Ser Ile Lys Thr Ala Gln Gly Ser Ile
65 70 75 80

Asp Gly Ser Met Arg Glu Ile Ser Gly Val Ile Met Glu Asp Val Lys
85 90 95

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

Gln Leu Ser Met Ile His Gln Ile Ile Lys Asn Asp Val Pro Lys Gln
115 120 125

Cys Thr Pro Ser Phe Met Phe Asn Asn Thr Ile Cys Pro Leu Ala Glu
130 135 140

Asn Pro Thr His Ser Arg Tyr Phe Glu Glu Val Asn Leu Asp Ser Ile
145 150 155 160

Ser Glu Cys Ser Gly Pro Asp Met His Leu Gly Leu Gly Val Asn Pro
165 170 175

Glu Phe Ile Glu Phe Pro Ser Phe Ala Pro Gly Ser Thr Lys Pro Gly
180 185 190

Ser Cys Val Arg Leu Pro Ser Phe Ser Leu Ser Thr Thr Val Phe Ala
195 200 205

Tyr Thr His Thr Ile Met Gly His Gly Cys Ser Glu Leu Asp Val Gly
210 215 220

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

Pro Gln Phe Glu Thr Ile Ser Ser Trp Phe Ile Asn Asp Lys Ile Asn
245 250 255

Arg Arg Ser Cys Thr Val Ala Ala Gly Ala Met Glu Ala Trp Met Gly
260 265 270

Cys Val Ile Met Thr Glu Thr Phe Tyr Asp Asp Arg Asn Ser Leu Asp
275 280 285

Thr Gly Lys Leu Thr Ile Ser Tyr Leu Asp Val Phe Gly Arg Lys Lys
290 295 300

Glu Trp Ile Tyr Thr Arg Ser Glu Ile Leu Tyr Asp Tyr Thr Tyr Thr
305 310 315 320

Ser Val Tyr Phe Ser Val Gly Ser Gly Val Val Val Gly Asp Thr Val
325 330 335

Tyr Phe Leu Ile Trp Gly Ser Leu Ser Ser Pro Ile Glu Glu Thr Ala
340 345 350

Tyr Cys Phe Ala Pro Asp Cys Ser Asn Tyr Asn Gln Arg Met Cys Asn
355 360 365

Glu Ala Gln Arg Pro Ser Lys Phe Gly His Arg Gln Met Val Asn Gly
370 375 380

Ile Leu Lys Phe Lys Thr Thr Ser Thr Gly Lys Pro Leu Leu Ser Val
385 390 395 400

Gly Thr Leu Ser Pro Ser Val Val Pro Phe Gly Ser Glu Gly Arg Leu
405 410 415

Met Tyr Ser Glu Ile Thr Lys Ile Ile Tyr Leu Tyr Leu Arg Ser Thr
420 425 430

Ser Trp His Ala Leu Pro Leu Thr Gly Leu Phe Val Leu Gly Pro Pro
435 440 445

Thr Ser Ile Ser Trp Ile Val Gln Arg Ala Val Ser Arg Pro Gly Glu
450 455 460

Phe Pro Cys Gly Ala Ser Asn Arg Cys Pro Lys Asp Cys Val Thr Gly

465		470		475		480
Val Tyr Thr Asp	Leu Phe Pro Leu Gly	Ser Arg Tyr Glu Tyr	Ala Ala			
	485	490	495			
Thr Val Tyr	Leu Asn Ser Glu Thr	Tyr Arg Val Asn Pro	Thr Leu Ala			
	500	505	510			
Leu Ile Asn Gln Thr	Asn Ile Ile Ala Ser Lys Lys	Val Thr Thr Glu				
	515	520	525			
Ser Gln Arg Ala Gly Tyr	Thr Thr Thr Thr Cys Phe Val Phe Lys Leu					
	530	535	540			
Arg Val Trp Cys Ile	Ser Val Val Glu Leu Ala Pro Ser Thr Met Thr					
545	550	555	560			
Ala Tyr Glu Pro Ile	Pro Phe Leu Tyr Gln Leu Asp Leu Thr Cys Lys					
	565	570	575			
Gly Lys Asn Gly Ser	Leu Ala Met Arg Phe Ala Gly Lys Glu Gly Thr					
	580	585	590			
Tyr Lys Ser Gly Arg Tyr	Lys Ser Pro Arg Asn Glu Cys Phe Phe Glu					
	595	600	605			
Lys Val Ser Asn Lys Tyr	Tyr Phe Ile Val Ser Thr Pro Glu Gly Ile					
	610	615	620			
Gln Pro Tyr Glu Ile	Arg Asp Leu Thr Pro Asp Arg Met Pro His Ile					
625	630	635	640			
Ile Met Tyr Ile Ser	Asp Val Cys Ala Pro Ala Leu Ser Ala Phe Lys					
	645	650	655			
Lys Leu Leu Pro Ala	Met Arg Pro Ile Thr Thr Leu Thr Ile Gly Asn					
	660	665	670			

Trp Gln Phe Arg Pro Val Glu Val Ser Gly Gly Leu Arg Val Asn Ile
675 680 685

Gly Arg Asn Leu Thr Lys Glu Gly Asp Leu Thr Met Ser Ala Pro Glu
690 695 700

Asp Pro Gly Ser Asn Thr Phe Pro Gly Asn His Ile Pro Gly Asn Gly
705 710 715 720

Ile Leu Asp Ala Gly Tyr Tyr Thr Val Glu Tyr Pro Lys Glu
725 730

<210> 106
<211> 582
<212> PRT
<213> Mapuera virus

<220>
<221> MISC_FEATURE
<223> attachment protein

<400> 106

Met Ala Ser Leu Gln Ser Glu Pro Gly Ser Gln Lys Pro His Tyr Gln
1 5 10 15

Ser Asp Asp Gln Leu Val Lys Arg Thr Trp Arg Ser Phe Phe Arg Phe
20 25 30

Ser Val Leu Val Val Thr Ile Thr Ser Leu Ala Leu Ser Ile Ile Thr
35 40 45

Leu Ile Gly Val Asn Arg Ile Ser Thr Ala Lys Gln Ile Ser Asn Ala
50 55 60

Phe Ala Ala Ile Gln Ala Asn Ile Leu Ser Ser Ile Pro Asp Ile Arg
65 70 75 80

Pro Ile Asn Ser Leu Leu Asn Gln Leu Val Tyr Thr Ser Ser Val Thr
85 90 95

Leu Pro Leu Arg Ile Ser Ser Leu Glu Ser Asn Val Leu Ala Ala Ile
100 105 110

Gln Glu Ala Cys Thr Tyr Arg Asp Ser Gln Ser Ser Cys Ser Ala Thr
115 120 125

Met Ser Val Met Asn Asp Gln Arg Tyr Ile Glu Gly Ile Gln Val Tyr
130 135 140

Ser Gly Ser Phe Leu Asp Leu Gln Lys His Thr Leu Ser Pro Pro Ile
145 150 155 160

Ala Phe Pro Ser Phe Ile Pro Thr Ser Thr Thr Thr Val Gly Cys Thr
165 170 175

Arg Ile Pro Ser Phe Ser Leu Thr Lys Thr His Trp Cys Tyr Thr His
180 185 190

Asn Tyr Ile Lys Thr Gly Cys Arg Asp Ala Thr Gln Ser Asn Gln Tyr
195 200 205

Ile Ala Leu Gly Thr Ile Tyr Thr Asp Pro Asp Gly Thr Pro Gly Phe
210 215 220

Ser Thr Ser Arg Ser Gln Tyr Leu Asn Asp Gly Val Asn Arg Lys Ser
225 230 235 240

Cys Ser Ile Ser Ala Val Pro Met Gly Cys Ala Leu Tyr Cys Phe Ile
245 250 255

Ser Val Lys Glu Glu Val Asp Tyr Tyr Lys Gly Thr Val Pro Pro Ala
260 265 270

Gln Thr Leu Ile Leu Phe Phe Phe Asn Gly Thr Val His Glu His Arg
275 280 285

Ile Val Pro Ser Ser Met Asn Ser Glu Trp Val Met Leu Ser Pro Gly
290 295 300

Val Gly Ser Gly Val Phe Tyr Asn Asn Tyr Ile Ile Phe Pro Leu Tyr
305 310 315 320

Gly Gly Met Thr Lys Asp Lys Ala Glu Lys Arg Gly Glu Leu Thr Arg
325 330 335

Phe Phe Thr Pro Lys Asn Ser Arg Ser Leu Cys Lys Met Asn Asp Ser
340 345 350

Val Phe Ser Asn Ala Ala Gln Ser Ala Tyr Tyr Pro Pro Tyr Phe Ser
355 360 365

Ser Arg Trp Ile Arg Ser Gly Leu Leu Ala Cys Asn Trp Asn Gln Ile
370 375 380

Ile Thr Thr Asn Cys Glu Ile Leu Thr Phe Ser Asn Gln Val Met Met
385 390 395 400

Met Gly Ala Glu Gly Arg Leu Ile Leu Ile Asn Asp Asp Leu Phe Tyr
405 410 415

Tyr Gln Arg Ser Thr Ser Trp Trp Pro Arg Pro Leu Val Tyr Lys Leu
420 425 430

Asp Ile Glu Leu Asn Tyr Pro Asp Ser His Ile Gln Arg Val Asp Gln
435 440 445

Val Glu Val Thr Phe Pro Thr Arg Pro Gly Trp Gly Gly Cys Val Gly
450 455 460

Asn Asn Phe Cys Pro Met Ile Cys Val Ser Gly Val Tyr Gln Asp Val

465 470 475 480

Trp Pro Val Thr Asn Pro Val Asn Thr Thr Asp Ser Arg Thr Leu Trp
 485 490 495

Val Gly Gly Thr Leu Leu Ser Asn Thr Thr Arg Glu Asn Pro Ala Ser
 500 505 510

Val Val Thr Ser Gly Gly Ser Ile Ser Gln Thr Val Ser Trp Phe Asn
 515 520 525

Gln Thr Val Pro Gly Ala Tyr Ser Thr Thr Thr Cys Phe Asn Asp Gln
 530 535 540

Val Gln Gly Arg Ile Phe Cys Leu Ile Ile Phe Glu Val Gly Gly Gly
 545 550 555 560

Leu Leu Gly Glu Tyr Gln Ile Val Pro Phe Leu Lys Glu Leu Lys Tyr
 565 570 575

Gln Gly Ala Val His Ala
 580

<210> 107
 <211> 657
 <212> PRT
 <213> Nariva virus

<220>
 <221> MISC_FEATURE
 <223> attachment protein

<400> 107

Met Ala Pro Ile Asn Tyr Pro Ala Ser Tyr Tyr Thr Asn Asn Ala Glu
 1 5 10 15

Arg Pro Val Val Ile Thr Thr Lys Ser Thr Glu Ser Lys Gly Gln Arg
 20 25 30

Pro Leu Pro Leu Gly Asn Ala Arg Phe Trp Glu Tyr Phe Gly His Val
35 40 45

Cys Gly Thr Leu Thr Phe Cys Met Ser Leu Ile Gly Ile Ile Val Gly
50 55 60

Ile Ile Ala Leu Ala Asn Tyr Ser Ser Asp Lys Asp Trp Lys Gly Arg
65 70 75 80

Ile Gly Gly Asp Ile Gln Val Thr Arg Met Ala Thr Glu Lys Thr Val
85 90 95

Lys Leu Ile Leu Glu Asp Thr Thr Pro Lys Leu Arg Asn Ile Leu Asp
100 105 110

Ser Val Leu Phe Gln Leu Pro Lys Met Leu Ala Ser Ile Ala Ser Lys
115 120 125

Ile Asn Thr Gln Thr Pro Pro Pro Pro Thr Thr Ser Gly His Ser Thr
130 135 140

Ala Leu Ala Thr Gln Cys Ser Ser Asn Cys Glu Asn Arg Pro Glu Ile
145 150 155 160

Gly Tyr Asp Tyr Leu Arg Gln Val Glu Gln Ser Leu Gln Arg Ile Thr
165 170 175

Asn Ile Ser Ile Gln Leu Leu Glu Ala Ser Glu Ile His Ser Met Ala
180 185 190

Gly Ala Tyr Pro Asn Ala Leu Tyr Lys Ile Arg Thr Gln Asp Ser Trp
195 200 205

Ser Val Thr Ala Lys Glu Cys Pro Leu Gln Ala Phe Gln Pro Asn Leu
210 215 220

Asn Leu Ile Pro Ala Met Ile Gly Thr Ala Thr Gly Ala Leu Ile Arg
225 230 235 240

Asn Cys Val Arg Gln Pro Val Ile Val Val Asp Asp Gly Val Tyr Met
245 250 255

Leu Thr Tyr Leu Ala Met Arg Gly Ser Cys Gln Asp His Gln Lys Ser
260 265 270

Val Arg His Phe Glu Met Gly Val Ile Thr Ser Asp Pro Phe Gly Asp
275 280 285

Pro Val Pro Thr Pro Leu Arg His Trp Thr Lys Arg Ala Leu Pro Ala
290 295 300

Tyr Asp Gly Cys Ala Leu Ala Val Lys Gly His Ala Gly Phe Ala Leu
305 310 315 320

Cys Thr Glu Thr Ser Val Gly Pro Leu Arg Asp Arg Thr Ala Lys Arg
325 330 335

Lys Pro Asn Ile Val Leu Phe Lys Ala Ser Leu Val Gly Glu Leu Ser
340 345 350

Glu Arg Val Ile Pro Pro Gln Ser Trp Leu Ser Gly Phe Ser Phe Phe
355 360 365

Ser Val Tyr Thr Val Ala Gly Lys Gly Tyr Ala Tyr His Ser Lys Phe
370 375 380

His Ala Phe Gly Asn Val Val Arg Val Gly Gln Ser Glu Tyr Gln Ala
385 390 395 400

Lys Cys Arg Gly Thr Gly Cys Pro Thr Ala Asn Gln Asp Asp Cys Asn
405 410 415

Thr Ala Gln Arg Val Ser Gln Glu Asp Asn Thr Tyr Leu His Gln Ala
420 425 430

Ile Leu Ser Val Asp Ile Asp Ser Val Ile Asp Pro Glu Asp Val Val
435 440 445

Tyr Val Ile Glu Arg Asp Gln Tyr Tyr Gln Ala Ser Ala Gly Asp Leu
450 455 460

Tyr Arg Val Pro Glu Thr Gly Glu Ile Leu Tyr Asn Leu His Asn Gly
465 470 475 480

Gly Trp Ser Asn Glu Val Gln Val Gly Arg Ile Gln Pro Ser Asp Arg
485 490 495

Phe Tyr Met Arg Glu Ile Gln Leu Thr Ser Thr Arg Val Pro Ala Pro
500 505 510

Asn Gly Cys Asn Arg Val Lys Gly Cys Pro Gly Gly Cys Val Ala Val
515 520 525

Ile Ser Pro Ala Phe Thr Pro Met His Pro Glu Phe Asn Val Gly Val
530 535 540

Gly Ile Phe Pro Met Asn Gln Pro His Asn Pro Ser Ile Met His Val
545 550 555 560

Gln Gln Gln Thr Glu Leu Phe Trp Lys Pro Ile Val Gly Gly Asn Ile
565 570 575

Thr Leu His Glu Ser Ser Ile Ala Cys Tyr Ser Thr Val Pro Pro Asn
580 585 590

Pro Ser Tyr Asp Leu Cys Ile Gly Val Met Thr Leu Leu Leu His Gln
595 600 605

Gly Gln Leu Pro Gln Phe Gln Ala Leu Ser Trp Tyr Gln Pro Thr Met

610

615

620

Cys Asn Gly Asn Ala Pro Gln Asn Arg Arg Ala Leu Ile Pro Val Ile
 625 630 635 640

Val Glu Asp Ser Lys Ala Met Ser Val Ser Ser Asp Ala Pro Arg Thr
 645 650 655

Pro

<210> 108
 <211> 632
 <212> PRT
 <213> Bat Paramyxovirus Eid_hel/GH-M74a/GHA/2009

<220>
 <221> MISC_FEATURE
 <223> glycoprotein

<400> 108

Met Pro Gln Lys Thr Val Glu Phe Ile Asn Met Asn Ser Pro Leu Glu
 1 5 10 15

Arg Gly Val Ser Thr Leu Ser Asp Lys Lys Thr Leu Asn Gln Ser Lys
 20 25 30

Ile Thr Lys Gln Gly Tyr Phe Gly Leu Gly Ser His Ser Glu Arg Asn
 35 40 45

Trp Lys Lys Gln Lys Asn Gln Asn Asp His Tyr Met Thr Val Ser Thr
 50 55 60

Met Ile Leu Glu Ile Leu Val Val Leu Gly Ile Met Phe Asn Leu Ile
 65 70 75 80

Val Leu Thr Met Val Tyr Tyr Gln Asn Asp Asn Ile Asn Gln Arg Met
 85 90 95

Ala Glu Leu Thr Ser Asn Ile Thr Val Leu Asn Leu Asn Leu Asn Gln
100 105 110

Leu Thr Asn Lys Ile Gln Arg Glu Ile Ile Pro Arg Ile Thr Leu Ile
115 120 125

Asp Thr Ala Thr Thr Ile Thr Ile Pro Ser Ala Ile Thr Tyr Ile Leu
130 135 140

Ala Thr Leu Thr Thr Arg Ile Ser Glu Leu Leu Pro Ser Ile Asn Gln
145 150 155 160

Lys Cys Glu Phe Lys Thr Pro Thr Leu Val Leu Asn Asp Cys Arg Ile
165 170 175

Asn Cys Thr Pro Pro Leu Asn Pro Ser Asp Gly Val Lys Met Ser Ser
180 185 190

Leu Ala Thr Asn Leu Val Ala His Gly Pro Ser Pro Cys Arg Asn Phe
195 200 205

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

Arg Thr Ala Leu Asp Glu Arg Cys Ile Leu Asn Pro Arg Leu Thr Ile
225 230 235 240

Ser Ser Thr Lys Phe Ala Tyr Val His Ser Glu Tyr Asp Lys Asn Cys
245 250 255

Thr Arg Gly Phe Lys Tyr Tyr Glu Leu Met Thr Phe Gly Glu Ile Leu
260 265 270

Glu Gly Pro Glu Lys Glu Pro Arg Met Phe Ser Arg Ser Phe Tyr Ser
275 280 285

Pro Thr Asn Ala Val Asn Tyr His Ser Cys Thr Pro Ile Val Thr Val
290 295 300

Asn Glu Gly Tyr Phe Leu Cys Leu Glu Cys Thr Ser Ser Asp Pro Leu
305 310 315 320

Tyr Lys Ala Asn Leu Ser Asn Ser Thr Phe His Leu Val Ile Leu Arg
325 330 335

His Asn Lys Asp Glu Lys Ile Val Ser Met Pro Ser Phe Asn Leu Ser
340 345 350

Thr Asp Gln Glu Tyr Val Gln Ile Ile Pro Ala Glu Gly Gly Gly Thr
355 360 365

Ala Glu Ser Gly Asn Leu Tyr Phe Pro Cys Ile Gly Arg Leu Leu His
370 375 380

Lys Arg Val Thr His Pro Leu Cys Lys Lys Ser Asn Cys Ser Arg Thr
385 390 395 400

Asp Asp Glu Ser Cys Leu Lys Ser Tyr Tyr Asn Gln Gly Ser Pro Gln
405 410 415

His Gln Val Val Asn Cys Leu Ile Arg Ile Arg Asn Ala Gln Arg Asp
420 425 430

Asn Pro Thr Trp Asp Val Ile Thr Val Asp Leu Thr Asn Thr Tyr Pro
435 440 445

Gly Ser Arg Ser Arg Ile Phe Gly Ser Phe Ser Lys Pro Met Leu Tyr
450 455 460

Gln Ser Ser Val Ser Trp His Thr Leu Leu Gln Val Ala Glu Ile Thr
465 470 475 480

Asp Leu Asp Lys Tyr Gln Leu Asp Trp Leu Asp Thr Pro Tyr Ile Ser
485 490 495

Arg Pro Gly Gly Ser Glu Cys Pro Phe Gly Asn Tyr Cys Pro Thr Val
500 505 510

Cys Trp Glu Gly Thr Tyr Asn Asp Val Tyr Ser Leu Thr Pro Asn Asn
515 520 525

Asp Leu Phe Val Thr Val Tyr Leu Lys Ser Glu Gln Val Ala Glu Asn
530 535 540

Pro Tyr Phe Ala Ile Phe Ser Arg Asp Gln Ile Leu Lys Glu Phe Pro
545 550 555 560

Leu Asp Ala Trp Ile Ser Ser Ala Arg Thr Thr Thr Ile Ser Cys Phe
565 570 575

Met Phe Asn Asn Glu Ile Trp Cys Ile Ala Ala Leu Glu Ile Thr Arg
580 585 590

Leu Asn Asp Asp Ile Ile Arg Pro Ile Tyr Tyr Ser Phe Trp Leu Pro
595 600 605

Thr Asp Cys Arg Thr Pro Tyr Pro His Thr Gly Lys Met Thr Arg Val
610 615 620

Pro Leu Arg Ser Thr Tyr Asn Tyr
625 630

<210> 109
<211> 569
<212> PRT
<213> Avian paramyxovirus 7

<220>
<221> MISC_FEATURE
<223> hemagglutinin-neuraminidase

<400> 109

Met Glu Ser Ile Gly Lys Gly Thr Trp Arg Thr Val Tyr Arg Val Leu
1 5 10 15

Thr Ile Leu Leu Asp Val Val Ile Ile Ile Leu Ser Val Ile Ala Leu
20 25 30

Ile Ser Leu Gly Leu Lys Pro Gly Glu Arg Ile Ile Asn Glu Val Asn
35 40 45

Gly Ser Ile His Asn Gln Leu Val Pro Leu Ser Gly Ile Thr Ser Asp
50 55 60

Ile Gln Ala Lys Val Ser Ser Ile Tyr Arg Ser Asn Leu Leu Ser Ile
65 70 75 80

Pro Leu Gln Leu Asp Gln Ile Asn Gln Ala Ile Ser Ser Ser Ala Arg
85 90 95

Gln Ile Ala Asp Thr Ile Asn Ser Phe Leu Ala Leu Asn Gly Ser Gly
100 105 110

Thr Phe Ile Tyr Thr Asn Ser Pro Glu Phe Ala Asn Gly Phe Asn Arg
115 120 125

Ala Met Phe Pro Thr Leu Asn Gln Ser Leu Asn Met Leu Thr Pro Gly
130 135 140

Asn Leu Ile Glu Phe Thr Asn Phe Ile Pro Thr Pro Thr Thr Lys Ser
145 150 155 160

Gly Cys Ile Arg Ile Pro Ser Phe Ser Met Ser Ser Ser His Trp Cys
165 170 175

Tyr Thr His Asn Ile Ile Ala Ser Gly Cys Gln Asp His Ser Thr Ser
180 185 190

Ser Glu Tyr Ile Ser Met Gly Val Val Glu Val Thr Asp Gln Ala Tyr
195 200 205

Pro Asn Phe Arg Thr Thr Leu Ser Ile Thr Leu Ala Asp Asn Leu Asn
210 215 220

Arg Lys Ser Cys Ser Ile Ala Ala Thr Gly Phe Gly Cys Asp Ile Leu
225 230 235 240

Cys Ser Val Val Thr Glu Thr Glu Asn Asp Asp Tyr Gln Ser Pro Glu
245 250 255

Pro Thr Gln Met Ile Tyr Gly Arg Leu Phe Phe Asn Gly Thr Tyr Ser
260 265 270

Glu Met Ser Leu Asn Val Asn Gln Met Phe Ala Asp Trp Val Ala Asn
275 280 285

Tyr Pro Ala Val Gly Ser Gly Val Glu Leu Ala Asp Phe Val Ile Phe
290 295 300

Pro Leu Tyr Gly Gly Val Lys Ile Thr Ser Thr Leu Gly Ala Ser Leu
305 310 315 320

Ser Gln Tyr Tyr Tyr Ile Pro Lys Val Pro Thr Val Asn Cys Ser Glu
325 330 335

Thr Asp Ala Gln Gln Ile Glu Lys Ala Lys Ala Ser Tyr Ser Pro Pro
340 345 350

Lys Val Ala Pro Asn Ile Trp Ala Gln Ala Val Val Arg Cys Asn Lys
355 360 365

Ser Val Asn Leu Ala Asn Ser Cys Glu Ile Leu Thr Phe Asn Thr Ser
370 375 380

Thr Met Met Met Gly Ala Glu Gly Arg Leu Leu Met Ile Gly Lys Asn
385 390 395 400

Val Tyr Phe Tyr Gln Arg Ser Ser Ser Tyr Trp Pro Val Gly Ile Ile
405 410 415

Tyr Lys Leu Asp Leu Gln Glu Leu Thr Thr Phe Ser Ser Asn Gln Leu
420 425 430

Leu Ser Thr Ile Pro Ile Pro Phe Glu Lys Phe Pro Arg Pro Ala Ser
435 440 445

Thr Ala Gly Val Cys Ser Lys Pro Asn Val Cys Pro Ala Val Cys Gln
450 455 460

Thr Gly Val Tyr Gln Asp Leu Trp Val Leu Tyr Asp Leu Gly Lys Leu
465 470 475 480

Glu Asn Thr Thr Ala Val Gly Leu Tyr Leu Asn Ser Ala Val Gly Arg
485 490 495

Met Asn Pro Phe Ile Gly Ile Ala Asn Thr Leu Ser Trp Tyr Asn Thr
500 505 510

Thr Arg Leu Phe Ala Gln Gly Thr Pro Ala Ser Tyr Ser Thr Thr Thr
515 520 525

Cys Phe Lys Asn Thr Lys Ile Asp Thr Ala Tyr Cys Leu Ser Ile Leu
530 535 540

Glu Leu Ser Asp Ser Leu Leu Gly Ser Trp Arg Ile Thr Pro Leu Leu
545 550 555 560

Tyr Asn Ile Thr Leu Ser Ile Met Ser
565

<210> 110
<211> 588
<212> PRT
<213> Tuhoko virus 2

<220>
<221> MISC_FEATURE
<223> hemagglutinin-neuraminidase

<400> 110

Met Pro Pro Val Pro Thr Val Ser Gln Ser Ile Asp Glu Gly Ser Phe
1 5 10 15

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

Lys Thr Cys Arg Lys Leu Phe Arg Ile Val Thr Leu Ile Gly Val Gly
35 40 45

Leu Ile Ser Ile Leu Thr Ile Ile Ser Leu Ala Gln Gln Thr Gly Ile
50 55 60

Leu Arg Lys Val Asp Ser Ser Asp Phe Gln Ser Tyr Val Gln Glu Ser
65 70 75 80

Phe Lys Gln Val Leu Asn Leu Met Lys Gln Phe Ser Ser Asn Leu Asn
85 90 95

Ser Leu Ile Glu Ile Thr Ser Val Thr Leu Pro Phe Arg Ile Asp Gln
100 105 110

Phe Gly Thr Asp Ile Lys Thr Gln Val Ala Gln Leu Val Arg Gln Cys
115 120 125

Asn Ala Val Cys Arg Gly Pro Ile Lys Gly Pro Thr Thr Gln Asn Ile
130 135 140

Val Tyr Pro Ala Leu Tyr Glu Thr Ser Leu Asn Lys Thr Leu Glu Thr

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

Ala Asp Thr Cys Asn His Thr Glu Lys Glu Leu Gly Arg Ser Phe Pro
355 360 365

Gly Ala Phe Ser Ser Pro Tyr Tyr His Asp Ala Val Met Leu Asn Phe
370 375 380

Leu Leu Ile Cys Glu Met Ile Glu Asn Leu Pro Gly Asp Cys Asp Leu
385 390 395 400

Gln Ile Leu Asn Pro Thr Asn Met Ser Met Gly Ser Glu Ser Gln Leu
405 410 415

Ser Val Leu Asp Asn Glu Leu Phe Leu Tyr Gln Arg Ser Ala Ser Trp
420 425 430

Trp Pro Tyr Thr Leu Ile Tyr Arg Leu Asn Met Arg Tyr Thr Gly Lys
435 440 445

Tyr Leu Lys Pro Lys Ser Ile Ile Pro Met Val Ile Lys Ser Asn Thr
450 455 460

Arg Pro Gly Tyr Glu Gly Cys Asn His Glu Arg Val Cys Pro Lys Val
465 470 475 480

Cys Val Thr Gly Val Phe Gln Ala Pro Trp Ile Leu Ser Ile Gly Arg
485 490 495

Asp His Lys Glu Arg Val Ser Asn Val Thr Tyr Met Val Ala Trp Ser
500 505 510

Met Asp Lys Ser Asp Arg Thr Tyr Pro Ala Val Ser Val Cys Gly Ser
515 520 525

Asp Thr Cys Lys Leu Thr Val Pro Leu Gly Asp Ser Lys Val His Ser
530 535 540

Ala Tyr Ser Val Thr Arg Cys Tyr Leu Ser Arg Asp His Met Ser Ala
 545 550 555 560

Tyr Cys Leu Val Ile Phe Glu Leu Asp Ala Arg Pro Trp Ala Glu Met
 565 570 575

Arg Ile Gln Ser Phe Leu Tyr Lys Leu Ile Leu Thr
 580 585

<210> 111
 <211> 582
 <212> PRT
 <213> Tuhoko virus 3

<220>
 <221> MISC_FEATURE
 <223> hemagglutinin-neuraminidase

<400> 111

Met His Asn Arg Thr Gln Ser Val Ser Ser Ile Asp Thr Ser Ser Asp
 1 5 10 15

Val Tyr Leu Pro Arg Arg Lys Lys Ala Val Thr Lys Phe Thr Phe Lys
 20 25 30

Lys Ile Phe Arg Val Leu Ile Leu Thr Leu Leu Leu Ser Ile Ile Ile
 35 40 45

Ile Ile Ala Val Ile Phe Pro Lys Ile Asp His Ile Arg Glu Thr Cys
 50 55 60

Asp Asn Ser Gln Ile Leu Glu Thr Ile Thr Asn Gln Asn Ser Glu Ile
 65 70 75 80

Lys Asn Leu Ile Asn Ser Ala Ile Thr Asn Leu Asn Val Leu Leu Thr
 85 90 95

Ser Thr Thr Val Asp Leu Pro Ile Lys Leu Asn Asn Phe Gly Lys Ser
100 105 110

Ile Val Asp Gln Val Thr Met Met Val Arg Gln Cys Asn Ala Val Cys
115 120 125

Arg Gly Pro Gly Asp Arg Pro Thr Gln Asn Ile Glu Leu Phe Lys Gly
130 135 140

Leu Tyr His Thr Ser Pro Pro Ser Asn Thr Ser Thr Lys Leu Ser Met
145 150 155 160

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

Leu Leu Gly Cys Thr Arg Phe Pro Ser Phe Ser Val His Tyr Gly Leu
180 185 190

Trp Cys Tyr Gly His Met Ala Ser Thr Gly Asn Cys Ser Gly Ser Ser
195 200 205

Pro Ser Val Gln Ile Ile Arg Ile Gly Ser Ile Gly Thr Asn Lys Asp
210 215 220

Gly Thr Pro Lys Tyr Val Ile Ile Ala Ser Ala Ser Leu Pro Glu Thr
225 230 235 240

Thr Arg Leu Tyr His Cys Ser Val Thr Met Thr Ser Ile Gly Cys Tyr
245 250 255

Ile Leu Cys Thr Thr Pro Ser Val Ser Glu Thr Asp Asp Tyr Ser Thr
260 265 270

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

Leu Thr Gln Leu Gly Gln Pro Thr Gly Leu Asp Asn Gln Asn Leu Tyr

290

295

300

Ala Leu Tyr Pro Gly Pro Gly Ser Gly Val Ile Phe Arg Asp Phe Leu
 305 310 315 320

Ile Phe Pro Met Met Gly Gly Ile Arg Leu Met Asp Ala Gln Lys Met
 325 330 335

Leu Asn Arg Asn Ile Thr Tyr Arg Gly Phe Pro Pro Ser Glu Thr Cys
 340 345 350

Thr Glu Ser Glu Leu Lys Leu Lys Gln Glu Val Ala Asn Met Leu Thr
 355 360 365

Ser Pro Tyr Tyr Gly Glu Val Leu Val Leu Asn Phe Leu Tyr Val Cys
 370 375 380

Ser Leu Leu Asp Asn Ile Pro Gly Asp Cys Ser Val Gln Leu Ile Pro
 385 390 395 400

Pro Asp Asn Met Thr Leu Gly Ala Glu Ser Arg Leu Tyr Val Leu Asn
 405 410 415

Gly Ser Leu Ile Met Tyr Lys Arg Gly Ser Ser Trp Trp Pro Tyr Thr
 420 425 430

Glu Leu Tyr Gln Ile Asn Tyr Arg Val Asn Asn Arg Ala Phe Arg Val
 435 440 445

Arg Glu Ser Val Arg Ile Asn Thr Thr Ser Thr Ser Arg Pro Gly Val
 450 455 460

Gln Gly Cys Asn Leu Glu Lys Val Cys Pro Lys Val Cys Val Ser Gly
 465 470 475 480

Ile Tyr Gln Ser Pro Gly Ile Ile Ser Ala Pro Val Asn Pro Thr Arg
 485 490 495

Gln Glu Glu Gly Leu Leu Tyr Phe Leu Val Trp Thr Ser Ser Met Ser
500 505 510

Ser Arg Thr Gly Pro Leu Ser Ser Leu Cys Asp His Ser Thr Cys Arg
515 520 525

Ile Thr Tyr Pro Ile Gly Asp Asp Thr Ile Phe Ile Gly Tyr Thr Asp
530 535 540

Ser Ser Cys Phe Met Ser Ser Ile Lys Glu Gly Ile Tyr Cys Ile Ala
545 550 555 560

Phe Leu Glu Leu Asp Asn Gln Pro Tyr Ser Met Met Ala Ile Arg Ser
565 570 575

Leu Ser Tyr Ile Ile Asn
580

<210> 112
<211> 625
<212> PRT
<213> Mojiang virus

<220>
<221> MISC_FEATURE
<223> attachment glycoprotein

<400> 112

Met Ala Thr Asn Arg Asp Asn Thr Ile Thr Ser Ala Glu Val Ser Gln
1 5 10 15

Glu Asp Lys Val Lys Lys Tyr Tyr Gly Val Glu Thr Ala Glu Lys Val
20 25 30

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

Leu Ile Leu Thr Gly Ala Ile Ile Thr Ile Thr Leu Asn Ile Thr Asn
50 55 60

Leu Thr Ala Ala Lys Ser Gln Gln Asn Met Leu Lys Ile Ile Gln Asp
65 70 75 80

Asp Val Asn Ala Lys Leu Glu Met Phe Val Asn Leu Asp Gln Leu Val
85 90 95

Lys Gly Glu Ile Lys Pro Lys Val Ser Leu Ile Asn Thr Ala Val Ser
100 105 110

Val Ser Ile Pro Gly Gln Ile Ser Asn Leu Gln Thr Lys Phe Leu Gln
115 120 125

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

Pro Leu Ser Gly Ile Phe Pro Thr Ser Gly Pro Thr Tyr Pro Pro Thr
145 150 155 160

Asp Lys Pro Asp Asp Asp Thr Thr Asp Asp Asp Lys Val Asp Thr Thr
165 170 175

Ile Lys Pro Ile Glu Tyr Pro Lys Pro Asp Gly Cys Asn Arg Thr Gly
180 185 190

Asp His Phe Thr Met Glu Pro Gly Ala Asn Phe Tyr Thr Val Pro Asn
195 200 205

Leu Gly Pro Ala Ser Ser Asn Ser Asp Glu Cys Tyr Thr Asn Pro Ser
210 215 220

Phe Ser Ile Gly Ser Ser Ile Tyr Met Phe Ser Gln Glu Ile Arg Lys
225 230 235 240

Thr Asp Cys Thr Ala Gly Glu Ile Leu Ser Ile Gln Ile Val Leu Gly
245 250 255

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

Val Trp Ala Val Pro Asn Pro Lys Ile Ile Asn Ser Cys Ala Val Ala
275 280 285

Ala Gly Asp Glu Met Gly Trp Val Leu Cys Ser Val Thr Leu Thr Ala
290 295 300

Ala Ser Gly Glu Pro Ile Pro His Met Phe Asp Gly Phe Trp Leu Tyr
305 310 315 320

Lys Leu Glu Pro Asp Thr Glu Val Val Ser Tyr Arg Ile Thr Gly Tyr
325 330 335

Ala Tyr Leu Leu Asp Lys Gln Tyr Asp Ser Val Phe Ile Gly Lys Gly
340 345 350

Gly Gly Ile Gln Lys Gly Asn Asp Leu Tyr Phe Gln Met Tyr Gly Leu
355 360 365

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

Leu Gly Thr Gly Gly Gly Tyr Gln Val Leu Cys Asp Arg Ala Val
385 390 395 400

Met Ser Phe Gly Ser Glu Glu Ser Leu Ile Thr Asn Ala Tyr Leu Lys
405 410 415

Val Asn Asp Leu Ala Ser Gly Lys Pro Val Ile Ile Gly Gln Thr Phe
420 425 430

Pro Pro Ser Asp Ser Tyr Lys Gly Ser Asn Gly Arg Met Tyr Thr Ile

435

440

445

Gly Asp Lys Tyr Gly Leu Tyr Leu Ala Pro Ser Ser Trp Asn Arg Tyr
 450 455 460

Leu Arg Phe Gly Ile Thr Pro Asp Ile Ser Val Arg Ser Thr Thr Trp
 465 470 475 480

Leu Lys Ser Gln Asp Pro Ile Met Lys Ile Leu Ser Thr Cys Thr Asn
 485 490 495

Thr Asp Arg Asp Met Cys Pro Glu Ile Cys Asn Thr Arg Gly Tyr Gln
 500 505 510

Asp Ile Phe Pro Leu Ser Glu Asp Ser Glu Tyr Tyr Thr Tyr Ile Gly
 515 520 525

Ile Thr Pro Asn Asn Gly Gly Thr Lys Asn Phe Val Ala Val Arg Asp
 530 535 540

Ser Asp Gly His Ile Ala Ser Ile Asp Ile Leu Gln Asn Tyr Tyr Ser
 545 550 555 560

Ile Thr Ser Ala Thr Ile Ser Cys Phe Met Tyr Lys Asp Glu Ile Trp
 565 570 575

Cys Ile Ala Ile Thr Glu Gly Lys Lys Gln Lys Asp Asn Pro Gln Arg
 580 585 590

Ile Tyr Ala His Ser Tyr Lys Ile Arg Gln Met Cys Tyr Asn Met Lys
 595 600 605

Ser Ala Thr Val Thr Val Gly Asn Ala Lys Asn Ile Thr Ile Arg Arg
 610 615 620

Tyr
 625

<210> 113
<211> 614
<212> PRT
<213> Avian paramyxovirus 12

<220>
<221> MISC_FEATURE
<223> hemagglutinin-neuraminidase

<400> 113

Met Glu Ser Ala Thr Ser Gln Val Ser Phe Glu Asn Asp Lys Thr Ser
1 5 10 15

Asp Arg Arg Thr Trp Arg Ala Val Phe Arg Val Leu Met Ile Ile Leu
20 25 30

Ala Leu Ser Ser Leu Cys Val Thr Val Ala Ala Leu Ile Tyr Ser Ala
35 40 45

Lys Ala Ala Ile Pro Gly Asn Ile Asp Ala Ser Glu Gln Arg Ile Leu
50 55 60

Ser Ser Val Glu Ala Val Gln Val Pro Val Ser Arg Leu Glu Asp Thr
65 70 75 80

Ser Gln Lys Ile Tyr Arg Gln Val Ile Leu Glu Ala Pro Val Thr Gln
85 90 95

Leu Asn Met Glu Thr Asn Ile Leu Asn Ala Ile Thr Ser Leu Ser Tyr
100 105 110

Gln Ile Asp Ala Ser Ala Asn Ser Ser Gly Cys Gly Ala Pro Val His
115 120 125

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

Glu Val Asn Leu Thr Ile Ile Arg Pro Ser Lys Phe Leu Glu His Leu
145 150 155 160

Asn Phe Ile Pro Ala Pro Thr Thr Gly Asn Gly Cys Thr Arg Ile Pro
165 170 175

Ser Phe Asp Leu Gly Gln Thr His Trp Cys Tyr Thr His Asn Val Val
180 185 190

Leu Asn Gly Cys Arg Asp Arg Gly His Ser Phe Gln Tyr Val Ala Leu
195 200 205

Gly Ile Leu Arg Thr Ser Ala Thr Gly Ser Val Phe Leu Ser Thr Leu
210 215 220

Arg Ser Val Asn Leu Asp Asp Asp Arg Asn Arg Lys Ser Cys Ser Val
225 230 235 240

Ser Ala Thr Pro Ile Gly Cys Glu Met Leu Cys Ser Leu Val Thr Glu
245 250 255

Thr Glu Glu Gly Asp Tyr Asp Ser Ile Asp Pro Thr Pro Met Val His
260 265 270

Gly Arg Leu Gly Phe Asp Gly Lys Tyr Arg Glu Val Asp Leu Ser Glu
275 280 285

Lys Glu Ile Phe Ala Asp Trp Arg Ala Asn Tyr Pro Ala Val Gly Gly
290 295 300

Gly Ala Phe Phe Gly Asn Arg Val Trp Phe Pro Val Tyr Gly Gly Leu
305 310 315 320

Lys Glu Gly Thr Gln Ser Glu Arg Asp Ala Glu Lys Gly Tyr Ala Ile
325 330 335

Tyr Lys Arg Phe Asn Asn Thr Cys Pro Asp Asp Asn Thr Thr Gln Ile
340 345 350

Ala Asn Ala Lys Ala Ser Tyr Arg Pro Ser Arg Phe Gly Gly Arg Phe
355 360 365

Ile Gln Gln Gly Ile Leu Ser Phe Lys Val Glu Gly Asn Leu Gly Ser
370 375 380

Asp Pro Ile Leu Ser Leu Thr Asp Asn Ser Ile Thr Leu Met Gly Ala
385 390 395 400

Glu Ala Arg Val Met Asn Ile Glu Asn Lys Leu Tyr Leu Tyr Gln Arg
405 410 415

Gly Thr Ser Trp Phe Pro Ser Ala Leu Val Tyr Pro Leu Asp Val Ala
420 425 430

Asn Thr Ala Val Lys Val Arg Ala Pro Tyr Ile Phe Asp Lys Phe Thr
435 440 445

Arg Pro Gly Gly His Pro Cys Ser Ala Ser Ser Arg Cys Pro Asn Val
450 455 460

Cys Val Thr Gly Val Tyr Thr Asp Ala Tyr Pro Leu Val Phe Ser Arg
465 470 475 480

Ser His Asp Ile Val Ala Val Tyr Gly Met Gln Leu Ala Ala Gly Thr
485 490 495

Ala Arg Leu Asp Pro Gln Ala Ala Ile Trp Tyr Gly Asn Glu Met Ser
500 505 510

Thr Pro Thr Lys Val Ser Ser Ser Thr Thr Lys Ala Ala Tyr Thr Thr
515 520 525

Ser Thr Cys Phe Lys Val Thr Lys Thr Lys Arg Ile Tyr Cys Ile Ser

530

535

540

Ile Ala Glu Ile Gly Asn Thr Leu Phe Gly Glu Phe Arg Ile Val Pro
 545 550 555 560

Leu Leu Ile Glu Val Gln Lys Thr Pro Leu Thr Arg Arg Ser Glu Leu
 565 570 575

Arg Gln Gln Met Pro Gln Pro Pro Ile Asp Leu Val Ile Asp Asn Pro
 580 585 590

Phe Cys Ala Pro Ser Gly Asn Leu Ser Arg Lys Asn Ala Ile Asp Glu
 595 600 605

Tyr Ala Asn Ser Trp Pro
 610

<210> 114
 <211> 577
 <212> PRT
 <213> Avian paramyxovirus

<220>
 <221> MISC_FEATURE
 <223> hemagglutinin

<400> 114

Met Glu Pro Thr Gly Ser Lys Val Asp Ile Val Pro Ser Gln Gly Thr
 1 5 10 15

Lys Arg Thr Cys Arg Thr Phe Tyr Arg Leu Leu Ile Leu Ile Leu Asn
 20 25 30

Leu Ile Ile Ile Ile Leu Thr Ile Ile Ser Ile Tyr Val Ser Ile Ser
 35 40 45

Thr Asp Gln His Lys Leu Cys Asn Asn Glu Ala Asp Ser Leu Leu His
 50 55 60

Ser Ile Val Glu Pro Ile Thr Val Pro Leu Gly Thr Asp Ser Asp Val
65 70 75 80

Glu Asp Glu Leu Arg Glu Ile Arg Arg Asp Thr Gly Ile Asn Ile Pro
85 90 95

Ile Gln Ile Asp Asn Thr Glu Asn Ile Ile Leu Thr Thr Leu Ala Ser
100 105 110

Ile Asn Ser Asn Ile Ala Arg Leu His Asn Ala Thr Asp Glu Ser Pro
115 120 125

Thr Cys Leu Ser Pro Val Asn Asp Pro Arg Phe Ile Ala Gly Ile Asn
130 135 140

Lys Ile Thr Lys Gly Ser Met Ile Tyr Arg Asn Phe Ser Asn Leu Ile
145 150 155 160

Glu His Val Asn Phe Ile Pro Ser Pro Thr Thr Leu Ser Gly Cys Thr
165 170 175

Arg Ile Pro Ser Phe Ser Leu Ser Lys Thr His Trp Cys Tyr Ser His
180 185 190

Asn Val Ile Ser Thr Gly Cys Gln Asp His Ala Ala Ser Ser Gln Tyr
195 200 205

Ile Ser Ile Gly Ile Val Asp Thr Gly Leu Asn Asn Glu Pro Tyr Leu
210 215 220

Arg Thr Met Ser Ser Arg Leu Leu Asn Asp Gly Leu Asn Arg Lys Ser
225 230 235 240

Cys Ser Val Thr Ala Gly Ala Gly Val Cys Trp Leu Leu Cys Ser Val
245 250 255

Val Thr Glu Ser Glu Ser Ala Asp Tyr Arg Ser Arg Ala Pro Thr Ala
260 265 270

Met Ile Leu Gly Arg Phe Asn Phe Tyr Gly Asp Tyr Thr Glu Ser Pro
275 280 285

Val Pro Ala Ser Leu Phe Ser Gly Arg Phe Thr Ala Asn Tyr Pro Gly
290 295 300

Val Gly Ser Gly Thr Gln Leu Asn Gly Thr Leu Tyr Phe Pro Ile Tyr
305 310 315 320

Gly Gly Val Val Asn Asp Ser Asp Ile Glu Leu Ser Asn Arg Gly Lys
325 330 335

Ser Phe Arg Pro Arg Asn Pro Thr Asn Pro Cys Pro Asp Pro Glu Val
340 345 350

Thr Gln Ser Gln Arg Ala Gln Ala Ser Tyr Tyr Pro Thr Arg Phe Gly
355 360 365

Arg Leu Leu Ile Gln Gln Ala Ile Leu Ala Cys Arg Ile Ser Asp Thr
370 375 380

Thr Cys Thr Asp Tyr Tyr Leu Leu Tyr Phe Asp Asn Asn Gln Val Met
385 390 395 400

Met Gly Ala Glu Ala Arg Ile Tyr Tyr Leu Asn Asn Gln Met Tyr Leu
405 410 415

Tyr Gln Arg Ser Ser Ser Trp Trp Pro His Pro Leu Phe Tyr Arg Phe
420 425 430

Ser Leu Pro His Cys Glu Pro Met Ser Val Cys Met Ile Thr Asp Thr
435 440 445

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

Thr Gly Ala Ser Arg Cys Pro Asn Asn Cys Val Asp Gly Val Tyr Thr
465 470 475 480

Asp Val Trp Pro Leu Thr Glu Gly Thr Thr Gln Asp Pro Asp Ser Tyr
485 490 495

Tyr Thr Val Phe Leu Asn Ser Pro Asn Arg Arg Ile Ser Pro Thr Ile
500 505 510

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

Ser Glu Ile Gly Ala Ala Tyr Thr Thr Ser Thr Cys Phe Ser Arg Thr
530 535 540

Asp Thr Gly Ala Leu Tyr Cys Ile Thr Ile Ile Glu Ala Val Asn Thr
545 550 555 560

Ile Phe Gly Gln Tyr Arg Ile Val Pro Ile Leu Val Gln Leu Ile Ser
565 570 575

Asp

<210> 115
<211> 620
<212> PRT
<213> Salem virus

<220>
<221> MISC_FEATURE
<223> attachment glycoprotein

<400> 115

Met Lys Ala Met His Tyr Tyr Lys Asn Asp Phe Ala Asp Pro Gly Thr

1	5	10	15
Asn Asp Asn Ser Ser Asp Leu Thr Thr Asn Pro Phe Ile Ser Asn Gln	20	25	30
Ile Lys Ser Asn Leu Ser Pro Pro Val Leu Ala Glu Gly His Leu Ser	35	40	45
Pro Ser Pro Ile Pro Lys Phe Arg Lys Ile Leu Leu Thr Ile Ser Phe	50	55	60
Val Ser Thr Ile Val Val Leu Thr Val Ile Leu Leu Val Leu Thr Ile	65	70	75
Arg Ile Leu Thr Ile Ile Glu Ala Ser Ala Gly Asp Glu Lys Asp Ile	85	90	95
His Thr Ile Leu Ser Ser Leu Leu Asn Thr Phe Met Asn Glu Tyr Ile	100	105	110
Pro Val Phe Lys Asn Leu Val Ser Ile Ile Ser Leu Gln Ile Pro Gln	115	120	125
Met Leu Ile Asp Leu Lys Thr Ser Ser Thr Gln Met Met Gln Ser Leu	130	135	140
Lys Thr Phe Pro Arg Asp Leu Glu Thr Leu Ser Thr Val Thr Gln Ser	145	150	155
Val Ala Val Leu Leu Glu Lys Ala Lys Ser Thr Ile Pro Asp Ile Asn	165	170	175
Lys Phe Tyr Lys Asn Val Gly Lys Val Thr Phe Asn Asp Pro Asn Ile	180	185	190
Lys Val Leu Thr Leu Glu Val Pro Ala Trp Leu Pro Ile Val Arg Gln	195	200	205

Cys Leu Lys Gln Asp Phe Arg Gln Val Ile Ser Asn Ser Thr Gly Phe
210 215 220

Ala Leu Ile Gly Ala Leu Pro Ser Gln Leu Phe Asn Glu Phe Glu Gly
225 230 235 240

Tyr Pro Ser Leu Ala Ile Val Ser Glu Val Tyr Ala Ile Thr Tyr Leu
245 250 255

Lys Gly Val Met Phe Glu Asn Gln Glu Asn Phe Leu Tyr Gln Tyr Phe
260 265 270

Glu Ile Gly Thr Ile Ser Pro Asp Gly Tyr Asn Lys Pro Tyr Phe Leu
275 280 285

Arg His Thr Ser Val Met Leu Ser Thr Phe Lys Leu Ser Gly Lys Cys
290 295 300

Thr Ala Ala Val Asp Tyr Arg Gly Gly Ile Phe Leu Cys Thr Pro Ser
305 310 315 320

Pro Lys Ile Pro Lys Ile Leu Gln Asn Pro Pro Asp Leu Pro Thr Leu
325 330 335

Thr Val Val Ser Ile Pro Phe Asp Gly Arg Tyr Thr Ile Arg Asn Ile
340 345 350

Ser Leu Met Leu Thr Asp Glu Ala Asp Ile Ile Tyr Asp Leu Asp Thr
355 360 365

Leu Gln Gly Arg Gly Val Leu Gln Ala Met Arg Phe Tyr Ala Leu Val
370 375 380

Arg Val Ile Ser Ser Ser Ser Pro Arg His Phe Pro Phe Cys Lys Asn
385 390 395 400

Ser Trp Cys Pro Thr Ala Asp Asp Lys Ile Cys Asp Gln Ser Arg Arg
405 410 415

Leu Gly Ala Asp Gly Asn Tyr Pro Val Met Tyr Gly Leu Ile Ser Ile
420 425 430

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

Pro Lys Tyr Tyr Ala Tyr Thr Arg Asp Ala Ser Leu Phe Tyr Asn Ser
450 455 460

Met Thr Asp Thr Tyr His Tyr Ser Phe Gly Thr Arg Gly Trp Val Ser
465 470 475 480

Arg Pro Ile Ile Gly Glu Leu Leu Leu Gly Asp Asp Ile Val Leu Thr
485 490 495

Arg Tyr Thr Val Arg Ser Val Ser Arg Ala Thr Ala Gly Asp Cys Thr
500 505 510

Thr Val Ser Met Cys Pro Gln Ala Cys Ser Gly Gly Met Asn Ser Ile
515 520 525

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

Arg Gln Tyr Glu Arg Gln Gln Glu Gly Ile Ile Val Val Thr Met Asn
545 550 555 560

Asp His Tyr Tyr Tyr Ser Val Pro Ile Ile Lys Asn Gly Thr Leu Leu
565 570 575

Ile Ser Ser Val Thr Asp Cys Phe Trp Leu Met Gly Asp Leu Trp Cys
580 585 590

Met Ser Leu Met Glu Lys Asn Asn Leu Pro Leu Gly Val Arg Ser Leu
595 600 605

Ala His Leu Thr Trp Asn Ile His Trp Ser Cys Ser
610 615 620

<210> 116
<211> 579
<212> PRT
<213> Avian paramyxovirus 9

<220>
<221> MISC_FEATURE
<223> hemagglutinin-neuraminidase

<400> 116

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

Leu Arg Asn Thr Trp Arg Thr Ala Phe Arg Val Val Ser Leu Leu Leu
20 25 30

Gly Phe Thr Ser Leu Val Leu Thr Ala Cys Ala Leu His Phe Ala Leu
35 40 45

Asn Ala Ala Thr Pro Ala Asp Leu Ser Ser Ile Pro Val Ala Val Asp
50 55 60

Gln Ser His His Glu Ile Leu Gln Thr Leu Ser Leu Met Ser Asp Ile
65 70 75 80

Gly Asn Lys Ile Tyr Lys Gln Val Ala Leu Asp Ser Pro Val Ala Leu
85 90 95

Leu Asn Thr Glu Ser Thr Leu Met Ser Ala Ile Thr Ser Leu Ser Tyr
100 105 110

Gln Ile Asn Asn Ala Ala Asn Asn Ser Gly Cys Gly Ala Pro Val His

115

120

125

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

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

Asn Phe Ile Pro Ala Pro Thr Thr Gly Lys Gly Cys Thr Arg Ile Pro
 165 170 175

Ser Phe Asp Leu Ala Ala Thr His Trp Cys Tyr Thr His Asn Val Ile
 180 185 190

Leu Asn Gly Cys Asn Asp His Ala Gln Ser Tyr Gln Tyr Ile Ser Leu
 195 200 205

Gly Ile Leu Lys Val Ser Ala Thr Gly Asn Val Phe Leu Ser Thr Leu
 210 215 220

Arg Ser Ile Asn Leu Asp Asp Asp Glu Asn Arg Lys Ser Cys Ser Ile
 225 230 235 240

Ser Ala Thr Pro Leu Gly Cys Asp Leu Leu Cys Ala Lys Val Thr Glu
 245 250 255

Arg Glu Glu Ala Asp Tyr Asn Ser Asp Ala Ala Thr Arg Leu Val His
 260 265 270

Gly Arg Leu Gly Phe Asp Gly Val Tyr His Glu Gln Ala Leu Pro Val
 275 280 285

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

Gly Ser Tyr Phe Asp Asn Arg Val Trp Phe Gly Val Tyr Gly Gly Ile
 305 310 315 320

Arg Pro Gly Ser Gln Thr Asp Leu Leu Gln Ser Glu Lys Tyr Ala Ile
325 330 335

Tyr Arg Arg Tyr Asn Asn Thr Cys Pro Asp Asn Asn Pro Thr Gln Ile
340 345 350

Glu Arg Ala Lys Ser Ser Tyr Arg Pro Gln Arg Phe Gly Gln Arg Leu
355 360 365

Val Gln Gln Ala Ile Leu Ser Ile Arg Val Glu Pro Ser Leu Gly Asn
370 375 380

Asp Pro Lys Leu Ser Val Leu Asp Asn Thr Val Val Leu Met Gly Ala
385 390 395 400

Glu Ala Arg Ile Met Thr Phe Gly His Val Ala Leu Met Tyr Gln Arg
405 410 415

Gly Ser Ser Tyr Phe Pro Ser Ala Leu Leu Tyr Pro Leu Ser Leu Thr
420 425 430

Asn Gly Ser Ala Ala Ala Ser Lys Pro Phe Ile Phe Glu Gln Tyr Thr
435 440 445

Arg Pro Gly Ser Pro Pro Cys Gln Ala Thr Ala Arg Cys Pro Asn Ser
450 455 460

Cys Val Thr Gly Val Tyr Thr Asp Ala Tyr Pro Leu Phe Trp Ser Glu
465 470 475 480

Asp His Lys Val Asn Gly Val Tyr Gly Met Met Leu Asp Asp Ile Thr
485 490 495

Ser Arg Leu Asn Pro Val Ala Ala Ile Phe Asp Arg Tyr Gly Arg Ser
500 505 510

Arg Val Thr Arg Val Ser Ser Ser Ser Thr Lys Ala Ala Tyr Thr Thr
515 520 525

Asn Thr Cys Phe Lys Val Val Lys Thr Lys Arg Val Tyr Cys Leu Ser
530 535 540

Ile Ala Glu Ile Glu Asn Thr Leu Phe Gly Glu Phe Arg Ile Thr Pro
545 550 555 560

Leu Leu Ser Glu Ile Ile Phe Asp Pro Asn Leu Glu Pro Ser Asp Thr
565 570 575

Ser Arg Asn

<210> 117
<211> 595
<212> PRT
<213> Achimota virus 1

<220>
<221> MISC_FEATURE
<223> attachment protein

<400> 117

Met Ala Thr Asn Leu Ser Thr Ile Thr Asn Gly Lys Phe Ser Gln Asn
1 5 10 15

Ser Asp Glu Gly Ser Leu Thr Glu Leu Pro Phe Phe Glu His Asn Arg
20 25 30

Lys Val Ala Thr Thr Lys Arg Thr Cys Arg Phe Val Phe Arg Ser Val
35 40 45

Ile Thr Leu Cys Asn Leu Thr Ile Leu Ile Val Thr Val Val Val Leu
50 55 60

Phe Gln Gln Ala Gly Phe Ile Lys Arg Thr Glu Ser Asn Gln Val Cys
65 70 75 80

Glu Thr Leu Gln Asn Asp Met His Gly Val Val Thr Met Ser Lys Gly
85 90 95

Val Ile Thr Thr Leu Asn Asn Leu Ile Glu Ile Thr Ser Val Asn Leu
100 105 110

Pro Phe Gln Met Lys Gln Phe Gly Gln Gly Ile Val Thr Gln Val Thr
115 120 125

Gln Met Val Arg Gln Cys Asn Ala Val Cys Lys Gly Pro Thr Ile Gly
130 135 140

Pro Asp Ile Gln Asn Ile Val Tyr Pro Ala Ser Tyr Glu Ser Met Ile
145 150 155 160

Lys His Pro Val Asn Asn Ser Asn Ile Leu Leu Ser Glu Ile Arg Gln
165 170 175

Pro Leu Asn Phe Val Pro Asn Thr Gly Lys Leu Asn Gly Cys Thr Arg
180 185 190

Thr Pro Ser Phe Ser Val Tyr Asn Gly Phe Trp Cys Tyr Thr His Ala
195 200 205

Glu Ser Asp Trp Asn Cys Asn Gly Ser Ser Pro Tyr Met Gln Val Phe
210 215 220

Arg Val Gly Val Val Thr Ser Asp Tyr Asp Tyr Asn Val Ile His Lys
225 230 235 240

Thr Leu His Thr Lys Thr Ser Arg Leu Ala Asn Val Thr Tyr Gln Cys
245 250 255

Ser Thr Ile Ser Thr Gly Tyr Glu Cys Tyr Phe Leu Cys Ser Thr Pro

260

265

270

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

Gln Ile Tyr Lys Ile Asp Asn Arg Gly Thr Phe Ala Lys Phe Pro Ile
 290 295 300

Thr Asp Gln Leu Asn Lys Glu Leu Leu Thr Ala Leu Tyr Pro Gly Pro
 305 310 315 320

Gly Asn Gly Val Leu Tyr Gln Gly Arg Leu Leu Phe Pro Met His Gly
 325 330 335

Gly Met Gln Ser Ser Glu Leu Asn Lys Val Asn Leu Asn Asn Thr Val
 340 345 350

Leu Ser Gln Phe Asn Asp Asn Lys Gly Cys Asn Ala Thr Glu Ile Lys
 355 360 365

Leu Glu Ser Glu Phe Pro Gly Thr Phe Thr Ser Pro Tyr Tyr Ser Asn
 370 375 380

Gln Val Met Leu Asn Tyr Ile Leu Ile Cys Glu Met Ile Glu Asn Leu
 385 390 395 400

Pro Gly Asn Cys Asp Leu Gln Ile Val Ala Pro Lys Asn Met Ser Met
 405 410 415

Gly Ser Glu Ser Gln Leu Tyr Ser Ile Asn Asn Lys Leu Tyr Leu Tyr
 420 425 430

Gln Arg Ser Ser Ser Arg Trp Pro Tyr Pro Leu Ile Tyr Glu Val Gly
 435 440 445

Thr Arg Leu Thr Asn Arg Gln Phe Arg Leu Arg Ala Ile Asn Arg Phe
 450 455 460

Leu Ile Lys Ser Thr Thr Arg Pro Gly Ser Glu Gly Cys Asn Ile Tyr
465 470 475 480

Arg Val Cys Pro Lys Val Cys Val Thr Gly Val Tyr Gln Ala Pro Trp
485 490 495

Ile Leu His Val Ser Lys Ala Gly Ser Gln Ser Ile Ala Lys Val Leu
500 505 510

Tyr Ala Val Ala Trp Ser Lys Asp His Met Ser Arg Lys Gly Pro Leu
515 520 525

Phe Ser Ile Cys Asp Asn Asp Thr Cys Phe Leu Thr Lys Ser Leu Ala
530 535 540

Ser Glu His Val His Ser Gly Tyr Ser Ile Thr Arg Cys Tyr Leu Glu
545 550 555 560

Asn Ser Glu Arg His Ile Ile Cys Val Val Ile Met Glu Leu Asp Ala
565 570 575

Ser Pro Trp Ala Glu Met Arg Ile Gln Ser Val Ile Tyr Asn Ile Thr
580 585 590

Leu Pro Ser
595

<210> 118
<211> 583
<212> PRT
<213> Achimota virus 2

<220>
<221> MISC_FEATURE
<223> attachment protein

<400> 118

Met Asp Asn Ser Met Ser Ile Ser Thr Ile Ser Leu Asp Ala Gln Pro
1 5 10 15

Arg Ile Trp Ser Arg His Glu Ser Arg Arg Thr Trp Arg Asn Ile Phe
20 25 30

Arg Ile Thr Ser Leu Val Leu Leu Gly Val Thr Val Ile Ile Cys Ile
35 40 45

Trp Leu Cys Cys Glu Val Ala Arg Glu Ser Glu Leu Glu Leu Leu Ala
50 55 60

Ser Pro Leu Gly Ala Leu Ile Met Ala Ile Asn Thr Ile Lys Ser Ser
65 70 75 80

Val Val Lys Met Thr Thr Glu Leu Asn Gln Val Thr Phe Thr Thr Ser
85 90 95

Ile Ile Leu Pro Asn Lys Val Asp Gln Phe Gly Gln Asn Val Val Ser
100 105 110

Gln Val Ala Gln Leu Val Lys Gln Cys Asn Ala Val Cys Arg Gly His
115 120 125

Gln Asp Thr Pro Glu Leu Glu Gln Phe Ile Asn Gln Lys Asn Pro Thr
130 135 140

Trp Ile Leu Gln Pro Asn Tyr Thr Thr Lys Leu Thr Asn Leu His Glu
145 150 155 160

Ile Asp Ser Ile Ile Pro Leu Val Asp Tyr Pro Gly Phe Ser Lys Ser
165 170 175

Cys Thr Arg Phe Pro Ser Phe Ser Glu Gly Ser Lys Phe Trp Cys Phe
180 185 190

Thr Tyr Ala Val Val Lys Glu Pro Cys Ser Asp Ile Ser Ser Ser Ile
195 200 205

Gln Val Val Lys Tyr Gly Ala Ile Lys Ala Asn His Ser Asp Gly Asn
210 215 220

Pro Tyr Leu Val Leu Gly Thr Lys Val Leu Asp Asp Gly Lys Phe Arg
225 230 235 240

Arg Gly Cys Ser Ile Thr Ser Ser Leu Tyr Gly Cys Tyr Leu Leu Cys
245 250 255

Ser Thr Ala Asn Val Ser Glu Val Asn Asp Tyr Ala His Thr Pro Ala
260 265 270

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

Leu Ser Pro Thr Tyr Thr Val Gln Leu Asp Lys Trp Ser Ala Leu Tyr
290 295 300

Pro Gly Ile Gly Ser Gly Val Ile Phe Lys Gly Tyr Leu Met Phe Pro
305 310 315 320

Val Tyr Gly Gly Leu Pro Phe Lys Ser Pro Leu Ile Ser Ala Ser Trp
325 330 335

Val Gly Pro Gly Asn Lys Trp Pro Val Asp Phe Ser Cys Ser Glu Asp
340 345 350

Gln Tyr Ser Thr Phe Asn Phe Ser Asn Pro Tyr Ser Ala Leu Tyr Ser
355 360 365

Pro His Phe Ser Asn Asn Ile Val Val Ser Ala Leu Phe Val Cys Pro
370 375 380

Leu Asn Glu Asn Leu Pro Tyr Ser Cys Glu Val Gln Val Leu Pro Gln

385		390		395		400
Gly Asn Leu Thr	Ile Gly Ala Glu Gly Arg Leu Tyr Val	Ile Asp Gln				
	405	410		415		
Asp Leu Tyr Tyr	Tyr Gln Arg Ser Thr Ser Trp Trp Pro Tyr Leu Gln					
	420	425		430		
Leu Tyr Lys Leu	Asn Ile Arg Ile Thr Asn Arg Val Phe Arg Val Arg					
	435	440		445		
Ser Leu Ser Leu	Leu Pro Ile Lys Ser Thr Thr Arg Pro Gly Tyr Gly					
	450	455		460		
Asn Cys Thr Tyr	Phe Lys Leu Cys Pro His Ile Cys Val Thr Gly Val					
465	470	475		480		
Tyr Gln Ser Pro	Trp Leu Ile Ser Ile Arg Asp Lys Arg Pro His Glu					
	485	490		495		
Glu Lys Asn Ile	Leu Tyr Phe Ile Gly Trp Ser Pro Asp Glu Gln Ile					
	500	505		510		
Arg Gln Asn Pro	Leu Val Ser Leu Cys His Glu Thr Ala Cys Phe Ile					
	515	520		525		
Asn Arg Ser Leu	Ala Thr Asn Lys Thr His Ala Gly Tyr Ser Glu Ser					
	530	535		540		
His Cys Val Gln	Ser Phe Glu Arg Asn Lys Leu Thr Cys Thr Val Phe					
545	550	555		560		
Tyr Glu Leu Thr	Ala Lys Pro Trp Ala Glu Met Arg Val Gln Ser Leu					
	565	570		575		
Leu Phe Gln Val	Asp Phe Leu					
	580					

<210> 119
<211> 580
<212> PRT
<213> Tuhoko virus 1

<220>
<221> MISC_FEATURE
<223> hemagglutinin-neuraminidase

<400> 119

Met Asp Ser Arg Ser Asp Ser Phe Thr Asp Ile Pro Leu Asp Asn Arg
1 5 10 15

Ile Glu Arg Thr Val Thr Ser Lys Lys Thr Trp Arg Ser Ile Phe Arg
20 25 30

Val Thr Ala Ile Ile Leu Leu Ile Ile Cys Val Val Val Ser Ser Ile
35 40 45

Ser Leu Asn Gln His Asn Asp Ala Pro Leu Asn Gly Ala Gly Asn Gln
50 55 60

Ala Thr Ser Gly Phe Met Asp Ala Ile Lys Ser Leu Glu Lys Leu Met
65 70 75 80

Ser Gln Thr Ile Asn Glu Leu Asn Gln Val Val Met Thr Thr Ser Val
85 90 95

Gln Leu Pro Asn Arg Ile Thr Lys Phe Gly Gln Asp Ile Leu Asp Gln
100 105 110

Val Thr Gln Met Val Arg Gln Cys Asn Ala Val Cys Arg Gly Pro Gly
115 120 125

Val Gly Pro Ser Ile Gln Asn Tyr Val Ile Gln Gly His Ala Pro Thr
130 135 140

Val Ser Phe Asp Pro Ile Ser Ala Glu Tyr Gln Lys Phe Val Phe Gly
145 150 155 160

Ile Thr Glu Lys Thr Leu Ile Thr Ala Tyr His Asn Pro Trp Glu Cys
165 170 175

Leu Arg Phe Pro Ser Gln His Leu Phe Asp Thr Thr Trp Cys Val Ser
180 185 190

Tyr Gln Ile Leu Thr Gln Asn Cys Ser Asp His Gly Pro Arg Ile Thr
195 200 205

Val Ile Gln Leu Gly Glu Ile Met Ile Ala Asn Asn Leu Ser Thr Val
210 215 220

Phe Arg Asp Pro Val Ile Lys Tyr Ile Arg His His Ile Trp Leu Arg
225 230 235 240

Ser Cys Ser Val Val Ala Tyr Tyr Ser Gln Cys Thr Ile Phe Cys Thr
245 250 255

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

Gln Leu Phe Leu Ala Thr Leu Gln Ser Asp Gly Thr Phe Thr Glu His
275 280 285

Ser Met His Gly Val Asn Ile Val His Gln Trp Asn Ala Ile Tyr Gly
290 295 300

Gly Val Gly Asn Gly Val Ile Ile Gly Arg Asn Met Leu Ile Pro Leu
305 310 315 320

Tyr Gly Gly Ile Asn Tyr Tyr Asp His Asn Thr Thr Ile Val Gln Thr
325 330 335

Val Asp Leu Arg Pro Tyr Pro Ile Pro Asp Ser Cys Ser Gln Thr Asp
340 345 350

Asn Tyr Gln Thr Asn Tyr Leu Pro Ser Met Phe Thr Asn Ser Tyr Tyr
355 360 365

Gly Thr Asn Leu Val Val Ser Gly Tyr Leu Ser Cys Arg Leu Met Ala
370 375 380

Gly Thr Pro Thr Ser Cys Ser Ile Arg Val Ile Pro Ile Glu Asn Met
385 390 395 400

Thr Met Gly Ser Glu Gly Gln Phe Tyr Leu Ile Asn Asn Gln Leu Tyr
405 410 415

Tyr Tyr Lys Arg Ser Ser Asn Trp Ile Arg Asp Thr Gln Val Tyr Leu
420 425 430

Leu Ser Tyr Ser Asp Lys Gly Asn Ile Ile Glu Ile Thr Ser Ala Glu
435 440 445

Arg Tyr Ile Phe Lys Ser Val Thr Ser Pro Asp Glu Gly Asp Cys Val
450 455 460

Thr Asn His Gly Cys Pro Ser Asn Cys Ile Gly Gly Leu Phe Gln Ala
465 470 475 480

Pro Trp Ile Leu Asn Asp Phe Lys Leu Cys Gly Ser Asn Ile Thr Cys
485 490 495

Pro Lys Ile Val Thr Val Trp Ala Asp Gln Pro Asp Lys Arg Ser Asn
500 505 510

Pro Met Leu Ser Ile Ala Glu Thr Asp Lys Leu Leu Leu His Lys Ser
515 520 525

Tyr Ile Asn Tyr His Thr Ala Val Gly Tyr Ser Thr Val Leu Cys Phe

530

535

540

Asp Ser Pro Lys Leu Asn Leu Lys Thr Cys Val Val Leu Gln Glu Leu
 545 550 555 560

Met Ser Asp Asp Lys Leu Leu Ile Arg Ile Ser Tyr Ser Ile Val Ser
 565 570 575

Ile Met Val Glu
 580

<210> 120
 <211> 607
 <212> PRT
 <213> Phocine distemper virus

<220>
 <221> MISC_FEATURE
 <223> hemagglutinin protein

<400> 120

Met Phe Ser His Gln Asp Lys Val Gly Ala Phe Tyr Lys Asn Asn Ala
 1 5 10 15

Arg Ala Asn Ser Ser Lys Leu Ser Leu Val Thr Asp Glu Val Glu Glu
 20 25 30

Arg Arg Ser Pro Trp Phe Leu Ser Ile Leu Leu Ile Leu Leu Val Gly
 35 40 45

Ile Leu Ile Leu Leu Ala Ile Thr Gly Ile Arg Phe His Gln Val Val
 50 55 60

Lys Ser Asn Leu Glu Phe Asn Lys Leu Leu Ile Glu Asp Met Glu Lys
 65 70 75 80

Thr Lys Ala Val His His Gln Val Lys Asp Val Leu Thr Pro Leu Phe
 85 90 95

Lys Ile Ile Gly Asp Glu Val Gly Leu Arg Leu Pro Gln Lys Leu Asn
100 105 110

Glu Ile Lys Gln Phe Ile Val Gln Lys Thr Asn Phe Phe Asn Pro Asn
115 120 125

Arg Glu Phe Asp Phe Arg Glu Leu His Trp Cys Ile Asn Pro Pro Ser
130 135 140

Lys Val Lys Val Asn Phe Thr Gln Tyr Cys Glu Ile Thr Glu Phe Lys
145 150 155 160

Glu Ala Thr Arg Ser Val Ala Asn Ser Ile Leu Leu Leu Thr Leu Tyr
165 170 175

Arg Gly Arg Asp Asp Ile Phe Pro Pro Tyr Lys Cys Arg Gly Ala Thr
180 185 190

Thr Ser Met Gly Asn Val Phe Pro Leu Ala Val Ser Leu Ser Met Ser
195 200 205

Leu Ile Ser Lys Pro Ser Glu Val Ile Asn Met Leu Thr Ala Ile Ser
210 215 220

Glu Gly Ile Tyr Gly Lys Thr Tyr Leu Leu Val Thr Asp Asp Thr Glu
225 230 235 240

Glu Asn Phe Glu Thr Pro Glu Ile Arg Val Phe Glu Ile Gly Phe Ile
245 250 255

Asn Arg Trp Leu Gly Asp Met Pro Leu Phe Gln Thr Thr Asn Tyr Arg
260 265 270

Ile Ile Ser Asn Asn Ser Asn Thr Lys Ile Cys Thr Ile Ala Val Gly
275 280 285

Glu Leu Ala Leu Ala Ser Leu Cys Thr Lys Glu Ser Thr Ile Leu Leu
290 295 300

Asn Leu Gly Asp Glu Glu Ser Gln Asn Ser Val Leu Val Val Ile Leu
305 310 315 320

Gly Leu Phe Gly Ala Thr His Met Asp Gln Leu Glu Glu Val Ile Pro
325 330 335

Val Ala His Pro Ser Ile Glu Lys Ile His Ile Thr Asn His Arg Gly
340 345 350

Phe Ile Lys Asp Ser Val Ala Thr Trp Met Val Pro Ala Leu Ala Leu
355 360 365

Ser Glu Gln Gly Glu Gln Ile Asn Cys Leu Arg Ser Ala Cys Lys Arg
370 375 380

Arg Thr Tyr Pro Met Cys Asn Gln Thr Ser Trp Glu Pro Phe Gly Asp
385 390 395 400

Lys Arg Leu Pro Ser Tyr Gly Arg Leu Thr Leu Ser Leu Asp Val Ser
405 410 415

Thr Asp Leu Ser Ile Asn Val Ser Val Ala Gln Gly Pro Ile Ile Phe
420 425 430

Asn Gly Asp Gly Met Asp Tyr Tyr Glu Gly Thr Leu Leu Asn Ser Gly
435 440 445

Trp Leu Thr Ile Pro Pro Lys Asn Gly Thr Ile Leu Gly Leu Ile Asn
450 455 460

Gln Ala Ser Lys Gly Asp Gln Phe Ile Val Thr Pro His Ile Leu Thr
465 470 475 480

Phe Ala Pro Arg Glu Ser Ser Thr Asp Cys His Leu Pro Ile Gln Thr
485 490 495

Tyr Gln Ile Gln Asp Asp Asp Val Leu Leu Glu Ser Asn Leu Val Val
500 505 510

Leu Pro Thr Gln Ser Phe Glu Tyr Val Val Ala Thr Tyr Asp Val Ser
515 520 525

Arg Ser Asp His Ala Ile Val Tyr Tyr Val Tyr Asp Pro Ala Arg Thr
530 535 540

Val Ser Tyr Thr Tyr Pro Phe Arg Leu Arg Thr Lys Gly Arg Pro Asp
545 550 555 560

Ile Leu Arg Ile Glu Cys Phe Val Trp Asp Gly His Leu Trp Cys His
565 570 575

Gln Phe Tyr Arg Phe Gln Leu Asp Ala Thr Asn Ser Thr Ser Val Val
580 585 590

Glu Asn Leu Ile Arg Ile Arg Phe Ser Cys Asp Arg Leu Asp Pro
595 600 605

<210> 121
<211> 574
<212> PRT
<213> Caprine parainfluenza virus 3

<220>
<221> MISC_FEATURE
<223> hemagglutinin-neuraminidase

<400> 121

Met Glu Tyr Trp Gly His Thr Asn Asn Pro Asp Lys Ile Asn Arg Lys
1 5 10 15

Val Gly Val Asp Gln Val Arg Asp Arg Ser Lys Thr Leu Lys Ile Ile

20

25

30

Thr Phe Ile Ile Ser Met Met Thr Ser Ile Met Ser Thr Val Ala Leu
 35 40 45

Ile Leu Ile Leu Ile Met Phe Ile Gln Asn Asn Asn Asn Asn Arg Ile
 50 55 60

Ile Leu Gln Glu Leu Arg Asp Glu Thr Asp Ala Ile Glu Ala Arg Ile
 65 70 75 80

Gln Lys Ala Ser Asn Asp Ile Gly Val Ser Ile Gln Ser Gly Ile Asn
 85 90 95

Thr Arg Leu Leu Thr Ile Gln Asn His Val Gln Asn Tyr Ile Pro Leu
 100 105 110

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

Ile Thr Lys Arg Glu Glu Thr Gln Ser Lys Met Pro Ile Gln Arg Met
 130 135 140

Thr His Asp Asp Gly Ile Glu Pro Leu Ile Pro Asp Asn Phe Trp Lys
 145 150 155 160

Cys Pro Ser Gly Ile Pro Thr Ile Ser Ala Ser Pro Lys Ile Arg Leu
 165 170 175

Ile Pro Gly Pro Gly Leu Leu Ala Thr Ser Thr Thr Ile Asn Gly Cys
 180 185 190

Ile Arg Leu Pro Ser Leu Val Ile Asn Asn Leu Ile Tyr Ala Tyr Thr
 195 200 205

Ser Asn Leu Ile Thr Gln Gly Cys Gln Asp Ile Gly Lys Ser Tyr Gln
 210 215 220

Val Leu Gln Ile Gly Ile Ile Thr Ile Asn Ser Asp Leu Val Pro Asp
225 230 235 240

Leu Asn Pro Arg Ile Thr His Thr Phe Asp Ile Asp Asp Asn Arg Lys
245 250 255

Ser Cys Ser Leu Ala Leu Arg Asn Ala Asp Val Tyr Gln Leu Cys Ser
260 265 270

Thr Pro Lys Val Asp Glu Arg Ser Asp Tyr Ser Ser Ile Gly Ile Glu
275 280 285

Asp Ile Val Leu Asp Ile Val Thr Ser Glu Gly Thr Val Ser Thr Thr
290 295 300

Arg Phe Thr Asn Asn Asn Ile Thr Phe Asp Lys Pro Tyr Ala Ala Leu
305 310 315 320

Tyr Pro Ser Val Gly Pro Gly Ile Tyr Tyr Asp Asn Lys Ile Ile Phe
325 330 335

Leu Gly Tyr Gly Gly Leu Glu His Glu Glu Asn Gly Asp Val Ile Cys
340 345 350

Asn Ile Thr Gly Cys Pro Gly Lys Thr Gln His Asp Cys Asn Gln Ala
355 360 365

Ser Tyr Ser Pro Trp Phe Ser Asn Arg Arg Met Val Asn Ala Ile Ile
370 375 380

Leu Val Asn Lys Gly Leu Asn Lys Val Pro Ser Leu Gln Val Trp Thr
385 390 395 400

Ile Pro Met Arg Gln Asn Tyr Trp Gly Ser Glu Gly Arg Leu Leu Leu
405 410 415

Leu Gly Asn Lys Ile Tyr Ile Tyr Thr Arg Ser Thr Ser Trp His Ser
420 425 430

Lys Leu Gln Leu Gly Thr Leu Asp Ile Ser Asn Tyr Asn Asp Ile Arg
435 440 445

Ile Arg Trp Thr His His Asp Val Leu Ser Arg Pro Gly Ser Glu Glu
450 455 460

Cys Pro Trp Gly Asn Thr Cys Pro Arg Gly Cys Ile Thr Gly Val Tyr
465 470 475 480

Asn Asp Ala Tyr Pro Leu Asn Pro Ser Gly Ser Val Val Ser Ser Val
485 490 495

Ile Leu Asp Ser Arg Thr Ser Arg Glu Asn Pro Ile Ile Thr Tyr Ser
500 505 510

Thr Asp Thr Ser Arg Val Asn Glu Leu Ala Ile Arg Asn Asn Thr Leu
515 520 525

Ser Ala Ala Tyr Thr Thr Thr Asn Cys Val Thr His Tyr Gly Lys Gly
530 535 540

Tyr Cys Phe His Ile Ile Glu Ile Asn His Lys Ser Leu Asn Thr Leu
545 550 555 560

Gln Pro Met Leu Phe Lys Thr Glu Ile Pro Lys Ser Cys Asn
565 570

<210> 122
<211> 414
<212> PRT
<213> Avian metapneumovirus

<220>
<221> MISC_FEATURE

<223> attachment glycoprotein

<400> 122

Met Gly Ser Glu Leu Tyr Ile Ile Glu Gly Val Ser Ser Ser Glu Ile
1 5 10 15

Val Leu Lys Gln Val Leu Arg Arg Ser Lys Lys Ile Leu Leu Gly Leu
20 25 30

Val Leu Ser Ala Leu Gly Leu Thr Leu Thr Ser Thr Ile Val Ile Ser
35 40 45

Ile Cys Ile Ser Val Glu Gln Val Lys Leu Arg Gln Cys Val Asp Thr
50 55 60

Tyr Trp Ala Glu Asn Gly Ser Leu His Pro Gly Gln Ser Thr Glu Asn
65 70 75 80

Thr Ser Thr Arg Gly Lys Thr Thr Thr Lys Asp Pro Arg Arg Leu Gln
85 90 95

Ala Thr Gly Ala Gly Lys Phe Glu Ser Cys Gly Tyr Val Gln Val Val
100 105 110

Asp Gly Asp Met His Asp Arg Ser Tyr Ala Val Leu Gly Gly Val Asp
115 120 125

Cys Leu Gly Leu Leu Ala Leu Cys Glu Ser Gly Pro Ile Cys Gln Gly
130 135 140

Asp Thr Trp Ser Glu Asp Gly Asn Phe Cys Arg Cys Thr Phe Ser Ser
145 150 155 160

His Gly Val Ser Cys Cys Lys Lys Pro Lys Ser Lys Ala Thr Thr Ala
165 170 175

Gln Arg Asn Ser Lys Pro Ala Asn Ser Lys Ser Thr Pro Pro Val His

180

185

190

Ser Asp Arg Ala Ser Lys Glu His Asn Pro Ser Gln Gly Glu Gln Pro
 195 200 205

Arg Arg Gly Pro Thr Ser Ser Lys Thr Thr Ile Ala Ser Thr Pro Ser
 210 215 220

Thr Glu Asp Thr Ala Lys Pro Thr Ile Ser Lys Pro Lys Leu Thr Ile
 225 230 235 240

Arg Pro Ser Gln Arg Gly Pro Ser Gly Ser Thr Lys Ala Ala Ser Ser
 245 250 255

Thr Pro Ser His Lys Thr Asn Thr Arg Gly Thr Ser Lys Thr Thr Asp
 260 265 270

Gln Arg Pro Arg Thr Gly Pro Thr Pro Glu Arg Pro Arg Gln Thr His
 275 280 285

Ser Thr Ala Thr Pro Pro Pro Thr Thr Pro Ile His Lys Gly Arg Ala
 290 295 300

Pro Thr Pro Lys Pro Thr Thr Asp Leu Lys Val Asn Pro Arg Glu Gly
 305 310 315 320

Ser Thr Ser Pro Thr Ala Ile Gln Lys Asn Pro Thr Thr Gln Ser Asn
 325 330 335

Leu Val Asp Cys Thr Leu Ser Asp Pro Asp Glu Pro Gln Arg Ile Cys
 340 345 350

Tyr Gln Val Gly Thr Tyr Asn Pro Ser Gln Ser Gly Thr Cys Asn Ile
 355 360 365

Glu Val Pro Lys Cys Ser Thr Tyr Gly His Ala Cys Met Ala Thr Leu
 370 375 380

Tyr Asp Thr Pro Phe Asn Cys Trp Arg Arg Thr Arg Arg Cys Ile Cys
 385 390 395 400

Asp Ser Gly Gly Glu Leu Ile Glu Trp Cys Cys Thr Ser Gln
 405 410

<210> 123
 <211> 665
 <212> PRT
 <213> Tupaia paramyxovirus

<220>
 <221> MISC_FEATURE
 <223> hemagglutinin

<400> 123

Met Asp Tyr His Ser His Thr Thr Gln Thr Gly Ser Asn Glu Thr Leu
 1 5 10 15

Tyr Gln Asp Pro Leu Gln Ser Gln Ser Gly Ser Arg Asp Thr Leu Asp
 20 25 30

Gly Pro Pro Ser Thr Leu Gln His Tyr Ser Asn Pro Pro Pro Tyr Ser
 35 40 45

Glu Glu Asp Gln Gly Ile Asp Gly Pro Gln Arg Ser Gln Pro Leu Ser
 50 55 60

Thr Pro His Gln Tyr Asp Arg Tyr Tyr Gly Val Asn Ile Gln His Thr
 65 70 75 80

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

Phe Gln Ile Leu Gly Trp Val Ser Val Ile Ile Thr Met Ile Ile Thr
 100 105 110

Val Thr Thr Leu Lys Lys Met Ser Asp Gly Asn Ser Gln Asp Ser Ala
115 120 125

Met Leu Lys Ser Leu Asp Glu Asn Phe Asp Ala Ile Gln Glu Val Ala
130 135 140

Asn Leu Leu Asp Asn Glu Val Arg Pro Lys Leu Gly Val Thr Met Thr
145 150 155 160

Gln Thr Thr Phe Gln Leu Pro Lys Glu Leu Ser Glu Ile Lys Arg Tyr
165 170 175

Leu Leu Arg Leu Glu Arg Asn Cys Pro Val Cys Gly Thr Glu Ala Thr
180 185 190

Pro Gln Gly Ser Lys Gly Asn Ala Ser Gly Asp Thr Ala Phe Cys Pro
195 200 205

Pro Cys Leu Thr Arg Gln Cys Ser Glu Asp Ser Thr His Asp Gln Gly
210 215 220

Pro Gly Val Glu Gly Thr Ser Arg Asn His Lys Gly Lys Ile Asn Phe
225 230 235 240

Pro His Ile Leu Gln Ser Asp Asp Cys Gly Arg Ser Asp Asn Leu Ile
245 250 255

Val Tyr Ser Ile Asn Leu Val Pro Gly Leu Ser Phe Ile Gln Leu Pro
260 265 270

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

Thr Leu Ala Gly Tyr Leu Ile Val Gly Gly Val Asp Gly Cys Gln Leu
290 295 300

His Asn Lys Ala Ile Ile Tyr Leu Ser Leu Gly Tyr Tyr Lys Thr Lys
305 310 315 320

Met Ile Tyr Pro Pro Asp Tyr Ile Ala Ile Ala Thr Tyr Thr Tyr Asp
325 330 335

Leu Val Pro Asn Leu Arg Asp Cys Ser Ile Ala Val Asn Gln Thr Ser
340 345 350

Leu Ala Ala Ile Cys Thr Ser Lys Lys Thr Lys Glu Asn Gln Asp Phe
355 360 365

Ser Thr Ser Gly Val His Pro Phe Tyr Ile Phe Thr Leu Asn Thr Asp
370 375 380

Gly Ile Phe Thr Val Thr Val Ile Glu Gln Ser Gln Leu Lys Leu Asp
385 390 395 400

Tyr Gln Tyr Ala Ala Leu Tyr Pro Ala Thr Gly Pro Gly Ile Phe Ile
405 410 415

Gly Asp His Leu Val Phe Leu Met Trp Gly Gly Leu Met Thr Lys Ala
420 425 430

Glu Gly Asp Ala Tyr Cys Gln Ala Ser Gly Cys Asn Asp Ala His Arg
435 440 445

Thr Ser Cys Asn Ile Ala Gln Met Pro Ser Ala Tyr Gly His Arg Gln
450 455 460

Leu Val Asn Gly Leu Leu Met Leu Pro Ile Lys Glu Leu Gly Ser His
465 470 475 480

Leu Ile Gln Pro Ser Leu Glu Thr Ile Ser Pro Lys Ile Asn Trp Ala
485 490 495

Gly Gly His Gly Arg Leu Tyr Tyr Asn Trp Glu Ile Asn Thr Thr Tyr

500

505

510

Ile Tyr Ile Glu Gly Lys Thr Trp Arg Ser Arg Pro Asn Leu Gly Ile
 515 520 525

Ile Ser Trp Ser Lys Pro Leu Ser Ile Arg Trp Ile Asp His Ser Val
 530 535 540

Ala Arg Arg Pro Gly Ala Arg Pro Cys Asp Ser Ala Asn Asp Cys Pro
 545 550 555 560

Glu Asp Cys Leu Val Gly Gly Tyr Tyr Asp Met Phe Pro Met Ser Ser
 565 570 575

Asp Tyr Lys Thr Ala Ile Thr Ile Ile Pro Thr His His Gln Trp Pro
 580 585 590

Ser Ser Pro Ala Leu Lys Leu Phe Asn Thr Asn Arg Glu Val Arg Val
 595 600 605

Val Met Ile Leu Arg Pro Pro Asn Asn Val Lys Lys Thr Thr Ile Ser
 610 615 620

Cys Ile Arg Ile Met Gln Thr Asn Trp Cys Leu Gly Phe Ile Ile Phe
 625 630 635 640

Lys Glu Gly Asn Asn Ala Trp Gly Gln Ile Tyr Ser Tyr Ile Tyr Gln
 645 650 655

Val Glu Ser Thr Cys Pro Asn Thr Lys
 660 665

<210> 124

<211> 585

<212> PRT

<213> Avian metapneumovirus

<220>

<221> MISC_FEATURE

<223> attachment glycoprotein

<400> 124

Met Glu Val Lys Val Glu Asn Val Gly Lys Ser Gln Glu Leu Lys Val
1 5 10 15

Lys Val Lys Asn Phe Ile Lys Arg Ser Asp Cys Lys Lys Lys Leu Phe
20 25 30

Ala Leu Ile Leu Gly Leu Val Ser Phe Glu Leu Thr Met Asn Ile Met
35 40 45

Leu Ser Val Met Tyr Val Glu Ser Asn Glu Ala Leu Ser Leu Cys Arg
50 55 60

Ile Gln Gly Thr Pro Ala Pro Arg Asp Asn Lys Thr Asn Thr Glu Asn
65 70 75 80

Ala Thr Lys Glu Thr Thr Leu His Thr Thr Thr Thr Thr Arg Asp Pro
85 90 95

Glu Val Arg Glu Thr Lys Thr Thr Lys Pro Gln Ala Asn Glu Gly Ala
100 105 110

Thr Asn Pro Ser Arg Asn Leu Thr Thr Lys Gly Asp Lys His Gln Thr
115 120 125

Thr Arg Ala Thr Thr Glu Ala Glu Leu Glu Lys Gln Ser Lys Gln Thr
130 135 140

Thr Glu Pro Gly Thr Ser Thr Gln Lys His Thr Pro Thr Arg Pro Ser
145 150 155 160

Ser Lys Ser Pro Thr Thr Thr Gln Ala Ile Ala Gln Leu Thr Thr Pro
165 170 175

Thr Thr Pro Lys Ala Ser Thr Ala Pro Lys Asn Arg Gln Ala Thr Thr
180 185 190

Lys Lys Thr Glu Thr Asp Thr Thr Thr Ala Ser Arg Ala Arg Asn Thr
195 200 205

Asn Asn Pro Thr Glu Thr Ala Thr Thr Thr Pro Lys Ala Thr Thr Glu
210 215 220

Thr Gly Lys Ser Lys Glu Gly Pro Thr Gln His Thr Thr Lys Glu Gln
225 230 235 240

Pro Glu Thr Thr Ala Gly Glu Thr Thr Thr Pro Gln Pro Arg Arg Thr
245 250 255

Ala Ser Arg Pro Ala Pro Thr Thr Lys Ile Glu Glu Glu Ala Glu Thr
260 265 270

Thr Lys Thr Arg Thr Thr Lys Ser Thr Gln Thr Ser Thr Gly Pro Pro
275 280 285

Arg Pro Thr Gly Gly Ala Pro Ser Gly Ala Ala Thr Glu Gly Ser Gly
290 295 300

Arg Ala Ala Ala Ala Gly Gly Pro Ser Ala Ala Ser Ala Gly Gly Arg
305 310 315 320

Arg Arg Thr Glu Ala Ala Ala Glu Arg Asp Arg Arg Thr Arg Ala Gly
325 330 335

Ala Gly Pro Thr Ala Gly Gly Ala Arg Ala Arg Thr Ala Ala Ala Ser
340 345 350

Glu Arg Gly Ala Asp Thr Ala Gly Ser Ala Gly Gly Gly Pro Gly Gly
355 360 365

Asp Gly Ala Thr Gly Gly Leu Ser Gly Gly Ala Pro Ala Glu Arg Glu
370 375 380

Asp Ala Ser Gly Gly Thr Ala Ala Ala Gly Pro Gly Asp Gly Thr Glu
385 390 395 400

Ala Asp Gly Arg Ala Pro Pro Ala Ala Ala Leu Ala Gly Arg Thr Thr
405 410 415

Glu Ser Ala Ala Gly Ala Ala Gly Asp Ser Gly Arg Ala Gly Thr Ala
420 425 430

Gly Trp Gly Ser Ala Ala Asp Gly Arg Ser Thr Gly Gly Asn Ala Ala
435 440 445

Ala Glu Ala Gly Ala Ala Gln Ser Gly Arg Ala Ala Pro Arg Gln Pro
450 455 460

Ser Gly Gly Thr Ala Pro Glu Ser Thr Ala Pro Pro Asn Ser Gly Gly
465 470 475 480

Ser Gly Arg Ala Asp Ala Ala Pro Thr Glu Glu Val Gly Val Gly Ser
485 490 495

Gly Leu Trp Arg Gly Arg Tyr Val Cys Gly Pro Cys Gly Glu Ser Val
500 505 510

Pro Glu His Pro Met Asn Pro Cys Phe Gly Asp Gly Thr Ala Trp Ile
515 520 525

Cys Ser Asp Asp Gly Gly Ser Leu Pro Ala Gly Cys Tyr Asp Gly Gly
530 535 540

Thr Asp Gly Val Val Cys Cys Gly Val Cys Gly Gly Asn Ser Cys Cys
545 550 555 560

Cys Gly Arg Val Glu Cys Thr Cys Gly Gly Gly Ala Gly Leu Leu Ser

565

570

575

Cys Cys Cys Gly Ser Tyr Ser Trp Ser
580 585

<210> 125

<211> 577

<212> PRT

<213> Avian paramyxovirus 3

<220>

<221> MISC_FEATURE

<223> hemagglutinin-neuraminidase protein

<400> 125

Met Glu Ser Pro Pro Ser Gly Lys Asp Ala Pro Ala Phe Arg Glu Pro
1 5 10 15

Lys Arg Thr Cys Arg Leu Cys Tyr Arg Ala Thr Thr Leu Ser Leu Asn
20 25 30

Leu Thr Ile Val Val Leu Ser Ile Ile Ser Ile Tyr Val Ser Thr Gln
35 40 45

Thr Gly Ala Asn Asn Ser Cys Val Asn Pro Thr Ile Val Thr Pro Asp
50 55 60

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

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

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

Ile Asn Ser Asn Leu Arg Phe Leu Gln Asn Ala Thr Thr Glu Ser Gln
115 120 125

Thr Cys Leu Ser Pro Val Asn Asp Pro Arg Phe Val Ala Gly Ile Asn
130 135 140

Arg Ile Pro Ala Gly Ser Met Ala Tyr Asn Asp Phe Ser Asn Leu Ile
145 150 155 160

Glu His Val Asn Phe Ile Pro Ser Pro Thr Thr Leu Ser Gly Cys Thr
165 170 175

Arg Ile Pro Ser Phe Ser Leu Ser Lys Thr His Trp Cys Tyr Thr His
180 185 190

Asn Val Ile Ser Asn Gly Cys Leu Asp His Ala Ala Ser Ser Gln Tyr
195 200 205

Ile Ser Ile Gly Ile Val Asp Thr Gly Leu Asn Asn Glu Pro Tyr Phe
210 215 220

Arg Thr Met Ser Ser Lys Ser Leu Asn Asp Gly Leu Asn Arg Lys Ser
225 230 235 240

Cys Ser Val Thr Ala Ala Ala Asn Ala Cys Trp Leu Leu Cys Ser Val
245 250 255

Val Thr Glu Tyr Glu Ala Ala Asp Tyr Arg Ser Arg Thr Pro Thr Ala
260 265 270

Met Val Leu Gly Arg Phe Asp Phe Asn Gly Glu Tyr Thr Glu Ile Ala
275 280 285

Val Pro Ser Ser Leu Phe Asp Gly Arg Phe Ala Ser Asn Tyr Pro Gly
290 295 300

Val Gly Ser Gly Thr Gln Val Asn Gly Thr Leu Tyr Phe Pro Leu Tyr
305 310 315 320

Gly Gly Val Leu Asn Gly Ser Asp Ile Glu Thr Ala Asn Lys Gly Lys
325 330 335

Ser Phe Arg Pro Gln Asn Pro Lys Asn Arg Cys Pro Asp Ser Glu Ala
340 345 350

Ile Gln Ser Phe Arg Ala Gln Asp Ser Tyr Tyr Pro Thr Arg Phe Gly
355 360 365

Lys Val Leu Ile Gln Gln Ala Ile Ile Ala Cys Arg Ile Ser Asn Lys
370 375 380

Ser Cys Thr Asp Phe Tyr Leu Leu Tyr Phe Asp Asn Asn Arg Val Met
385 390 395 400

Met Gly Ala Glu Ala Arg Leu Tyr Tyr Leu Asn Asn Gln Leu Tyr Leu
405 410 415

Tyr Gln Arg Ser Ser Ser Trp Trp Pro His Pro Leu Phe Tyr Ser Ile
420 425 430

Ser Leu Pro Ser Cys Gln Ala Leu Ala Val Cys Gln Ile Thr Glu Ala
435 440 445

His Leu Thr Leu Thr Tyr Ala Thr Ser Arg Pro Gly Met Ser Ile Cys
450 455 460

Thr Gly Ala Ser Arg Cys Pro Asn Asn Cys Val Asp Gly Val Tyr Thr
465 470 475 480

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

Tyr Thr Val Tyr Leu Asn Asn Ser Thr Arg Arg Ile Ser Pro Thr Ile
500 505 510

Ser Leu Tyr Thr Tyr Asp Arg Arg Ile Lys Ser Lys Leu Ala Val Gly
515 520 525

Ser Asp Ile Gly Ala Ala Tyr Thr Thr Ser Thr Cys Phe Gly Arg Ser
530 535 540

Asp Thr Gly Ala Val Tyr Cys Leu Thr Ile Met Glu Thr Val Asn Thr
545 550 555 560

Ile Phe Gly Gln Tyr Arg Ile Val Pro Ile Leu Leu Arg Val Thr Ser
565 570 575

Arg

<210> 126
<211> 585
<212> PRT
<213> Avian metapneumovirus

<220>
<221> MISC_FEATURE
<223> attachment glycoprotein

<400> 126

Met Glu Val Lys Val Glu Asn Val Gly Lys Ser Gln Glu Leu Lys Val
1 5 10 15

Lys Val Lys Asn Phe Ile Lys Arg Ser Asp Cys Lys Lys Lys Leu Phe
20 25 30

Ala Leu Ile Leu Gly Leu Val Ser Phe Glu Leu Thr Met Asn Ile Met
35 40 45

Leu Ser Val Met Tyr Val Glu Ser Asn Glu Ala Leu Ser Leu Cys Arg
50 55 60

Ile Gln Gly Thr Pro Ala Pro Arg Asp Asn Lys Thr Asn Thr Glu Asn

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

Thr Lys Thr Arg Thr Thr Lys Asn Thr Gln Thr Ser Thr Gly Pro Pro
275 280 285

Arg Pro Thr Arg Ser Thr Pro Ser Lys Thr Ala Thr Glu Asn Asn Lys
290 295 300

Arg Thr Thr Thr Thr Lys Arg Pro Asn Thr Ala Ser Thr Asp Ser Arg
305 310 315 320

Gln Gln Thr Arg Thr Thr Ala Glu Gln Asp Gln Gln Thr Gln Thr Arg
325 330 335

Ala Lys Pro Thr Thr Asn Gly Ala His Pro Gln Thr Thr Thr Thr Pro
340 345 350

Glu His Asn Thr Asp Thr Thr Asn Ser Thr Lys Gly Ser Pro Lys Glu
355 360 365

Asp Lys Thr Thr Arg Asp Pro Ser Ser Lys Thr Pro Thr Glu Gln Glu
370 375 380

Asp Ala Ser Lys Gly Thr Ala Ala Ala Asn Pro Gly Gly Ser Ala Glu
385 390 395 400

Ala Asp Arg Arg Ala Pro Pro Ala Thr Thr Pro Thr Gly Arg Thr Thr
405 410 415

Glu Ser Ala Ala Gly Thr Thr Gly Asp Asp Ser Gly Ala Glu Thr Thr
420 425 430

Arg Arg Arg Ser Ala Ala Asp Arg Arg Pro Thr Gly Gly Ser Thr Ala
435 440 445

Ala Glu Ala Gly Thr Ala Gln Ser Gly Arg Ala Thr Pro Lys Gln Pro
450 455 460

Ser Gly Gly Thr Ala Ala Gly Asn Thr Ala Pro Pro Asn Asn Glu Ser
 465 470 475 480

Ser Gly Arg Ala Asp Ala Ala Pro Ala Glu Glu Ala Gly Val Gly Pro
 485 490 495

Ser Ile Arg Arg Gly Arg His Ala Cys Gly Pro Arg Arg Glu Ser Ala
 500 505 510

Pro Glu His Pro Thr Asn Pro Cys Pro Gly Asp Gly Thr Ala Trp Thr
 515 520 525

Arg Ser Asp Gly Gly Gly Asn Leu Pro Ala Gly Arg His Asp Ser Gly
 530 535 540

Ala Asp Gly Ala Ala Arg Arg Gly Ala Arg Gly Gly Asn Pro Arg Arg
 545 550 555 560

Arg Gly Arg Ala Glu Arg Thr Arg Gly Gly Gly Ala Gly Pro Pro Ser
 565 570 575

Cys Arg Cys Gly Ser His Asn Arg Ser
 580 585

<210> 127
 <211> 389
 <212> PRT
 <213> Avian metapneumovirus type D

<220>
 <221> MISC_FEATURE
 <223> attachment glycoprotein

<400> 127

Met Gly Ala Lys Leu Tyr Ala Ile Ser Gly Ala Ser Asp Ala Gln Leu
 1 5 10 15

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

Ile Leu Ala Val Leu Gly Ile Thr Gly Thr Thr Thr Ile Ala Leu Ser
35 40 45

Ile Ser Ile Ser Ile Glu Arg Ala Val Leu Ser Asp Cys Thr Thr Gln
50 55 60

Leu Arg Asn Gly Thr Thr Ser Gly Ser Leu Ser Asn Pro Thr Arg Ser
65 70 75 80

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

Thr Arg Thr Arg Glu Leu Lys Ser Cys Ser Asn Val Gln Ile Ala Tyr
100 105 110

Gly Tyr Leu His Asp Ser Ser Asn Pro Val Leu Asp Ser Ile Gly Cys
115 120 125

Leu Gly Leu Leu Ala Leu Cys Glu Ser Gly Pro Phe Cys Gln Arg Asn
130 135 140

Tyr Asn Pro Arg Asp Arg Pro Lys Cys Arg Cys Thr Leu Arg Gly Lys
145 150 155 160

Asp Ile Ser Cys Cys Lys Glu Pro Pro Thr Ala Val Thr Thr Ser Lys
165 170 175

Thr Thr Pro Trp Gly Thr Glu Val His Pro Thr Tyr Pro Thr Gln Val
180 185 190

Thr Pro Gln Ser Gln Pro Ala Thr Met Ala His Gln Thr Ala Thr Ala
195 200 205

Asn Gln Arg Ser Ser Thr Thr Glu Pro Val Gly Ser Gln Gly Asn Thr

210

215

220

Thr Ser Ser Asn Pro Glu Gln Gln Thr Glu Pro Pro Pro Ser Pro Gln
 225 230 235 240

His Pro Pro Thr Thr Thr Ser Gln Asp Gln Ser Thr Glu Thr Ala Asp
 245 250 255

Gly Gln Glu His Thr Pro Thr Arg Lys Thr Pro Thr Ala Thr Ser Asn
 260 265 270

Arg Arg Ser Pro Thr Pro Lys Arg Gln Glu Thr Gly Arg Ala Thr Pro
 275 280 285

Arg Asn Thr Ala Thr Thr Gln Ser Gly Ser Ser Pro Pro His Ser Ser
 290 295 300

Pro Pro Gly Val Asp Ala Asn Met Glu Gly Gln Cys Lys Glu Leu Gln
 305 310 315 320

Ala Pro Lys Pro Asn Ser Val Cys Lys Gly Leu Asp Ile Tyr Arg Glu
 325 330 335

Ala Leu Pro Arg Gly Cys Asp Lys Val Leu Pro Leu Cys Lys Thr Ser
 340 345 350

Thr Ile Met Cys Val Asp Ala Tyr Tyr Ser Lys Pro Pro Ile Cys Phe
 355 360 365

Gly Tyr Asn Gln Arg Cys Phe Cys Met Glu Thr Phe Gly Pro Ile Glu
 370 375 380

Phe Cys Cys Lys Ser
 385

<210> 128

<211> 197

<212> PRT
<213> Respiratory syncytial virus

<220>
<221> MISC_FEATURE
<223> attachment glycoprotein

<400> 128

Met Ser Lys Asn Lys Asn Gln Arg Thr Ala Arg Thr Leu Glu Lys Thr
1 5 10 15

Trp Asp Thr Leu Asn His Leu Ile Val Ile Ser Ser Cys Leu Tyr Lys
20 25 30

Leu Asn Leu Lys Ser Ile Ala Gln Ile Ala Leu Ser Val Leu Ala Met
35 40 45

Ile Ile Ser Thr Ser Leu Ile Ile Ala Ala Ile Ile Phe Ile Ile Ser
50 55 60

Ala Asn His Lys Val Thr Leu Thr Thr Val Thr Val Gln Thr Ile Lys
65 70 75 80

Asn His Thr Glu Lys Asn Ile Thr Thr Tyr Leu Thr Gln Val Ser Pro
85 90 95

Glu Arg Val Ser Pro Ser Lys Gln Pro Thr Thr Thr Pro Pro Ile His
100 105 110

Thr Asn Ser Ala Thr Ile Ser Pro Asn Thr Lys Ser Glu Ile His His
115 120 125

Thr Thr Ala Gln Thr Lys Gly Arg Thr Ser Thr Pro Thr Gln Asn Asn
130 135 140

Lys Pro Asn Thr Lys Pro Arg Pro Lys Asn Pro Pro Lys Lys Asp Asp
145 150 155 160

Tyr His Phe Glu Val Phe Asn Phe Val Pro Cys Ser Ile Cys Gly Asn
165 170 175

Asn Gln Leu Cys Lys Ser Ile Cys Lys Thr Ile Pro Ser Asn Lys Pro
180 185 190

Arg Lys Asn Gln Pro
195

<210> 129
<211> 580
<212> PRT
<213> Avian paramyxovirus 14

<220>
<221> MISC_FEATURE
<223> hemagglutinin-neuraminidase protein

<400> 129

Met Glu Gly Ser Arg Thr Val Ile Tyr Gln Gly Asp Pro Asn Glu Lys
1 5 10 15

Asn Thr Trp Arg Leu Val Phe Arg Thr Leu Thr Leu Ile Leu Asn Leu
20 25 30

Ala Ile Leu Ser Val Thr Ile Ala Ser Ile Ile Ile Thr Ser Lys Ile
35 40 45

Thr Leu Ser Glu Val Thr Thr Leu Lys Thr Glu Gly Val Glu Glu Val
50 55 60

Ile Thr Pro Leu Met Ala Thr Leu Ser Asp Ser Val Gln Gln Glu Lys
65 70 75 80

Met Ile Tyr Lys Glu Val Ala Ile Ser Ile Pro Leu Val Leu Asp Lys
85 90 95

Ile Gln Thr Asp Val Gly Thr Ser Val Ala Gln Ile Thr Asp Ala Leu
100 105 110

Arg Gln Ile Gln Gly Val Asn Gly Thr Gln Ala Phe Ala Leu Ser Asn
115 120 125

Ala Pro Glu Tyr Ser Gly Gly Ile Glu Val Pro Leu Phe Gln Ile Asp
130 135 140

Ser Phe Val Asn Lys Ser Met Ser Ile Ser Gly Leu Leu Glu His Ala
145 150 155 160

Ser Phe Ile Pro Ser Pro Thr Thr Leu His Gly Cys Thr Arg Ile Pro
165 170 175

Ser Phe His Leu Gly Pro Arg His Trp Cys Tyr Thr His Asn Ile Ile
180 185 190

Gly Ser Arg Cys Arg Asp Glu Gly Phe Ser Ser Met Tyr Ile Ser Ile
195 200 205

Gly Ala Ile Thr Val Asn Arg Asp Gly Asn Pro Leu Phe Ile Thr Thr
210 215 220

Ala Ser Thr Ile Leu Ala Asp Asp Asn Asn Arg Lys Ser Cys Ser Ile
225 230 235 240

Ile Ala Ser Ser Tyr Gly Cys Asp Leu Leu Cys Ser Ile Val Thr Glu
245 250 255

Ser Glu Asn Asp Asp Tyr Ala Asn Pro Asn Pro Thr Lys Met Val His
260 265 270

Gly Arg Phe Leu Tyr Asn Gly Ser Tyr Val Glu Gln Ala Leu Pro Asn
275 280 285

Ser Leu Phe Gln Asp Lys Trp Val Ala Gln Tyr Pro Gly Val Gly Ser

290

295

300

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

Lys Lys Asn Thr Gln Leu Phe Tyr Glu Leu Ser Lys Tyr Gly Phe Phe
 325 330 335

Ala His Asn Lys Glu Leu Glu Cys Lys Asn Met Thr Glu Glu Gln Ile
 340 345 350

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

Phe Ala Gln Gly Ile Ile Tyr Cys Asn Ile Ser Lys Leu Gly Asp Cys
 370 375 380

Asn Val Ala Val Leu Asn Thr Ser Thr Thr Met Met Gly Ala Glu Gly
 385 390 395 400

Arg Leu Gln Met Met Gly Glu Tyr Val Tyr Tyr Tyr Gln Arg Ser Ser
 405 410 415

Ser Trp Trp Pro Val Gly Ile Val Tyr Lys Lys Ser Leu Ala Glu Leu
 420 425 430

Met Asn Gly Ile Asn Met Glu Val Leu Ser Phe Glu Pro Ile Pro Leu
 435 440 445

Ser Lys Phe Pro Arg Pro Thr Trp Thr Ala Gly Leu Cys Gln Lys Pro
 450 455 460

Ser Ile Cys Pro Asp Val Cys Val Thr Gly Val Tyr Thr Asp Leu Phe
 465 470 475 480

Ser Val Thr Ile Gly Ser Thr Thr Asp Lys Asp Thr Tyr Phe Gly Val
 485 490 495

Tyr Leu Asp Ser Ala Thr Glu Arg Lys Asp Pro Trp Val Ala Ala Ala
500 505 510

Asp Gln Tyr Glu Trp Arg Asn Arg Val Arg Leu Phe Glu Ser Thr Thr
515 520 525

Glu Ala Ala Tyr Thr Thr Ser Thr Cys Phe Lys Asn Thr Val Asn Asn
530 535 540

Arg Val Phe Cys Val Ser Ile Val Glu Leu Arg Glu Asn Leu Leu Gly
545 550 555 560

Asp Trp Lys Ile Val Pro Leu Leu Phe Gln Ile Gly Val Ser Gln Gly
565 570 575

Pro Pro Pro Lys
580

<210> 130
<211> 1046
<212> PRT
<213> Beilong virus

<220>
<221> MISC_FEATURE
<223> attachment glycoprotein

<400> 130

Met Ser Gln Leu Ala Ala His Asn Leu Ala Met Ser Asn Phe Tyr Gly
1 5 10 15

Thr His Gln Gly Asp Leu Ser Gly Ser Gln Lys Gly Glu Glu Gln Gln
20 25 30

Val Gln Gly Val Ile Arg Tyr Val Ser Met Ile Val Gly Leu Leu Ser
35 40 45

Leu Phe Thr Ile Ile Ala Leu Asn Val Thr Asn Ile Ile Tyr Met Thr
50 55 60

Glu Ser Gly Gly Thr Met Gln Ser Ile Lys Thr Ala Gln Gly Ser Ile
65 70 75 80

Asp Gly Ser Met Arg Glu Ile Ser Gly Val Ile Met Glu Asp Val Lys
85 90 95

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

Gln Leu Ser Met Ile His Gln Ile Ile Lys Asn Asp Val Leu Lys Gln
115 120 125

Cys Thr Pro Ser Phe Met Phe Asn Asn Thr Ile Cys Pro Leu Ala Glu
130 135 140

Asn Pro Thr His Ser Arg Tyr Phe Glu Glu Val Asn Leu Asp Ser Ile
145 150 155 160

Ser Glu Cys Ser Gly Pro Asp Met His Leu Gly Leu Gly Val Asn Pro
165 170 175

Glu Phe Ile Glu Phe Pro Ser Phe Ala Pro Gly Ser Thr Lys Pro Gly
180 185 190

Ser Cys Val Arg Leu Pro Ser Phe Ser Leu Ser Thr Thr Val Phe Ala
195 200 205

Tyr Thr His Thr Ile Met Gly His Gly Cys Ser Glu Leu Asp Val Gly
210 215 220

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

Pro Gln Phe Glu Thr Ile Ser Ser Trp Phe Ile Asn Asp Lys Ile Asn
245 250 255

Arg Arg Ser Cys Thr Val Ala Ala Gly Ala Met Glu Ala Trp Met Gly
260 265 270

Cys Val Ile Met Thr Glu Thr Phe Tyr Asp Asp Leu Asn Ser Leu Asp
275 280 285

Thr Gly Lys Leu Thr Ile Ser Tyr Leu Asp Val Phe Gly Arg Lys Lys
290 295 300

Glu Trp Ile Tyr Thr Arg Ser Glu Ile Leu Tyr Asp Tyr Thr Tyr Thr
305 310 315 320

Ser Val Tyr Phe Ser Val Gly Ser Gly Val Val Val Gly Asp Thr Val
325 330 335

Tyr Phe Leu Ile Trp Gly Ser Leu Ser Ser Pro Ile Glu Glu Thr Ala
340 345 350

Tyr Cys Phe Ala Pro Asp Cys Ser Asn Tyr Asn Gln Arg Met Cys Asn
355 360 365

Glu Ala Gln Arg Pro Ser Lys Phe Gly His Arg Gln Met Val Asn Gly
370 375 380

Ile Leu Lys Phe Lys Thr Thr Ser Thr Gly Lys Pro Leu Leu Ser Val
385 390 395 400

Gly Thr Leu Ser Pro Ser Val Val Pro Phe Gly Ser Glu Gly Arg Leu
405 410 415

Met Tyr Ser Glu Ile Thr Lys Ile Ile Tyr Leu Tyr Leu Arg Ser Thr
420 425 430

Ser Trp His Ala Leu Pro Leu Thr Gly Leu Phe Val Leu Gly Pro Pro

435

440

445

Thr Ser Ile Ser Trp Ile Val Gln Arg Ala Val Ser Arg Pro Gly Glu
 450 455 460

Phe Pro Cys Gly Ala Ser Asn Arg Cys Pro Lys Asp Cys Val Thr Gly
 465 470 475 480

Val Tyr Thr Asp Leu Phe Pro Leu Gly Ser Arg Tyr Glu Tyr Ala Ala
 485 490 495

Thr Val Tyr Leu Asn Ser Glu Thr Tyr Arg Val Asn Pro Thr Leu Ala
 500 505 510

Leu Ile Asn Gln Thr Asn Ile Ile Ala Ser Lys Lys Val Thr Thr Glu
 515 520 525

Ser Gln Arg Ala Gly Tyr Thr Thr Thr Thr Cys Phe Val Phe Lys Leu
 530 535 540

Arg Val Trp Cys Ile Ser Val Val Glu Leu Ala Pro Ser Thr Met Thr
 545 550 555 560

Ala Tyr Glu Pro Ile Pro Phe Leu Tyr Gln Leu Asp Leu Thr Cys Lys
 565 570 575

Gly Lys Asn Gly Ser Leu Ala Met Arg Phe Thr Gly Lys Glu Gly Thr
 580 585 590

Tyr Lys Ser Gly Arg Tyr Lys Ser Pro Arg Asn Glu Cys Phe Phe Glu
 595 600 605

Lys Val Ser Asn Lys Tyr Tyr Phe Ile Val Ser Thr Pro Glu Gly Ile
 610 615 620

Gln Pro Tyr Glu Ile Arg Asp Leu Thr Pro Asp Arg Met Pro His Ile
 625 630 635 640

Ile Met Tyr Ile Ser Asp Val Cys Ala Pro Ala Leu Ser Ala Phe Lys
645 650 655

Lys Leu Leu Pro Ala Met Arg Pro Ile Thr Thr Leu Thr Ile Gly Asn
660 665 670

Trp Gln Phe Arg Pro Val Glu Val Ser Gly Gly Leu Arg Val Ser Ile
675 680 685

Gly Arg Asn Leu Thr Lys Glu Gly Asp Leu Thr Met Ser Ala Pro Glu
690 695 700

Asp Pro Gly Ser Asn Thr Phe Pro Gly Gly His Ile Pro Gly Asn Gly
705 710 715 720

Leu Phe Asp Ala Gly Tyr Tyr Thr Val Glu Tyr Pro Lys Glu Trp Lys
725 730 735

Gln Thr Thr Pro Lys Pro Ser Glu Gly Gly Asn Ile Ile Asp Lys Asn
740 745 750

Lys Thr Pro Val Ile Pro Ser Arg Asp Asn Pro Thr Ser Asp Ser Ser
755 760 765

Ile Pro His Arg Glu Ser Ile Glu Pro Val Arg Pro Thr Arg Glu Val
770 775 780

Leu Lys Ser Ser Asp Tyr Val Thr Ile Val Ser Thr Asp Ser Gly Ser
785 790 795 800

Gly Ser Gly Asp Phe Ala Thr Gly Val Pro Trp Thr Gly Val Ser Pro
805 810 815

Lys Ala Pro Gln Asn Gly Ile Asn Leu Pro Gly Thr Glu Leu Pro His
820 825 830

Pro Thr Val Leu Asp Arg Ile Asn Thr Pro Ala Pro Ser Asp Pro Lys
835 840 845

Val Ser Ala Asp Ser Asp His Thr Arg Asp Thr Ile Asp Pro Thr Ala
850 855 860

Leu Ser Lys Pro Leu Asn His Asp Thr Thr Gly Asp Thr Asp Thr Arg
865 870 875 880

Ile Asn Thr Gly Thr Ala Thr Tyr Gly Phe Thr Pro Gly Arg Glu Ala
885 890 895

Thr Ser Ser Gly Lys Leu Ala Asn Asp Leu Thr Asn Ser Thr Ser Val
900 905 910

Pro Ser Glu Ala His Pro Ser Ala Ser Thr Ser Glu Ala Ser Lys Pro
915 920 925

Glu Lys Asn Thr Asp Asn Arg Val Thr Gln Asp Pro Thr Ser Gly Thr
930 935 940

Ala Glu Arg Pro Thr Thr Asn Ala Pro Val Asp Gly Lys His Ser Thr
945 950 955 960

Gln Leu Thr Asp Ala Arg Pro Asn Thr Ala Asp Pro Glu Arg Thr Ser
965 970 975

Gln His Ser Ser Ser Thr Thr Arg Asp Glu Val Lys Pro Ser Leu Pro
980 985 990

Ser Thr Thr Glu Ala Ser Thr His Gln Arg Thr Glu Ala Ala Thr Pro
995 1000 1005

Pro Glu Leu Val Asn Asn Thr Leu Asn Pro Pro Ser Thr Gln Val
1010 1015 1020

Arg Ser Val Arg Ser Leu Met Gln Asp Ala Ile Ala Gln Ala Trp
1025 1030 1035

Asn Phe Val Arg Gly Val Thr Pro
1040 1045

<210> 131
<211> 618
<212> PRT
<213> Avian paramyxovirus UPO216

<220>
<221> MISC_FEATURE
<223> hemagglutinin-neuraminidase protein

<400> 131

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

Glu Lys Asn Thr Trp Arg Leu Ile Phe Arg Ile Thr Val Leu Val Val
20 25 30

Ser Val Ile Thr Leu Gly Leu Thr Ala Ala Ser Leu Val Tyr Ser Met
35 40 45

Asn Ala Ala Gln Pro Ala Asp Phe Asp Gly Ile Ile Pro Ala Val Gln
50 55 60

Gln Val Gly Thr Ser Leu Thr Asn Ser Ile Gly Gly Met Gln Asp Val
65 70 75 80

Leu Asp Arg Thr Tyr Lys Gln Val Ala Leu Glu Ser Pro Leu Thr Leu
85 90 95

Leu Asn Met Glu Ser Thr Ile Met Asn Ala Ile Thr Ser Leu Ser Tyr
100 105 110

Lys Ile Asn Asn Gly Gly Asn Ser Ser Gly Cys Gly Ala Pro Ile His

115

120

125

Asp Pro Glu Tyr Ile Gly Gly Ile Gly Lys Glu Leu Leu Ile Asp Asp
 130 135 140

Asn Val Asp Val Thr Ser Phe Tyr Pro Ser Ala Phe Lys Glu His Leu
 145 150 155 160

Asn Phe Ile Pro Ala Pro Thr Thr Gly Ala Gly Cys Thr Arg Ile Pro
 165 170 175

Ser Phe Asp Leu Ser Ala Thr His Tyr Cys Tyr Thr His Asn Val Ile
 180 185 190

Leu Ser Gly Cys Gln Asp His Ser His Ser His Gln Tyr Ile Ala Leu
 195 200 205

Gly Val Leu Lys Leu Ser Asp Thr Gly Asn Val Phe Phe Ser Thr Leu
 210 215 220

Arg Ser Ile Asn Leu Asp Asp Thr Ala Asn Arg Lys Ser Cys Ser Ile
 225 230 235 240

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

Thr Glu Leu Glu Asp Tyr Lys Ser Glu Glu Pro Thr Pro Met Val His
 260 265 270

Gly Arg Leu Ser Phe Asp Gly Thr Tyr Ser Glu Lys Asp Leu Asp Val
 275 280 285

Asn Asn Leu Phe Ser Asp Trp Thr Ala Asn Tyr Pro Ser Val Gly Gly
 290 295 300

Gly Ser Tyr Ile Gly Asn Arg Val Trp Tyr Ala Val Tyr Gly Gly Leu
 305 310 315 320

Lys Pro Gly Ser Asn Thr Asp Gln Ser Gln Arg Asp Lys Tyr Val Ile
325 330 335

Tyr Lys Arg Tyr Asn Asn Thr Cys Pro Asp Pro Glu Asp Tyr Gln Ile
340 345 350

Asn Lys Ala Lys Ser Ser Tyr Thr Pro Ser Tyr Phe Gly Ser Lys Arg
355 360 365

Val Gln Gln Ala Ile Leu Ser Ile Ala Val Ser Pro Thr Leu Gly Ser
370 375 380

Asp Pro Val Leu Thr Pro Leu Ser Asn Asp Val Val Leu Met Gly Ala
385 390 395 400

Glu Gly Arg Val Met His Ile Gly Gly Tyr Thr Tyr Leu Tyr Gln Arg
405 410 415

Gly Thr Ser Tyr Tyr Ser Pro Ala Leu Leu Tyr Pro Leu Asn Ile Gln
420 425 430

Asp Lys Ser Ala Thr Ala Ser Ser Pro Tyr Lys Phe Asp Ala Phe Thr
435 440 445

Arg Pro Gly Ser Val Pro Cys Gln Ala Asp Ala Arg Cys Pro Gln Ser
450 455 460

Cys Val Thr Gly Val Tyr Thr Asp Pro Tyr Pro Leu Ile Phe Ala Lys
465 470 475 480

Asp His Ser Ile Arg Gly Val Tyr Gly Met Met Leu Asn Asp Val Thr
485 490 495

Ala Arg Leu Asn Pro Ile Ala Ala Val Phe Ser Asn Ile Ser Arg Ser
500 505 510

Gln Ile Thr Arg Val Ser Ser Ser Ser Thr Lys Ala Ala Tyr Thr Thr
515 520 525

Ser Thr Cys Phe Lys Val Ile Lys Thr Asn Arg Ile Tyr Cys Met Ser
530 535 540

Ile Ala Glu Ile Ser Asn Thr Leu Phe Gly Glu Phe Arg Ile Val Pro
545 550 555 560

Leu Leu Val Glu Ile Leu Ser Asn Gly Gly Asn Thr Ala Arg Ser Ala
565 570 575

Gly Gly Thr Pro Val Lys Glu Ser Pro Lys Gly Trp Ser Asp Ala Ile
580 585 590

Ala Glu Pro Leu Phe Cys Thr Pro Thr Asn Val Thr Arg Tyr Asn Ala
595 600 605

Asp Ile Arg Arg Tyr Ala Tyr Ser Trp Pro
610 615

<210> 132
<211> 576
<212> PRT
<213> Atlantic salmon paramyxovirus

<220>
<221> MISC_FEATURE
<223> hemagglutinin-neuraminidase protein

<400> 132

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1 5 10 15

Ser Ser Leu Phe Asn Glu Asp Thr Ala Ser Arg Lys Gly Thr Ser Glu
20 25 30

Glu Ile His Leu Leu Gly Ile Arg Trp Asn Thr Val Leu Ile Val Leu
35 40 45

Gly Leu Ile Leu Ala Ile Ile Gly Ile Gly Ile Gly Ala Ser Ser Phe
50 55 60

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

Val Glu Glu Met Ser Tyr Gly Leu Val Arg Ile Ser Asp Ser Val Arg
85 90 95

Gln Glu Ile Ser Pro Lys Val Thr Leu Leu Gln Asn Ala Val Leu Ser
100 105 110

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

Val Lys Asn His Cys Asn Ser Pro Pro Thr Pro Pro Pro Pro Thr Glu
130 135 140

Ala Pro Leu Lys Lys His Glu Thr Gly Met Ala Pro Leu Asp Pro Thr
145 150 155 160

Thr Tyr Trp Thr Cys Thr Ser Gly Thr Pro Arg Phe Tyr Ser Ser Pro
165 170 175

Asn Ala Thr Phe Ile Pro Gly Pro Ser Pro Leu Pro His Thr Ala Thr
180 185 190

Pro Gly Gly Cys Val Arg Ile Pro Ser Met His Ile Gly Ser Glu Ile
195 200 205

Tyr Ala Tyr Thr Ser Asn Leu Ile Ala Ser Gly Cys Gln Asp Ile Gly
210 215 220

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

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

Gly Trp His Ser Pro Ile Gln Ile Gly Val Ile Tyr Thr Met Asn Pro
435 440 445

Leu Ala Ile Thr Trp Val Thr Asn Thr Val Leu Ser Arg Pro Gly Ser
450 455 460

Ala Gly Cys Asp Trp Asn Asn Arg Cys Pro Lys Ala Cys Leu Ser Gly
465 470 475 480

Val Tyr Thr Asp Ala Tyr Pro Ile Ser Pro Asp Tyr Asn His Leu Ala
485 490 495

Thr Met Ile Leu His Ser Thr Ser Thr Arg Ser Asn Pro Val Met Val
500 505 510

Tyr Ser Ser Pro Thr Asn Met Val Asn Tyr Ala Gln Leu Thr Thr Thr
515 520 525

Ala Gln Ile Ala Gly Tyr Thr Thr Thr Ser Cys Phe Thr Asp Asn Glu
530 535 540

Val Gly Tyr Cys Ala Thr Ala Leu Glu Leu Thr Pro Gly Thr Leu Ser
545 550 555 560

Ser Val Gln Pro Ile Leu Val Met Thr Lys Ile Pro Lys Glu Cys Val
565 570 575

<210> 133
<211> 1122
<212> DNA
<213> artificial sequence

<220>
<223> ApoE.HCR-hAAT

<400> 133
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60

ttcccatcct ccagcagctg tttgtgtgct gcctctgaag tccacactga acaaacttca	120
gcctactcat gtccctaataa tgggcaaaca ttgcaagcag caaacagcaa acacacagcc	180
ctccctgcct gctgaccttg gagctggggc agaggtcaga gacctctctg ggcccatgcc	240
acctccaaca tccactcgac cccttggaat ttcggtggag aggagcagag gttgtcctgg	300
cgtggttttag gtagtgtgag aggggtaccc ggggatcttg ctaccagtgg aacagccact	360
aaggattctg cagtgagagc agagggccag ctaagtggta ctctcccaga gactgtctga	420
ctcacgccac cccctccacc ttggacacag gacgctgtgg tttctgagcc aggtacaatg	480
actcctttcg gtaagtgcag tggaagctgt aactgcccga ggcaaagcgt ccgggcagcg	540
taggcgggcg actcagatcc cagccagtgg acttagcccc tgtttgctcc tccgataact	600
ggggtgacct tgggttaatat tcaccagcag cctccccctg tgccccctctg gatccactgc	660
ttaaatacgg acgaggacag ggccctgtct cctcagcttc aggcaccacc actgacctgg	720
gacagtgaat gatccccctg atctgcggcc tcgacggtat cgataagctt gatatcgaat	780
tctagtcgtc gaccactttc acaatctgct agcaacctga ggaggttatc gtacgaaatt	840
cgctgtctgc gagggccagc tggtgggggtg agtactccct ctcaaaagcg ggcatgactt	900
ctgcgctaag attgtcagtt tccaaaaacg aggaggattt gatattcacc tggcccgcg	960
tgatgccttt gaggggtggc gcgtccatct ggtcagaaaa gacaatcttt ttgttgtcaa	1020
gcttgagggtg tggcaggcct gagatcgatc tgaccataca cttgagtgac aatgacatcc	1080
actttgcctt tctctccaca ggtgtccact cccaggtcca ac	1122

<210> 134
 <211> 2428
 <212> DNA
 <213> artificial sequence

<220>
 <223> LP1B

<400> 134	
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gagcttactt ctttgatttg atcttttgtg aaacttttgg aaattaccca tcttcctaag	120

cttctgcttc tctcagtttt ctgcttgctc attccacttt tccagctgac cctgccccct	180
accaacattg ctccacaagc acaaattcat ccagagaaaa taaattctaa gttttatagt	240
tgtttggatc gcataggttag ctaaagaggt ggcaaccac acatccttag gcatgagctt	300
gatttttttt gatttagaac cttccccctc ctgttcctag actacactac acattctgca	360
agcatagcac agagcaatgt tctactttaa ttactttcat tttcttgat cctcacagcc	420
tagaaaataa cctgcgttac agcatccact cagtatccct tgagcatgag gtgacactac	480
ttaacatagg gacgagatgg tactttgtgt ctctgctct gtcagcaggg cactgtactt	540
gctgatacca gggaatgttt gttcttaaat accatcattc cggacgtgtt tgccttggcc	600
agttttccat gtacatgcag aaagaagttt ggactgatca atacagtcct ctgcctttaa	660
agcaatagga aaaggccaac ttgtctacgt ttagtatgtg gctgtagaaa gggatatagat	720
ataaaaatta aaactaatga aatggcagtc ttacacattt ttggcagctt atttaaagtc	780
ttggtgttaa gtacgctgga gctgtcacag ctaccaatca ggcatgtctg ggaatgagta	840
cacggggacc ataagttact gacattcgtt tcccattcca tttgaataca cacttttgtc	900
atggtattgc ttgctgaaat tgttttgcaa aaaaaacccc ttcaaattca tatatattat	960
tttaataaat gaattttaat ttatctcaat gttataaaaa agtcaatttt aataattagg	1020
tacttatata cccaataata tctaacaatc atttttaaac atttgtttat tgagcttatt	1080
atggatgaat ctatctctat atactctata tactctaaaa aagaagaaag accatagaca	1140
atcatctatt tgatatgtgt aaagtttaca tgtgagtaga catcagatgc tccatttctc	1200
actgtaatac catttatagt tacttgcaaa actaactgga attctaggac ttaaataattt	1260
taagtttttag ctgggtgact ggttggaataa ttttaggtaa gtactgaaac caagagatta	1320
taaaacaata aattctaaag ttttagaagt gatcataatc aaatattacc ctctaataa	1380
aatattccaa agttgagcta cagaaatttc aacataagat aatttttagct gtaacaatgt	1440
aatttgttgt ctattttctt ttgagataga gttttttctg tctagctttg gctgtcctgg	1500
accttgctct gtagaccagg ttggtcttga actcagagat ctgcttgccct ctgccttgca	1560

agtgctagga ttaaaagcat gtgccaccac tgcctggcta caatctatgt tttataagag	1620
attataaagc tctggctttg tgacattaat ctttcagata ataagtcttt tggattgtgt	1680
ctggagaaca tacagactgt gagcagatgt tcagaggat atttgcttag ggggtgaattc	1740
aatctgcagc aataattatg agcagaatta ctgacacttc cattttatac attctacttg	1800
ctgatctatg aaacatagat aagcatgcag gcattcatca tagttttctt tatctggaaa	1860
aacattaaat atgaaagaag cactttatta atacagtta gatgtgtttt gccatctttt	1920
aatttcttaa gaaataactaa gctgatgcag agtgaagagt gtgtgaaaag cagtgggtgca	1980
gcttggcttg aactcgttct ccagcttggg atcgacctgc aggcattgctt ccatgccaaag	2040
gcccacactg aaatgctcaa atgggagaca aagagattaa gctcttatgt aaaatttgct	2100
gttttacata actttaatga atggacaaag tcttgtgcat ggggggtgggg gtgggggttag	2160
aggggaacag ctccagatgg caaacatacg caagggattt agtcaaaca ctttttggca	2220
aagatggtat gattttgtaa tggggtagga accaatgaaa tgcgaggtaa gtatgggttaa	2280
tgatctacag ttattgggtta aagaagtata ttagagcgag tctttctgca cacagatcac	2340
ctttcctatc aacccccggga tccccgggc tgcaggaatt cgatatcaag cttatcgata	2400
ccgtcgacct cgaggggggg cccggtac	2428

<210> 135
 <211> 530
 <212> DNA
 <213> artificial sequence

<220>
 <223> LP1B

<400> 135	
cggcctctag actcgagccc taaaatgggc aaacattgca agcagcaaac agcaaacaca	60
cagccctccc tgcctgctga ctttggagct ggggcagagg tcagagacct ctctgggccc	120
atgccacctc caacatccac tcgacccctt ggaatttcgg tggagaggag cagaggttgt	180
cctggcgtgg tttaggtagt gtgagagggt ggacacagga cgctgtgggt tctgagccag	240
ggggcgactc agatcccagc cagtggactt agccccgtgt tgctcctccg ataactgggg	300

tgaccttggt taatattcac cagcagcctc ccccgttgcc cctctggatc cactgcttaa	360
atacggacga ggacagggcc ctgtctcctc agcttcaggc accaccactg acctgggaca	420
gtgaatccgg actctaaggt aaatataaaa tttttaagtg tataatgtgt taaactactg	480
attctaattg tttctctctt ttagattcca acctttggaa ctgaaccggt	530

<210> 136
 <211> 252
 <212> DNA
 <213> artificial sequence

<220>
 <223> HLP

<400> 136	
tgtttgctgc ttgcaatggt tgcccatttt aggggtggaca caggacgctg tggtttctga	60
gccagggggc gactcagatc ccagccagtg gacttagccc ctgtttgctc ctccgataac	120
tggggtgacc ttggttaata ttcaccagca gcctcccccg ttgcccctct ggatccactg	180
cttaaatacg gacgaggaca gggccctgtc tcctcagctt caggcaccac cactgacctg	240
ggacagtga tc	252

<210> 137
 <211> 212
 <212> DNA
 <213> artificial sequence

<220>
 <223> EF1a core promoter

<400> 137	
gggcagagcg cacatcgccc acagtccccg agaagttggg gggaggggtc ggcaattgaa	60
cgggtgccta gagaaggtgg cgcggggtaa actgggaaag tgatgtcgtg tactggctcc	120
gcctttttcc cgagggtggg ggagaaccgt atataagtc agtagtcgcc gtgaacgttc	180
tttttcgcaa cgggtttgcc gccagaacac ag	212

<210> 138

<211> 1163
 <212> DNA
 <213> artificial sequence

<220>
 <223> EF1a

<400> 138
 ggctccggtg cccgtcagtg ggcagagcgc acatcgccca cagtccccga gaagttgggg 60
 ggaggggtcg gcaattgaac cgggtgcctag agaaggtggc gcggggtaaa ctgggaaagt 120
 gatgtcgtgt actggctccg cctttttccc gaggggtgggg gagaaccgta tataagtgca 180
 gtagtcgccg tgaacgttct ttttcgcaac gggtttgccg ccagaacaca ggtaagtgcc 240
 gtgtgtgggt cccgcgggcc tggcctcttt acgggttatg gcccttgctg gccttgaatt 300
 acttccacct ggctccagta cgtgattctt gatcccgagc tggagccagg ggcgggcctt 360
 gcgcttttagg agcccccttcg cctcgtgctt gagttgaggc ctggcctggg cgctggggcc 420
 gccgcgtgcg aatctgggtg caccttcgcg cctgtctcgc tgctttcgat aagtctctag 480
 ccatttaaaa tttttgatga cctgctgcga cgcttttttt ctggcaagat agtcttgtaa 540
 atgcggggcca ggatctgcac actggtatatt cggttttttg gcccgcggcc ggcgacgggg 600
 cccgtgcgtc ccagcgcaca tggtcggcga ggcggggcct gcgagcgcgg ccaccgagaa 660
 tcggacgggg gtagtctcaa gctggccggc ctgctctggt gcctggcctc gcgccgccgt 720
 gtatcgcccc gccctgggcg gcaaggctgg cccggtcggc accagttgctg tgagcggaaa 780
 gatggccgct tcccggccct gctccagggg gctcaaaatg gaggacgcgg cgctcgggag 840
 agcgggcggg tgagtcaccc acacaaagga aaagggcctt tccgtcctca gccgtcgctt 900
 catgtgactc cacggagtac cgggcgccgt ccaggcacct cgattagttc tggagctttt 960
 ggagtacgtc gtcttttaggt tggggggagg ggttttatgc gatggagttt cccacactg 1020
 agtgggtgga gactgaagtt aggccagctt ggcacttgat gtaattctcc ttggaatttg 1080
 gcctttttga gtttgatct tggttcattc tcaagcctca gacagtgggt caaagttttt 1140
 ttcttccatt tcaggtgtcg tga 1163

<210> 139
 <211> 510
 <212> DNA
 <213> artificial sequence

<220>
 <223> hPGK

<400> 139
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 tgggcgtggt tccgggaaac gcagcggcgc cgaccctggg tctcgacat tcttcacgtc 120
 cgttcgcagc gtcacccgga tcttcgccgc tacccttggt ggccccccgg cgacgcttcc 180
 tgctccgccc ctaagtcggg aagggttcctt gcggttcgcg gcgtgccgga cgtgacaaac 240
 ggaagccgca cgtctcacta gtaccctcgc agacggacag cgccagggag caatggcagc 300
 gcgccgaccg cgatgggctg tggccaatag cggctgctca gcggggcgcg ccgagagcag 360
 cggccgggaa ggggcggtgc gggaggcggg gtgtggggcg gtagtgtggg ccctgttcct 420
 gcccgcgcgg tgttccgcat tctgcaagcc tccggagcgc acgtcggcag tcggctccct 480
 cgttgaccga atcaccgacc tctctcccca 510

<210> 140
 <211> 39
 <212> DNA
 <213> artificial sequence

<220>
 <223> mCMV

<400> 140
 ggtaggcgtg tacggtggga ggcctatata agcagagct 39

<210> 141
 <211> 1212
 <212> DNA
 <213> artificial sequence

<220>
 <223> Ubc

<400> 141

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aaaattacat attgacccaa atgattacat ttcaaaaggt gcctaaaaaa cttcacaaaa	120
cacactcgcc aaccccgagc gcatagttca aaaccggagc ttcagctact taagaagata	180
ggtacataaa accgaccaa gaaactgacg cctcacttat ccctcccctc accagaggtc	240
cggcgcctgt cgattcagga gagcctaccc taggcccga ccttgcgtcc tgcgacggag	300
aaaagcctac cgcacaccta ccggcagggtg gccccaccct gcattataag ccaacagaac	360
gggtgacgtc acgacacgac gagggcgcg cgtcccaaag gtacgggtgc actgccaac	420
ggcaccgcca taactgccgc ccccgcaaca gacgacaaac cgagttctcc agtcagtgc	480
aaacttcacg tcagggtccc cagatgggtgc ccagcccat ctcacccgaa taagagcttt	540
cccgcattag cgaaggcctc aagaccttgg gttcttgccg cccaccatgc cccccacctt	600
gtttcaacga cctcacagcc cgcctcacia gcgtcttcca ttcaagactc gggaacagcc	660
gccattttgc tgcgtcccc ccaaccccc gttcaggga accttgctcg cggaccaga	720
ctacagccct tggcgggtctc tccacacgct tccgtccac cgagcggccc ggcgccacg	780
aaagccccgg ccagcccagc agcccgtac tcaccaagtg acgatcacag cgatccacia	840
acaagaaccg cgacccaaat cccggctgcg acggaactag ctgtgccaca cccggcgcg	900
ccttatataa tcacggcgt tcaccgcccc acggagatcc ctccgcagaa tcgccgagaa	960
gggactactt ttcctcgcct gttccgctct ctggaaagaa aaccagtgc ctagagtcac	1020
ccaagtcccc tcctaaaatg tccttctgct gatactgggg ttctaaggcc gagtcttatg	1080
agcagcgggc cgctgtcctg agcgtccggg cggaaggatc aggacgctcg ctgcgccctt	1140
cgtctgacgt ggcagcgctc gccgtgagga ggggggcgcc cgcgggaggc gccaaaaccc	1200
ggcgcggagg cc	1212

<210> 142
 <211> 408
 <212> DNA
 <213> artificial sequence
 <220>

<223> SFFV

<400> 142

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agggcgggta catgaaaata gctaacgttg ggccaaacag gatattctgcg gtgagcagtt 120
tcggccccgg cccggggcca agaacagatg gtcaccgcag tttcggcccc ggcccagggc 180
caagaacaga tgggtccccag atatggccca accctcagca gtttcttaag acccatcaga 240
tgtttccagg ctcccccaag gacctgaaat gaccctgcgc cttatttgaa ttaaccaatc 300
agcctgcttc tcgcttctgt tcgcgcgctt ctgcttcccg agctctataa aagagctcac 360
aaccctcac tcggcgcgcc agtcctccga cagactgagt cgcccggg 408

<210> 143

<211> 23

<212> RNA

<213> artificial sequence

<220>

<223> miR-142

<400> 143

uguaguguuu ccuacuuuau gga 23

<210> 144

<211> 21

<212> RNA

<213> artificial sequence

<220>

<223> miR-142

<400> 144

cauaaaguag aaagcacuac u 21

<210> 145

<211> 23

<212> RNA

<213> artificial sequence

<220>

<223> mir-181a-2

<400> 145
aacauucaac gcugucggug agu 23

<210> 146
<211> 22
<212> RNA
<213> artificial sequence

<220>
<223> mir-181a-2

<400> 146
accacugacc guugacugua cc 22

<210> 147
<211> 23
<212> RNA
<213> artificial sequence

<220>
<223> mir-181b-1

<400> 147
aacauucauu gcugucggug ggu 23

<210> 148
<211> 21
<212> RNA
<213> artificial sequence

<220>
<223> mir-181b-1

<400> 148
cucacugaac aaugaaugca a 21

<210> 149
<211> 22
<212> RNA
<213> artificial sequence

<220>
<223> mir-181c

<400> 149
aacauucaac cugucgguga gu 22

<210> 150
<211> 22
<212> RNA
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<220>
<223> mir-181c

<400> 150
aaccaucgac cguugagugg ac 22

<210> 151
<211> 23
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<213> artificial sequence

<220>
<223> mir-181a-1

<400> 151
aacauucaac gcugucggug agu 23

<210> 152
<211> 22
<212> RNA
<213> artificial sequence

<220>
<223> mir-181a-1

<400> 152
accaucgacc guugauugua cc 22

<210> 153
<211> 23
<212> RNA
<213> artificial sequence

<220>
<223> mir-181b-2

<400> 153

aacauucauu gcugucggug ggu 23

<210> 154
<211> 20
<212> RNA
<213> artificial sequence

<220>
<223> mir-181b-2

<400> 154
cucacugauc aaugaaugca 20

<210> 155
<211> 23
<212> RNA
<213> artificial sequence

<220>
<223> mir-181d

<400> 155
aacauucauu guugucggug ggu 23

<210> 156
<211> 21
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<220>
<223> mir-181d

<400> 156
ccaccggggg augaauguca c 21

<210> 157
<211> 22
<212> RNA
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<220>
<223> miR-223

<400> 157
cguguauuuug acaagcugag uu 22

<210> 158
 <211> 22
 <212> RNA
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<220>
 <223> miR-223

<400> 158
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<210> 159
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 <212> RNA
 <213> miR-126

<400> 159
 cauuauuacu uuugguacgc g 21

<210> 160
 <211> 22
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<220>
 <223> miR-126

<400> 160
 ucguaccgug aguaauaaug cg 22

<210> 161
 <211> 628
 <212> DNA
 <213> artificial sequence

<220>
 <223> hAAT

<400> 161
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aagtgggtact ctcccagaga ctgtctgact cacgccaccc cctccacctt ggacacagga 120

cgctgtgggtt tctgagccag gtacaatgac tcctttcggt aagtgcagtg gaagctgtac 180

actgcccagg caaagcgtcc gggcagcgta ggcgggcgac tcagatccca gccagtggac	240
ttagcccctg tttgctcctc cgataactgg ggtgaccttg gttaatatcc accagcagcc	300
tcccccgttg cccctctgga tccactgctt aaatacggac gaggacaggg ccctgtctcc	360
tcagcttcag gcaccaccac tgacctggga cagtgaatgt cccctgatc tgcggccgtg	420
actctcttaa ggtagccttg cagaagttgg tcgtgaggca ctgggcaggt aagtatcaag	480
gttacaagac aggtttaagg agaccaatag aaactgggct tgctcgagaca gagaagactc	540
ttgcgtttct gataggcacc tattggctctt actgacatcc actttgcctt tctctccaca	600
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<210> 162
 <211> 577
 <212> DNA
 <213> artificial sequence

<220>
 <223> Enhanced transthyretin

<400> 162	
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ggggcaggtg acgtttgccc agcgcgcgct ggtaattatt aacctcgca atattgattc	120
gaggccgcga ttgccgcaat cgcgaggggc aggtgacctt tgcccagcgc gcgttcgccc	180
cgccccggac ggtatcgata agcttaggag cttgggctgc aggtcgaggg cactgggagg	240
atgttgagta agatggaaaa ctactgatga cccttgaga gacagagtat taggacatgt	300
ttgaacaggg gccgggcgat cagcaggtag ctctagagga tccccgtctg tctgcacatt	360
tcgtagagcg agtggtccga tactctaata tccctaggca aggttcatat ttgtgtaggt	420
tacttattct ccttttggtg actaagtcaa taatcagaat cagcaggttt ggagtcagct	480
tggcagggat cagcagcctg ggttggaagg aggggggtata aaagccccctt caccaggaga	540
agccgtcaca cagatccaca agctcctgcc accatgg	577

<210> 163

<211> 1503
<212> DNA
<213> artificial sequence

<220>
<223> transthyretin

<400> 163
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actctatcag ttatgggaat gttccctcaa ttcttagtgc tccaaaccgg acttgctctt 180
ggcttgtatt tgtccaaaat atttgtcttc tctatgtttt ctacatgttt gtcttataag 240
gacaaaaacc tgccttagtt tatccatgaa caaagccacg catgctagtg gacacacaca 300
cacatgcgcg tgcgcgcgca cacacacaca cacacacata cacacagaga ctttgtatgt 360
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gaaaagaatc tgctgtcaat catggcttct ggttctcaca gtcattctta ctttcttcca 480
gcaagtttgg ttctgtcaaa aaccagctgt cagccttggt cctgcatgcc caatgcagaa 540
gagtcagtaa agaagatttg gttctctgta tttcaggggc atcaatgcca ggttgaaata 600
tgccattctg gccagctca gtggctcaca cgtgtaatcc cagcactttg gaaggccaaa 660
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aaggaaggaa gggagggagg gaagatgcca ttcttagatt gaagtggact ttatctgggc 900
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aagggttttt cttgttgac ccatggatcc atcaagtga aacattttct aatgcactat 1080
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ctaattctctc tagacaaggt tcatatttgt atgggttact tattctctct ttgttgacta	1440
agtcaataat cagaatcagc aggtttgcag tcagattggc agggataagc agcctagctc	1500
agg	1503

<210> 164
 <211> 1437
 <212> DNA
 <213> artificial sequence

<220>
 <223> Apoa2

<400> 164	
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cttgaacccg ggaggtggag gttgcagtga gccgagatca tgccattacg ctccagcctg	120
agcaacaaga gcaaaaactcc gtctcaggaa aacaaacaaa aaaacctgca catatacttc	180
tgaatttaaa acaaaagtta aaaaacaaag atttcttgggt ctctgggtcac tacctccctc	240
atcagctttg cgcctccact gtcaccctca ggaatgttcc acatactcag cgagtatgct	300
tggggggcaa aagggtgaaa gatacaaaaag cttctgatat ctatttaact gatttcaccc	360
aaatgctttg aacctgggaa tgtacctctc cccctcccc accccaaca ggagtgagac	420
aagggccagg gctattgccc ctgctgactc aatattggct aatcactgcc tagaactgat	480
aaggatgatca aatgaccagg tgccttcaac ctttaccctg gtagaagcct cttattcacc	540
tcttttcctg ccagagccct ccattgggag gggacgggcg gaagctgttt tctgaatttg	600
ttttactggg ggtaggggtat gttcagtgat cagcatccag gtcattctgg gctctcctgt	660
tttctccccg tctcattaca cattaactca aaaacggaca agatcattta cacttgccct	720
cttaccggac cctcattccc ctaaccccca tagccctcaa ccctgtccct gatttcaatt	780
cctttctcct ttcttctgct cccaatatc tctctgcca gttgcagtaa agtgggataa	840

ggttgagaga tgagatctac ccataatgga ataaagacac catgagcttt ccatgggtatg	900
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tcctgcttcc tgttgcactc aagtccaagg acctcagatc tcaaaagaat gaacctcaaa	1020
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gtaaacagac aggtatatag ccccttcctc tccagccagg gcaggcacag acaccaagga	1260
cagagacgct ggctaggtaa gataaggagg caagatgtgt gagcagcatc caaagaggcc	1320
tgggcttcag ttgtggagag ggagagagcc aggttggaaat gggcagcagg tagggagatc	1380
cctggggagg agctgaagcc catttggctt cagtgtcccc caaaccccca ccacct	1437

<210> 165
 <211> 1267
 <212> DNA
 <213> artificial sequence

<220>
 <223> Cyp3a4

<400> 165	
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tgctgtgtga cctgcagtga cactgcccc atcattgctg gctgagggtgg ttgggggtcca	180
tctggctatc tgggcagctg ttctcttctc tcctttctct cctgtttcca gacatgcagt	240
atttccagag agaagggggcc actctttggc aaagaacctg tctaacttgc tatctatggc	300
aggacctttg aagggttcac aggaagcagc acaaattgat actattccac caagccatca	360
gctccatctc atccatgccc tgtctctcct ttaggggtcc ccttgccaac agaatcacag	420
aggaccagcc tgaaaagtga gagacagcag ctgaggcaca gccaaagagct ctggctgtat	480
taatgacctc agaagtcacc agaaagtcag aagggatgac atgcagaggc ccagcaatct	540
cagctaagtc aactccacca gcctttctag ttgcccactg tgtgtacagc accctggtag	600

ggaccagagc catgacaggg aataagacta gactatgccc ttgaggagct cacctctgtt	660
cagggaaaca ggcgtggaaa cacaatgggtg gtaaagagga aagaggacaa taggattgca	720
tgaaggggat ggaaagtgcc caggggagga aatgggttaca tctgtgtgag gagtttggtg	780
aggaaagact ctaagagaag gctctgtctg tctgggtttg gaaggatgtg taggagtctt	840
ctagggggca caggcacact ccaggcatag gtaaagatct gtaggtgtgg cttgttgga	900
tgaatttcaa gtatttttga atgaggacag ccatagagac aagggcagga gagaggcgat	960
ttaatagatt ttatgccaat ggctccactt gagtttctga taagaacca gaacccttgg	1020
actccccagt aacattgatt gagttgttta tgataacctca tagaatatga actcaaagga	1080
ggtcagtgag tgggtgtgtgt gtgattcttt gccaaacttcc aaggtggaga agcctcttcc	1140
aactgcaggc agagcacagg tggccctgct actggctgca gctccagccc tgcctccttc	1200
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ccatgca	1267

<210> 166
 <211> 661
 <212> DNA
 <213> artificial sequence

<220>
 <223> MIR122

<400> 166	
gaatgcatgg ttaactacgt cagaaatgac cagttcaaga ggagaatgag attggcttcc	60
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ctgtgaccgg tgactcttct gtctctagaa atctggggag gtgaccaggt catacatggc	180
agtcttccccg tgaggaacgt taaactgggtt ggaagttggg gttctgaggg gaagatgtat	240
tcactaggtg acctgtcttc tctgcctcgg tggcctccat ggctgcctgc tggccgcaca	300
ccccactca gcagaggaat ggactttcca atcttgctga gtgtgtttga ccaaagggtg	360
tgctgactta gtggcctaag gtcgtgccct ccctcccca ctgaatcgat aaataatgcg	420

acttatcaga aagagaaaga attgtttact tttaaaccct ggatcccata aaggagagg	480
ggagaggcct aaagccacag aagctgtgga aggcgccatc ctgcctgcca caggaagggc	540
cttggactga gaggaccgga gctgactggg ggtaagtgcg gctctcccc ggcgctgcc	600
gacccccctg agtgatcagg ccgttctttg ggggtggccgc tgaccgagaa atgacgggag	660
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<210> 167
 <211> 1299
 <212> DNA
 <213> artificial sequence

<220>
 <223> hemopexin

<400> 167	
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actcctagat ct cattatgc ctactaccat aacctacccc caattcctaa tattctccta	180
ccctagaggg ggggaaattg tcagaaattt ggctgcaaca ctagcaacac tactcagtac	240
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ccaggcacta ttttaggagt cagggatata taatggtaaa caagacaggc aaaacaaagc	360
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gtaaaataaaa acaagcaagg gtctgaaatg gctagataag gtgggtcaaga aaggcttcat	480
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accttatttg cagtgatgta atcagccaat attggcttag tcctgggaga cagcacattc	1260
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<210> 168
 <211> 1594
 <212> DNA
 <213> artificial sequence

<220>
 <223> VEC

<400> 168	
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atggcctcag atgccagcca taagctgttg ggttccaaac ctcgactcca ggctggactc	180
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acactcccct ccaccccaaa cccgccaccc tgcg	1594

<210> 169
 <211> 1731
 <212> DNA
 <213> artificial sequence

<220>
 <223> PAL

<400> 169	
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aagctgacca tcaacgacgt ggccagagtg gcccggaatg gcacactggg gtccctgacc	180
aacaacaccg atatcctgca gggcatccag gccagctgcg actacatcaa caacgccgtg	240
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ggcggagtga ttgtgcaggc tgtgcaagac atcctgcca gcctgcactg a	1731

