

Sequence Listing

<110> GI Innovation, Inc.

<120> FUSION PROTEIN COMPRISING IL-2 PROTEIN AND CD80 PROTEIN AND USE THEREOF

<130> PCB907063GEE

<150> KR 10-2018-0110698
<151> 2018-09-17

<150> KR 10-2019-0001867
<151> 2019-01-07

<150> US 62/832013
<151> 2019-04-10

<150> KR 10-2019-0053436
<151> 2019-05-08

<160> 37

<170> KopatentIn 3.0

<210> 1
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
<223> signal peptide (TPA)

<400> 1
Met Asp Ala Met Leu Arg Gly Leu Cys Cys Val Leu Leu Leu Cys Gly
1 5 10 15
Ala Val Phe Val Ser Pro Ser His Ala
20 25

<210> 2
<211> 208
<212> PRT
<213> Artificial Sequence

<220>
<223> hB7-1:35-242

Sequence Listing

```

<400>      2
Val Ile His Val Thr Lys Glu Val Lys Glu Val Ala Thr Leu Ser Cys
  1              5              10              15

Gly His Asn Val Ser Val Glu Glu Leu Ala Gln Thr Arg Ile Tyr Trp
      20              25              30

Gln Lys Glu Lys Lys Met Val Leu Thr Met Met Ser Gly Asp Met Asn
      35              40              45

Ile Trp Pro Glu Tyr Lys Asn Arg Thr Ile Phe Asp Ile Thr Asn Asn
      50              55              60

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

Glu Cys Val Val Leu Lys Tyr Glu Lys Asp Ala Phe Lys Arg Glu His
      85              90              95

Leu Ala Glu Val Thr Leu Ser Val Lys Ala Asp Phe Pro Thr Pro Ser
      100              105              110

Ile Ser Asp Phe Glu Ile Pro Thr Ser Asn Ile Arg Arg Ile Ile Cys
      115              120              125

Ser Thr Ser Gly Gly Phe Pro Glu Pro His Leu Ser Trp Leu Glu Asn
      130              135              140

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

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

Asn His Ser Phe Met Cys Leu Ile Lys Tyr Gly His Leu Arg Val Asn
      180              185              190

Gln Thr Phe Asn Trp Asn Thr Thr Lys Gln Glu His Phe Pro Asp Asn
      195              200              205

```

```

<210>      3
<211>      30
<212>      PRT
<213>      Artificial Sequence

```

Sequence Listing

<220>

<223> hinge

<400> 3

Gly	Ser	Gly	Gly	Gly	Gly	Ser	Gly	Gly	Gly	Gly	Ser	Gly	Gly	Gly	Gly
1				5				10						15	

Ser	Ala	Glu	Ser	Lys	Tyr	Gly	Pro	Pro	Cys	Pro	Pro	Cys	Pro
			20					25					30

<210> 4

<211> 216

<212> PRT

<213> Artificial Sequence

<220>

<223> immunoglobulin fc

<400> 4

Ala	Pro	Glu	Ala	Ala	Gly	Gly	Pro	Ser	Val	Phe	Leu	Phe	Pro	Pro	Lys
1				5					10					15	

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

Val	Val	Asp	Val	Ser	Gln	Glu	Asp	Pro	Glu	Val	Gln	Phe	Asn	Trp	Tyr
		35					40					45			

Val	Asp	Gly	Val	Glu	Val	His	Asn	Ala	Lys	Thr	Lys	Pro	Arg	Glu	Glu
	50					55					60				

Gln	Phe	Asn	Ser	Thr	Tyr	Arg	Val	Val	Ser	Val	Leu	Thr	Val	Leu	His
65					70					75					80

Gln	Asp	Trp	Leu	Asn	Gly	Lys	Glu	Tyr	Lys	Cys	Lys	Val	Ser	Asn	Lys
				85					90					95	

Gly	Leu	Pro	Ser	Ser	Ile	Glu	Lys	Thr	Ile	Ser	Lys	Ala	Lys	Gly	Gln
			100					105					110		

Pro	Arg	Glu	Pro	Gln	Val	Tyr	Thr	Leu	Pro	Pro	Ser	Gln	Glu	Glu	Met
		115					120					125			

Thr	Lys	Asn	Gln	Val	Ser	Leu	Thr	Cys	Leu	Val	Lys	Gly	Phe	Tyr	Pro
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Sequence Listing

130

135

140

Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn
145 150 155 160

Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Leu
165 170 175

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

Phe Ser Cys Ser Val Leu His Glu Ala Leu His Asn His Tyr Thr Gln
195 200 205

Lys Ser Leu Ser Leu Ser Leu Gly
210 215

<210> 5
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> linker

<400> 5
Gly Gly Gly Gly Ser
1 5

<210> 6
<211> 133
<212> PRT
<213> Artificial Sequence

<220>
<223> hIL-2M

<400> 6
Ala Pro Thr Ser Ser Ser Thr Lys Lys Thr Gln Leu Gln Leu Glu His
1 5 10 15

Leu Leu Leu Asp Leu Gln Met Ile Leu Asn Gly Ile Asn Asn Tyr Lys
20 25 30

Sequence Listing

Asn Pro Lys Leu Thr Ala Met Leu Thr Ala Lys Phe Tyr Met Pro Lys
 35 40 45

Lys Ala Thr Glu Leu Lys His Leu Gln Cys Leu Glu Glu Leu Lys
 50 55 60

Pro Leu Glu Glu Val Leu Asn Leu Ala Gln Ser Lys Asn Phe His Leu
 65 70 75 80

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

Lys Gly Ser Glu Thr Thr Phe Met Cys Glu Tyr Ala Asp Glu Thr Ala
 100 105 110

Thr Ile Val Glu Phe Leu Asn Arg Trp Ile Thr Phe Cys Gln Ser Ile
 115 120 125

Ile Ser Thr Leu Thr
 130

<210> 7
 <211> 617
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> fusion protein comprising variants of IL-2 and fragments of CD80

<400> 7
 Met Asp Ala Met Leu Arg Gly Leu Cys Cys Val Leu Leu Leu Cys Gly
 1 5 10 15

Ala Val Phe Val Ser Pro Ser His Ala Val Ile His Val Thr Lys Glu
 20 25 30

Val Lys Glu Val Ala Thr Leu Ser Cys Gly His Asn Val Ser Val Glu
 35 40 45

Glu Leu Ala Gln Thr Arg Ile Tyr Trp Gln Lys Glu Lys Lys Met Val
 50 55 60

Leu Thr Met Met Ser Gly Asp Met Asn Ile Trp Pro Glu Tyr Lys Asn
 65 70 75 80

Arg Thr Ile Phe Asp Ile Thr Asn Asn Leu Ser Ile Val Ile Leu Ala

Sequence Listing

85

90

95

Leu Arg Pro Ser Asp Glu Gly Thr Tyr Glu Cys Val Val Leu Lys Tyr
100 105 110

Glu Lys Asp Ala Phe Lys Arg Glu His Leu Ala Glu Val Thr Leu Ser
115 120 125

Val Lys Ala Asp Phe Pro Thr Pro Ser Ile Ser Asp Phe Glu Ile Pro
130 135 140

Thr Ser Asn Ile Arg Arg Ile Ile Cys Ser Thr Ser Gly Gly Phe Pro
145 150 155 160

Glu Pro His Leu Ser Trp Leu Glu Asn Gly Glu Glu Leu Asn Ala Ile
165 170 175

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

Ser Lys Leu Asp Phe Asn Met Thr Thr Asn His Ser Phe Met Cys Leu
195 200 205

Ile Lys Tyr Gly His Leu Arg Val Asn Gln Thr Phe Asn Trp Asn Thr
210 215 220

Thr Lys Gln Glu His Phe Pro Asp Asn Gly Ser Gly Gly Gly Gly Ser
225 230 235 240

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Ala Glu Ser Lys Tyr Gly
245 250 255

Pro Pro Cys Pro Pro Cys Pro Ala Pro Glu Ala Ala Gly Gly Pro Ser
260 265 270

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

Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser Gln Glu Asp Pro
290 295 300

Glu Val Gln Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala
305 310 315 320

Lys Thr Lys Pro Arg Glu Glu Gln Phe Asn Ser Thr Tyr Arg Val Val
325 330 335

Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr

Sequence Listing

340		345		350
Lys Cys Lys Val Ser Asn Lys Gly Leu Pro Ser Ser Ile Glu Lys Thr	355	360		365
Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu	370	375		380
Pro Pro Ser Gln Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys	385	390		395
Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser		405		410
Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp	420			425
Ser Asp Gly Ser Phe Phe Leu Tyr Ser Arg Leu Thr Val Asp Lys Ser	435	440		445
Arg Trp Gln Glu Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala	450	455		460
Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Leu Gly Gly	465	470		475
Gly Gly Gly Ser Ala Pro Thr Ser Ser Ser Thr Lys Lys Thr Gln Leu		485		490
Gln Leu Glu His Leu Leu Leu Asp Leu Gln Met Ile Leu Asn Gly Ile	500	505		510
Asn Asn Tyr Lys Asn Pro Lys Leu Thr Ala Met Leu Thr Ala Lys Phe	515	520		525
Tyr Met Pro Lys Lys Ala Thr Glu Leu Lys His Leu Gln Cys Leu Glu	530	535		540
Glu Glu Leu Lys Pro Leu Glu Glu Val Leu Asn Leu Ala Gln Ser Lys	545	550		555
Asn Phe His Leu Arg Pro Arg Asp Leu Ile Ser Asn Ile Asn Val Ile	565	570		575
Val Leu Glu Leu Lys Gly Ser Glu Thr Thr Phe Met Cys Glu Tyr Ala	580	585		590
Asp Glu Thr Ala Thr Ile Val Glu Phe Leu Asn Arg Trp Ile Thr Phe				

Sequence Listing

595

600

605

Cys Gln Ser Ile Ile Ser Thr Leu Thr
610 615

<210> 8
<211> 1857
<212> DNA
<213> Artificial Sequence

<220>
<223> nucleotides coding fusion protein (GI101)

<400> 8
atggatgcta tgctgagagg cctgtgttgc gtgctgctgc tgtgtggcgc tgtgttcgtg 60
tctccttctc acgctgtgat ccacgtgacc aaagaagtga aagaggctgc cacactgtcc 120
tgcggccaca acgtttcagt ggaagaactg gccagacca ggatctactg gcagaaagaa 180
aagaaaatgg tgctgaccat gatgtccggc gacatgaaca tctggcctga gtacaagaac 240
cggaccatct tcgacatcac caacaacctg tccatcgtga ttctggccct gaggccttct 300
gatgagggca cctatgagtg cgtggtgctg aagtacgaga aggacgcctt caagcgcgag 360
cacctggctg aagtgacact gtccgtgaag gccgactttc ccacaccttc catctccgac 420
ttcgagatcc ctacctcaa catccggcgg atcatctgtt ctacctctgg cggctttcct 480
gagcctcacc tgtcttggct ggaaaacggc gaggaactga acgccatcaa caccaccgtg 540
tctcaggacc ccgaaaccga gctgtacgct gtgtcctcca agctggactt caacatgacc 600
accaaccaca gcttcatgtg cctgattaag tacggccacc tgagagtga ccagaccttc 660
aactggaaca ccaccaagca agagcacttc cctgacaatg gatctggcgg cggagggttct 720
ggcggagggtg gaagcggagg cggaggatct gctgagtcta agtatggccc tccttgtcct 780
ccatgtcctg ctccagaagc tgctggcggg ccctctgtgt tcctgtttcc tccaaagcct 840
aaggaccagc tcatgatctc tcggacaccc gaagtgacct gcgtgggtgt ggatgtgtct 900
caagaggacc ctgagggtgca gttcaattgg tacgtggacg gcgtggaagt gcacaacgcc 960

Sequence Listing

```

aagaccaagc ctagagagga acagttcaac tccacctaca gagtggtgtc cgtgctgacc      1020
gtgctgcacc aggattggct gaacggcaaa gagtacaagt gcaagggtgtc caacaagggc      1080
ctgccttcca gcatcgaaaa gaccatctcc aaggctaagg gccagcctag ggaaccccag      1140
gtttacaccc tgcctccaag ccaagaggaa atgaccaaga accagggtgtc cctgacctgc      1200
ctgggtcaagg gcttctaccc ttccgacatt gccgtggaat gggagtccaa tggccagcct      1260
gagaacaact acaagaccac acctcctgtg ctggactccg acggctcctt ctttctgtac      1320
tctcgctga ccgtggacaa gtctagatgg caagagggca acgtgttctc ctgctctgtg      1380
ctgcacgagg ccctgcacaa tcactacacc cagaagtccc tgtctctgtc tcttgagggt      1440
ggtggcgggt ctgcccctac cagctcctct accaagaaaa cccagctcca gttggagcat      1500
ctgctgctgg acctccagat gattctgaac gggatcaaca actataagaa cccaagctg      1560
accgccatgc tgaccgctaa gttctacatg cccaagaagg ccaccgagct gaagcacctc      1620
cagtgcctgg aagaagaact gaagcccctg gaagagggtgc tgaatctggc ccagtccaag      1680
aacttccacc tgaggccacg ggacctgatc agcaacatca acgtgatcgt gctggaactg      1740
aagggtctcc agacaacctt tatgtgcgag tacgccgacg agacagccac catcgtggaa      1800
tttctgaacc ggtggatcac cttctgccag agcatcatct ccacactgac ctgatga      1857

```

```

<210>      9
<211>     592
<212>      PRT
<213>      Artificial Sequence

```

```

<220>
<223>      fusion protein (GI101)

```

```

<400>      9
Val Ile His Val Thr Lys Glu Val Lys Glu Val Ala Thr Leu Ser Cys
  1             5             10            15

Gly His Asn Val Ser Val Glu Glu Leu Ala Gln Thr Arg Ile Tyr Trp
      20             25             30

Gln Lys Glu Lys Lys Met Val Leu Thr Met Met Ser Gly Asp Met Asn

```

Sequence Listing

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

Sequence Listing

290

295

300

Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp
305 310 315 320

Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Gly Leu
325 330 335

Pro Ser Ser Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg
340 345 350

Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Gln Glu Glu Met Thr Lys
355 360 365

Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp
370 375 380

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

Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser
405 410 415

Arg Leu Thr Val Asp Lys Ser Arg Trp Gln Glu Gly Asn Val Phe Ser
420 425 430

Cys Ser Val Leu His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser
435 440 445

Leu Ser Leu Ser Leu Gly Gly Gly Gly Gly Ser Ala Pro Thr Ser Ser
450 455 460

Ser Thr Lys Lys Thr Gln Leu Gln Leu Glu His Leu Leu Leu Asp Leu
465 470 475 480

Gln Met Ile Leu Asn Gly Ile Asn Asn Tyr Lys Asn Pro Lys Leu Thr
485 490 495

Ala Met Leu Thr Ala Lys Phe Tyr Met Pro Lys Lys Ala Thr Glu Leu
500 505 510

Lys His Leu Gln Cys Leu Glu Glu Glu Leu Lys Pro Leu Glu Glu Val
515 520 525

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

Ile Ser Asn Ile Asn Val Ile Val Leu Glu Leu Lys Gly Ser Glu Thr

sequence ending

545 550 555 560

Leu Asn Arg Trp Ile Thr Phe Cys Gln Ser Ile Ile Ser Thr Leu Thr
580 585 590

$\langle 210 \rangle$	10
$\langle 211 \rangle$	133
$\langle 212 \rangle$	PRT
$\langle 213 \rangle$	Artificial Sequence

<220>
<223> hIL-2

<400> 10
Ala Pro Thr Ser Ser Ser Thr Lys Lys Thr Gln Leu Gln Leu Glu His
1 5 10 15

Leu Leu Leu Asp Leu Gln Met Ile Leu Asn Gly Ile Asn Asn Tyr Lys
20 25 30

Asn Pro Lys Leu Thr Arg Met Leu Thr Phe Lys Phe Tyr Met Pro Lys
35 40 45

Lys Ala Thr Glu Leu Lys His Leu Gln Cys Leu Glu Glu Glu Leu Lys
50 55 60

Pro Leu Glu Glu Val Leu Asn Leu Ala Gln Ser Lys Asn Phe His Leu
65 70 75 80

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

Lys Gly Ser Glu Thr Thr Phe Met Cys Glu Tyr Ala Asp Glu Thr Ala
100 105 110

Thr Ile Val Glu Phe Leu Asn Arg Trp Ile Thr Phe Cys Gln Ser Ile
115 120 125

Ile Ser Thr Leu Thr
130

Sequence Listing

<210> 11
 <211> 288
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> CD80

<400> 11
 Met Gly His Thr Arg Arg Gln Gly Thr Ser Pro Ser Lys Cys Pro Tyr
 1 5 10 15
 Leu Asn Phe Phe Gln Leu Leu Val Leu Ala Gly Leu Ser His Phe Cys
 20 25 30
 Ser Gly Val Ile His Val Thr Lys Glu Val Lys Glu Val Ala Thr Leu
 35 40 45
 Ser Cys Gly His Asn Val Ser Val Glu Glu Leu Ala Gln Thr Arg Ile
 50 55 60
 Tyr Trp Gln Lys Glu Lys Lys Met Val Leu Thr Met Met Ser Gly Asp
 65 70 75 80
 Met Asn Ile Trp Pro Glu Tyr Lys Asn Arg Thr Ile Phe Asp Ile Thr
 85 90 95
 Asn Asn Leu Ser Ile Val Ile Leu Ala Leu Arg Pro Ser Asp Glu Gly
 100 105 110
 Thr Tyr Glu Cys Val Val Leu Lys Tyr Glu Lys Asp Ala Phe Lys Arg
 115 120 125
 Glu His Leu Ala Glu Val Thr Leu Ser Val Lys Ala Asp Phe Pro Thr
 130 135 140
 Pro Ser Ile Ser Asp Phe Glu Ile Pro Thr Ser Asn Ile Arg Arg Ile
 145 150 155 160
 Ile Cys Ser Thr Ser Gly Gly Phe Pro Glu Pro His Leu Ser Trp Leu
 165 170 175
 Glu Asn Gly Glu Glu Leu Asn Ala Ile Asn Thr Thr Val Ser Gln Asp
 180 185 190
 Pro Glu Thr Glu Leu Tyr Ala Val Ser Ser Lys Leu Asp Phe Asn Met

Sequence Listing

195

200

205

Thr Thr Asn His Ser Phe Met Cys Leu Ile Lys Tyr Gly His Leu Arg
210 215 220

Val Asn Gln Thr Phe Asn Trp Asn Thr Thr Lys Gln Glu His Phe Pro
225 230 235 240

Asp Asn Leu Leu Pro Ser Trp Ala Ile Thr Leu Ile Ser Val Asn Gly
245 250 255

Ile Phe Val Ile Cys Cys Leu Thr Tyr Cys Phe Ala Pro Arg Cys Arg
260 265 270

Glu Arg Arg Arg Asn Glu Arg Leu Arg Arg Glu Ser Val Arg Pro Val
275 280 285

<210> 12
<211> 215
<212> PRT
<213> Artificial Sequence

<220>
<223> modified Fc

<400> 12
Ser His Thr Gln Pro Leu Gly Val Phe Leu Phe Pro Pro Lys Pro Lys
1 5 10 15

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

Asp Val Ser Gln Glu Asp Pro Glu Val Gln Phe Asn Trp Tyr Val Asp
35 40 45

Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Phe
50 55 60

Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp
65 70 75 80

Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Gly Leu
85 90 95

Sequence Listing

Pro Ser Ser Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg
100 105 110

Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Gln Glu Glu Met Thr Lys
115 120 125

Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp
130 135 140

Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys
145 150 155 160

Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser
165 170 175

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

Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser
195 200 205

Leu Ser Leu Ser Leu Gly Lys
210 215

<210> 13
<211> 306
<212> PRT
<213> Artificial Sequence

<220>
<223> mCD80

<400> 13
Met Ala Cys Asn Cys Gln Leu Met Gln Asp Thr Pro Leu Leu Lys Phe
1 5 10 15

Pro Cys Pro Arg Leu Ile Leu Leu Phe Val Leu Leu Ile Arg Leu Ser
20 25 30

Gln Val Ser Ser Asp Val Asp Glu Gln Leu Ser Lys Ser Val Lys Asp
35 40 45

Lys Val Leu Leu Pro Cys Arg Tyr Asn Ser Pro His Glu Asp Glu Ser
50 55 60

Glu Asp Arg Ile Tyr Trp Gln Lys His Asp Lys Val Val Leu Ser Val

65 70 75 80

Page 16

Sequence Listing

<210> 14
 <211> 1848
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> nucleotides coding fusion protein (mGI101)

<400> 14
 atggatgcta tgctgagagg cctgtgttgc gtgctgctgc tgtgtggcgc tgtgttcgtg 60
 tctccttctc acgctgtgga cgagcagctc tccaagtccg tgaaggataa ggtcctgctg 120
 ccttgccggg acaactctcc tcacgaggac gagtctgagg accggatcta ctggcagaaa 180
 cacgacaagg tgggtgctgtc cgtgatcgcc ggaaaagctga aagtgtggcc tgagtacaag 240
 aacaggaccc tgtacgacaa caccacctac agcctgatca tcctgggcct cgtgctgagc 300
 gatagaggca cctattcttg cgtgggtgcag aagaaagagc ggggcaccta cgaagtgaag 360
 cacctggctc tgggtcaagct gtccatcaag gccgacttca gcacccctaa catcaccgag 420
 tctggcaacc cttccgccga caccaagaga atcacctgtt tcgcctctgg cggcttccct 480
 aagcctcggg tctcttggct ggaaaacggc agagagctgc ccggcatcaa taccaccatt 540
 tctcaggacc cagagtccga gctgtacacc atctccagcc agctcgactt taacaccacc 600
 agaaaccaca ccatcaagtg cctgattaag tacggcgacg cccacgtgtc cgaggacttt 660
 acttgggaga aacctcctga ggaccctcct gactctggat ctggcggcgg aggttctggc 720
 ggaggtggaa gcggaggcgg aggatctgct gagtctaagt atggccctcc ttgtcctcca 780
 tgtcctgctc cagaagctgc tggcggaccc tctgtgttcc tgtttcctcc aaagcctaag 840
 gaccagctca tgatctctcg gacccctgaa gtgacctgcg tgggtggtgga tgtgtctcaa 900
 gaggaccctg aggtgcagtt caattggtac gtggacggcg tggaagtgca caacgccaag 960
 accaagccta gagaggaaca gttcaactcc acctatagag tgggtgtccgt gctgaccgtg 1020
 ctgcaccagg attggctgaa cggcaaagag tacaagtgca aggtgtccaa caagggcctg 1080
 cttccagca tcgaaaagac catcagcaag gctaagggcc agcctaggga accccaggtt 1140

Sequence Listing

```

tacaccctgc ctccaagcca agaggaaatg accaagaacc aggtgtccct gacctgcctg      1200
gtcaaggggt tctacccttc cgacattgcc gtggaatggg agtccaatgg ccagcctgag      1260
aacaactaca agaccacacc tcctgtgctg gactccgacg gctccttctt tctgtactct      1320
cgcctgaccg tggacaagtc taggtggcaa gagggcaacg tgttctcctg ctctgtgctg      1380
cacgaggctc tgcacaacca ctaccccag aagtccctgt ctctgtctct tggagggtgt      1440
ggcggttctg cccctacctc cagctctacc aagaaaaccc agctccagtt ggagcatctg      1500
ctgctggacc tccagatgat cctgaatggc atcaacaatt acaagaaccc caagctgacc      1560
gccatgctga ccgctaagtt ctacatgccc aagaaggcca ccgagctgaa gcacttgacg      1620
tgcctggaag aggaactgaa gcccctggaa gaagtgctga atctggccca gtccaagaac      1680
ttccacctga ggcctaggga cctgatctcc aacatcaacg tgatcgtgct ggaactgaaa      1740
ggctccgaga caaccttcat gtgcgagtac gccgacgaga cagccaccat cgtggaattt      1800
ctgaaccggg ggatcacctt ctgccagagc atcatctcca cactgacc      1848

```

```

<210>      15
<211>      616
<212>      PRT
<213>      Artificial Sequence

<220>
<223>      fusion protein (mGI101)

```

```

<400>      15
Met Asp Ala Met Leu Arg Gly Leu Cys Cys Val Leu Leu Leu Cys Gly
  1              5              10              15

Ala Val Phe Val Ser Pro Ser His Ala Val Asp Glu Gln Leu Ser Lys
      20              25              30

Ser Val Lys Asp Lys Val Leu Leu Pro Cys Arg Tyr Asn Ser Pro His
      35              40              45

Glu Asp Glu Ser Glu Asp Arg Ile Tyr Trp Gln Lys His Asp Lys Val
      50              55              60

Val Leu Ser Val Ile Ala Gly Lys Leu Lys Val Trp Pro Glu Tyr Lys

```

Sequence Listing

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

Sequence Listing

				325						330						335
Val	Leu	Thr	Val	Leu	His	Gln	Asp	Trp	Leu	Asn	Gly	Lys	Glu	Tyr	Lys	
			340					345					350			
Cys	Lys	Val	Ser	Asn	Lys	Gly	Leu	Pro	Ser	Ser	Ile	Glu	Lys	Thr	Ile	
		355					360					365				
Ser	Lys	Ala	Lys	Gly	Gln	Pro	Arg	Glu	Pro	Gln	Val	Tyr	Thr	Leu	Pro	
	370					375					380					
Pro	Ser	Gln	Glu	Glu	Met	Thr	Lys	Asn	Gln	Val	Ser	Leu	Thr	Cys	Leu	
385					390					395					400	
Val	Lys	Gly	Phe	Tyr	Pro	Ser	Asp	Ile	Ala	Val	Glu	Trp	Glu	Ser	Asn	
			405						410						415	
Gly	Gln	Pro	Glu	Asn	Asn	Tyr	Lys	Thr	Thr	Pro	Pro	Val	Leu	Asp	Ser	
			420					425					430			
Asp	Gly	Ser	Phe	Phe	Leu	Tyr	Ser	Arg	Leu	Thr	Val	Asp	Lys	Ser	Arg	
	435						440					445				
Trp	Gln	Glu	Gly	Asn	Val	Phe	Ser	Cys	Ser	Val	Leu	His	Glu	Ala	Leu	
	450					455					460					
His	Asn	His	Tyr	Thr	Gln	Lys	Ser	Leu	Ser	Leu	Ser	Leu	Gly	Gly	Gly	
465					470					475					480	
Gly	Gly	Ser	Ala	Pro	Thr	Ser	Ser	Ser	Thr	Lys	Lys	Thr	Gln	Leu	Gln	
			485						490					495		
Leu	Glu	His	Leu	Leu	Leu	Asp	Leu	Gln	Met	Ile	Leu	Asn	Gly	Ile	Asn	
			500					505					510			
Asn	Tyr	Lys	Asn	Pro	Lys	Leu	Thr	Ala	Met	Leu	Thr	Ala	Lys	Phe	Tyr	
	515						520					525				
Met	Pro	Lys	Lys	Ala	Thr	Glu	Leu	Lys	His	Leu	Gln	Cys	Leu	Glu	Glu	
	530					535					540					
Glu	Leu	Lys	Pro	Leu	Glu	Glu	Val	Leu	Asn	Leu	Ala	Gln	Ser	Lys	Asn	
545					550				555						560	
Phe	His	Leu	Arg	Pro	Arg	Asp	Leu	Ile	Ser	Asn	Ile	Asn	Val	Ile	Val	
			565					570						575		
Leu	Glu	Leu	Lys	Gly	Ser	Glu	Thr	Thr	Phe	Met	Cys	Glu	Tyr	Ala	Asp	

Sequence Listing

580

585

590

Glu Thr Ala Thr Ile Val Glu Phe Leu Asn Arg Trp Ile Thr Phe Cys
595 600 605

Gln Ser Ile Ile Ser Thr Leu Thr
610 615

<210> 16
<211> 1437
<212> DNA
<213> Artificial Sequence

<220>
<223> nucleotides coding fusion protein (GI101C1)

<400> 16
atggatgcta tgctgagagg cctgtgttgc gtgctgctgc tgtgtggcgc tgtgttcgtg 60
tctccttctc acgctgtgat ccacgtgacc aaagaagtga aagaggctgc cactctgtcc 120
tgcgccaca acgtttcagt ggaagaactg gccagacca ggatctactg gcagaaagaa 180
aagaaaatgg tgctgaccat gatgtccggc gacatgaaca tctggcctga gtacaagaac 240
cggaccatct tcgacatcac caacaacctg tccatcgtga ttctggccct gaggccttct 300
gatgagggca cctatgagtg cgtggtgctg aagtacgaga aggacgcctt caagcgcgag 360
cacctggctg aagtgacact gtccgtgaag gccgactttc ccacaccttc catctccgac 420
ttcgagatcc ctacctcaa catccggcgg atcatctgtt ctacctctgg cggctttcct 480
gagcctcacc tgtcttggct ggaaaacggc gaggaactga acgcatcaa caccaccgtg 540
tctcaggacc ccgaaaccga gctgtacgct gtgtcctcca agctggactt caacatgacc 600
accaaccaca gcttcatgtg cctgattaag tacggccacc tgagagtga ccagaccttc 660
aactggaaca ccaccaagca agagcacttc cctgacaatg gatctggcgg cggaggttct 720
ggcggagggtg gaagcggagg cggaggatct gctgagtcta agtatggccc tccttgcct 780
ccatgtcctg ctccagaagc tgctggcgga ccctctgtgt tcctgtttcc tccaaagcct 840
aaggaccagc tcatgatctc tcggacaccc gaagtgacct gcgtgggtgg ggatgtgtct 900

Sequence Listing

```

caagaggacc ctgagggtgca gttcaattgg tacgtggacg gcgtggaagt gcacaacgcc      960
aagaccaagc ctagagagga acagttcaac tccacctaca gagtggtgtc cgtgctgacc      1020
gtgctgcacc aggattggct gaacggcaaa gagtacaagt gcaagggtgtc caacaagggc      1080
ctgccttcca gcatcgaaaa gaccatctcc aaggctaagg gccagcctag ggaaccccag      1140
gtttacaccc tgcctccaag ccaagaggaa atgaccaaga accaggtgtc cctgacctgc      1200
ctgggtcaagg gcttctaccc ttccgacatt gccgtggaat gggagtccaa tggccagcct      1260
gagaacaact acaagaccac acctcctgtg ctggactccg acggctcctt ctttctgtac      1320
tctcgctga ccgtggacaa gtctaggtgg caagagggca acgtgttctc ctgctctgtg      1380
ctgcacgagg ccctgcacaa tcactacacc cagaagtccc tgtctctgtc cctgggc      1437

```

```

<210>      17
<211>      454
<212>      PRT
<213>      Artificial Sequence

```

```

<220>
<223>      fusion protein (GI101C1)

```

```

<400>      17
Val Ile His Val Thr Lys Glu Val Lys Glu Val Ala Thr Leu Ser Cys
  1               5               10               15

Gly His Asn Val Ser Val Glu Glu Leu Ala Gln Thr Arg Ile Tyr Trp
      20               25               30

Gln Lys Glu Lys Lys Met Val Leu Thr Met Met Ser Gly Asp Met Asn
      35               40               45

Ile Trp Pro Glu Tyr Lys Asn Arg Thr Ile Phe Asp Ile Thr Asn Asn
      50               55               60

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

Glu Cys Val Val Leu Lys Tyr Glu Lys Asp Ala Phe Lys Arg Glu His
      85               90               95

```

Sequence Listing

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

Sequence Listing

Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Gln Glu Glu Met Thr Lys
355 360 365

Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp
370 375 380

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

Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser
405 410 415

Arg Leu Thr Val Asp Lys Ser Arg Trp Gln Glu Gly Asn Val Phe Ser
420 425 430

Cys Ser Val Leu His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser
435 440 445

Leu Ser Leu Ser Leu Gly
450

<210> 18
<211> 1176
<212> DNA
<213> Artificial Sequence

<220>
<223> nucleotides coding fusion protein (GI101C2)

<400> 18
atggatgcta tgctgagagg cctgtgttgc gtgctgctgc tgtgtggcgc tgtgttcgtg 60
tctccatctc acgccgctga gtctaagtac ggccctcctt gtcctccatg tcctgctcca 120
gaagctgctg gcggaccctc tgtgttcctg tttcctccaa agcctaagga ccagctcatg 180
atctctcgga cccctgaagt gacctgcgtg gtggtggatg tgtctcaaga ggaccctgag 240
gtgcagttca attggtacgt ggacggcgtg gaagtgcaca acgccaagac caagcctaga 300
gaggaacagt tcaactccac ctacagagtg gtgtccgtgc tgaccgtgct gcaccaggat 360
tggctgaacg gcaaagagta caagtgaag gtgtccaaca agggcctgcc ttccagcatc 420
gaaaagacca tctccaaggc taagggccag cctagggaac cccagggtta caccctgcct 480

Sequence Listing

```

ccaagccaag aggaaatgac caagaaccag gtgtccctga cctgcctggt caagggcttc      540
tacccttccg acattgccgt ggaatgggag tccaatggcc agcctgagaa caactacaag      600
accacacctc ctgtgctgga ctccgacggc tccttctttc tgtactctcg cctgaccgtg      660
gacaagtcta ggtggcaaga gggcaacgtg ttctcctgct ctgtgctgca cgaggccctg      720
cacaatcact acaccagaa gtccctgtct ctgtctcttg gcggaggcgg aggatctgct      780
cctacctcca gctccacca gaaaaccag ctccagttgg agcatctgct gctggacctc      840
cagatgatcc tgaatggcat caacaattac aagaaccca agctgaccgc catgctgacc      900
gctaagttct acatgccccaa gaaggccacc gagctgaagc acctccagtg cctggaagag      960
gaactgaagc ccctggaaga agtgctgaat ctggcccagt ccaagaactt ccacctgagg     1020
cctagggacc tgatctccaa catcaacgtg atcgtgctgg aactgaaagg ctccgagaca     1080
accttcatgt gcgagtacgc cgacgagaca gccaccatcg tggaatttct gaaccggtgg     1140
atcaccttct gccagtccat catctccaca ctgacc                                1176

```

```

<210>      19
<211>      367
<212>      PRT
<213>      Artificial Sequence

<220>
<223>      fusion protein (GI101C2)

```

```

<400>      19
Ala Glu Ser Lys Tyr Gly Pro Pro Cys Pro Pro Cys Pro Ala Pro Glu
  1             5             10             15

Ala Ala Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp
      20             25             30

Gln Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp
      35             40             45

Val Ser Gln Glu Asp Pro Glu Val Gln Phe Asn Trp Tyr Val Asp Gly
      50             55             60

Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Phe Asn

```

Sequence Listing

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

Sequence Listing

325

330

335

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

Asn Arg Trp Ile Thr Phe Cys Gln Ser Ile Ile Ser Thr Leu Thr
355 360 365

<210> 20
<211> 1434
<212> DNA
<213> Artificial Sequence

<220>
<223> nucleotides coding fusion protein (mGI101C1)

<400> 20
atggatgcta tgctgagagg cctgtgttgc gtgctgctgc tgtgtggcgc tgtgttcgtg 60
tctccttctc acgctgtgga cgagcagctc tccaagtccg tgaaggataa ggtcctgctg 120
ccttgccggt acaactctcc tcacgaggac gagtctgagg accggatcta ctggcagaaa 180
cacgacaagg tgggtgctgtc cgtgatcgcc ggaaagctga aagtgtggcc tgagtacaag 240
aacaggaccc tgtacgacaa caccacctac agcctgatca tcctgggcct cgtgctgagc 300
gatagaggca cctattcttg cgtgggtgcag aagaaagagc ggggcaccta cgaagtgaag 360
cacctggctc tgggtcaagct gtccatcaag gccgacttca gcacccctaa catcaccgag 420
tctggcaacc cttccgccga caccaagaga atcacctgtt tcgcctctgg cggcttcctt 480
aagcctcggg tctcttgggt ggaaaacggc agagagctgc ccggcatcaa taccaccatt 540
tctcaggacc cagagtccga gctgtacacc atctccagcc agctcgactt taacaccacc 600
agaaaccaca ccatcaagtg cctgattaag tacggcgacg cccacgtgtc cgaggacttt 660
acttgggaga aacctcctga ggaccctcct gactctggat ctggcggcgg aggttctggc 720
ggaggtggaa gcggaggcgg aggatctgct gagtctaagt atggccctcc ttgtcctcca 780
tgtcctgctc cagaagctgc tggcggaccc tctgtgttcc tgtttctctc aaagcctaag 840

Sequence Listing

gaccagctca tgatctctcg gacccctgaa gtgacctgcg tgggtggtgga tgtgtctcaa 900
gaggaccctg aggtgcagtt caattggtac gtggacggcg tggaaagtga caacgccaaag 960
accaagccta gagaggaaca gttcaactcc acctatagag tgggtgtccgt gctgaccgtg 1020
ctgcaccagg attggctgaa cggcaaagag tacaagtga aggtgtccaa caagggcctg 1080
ccttccagca tcgaaaagac catcagcaag gctaagggcc agcctaggga accccaggtt 1140
tacaccctgc ctccaagcca agaggaaatg accaagaacc aggtgtccct gacctgcctg 1200
gtcaagggtc tctacccttc cgacattgcc gtggaatggg agtccaatgg ccagcctgag 1260
aacaactaca agaccacacc tcctgtgctg gactccgacg gtccttctt tctgtactct 1320
cgcctgaccg tggacaagtc taggtggcaa gagggcaacg tggttctcctg ctctgtgctg 1380
cacgaggctc tgcacaacca ctacaccag aagtcctgt ctctgtccct gggc 1434

<210> 21
<211> 478
<212> PRT
<213> Artificial Sequence

<220>
<223> fusion protein (mGI101C1)

<400> 21
Met Asp Ala Met Leu Arg Gly Leu Cys Cys Val Leu Leu Leu Cys Gly
1 5 10 15
Ala Val Phe Val Ser Pro Ser His Ala Val Asp Glu Gln Leu Ser Lys
20 25 30
Ser Val Lys Asp Lys Val Leu Leu Pro Cys Arg Tyr Asn Ser Pro His
35 40 45
Glu Asp Glu Ser Glu Asp Arg Ile Tyr Trp Gln Lys His Asp Lys Val
50 55 60
Val Leu Ser Val Ile Ala Gly Lys Leu Lys Val Trp Pro Glu Tyr Lys
65 70 75 80
Asn Arg Thr Leu Tyr Asp Asn Thr Thr Tyr Ser Leu Ile Ile Leu Gly

Sequence Listing

85

90

95

Leu Val Leu Ser Asp Arg Gly Thr Tyr Ser Cys Val Val Gln Lys Lys
100 105 110

Glu Arg Gly Thr Tyr Glu Val Lys His Leu Ala Leu Val Lys Leu Ser
115 120 125

Ile Lys Ala Asp Phe Ser Thr Pro Asn Ile Thr Glu Ser Gly Asn Pro
130 135 140

Ser Ala Asp Thr Lys Arg Ile Thr Cys Phe Ala Ser Gly Gly Phe Pro
145 150 155 160

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

Asn Thr Thr Ile Ser Gln Asp Pro Glu Ser Glu Leu Tyr Thr Ile Ser
180 185 190

Ser Gln Leu Asp Phe Asn Thr Thr Arg Asn His Thr Ile Lys Cys Leu
195 200 205

Ile Lys Tyr Gly Asp Ala His Val Ser Glu Asp Phe Thr Trp Glu Lys
210 215 220

Pro Pro Glu Asp Pro Pro Asp Ser Gly Ser Gly Gly Gly Gly Ser Gly
225 230 235 240

Gly Gly Gly Ser Gly Gly Gly Gly Ser Ala Glu Ser Lys Tyr Gly Pro
245 250 255

Pro Cys Pro Pro Cys Pro Ala Pro Glu Ala Ala Gly Gly Pro Ser Val
260 265 270

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

Pro Glu Val Thr Cys Val Val Val Asp Val Ser Gln Glu Asp Pro Glu
290 295 300

Val Gln Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys
305 310 315 320

Thr Lys Pro Arg Glu Glu Gln Phe Asn Ser Thr Tyr Arg Val Val Ser
325 330 335

Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys

Sequence Listing

340

345

350

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

Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro
370 375 380

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

Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn
405 410 415

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

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

Trp Gln Glu Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu
450 455 460

His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Leu Gly
465 470 475

<210> 22

<211> 133

<212> PRT

<213> Artificial Sequence

<220>

<223> variants of IL-2 (3M, M45)

<400> 22

Ala Pro Thr Ser Ser Ser Thr Lys Lys Thr Gln Leu Gln Leu Glu His
1 5 10 15

Leu Leu Leu Asp Leu Gln Met Ile Leu Asn Gly Ile Asn Asn Tyr Lys
20 25 30

Asn Pro Lys Leu Thr Ala Met Leu Thr Ala Lys Phe Ala Met Pro Lys
35 40 45

Lys Ala Thr Glu Leu Lys His Leu Gln Cys Leu Glu Glu Glu Leu Lys
50 55 60

Sequence Listing

Pro Leu Glu Glu Val Leu Asn Leu Ala Gln Ser Lys Asn Phe His Leu
65 70 75 80

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

Lys Gly Ser Glu Thr Thr Phe Met Cys Glu Tyr Ala Asp Glu Thr Ala
100 105 110

Thr Ile Val Glu Phe Leu Asn Arg Trp Ile Thr Phe Cys Gln Ser Ile
115 120 125

Ile Ser Thr Leu Thr
130

<210> 23
<211> 133
<212> PRT
<213> Artificial Sequence

<220>
<223> variants of IL-2 (3M, M61)

<400> 23
Ala Pro Thr Ser Ser Ser Thr Lys Lys Thr Gln Leu Gln Leu Glu His
1 5 10 15

Leu Leu Leu Asp Leu Gln Met Ile Leu Asn Gly Ile Asn Asn Tyr Lys
20 25 30

Asn Pro Lys Leu Thr Ala Met Leu Thr Ala Lys Phe Tyr Met Pro Lys
35 40 45

Lys Ala Thr Glu Leu Lys His Leu Gln Cys Leu Glu Arg Glu Leu Lys
50 55 60

Pro Leu Glu Glu Val Leu Asn Leu Ala Gln Ser Lys Asn Phe His Leu
65 70 75 80

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

Lys Gly Ser Glu Thr Thr Phe Met Cys Glu Tyr Ala Asp Glu Thr Ala
100 105 110

Sequence Listing

Thr Ile Val Glu Phe Leu Asn Arg Trp Ile Thr Phe Cys Gln Ser Ile
115 120 125

Ile Ser Thr Leu Thr
130

<210> 24
<211> 133
<212> PRT
<213> Artificial Sequence

<220>
<223> variants of IL-2 (3M, M72)

<400> 24
Ala Pro Thr Ser Ser Ser Thr Lys Lys Thr Gln Leu Gln Leu Glu His
1 5 10 15

Leu Leu Leu Asp Leu Gln Met Ile Leu Asn Gly Ile Asn Asn Tyr Lys
20 25 30

Asn Pro Lys Leu Thr Ala Met Leu Thr Ala Lys Phe Tyr Met Pro Lys
35 40 45

Lys Ala Thr Glu Leu Lys His Leu Gln Cys Leu Glu Glu Glu Leu Lys
50 55 60

Pro Leu Glu Glu Val Leu Asn Gly Ala Gln Ser Lys Asn Phe His Leu
65 70 75 80

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

Lys Gly Ser Glu Thr Thr Phe Met Cys Glu Tyr Ala Asp Glu Thr Ala
100 105 110

Thr Ile Val Glu Phe Leu Asn Arg Trp Ile Thr Phe Cys Gln Ser Ile
115 120 125

Ile Ser Thr Leu Thr
130

<210> 25
<211> 1851
<212> DNA

Sequence Listing

<213> Artificial Sequence

<220>

<223> nucleotides coding fusion protein (GI102-M45)

<400> 25

atggatgcta tgctgagagg cctgtgttgc gtgctgctgc tgtgtggcgc tgtgttcgtg	60
tctccttctc acgctgtgat ccacgtgacc aaagaagtga aagaggctgc cacactgtcc	120
tgcggccaca acgtttcagt ggaagaactg gcccagacca ggatctactg gcagaaagaa	180
aagaaaatgg tgctgaccat gatgtccggc gacatgaaca tctggcctga gtacaagaac	240
cggaccatct tcgacatcac caacaacctg tccatcgtga ttctggccct gaggccttct	300
gatgagggca cctatgagtg cgtgggtgctg aagtacgaga aggacgcctt caagcgcgag	360
cacctggctg aagtgacact gtccgtgaag gccgactttc ccacaccttc catctccgac	420
ttcgagatcc ctacctcaa catccggcgg atcatctgtt ctacctctgg cggctttcct	480
gagcctcacc tgtcttggct ggaaaacggc gaggaactga acgccatcaa caccaccgtg	540
tctcaggacc ccgaaaccga gctgtacgct gtgtcctcca agctggactt caacatgacc	600
accaaccaca gcttcatgtg cctgattaag tacggccacc tgagagtga ccagaccttc	660
aactggaaca ccaccaagca agagcacttc cctgacaatg gatctggcgg cggagggttct	720
ggcggagggtg gaagcggagg cggaggatct gctgagtcta agtatggccc tccttgtcct	780
ccatgtcctg ctccagaagc tgctggcggga ccctctgtgt tcctgtttcc tccaaagcct	840
aaggaccagc tcatgatctc tcggacaccc gaagtgacct gcgtgggtgt ggatgtgtct	900
caagaggacc ctgagggtgca gttcaattgg tacgtggacg gcgtggaagt gcacaacgcc	960
aagaccaagc ctagagagga acagttcaac tccacctaca gagtgggtgtc cgtgctgacc	1020
gtgctgcacc aggattggct gaacggcaaa gagtacaagt gcaagggtgtc caacaagggc	1080
ctgccttcca gcatcgaaaa gaccatctcc aaggctaagg gccagcctag ggaaccccag	1140
gtttacaccc tgcctccaag ccaagaggaa atgaccaaga accagggtgtc cctgacctgc	1200
ctgggtcaagg gcttctaccc ttccgacatt gccgtggaat gggagtccaa tggccagcct	1260

Sequence Listing

gagaacaact acaagaccac acctcctgtg ctggactccg acggctcctt ctttctgtac 1320
tctcgctga ccgtggacaa gtctagatgg caagagggca acgtgttctc ctgctctgtg 1380
ctgcacgagg ccctgcacaa tctactacacc cagaagtccc tgtctctgtc tcttgagggt 1440
ggtagcggtt ctgcccctac cagctcctct accaagaaaa cccagctcca gttggagcat 1500
ctgctgctgg acctccagat gattctgaac gggatcaaca actataagaa cccaagctg 1560
accgcatgc tgaccgctaa gttcgccatg cccaagaagg ccaccgagct gaagcacctc 1620
cagtgctgg aagaagaact gaagcccctg gaagaggtgc tgaatctggc ccagtccaag 1680
aacttccacc tgaggccacg ggacctgatc agcaacatca acgtgatcgt gctggaactg 1740
aagggtccg agacaacctt tatgtgcgag tacgccgacg agacagccac catcgtggaa 1800
tttctgaacc ggtggatcac cttctgccag agcatcatct ccacactgac c 1851

<210> 26
<211> 592
<212> PRT
<213> Artificial Sequence

<220>
<223> fusion protein (GI102-M45)

<400> 26
Val Ile His Val Thr Lys Glu Val Lys Glu Val Ala Thr Leu Ser Cys
1 5 10 15
Gly His Asn Val Ser Val Glu Glu Leu Ala Gln Thr Arg Ile Tyr Trp
20 25 30
Gln Lys Glu Lys Lys Met Val Leu Thr Met Met Ser Gly Asp Met Asn
35 40 45
Ile Trp Pro Glu Tyr Lys Asn Arg Thr Ile Phe Asp Ile Thr Asn Asn
50 55 60
Leu Ser Ile Val Ile Leu Ala Leu Arg Pro Ser Asp Glu Gly Thr Tyr
65 70 75 80
Glu Cys Val Val Leu Lys Tyr Glu Lys Asp Ala Phe Lys Arg Glu His

85 90 95

Page 35

Sequence Listing

340		345		350
Glu Pro Gln Val Tyr Thr	Leu Pro Pro Ser Gln Glu Glu Met Thr Lys			
355	360	365		
Asn Gln Val Ser Leu Thr	Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp			
370	375	380		
Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys				
385	390	395	400	
Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser				
405	410	415		
Arg Leu Thr Val Asp Lys Ser Arg Trp Gln Glu Gly Asn Val Phe Ser				
420	425	430		
Cys Ser Val Leu His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser				
435	440	445		
Leu Ser Leu Ser Leu Gly Gly Gly Gly Gly Ser Ala Pro Thr Ser Ser				
450	455	460		
Ser Thr Lys Lys Thr Gln Leu Gln Leu Glu His Leu Leu Leu Asp Leu				
465	470	475	480	
Gln Met Ile Leu Asn Gly Ile Asn Asn Tyr Lys Asn Pro Lys Leu Thr				
485	490	495		
Ala Met Leu Thr Ala Lys Phe Ala Met Pro Lys Lys Ala Thr Glu Leu				
500	505	510		
Lys His Leu Gln Cys Leu Glu Glu Glu Leu Lys Pro Leu Glu Glu Val				
515	520	525		
Leu Asn Leu Ala Gln Ser Lys Asn Phe His Leu Arg Pro Arg Asp Leu				
530	535	540		
Ile Ser Asn Ile Asn Val Ile Val Leu Glu Leu Lys Gly Ser Glu Thr				
545	550	555	560	
Thr Phe Met Cys Glu Tyr Ala Asp Glu Thr Ala Thr Ile Val Glu Phe				
565	570	575		
Leu Asn Arg Trp Ile Thr Phe Cys Gln Ser Ile Ile Ser Thr Leu Thr				
580	585	590		

Sequence Listing

<210> 27
 <211> 1851
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> nucleotides coding fusion protein (GI102-M61)

<400> 27
 atggatgcta tgctgagagg cctgtgttgc gtgctgctgc tgtgtggcgc tgtgttcgtg 60
 tctccttctc acgctgtgat ccacgtgacc aaagaagtga aagaggctgc cacactgtcc 120
 tgcggccaca acgtttcagt ggaagaactg gcccagacca ggatctactg gcagaaagaa 180
 aagaaaatgg tgctgaccat gatgtccggc gacatgaaca tctggcctga gtacaagaac 240
 cggaccatct tcgacatcac caacaacctg tccatcgtga ttctggccct gaggccttct 300
 gatgagggca cctatgagtg cgtggtgctg aagtacgaga aggacgcctt caagcgcgag 360
 cacctggctg aagtgacact gtccgtgaag gccgactttc ccacaccttc catctccgac 420
 ttcgagatcc ctacctcaa catccggcgg atcatctgtt ctacctctgg cggcttttct 480
 gagcctcacc tgtcttggct ggaaaacggc gaggaactga acgccatcaa caccaccgtg 540
 tctcaggacc ccgaaaccga gctgtacgct gtgtcctcca agctggactt caacatgacc 600
 accaaccaca gcttcatgtg cctgattaag tacggccacc tgagagtga ccagaccttc 660
 aactggaaca ccaccaagca agagcacttc cctgacaatg gatctggcgg cggagggttct 720
 ggaggagggtg gaagcggagg cggaggatct gctgagtcta agtatggccc tccttgtcct 780
 ccatgtcctg ctccagaagc tgctggcgga ccctctgtgt tcctgtttcc tccaaagcct 840
 aaggaccagc tcatgatctc tcggacaccc gaagtgacct gcgtgggtgg ggatgtgtct 900
 caagaggacc ctgagggtga gttcaattgg tacgtggacg gcgtggaagt gcacaacgcc 960
 aagaccaagc ctagagagga acagttcaac tccacctaca gagtgggtgtc cgtgctgacc 1020
 gtgctgcacc aggattggct gaacggcaaa gagtacaagt gcaagggtgtc caacaagggc 1080

Sequence Listing

```

ctgccttcca gcatcgaaaa gaccatctcc aaggctaagg gccagcctag ggaaccccag      1140
gtttacaccc tgcctccaag ccaagaggaa atgaccaaga accagggtgtc cctgacctgc      1200
ctgggtcaagg gcttctaccc ttccgacatt gccgtggaat gggagtccaa tggccagcct      1260
gagaacaact acaagaccac acctcctgtg ctggactccg acggctcctt ctttctgtac      1320
tctcgcctga ccgtggacaa gtctagatgg caagagggca acgtgttctc ctgctctgtg      1380
ctgcacgagg ccctgcacaa tcactacacc cagaagtccc tgtctctgtc tcttgagggt      1440
ggtaggcggtt ctgcccctac cagctcctct accaagaaaa cccagctcca gttggagcat      1500
ctgctgtctgg acctccagat gattctgaac gggatcaaca actataagaa ccccaagctg      1560
accgccatgc tgaccgctaa gttctacatg cccaagaagg ccaccgagct gaagcacctc      1620
cagtgcctgg aaaggggaact gaagcccctg gaagagggtgc tgaatctggc ccagtccaag      1680
aacttccacc tgaggccacg ggacctgatc agcaacatca acgtgatcgt gctggaactg      1740
aagggtcccg agacaacctt tatgtgagag tacgccgacg agacagccac catcgtggaa      1800
tttctgaacc ggtggatcac cttctgccag agcatcatct ccacactgac c              1851

```

```

<210>      28
<211>      592
<212>      PRT
<213>      Artificial Sequence

```

```

<220>
<223>      fusion protein (GI102-M61)

```

```

<400>      28
Val Ile His Val Thr Lys Glu Val Lys Glu Val Ala Thr Leu Ser Cys
 1             5             10             15

Gly His Asn Val Ser Val Glu Glu Leu Ala Gln Thr Arg Ile Tyr Trp
      20             25             30

Gln Lys Glu Lys Lys Met Val Leu Thr Met Met Ser Gly Asp Met Asn
      35             40             45

Ile Trp Pro Glu Tyr Lys Asn Arg Thr Ile Phe Asp Ile Thr Asn Asn
      50             55             60

```

Sequence Listing

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

Sequence Listing

Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Gly Leu
325 330 335

Pro Ser Ser Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg
340 345 350

Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Gln Glu Glu Met Thr Lys
355 360 365

Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp
370 375 380

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

Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser
405 410 415

Arg Leu Thr Val Asp Lys Ser Arg Trp Gln Glu Gly Asn Val Phe Ser
420 425 430

Cys Ser Val Leu His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser
435 440 445

Leu Ser Leu Ser Leu Gly Gly Gly Gly Gly Ser Ala Pro Thr Ser Ser
450 455 460

Ser Thr Lys Lys Thr Gln Leu Gln Leu Glu His Leu Leu Leu Asp Leu
465 470 475 480

Gln Met Ile Leu Asn Gly Ile Asn Asn Tyr Lys Asn Pro Lys Leu Thr
485 490 495

Ala Met Leu Thr Ala Lys Phe Tyr Met Pro Lys Lys Ala Thr Glu Leu
500 505 510

Lys His Leu Gln Cys Leu Glu Arg Glu Leu Lys Pro Leu Glu Glu Val
515 520 525

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

Ile Ser Asn Ile Asn Val Ile Val Leu Glu Leu Lys Gly Ser Glu Thr
545 550 555 560

Thr Phe Met Cys Glu Tyr Ala Asp Glu Thr Ala Thr Ile Val Glu Phe
565 570 575

Sequence Listing

Leu Asn Arg Trp Ile Thr Phe Cys Gln Ser Ile Ile Ser Thr Leu Thr
580 585 590

<210> 29
<211> 1857
<212> DNA
<213> Artificial Sequence

<220>
<223> nucleotides coding fusion protein (GI102-M72)

<400> 29
atggatgcta tgctgagagg cctgtgttgc gtgctgctgc tgtgtggcgc tgtgttcgtg 60
tctccttctc acgctgtgat ccacgtgacc aaagaagtga aagaggtcgc cacactgtcc 120
tgcggccaca acgtttcagt ggaagaactg gcccagacca ggatctactg gcagaaagaa 180
aagaaaatgg tgctgaccat gatgtccggc gacatgaaca tctggcctga gtacaagaac 240
cggaccatct tcgacatcac caacaacctg tccatcgtga ttctggccct gaggccttct 300
gatgagggca cctatgagtg cgtgggtgctg aagtacgaga aggacgcctt caagcgcgag 360
cacctggctg aagtgacact gtccgtgaag gccgactttc ccacaccttc catctccgac 420
ttcgagatcc ctacctcaa catccggcgg atcatctgtt ctacctctgg cggctttcct 480
gagcctcacc tgtcttggct ggaaaacggc gaggaactga acgccatcaa caccaccgtg 540
tctcaggacc ccgaaaccga gctgtacgct gtgtcctcca agctggactt caacatgacc 600
accaaccaca gcttcatgtg cctgattaag tacggccacc tgagagtga ccagaccttc 660
aactggaaca ccaccaagca agagcacttc cctgacaatg gatctggcgg cggagggttct 720
ggcggagggtg gaagcggagg cggaggatct gctgagtcta agtatggccc tccttgtcct 780
ccatgtcctg ctccagaagc tgctggcgga ccctctgtgt tcctgtttcc tccaaagcct 840
aaggaccagc tcatgatctc tcggacaccc gaagtgacct gcgtgggtgt ggatgtgtct 900
caagaggacc ctgagggtgca gttcaattgg tacgtggacg gcgtggaagt gcacaacgcc 960

Sequence Listing

```

aagaccaagc ctagagagga acagttcaac tccacctaca gagtgggtgtc cgtgctgacc      1020
gtgctgcacc aggattggct gaacggcaaa gagtacaagt gcaagggtgtc caacaagggc      1080
ctgccttcca gcatcgaaaa gaccatctcc aaggctaagg gccagcctag ggaaccccag      1140
gtttacaccc tgcctccaag ccaagaggaa atgaccaaga accaggtgtc cctgacctgc      1200
ctgggtcaagg gcttctaccc ttccgacatt gccgtggaat gggagtccaa tggccagcct      1260
gagaacaact acaagaccac acctcctgtg ctggactccg acggctcctt ctttctgtac      1320
tctcgctga ccgtggacaa gtctagatgg caagagggca acgtgttctc ctgctctgtg      1380
ctgcacgagg ccctgcacaa tcactacacc cagaagtccc tgtctctgtc tcttgagggt      1440
ggtaggcggtt ctgcccctac cagctcctct accaagaaaa cccagctcca gttggagcat      1500
ctgctgctgg acctccagat gattctgaac gggatcaaca actataagaa cccaagctg      1560
accgccatgc tgaccgctaa gttctacatg cccaagaagg ccaccgagct gaagcacctc      1620
cagtgcctgg aagaagaact gaagcccctg gaagaggtgc tgaatggggc ccagtccaag      1680
aacttccacc tgaggccacg ggacctgatc agcaacatca acgtgatcgt gctggaactg      1740
aagggtccg agacaacctt tatgtgcgag tacgccgacg agacagccac catcgtggaa      1800
tttctgaacc ggtggatcac cttctgccag agcatcatct ccacactgac ctgatga      1857

```

```

<210>      30
<211>      592
<212>      PRT
<213>      Artificial Sequence

```

```

<220>
<223>      fusion protein (GI102-M72)

```

```

<400>      30
Val Ile His Val Thr Lys Glu Val Lys Glu Val Ala Thr Leu Ser Cys
  1             5             10             15

Gly His Asn Val Ser Val Glu Glu Leu Ala Gln Thr Arg Ile Tyr Trp
      20             25             30

```

Sequence Listing

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

Sequence Listing

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

Sequence Listing

Ile Ser Asn Ile Asn Val Ile Val Leu Glu Leu Lys Gly Ser Glu Thr
545 550 555 560

Thr Phe Met Cys Glu Tyr Ala Asp Glu Thr Ala Thr Ile Val Glu Phe
565 570 575

Leu Asn Arg Trp Ile Thr Phe Cys Gln Ser Ile Ile Ser Thr Leu Thr
580 585 590

<210> 31
<211> 1851
<212> DNA
<213> Artificial Sequence

<220>
<223> nucleotides coding fusion protein (GI101w)

<400> 31
atggatgcta tgctgagagg cctgtgttgc gtgctgctgc tgtgtggcgc tgtgttcgtg 60
tctccttctc acgctgtgat ccacgtgacc aaagaagtga aagaggctgc cacactgtcc 120
tgcggccaca acgtttcagt ggaagaactg gccagacca ggatctactg gcagaaagaa 180
aagaaaatgg tgctgaccat gatgtccggc gacatgaaca tctggcctga gtacaagaac 240
cggaccatct tcgacatcac caacaacctg tccatcgtga ttctggccct gaggccttct 300
gatgagggca cctatgagtg cgtgggtgctg aagtacgaga aggacgcctt caagcgcgag 360
cacctggctg aagtgacact gtccgtgaag gccgactttc ccacaccttc catctccgac 420
ttcgagatcc ctacctcaa catccggcgg atcatctgtt ctacctctgg cggctttcct 480
gagcctcacc tgtcttggct ggaaaacggc gaggaactga acgcatcaa caccaccgtg 540
tctcaggacc ccgaaaccga gctgtacgct gtgtcctcca agctggactt caacatgacc 600
accaaccaca gcttcatgtg cctgattaag tacggccacc tgagagtga ccagaccttc 660
aactggaaca ccaccaagca agagcacttc cctgacaatg gatctggcgg cggagggttct 720
ggcggagggtg gaagcggagg cggaggatct gctgagtcta agtatggccc tccttgcct 780

Sequence Listing

```

ccatgtcctg ctccagaagc tgctggcgga ccctctgtgt tcctgtttcc tccaaagcct      840
aaggaccagc tcatgatctc tcggacaccc gaagtgaacct gcgtgggtgt ggatgtgtct      900
caagaggacc ctgagggtgca gttcaattgg tacgtggacg gcgtggaagt gcacaacgcc      960
aagaccaagc ctagagagga acagttcaac tccacctaca gagtgggtgtc cgtgctgacc     1020
gtgctgcacc aggattggct gaacggcaaa gagtacaagt gcaagggtgtc caacaagggc     1080
ctgccttcca gcatcgaaaa gaccatctcc aaggctaagg gccagcctag ggaaccccag     1140
gtttacaccc tgctccaag ccaagaggaa atgaccaaga accagggtgtc cctgacctgc     1200
ctgggtcaagg gcttctaccc ttccgacatt gccgtggaat gggagtccaa tggccagcct     1260
gagaacaact acaagaccac acctcctgtg ctggactccg acggctcctt ctttctgtac     1320
tctcgctga ccgtggacaa gtctagatgg caagagggca acgtgttctc ctgctctgtg     1380
ctgcacgagg ccctgcacaa tactacacc cagaagtccc tgtctctgtc tcttgagggt     1440
gggtggcggtt ctgcccctac cagctcctct accaagaaaaa cccagctcca gttggagcat     1500
ctgctgctgg acctccagat gattctgaac gggatcaaca actataagaa cccaagctg     1560
acccgcatgc tgacctttaa gttctacatg cccaagaagg ccaccgagct gaagcacctc     1620
cagtgcttgg aagaagaact gaagcccctg gaagaggtgc tgaatctggc ccagtccaag     1680
aacttccacc tgaggccacg ggacctgatc agcaacatca acgtgatcgt gctggaactg     1740
aagggctccg agacaacctt tatgtgcgag tacgccgacg agacagccac catcgtggaa     1800
tttctgaacc ggtggatcac cttctgccag agcatcatct ccacactgac c              1851

```

```

<210>      32
<211>      592
<212>      PRT
<213>      Artificial Sequence

<220>
<223>      fusion protein (GI101w)

```

```

<400>      32
Val Ile His Val Thr Lys Glu Val Lys Glu Val Ala Thr Leu Ser Cys

```

Sequence Listing

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

Sequence Listing

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

Sequence Listing

515	520	525
Leu Asn Leu Ala Gln Ser Lys Asn Phe His Leu Arg Pro Arg Asp Leu		
530	535	540
Ile Ser Asn Ile Asn Val Ile Val Leu Glu Leu Lys Gly Ser Glu Thr		
545	550	555
Thr Phe Met Cys Glu Tyr Ala Asp Glu Thr Ala Thr Ile Val Glu Phe		
565	570	575
Leu Asn Arg Trp Ile Thr Phe Cys Gln Ser Ile Ile Ser Thr Leu Thr		
580	585	590

<210> 33
 <211> 1848
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> nucleotides coding fusion protein (mGI102-M61)

<400> 33
 atggatgcta tgctgagagg cctgtgttgc gtgctgctgc tgtgtggcgc tgtgttcgtg 60
 tctccttctc acgctgtgga cgagcagctc tccaagtccg tgaaggataa ggtcctgtctg 120
 ccttgccggt acaactctcc tcacgaggac gagtctgagg accggatcta ctggcagaaa 180
 cacgacaagg tgggtgctgtc cgtgatcgcc ggaaagctga aagtgtggcc tgagtacaag 240
 aacaggaccc tgtacgacaa caccacctac agcctgatca tcctgggcct cgtgctgagc 300
 gatagaggca cctattcttg cgtgggtgcag aagaaaagagc ggggcaccta cgaagtgaag 360
 cacctggctc tgggtcaagct gtccatcaag gccgacttca gcacccctaa catcaccgag 420
 tctggcaacc cttccgccga caccaagaga atcacctgtt tcgcctctgg cggcttcctt 480
 aagcctcggg tctcttggct ggaaaacggc agagagctgc ccggcatcaa taccaccatt 540
 tctcaggacc cagagtccga gctgtacacc atctccagcc agctcgactt taacaccacc 600
 agaaaccaca ccatcaagtg cctgattaag tacggcgacg cccacgtgtc cgaggacttt 660

Sequence Listing

acttgggaga aacctcctga ggaccctcct gactctggat ctggcggcgg aggttctggc	720
ggagggtggaa gcggaggcgg aggatctgct gagtctaagt atggccctcc ttgtcctcca	780
tgtcctgctc cagaagctgc tggcggaccc tctgtgttcc tgtttcctcc aaagcctaag	840
gaccagctca tgatctctcg gaccctgaa gtgacctgcg tggtggtgga tgtgtctcaa	900
gaggaccctg aggtgcagtt caattggtac gtggacggcg tggaagtgca caacgccaag	960
accaagccta gagaggaaca gttcaactcc acctatagag tgggtgtccgt gctgaccgtg	1020
ctgcaccagg attggctgaa cggcaaagag tacaagtgca aggtgtccaa caagggcctg	1080
ccttccagca tcgaaaagac catcagcaag gctaagggcc agcctaggga accccaggtt	1140
tacaccctgc ctccaagcca agaggaaatg accaagaacc aggtgtccct gacctgcctg	1200
gtcaagggtt tctacccttc cgacattgcc gtggaatggg agtccaatgg ccagcctgag	1260
aacaactaca agaccacacc tcctgtgctg gactccgacg gctccttctt tctgtactct	1320
cgcctgaccg tggacaagtc taggtggcaa gagggaacg tgttctcctg ctctgtgctg	1380
cacgaggctc tgcacaacca ctaccccag aagtccctgt ctctgtctct tggagggtgt	1440
ggcggttctg cccctacctc cagctctacc aagaaaaccc agctccagtt ggagcatctg	1500
ctgctggacc tccagatgat cctgaatggc atcaacaatt acaagaaccc caagctgacc	1560
gccatgctga ccgctaagtt ctacatgccc aagaaggcca ccgagctgaa gcacttgacg	1620
tgcttggaag gggaaactgaa gcccctggaa gaagtgtgta atctggccca gtccaagaac	1680
ttccacctga ggcctaggga cctgatctcc aacatcaacg tgatcgtgct ggaactgaaa	1740
ggctccgaga caaccttcat gtgcgagtac gccgacgaga cagccaccat cgtggaattt	1800
ctgaaccggt ggatcacctt ctgccagagc atcatctcca cactgacc	1848

<210> 34
 <211> 616
 <212> PRT
 <213> Artificial Sequence

<220>

Sequence Listing

<223> fusion protein (mGI102-M61)

<400> 34

```

Met Asp Ala Met Leu Arg Gly Leu Cys Cys Val Leu Leu Leu Cys Gly
 1           5           10           15

Ala Val Phe Val Ser Pro Ser His Ala Val Asp Glu Gln Leu Ser Lys
          20           25           30

Ser Val Lys Asp Lys Val Leu Leu Pro Cys Arg Tyr Asn Ser Pro His
          35           40           45

Glu Asp Glu Ser Glu Asp Arg Ile Tyr Trp Gln Lys His Asp Lys Val
          50           55           60

Val Leu Ser Val Ile Ala Gly Lys Leu Lys Val Trp Pro Glu Tyr Lys
          65           70           75           80

Asn Arg Thr Leu Tyr Asp Asn Thr Thr Tyr Ser Leu Ile Ile Leu Gly
          85           90           95

Leu Val Leu Ser Asp Arg Gly Thr Tyr Ser Cys Val Val Gln Lys Lys
          100          105          110

Glu Arg Gly Thr Tyr Glu Val Lys His Leu Ala Leu Val Lys Leu Ser
          115          120          125

Ile Lys Ala Asp Phe Ser Thr Pro Asn Ile Thr Glu Ser Gly Asn Pro
          130          135          140

Ser Ala Asp Thr Lys Arg Ile Thr Cys Phe Ala Ser Gly Gly Phe Pro
          145          150          155          160

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

Asn Thr Thr Ile Ser Gln Asp Pro Glu Ser Glu Leu Tyr Thr Ile Ser
          180          185          190

Ser Gln Leu Asp Phe Asn Thr Thr Arg Asn His Thr Ile Lys Cys Leu
          195          200          205

Ile Lys Tyr Gly Asp Ala His Val Ser Glu Asp Phe Thr Trp Glu Lys
          210          215          220

Pro Pro Glu Asp Pro Pro Asp Ser Gly Ser Gly Gly Gly Gly Ser Gly
          225          230          235          240

```

Sequence Listing

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

Sequence Listing

Leu Glu His Leu Leu Leu Asp Leu Gln Met Ile Leu Asn Gly Ile Asn
500 505 510

Asn Tyr Lys Asn Pro Lys Leu Thr Ala Met Leu Thr Ala Lys Phe Tyr
515 520 525

Met Pro Lys Lys Ala Thr Glu Leu Lys His Leu Gln Cys Leu Glu Arg
530 535 540

Glu Leu Lys Pro Leu Glu Glu Val Leu Asn Leu Ala Gln Ser Lys Asn
545 550 555 560

Phe His Leu Arg Pro Arg Asp Leu Ile Ser Asn Ile Asn Val Ile Val
565 570 575

Leu Glu Leu Lys Gly Ser Glu Thr Thr Phe Met Cys Glu Tyr Ala Asp
580 585 590

Glu Thr Ala Thr Ile Val Glu Phe Leu Asn Arg Trp Ile Thr Phe Cys
595 600 605

Gln Ser Ile Ile Ser Thr Leu Thr
610 615

<210> 35
<211> 153
<212> PRT
<213> Artificial Sequence

<220>
<223> wild type hIL-2

<400> 35
Met Tyr Arg Met Gln Leu Leu Ser Cys Ile Ala Leu Ser Leu Ala Leu
1 5 10 15

Val Thr Asn Ser Ala Pro Thr Ser Ser Ser Thr Lys Lys Thr Gln Leu
20 25 30

Gln Leu Glu His Leu Leu Leu Asp Leu Gln Met Ile Leu Asn Gly Ile
35 40 45

Asn Asn Tyr Lys Asn Pro Lys Leu Thr Arg Met Leu Thr Phe Lys Phe
50 55 60

Sequence Listing

Tyr Met Pro Lys Lys Ala Thr Glu Leu Lys His Leu Gln Cys Leu Glu
65 70 75 80

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

Asn Phe His Leu Arg Pro Arg Asp Leu Ile Ser Asn Ile Asn Val Ile
100 105 110

Val Leu Glu Leu Lys Gly Ser Glu Thr Thr Phe Met Cys Glu Tyr Ala
115 120 125

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

Cys Gln Ser Ile Ile Ser Thr Leu Thr
145 150

<210> 36
<211> 158
<212> PRT
<213> Artificial Sequence

<220>
<223> IL-2 with signal sequence

<400> 36
Met Asp Ala Met Leu Arg Gly Leu Cys Cys Val Leu Leu Leu Cys Gly
1 5 10 15

Ala Val Phe Val Ser Pro Ser His Ala Ala Pro Thr Ser Ser Ser Thr
20 25 30

Lys Lys Thr Gln Leu Gln Leu Glu His Leu Leu Leu Asp Leu Gln Met
35 40 45

Ile Leu Asn Gly Ile Asn Asn Tyr Lys Asn Pro Lys Leu Thr Arg Met
50 55 60

Leu Thr Phe Lys Phe Tyr Met Pro Lys Lys Ala Thr Glu Leu Lys His
65 70 75 80

Leu Gln Cys Leu Glu Glu Glu Leu Lys Pro Leu Glu Glu Val Leu Asn
85 90 95

Leu Ala Gln Ser Lys Asn Phe His Leu Arg Pro Arg Asp Leu Ile Ser

Sequence Listing

100	105	110
Asn Ile Asn Val Ile Val Leu Glu Leu Lys Gly Ser Glu Thr Thr Phe		
115	120	125
Met Cys Glu Tyr Ala Asp Glu Thr Ala Thr Ile Val Glu Phe Leu Asn		
130	135	140
Arg Trp Ile Thr Phe Cys Gln Ser Ile Ile Ser Thr Leu Thr		
145	150	155

<210> 37
 <211> 474
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> nucleotide sequence coding IL-2 with signal sequence

<400> 37	
atggatgcta tgctgagagg cctgtgttgc gtgctgctgc tgtgtggcgc tgtgttcgtg	60
tctccttctc acgctgcccc taccagctcc tctaccaaga aaacccagct ccagttggag	120
catctgctgc tggacctcca gatgattctg aacgggatca acaactataa gaacccaag	180
ctgaccgcga tgctgacctt taagttctac atgccaaga aggccaccga gctgaagcac	240
ctccagtgcc tggaagaaga actgaagccc ctggaagagg tgctgaatct ggcccagtcc	300
aagaacttcc acctgaggcc acgggacctg atcagcaaca tcaacgtgat cgtgctggaa	360
ctgaagggtc ccgagacaac ctttatgtgc gagtacgccg acgagacagc caccatcgtg	420
gaatttctga accggtggat caccttctgc cagagcatca tctccacact gacc	474