

SEQUENCE LISTING

<110> Noile-Immune Biotech Inc.

<120> Medicament, combination medicament, medical composition,
immunoresponsive cell, nucleic acid delivery vehicle, and product
for treating cancer

<130> CO-F05142-00

<150> JP2019-195407

<151> 2019-10-28

<160> 18

<170> PatentIn version 3.5

<210> 1

<211> 22

<212> DNA

<213> Artificial

<220>

<223> 5'-R primer

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22

<210> 2

<211> 24

<212> DNA

<213> Artificial

<220>

<223> 3-TRa-C primer

<400> 2

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24

<210> 3

<211> 21

<212> DNA

<213> Artificial

<220>

<223> 3-TRb-C1 primer

<400> 3

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<210> 4
<211> 24
<212> DNA
<213> Artificial

<220>
<223> 3-TRbeta-C2 primer

<400> 4
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<210> 5
<211> 177
<212> PRT
<213> Artificial

<220>
<223> human IL-7

<400> 5

Met Phe His Val Ser Phe Arg Tyr Ile Phe Gly Leu Pro Pro Leu Ile
1 5 10 15

Leu Val Leu Leu Pro Val Ala Ser Ser Asp Cys Asp Ile Glu Gly Lys
20 25 30

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

Leu Asp Ser Met Lys Glu Ile Gly Ser Asn Cys Leu Asn Asn Glu Phe
50 55 60

Asn Phe Phe Lys Arg His Ile Cys Asp Ala Asn Lys Glu Gly Met Phe
65 70 75 80

Leu Phe Arg Ala Ala Arg Lys Leu Arg Gln Phe Leu Lys Met Asn Ser
85 90 95

Thr Gly Asp Phe Asp Leu His Leu Leu Lys Val Ser Glu Gly Thr Thr

100

105

110

Ile Leu Leu Asn Cys Thr Gly Gln Val Lys Gly Arg Lys Pro Ala Ala
 115 120 125

Leu Gly Glu Ala Gln Pro Thr Lys Ser Leu Glu Glu Asn Lys Ser Leu
 130 135 140

Lys Glu Gln Lys Lys Leu Asn Asp Leu Cys Phe Leu Lys Arg Leu Leu
 145 150 155 160

Gln Glu Ile Lys Thr Cys Trp Asn Lys Ile Leu Met Gly Thr Lys Glu
 165 170 175

His

<210> 6
 <211> 98
 <212> PRT
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<220>
 <223> human CCL19

<400> 6

Met Ala Leu Leu Leu Ala Leu Ser Leu Leu Val Leu Trp Thr Ser Pro
 1 5 10 15

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

Val Thr Gln Lys Pro Ile Pro Gly Tyr Ile Val Arg Asn Phe His Tyr
 35 40 45

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

Leu Arg Gly Arg Gln Leu Cys Ala Pro Pro Asp Gln Pro Trp Val Glu

65		70		75		80
Arg	Ile	Ile	Gln	Arg	Leu	Gln
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				Thr	Ser	Ala
					90	
						Lys
						Met
						Lys
						Arg
						95
						Arg

Ser Ser

<210> 7
 <211> 8
 <212> PRT
 <213> Artificial

<220>
 <223> 2A peptide cleavage region

<220>
 <221> MISC_FEATURE
 <223> Val or Ile

<220>
 <221> misc_feature
 <222> (2)..(2)
 <223> Xaa can be any naturally occurring amino acid

<220>
 <221> MISC_FEATURE
 <222> (4)..(4)
 <223> any amino acid

<400> 7

Asp	Xaa	Glu	Xaa	Asn	Pro	Gly	Pro
1				5			

<210> 8
 <211> 25
 <212> PRT
 <213> Artificial

<220>
 <223> 2Apeptide(F2A)

<400> 8

Gly Ser Gly Val Lys Gln Thr Leu Asn Phe Asp Leu Leu Lys Leu Ala
 1 5 10 15

Gly Asp Val Glu Ser Asn Pro Gly Pro
 20 25

<210> 9
 <211> 864
 <212> DNA
 <213> Artificial

<220>
 <223> mouseIL-7-F2A-mouseCCL19

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 ctgatgatca gcatcgatga attggacaaa atgacaggaa ctgatatga ttgcccgaat 180
 aatgaaccaa acttttttag aaaacatgta tgtgatgata caaaggaagc tgcttttcta 240
 aatcgtgctg ctcgcaagtt gaagcaattt cttaaaatga atatcagtga agaattcaat 300
 gtccacttac taacagtatc acaaggcaca caaacactgg tgaactgcac aagtaaggaa 360
 gaaaaaaaaacg taaaggaaca gaaaaagaat gacgcatggt tcctaaagag actactgaga 420
 gaaataaaaaa cttgttgga taaaattttg aagggcagta taggaagcgg agtgaaacag 480
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 ccaactctgg ggggtgctaa tgatgcggaa gactgctgcc tgtctgtgac ccagcgcccc 660
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 accagaagga gccctgtgtc ttga 864

<210> 10
 <211> 1665

<212> DNA
<213> Artificial

<220>
<223> Mouse Il-7-F2A-mouseCCL19-F2A-eGFP

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ctgatgatct ccattgatga gctggataag atgaccggca ccgacagcaa ctgtcccaac 180
aatgagccca acttcttttag aaagcacgtg tgtgacgata ccaaggaggc tgccttcctg 240
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gagaagaacg tgaaagagca gaaaaagaat gatgcttggt tcctcaagag gctgctgagg 420
gagatcaaga cctgttgga taagatcctg aaaggcagca tcggcagcgg agtcaagcaa 480
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 aacacccccca tcggcgacgg ccccgctgctg ctgcccgaca accactacct gagcaccag 1560
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<210> 11

<211> 554

<212> PRT

<213> Artificial

<220>

<223> Mouse Il-7-F2A-mouse CCL19-2A-eGFP amino acid

<400> 11

Met Val His Val Ser Phe Arg Tyr Ile Phe Gly Ile Pro Pro Leu Ile
 1 5 10 15

Leu Val Leu Leu Pro Val Thr Ser Ser Glu Cys His Ile Lys Asp Lys
 20 25 30

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

Asp Lys Met Thr Gly Thr Asp Ser Asn Cys Pro Asn Asn Glu Pro Asn
 50 55 60

Phe Phe Arg Lys His Val Cys Asp Asp Thr Lys Glu Ala Ala Phe Leu
 65 70 75 80

Asn Arg Ala Ala Arg Lys Leu Lys Gln Phe Leu Lys Met Asn Ile Ser
 85 90 95

Glu Glu Phe Asn Val His Leu Leu Thr Val Ser Gln Gly Thr Gln Thr
 100 105 110

Leu Val Asn Cys Thr Ser Lys Glu Glu Lys Asn Val Lys Glu Gln Lys
115 120 125

Lys Asn Asp Ala Cys Phe Leu Lys Arg Leu Leu Arg Glu Ile Lys Thr
130 135 140

Cys Trp Asn Lys Ile Leu Lys Gly Ser Ile Gly Ser Gly Val Lys Gln
145 150 155 160

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

Pro Gly Pro Met Ala Pro Arg Val Thr Pro Leu Leu Ala Phe Ser Leu
180 185 190

Leu Val Leu Trp Thr Phe Pro Ala Pro Thr Leu Gly Gly Ala Asn Asp
195 200 205

Ala Glu Asp Cys Cys Leu Ser Val Thr Gln Arg Pro Ile Pro Gly Asn
210 215 220

Ile Val Lys Ala Phe Arg Tyr Leu Leu Asn Glu Asp Gly Cys Arg Val
225 230 235 240

Pro Ala Val Val Phe Thr Thr Leu Arg Gly Tyr Gln Leu Cys Ala Pro
245 250 255

Pro Asp Gln Pro Trp Val Asp Arg Ile Ile Arg Arg Leu Lys Lys Ser
260 265 270

Ser Ala Lys Asn Lys Gly Asn Ser Thr Arg Arg Ser Pro Val Ser Glu
275 280 285

Phe Gly Ser Gly Val Lys Gln Thr Leu Asn Phe Asp Leu Leu Lys Leu
290 295 300

Ala Gly Asp Val Glu Ser Asn Pro Gly Pro Cys Met Val Ser Lys Gly
305 310 315 320

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

Asp Val Asn Gly His Lys Phe Ser Val Ser Gly Glu Gly Glu Gly Asp
340 345 350

Ala Thr Tyr Gly Lys Leu Thr Leu Lys Phe Ile Cys Thr Thr Gly Lys
355 360 365

Leu Pro Val Pro Trp Pro Thr Leu Val Thr Thr Leu Thr Tyr Gly Val
370 375 380

Gln Cys Phe Ser Arg Tyr Pro Asp His Met Lys Gln His Asp Phe Phe
385 390 395 400

Lys Ser Ala Met Pro Glu Gly Tyr Val Gln Glu Arg Thr Ile Phe Phe
405 410 415

Lys Asp Asp Gly Asn Tyr Lys Thr Arg Ala Glu Val Lys Phe Glu Gly
420 425 430

Asp Thr Leu Val Asn Arg Ile Glu Leu Lys Gly Ile Asp Phe Lys Glu
435 440 445

Asp Gly Asn Ile Leu Gly His Lys Leu Glu Tyr Asn Tyr Asn Ser His
450 455 460

Asn Val Tyr Ile Met Ala Asp Lys Gln Lys Asn Gly Ile Lys Val Asn
465 470 475 480

Phe Lys Ile Arg His Asn Ile Glu Asp Gly Ser Val Gln Leu Ala Asp
485 490 495

His Tyr Gln Gln Asn Thr Pro Ile Gly Asp Gly Pro Val Leu Leu Pro
500 505 510

Asp Asn His Tyr Leu Ser Thr Gln Ser Ala Leu Ser Lys Asp Pro Asn
515 520 525

Glu Lys Arg Asp His Met Val Leu Leu Glu Phe Val Thr Ala Ala Gly
530 535 540

Ile Thr Leu Gly Met Asp Glu Leu Tyr Lys
545 550

<210> 12
<211> 9
<212> PRT
<213> Artificial

<220>
<223> P1A peptide

<400> 12

Leu Pro Tyr Leu Gly Trp Leu Val Phe
1 5

<210> 13
<211> 20
<212> RNA
<213> Artificial

<220>
<223> Guide RNA for PD-1 Gene

<400> 13
ucugggcaug ugguccggc 20

<210> 14
<211> 20
<212> RNA
<213> Artificial

<220>
<223> Guide RNA for ROSA26

<400> 14
cuccagucuu ucuagaagau 20

<210> 15
<211> 2559
<212> DNA
<213> Artificial

<220>
<223> anti-hCD20 CAR and anti-mPD-antibody

<400> 15
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acctgcagag ccagcagcag cgtgtcctac atccactggg tccagcagaa gcccggcagc 180
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gagactgctg ccaacctgca ggacccaac cagctctaca atgagctcaa tctagggcga	1380
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cagcagagga ggaggaaccc ccaggaaggc gtatacaatg cactgcagaa agacaagatg	1500
gcagaagcct acagtgagat cggcacaaaa ggcgagaggc ggagaggcaa ggggcacgat	1560
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aagctggctg gagacgtgga gagcaacccc ggccctatga catgggcccc tctgctgctg	1740
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gtgtccgaga gcctgggcag aaccgtgaca atcagctgca aaaggagcag cggctccgtg	1860
ggcgattact acgtgagctg gcaccagcag aggtttggca gcagccctaa gaccgtcatc	1920
tacctggacg atgagaggcc ttccggcgtc cccaaaaggt tctccggctc catcgacagc	1980
tccagcaata gcgctagcct caccatcacc gacctccaga ccgacgatga ggccgattac	2040
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aataacctga agagcgagga taccgccatc tactattgcg tggattccgg cttcaactcc	2460
tatagcgacg tctggggcca gggcatccag gtcaccgtga gcagcgacta caaggacgac	2520
gacgacaagt tcgtggagca tcaccacat caccactga	2559

<210> 16

<211> 852

<212> PRT
<213> Artificial

<220>
<223> anti-hCD20 CAR and anti-mPD-antibody

<400> 16

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Ala His Ser Gln Ile Val Leu Ser Gln Ser Pro Ala Ile Leu Ser Ala
20 25 30

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

Ser Tyr Ile His Trp Phe Gln Gln Lys Pro Gly Ser Ser Pro Lys Pro
50 55 60

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

Ser Gly Ser Gly Ser Gly Thr Ser Tyr Ser Leu Thr Ile Ser Arg Val
85 90 95

Glu Ala Glu Asp Ala Ala Thr Tyr Tyr Cys Gln Gln Trp Thr Ser Asn
100 105 110

Pro Pro Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys Gly Gly Gly
115 120 125

Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gln Val Gln Leu
130 135 140

Gln Gln Pro Gly Ala Glu Leu Val Lys Pro Gly Ala Ser Val Lys Met
145 150 155 160

Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Ser Tyr Asn Met His Trp
165 170 175

Val Lys Gln Thr Pro Gly Arg Gly Leu Glu Trp Ile Gly Ala Ile Tyr
180 185 190

Pro Gly Asn Gly Asp Thr Ser Tyr Asn Gln Lys Phe Lys Gly Lys Ala
195 200 205

Thr Leu Thr Ala Asp Lys Ser Ser Ser Thr Ala Tyr Met Gln Leu Ser
210 215 220

Ser Leu Thr Ser Glu Asp Ser Ala Val Tyr Tyr Cys Ala Arg Ser Thr
225 230 235 240

Tyr Tyr Gly Gly Asp Trp Tyr Phe Asn Val Trp Gly Ala Gly Thr Thr
245 250 255

Val Thr Val Ser Ala Ala Ala Ala Val Val Pro Val Leu Gln Lys Val
260 265 270

Asn Ser Thr Thr Thr Lys Pro Val Leu Arg Thr Pro Ser Pro Val His
275 280 285

Pro Thr Gly Thr Ser Gln Pro Gln Arg Pro Glu Asp Cys Arg Pro Arg
290 295 300

Gly Ser Val Lys Gly Thr Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile
305 310 315 320

Trp Ala Pro Leu Ala Gly Ile Cys Val Ala Pro Leu Leu Ser Leu Ile
325 330 335

Ile Thr Leu Ile Cys Tyr His Arg Ser Arg Asn Ser Arg Arg Asn Arg
340 345 350

Leu Leu Gln Ser Asp Tyr Met Asn Met Thr Pro Arg Arg Pro Gly Leu
355 360 365

Thr Arg Lys Pro Tyr Gln Pro Tyr Ala Pro Ala Arg Asp Phe Ala Ala
370 375 380

Tyr Arg Pro Lys Trp Ile Arg Lys Lys Phe Pro His Ile Phe Lys Gln
385 390 395 400

Pro Phe Lys Lys Thr Thr Gly Ala Ala Gln Glu Glu Asp Ala Cys Ser
405 410 415

Cys Arg Cys Pro Gln Glu Glu Glu Gly Gly Gly Gly Gly Tyr Glu Leu
420 425 430

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

Pro Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr
450 455 460

Asp Val Leu Glu Lys Lys Arg Ala Arg Asp Pro Glu Met Gly Gly Lys
465 470 475 480

Gln Gln Arg Arg Arg Asn Pro Gln Glu Gly Val Tyr Asn Ala Leu Gln
485 490 495

Lys Asp Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly Thr Lys Gly Glu
500 505 510

Arg Arg Arg Gly Lys Gly His Asp Gly Leu Tyr Gln Gly Leu Ser Thr
515 520 525

Ala Thr Lys Asp Thr Tyr Asp Ala Leu His Met Gln Thr Leu Ala Pro
530 535 540

Arg Glu Phe Gly Ser Gly Val Lys Gln Thr Leu Asn Phe Asp Leu Leu
545 550 555 560

Lys Leu Ala Gly Asp Val Glu Ser Asn Pro Gly Pro Met Thr Trp Ala
565 570 575

Pro Leu Leu Leu Ile Phe Leu Gln His Leu Arg Gly Ser Cys Ala Gln
580 585 590

Phe Val Leu Thr Gln Pro Lys Thr Val Ser Glu Ser Leu Gly Arg Thr
595 600 605

Val Thr Ile Ser Cys Lys Arg Ser Ser Gly Ser Val Gly Asp Tyr Tyr
610 615 620

Val Ser Trp His Gln Gln Arg Phe Gly Ser Ser Pro Lys Thr Val Ile
625 630 635 640

Tyr Leu Asp Asp Glu Arg Pro Ser Gly Val Pro Lys Arg Phe Ser Gly
645 650 655

Ser Ile Asp Ser Ser Ser Asn Ser Ala Ser Leu Thr Ile Thr Asp Leu
660 665 670

Gln Thr Asp Asp Glu Ala Asp Tyr Phe Cys Leu Ser Tyr Asp Ser Asn
675 680 685

Asn His Phe Val Phe Gly Ser Gly Thr His Leu Thr Val Leu Gly Gly
690 695 700

Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Ser Glu Val Gln
705 710 715 720

Leu Val Glu Ser Gly Gly Gly Leu Ala Gln Pro Gly Lys Ser Leu Lys
725 730 735

Leu Ser Cys Glu Ala Ser Gly Phe Thr Phe Ser Asp Tyr Gly Met Asn
740 745 750

Trp Phe Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val Ala Tyr Ile
755 760 765

Ser Ser Gly Ser Asn Lys Ile Thr Tyr Ala Asp Thr Val Lys Gly Arg
770 775 780

Phe Thr Val Ser Arg Asp Asn Gly Lys Asn Gln Leu Phe Leu Gln Met
785 790 795 800

Asn Asn Leu Lys Ser Glu Asp Thr Ala Ile Tyr Tyr Cys Val Asp Ser
805 810 815

Gly Phe Asn Ser Tyr Ser Asp Val Trp Gly Gln Gly Ile Gln Val Thr
820 825 830

Val Ser Ser Asp Tyr Lys Asp Asp Asp Asp Lys Phe Val Glu His His
835 840 845

His His His His
850

<210> 17
<211> 3501
<212> DNA
<213> Artificial

<220>
<223> anti-hCD20 CAR, mil7, mccl19, and anti-mPD-antibody

<400> 17
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acctgcagag ccagcagcag cgtgtcctac atccactggg tccagcagaa gcccggcagc 180
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caggtgcagc tgcagcagcc tggcgctgag ctcgtgaaac ctggcgccctc cgtgaagatg 480
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tgggcaccct tggccggaat ctgcgtggcc cctctgctgt ccttgatcat cactctcatc	1020
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atgactcccc ggaggcctgg gctcactcga aagccttacc agccctacgc ccctgccaga	1140
gactttgcag cgtaccgccc caaatggatc agggaaaaaat tccccacat attcaagcaa	1200
ccatttaaga agaccactgg agcagctcaa gaggaagatg cttgtagctg ccgatgtcca	1260
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<212> PRT
<213> Artificial

<220>
<223> anti-hCD20 CAR, mil7, mccl19, and anti-mPD-antibody

<400> 18

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

Ser Tyr Ile His Trp Phe Gln Gln Lys Pro Gly Ser Ser Pro Lys Pro
50 55 60

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

Ser Gly Ser Gly Ser Gly Thr Ser Tyr Ser Leu Thr Ile Ser Arg Val
85 90 95

Glu Ala Glu Asp Ala Ala Thr Tyr Tyr Cys Gln Gln Trp Thr Ser Asn
100 105 110

Pro Pro Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys Gly Gly Gly
115 120 125

Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gln Val Gln Leu
130 135 140

Gln Gln Pro Gly Ala Glu Leu Val Lys Pro Gly Ala Ser Val Lys Met
145 150 155 160

Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Ser Tyr Asn Met His Trp
165 170 175

Val Lys Gln Thr Pro Gly Arg Gly Leu Glu Trp Ile Gly Ala Ile Tyr
180 185 190

Pro Gly Asn Gly Asp Thr Ser Tyr Asn Gln Lys Phe Lys Gly Lys Ala
195 200 205

Thr Leu Thr Ala Asp Lys Ser Ser Ser Thr Ala Tyr Met Gln Leu Ser
210 215 220

Ser Leu Thr Ser Glu Asp Ser Ala Val Tyr Tyr Cys Ala Arg Ser Thr
225 230 235 240

Tyr Tyr Gly Gly Asp Trp Tyr Phe Asn Val Trp Gly Ala Gly Thr Thr
245 250 255

Val Thr Val Ser Ala Ala Ala Ala Val Val Pro Val Leu Gln Lys Val
260 265 270

Asn Ser Thr Thr Thr Lys Pro Val Leu Arg Thr Pro Ser Pro Val His
275 280 285

Pro Thr Gly Thr Ser Gln Pro Gln Arg Pro Glu Asp Cys Arg Pro Arg
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Gly Ser Val Lys Gly Thr Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile
305 310 315 320

Trp Ala Pro Leu Ala Gly Ile Cys Val Ala Pro Leu Leu Ser Leu Ile
325 330 335

Ile Thr Leu Ile Cys Tyr His Arg Ser Arg Asn Ser Arg Arg Asn Arg
340 345 350

Leu Leu Gln Ser Asp Tyr Met Asn Met Thr Pro Arg Arg Pro Gly Leu
355 360 365

Thr Arg Lys Pro Tyr Gln Pro Tyr Ala Pro Ala Arg Asp Phe Ala Ala
370 375 380

Tyr Arg Pro Lys Trp Ile Arg Lys Lys Phe Pro His Ile Phe Lys Gln
385 390 395 400

Pro Phe Lys Lys Thr Thr Gly Ala Ala Gln Glu Glu Asp Ala Cys Ser
405 410 415

Cys Arg Cys Pro Gln Glu Glu Glu Gly Gly Gly Gly Gly Tyr Glu Leu
420 425 430

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

Pro Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr
450 455 460

Asp Val Leu Glu Lys Lys Arg Ala Arg Asp Pro Glu Met Gly Gly Lys
465 470 475 480

Gln Gln Arg Arg Arg Asn Pro Gln Glu Gly Val Tyr Asn Ala Leu Gln
485 490 495

Lys Asp Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly Thr Lys Gly Glu
500 505 510

Arg Arg Arg Gly Lys Gly His Asp Gly Leu Tyr Gln Gly Leu Ser Thr
515 520 525

Ala Thr Lys Asp Thr Tyr Asp Ala Leu His Met Gln Thr Leu Ala Pro
530 535 540

Arg Glu Phe Gly Ser Gly Val Lys Gln Thr Leu Asn Phe Asp Leu Leu
545 550 555 560

Lys Leu Ala Gly Asp Val Glu Ser Asn Pro Gly Pro Cys Met Phe His
565 570 575

Val Ser Phe Arg Tyr Ile Phe Gly Ile Pro Pro Leu Ile Leu Val Leu
580 585 590

Leu Pro Val Thr Ser Ser Glu Cys His Ile Lys Asp Lys Glu Gly Lys
595 600 605

Ala Tyr Glu Ser Val Leu Met Ile Ser Ile Asp Glu Leu Asp Lys Met
610 615 620

Thr Gly Thr Asp Ser Asn Cys Pro Asn Asn Glu Pro Asn Phe Phe Arg
625 630 635 640

Lys His Val Cys Asp Asp Thr Lys Glu Ala Ala Phe Leu Asn Arg Ala
645 650 655

Ala Arg Lys Leu Lys Gln Phe Leu Lys Met Asn Ile Ser Glu Glu Phe
660 665 670

Asn Val His Leu Leu Thr Val Ser Gln Gly Thr Gln Thr Leu Val Asn
675 680 685

Cys Thr Ser Lys Glu Glu Lys Asn Val Lys Glu Gln Lys Lys Asn Asp
690 695 700

Ala Cys Phe Leu Lys Arg Leu Leu Arg Glu Ile Lys Thr Cys Trp Asn
705 710 715 720

Lys Ile Leu Lys Gly Ser Ile Gly Ser Gly Val Lys Gln Thr Leu Asn
725 730 735

Phe Asp Leu Leu Lys Leu Ala Gly Asp Val Glu Ser Asn Pro Gly Pro
740 745 750

Met Ala Pro Arg Val Thr Pro Leu Leu Ala Phe Ser Leu Leu Val Leu
755 760 765

Trp Thr Phe Pro Ala Pro Thr Leu Gly Gly Ala Asn Asp Ala Glu Asp
770 775 780

Cys Cys Leu Ser Val Thr Gln Arg Pro Ile Pro Gly Asn Ile Val Lys
785 790 795 800

Ala Phe Arg Tyr Leu Leu Asn Glu Asp Gly Cys Arg Val Pro Ala Val
805 810 815

Val Phe Thr Thr Leu Arg Gly Tyr Gln Leu Cys Ala Pro Pro Asp Gln
820 825 830

Pro Trp Val Asp Arg Ile Ile Arg Arg Leu Lys Lys Ser Ser Ala Lys
835 840 845

Asn Lys Gly Asn Ser Thr Arg Arg Ser Pro Val Ser Arg Gly Ser Gly
850 855 860

Val Lys Gln Thr Leu Asn Phe Asp Leu Leu Lys Leu Ala Gly Asp Val
865 870 875 880

Glu Ser Asn Pro Gly Pro Met Thr Trp Ala Pro Leu Leu Leu Ile Phe
885 890 895

Leu Gln His Leu Arg Gly Ser Cys Ala Gln Phe Val Leu Thr Gln Pro
900 905 910

Lys Thr Val Ser Glu Ser Leu Gly Arg Thr Val Thr Ile Ser Cys Lys
915 920 925

Arg Ser Ser Gly Ser Val Gly Asp Tyr Tyr Val Ser Trp His Gln Gln
930 935 940

Arg Phe Gly Ser Ser Pro Lys Thr Val Ile Tyr Leu Asp Asp Glu Arg
945 950 955 960

Pro Ser Gly Val Pro Lys Arg Phe Ser Gly Ser Ile Asp Ser Ser Ser
965 970 975

Asn Ser Ala Ser Leu Thr Ile Thr Asp Leu Gln Thr Asp Asp Glu Ala
980 985 990

Asp Tyr Phe Cys Leu Ser Tyr Asp Ser Asn Asn His Phe Val Phe Gly
995 1000 1005

Ser Gly Thr His Leu Thr Val Leu Gly Gly Gly Gly Ser Gly Gly
1010 1015 1020

Gly Gly Ser Gly Gly Gly Gly Ser Glu Val Gln Leu Val Glu Ser
1025 1030 1035

Gly Gly Gly Leu Ala Gln Pro Gly Lys Ser Leu Lys Leu Ser Cys
1040 1045 1050

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

Ser Gly Ser Asn Lys Ile Thr Tyr Ala Asp Thr Val Lys Gly Arg
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Phe Thr Val Ser Arg Asp Asn Gly Lys Asn Gln Leu Phe Leu Gln
1100 1105 1110

Met Asn Asn Leu Lys Ser Glu Asp Thr Ala Ile Tyr Tyr Cys Val
1115 1120 1125

Asp Ser Gly Phe Asn Ser Tyr Ser Asp Val Trp Gly Gln Gly Ile
1130 1135 1140

Gln	Val	Thr	Val	Ser	Ser	Asp	Tyr	Lys	Asp	Asp	Asp	Asp	Lys	Phe
1145						1150					1155			

Val	Glu	His	His	His	His	His	His
1160						1165	