

SEQUENCE LISTING

<110> Regeneron Pharmaceuticals, Inc.

<120> Treatment Of Glycemic Deficiencies With Solute Carrier Family 39 Member 5 Inhibitors (SLC39A5)

<130> 189238.02302 (3199) (10534W001)

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<151> 2020-02-14

<150> 62/818,811

<151> 2019-03-15

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<170> PatentIn version 3.5

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 <213> homo sapien

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cacccccagg	ggauacuacua
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tggggctcag cctgggccct gtccccctca ctccctgggt gtttggggtc actgctgggg	1680
tcttcctcta tgtggccctt gtggacatgc taccagccct gcttcgtcct ccggagcccc	1740
tgccctacgcc ccatgtgctc ctgcaggggc tggggctgct gctggggggc ggccctcatgc	1800
ttgccataac cctgctggag gagcggctac tgcccgtgac cactgagggc tgatggggcc	1860
agtggaaagg ggtcgggttg cccttccttc cccccaacca caggaatgga ggccgggacac	1920
agggccagta ggagcaatag gattttaata aacagaaccc atcccaaa	1968

<210> 20
 <211> 1968
 <212> DNA
 <213> homo sapien

<400> 20	
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tgcttaacgt ctacagcaag gcctaataagg ggacctgagg gcacagtcct caggatgttt	180
cggggagaaat aggagccaga acctgagccc ctaagctatt cccctcacca atgatgggggt	240
ccccagtgag tcacttgctg gccggcttct gtgtgtgggt cgtcttgggc tgggtagggg	300
gctcagtccc caacctgggc cctgctgagc aggagcagaa ccattacctg gcccagctgt	360
ttggcctgta cggcgagaat gggacgctga ctgcaggggg cttggcgagg cttctccaca	420
gcctgggggct agggccaggt caggggcttc gcctgggaca gcatgggcct ctgactggac	480
gggctgcatc cccagctgca gacaattcca cacacaggcc acagaaccct gagctgagtg	540
tggatgtctg ggcagggatg cctctgggtc cctcagggtg gggtgacctg gaagagtcaa	600
aggccccctca cctaccccgt gggccagccc cctcgggcct ggacctcctt cacaggcttc	660
tgcttgctgga ccactcattg gctgaccacc tgaatgagga ttgtctgaac ggctcccagc	720
tgctgggtcaa ttttggcttg agccccgctg ctctctgac ccctcgtcag tttgctctgc	780
tgtgcccagc cctgctttat cagatcgaca gccgcgtctg catcggcgct ccggccccctg	840
cacccccagg ggatctacta tctgccctgc ttcagagtgc cctggcagtc ctgttgctca	900

gcctcccttc tcccctatcc ctgctgctgc tgcggctcct gggacctcgt ctactacggc	960
ccttgctggg cttcctgggg gccctggcgg tgggcactct ttgtggggat gcactgctac	1020
atctgctacc gcatgcacaa gaagggcggc acgcaggacc tggcggacta ccagagaagg	1080
acctgggccc ggggctgtca gtgctcggag gcctcttcct gctctttgtg ctggagaaca	1140
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cgtggatggg cctcctggga gatgggtctac acaacctcac tgatgggctg gccatagggtg	1440
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agctgcccc cgaactgggt gactttgcca tgctgctcca gtcagggtg tcctttcggc	1560
ggctgctgct gctgagcctc gtgtctggag ccctgggatt ggggggtgca gtcctggggg	1620
tggggctcag cctgggccct gtccccctca ctccctgggt gtttggggtc actgctgggg	1680
tcttcctcta tgtggccctt gtggacatgc taccagccct gcttcgtcct ccggagcccc	1740
tgcttacgcc ccatgtgctc ctgcaggggc tggggctgct gctggggggc ggctcatgc	1800
ttgccataac cctgctggag gagcggctac tgcccgtgac cactgagggc tgatggggcc	1860
agtggaaagg ggtcgggttg cccttccttc cccccaacca caggaatgga ggcgggacac	1920
agggccagta ggagcaatag gattttaata aacagaaccc atcccaaa	1968

<210> 21
 <211> 1968
 <212> DNA
 <213> homo sapien

<400> 21	
agctggaacc aagaagggtg tgtccccctt cctctgggtg tccttgtctc ctgctatcag	60
ggcttccccct ttcttgggtca tcgatcccta gagctctggc tctttctctt cttggggaac	120
tgcttaacgt ctacagcaag gcctaataagg ggacctgagg gcacagtcct caggatgttt	180
cggggagaat aggagccaga acctgagccc ctaagctatt cccctacca atgatgggggt	240

ccccagtgag tcatctgctg gccggcttct gtgtgtgggt cgtcttgggc tgggtagggg	300
gctcagtcac caacctgggc cctgctgagc aggagcagaa ccattacctg gcccagctgt	360
ttggcctgta cggcgagaat gggacgctga ctgcaggggg cttggcgagg cttctccaca	420
gcctggggct aggccgagtt caggggcttc gcctgggaca gcatgggcct ctgactggac	480
gggctgcatc cccagctgca gacaattcca cacacaggcc acagaaccct gagctgagtg	540
tggatgtctg ggcagggatg cctctgggtc cctcagggtg gggtagacct gaagagtcaa	600
aggccccctc cctaccccggt gggccagccc cctcgggcct ggacctcctt cacaggcttc	660
tgttgctgga ccactcattg gctgaccacc tgaatgagga ttgtctgaac ggctcccagc	720
tgctgggtcaa ttttggcttg agccccgctg ctctctgac ccctcgtagc ttgtctctgc	780
tgtgcccagc cctgctttat cagatcgaca gccgcgtctg catcggcgct ccggccccctg	840
cacccccagg ggatctacta tctgccctgc ttcagagtgc cctggcagtc ctgttgctca	900
gcctcccttc tcccctatcc ctgctgctgc tgcggctcct gggacctcgt ctactacggc	960
ccttgctggg cttcctgggg gccctggcgg tgggcactct ttgtggggat gcaactgtac	1020
atctgctacc gcatgcacaa gaaggcgagg acgcaggacc tggcggacta ccagagaagg	1080
acctgggccc ggggctgtca gtgctcggag gcctcttcct gctctttgtg ctggagaaca	1140
tgctggggct tttgcggcac tgagggtca ggccaagatg ctgcaggcga aaacgaagga	1200
atctcgaaac acgcaacttg gatccggaga atggcagtggt gatggccctt cagcccctac	1260
aggcagctcc agagccaggg gctcagggcc agaggagaaa gaacagccag caccaccag	1320
ctctggcccc tcctgggcac caaggccaca gtcattggga ccagggtggc actgatata	1380
cgtggatggt cctcctggga gatggtctac acaacctcac tgatgggctg gccatagggtg	1440
ctgccttctc tgatggcttc tccagcggcc tcagtaccac cttagcggtc ttctgccatg	1500
agctgcccc agaactgggt gactttgcca tgctgctcca gtcagggtg tcctttcggc	1560
ggctgctgct gctgagcctc gtgtctggag ccctgggatt ggggggtgca gtcctggggg	1620
tggggctcag cctgggcccgt gtcacctca ctccctgggt gtttggggtc actgctgggg	1680
tcttcctcta tgtggccctt gtggacatgc taccagccct gcttcgtcct ccggagcccc	1740

tgcctacgcc ccatgtgctc ctgcaggggc tggggctgct gctggggggc ggcctcatgc 1800
 ttgccataac cctgctggag gagcggctac tgcccgtgac cactgagggc tgatggggcc 1860
 agtggaaagg ggtcgggttg cccttccttc cccccaacca caggaatgga ggcgggacac 1920
 agggccagta ggagcaatag gattttaata aacagaaccc atcccaaa 1968

<210> 22
 <211> 540
 <212> PRT
 <213> homo sapien

<400> 22

Met Met Gly Ser Pro Val Ser His Leu Leu Ala Gly Phe Cys Val Trp
 1 5 10 15

Val Val Leu Gly Trp Val Gly Gly Ser Val Pro Asn Leu Gly Pro Ala
 20 25 30

Glu Gln Glu Gln Asn His Tyr Leu Ala Gln Leu Phe Gly Leu Tyr Gly
 35 40 45

Glu Asn Gly Thr Leu Thr Ala Gly Gly Leu Ala Arg Leu Leu His Ser
 50 55 60

Leu Gly Leu Gly Arg Val Gln Gly Leu Arg Leu Gly Gln His Gly Pro
 65 70 75 80

Leu Thr Gly Arg Ala Ala Ser Pro Ala Ala Asp Asn Ser Thr His Arg
 85 90 95

Pro Gln Asn Pro Glu Leu Ser Val Asp Val Trp Ala Gly Met Pro Leu
 100 105 110

Gly Pro Ser Gly Trp Gly Asp Leu Glu Glu Ser Lys Ala Pro His Leu
 115 120 125

Pro Arg Gly Pro Ala Pro Ser Gly Leu Asp Leu Leu His Arg Leu Leu

130

135

140

Leu Leu Asp His Ser Leu Ala Asp His Leu Asn Glu Asp Cys Leu Asn
 145 150 155 160

Gly Ser Gln Leu Leu Val Asn Phe Gly Leu Ser Pro Ala Ala Pro Leu
 165 170 175

Thr Pro Arg Gln Phe Ala Leu Leu Cys Pro Ala Leu Leu Tyr Gln Ile
 180 185 190

Asp Ser Arg Val Cys Ile Gly Ala Pro Ala Pro Ala Pro Pro Gly Asp
 195 200 205

Leu Leu Ser Ala Leu Leu Gln Ser Ala Leu Ala Val Leu Leu Leu Ser
 210 215 220

Leu Pro Ser Pro Leu Ser Leu Leu Leu Leu Arg Leu Leu Gly Pro Arg
 225 230 235 240

Leu Leu Arg Pro Leu Leu Gly Phe Leu Gly Ala Leu Ala Val Gly Thr
 245 250 255

Leu Cys Gly Asp Ala Leu Leu His Leu Leu Pro His Ala Gln Glu Gly
 260 265 270

Arg His Ala Gly Pro Gly Gly Leu Pro Glu Lys Asp Leu Gly Pro Gly
 275 280 285

Leu Ser Val Leu Gly Gly Leu Phe Leu Leu Phe Val Leu Glu Asn Met
 290 295 300

Leu Gly Leu Leu Arg His Arg Gly Leu Arg Pro Arg Cys Cys Arg Arg
 305 310 315 320

Lys Arg Arg Asn Leu Glu Thr Arg Asn Leu Asp Pro Glu Asn Gly Ser
 325 330 335

Gly Met Ala Leu Gln Pro Leu Gln Ala Ala Pro Glu Pro Gly Ala Gln
340 345 350

Gly Gln Arg Glu Lys Asn Ser Gln His Pro Pro Ala Leu Ala Pro Pro
355 360 365

Gly His Gln Gly His Ser His Gly His Gln Gly Gly Thr Asp Ile Thr
370 375 380

Trp Met Val Leu Leu Gly Asp Gly Leu His Asn Leu Thr Asp Gly Leu
385 390 395 400

Ala Ile Gly Ala Ala Phe Ser Asp Gly Phe Ser Ser Gly Leu Ser Thr
405 410 415

Thr Leu Ala Val Phe Cys His Glu Leu Pro His Glu Leu Gly Asp Phe
420 425 430

Ala Met Leu Leu Gln Ser Gly Leu Ser Phe Arg Arg Leu Leu Leu Leu
435 440 445

Ser Leu Val Ser Gly Ala Leu Gly Leu Gly Gly Ala Val Leu Gly Val
450 455 460

Gly Leu Ser Leu Gly Pro Val Pro Leu Thr Pro Trp Val Phe Gly Val
465 470 475 480

Thr Ala Gly Val Phe Leu Tyr Val Ala Leu Val Asp Met Leu Pro Ala
485 490 495

Leu Leu Arg Pro Pro Glu Pro Leu Pro Thr Pro His Val Leu Leu Gln
500 505 510

Gly Leu Gly Leu Leu Leu Gly Gly Gly Leu Met Leu Ala Ile Thr Leu
515 520 525

Leu Glu Glu Arg Leu Leu Pro Val Thr Thr Glu Gly

530

535

540

<210> 23
 <211> 46
 <212> PRT
 <213> homo sapien

<400> 23

Met Met Gly Ser Pro Val Ser His Leu Leu Ala Gly Phe Cys Val Trp
 1 5 10 15

Val Val Leu Gly Trp Val Gly Gly Ser Val Pro Asn Leu Gly Pro Ala
 20 25 30

Glu Gln Glu Gln Asn His Tyr Leu Ala Gln Leu Phe Gly Leu
 35 40 45

<210> 24
 <211> 540
 <212> PRT
 <213> homo sapien

<400> 24

Met Met Gly Ser Pro Val Ser His Leu Leu Ala Gly Phe Cys Val Trp
 1 5 10 15

Val Val Leu Gly Trp Val Gly Gly Ser Val Pro Asn Leu Gly Pro Ala
 20 25 30

Glu Gln Glu Gln Asn His Tyr Leu Ala Gln Leu Phe Gly Leu Tyr Gly
 35 40 45

Glu Asn Gly Thr Leu Thr Ala Gly Gly Leu Ala Arg Leu Leu His Ser
 50 55 60

Leu Gly Leu Gly Arg Val Gln Gly Leu Arg Leu Gly Gln His Gly Pro
 65 70 75 80

Leu Thr Gly Arg Ala Ala Ser Pro Ala Ala Asp Asn Ser Thr His Arg

85

90

95

Pro Gln Asn Pro Glu Leu Ser Val Asp Val Trp Ala Gly Met Pro Leu
 100 105 110

Gly Pro Ser Gly Trp Gly Asp Leu Glu Glu Ser Lys Ala Pro His Leu
 115 120 125

Pro Arg Gly Pro Ala Pro Ser Gly Leu Asp Leu Leu His Arg Leu Leu
 130 135 140

Leu Leu Asp His Ser Leu Ala Asp His Leu Asn Glu Asp Cys Leu Asn
 145 150 155 160

Gly Ser Gln Leu Leu Val Asn Phe Gly Leu Ser Pro Ala Ala Pro Leu
 165 170 175

Thr Pro Arg Gln Phe Ala Leu Leu Cys Pro Ala Leu Leu Tyr Gln Ile
 180 185 190

Asp Ser Arg Val Cys Ile Gly Ala Pro Ala Pro Ala Pro Pro Gly Asp
 195 200 205

Leu Leu Ser Ala Leu Leu Gln Ser Ala Leu Ala Val Leu Leu Leu Ser
 210 215 220

Leu Pro Ser Pro Leu Ser Leu Leu Leu Leu Arg Leu Leu Gly Pro Arg
 225 230 235 240

Leu Leu Arg Pro Leu Leu Gly Phe Leu Gly Ala Leu Ala Val Gly Thr
 245 250 255

Leu Cys Gly Asp Ala Leu Leu His Leu Leu Pro His Ala Gln Glu Gly
 260 265 270

Arg His Ala Gly Pro Gly Gly Leu Pro Glu Lys Asp Leu Gly Pro Gly
 275 280 285

Leu Ser Val Leu Gly Gly Leu Phe Leu Leu Phe Val Leu Glu Asn Thr
 290 295 300

Leu Gly Leu Leu Arg His Arg Gly Leu Arg Pro Arg Cys Cys Arg Arg
 305 310 315 320

Lys Arg Arg Asn Leu Glu Thr Arg Asn Leu Asp Pro Glu Asn Gly Ser
 325 330 335

Gly Met Ala Leu Gln Pro Leu Gln Ala Ala Pro Glu Pro Gly Ala Gln
 340 345 350

Gly Gln Arg Glu Lys Asn Ser Gln His Pro Pro Ala Leu Ala Pro Pro
 355 360 365

Gly His Gln Gly His Ser His Gly His Gln Gly Gly Thr Asp Ile Thr
 370 375 380

Trp Met Val Leu Leu Gly Asp Gly Leu His Asn Leu Thr Asp Gly Leu
 385 390 395 400

Ala Ile Gly Ala Ala Phe Ser Asp Gly Phe Ser Ser Gly Leu Ser Thr
 405 410 415

Thr Leu Ala Val Phe Cys His Glu Leu Pro His Glu Leu Gly Asp Phe
 420 425 430

Ala Met Leu Leu Gln Ser Gly Leu Ser Phe Arg Arg Leu Leu Leu Leu
 435 440 445

Ser Leu Val Ser Gly Ala Leu Gly Leu Gly Gly Ala Val Leu Gly Val
 450 455 460

Gly Leu Ser Leu Gly Pro Val Pro Leu Thr Pro Trp Val Phe Gly Val
 465 470 475 480

Thr Ala Gly Val Phe Leu Tyr Val Ala Leu Val Asp Met Leu Pro Ala

485

490

495

Leu Leu Arg Pro Pro Glu Pro Leu Pro Thr Pro His Val Leu Leu Gln
 500 505 510

Gly Leu Gly Leu Leu Leu Gly Gly Gly Leu Met Leu Ala Ile Thr Leu
 515 520 525

Leu Glu Glu Arg Leu Leu Pro Val Thr Thr Glu Gly
 530 535 540

<210> 25
 <211> 321
 <212> PRT
 <213> homo sapien

<400> 25

Met Met Gly Ser Pro Val Ser His Leu Leu Ala Gly Phe Cys Val Trp
 1 5 10 15

Val Val Leu Gly Trp Val Gly Gly Ser Val Pro Asn Leu Gly Pro Ala
 20 25 30

Glu Gln Glu Gln Asn His Tyr Leu Ala Gln Leu Phe Gly Leu Tyr Gly
 35 40 45

Glu Asn Gly Thr Leu Thr Ala Gly Gly Leu Ala Arg Leu Leu His Ser
 50 55 60

Leu Gly Leu Gly Arg Val Gln Gly Leu Arg Leu Gly Gln His Gly Pro
 65 70 75 80

Leu Thr Gly Arg Ala Ala Ser Pro Ala Ala Asp Asn Ser Thr His Arg
 85 90 95

Pro Gln Asn Pro Glu Leu Ser Val Asp Val Trp Ala Gly Met Pro Leu
 100 105 110

Gly Pro Ser Gly Trp Gly Asp Leu Glu Glu Ser Lys Ala Pro His Leu
115 120 125

Pro Arg Gly Pro Ala Pro Ser Gly Leu Asp Leu Leu His Arg Leu Leu
130 135 140

Leu Leu Asp His Ser Leu Ala Asp His Leu Asn Glu Asp Cys Leu Asn
145 150 155 160

Gly Ser Gln Leu Leu Val Asn Phe Gly Leu Ser Pro Ala Ala Pro Leu
165 170 175

Thr Pro Arg Gln Phe Ala Leu Leu Cys Pro Ala Leu Leu Tyr Gln Ile
180 185 190

Asp Ser Arg Val Cys Ile Gly Ala Pro Ala Pro Ala Pro Pro Gly Asp
195 200 205

Leu Leu Ser Ala Leu Leu Gln Ser Ala Leu Ala Val Leu Leu Leu Ser
210 215 220

Leu Pro Ser Pro Leu Ser Leu Leu Leu Leu Arg Leu Leu Gly Pro Arg
225 230 235 240

Leu Leu Arg Pro Leu Leu Gly Phe Leu Gly Ala Leu Ala Val Gly Thr
245 250 255

Leu Cys Gly Asp Ala Leu Leu His Leu Leu Pro His Ala Gln Glu Gly
260 265 270

Arg His Ala Gly Pro Gly Gly Leu Pro Glu Lys Asp Leu Gly Pro Gly
275 280 285

Leu Ser Val Leu Gly Gly Leu Phe Leu Leu Phe Val Leu Glu Asn Met
290 295 300

Leu Gly Leu Leu Arg His Arg Gly Leu Arg Pro Arg Cys Cys Arg Arg
305 310 315 320

Lys

<210> 26
<211> 540
<212> PRT
<213> homo sapien

<400> 26

Met Met Gly Ser Pro Val Ser His Leu Leu Ala Gly Phe Cys Val Trp
1 5 10 15

Val Val Leu Gly Trp Val Gly Gly Ser Val Pro Asn Leu Gly Pro Ala
20 25 30

Glu Gln Glu Gln Asn His Tyr Leu Ala Gln Leu Phe Gly Leu Tyr Gly
35 40 45

Glu Asn Gly Thr Leu Thr Ala Gly Gly Leu Ala Arg Leu Leu His Ser
50 55 60

Leu Gly Leu Gly Arg Val Gln Gly Leu Arg Leu Gly Gln His Gly Pro
65 70 75 80

Leu Thr Gly Arg Ala Ala Ser Pro Ala Ala Asp Asn Ser Thr His Arg
85 90 95

Pro Gln Asn Pro Glu Leu Ser Val Asp Val Trp Ala Gly Met Pro Leu
100 105 110

Gly Pro Ser Gly Trp Gly Asp Leu Glu Glu Ser Lys Ala Pro His Leu
115 120 125

Pro Arg Gly Pro Ala Pro Ser Gly Leu Asp Leu Leu His Arg Leu Leu
130 135 140

Leu Leu Asp His Ser Leu Ala Asp His Leu Asn Glu Asp Cys Leu Asn

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

Gly Gln Arg Glu Lys Asn Ser Gln His Pro Pro Ala Leu Ala Pro Pro
355 360 365

Gly His Gln Gly His Ser His Gly His Gln Gly Gly Thr Asp Ile Thr
370 375 380

Trp Met Val Leu Leu Gly Asp Gly Leu His Asn Leu Thr Asp Gly Leu
385 390 395 400

Ala Ile Gly Ala Ala Phe Ser Asp Gly Phe Ser Ser Ala Leu Ser Thr
405 410 415

Thr Leu Ala Val Phe Cys His Glu Leu Pro His Glu Leu Gly Asp Phe
420 425 430

Ala Met Leu Leu Gln Ser Gly Leu Ser Phe Arg Arg Leu Leu Leu Leu
435 440 445

Ser Leu Val Ser Gly Ala Leu Gly Leu Gly Gly Ala Val Leu Gly Val
450 455 460

Gly Leu Ser Leu Gly Pro Val Pro Leu Thr Pro Trp Val Phe Gly Val
465 470 475 480

Thr Ala Gly Val Phe Leu Tyr Val Ala Leu Val Asp Met Leu Pro Ala
485 490 495

Leu Leu Arg Pro Pro Glu Pro Leu Pro Thr Pro His Val Leu Leu Gln
500 505 510

Gly Leu Gly Leu Leu Leu Gly Gly Gly Leu Met Leu Ala Ile Thr Leu
515 520 525

Leu Glu Glu Arg Leu Leu Pro Val Thr Thr Glu Gly
530 535 540

<210> 27

<211> 310
 <212> PRT
 <213> homo sapien

<400> 27

Met Met Gly Ser Pro Val Ser His Leu Leu Ala Gly Phe Cys Val Trp
 1 5 10 15

Val Val Leu Gly Trp Val Gly Gly Ser Val Pro Asn Leu Gly Pro Ala
 20 25 30

Glu Gln Glu Gln Asn His Tyr Leu Ala Gln Leu Phe Gly Leu Tyr Gly
 35 40 45

Glu Asn Gly Thr Leu Thr Ala Gly Gly Leu Ala Arg Leu Leu His Ser
 50 55 60

Leu Gly Leu Gly Arg Val Gln Gly Leu Arg Leu Gly Gln His Gly Pro
 65 70 75 80

Leu Thr Gly Arg Ala Ala Ser Pro Ala Ala Asp Asn Ser Thr His Arg
 85 90 95

Pro Gln Asn Pro Glu Leu Ser Val Asp Val Trp Ala Gly Met Pro Leu
 100 105 110

Gly Pro Ser Gly Trp Gly Asp Leu Glu Glu Ser Lys Ala Pro His Leu
 115 120 125

Pro Arg Gly Pro Ala Pro Ser Gly Leu Asp Leu Leu His Arg Leu Leu
 130 135 140

Leu Leu Asp His Ser Leu Ala Asp His Leu Asn Glu Asp Cys Leu Asn
 145 150 155 160

Gly Ser Gln Leu Leu Val Asn Phe Gly Leu Ser Pro Ala Ala Pro Leu
 165 170 175

Thr Pro Arg Gln Phe Ala Leu Leu Cys Pro Ala Leu Leu Tyr Gln Ile
180 185 190

Asp Ser Arg Val Cys Ile Gly Ala Pro Ala Pro Ala Pro Pro Gly Asp
195 200 205

Leu Leu Ser Ala Leu Leu Gln Ser Ala Leu Ala Val Leu Leu Leu Ser
210 215 220

Leu Pro Ser Pro Leu Ser Leu Leu Leu Leu Arg Leu Leu Gly Pro Arg
225 230 235 240

Leu Leu Arg Pro Leu Leu Gly Phe Leu Gly Ala Leu Ala Val Gly Thr
245 250 255

Leu Cys Gly Asp Ala Leu Leu His Leu Leu Pro His Ala Gln Glu Gly
260 265 270

Arg His Ala Gly Pro Gly Gly Leu Pro Glu Lys Asp Leu Gly Pro Gly
275 280 285

Leu Ser Val Leu Gly Gly Leu Phe Leu Leu Phe Val Leu Glu Asn Met
290 295 300

Leu Gly Leu Leu Arg His
305 310

<210> 28
<211> 23
<212> DNA
<213> artificial sequence

<220>
<223> Guide RNA Recognition Sequence

<400> 28
cgcaacttgg atccggagaa tgg

23

<210> 29
<211> 23

<212> DNA
 <213> artificial sequence

 <220>
 <223> Guide RNA Recognition Sequence

 <400> 29
 gaatctcgaa acacgcaact tgg 23

<210> 30
 <211> 23
 <212> DNA
 <213> artificial sequence

 <220>
 <223> Guide RNA Recognition Sequence

 <400> 30
 cgaaacacgc aacttgatc cgg 23

<210> 31
 <211> 23
 <212> DNA
 <213> artificial sequence

 <220>
 <223> Guide RNA Recognition Sequence

 <400> 31
 tggatccgga gaatggcagt ggg 23

<210> 32
 <211> 23
 <212> DNA
 <213> artificial sequence

 <220>
 <223> Guide RNA Recognition Sequence

 <400> 32
 aggcagctcc aggtgactag agg 23

<210> 33
 <211> 23
 <212> DNA
 <213> artificial sequence

<220>
 <223> Guide RNA Recognition Sequence

 <400> 33
 gatggccctt cagcccctac agg 23

 <210> 34
 <211> 23
 <212> DNA
 <213> artificial sequence

 <220>
 <223> Guide RNA Recognition Sequence

 <400> 34
 aaataggagg gcatccctcc tgg 23

 <210> 35
 <211> 23
 <212> DNA
 <213> artificial sequence

 <220>
 <223> Guide RNA Recognition Sequence

 <400> 35
 ttggatccgg agaatggcag tgg 23

 <210> 36
 <211> 23
 <212> DNA
 <213> artificial sequence

 <220>
 <223> Guide RNA Recognition Sequence

 <400> 36
 gtcacctgga gctgcctgta ggg 23

 <210> 37
 <211> 23
 <212> DNA
 <213> artificial sequence

 <220>

<223> Guide RNA Recognition Sequence

<400> 37

aattttctcc tctagtcacc tgg

23

<210> 38

<211> 23

<212> DNA

<213> artificial sequence

<220>

<223> Guide RNA Recognition Sequence

<400> 38

tcacctggag ctgcctgtag ggg

23

<210> 39

<211> 23

<212> DNA

<213> artificial sequence

<220>

<223> Guide RNA Recognition Sequence

<400> 39

tcctatttca gagatgctgc agg

23

<210> 40

<211> 23

<212> DNA

<213> artificial sequence

<220>

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 ccaggacagg ggctggagtg gctgggagtg atttgggggtg atggaagaac agactataat 180
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20 25 30

Ala Val Asn Trp Val Arg Gln Pro Pro Gly Gln Gly Leu Glu Trp Leu
35 40 45

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

Ser Arg Leu Ser Ile Asn Lys Asp Asn Ser Lys Ser Gln Val Phe Leu
65 70 75 80

Lys Met Asn Ser Leu Gln Thr Asp Asp Thr Ala Arg Tyr Tyr Cys Ala
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Arg Phe Gly Asn Ser Tyr Ala Leu Asp Tyr Trp Gly Gln Gly Thr Ser
100 105 110

Val Thr Val Ser Ser
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tggtaccagc agaaaccagg gcagtctcct aaactgctga tctactgggc atccactagg	180
gaatctggggg tccctgatcg cttcacaggc agtggatctg ggacagattt cactctcacc	240
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			20					25					30		

Arg	Thr	Arg	Lys	Asn	Tyr	Leu	Ala	Trp	Tyr	Gln	Gln	Lys	Pro	Gly	Gln
			35				40					45			

Ser	Pro	Lys	Leu	Leu	Ile	Tyr	Trp	Ala	Ser	Thr	Arg	Glu	Ser	Gly	Val
	50					55					60				

Pro	Asp	Arg	Phe	Thr	Gly	Ser	Gly	Ser	Gly	Thr	Asp	Phe	Thr	Leu	Thr
65					70					75				80	

Ile	Ser	Ser	Val	Gln	Ala	Glu	Asp	Leu	Ala	Val	Tyr	Tyr	Cys	Lys	Gln
			85						90					95	

Ser	Tyr	Asn	Leu	His	Thr	Phe	Gly	Gly	Gly	Thr	Lys	Leu	Glu	Ile	Lys
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Trp Leu Gly Val Ile Trp Gly Asp Gly Arg Thr Asp Tyr
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His Gly