

SEQUENCE LISTING

<110> MediSix Therapeutics Pte Ltd.

<120> TWO-GENE VECTORS FOR GENERATING CAR-T CELLS AND USES THEREOF

<130> 119419-5007-WO

<140> Filed Herewith

<141> 2019-11-13

<150> 62/767,069

<151> 2018-11-14

<160> 98

<170> PatentIn version 3.5

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<223> synthetic polynucleotide of CPPT-CMV-MCS-PGK-GFP-WPRE

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<223> synthetic polynucleotide of CMV promoter

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<210> 12

<211> 2974

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic polynucleotide of anti-human CD7 (TH69)

CAR-IRES-anti-human CD7 (TH69) PEBL

<400> 12

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<210> 13

<211> 2400

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic polynucleotide of anti-human CD7 (TH69)

CAR-p2A-anti-human CD7 (TH69) PEBL

<400> 13

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<210> 14

<211> 2803

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic polynucleotide of MSCV promoter-Anti-human CD7 (TH69)
CAR-p2A-Anti-human CD7 (TH69) PEBL

<400> 14

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<210> 15

<211> 3598

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic polynucleotide of EF1a promoter-Anti-human CD7 (TH69)
CAR-p2A-Anti-human CD7 (TH69) PEBL

<400> 15

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<210> 16

<211> 2792

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic polynucleotide of EF1a promoter-Anti-human CD7 (TH69)
 CAR-p2A-Anti-human CD7 (TH69) PEBL

<400> 16

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<210> 17

<211> 3346

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic polynucleotide of MSCV promoter-Anti-human CD7 (TH69)
 CAR-PGK promoter-Anti-human CD7 (TH69) PEBL

<400> 17

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<210> 18

<211> 3938

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic polynucleotide of MSCV promoter-anti-human CD7 CAR
(TH69)-EF1a promoter- Anti-human CD7

<400> 18

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<210> 19
<211> 3132
<212> DNA
<213> Artificial Sequence

<220>
<223> synthetic polynucleotide of MSCV promoter-anti-human CD7 CAR
(TH69)-EFS promoter- Anti-human CD7 (TH69) PEBL

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<210> 20

<211> 4057

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic polynucleotide of PGK promoter -anti-human CD7 CAR
 (3A1F)-EF1a promoter- Anti-human CD7 (TH69) PEBL

<400> 20

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(TH69)-EF1a promoter- Anti-human CD7 (3A1F) PEBL

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(TH69)-EF1a promoter-Anti-human CD7 (TH69) PEBL

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 taaactggga aagtgatgtc gtgtactggc tccgcctttt tccgagggt gggggagaac 2160
 cgtatataag tgcagtagtc gccgtgaacg ttcttttcg caacgggttt gccgccagaa 2220
 cacaggtgtc gtgaccgcgg gtctagagga tccgttactc gaggaactga aaaaccagaa 2280
 agttaactgg taagtttagt cttttgtct tttatttcag gtcccggatc cgggtggtgt 2340
 gcaaatcaaa gaactgtcc tcagtggatg ttgccttac tttagcccg ggggcttcca 2400
 ccatggctct gcctgtgacc gactgtgtc tgccctggc tctgtgtctg cagccgcaa 2460

gacctgccgc atacaaggat attcagatga ctgagaccac aagctccctg agcgcctccc 2520
tgggagaccg agtgacaatc tcttgcaatg catcacaggg aattagcaac tacctgaatt 2580
ggtatcagca gaagccagat ggcactgtga aactgctgat ctactatacc tctagtctgc 2640
acagtgggggt cccctcacga ttcagcggat cgggctctgg gacagactac agcctgacta 2700
tctccaacct ggagcccga gatatgcc cctactattg ccagcagtag tccaagctgc 2760
cttatactt tggcggggga acaaagctgg agattaaaag gggaggagga ggaagcggag 2820
gaggaggatc cggaggcggg ggaatctggg gaggaggaag tgaggtagc ctggcgaat 2880
ctggaggagg actggtgaag ccaggaggat ctctgaaact gagttgtgcc gcttcaggcc 2940
tgacctctc aagctacgcc atgagctggg tgcgacagac acctgagaag cggctggaat 3000
gggtcgtag catctctct ggcggttca catactatcc agactccgtg aaaggcagat 3060
ttactatctc tcgggataac gcaagaaata ttctgtacct gcagatgagt tctactgagga 3120
gcgaggacac cgcaatgtac tattgtgcca gggacgaagt gcgcggtat ctggatgtct 3180
ggggagctgg cactaccgtc accgtctcca gcgagcagaa actgattagc gaagaggacc 3240
tgaaagatga actgtaa 3257

<210> 24
<211> 284
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic polypeptide of anti CD7 (TH69) PEBL

<400> 24

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

His Ala Ala Arg Pro Ala Ala Tyr Lys Asp Ile Gln Met Thr Gln Thr
20 25 30

Thr Ser Ser Leu Ser Ala Ser Leu Gly Asp Arg Val Thr Ile Ser Cys
35 40 45

Ser Ala Ser Gln Gly Ile Ser Asn Tyr Leu Asn Trp Tyr Gln Gln Lys
50 55 60

Pro Asp Gly Thr Val Lys Leu Leu Ile Tyr Tyr Thr Ser Ser Leu His
65 70 75 80

Ser Gly Val Pro Ser Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Tyr
 85 90 95

Ser Leu Thr Ile Ser Asn Leu Glu Pro Glu Asp Ile Ala Thr Tyr Tyr
 100 105 110

Cys Gln Gln Tyr Ser Lys Leu Pro Tyr Thr Phe Gly Gly Gly Thr Lys
 115 120 125

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

Gly Gly Gly Ser Gly Gly Gly Gly Ser Glu Val Gln Leu Val Glu Ser
145 150 155 160

Gly Gly Gly Leu Val Lys Pro Gly Gly Ser Leu Lys Leu Ser Cys Ala
 165 170 175

Ala Ser Gly Leu Thr Phe Ser Ser Tyr Ala Met Ser Trp Val Arg Gln
 180 185 190

Thr Pro Glu Lys Arg Leu Glu Trp Val Ala Ser Ile Ser Ser Gly Gly
 195 200 205

Phe Thr Tyr Tyr Pro Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg
 210 215 220

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

Glu Asp Thr Ala Met Tyr Tyr Cys Ala Arg Asp Glu Val Arg Gly Tyr
 245 250 255

Leu Asp Val Trp Gly Ala Gly Thr Thr Val Thr Val Ser Ser Glu Gln
 260 265 270

Lys Leu Ile Ser Glu Glu Asp Leu Lys Asp Glu Leu
 275 280

<210> 25

<211> 285

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic polypeptide of anti CD7 (TH69) PEBL variant

<400> 25

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

Leu His Ala Ala Arg Pro Ala Ala Tyr Lys Asp Ile Gln Met Thr Gln
20 25 30

Thr Thr Ser Ser Leu Ser Ala Ser Leu Gly Asp Arg Val Thr Ile Ser
35 40 45

Cys Ser Ala Ser Gln Gly Ile Ser Asn Tyr Leu Asn Trp Tyr Gln Gln
50 55 60

Lys Pro Asp Gly Thr Val Lys Leu Leu Ile Tyr Tyr Thr Ser Ser Leu
65 70 75 80

His Ser Gly Val Pro Ser Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp
85 90 95

Tyr Ser Leu Thr Ile Ser Asn Leu Glu Pro Glu Asp Ile Ala Thr Tyr
100 105 110

Tyr Cys Gln Gln Tyr Ser Lys Leu Pro Tyr Thr Phe Gly Gly Gly Thr
115 120 125

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

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Glu Val Gln Leu Val Glu
145 150 155 160

Ser Gly Gly Gly Leu Val Lys Pro Gly Gly Ser Leu Lys Leu Ser Cys
165 170 175

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

Gln Thr Pro Glu Lys Arg Leu Glu Trp Val Ala Ser Ile Ser Ser Gly
195 200 205

Gly Phe Thr Tyr Tyr Pro Asp Ser Val Lys Gly Arg Phe Thr Ile Ser
210 215 220

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

Ser Glu Asp Thr Ala Met Tyr Tyr Cys Ala Arg Asp Glu Val Arg Gly
245 250 255

Tyr Leu Asp Val Trp Gly Ala Gly Thr Thr Val Thr Val Ser Ser Glu
260 265 270

Gln Lys Leu Ile Ser Glu Glu Asp Leu Lys Asp Glu Leu
275 280 285

<210> 26

<211> 281

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic polypeptide of anti-human CD7 (3A1F) PEBL

<400> 26

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

His Ala Ala Arg Pro Gln Val Gln Leu Gln Glu Ser Gly Ala Glu Leu
20 25 30

Val Lys Pro Gly Ala Ser Val Lys Leu Ser Cys Lys Ala Ser Gly Tyr
35 40 45

Thr Phe Thr Ser Tyr Trp Met His Trp Val Lys Gln Arg Pro Gly Gln
50 55 60

Gly Leu Glu Trp Ile Gly Lys Ile Asn Pro Ser Asn Gly Arg Thr Asn
65 70 75 80

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

Ser Ser Thr Ala Tyr Met Gln Leu Ser Ser Leu Thr Ser Glu Asp Ser
100 105 110

Ala Val Tyr Tyr Cys Ala Arg Gly Gly Val Tyr Tyr Asp Leu Tyr Tyr
115 120 125

Tyr Ala Leu Asp Tyr Trp Gly Gln Gly Thr Thr Val Thr Val Ser Ser
130 135 140

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Asp
145 150 155 160

Ile Glu Leu Thr Gln Ser Pro Ala Thr Leu Ser Val Thr Pro Gly Asp
165 170 175

Ser Val Ser Leu Ser Cys Arg Ala Ser Gln Ser Ile Ser Asn Asn Leu
180 185 190

His Trp Tyr Gln Gln Lys Ser His Glu Ser Pro Arg Leu Leu Ile Lys
195 200 205

Ser Ala Ser Gln Ser Ile Ser Gly Ile Pro Ser Arg Phe Ser Gly Ser
210 215 220

Gly Ser Gly Thr Asp Phe Thr Leu Ser Ile Asn Ser Val Glu Thr Glu
225 230 235 240

Asp Phe Gly Met Tyr Phe Cys Gln Gln Ser Asn Ser Trp Pro Tyr Thr
245 250 255

Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys Arg Glu Gln Lys Leu Ile
260 265 270

Ser Glu Glu Asp Leu Lys Asp Glu Leu
275 280

<210> 27
<211> 282
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic polypeptide of anti-human CD7 (3A1F) PEBL variant

<400> 27

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

Leu His Ala Ala Arg Pro Gln Val Gln Leu Gln Glu Ser Gly Ala Glu
20 25 30

Leu Val Lys Pro Gly Ala Ser Val Lys Leu Ser Cys Lys Ala Ser Gly
35 40 45

Tyr Thr Phe Thr Ser Tyr Trp Met His Trp Val Lys Gln Arg Pro Gly
50 55 60

Gln Gly Leu Glu Trp Ile Gly Lys Ile Asn Pro Ser Asn Gly Arg Thr
65 70 75 80

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

Ser Ser Ser Thr Ala Tyr Met Gln Leu Ser Ser Leu Thr Ser Glu Asp
100 105 110

Ser Ala Val Tyr Tyr Cys Ala Arg Gly Gly Val Tyr Tyr Asp Leu Tyr
115 120 125

Tyr Tyr Ala Leu Asp Tyr Trp Gly Gln Gly Thr Thr Val Thr Val Ser
130 135 140

Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser
145 150 155 160

Asp Ile Glu Leu Thr Gln Ser Pro Ala Thr Leu Ser Val Thr Pro Gly
165 170 175

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

Leu His Trp Tyr Gln Gln Lys Ser His Glu Ser Pro Arg Leu Leu Ile
195 200 205

Lys Ser Ala Ser Gln Ser Ile Ser Gly Ile Pro Ser Arg Phe Ser Gly
210 215 220

Ser Gly Ser Gly Thr Asp Phe Thr Leu Ser Ile Asn Ser Val Glu Thr
225 230 235 240

Glu Asp Phe Gly Met Tyr Phe Cys Gln Gln Ser Asn Ser Trp Pro Tyr
245 250 255

Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys Arg Glu Gln Lys Leu
260 265 270

Ile Ser Glu Glu Asp Leu Lys Asp Glu Leu
275 280

<210> 28

<211> 493

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic polypeptide of anti-human CD7 (TH69) CAR

<400> 28

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

His Ala Ala Arg Pro Ala Ala Tyr Lys Asp Ile Gln Met Thr Gln Thr
20 25 30

Thr Ser Ser Leu Ser Ala Ser Leu Gly Asp Arg Val Thr Ile Ser Cys
35 40 45

Ser Ala Ser Gln Gly Ile Ser Asn Tyr Leu Asn Trp Tyr Gln Gln Lys
50 55 60

Pro Asp Gly Thr Val Lys Leu Leu Ile Tyr Tyr Thr Ser Ser Leu His

65 70 75 80

Ser Gly Val Pro Ser Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Tyr
85 90 95

Ser Leu Thr Ile Ser Asn Leu Glu Pro Glu Asp Ile Ala Thr Tyr Tyr
100 105 110

Cys Gln Gln Tyr Ser Lys Leu Pro Tyr Thr Phe Gly Gly Gly Thr Lys
115 120 125

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

Gly Gly Gly Ser Gly Gly Gly Gly Ser Glu Val Gln Leu Val Glu Ser
145 150 155 160

Gly Gly Gly Leu Val Lys Pro Gly Gly Ser Leu Lys Leu Ser Cys Ala
165 170 175

Ala Ser Gly Leu Thr Phe Ser Ser Tyr Ala Met Ser Trp Val Arg Gln
180 185 190

Thr Pro Glu Lys Arg Leu Glu Trp Val Ala Ser Ile Ser Ser Gly Gly
195 200 205

Phe Thr Tyr Tyr Pro Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg
210 215 220

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

Glu Asp Thr Ala Met Tyr Tyr Cys Ala Arg Asp Glu Val Arg Gly Tyr
245 250 255

Leu Asp Val Trp Gly Ala Gly Thr Thr Val Thr Val Ser Ser Thr Thr
260 265 270

Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln
275 280 285

Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala
290 295 300

Val His Thr Arg Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala
305 310 315 320

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

Leu Tyr Cys Lys Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln
340 345 350

Pro Phe Met Arg Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser
355 360 365

Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly Cys Glu Leu Arg Val Lys
370 375 380

Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln
385 390 395 400

Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu
405 410 415

Asp Lys Arg Arg Gly Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg
420 425 430

Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met
435 440 445

Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly
450 455 460

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

Thr Tyr Asp Ala Leu His Met Gln Ala Leu Pro Pro Arg
485 490

<210> 29
<211> 514
<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic polypeptide of anti-human CD7 (TH69) CAR variant

<400> 29

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

His Ala Ala Arg Pro Ala Ala Tyr Lys Asp Ile Gln Met Thr Gln Thr
20 25 30

Thr Ser Ser Leu Ser Ala Ser Leu Gly Asp Arg Val Thr Ile Ser Cys
35 40 45

Ser Ala Ser Gln Gly Ile Ser Asn Tyr Leu Asn Trp Tyr Gln Gln Lys
50 55 60

Pro Asp Gly Thr Val Lys Leu Leu Ile Tyr Tyr Thr Ser Ser Leu His
65 70 75 80

Ser Gly Val Pro Ser Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Tyr
85 90 95

Ser Leu Thr Ile Ser Asn Leu Glu Pro Glu Asp Ile Ala Thr Tyr Tyr
100 105 110

Cys Gln Gln Tyr Ser Lys Leu Pro Tyr Thr Phe Gly Gly Gly Thr Lys
115 120 125

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

Gly Gly Gly Ser Gly Gly Gly Gly Ser Glu Val Gln Leu Val Glu Ser
145 150 155 160

Gly Gly Gly Leu Val Lys Pro Gly Gly Ser Leu Lys Leu Ser Cys Ala
165 170 175

Ala Ser Gly Leu Thr Phe Ser Ser Tyr Ala Met Ser Trp Val Arg Gln
180 185 190

Thr Pro Glu Lys Arg Leu Glu Trp Val Ala Ser Ile Ser Ser Gly Gly
195 200 205

Phe Thr Tyr Tyr Pro Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg
210 215 220

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

Glu Asp Thr Ala Met Tyr Tyr Cys Ala Arg Asp Glu Val Arg Gly Tyr
245 250 255

Leu Asp Val Trp Gly Ala Gly Thr Thr Val Thr Val Ser Ser Thr Thr
260 265 270

Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln
275 280 285

Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala
290 295 300

Val His Thr Arg Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala
305 310 315 320

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

Leu Tyr Cys Lys Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln
340 345 350

Pro Phe Met Arg Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser
355 360 365

Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly Cys Glu Leu Arg Val Lys
370 375 380

Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln
385 390 395 400

Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu
405 410 415

Asp Lys Arg Arg Gly Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg
420 425 430

Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met
435 440 445

Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly
450 455 460

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

Thr Tyr Asp Ala Leu His Met Gln Ala Leu Pro Pro Arg Gly Ser Gly
485 490 495

Ala Thr Asn Phe Ser Leu Leu Lys Gln Ala Gly Asp Val Glu Glu Asn
500 505 510

Pro Gly

<210> 30

<211> 490

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic polypeptide of anti-human CD7 (3A1F) CAR

<400> 30

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

His Ala Ala Arg Pro Gln Val Gln Leu Gln Glu Ser Gly Ala Glu Leu
20 25 30

Val Lys Pro Gly Ala Ser Val Lys Leu Ser Cys Lys Ala Ser Gly Tyr
35 40 45

Thr Phe Thr Ser Tyr Trp Met His Trp Val Lys Gln Arg Pro Gly Gln
50 55 60

Gly Leu Glu Trp Ile Gly Lys Ile Asn Pro Ser Asn Gly Arg Thr Asn
65 70 75 80

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

Ser Ser Thr Ala Tyr Met Gln Leu Ser Ser Leu Thr Ser Glu Asp Ser
 100 105 110

Ala Val Tyr Tyr Cys Ala Arg Gly Gly Val Tyr Tyr Asp Leu Tyr Tyr
 115 120 125

Tyr Ala Leu Asp Tyr Trp Gly Gln Gly Thr Thr Val Thr Val Ser Ser
 130 135 140

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Asp
145 150 155 160

Ile Glu Leu Thr Gln Ser Pro Ala Thr Leu Ser Val Thr Pro Gly Asp
 165 170 175

Ser Val Ser Leu Ser Cys Arg Ala Ser Gln Ser Ile Ser Asn Asn Leu
 180 185 190

His Trp Tyr Gln Gln Lys Ser His Glu Ser Pro Arg Leu Leu Ile Lys
 195 200 205

Ser Ala Ser Gln Ser Ile Ser Gly Ile Pro Ser Arg Phe Ser Gly Ser
 210 215 220

Gly Ser Gly Thr Asp Phe Thr Leu Ser Ile Asn Ser Val Glu Thr Glu
225 230 235 240

Asp Phe Gly Met Tyr Phe Cys Gln Gln Ser Asn Ser Trp Pro Tyr Thr
 245 250 255

Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys Arg Thr Thr Thr Pro Ala
 260 265 270

Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser
 275 280 285

Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr
290 295 300

Arg Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala
305 310 315 320

Gly Thr Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys
325 330 335

Lys Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met
340 345 350

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

Pro Glu Glu Glu Glu Gly Gly Cys Glu Leu Arg Val Lys Phe Ser Arg
370 375 380

Ser Ala Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn
385 390 395 400

Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg
405 410 415

Arg Gly Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro
420 425 430

Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met Ala Glu Ala
435 440 445

Tyr Ser Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His
450 455 460

Asp Gly Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp
465 470 475 480

Ala Leu His Met Gln Ala Leu Pro Pro Arg
485 490

<210> 31
<211> 511

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic polypeptide of anti-human CD7 (3A1F) CAR variant

<400> 31

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

His Ala Ala Arg Pro Gln Val Gln Leu Gln Glu Ser Gly Ala Glu Leu
20 25 30

Val Lys Pro Gly Ala Ser Val Lys Leu Ser Cys Lys Ala Ser Gly Tyr
35 40 45

Thr Phe Thr Ser Tyr Trp Met His Trp Val Lys Gln Arg Pro Gly Gln
50 55 60

Gly Leu Glu Trp Ile Gly Lys Ile Asn Pro Ser Asn Gly Arg Thr Asn
65 70 75 80

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

Ser Ser Thr Ala Tyr Met Gln Leu Ser Ser Leu Thr Ser Glu Asp Ser
100 105 110

Ala Val Tyr Tyr Cys Ala Arg Gly Gly Val Tyr Tyr Asp Leu Tyr Tyr
115 120 125

Tyr Ala Leu Asp Tyr Trp Gly Gln Gly Thr Thr Val Thr Val Ser Ser
130 135 140

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Asp
145 150 155 160

Ile Glu Leu Thr Gln Ser Pro Ala Thr Leu Ser Val Thr Pro Gly Asp
165 170 175

Ser Val Ser Leu Ser Cys Arg Ala Ser Gln Ser Ile Ser Asn Asn Leu
180 185 190

His Trp Tyr Gln Gln Lys Ser His Glu Ser Pro Arg Leu Leu Ile Lys
195 200 205

Ser Ala Ser Gln Ser Ile Ser Gly Ile Pro Ser Arg Phe Ser Gly Ser
210 215 220

Gly Ser Gly Thr Asp Phe Thr Leu Ser Ile Asn Ser Val Glu Thr Glu
225 230 235 240

Asp Phe Gly Met Tyr Phe Cys Gln Gln Ser Asn Ser Trp Pro Tyr Thr
245 250 255

Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys Arg Thr Thr Thr Pro Ala
260 265 270

Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser
275 280 285

Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr
290 295 300

Arg Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala
305 310 315 320

Gly Thr Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys
325 330 335

Lys Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met
340 345 350

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

Pro Glu Glu Glu Glu Gly Gly Cys Glu Leu Arg Val Lys Phe Ser Arg
370 375 380

Ser Ala Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn
385 390 395 400

Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg
405 410 415

Arg Gly Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro
420 425 430

Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met Ala Glu Ala
435 440 445

Tyr Ser Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His
450 455 460

Asp Gly Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp
465 470 475 480

Ala Leu His Met Gln Ala Leu Pro Pro Arg Gly Ser Gly Ala Thr Asn
485 490 495

Phe Ser Leu Leu Lys Gln Ala Gly Asp Val Glu Glu Asn Pro Gly
500 505 510

<210> 32

<211> 117

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic polypeptide of anti-human CD7 TH69 VH domain

<400> 32

Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Lys Pro Gly Gly
1 5 10 15

Ser Leu Lys Leu Ser Cys Ala Ala Ser Gly Leu Thr Phe Ser Ser Tyr
20 25 30

Ala Met Ser Trp Val Arg Gln Thr Pro Glu Lys Arg Leu Glu Trp Val
35 40 45

Ala Ser Ile Ser Ser Gly Gly Phe Thr Tyr Tyr Pro Asp Ser Val Lys
50 55 60

Gly Arg Phe Thr Ile Ser Arg Asp Asn Ala Arg Asn Ile Leu Tyr Leu
65 70 75 80

Gln Met Ser Ser Leu Arg Ser Glu Asp Thr Ala Met Tyr Tyr Cys Ala
85 90 95

Arg Asp Glu Val Arg Gly Tyr Leu Asp Val Trp Gly Ala Gly Thr Thr
100 105 110

Val Thr Val Ser Ser
115

<210> 33

<211> 112

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic polypeptide of anti-human CD7 TH69 VL domain

<400> 33

Ala Ala Tyr Lys Asp Ile Gln Met Thr Gln Thr Thr Ser Ser Leu Ser
1 5 10 15

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

Ile Ser Asn Tyr Leu Asn Trp Tyr Gln Gln Lys Pro Asp Gly Thr Val
35 40 45

Lys Leu Leu Ile Tyr Tyr Thr Ser Ser Leu His Ser Gly Val Pro Ser
50 55 60

Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Tyr Ser Leu Thr Ile Ser
65 70 75 80

Asn Leu Glu Pro Glu Asp Ile Ala Thr Tyr Tyr Cys Gln Gln Tyr Ser
85 90 95

Lys Leu Pro Tyr Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys Arg
100 105 110

<210> 34

<211> 123

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic polypeptide of anti-human CD7 3A1F VH domain

<400> 34

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

Ser Val Lys Leu Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Ser Tyr
20 25 30

Trp Met His Trp Val Lys Gln Arg Pro Gly Gln Gly Leu Glu Trp Ile
35 40 45

Gly Lys Ile Asn Pro Ser Asn Gly Arg Thr Asn Tyr Asn Glu Lys Phe
50 55 60

Lys Ser Lys Ala Thr Leu Thr Val Asp Lys Ser Ser Ser Thr Ala Tyr
65 70 75 80

Met Gln Leu Ser Ser Leu Thr Ser Glu Asp Ser Ala Val Tyr Tyr Cys
85 90 95

Ala Arg Gly Gly Val Tyr Tyr Asp Leu Tyr Tyr Tyr Ala Leu Asp Tyr
100 105 110

Trp Gly Gln Gly Thr Thr Val Thr Val Ser Ser
115 120

<210> 35

<211> 108

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic polypeptide of anti-human CD7 3A1F VL domain

<400> 35

Asp Ile Glu Leu Thr Gln Ser Pro Ala Thr Leu Ser Val Thr Pro Gly
1 5 10 15

Asp Ser Val Ser Leu Ser Cys Arg Ala Ser Gln Ser Ile Ser Asn Asn
20 25 30

Leu His Trp Tyr Gln Gln Lys Ser His Glu Ser Pro Arg Leu Leu Ile
35 40 45

Lys Ser Ala Ser Gln Ser Ile Ser Gly Ile Pro Ser Arg Phe Ser Gly
50 55 60

Ser Gly Ser Gly Thr Asp Phe Thr Leu Ser Ile Asn Ser Val Glu Thr
65 70 75 80

Glu Asp Phe Gly Met Tyr Phe Cys Gln Gln Ser Asn Ser Trp Pro Tyr
85 90 95

Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys Arg
100 105

<210> 36

<211> 120

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic polypeptide of anti-human CD7 T3-3A1 VH domain

<400> 36

Asp Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15

Ser Arg Lys Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Ser Phe
20 25 30

Gly Met His Trp Val Arg Gln Ala Pro Glu Lys Gly Leu Glu Trp Val
35 40 45

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

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

Leu Gln Met Thr Ser Leu Arg Ser Glu Asp Thr Ala Met Tyr Tyr Cys
85 90 95

Ala Arg Trp Gly Asn Tyr Pro His Tyr Ala Met Asp Tyr Trp Gly Gln
100 105 110

Gly Thr Ser Val Thr Val Ser Ser
115 120

<210> 37

<211> 111

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic polypeptide of anti-human CD7 T3-3A1 VL domain

<400> 37

Asp Ile Val Met Thr Gln Ser Pro Ala Ser Leu Ala Val Ser Leu Gly
1 5 10 15

Gln Arg Ala Thr Ile Ser Cys Arg Ala Ser Lys Ser Val Ser Ala Ser
20 25 30

Gly Tyr Ser Tyr Met His Trp Tyr Gln Gln Lys Pro Gly Gln Pro Pro
35 40 45

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

Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Asn Ile His
65 70 75 80

Pro Val Glu Glu Glu Asp Ala Val Thr Tyr Tyr Cys Gln His Ser Arg
85 90 95

Glu Leu Pro Tyr Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys
100 105 110

<210> 38

<211> 351

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic polynucleotide of anti-human CD7 TH69 VH domain

<400> 38

gaggtgcagc tggcgaatc tggaggagga ctggtgaagc caggaggatc tctgaaactg 60
 agttgtgccg cttcaggcct gaccttctca agctacgccca tgagctgggt gcgacagaca 120
 cctgagaagc ggctggaatg ggctcgtagc atctcctctg gcgggttcac atactatcca 180
 gactccgtga aaggcagatt tactatctct cgggataacg caagaaatat tctgtacctg 240
 cagatgagtt cactgaggag cgaggacacc gcaatgtact attgtgccag ggacgaagtg 300
 cgcggtctatc tggatgtctg gggagctggc actaccgtca ccgtctccag c 351

<210> 39
 <211> 336
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> synthetic polynucleotide of anti-human CD7 TH69 VL domain

<400> 39
 gccgcataca aggatattca gatgactcag accacaagct ccctgagcgc ctccctggga 60
 gaccgagtga caatctcttg cagtgcacga cagggaatta gcaactacct gaattggtat 120
 cagcagaagc cagatggcac tgtgaaactg ctgatctact atacctctag tctgcacagt 180
 ggggtcccct cacgattcag cggatccggc tctgggacag actacagcct gactatctcc 240
 aacctggagc ccgaagatat tgccacctac tattgccagc agtactccaa gctgccttat 300
 acctttggcg ggggaacaaa gctggagatt aaaagg 336

<210> 40
 <211> 369
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> synthetic polynucleotide of anti-human CD7 3A1F VH domain

<400> 40
 caggtccagc tgcaggagtc aggagctgag ctggtgaagc caggggcaag cgtcaaactg 60
 tcctgcaagg cctctggata tacattcact agctactgga tgactgggt gaaacagaga 120
 cccggacagg gcctggagtg gatcggaagc attaaccta gcaatggcag gaccaactac 180
 aacgaaaagt taaatccaa ggcaaccctg acagtggaca agagctctc tacagcctac 240
 atgcagctga gttcactgac tcagaggat agcgcagtgt actattgcgc cagaggcggg 300
 gtctactatg acctgtacta ttacgccctg gattattggg ggcagggaac cacagtgact 360

<210> 41
 <211> 324
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> synthetic polynucleotide of anti-human CD7 3A1F VL domain

<400> 41
 gacatcgagc tgaccagag tctgtctaca ctgagcgtga ctccaggcga ttctgtcagt 60
 ctgtcatgtc gggcaagcca gtccatctct aacaatctgc actggtacca gcagaaatcc 120
 catgaatctc cactgactgt gattaagagt gcctcacaga gcatctccgg cattccctcc 180
 cggttctctg gcagtgggtc aggaactgac ttaccctga gtattaactc agtggagaca 240
 gaagatttcg gcatgtattt ttgccagcag agcaattcct ggccctacac ttccggaggc 300
 gggaccaaac tggagatcaa gcgg 324

<210> 42
 <211> 360
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> synthetic polynucleotide of anti-human CD7 T3-3A1 VH domain

<400> 42
 gatgtgcagc tggaggagtc tgggggaggc ttagtgcagc ctggagggtc ccggaactc 60
 tcctgtgcag cctctggatt cactttcagt agctttggaa tgcactgggt tcgtcaggct 120
 ccagagaagg ggctggagtg ggtcgcatc attagtagtg gcagtagtac cctccactat 180
 gcagacacag tgaagggccg attcaccatc tccagagaca atccaagaa caccctgttc 240
 ctgcaaatga ccagtctaag gtctgaggac acggccatgt attactgtgc aagatggggt 300
 aactaccctc actatgctat ggactactgg ggtcaaggaa cctcagtcac cgtctcctca 360

<210> 43
 <211> 333
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> synthetic polynucleotide of anti-human CD7 T3-3A1 VL domain

<400> 43
 gacattgtga tgaccagtc tctgcttcc ttagctgtat ctctggggca gagggccacc 60
 atctcatgca gggccagcaa aagtgtcagt gcatctggct atagttatat gcactgggtac 120
 caacagaaac caggacagcc acccaaactc ctcatctatc ttgcatccaa cctagaatct 180
 ggggtccctg ccaggttcag tggcagtggg tctgggacag acttcaccct caacatccat 240
 cctgtggagg aggaggatgc tgtaacctat tactgtcagc acagtaggga gcttcctac 300
 acgttcggag gggggaccaa gctggaaata aaa 333

<210> 44
 <211> 11
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> synthetic peptide

<400> 44

Ser Ala Ser Gln Gly Ile Ser Asn Tyr Leu Asn
 1 5 10

<210> 45
 <211> 7
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> synthetic peptide

<400> 45

Tyr Thr Ser Ser Leu His Ser
 1 5

<210> 46
 <211> 9
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> synthetic peptide

<400> 46

Gln Gln Tyr Ser Lys Leu Pro Tyr Thr
 1 5

<210> 47
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic peptide

<400> 47

Ser Tyr Ala Met Ser
1 5

<210> 48
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic peptide

<400> 48

Ser Ile Ser Ser Gly Gly Phe Thr Tyr Tyr Pro Asp Ser Val Lys Gly
1 5 10 15

<210> 49
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic peptide

<400> 49

Asp Glu Val Arg Gly Tyr Leu Asp Val
1 5

<210> 50
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic peptide

<400> 50

Arg Ala Ser Gln Ser Ile Ser Asn Asn Leu His

1 5 10

<210> 51
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic peptide

<400> 51

Ser Ala Ser Gln Ser Ile Ser
1 5

<210> 52
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic peptide

<400> 52

Gln Gln Ser Asn Ser Trp Pro Tyr Thr
1 5

<210> 53
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic peptide

<400> 53

Ser Tyr Trp Met His
1 5

<210> 54
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic peptide

<400> 54

Lys Ile Asn Pro Ser Asn Gly Arg Thr Asn Tyr Asn Glu Lys Phe Lys
1 5 10 15

Ser

<210> 55
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic peptide

<400> 55

Gly Gly Val Tyr Tyr Asp Leu Tyr Tyr Tyr Ala Leu Asp Tyr
1 5 10

<210> 56
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic peptide

<400> 56

Arg Ala Ser Lys Ser Val Ser Ala Ser Gly Tyr Ser Tyr Met His
1 5 10 15

<210> 57
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic peptide

<400> 57

Leu Ala Ser Asn Leu Glu Ser
1 5

<210> 58
<211> 9
<212> PRT
<213> Artificial Sequence

<220>

<223> synthetic peptide

<400> 58

Gln His Ser Arg Glu Leu Pro Tyr Thr

1 5

<210> 59

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic peptide

<400> 59

Ser Phe Gly Met His

1 5

<210> 60

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic peptide

<400> 60

Tyr Ile Ser Ser Gly Ser Ser Thr Leu His Tyr Ala Asp Thr Val Lys

1 5 10 15

Gly

<210> 61

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic peptide

<400> 61

Trp Gly Asn Tyr Pro His Tyr Ala Met Asp Tyr

1 5 10

<210> 62
<211> 577
<212> DNA
<213> Artificial Sequence

<220>
<223> synthetic polynucleotide of IRES

<400> 62
cgggatcaat tccgcccc ccctaactt actggccgaa gccgcttga ataaggccgg 60
tgtgcgtttg tctatatgtt atttccacc atattgccgt cttttggcaa tgtgagggcc 120
cggaacactg gccctgtctt cttgacgagc attcctaggg gtctttcccc tctcgccaaa 180
ggaatgcaag gtctgttgaa tgcgtgaag gaagcagttc ctctggaagc ttcttgaaga 240
caaacaactg ctgtagcgac ctttgcagg cagcgggaacc cccacactgg cgacaggtgc 300
ctctgcggcc aaaagccacg tgtataagat acacctgcaa aggcggcaca accccagtgc 360
cacgttgtga gttggatagt tgtgaaaga gtcaaatggc tctctcaag cgtattcaac 420
aaggggctga aggatgccc gaaggtaccc cattgtatgg gatctgatct ggggcctcgg 480
tgcacatgct ttacatgtgt ttatgcagg ttaaaaaaac gtctaggccc cccgaaccac 540
ggggacgtgg tttccttg aaaaacacga taatacc 577

<210> 63
<211> 57
<212> DNA
<213> Artificial Sequence

<220>
<223> synthetic polynucleotide of P2A

<400> 63
gccacaaact tctctctgct aaagcaagca ggtgatgttg aagaaaaccc cgggcct 57

<210> 64
<211> 60
<212> DNA
<213> Artificial Sequence

<220>
<223> synthetic polynucleotide of E2A

<400> 64
cagtgtacta attatgctct cttgaaattg gctggagatg ttgagagcaa cggaggtccc 60

<210> 65

<211> 66
<212> DNA
<213> Artificial Sequence

<220>
<223> synthetic polynucleotide of F2A

<400> 65
gtgaaacaga ctttgaattt tgaccttctc aagttggcgg gagacgtgga gtccaaccct 60
ggacct 66

<210> 66
<211> 54
<212> DNA
<213> Artificial Sequence

<220>
<223> synthetic polynucleotide of T2A

<400> 66
gagggcaggg gaagtcttct aacatgcggg gacgtggagg aaaatcccgg ccca 54

<210> 67
<211> 19
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic polypeptide of P2A

<400> 67

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

Pro Gly Pro

<210> 68
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic polypeptide of E2A

<400> 68

Gln Cys Thr Asn Tyr Ala Leu Leu Lys Leu Ala Gly Asp Val Glu Ser
1 5 10 15

Asn Pro Gly Pro
20

<210> 69
<211> 22
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic polypeptide of F2A

<400> 69

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

Glu Ser Asn Pro Gly Pro
20

<210> 70
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic polypeptide of T2A

<400> 70

Glu Gly Arg Gly Ser Leu Leu Thr Cys Gly Asp Val Glu Glu Asn Pro
1 5 10 15

Gly Pro

<210> 71
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic polypeptide of myc-KDEL domain

<400> 71

Glu Gln Lys Leu Ile Ser Glu Glu Asp Leu Lys Asp Glu Leu
1 5 10

<210> 72
<211> 26
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic polypeptide of link(20)AEKDEL domain

<400> 72

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

Gly Gly Gly Ser Ala Glu Lys Asp Glu Leu
20 25

<210> 73
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic polypeptide of KDEL domain

<400> 73

Lys Asp Glu Leu
1

<210> 74
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic polypeptide of KXD/E domain

<220>
<221> MISC_FEATURE
<222> (3)..(3)
<223> wherein Xaa is any amino acid

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

<400> 74

Lys Lys Xaa Xaa

1

<210> 75

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic polypeptide of YQRL domain

<400> 75

Tyr Gln Arg Leu

1

<210> 76

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic polypeptide of PEST motif

<400> 76

Pro Glu Ser Thr

1

<210> 77

<211> 83

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic polypeptide of mb-DEKKMP domain

<400> 77

Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala

1 5 10 15

Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly

20 25 30

Gly Ala Val His Thr Arg Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile

35 40 45

Trp Ala Pro Leu Ala Gly Thr Cys Gly Val Leu Leu Leu Ser Leu Val

50 55 60

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

Lys Met Pro

<210> 78
<211> 68
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic polypeptide of CD8alpha hinge and transmembrane domain

<400> 78

Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala
1 5 10 15

Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly
 20 25 30

Gly Ala Val His Thr Arg Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile
 35 40 45

Trp Ala Pro Leu Ala Gly Thr Cys Gly Val Leu Leu Leu Ser Leu Val
 50 55 60

Ile Thr Leu Tyr
65

<210> 79
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic polypeptide of VH-VL linker

<400> 79

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

Gly Gly Gly Ser

<210> 80

<211> 21

<212> PRT

<213> Artificial Sequence

 $\langle 220 \rangle$

<223> synthetic polypeptide of CD8alpha signal peptide

<400> 80

Met Ala Leu Pro Val Thr Ala Leu Leu Leu Pro Leu Ala Leu Leu Leu

1 5 10 15

His Ala Ala Arg Pro

20

<210> 81

<211> 63

<212> DNA

<213> Artificial Sequence

 $\langle 220 \rangle$

<223> synthetic polynucleotide of CD8alpha signal peptide

<400> 81

atggctctgc ctgtgaccgc actgctgctg cccctggctc tgctgctgca cgccgcaaga 60

cct

63

<210> 82

<211> 60

<212> DNA

<213> Artificial Sequence

 $\langle 220 \rangle$

<223> synthetic polynucleotide of VH-VL linker

<400> 82

ggaggaggag gaagcggagg aggaggatcc ggaggcgggg gatctggagg aggaggaaagt 60

<210> 83

<211> 42

<212> DNA

<213> Artificial Sequence

 $\langle 220 \rangle$

<223> synthetic polynucleotide of myc-KDEL domain

<400> 83

gagcagaaac tgattagcga agaggacctg aaagatgaac tg

42

<210> 84

<211> 68

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic polypeptide of CD8alpha hinge and transmembrane domain

<400> 84

Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala
1 5 10 15

Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly
20 25 30

Gly Ala Val His Thr Arg Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile
35 40 45

Trp Ala Pro Leu Ala Gly Thr Cys Gly Val Leu Leu Leu Ser Leu Val
50 55 60

Ile Thr Leu Tyr
65

<210> 85

<211> 42

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic polypeptide of intracellular signaling domain of 4-1BB

<400> 85

Lys Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met
1 5 10 15

Arg Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser Cys Arg Phe
20 25 30

Pro Glu Glu Glu Glu Gly Gly Cys Glu Leu
35 40

<210> 86
 <211> 112
 <212> PRT
 <213> Artificial Sequence

 <220>
 <223> synthetic polypeptide of intracellular signaling domain CD3zeta

 <400> 86

Arg Val Lys Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr Gln Gln Gly
 1 5 10 15

Gln Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr
 20 25 30

Asp Val Leu Asp Lys Arg Arg Gly Arg Asp Pro Glu Met Gly Gly Lys
 35 40 45

Pro Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys
 50 55 60

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

Arg Arg Gly Lys Gly His Asp Gly Leu Tyr Gln Gly Leu Ser Thr Ala
 85 90 95

Thr Lys Asp Thr Tyr Asp Ala Leu His Met Gln Ala Leu Pro Pro Arg
 100 105 110

<210> 87
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> synthetic oligonucleotide

<400> 87
 gagggaagct catcagtggg 20

<210> 88
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
<223> synthetic oligonucleotide

<400> 88
catctcctgc ccagtctgac 20

<210> 89
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> synthetic oligonucleotide

<400> 89
cctttccggg actttcgctt t 21

<210> 90
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> synthetic oligonucleotide

<400> 90
gcagaatcca ggtggcaaca 20

<210> 91
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> synthetic oligonucleotide

<400> 91
gcagcctttc atgagaccag 20

<210> 92
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> synthetic oligonucleotide

<400> 92
tgcccagggt cagctcatta 20

<210> 93
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> synthetic oligonucleotide

<400> 93
acctgccgca tacaaggata 20

<210> 94
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> synthetic oligonucleotide

<400> 94
ccactgtgca gactagaggt 20

<210> 95
<211> 799
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic polypeptide of anti-human CD7 (TH69) CAR-p2A-
Anti-human CD7 (TH69) PEBL

<400> 95

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

His Ala Ala Arg Pro Ala Ala Tyr Lys Asp Ile Gln Met Thr Gln Thr
20 25 30

Thr Ser Ser Leu Ser Ala Ser Leu Gly Asp Arg Val Thr Ile Ser Cys
35 40 45

Ser Ala Ser Gln Gly Ile Ser Asn Tyr Leu Asn Trp Tyr Gln Gln Lys
50 55 60

Pro Asp Gly Thr Val Lys Leu Leu Ile Tyr Tyr Thr Ser Ser Leu His
65 70 75 80

Ser Gly Val Pro Ser Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Tyr
85 90 95

Ser Leu Thr Ile Ser Asn Leu Glu Pro Glu Asp Ile Ala Thr Tyr Tyr
100 105 110

Cys Gln Gln Tyr Ser Lys Leu Pro Tyr Thr Phe Gly Gly Gly Thr Lys
115 120 125

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

Gly Gly Gly Ser Gly Gly Gly Gly Ser Glu Val Gln Leu Val Glu Ser
145 150 155 160

Gly Gly Gly Leu Val Lys Pro Gly Gly Ser Leu Lys Leu Ser Cys Ala
165 170 175

Ala Ser Gly Leu Thr Phe Ser Ser Tyr Ala Met Ser Trp Val Arg Gln
180 185 190

Thr Pro Glu Lys Arg Leu Glu Trp Val Ala Ser Ile Ser Ser Gly Gly
195 200 205

Phe Thr Tyr Tyr Pro Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg
210 215 220

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

Glu Asp Thr Ala Met Tyr Tyr Cys Ala Arg Asp Glu Val Arg Gly Tyr
245 250 255

Leu Asp Val Trp Gly Ala Gly Thr Thr Val Thr Val Ser Ser Thr Thr
260 265 270

Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln
275 280 285

Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala
290 295 300

Val His Thr Arg Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala
305 310 315 320

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

Leu Tyr Cys Lys Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln
340 345 350

Pro Phe Met Arg Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser
355 360 365

Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly Cys Glu Leu Arg Val Lys
370 375 380

Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln
385 390 395 400

Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu
405 410 415

Asp Lys Arg Arg Gly Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg
420 425 430

Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met
435 440 445

Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly
450 455 460

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

Thr Tyr Asp Ala Leu His Met Gln Ala Leu Pro Pro Arg Gly Ser Gly
485 490 495

Ala Thr Asn Phe Ser Leu Leu Lys Gln Ala Gly Asp Val Glu Glu Asn
500 505 510

Pro Gly Pro Met Ala Leu Pro Val Thr Ala Leu Leu Leu Pro Leu Ala

515 520 525

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

Thr Gln Thr Thr Ser Ser Leu Ser Ala Ser Leu Gly Asp Arg Val Thr
545 550 555 560

Ile Ser Cys Ser Ala Ser Gln Gly Ile Ser Asn Tyr Leu Asn Trp Tyr
565 570 575

Gln Gln Lys Pro Asp Gly Thr Val Lys Leu Leu Ile Tyr Tyr Thr Ser
580 585 590

Ser Leu His Ser Gly Val Pro Ser Arg Phe Ser Gly Ser Gly Ser Gly
595 600 605

Thr Asp Tyr Ser Leu Thr Ile Ser Asn Leu Glu Pro Glu Asp Ile Ala
610 615 620

Thr Tyr Tyr Cys Gln Gln Tyr Ser Lys Leu Pro Tyr Thr Phe Gly Gly
625 630 635 640

Gly Thr Lys Leu Glu Ile Lys Arg Gly Gly Gly Gly Ser Gly Gly Gly
645 650 655

Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Glu Val Gln Leu
660 665 670

Val Glu Ser Gly Gly Gly Leu Val Lys Pro Gly Gly Ser Leu Lys Leu
675 680 685

Ser Cys Ala Ala Ser Gly Leu Thr Phe Ser Ser Tyr Ala Met Ser Trp
690 695 700

Val Arg Gln Thr Pro Glu Lys Arg Leu Glu Trp Val Ala Ser Ile Ser
705 710 715 720

Ser Gly Gly Phe Thr Tyr Tyr Pro Asp Ser Val Lys Gly Arg Phe Thr
725 730 735

Ile Ser Arg Asp Asn Ala Arg Asn Ile Leu Tyr Leu Gln Met Ser Ser
740 745 750

Leu Arg Ser Glu Asp Thr Ala Met Tyr Tyr Cys Ala Arg Asp Glu Val
755 760 765

Arg Gly Tyr Leu Asp Val Trp Gly Ala Gly Thr Thr Val Thr Val Ser
770 775 780

Ser Glu Gln Lys Leu Ile Ser Glu Glu Asp Leu Lys Asp Glu Leu
785 790 795

<210> 96

<211> 207

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic polypeptide of CD8alpha hinge and transmembrane domain

<400> 96

accactacac ctgcaccaag gcctcccaca cccgtccca ctatcgcttc ccagccactg 60

tccctgaggc ccgaggcctg caggccagca gctggcggag ccgtgcatac tagggggctg 120

gacttcgctt gcgacatcta catctgggcc ccactggcag ggacatgcgg agtcctgctg 180

ctgtccctgg tcatcacact gtactgc 207

<210> 97

<211> 126

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic polypeptide of intracellular signaling domain of 4-1BB

<400> 97

aagcgggggc gcaaaaaact gctgtatc ttaagcagc cttcatgag accagtgcag 60

acaaccagg aggaagatgg gtgctcatgc cggttcccg aggaggagga aggcggctgc 120

gagctg 126

<210> 98

<211> 335

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic polypeptide of intracellular signaling domain CD3zeta

<400> 98

gggtgaagtt ttcccgctca gcagatgctc ctgcctacca gcagggccag aaccagctgt 60

ataatgagct gaacctgggc agacgcgaag agtatgatgt gctggacaaa aggcggggaa 120

gagaccccgga aatgggaggg aagccaaggc ggaaaaaccc ccaggagggc ctgtacaatg 180

agctgcagaa ggacaaaatg gcagaggctt acagtgagat tgggatgaag ggagagagac 240

ggaggggaaa agggcacgat ggcctgtacc aggggctgag cacagcaacc aaagatactt 300

atgacgcact gcacatgcag gcactgccac ccaga 335