SEQUENCE LISTING

<110> Cartherics Pty. Ltd.

<120> GENETICALLY MODIFIED CELLS AND USES THEREOF

<130> 34247

<160> 25

<170> PatentIn version 3.5

<210> 1

<211> 2670

<212> DNA

<213> Artificial Sequence

<220>

<223> DNA coding for TAG72 CAR-P2A-CD47 binding receptor

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cagctgaaca gcctgaccag cgaggacagc gccgtgtact tctgcacccg cagcctgaac 360

atggcctact ggggccaggg caccagcgtg accgtgagca gcggcggcgg cggcagcggc 420

ggcggcggca gcggcggcgg cggcagcgac atcgtgatga cccagagccc cagcagcctg 480

cccgtgagcg tgggcgagaa ggtgaccctg agctgcaaga gcagccagag cctgctgtac 540

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ggcagcggca ccgacttcac cctgagcatc agcagcgtgg agaccgagga cctggccgtg 720

tactactgcc agcagtacta cagctacccc ctgaccttcg gcgccggcac caagctggtg 780

ctgaagcgcg actacaagga cgacgacgac aagctgagca actccatcat gtacttcagc 840

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aagcgcagcc gcctgctgca cagcgactaa 2670

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<213> Artificial Sequence

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<223> Protein sequence of TAG72 CAR-P2A-CD47 binding receptor

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<223> Kappa leader

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<221> misc_feature

<222> (20)..(134)

<223> anti-TAG72 VH

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<221> misc_feature

<222> (135)..(149)

<223> GS Linker

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<221> misc_feature

<222> (150)..(263)

<223> anti-TAG72 VL

<220>

<221> misc_feature

<222> (264)..(272)

<223> FLAG epitope

<220>

<221> misc_feature

<222> (273)..(331)

<223> CD8 hinge

<220>

<221> misc_feature

<222> (332)..(358)

<223> CD28 TM

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<221> misc_feature

<222> (359)..(399)

<223> CD28 Signalling domain

<220>

<221> misc_feature

<222> (400)..(513)

<223> TCR3-zeta Signalling domain

<220>

<221> misc_feature

<222> (514)..(535)

<223> P2A self cleaving peptide

<220>

<221> misc_feature

<222> (536)..(556)

<223> CD8a leader

<220>

<221> misc_feature

<222> (557)..(673)

<223> anti-CD47 VH

<220>

<221> misc_feature

<222> (674)..(688)

<223> GS linker

<220>

<221> misc_feature

<222> (689)..(800)

<223> anti-CD47 VL

<220>

<221> misc_feature

<222> (801)..(812)

<223> c-Myc epitope

<220>

<221> misc_feature

<222> (813)..(851)

<223> CD28 hinge

<220>

<221> misc_feature

<222> (852)..(878)

<223> CD28 TM

<220>

<221> misc_feature

<222> (879)..(889)

<223> cytoplasmic tail derived from CD28

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Val Gln Cys Gln Val Gln Leu Gln Gln Ser Asp Ala Glu Leu Val Lys

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Pro Gly Ala Ser Val Lys Ile Ser Cys Lys Ala Ser Gly Tyr Thr Phe

35 40 45

Thr Asp His Ala Ile His Trp Val Lys Gln Asn Pro Glu Gln Gly Leu

50 55 60

Glu Trp Ile Gly Tyr Phe Ser Pro Gly Asn Asp Asp Phe Lys Tyr Asn

65 70 75 80

Glu Arg Phe Lys Gly Lys Ala Thr Leu Thr Ala Asp Lys Ser Ser Ser

85 90 95

Thr Ala Tyr Leu Gln Leu Asn Ser Leu Thr Ser Glu Asp Ser Ala Val

100 105 110

Tyr Phe Cys Thr Arg Ser Leu Asn Met Ala Tyr Trp Gly Gln Gly Thr

115 120 125

Ser Val Thr Val Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser

130 135 140

Gly Gly Gly Gly Ser Asp Ile Val Met Thr Gln Ser Pro Ser Ser Leu

145 150 155 160

Pro Val Ser Val Gly Glu Lys Val Thr Leu Ser Cys Lys Ser Ser Gln

165 170 175

Ser Leu Leu Tyr Ser Gly Asn Gln Lys Asn Tyr Leu Ala Trp Tyr Gln

180 185 190

Gln Lys Pro Gly Gln Ser Pro Lys Leu Leu Ile Tyr Trp Ala Ser Thr

195 200 205

Arg Glu Ser Gly Val Pro Asp Arg Phe Thr Gly Ser Gly Ser Gly Thr

210 215 220

Asp Phe Thr Leu Ser Ile Ser Ser Val Glu Thr Glu Asp Leu Ala Val

225 230 235 240

Tyr Tyr Cys Gln Gln Tyr Tyr Ser Tyr Pro Leu Thr Phe Gly Ala Gly

245 250 255

Thr Lys Leu Val Leu Lys Arg Asp Tyr Lys Asp Asp Asp Asp Lys Leu

260 265 270

Ser Asn Ser Ile Met Tyr Phe Ser His Phe Val Pro Val Phe Leu Pro

275 280 285

Ala Lys Pro Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala Pro

290 295 300

Thr Ile Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg Pro

305 310 315 320

Ala Ala Gly Gly Ala Val His Thr Arg Gly Leu Phe Trp Val Leu Val

325 330 335

Val Val Gly Gly Val Leu Ala Cys Tyr Ser Leu Leu Val Thr Val Ala

340 345 350

Phe Ile Ile Phe Trp Val Arg Ser Lys Arg Ser Arg Leu Leu His Ser

355 360 365

Asp Tyr Met Asn Met Thr Pro Arg Arg Pro Gly Pro Thr Arg Lys His

370 375 380

Tyr Gln Pro Tyr Ala Pro Pro Arg Asp Phe Ala Ala Tyr Arg Ser Arg

385 390 395 400

Val Lys Phe Ser Arg Ser Ala Asp Ala Pro Ala Tyr Gln Gln Gly Gln

405 410 415

Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp

420 425 430

Val Leu Asp Lys Arg Arg Gly Arg Asp Pro Glu Met Gly Gly Lys Pro

435 440 445

Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp

450 455 460

Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly Met Lys Gly Glu Arg Arg

465 470 475 480

Arg Gly Lys Gly His Asp Gly Leu Tyr Gln Gly Leu Ser Thr Ala Thr

485 490 495

Lys Asp Thr Tyr Asp Ala Leu His Met Gln Ala Leu Pro Pro Arg Val

500 505 510

Asp Gly Ser Gly Ala Thr Asn Phe Ser Leu Leu Lys Gln Ala Gly Asp

515 520 525

Val Glu Glu Asn Pro Gly Pro Met Ala Leu Pro Val Thr Ala Leu Leu

530 535 540

Leu Pro Leu Ala Leu Leu Leu His Ala Ala Arg Ala Gln Val Gln Leu

545 550 555 560

Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala Ser Val Lys Val

565 570 575

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

580 585 590

Val Arg Gln Ala Pro Gly Gln Arg Leu Glu Trp Met Gly Thr Ile Tyr

595 600 605

Pro Gly Asn Asp Asp Thr Ser Tyr Asn Gln Lys Phe Lys Asp Arg Val

610 615 620

Thr Ile Thr Ala Asp Thr Ser Ala Ser Thr Ala Tyr Met Glu Leu Ser

625 630 635 640

Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Tyr Cys Ala Arg Gly Gly

645 650 655

Tyr Arg Ala Met Asp Tyr Trp Gly Gln Gly Thr Leu Val Thr Val Ser

660 665 670

Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser

675 680 685

Asp Ile Val Met Thr Gln Ser Pro Leu Ser Leu Pro Val Thr Pro Gly

690 695 700

Glu Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser Ile Val Tyr Ser

705 710 715 720

Asn Gly Asn Thr Tyr Leu Gly Trp Tyr Leu Gln Lys Pro Gly Gln Ser

725 730 735

Pro Gln Leu Leu Ile Tyr Lys Val Ser Asn Arg Phe Ser Gly Val Pro

740 745 750

Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys Ile

755 760 765

Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr Cys Phe Gln Gly

770 775 780

Ser His Val Pro Tyr Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys

785 790 795 800

Ala Ala Glu Gln Lys Leu Ile Ser Glu Glu Asp Leu Ile Glu Val Met

805 810 815

Tyr Pro Pro Pro Tyr Leu Asp Asn Glu Lys Ser Asn Gly Thr Ile Ile

820 825 830

His Val Lys Gly Lys His Leu Cys Pro Ser Pro Leu Phe Pro Gly Pro

835 840 845

Ser Lys Pro Phe Trp Val Leu Val Val Val Gly Gly Val Leu Ala Cys

850 855 860

Tyr Ser Leu Leu Val Thr Val Ala Phe Ile Ile Phe Trp Val Arg Ser

865 870 875 880

Lys Arg Ser Arg Leu Leu His Ser Asp

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<211> 1062

<212> DNA

<213> Artificial Sequence

<220>

<223> DNA coding for CD47-binding receptor

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gtgagctgca aggccagcgg ctacaccttc accaactaca acatgcactg ggtgcgccag 180

gcccccggcc agcgcctgga gtggatgggc accatctacc ccggcaacga cgacaccagc 240

tacaaccaga agttcaagga ccgcgtgacc atcaccgccg acaccagcgc cagcaccgcc 300

tacatggagc tgagcagcct gcgcagcgag gacaccgccg tgtactactg cgcccgcggc 360

ggctaccgcg ccatggacta ctggggccag ggcaccctgg tgaccgtgag cagcggcgga 420

ggcggaagcg gaggcggagg cagcgggggc ggcggaagcg acatcgtgat gacccagagc 480

cccctgagcc tgcccgtgac ccccggcgag cccgccagca tcagctgccg cagcagccag 540

agcatcgtgt acagcaacgg caacacctac ctgggctggt acctgcagaa gcccggccag 600

agcccccagc tgctgatcta caaggtgagc aaccgcttca gcggcgtgcc cgaccgcttc 660

agcggcagcg gcagcggcac cgacttcacc ctgaagatca gccgcgtgga ggccgaggac 720

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aagctggaga tcaaggccgc cgagcagaag ctgatcagcg aggaggacct gatcgaggtg 840

atgtaccccc ccccctacct ggacaacgag aagagcaacg gcaccatcat ccacgtgaag 900

ggcaagcacc tgtgccccag ccccctgttc cccggcccca gcaagccctt ctgggtgctg 960

gtggtggtgg gcggcgtgct ggcctgctac agcctgctgg tgaccgtggc cttcatcatc 1020

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<210> 4

<211> 354

<212> PRT

<213> Artificial Sequence

<220>

<223> Protein sequence of CD47-binding receptor

<220>

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<222> (1)..(21)

<223> CD8a leader

<220>

<221> misc_feature

<222> (22)..(138)

<223> anti-CD47 VH

<220>

<221> misc_feature

<222> (139)..(153)

<223> GS linker

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<222> (154)..(265)

<223> anti-CD47 VL

<220>

<221> misc_feature

<222> (266)..(277)

<223> c-Myc epitope

<220>

<221> misc_feature

<222> (278)..(316)

<223> CD28 hinge

<220>

<221> misc_feature

<222> (317)..(343)

<223> CD28 TM

<220>

<221> misc_feature

<222> (344)..(354)

<223> cytoplasmic tail derived from CD28

<400> 4

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His Ala Ala Arg Ala Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val

20 25 30

Lys Lys Pro Gly Ala Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr

35 40 45

Thr Phe Thr Asn Tyr Asn Met His Trp Val Arg Gln Ala Pro Gly Gln

50 55 60

Arg Leu Glu Trp Met Gly Thr Ile Tyr Pro Gly Asn Asp Asp Thr Ser

65 70 75 80

Tyr Asn Gln Lys Phe Lys Asp Arg Val Thr Ile Thr Ala Asp Thr Ser

85 90 95

Ala Ser Thr Ala Tyr Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr

100 105 110

Ala Val Tyr Tyr Cys Ala Arg Gly Gly Tyr Arg Ala Met Asp Tyr Trp

115 120 125

Gly Gln Gly Thr Leu Val Thr Val Ser Ser Gly Gly Gly Gly Ser Gly

130 135 140

Gly Gly Gly Ser Gly Gly Gly Gly Ser Asp Ile Val Met Thr Gln Ser

145 150 155 160

Pro Leu Ser Leu Pro Val Thr Pro Gly Glu Pro Ala Ser Ile Ser Cys

165 170 175

Arg Ser Ser Gln Ser Ile Val Tyr Ser Asn Gly Asn Thr Tyr Leu Gly

180 185 190

Trp Tyr Leu Gln Lys Pro Gly Gln Ser Pro Gln Leu Leu Ile Tyr Lys

195 200 205

Val Ser Asn Arg Phe Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Gly

210 215 220

Ser Gly Thr Asp Phe Thr Leu Lys Ile Ser Arg Val Glu Ala Glu Asp

225 230 235 240

Val Gly Val Tyr Tyr Cys Phe Gln Gly Ser His Val Pro Tyr Thr Phe

245 250 255

Gly Gln Gly Thr Lys Leu Glu Ile Lys Ala Ala Glu Gln Lys Leu Ile

260 265 270

Ser Glu Glu Asp Leu Ile Glu Val Met Tyr Pro Pro Pro Tyr Leu Asp

275 280 285

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

290 295 300

Cys Pro Ser Pro Leu Phe Pro Gly Pro Ser Lys Pro Phe Trp Val Leu

305 310 315 320

Val Val Val Gly Gly Val Leu Ala Cys Tyr Ser Leu Leu Val Thr Val

325 330 335

Ala Phe Ile Ile Phe Trp Val Arg Ser Lys Arg Ser Arg Leu Leu His

340 345 350

Ser Asp

<210> 5

<211> 1065

<212> DNA

<213> Artificial Sequence

<220>

<223> DNA coding for CD47-binding receptor with C to S substitution

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gcccaggtgc agctggtgca gagcggcgcc gaggtgaaga agcccggcgc cagcgtgaag 120

gtgagctgca aggccagcgg ctacaccttc accaactaca acatgcactg ggtgcgccag 180

gcccccggcc agcgcctgga gtggatgggc accatctacc ccggcaacga cgacaccagc 240

tacaaccaga agttcaagga ccgcgtgacc atcaccgccg acaccagcgc cagcaccgcc 300

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cccctgagcc tgcccgtgac ccccggcgag cccgccagca tcagctgccg cagcagccag 540

agcatcgtgt acagcaacgg caacacctac ctgggctggt acctgcagaa gcccggccag 600

agcccccagc tgctgatcta caaggtgagc aaccgcttca gcggcgtgcc cgaccgcttc 660

agcggcagcg gcagcggcac cgacttcacc ctgaagatca gccgcgtgga ggccgaggac 720

gtgggcgtgt actactgctt ccagggcagc cacgtgccct acaccttcgg ccagggcacc 780

aagctggaga tcaaggccgc cgagcagaag ctgatcagcg aggaggacct gatcgaggtg 840

atgtaccccc ccccctacct ggacaacgag aagagcaacg gcaccatcat ccacgtgaag 900

ggcaagcacc tgagccccag ccccctgttc cccggcccca gcaagccctt ctgggtgctg 960

gtggtggtgg gcggcgtgct ggccagctac agcctgctgg tgaccgtggc cttcatcatc 1020

ttctgggtgc gcagcaagcg cagccgcctg ctgcacagcg actaa 1065

<210> 6

<211> 354

<212> PRT

<213> Artificial Sequence

<220>

<223> Protein sequence of CD47-binding receptor with C to S substitution

<400> 6

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

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

Thr Phe Thr Asn Tyr Asn Met His Trp Val Arg Gln Ala Pro Gly Gln
50 55 60

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

Tyr Asn Gln Lys Phe Lys Asp Arg Val Thr Ile Thr Ala Asp Thr Ser

85 90 95

Ala Ser Thr Ala Tyr Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr

100 105 110

Ala Val Tyr Tyr Cys Ala Arg Gly Gly Tyr Arg Ala Met Asp Tyr Trp

115 120 125

Gly Gln Gly Thr Leu Val Thr Val Ser Ser Gly Gly Gly Gly Ser Gly

130 135 140

Gly Gly Gly Ser Gly Gly Gly Gly Ser Asp Ile Val Met Thr Gln Ser

145 150 155 160

Pro Leu Ser Leu Pro Val Thr Pro Gly Glu Pro Ala Ser Ile Ser Cys

165 170 175

Arg Ser Ser Gln Ser Ile Val Tyr Ser Asn Gly Asn Thr Tyr Leu Gly

180 185 190

Trp Tyr Leu Gln Lys Pro Gly Gln Ser Pro Gln Leu Leu Ile Tyr Lys

195 200 205

Val Ser Asn Arg Phe Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Gly

210 215 220

Ser Gly Thr Asp Phe Thr Leu Lys Ile Ser Arg Val Glu Ala Glu Asp

225 230 235 240

Val Gly Val Tyr Tyr Cys Phe Gln Gly Ser His Val Pro Tyr Thr Phe

245 250 255

Gly Gln Gly Thr Lys Leu Glu Ile Lys Ala Ala Glu Gln Lys Leu Ile

260 265 270

Ser Glu Glu Asp Leu Ile Glu Val Met Tyr Pro Pro Pro Tyr Leu Asp

275 280 285

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

290 295 300

Ser Pro Ser Pro Leu Phe Pro Gly Pro Ser Lys Pro Phe Trp Val Leu

305 310 315 320

Val Val Val Gly Gly Val Leu Ala Ser Tyr Ser Leu Leu Val Thr Val

325 330 335

Ala Phe Ile Ile Phe Trp Val Arg Ser Lys Arg Ser Arg Leu Leu His

340 345 350

Ser Asp

<210> 7

<211> 732

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<220>

<223> DNA coding for TAG72 scFV

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cccgagcagg gcctggagtg gatcggctac ttcagccccg gcaacgacga cttcaagtac 180

aacgagcgct tcaagggcaa ggccaccctg accgccgaca agagcagcag caccgcctac 240

ctgcagctga acagcctgac cagcgaggac agcgccgtgt acttctgcac ccgcagcctg 300

aacatggcct actggggcca gggcaccagc gtgaccgtga gcagcggcgg cggcggcagc 360

ggcggcggcg gcagcggcgg cggcggcagc gacatcgtga tgacccagag ccccagcagc 420

ctgcccgtga gcgtgggcga gaaggtgacc ctgagctgca agagcagcca gagcctgctg 480

tacagcggca accagaagaa ctacctggcc tggtaccagc agaagcccgg ccagagcccc 540

aagctcctga tctactgggc cagcacccgc gagagcggcg tgcccgaccg cttcaccggc 600

agcggcagcg gcaccgactt caccctgagc atcagcagcg tggagaccga ggacctggcc 660

gtgtactact gccagcagta ctacagctac cccctgacct tcggcgccgg caccaagctg 720

gtgctgaagc gc 732

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<211> 244

<212> PRT

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<223> Protein sequence of TAG72 scFV

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Ser Val Lys Ile Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Asp His

20 25 30

Ala Ile His Trp Val Lys Gln Asn Pro Glu Gln Gly Leu Glu Trp Ile

35 40 45

Gly Tyr Phe Ser Pro Gly Asn Asp Asp Phe Lys Tyr Asn Glu Arg Phe

50 55 60

Lys Gly Lys Ala Thr Leu Thr Ala Asp Lys Ser Ser Ser Thr Ala Tyr

65 70 75 80

Leu Gln Leu Asn Ser Leu Thr Ser Glu Asp Ser Ala Val Tyr Phe Cys

85 90 95

Thr Arg Ser Leu Asn Met Ala Tyr Trp Gly Gln Gly Thr Ser Val Thr

100 105 110

Val Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly

115 120 125

Gly Ser Asp Ile Val Met Thr Gln Ser Pro Ser Ser Leu Pro Val Ser

130 135 140

Val Gly Glu Lys Val Thr Leu Ser Cys Lys Ser Ser Gln Ser Leu Leu

145 150 155 160

Tyr Ser Gly Asn Gln Lys Asn Tyr Leu Ala Trp Tyr Gln Gln Lys Pro

165 170 175

Gly Gln Ser Pro Lys Leu Leu Ile Tyr Trp Ala Ser Thr Arg Glu Ser

180 185 190

Gly Val Pro Asp Arg Phe Thr Gly Ser Gly Ser Gly Thr Asp Phe Thr

195 200 205

Leu Ser Ile Ser Ser Val Glu Thr Glu Asp Leu Ala Val Tyr Tyr Cys

210 215 220

Gln Gln Tyr Tyr Ser Tyr Pro Leu Thr Phe Gly Ala Gly Thr Lys Leu

225 230 235 240

Val Leu Lys Arg

<210> 9

<211> 117

<212> PRT

<213> Artificial Sequence

<220>

<223> Protein sequence of Hu5F9 VH-2 (CD47)

<400> 9

Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala

1 5 10 15

Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Asn Tyr

20 25 30

Asn Met His Trp Val Arg Gln Ala Pro Gly Gln Arg Leu Glu Trp Met

35 40 45

Gly Thr Ile Tyr Pro Gly Asn Asp Asp Thr Ser Tyr Asn Gln Lys Phe

50 55 60

Lys Asp Arg Val Thr Ile Thr Ala Asp Thr Ser Ala Ser Thr Ala Tyr

65 70 75 80

Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Tyr Cys

85 90 95

Ala Arg Gly Gly Tyr Arg Ala Met Asp Tyr Trp Gly Gln Gly Thr Leu

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Val Thr Val Ser Ser

115

<210> 10

<211> 112

<212> PRT

<213> Artificial Sequence

<220>

<223> Protein sequence of Hu5F9 VL-12

<400> 10

Asp Ile Val Met Thr Gln Ser Pro Leu Ser Leu Pro Val Thr Pro Gly

1 5 10 15

Glu Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser Ile Val Tyr Ser

20 25 30

Asn Gly Asn Thr Tyr Leu Gly Trp Tyr Leu Gln Lys Pro Gly Gln Ser

35 40 45

Pro Gln Leu Leu Ile Tyr Lys Val Ser Asn Arg Phe Ser Gly Val Pro

50 55 60

Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys Ile

65 70 75 80

Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr Cys Phe Gln Gly

85 90 95

Ser His Val Pro Tyr Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys

100 105 110

<210> 11

<211> 244

<212> PRT

<213> Artificial Sequence

<220>

<223> Protein sequence of scFv for CD47 Attachment stalk

<400> 11

Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala

1 5 10 15

Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Asn Tyr

20 25 30

Asn Met His Trp Val Arg Gln Ala Pro Gly Gln Arg Leu Glu Trp Met

35 40 45

Gly Thr Ile Tyr Pro Gly Asn Asp Asp Thr Ser Tyr Asn Gln Lys Phe

50 55 60

Lys Asp Arg Val Thr Ile Thr Ala Asp Thr Ser Ala Ser Thr Ala Tyr

65 70 75 80

Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Tyr Cys

85 90 95

Ala Arg Gly Gly Tyr Arg Ala Met Asp Tyr Trp Gly Gln Gly Thr Leu

100 105 110

Val Thr Val Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly

115 120 125

Gly Gly Gly Ser Asp Ile Val Met Thr Gln Ser Pro Leu Ser Leu Pro

130 135 140

Val Thr Pro Gly Glu Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser

145 150 155 160

Ile Val Tyr Ser Asn Gly Asn Thr Tyr Leu Gly Trp Tyr Leu Gln Lys

165 170 175

Pro Gly Gln Ser Pro Gln Leu Leu Ile Tyr Lys Val Ser Asn Arg Phe

180 185 190

Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe

195 200 205

Thr Leu Lys Ile Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr

210 215 220

Cys Phe Gln Gly Ser His Val Pro Tyr Thr Phe Gly Gln Gly Thr Lys

225 230 235 240

Leu Glu Ile Lys

<210> 12

<211> 60

<212> PRT

<213> Artificial Sequence

<220>

<223> CD8 hinge protein sequence

<400> 12

Leu Ser Asn Ser Ile Met Tyr Phe Ser His Phe Val Pro Val Phe Leu

1 5 10 15

Pro Ala Lys Pro Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala

20 25 30

Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg

35 40 45

Pro Ala Ala Gly Gly Ala Val His Thr Arg Gly Leu

50 55 60

<210> 13

<211> 24

<212> PRT

<213> Artificial Sequence

<220>

<223> CD8 TM protein sequence

<400> 13

Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val Leu Leu Leu

1 5 10 15

Ser Leu Val Ile Thr Leu Tyr Cys

20

<210> 14

<211> 39

<212> PRT

<213> Artificial Sequence

<220>

<223> CD28 hinge protein sequence

<400> 14

Ile Glu Val Met Tyr Pro Pro Pro Tyr Leu Asp Asn Glu Lys Ser Asn
1 5 10 15

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

Phe Pro Gly Pro Ser Lys Pro
35

<210> 15

<211> 39

<212> PRT

<213> Artificial Sequence

<220>

<223> CD28 hinge protein sequence with C to S substitution

<400> 15

Ile Glu Val Met Tyr Pro Pro Pro Tyr Leu Asp Asn Glu Lys Ser Asn
1 5 10 15

Gly Thr Ile Ile His Val Lys Gly Lys His Leu Ser Pro Ser Pro Leu
20 25 30

Phe Pro Gly Pro Ser Lys Pro
35

<210> 16

<211> 27

<212> PRT

<213> Artificial Sequence

<220>

<223> CD28 TM protein sequence

<400> 16

Phe Trp Val Leu Val Val Val Gly Gly Val Leu Ala Cys Tyr Ser Leu

1 5 10 15

Leu Val Thr Val Ala Phe Ile Ile Phe Trp Val

20 25

<210> 17

<211> 27

<212> PRT

<213> Artificial Sequence

<220>

<223> CD28 TM with C to S substitution

<400> 17

Phe Trp Val Leu Val Val Val Gly Gly Val Leu Ala Ser Tyr Ser Leu

1 5 10 15

Leu Val Thr Val Ala Phe Ile Ile Phe Trp Val

20 25

<210> 18

<211> 41

<212> PRT

<213> Artificial Sequence

<220>

<223> CD28 signalling domain protein sequence

<400> 18

Arg Ser Lys Arg Ser Arg Leu Leu His Ser Asp Tyr Met Asn Met Thr
1 5 10 15

Pro Arg Arg Pro Gly Pro Thr Arg Lys His Tyr Gln Pro Tyr Ala Pro
20 25 30

Pro Arg Asp Phe Ala Ala Tyr Arg Ser
35 40

<210> 19

<211> 42

<212> PRT

<213> Artificial Sequence

<220>

<223> 4-1BB signalling domain protein sequence

<400> 19

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> 20

<211> 112

<212> PRT

<213> Artificial Sequence

<220>

<223> TCR zeta signalling domain protein sequence

<400> 20

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> 21

<211> 22

<212> PRT

<213> Artificial Sequence

<220>

<223> P2A protein sequence

<400> 21

Gly Ser Gly Ala Thr Asn Phe Ser Leu Leu Lys Gln Ala Gly Asp Val

1 5 10 15

Glu Glu Asn Pro Gly Pro

20

<210> 22

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic peptide WT-1(37)

<400> 22

Val Leu Asp Phe Ala Pro Pro Gly Ala

1 5

<210> 23

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic peptide WT-1(126)

<400> 23

Arg Met Phe Pro Asn Ala Pro Tyr Leu

1 5

<210> 24

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic peptide WT-1(187)

<400> 24

Ser Leu Gly Glu Gln Gln Tyr Ser Val

1 5

<210> 25

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic peptide WT-1(235)

<400> 25

Cys Met Thr Trp Asn Gln Met Asn Leu

1 5