

# SEQUENCE LISTING

<110> Eureka Therapeutics, Inc.

<120> ANTIBODY/T-CELL RECEPTOR CHIMERIC  
CONSTRUCTS AND USES THEREOF

<130> 750042000340

<140> Not Yet Assigned

<141> Concurrently Herewith

<150> US 62/245,944

<151> 2015-10-23

<150> US 62/304,918

<151> 2016-03-07

<150> US 62/345,649

<151> 2016-06-03

<150> US 62/369,694

<151> 2016-08-01

<160> 82

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 20

<212> PRT

<213> Homo sapiens

<220>

<223> TCRalpha transmembrane domain

<400> 1

Ile Leu Leu Leu Lys Val Ala Gly Phe Asn Leu Leu Met Thr Leu Arg

1

5

10

15

Leu Trp Ser Ser

20

<210> 2

<211> 23

<212> PRT

<213> Homo sapiens

<220>

<223> TCRbeta transmembrane domain

<400> 2

Thr Ile Leu Tyr Glu Ile Leu Leu Gly Lys Ala Thr Leu Tyr Ala Val  
1 5 10 15  
Leu Val Ser Ala Leu Val Leu  
20

<210> 3  
<211> 20  
<212> PRT  
<213> Homo sapiens

<220>  
<223> TCRdelta transmembrane domain

<400> 3  
Met Leu Phe Ala Lys Thr Val Ala Val Asn Phe Leu Leu Thr Ala Lys  
1 5 10 15  
Leu Phe Phe Leu  
20

<210> 4  
<211> 23  
<212> PRT  
<213> Homo sapiens

<220>  
<223> TCRgamma transmembrane domain

<400> 4  
Tyr Tyr Met Tyr Leu Leu Leu Leu Leu Lys Ser Val Val Tyr Phe Ala  
1 5 10 15  
Ile Ile Thr Cys Cys Leu Leu  
20

<210> 5  
<211> 30  
<212> PRT  
<213> Homo sapiens

<220>  
<223> TCRalpha connecting peptide

<400> 5  
Glu Ser Ser Cys Asp Val Lys Leu Val Glu Lys Ser Phe Glu Thr Asp  
1 5 10 15  
Thr Asn Leu Asn Phe Gln Asn Leu Ser Val Ile Gly Phe Arg  
20 25 30

<210> 6  
<211> 17  
<212> PRT

<213> Homo sapiens

<220>

<223> TCRbeta connecting peptide

<400> 6

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ala | Asp | Cys | Gly | Phe | Thr | Ser | Val | Ser | Tyr | Gln | Gln | Gly | Val | Leu | Ser |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |

Ala

<210> 7

<211> 41

<212> PRT

<213> Homo sapiens

<220>

<223> TCRdelta connecting peptide

<400> 7

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asp | His | Val | Lys | Pro | Lys | Glu | Thr | Glu | Asn | Thr | Lys | Gln | Pro | Ser | Lys |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Ser | Cys | His | Lys | Pro | Lys | Ala | Ile | Val | His | Thr | Glu | Lys | Val | Asn | Met |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Met | Ser | Leu | Thr | Val | Leu | Gly | Leu | Arg |     |     |     |     |     |     |     |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     |     |     |     |     |

<210> 8

<211> 24

<212> PRT

<213> Homo sapiens

<220>

<223> TCRgamma connecting peptide

<400> 8

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Asp | Pro | Lys | Asp | Asn | Cys | Ser | Lys | Asp | Ala | Asn | Asp | Thr | Leu | Leu |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Leu | Gln | Leu | Thr | Asn | Thr | Ser | Ala |     |     |     |     |     |     |     |     |
|     |     |     |     | 20  |     |     |     |     |     |     |     |     |     |     |     |

<210> 9

<211> 40

<212> PRT

<213> Homo sapiens

<220>

<223> TCRalpha connecting peptide MD

<400> 9

Ile Pro Glu Asp Thr Phe Phe Pro Ser Pro Glu Ser Ser Cys Asp Val

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1   |     | 5   |     | 10  |     | 15  |     |     |     |     |     |     |     |     |     |
| Lys | Leu | Val | Glu | Lys | Ser | Phe | Glu | Thr | Asp | Thr | Asn | Leu | Asn | Phe | Gln |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Asn | Leu | Ser | Val | Ile | Gly | Phe | Arg |     |     |     |     |     |     |     |     |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     |     |     |     |     |

<210> 10  
 <211> 19  
 <212> PRT  
 <213> Homo sapiens

<220>  
 <223> TCRbeta connecting peptide MD

|                                                                 |
|-----------------------------------------------------------------|
| <400> 10                                                        |
| Gly Arg Ala Asp Cys Gly Phe Thr Ser Val Ser Tyr Gln Gln Gly Val |
| 1 5 10 15                                                       |
| Leu Ser Ala                                                     |

<210> 11  
 <211> 48  
 <212> PRT  
 <213> Homo sapiens

<220>  
 <223> TCRdelta connecting peptide MD

|                                                                 |
|-----------------------------------------------------------------|
| <400> 11                                                        |
| Glu Val Lys Thr Asp Ser Thr Asp His Val Lys Pro Lys Glu Thr Glu |
| 1 5 10 15                                                       |
| Asn Thr Lys Gln Pro Ser Lys Ser Cys His Lys Pro Lys Ala Ile Val |
| 20 25 30                                                        |
| His Thr Glu Lys Val Asn Met Met Ser Leu Thr Val Leu Gly Leu Arg |
| 35 40 45                                                        |

<210> 12  
 <211> 32  
 <212> PRT  
 <213> Homo sapiens

<220>  
 <223> TCRgamma connecting peptide MD

|                                                                 |
|-----------------------------------------------------------------|
| <400> 12                                                        |
| Pro Ile Lys Thr Asp Val Ile Thr Met Asp Pro Lys Asp Asn Cys Ser |
| 1 5 10 15                                                       |
| Lys Asp Ala Asn Asp Thr Leu Leu Leu Gln Leu Thr Asn Thr Ser Ala |
| 20 25 30                                                        |

<210> 13  
<211> 9  
<212> PRT  
<213> Homo sapiens

<220>  
<223> TCRbeta intracellular domain

<400> 13  
Met Ala Met Val Lys Arg Lys Asp Phe  
1 5

<210> 14  
<211> 12  
<212> PRT  
<213> Homo sapiens

<220>  
<223> TCRgamma intracellular domain

<400> 14  
Arg Arg Thr Ala Phe Cys Cys Asn Gly Glu Lys Ser  
1 5 10

<210> 15  
<211> 50  
<212> PRT  
<213> Homo sapiens

<220>  
<223> TCRD alpha

<400> 15  
Glu Ser Ser Cys Asp Val Lys Leu Val Glu Lys Ser Phe Glu Thr Asp  
1 5 10 15  
Thr Asn Leu Asn Phe Gln Asn Leu Ser Val Ile Gly Phe Arg Ile Leu  
20 25 30  
Leu Leu Lys Val Ala Gly Phe Asn Leu Leu Met Thr Leu Arg Leu Trp  
35 40 45  
Ser Ser  
50

<210> 16  
<211> 49  
<212> PRT  
<213> Homo sapiens

<220>  
<223> TCRD beta

<400> 16

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ala | Asp | Cys | Gly | Phe | Thr | Ser | Val | Ser | Tyr | Gln | Gln | Gly | Val | Leu | Ser |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Ala | Thr | Ile | Leu | Tyr | Glu | Ile | Leu | Leu | Gly | Lys | Ala | Thr | Leu | Tyr | Ala |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Val | Leu | Val | Ser | Ala | Leu | Val | Leu | Met | Ala | Met | Val | Lys | Arg | Lys | Asp |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |

Phe

<210> 17  
 <211> 60  
 <212> PRT  
 <213> Homo sapiens

<220>  
 <223> TCRD alpha MD

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ile | Pro | Glu | Asp | Thr | Phe | Phe | Pro | Ser | Pro | Glu | Ser | Ser | Cys | Asp | Val |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Lys | Leu | Val | Glu | Lys | Ser | Phe | Glu | Thr | Asp | Thr | Asn | Leu | Asn | Phe | Gln |
|     |     |     | 20  |     |     |     | 25  |     |     |     |     | 30  |     |     |     |
| Asn | Leu | Ser | Val | Ile | Gly | Phe | Arg | Ile | Leu | Leu | Leu | Lys | Val | Ala | Gly |
|     |     | 35  |     |     |     | 40  |     |     |     |     | 45  |     |     |     |     |
| Phe | Asn | Leu | Leu | Met | Thr | Leu | Arg | Leu | Trp | Ser | Ser |     |     |     |     |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |

<210> 18  
 <211> 51  
 <212> PRT  
 <213> Homo sapiens

<220>  
 <223> TCRD beta MD

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Arg | Ala | Asp | Cys | Gly | Phe | Thr | Ser | Val | Ser | Tyr | Gln | Gln | Gly | Val |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Leu | Ser | Ala | Thr | Ile | Leu | Tyr | Glu | Ile | Leu | Leu | Gly | Lys | Ala | Thr | Leu |
|     |     |     | 20  |     |     |     | 25  |     |     |     |     | 30  |     |     |     |
| Tyr | Ala | Val | Leu | Val | Ser | Ala | Leu | Val | Leu | Met | Ala | Met | Val | Lys | Arg |
|     |     | 35  |     |     |     | 40  |     |     |     |     | 45  |     |     |     |     |

Lys Asp Phe  
 50

<210> 19  
 <211> 61  
 <212> PRT  
 <213> Homo sapiens

<220>

<223> TCRD delta

<400> 19

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asp | His | Val | Lys | Pro | Lys | Glu | Thr | Glu | Asn | Thr | Lys | Gln | Pro | Ser | Lys |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Ser | Cys | His | Lys | Pro | Lys | Ala | Ile | Val | His | Thr | Glu | Lys | Val | Asn | Met |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Met | Ser | Leu | Thr | Val | Leu | Gly | Leu | Arg | Met | Leu | Phe | Ala | Lys | Thr | Val |
|     |     | 35  |     |     |     | 40  |     |     |     |     |     | 45  |     |     |     |
| Ala | Val | Asn | Phe | Leu | Leu | Thr | Ala | Lys | Leu | Phe | Phe | Leu |     |     |     |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |

<210> 20

<211> 59

<212> PRT

<213> Homo sapiens

<220>

<223> TCRD gamma

<400> 20

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Asp | Pro | Lys | Asp | Asn | Cys | Ser | Lys | Asp | Ala | Asn | Asp | Thr | Leu | Leu |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Leu | Gln | Leu | Thr | Asn | Thr | Ser | Ala | Tyr | Tyr | Met | Tyr | Leu | Leu | Leu | Leu |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Leu | Lys | Ser | Val | Val | Tyr | Phe | Ala | Ile | Ile | Thr | Cys | Cys | Leu | Leu | Arg |
|     |     | 35  |     |     |     | 40  |     |     |     |     |     | 45  |     |     |     |
| Arg | Thr | Ala | Phe | Cys | Cys | Asn | Gly | Glu | Lys | Ser |     |     |     |     |     |
|     | 50  |     |     |     |     | 55  |     |     |     |     |     |     |     |     |     |

<210> 21

<211> 68

<212> PRT

<213> Homo sapiens

<220>

<223> TCRD delta MD

<400> 21

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Glu | Val | Lys | Thr | Asp | Ser | Thr | Asp | His | Val | Lys | Pro | Lys | Glu | Thr | Glu |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Asn | Thr | Lys | Gln | Pro | Ser | Lys | Ser | Cys | His | Lys | Pro | Lys | Ala | Ile | Val |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| His | Thr | Glu | Lys | Val | Asn | Met | Met | Ser | Leu | Thr | Val | Leu | Gly | Leu | Arg |
|     |     | 35  |     |     |     | 40  |     |     |     |     |     | 45  |     |     |     |
| Met | Leu | Phe | Ala | Lys | Thr | Val | Ala | Val | Asn | Phe | Leu | Leu | Thr | Ala | Lys |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Leu | Phe | Phe | Leu |     |     |     |     |     |     |     |     |     |     |     |     |
| 65  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |

<210> 22

<211> 67  
 <212> PRT  
 <213> Homo sapiens

<220>  
 <223> TCRD gamma MD

<400> 22  
 Pro Ile Lys Thr Asp Val Ile Thr Met Asp Pro Lys Asp Asn Cys Ser  
 1 5 10 15  
 Lys Asp Ala Asn Asp Thr Leu Leu Leu Gln Leu Thr Asn Thr Ser Ala  
 20 25 30  
 Tyr Tyr Met Tyr Leu Leu Leu Leu Lys Ser Val Val Tyr Phe Ala  
 35 40 45  
 Ile Ile Thr Cys Cys Leu Leu Arg Arg Thr Ala Phe Cys Cys Asn Gly  
 50 55 60  
 Glu Lys Ser  
 65

<210> 23  
 <211> 270  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> anti-AFP158/HLA-A\*02:01-abTCR-3 alpha

<400> 23  
 Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Glu  
 1 5 10 15  
 Ser Leu Thr Ile Ser Cys Lys Ala Ser Gly Tyr Ser Phe Pro Asn Tyr  
 20 25 30  
 Trp Ile Thr Trp Val Arg Gln Met Ser Gly Gly Gly Leu Glu Trp Met  
 35 40 45  
 Gly Arg Ile Asp Pro Gly Asp Ser Tyr Thr Thr Tyr Asn Pro Ser Phe  
 50 55 60  
 Gln Gly His Val Thr Ile Ser Ile Asp Lys Ser Thr Asn Thr Ala Tyr  
 65 70 75 80  
 Leu His Trp Asn Ser Leu Lys Ala Ser Asp Thr Ala Met Tyr Tyr Cys  
 85 90 95  
 Ala Arg Tyr Tyr Val Ser Leu Val Asp Ile Trp Gly Gln Gly Thr Leu  
 100 105 110  
 Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu  
 115 120 125  
 Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys  
 130 135 140  
 Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser  
 145 150 155 160  
 Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser  
 165 170 175  
 Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser  
 180 185 190  
 Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn



<210> 25  
 <211> 266  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> anti-AFP158/HLA-A\*02:01-abTCR-4 alpha

<400> 25  
 Gln Ser Val Leu Thr Gln Pro Ala Ser Val Ser Gly Ser Pro Gly Gln  
 1 5 10 15  
 Ser Ile Thr Ile Ser Cys Thr Gly Thr Ser Ser Asp Val Gly Gly Tyr  
 20 25 30  
 Asn Tyr Val Ser Trp Tyr Gln Gln His Pro Gly Lys Ala Pro Lys Leu  
 35 40 45  
 Met Ile Tyr Asp Val Asn Asn Arg Pro Ser Glu Val Ser Asn Arg Phe  
 50 55 60  
 Ser Gly Ser Lys Ser Gly Asn Thr Ala Ser Leu Thr Ile Ser Gly Leu  
 65 70 75 80  
 Gln Ala Glu Asp Glu Ala Asp Tyr Tyr Cys Ser Ser Tyr Thr Thr Gly  
 85 90 95  
 Ser Arg Ala Val Phe Gly Gly Gly Thr Lys Leu Thr Val Leu Gly Gln  
 100 105 110  
 Pro Lys Ala Asn Pro Thr Val Thr Leu Phe Pro Pro Ser Ser Glu Glu  
 115 120 125  
 Leu Gln Ala Asn Lys Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr  
 130 135 140  
 Pro Gly Ala Val Thr Val Ala Trp Lys Ala Asp Gly Ser Pro Val Lys  
 145 150 155 160  
 Ala Gly Val Glu Thr Thr Lys Pro Ser Lys Gln Ser Asn Asn Lys Tyr  
 165 170 175  
 Ala Ala Ser Ser Tyr Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His  
 180 185 190  
 Arg Ser Tyr Ser Cys Gln Val Thr His Glu Gly Ser Thr Val Glu Lys  
 195 200 205  
 Thr Val Ala Pro Thr Glu Cys Ser Glu Ser Ser Cys Asp Val Lys Leu  
 210 215 220  
 Val Glu Lys Ser Phe Glu Thr Asp Thr Asn Leu Asn Phe Gln Asn Leu  
 225 230 235 240  
 Ser Val Ile Gly Phe Arg Ile Leu Leu Leu Lys Val Ala Gly Phe Asn  
 245 250 255  
 Leu Leu Met Thr Leu Arg Leu Trp Ser Ser  
 260 265

<210> 26  
 <211> 269  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> anti-AFP158/HLA-A\*02:01-abTCR-4 beta

<400> 26

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Glu | Val | Gln | Leu | Val | Gln | Ser | Gly | Ala | Glu | Val | Lys | Lys | Pro | Gly | Glu |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Ser | Leu | Thr | Ile | Ser | Cys | Lys | Ala | Ser | Gly | Tyr | Ser | Phe | Pro | Asn | Tyr |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Trp | Ile | Thr | Trp | Val | Arg | Gln | Met | Ser | Gly | Gly | Gly | Leu | Glu | Trp | Met |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Gly | Arg | Ile | Asp | Pro | Gly | Asp | Ser | Tyr | Thr | Thr | Tyr | Asn | Pro | Ser | Phe |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Gln | Gly | His | Val | Thr | Ile | Ser | Ile | Asp | Lys | Ser | Thr | Asn | Thr | Ala | Tyr |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |
| Leu | His | Trp | Asn | Ser | Leu | Lys | Ala | Ser | Asp | Thr | Ala | Met | Tyr | Tyr | Cys |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Ala | Arg | Tyr | Tyr | Val | Ser | Leu | Val | Asp | Ile | Trp | Gly | Gln | Gly | Thr | Leu |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Val | Thr | Val | Ser | Ser | Ala | Ser | Thr | Lys | Gly | Pro | Ser | Val | Phe | Pro | Leu |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Ala | Pro | Ser | Ser | Lys | Ser | Thr | Ser | Gly | Gly | Thr | Ala | Ala | Leu | Gly | Cys |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Leu | Val | Lys | Asp | Tyr | Phe | Pro | Glu | Pro | Val | Thr | Val | Ser | Trp | Asn | Ser |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |
| Gly | Ala | Leu | Thr | Ser | Gly | Val | His | Thr | Phe | Pro | Ala | Val | Leu | Gln | Ser |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Ser | Gly | Leu | Tyr | Ser | Leu | Ser | Ser | Val | Val | Thr | Val | Pro | Ser | Ser | Ser |
|     |     | 180 |     |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Leu | Gly | Thr | Gln | Thr | Tyr | Ile | Cys | Asn | Val | Asn | His | Lys | Pro | Ser | Asn |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Thr | Lys | Val | Asp | Lys | Arg | Val | Glu | Pro | Lys | Ser | Cys | Ala | Asp | Cys | Gly |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Phe | Thr | Ser | Val | Ser | Tyr | Gln | Gln | Gly | Val | Leu | Ser | Ala | Thr | Ile | Leu |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Tyr | Glu | Ile | Leu | Leu | Gly | Lys | Ala | Thr | Leu | Tyr | Ala | Val | Leu | Val | Ser |
|     |     |     | 245 |     |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Ala | Leu | Val | Leu | Met | Ala | Met | Val | Lys | Arg | Lys | Asp | Phe |     |     |     |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     |     |     |     |

<210> 27

<211> 276

<212> PRT

<213> Artificial Sequence

<220>

<223> anti-AFP158/HLA-A\*02:01-abTCR-4MD alpha

<400> 27

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gln | Ser | Val | Leu | Thr | Gln | Pro | Ala | Ser | Val | Ser | Gly | Ser | Pro | Gly | Gln |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Ser | Ile | Thr | Ile | Ser | Cys | Thr | Gly | Thr | Ser | Ser | Asp | Val | Gly | Gly | Tyr |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Asn | Tyr | Val | Ser | Trp | Tyr | Gln | Gln | His | Pro | Gly | Lys | Ala | Pro | Lys | Leu |
|     |     | 35  |     |     |     | 40  |     |     |     |     | 45  |     |     |     |     |
| Met | Ile | Tyr | Asp | Val | Asn | Asn | Arg | Pro | Ser | Glu | Val | Ser | Asn | Arg | Phe |

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

<210> 28

<211> 271

<212> PRT

<213> Artificial Sequence

<220>

<223> anti-AFP158/HLA-A\*02:01-abTCR-4MD beta

<400> 28

|                                                                 |     |
|-----------------------------------------------------------------|-----|
| Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Glu |     |
| 1                                                               | 15  |
| Ser Leu Thr Ile Ser Cys Lys Ala Ser Gly Tyr Ser Phe Pro Asn Tyr |     |
|                                                                 | 30  |
| Trp Ile Thr Trp Val Arg Gln Met Ser Gly Gly Gly Leu Glu Trp Met |     |
|                                                                 | 45  |
| Gly Arg Ile Asp Pro Gly Asp Ser Tyr Thr Thr Tyr Asn Pro Ser Phe |     |
| 50                                                              | 60  |
| Gln Gly His Val Thr Ile Ser Ile Asp Lys Ser Thr Asn Thr Ala Tyr |     |
| 65                                                              | 80  |
| Leu His Trp Asn Ser Leu Lys Ala Ser Asp Thr Ala Met Tyr Tyr Cys |     |
|                                                                 | 95  |
| Ala Arg Tyr Tyr Val Ser Leu Val Asp Ile Trp Gly Gln Gly Thr Leu |     |
|                                                                 | 110 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Thr | Val | Ser | Ser | Ala | Ser | Thr | Lys | Gly | Pro | Ser | Val | Phe | Pro | Leu |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Ala | Pro | Ser | Ser | Lys | Ser | Thr | Ser | Gly | Gly | Thr | Ala | Ala | Leu | Gly | Cys |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Leu | Val | Lys | Asp | Tyr | Phe | Pro | Glu | Pro | Val | Thr | Val | Ser | Trp | Asn | Ser |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |
| Gly | Ala | Leu | Thr | Ser | Gly | Val | His | Thr | Phe | Pro | Ala | Val | Leu | Gln | Ser |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Ser | Gly | Leu | Tyr | Ser | Leu | Ser | Ser | Val | Val | Thr | Val | Pro | Ser | Ser | Ser |
|     |     | 180 |     |     |     |     |     | 185 |     |     |     | 190 |     |     |     |
| Leu | Gly | Thr | Gln | Thr | Tyr | Ile | Cys | Asn | Val | Asn | His | Lys | Pro | Ser | Asn |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Thr | Lys | Val | Asp | Lys | Arg | Val | Glu | Pro | Lys | Ser | Cys | Gly | Arg | Ala | Asp |
|     |     | 210 |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Cys | Gly | Phe | Thr | Ser | Val | Ser | Tyr | Gln | Gln | Gly | Val | Leu | Ser | Ala | Thr |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Ile | Leu | Tyr | Glu | Ile | Leu | Leu | Gly | Lys | Ala | Thr | Leu | Tyr | Ala | Val | Leu |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Val | Ser | Ala | Leu | Val | Leu | Met | Ala | Met | Val | Lys | Arg | Lys | Asp | Phe |     |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |

<210> 29

<211> 277

<212> PRT

<213> Artificial Sequence

<220>

<223> anti-AFP158/HLA-A\*02:01-abTCR-5 delta

<400> 29

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

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|     |     |     | 180 |     |     |     |     | 185 |     |     |     | 190 |     |     |     |
| Arg | Ser | Tyr | Ser | Cys | Gln | Val | Thr | His | Glu | Gly | Ser | Thr | Val | Glu | Lys |
|     |     | 195 |     |     |     |     |     | 200 |     |     |     | 205 |     |     |     |
| Thr | Val | Ala | Pro | Thr | Glu | Cys | Ser | Asp | His | Val | Lys | Pro | Lys | Glu | Thr |
|     |     | 210 |     |     |     |     |     | 215 |     |     |     | 220 |     |     |     |
| Glu | Asn | Thr | Lys | Gln | Pro | Ser | Lys | Ser | Cys | His | Lys | Pro | Lys | Ala | Ile |
| 225 |     |     |     |     |     |     |     |     |     |     |     |     |     |     | 240 |
| Val | His | Thr | Glu | Lys | Val | Asn | Met | Met | Ser | Leu | Thr | Val | Leu | Gly | Leu |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     |     | 255 |
| Arg | Met | Leu | Phe | Ala | Lys | Thr | Val | Ala | Val | Asn | Phe | Leu | Leu | Thr | Ala |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     |     | 270 |     |
| Lys | Leu | Phe | Phe | Leu |     |     |     |     |     |     |     |     |     |     |     |
|     |     |     | 275 |     |     |     |     |     |     |     |     |     |     |     |     |

<210> 30

<211> 279

<212> PRT

<213> Artificial Sequence

<220>

<223> anti-AFP158/HLA-A\*02:01-abTCR-5 gamma

<400> 30

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Glu | Val | Gln | Leu | Val | Gln | Ser | Gly | Ala | Glu | Val | Lys | Lys | Pro | Gly | Glu |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Ser | Leu | Thr | Ile | Ser | Cys | Lys | Ala | Ser | Gly | Tyr | Ser | Phe | Pro | Asn | Tyr |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Trp | Ile | Thr | Trp | Val | Arg | Gln | Met | Ser | Gly | Gly | Gly | Leu | Glu | Trp | Met |
|     |     |     | 35  |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Gly | Arg | Ile | Asp | Pro | Gly | Asp | Ser | Tyr | Thr | Thr | Tyr | Asn | Pro | Ser | Phe |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Gln | Gly | His | Val | Thr | Ile | Ser | Ile | Asp | Lys | Ser | Thr | Asn | Thr | Ala | Tyr |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |
| Leu | His | Trp | Asn | Ser | Leu | Lys | Ala | Ser | Asp | Thr | Ala | Met | Tyr | Tyr | Cys |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Ala | Arg | Tyr | Tyr | Val | Ser | Leu | Val | Asp | Ile | Trp | Gly | Gln | Gly | Thr | Leu |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Val | Thr | Val | Ser | Ser | Ala | Ser | Thr | Lys | Gly | Pro | Ser | Val | Phe | Pro | Leu |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Ala | Pro | Ser | Ser | Lys | Ser | Thr | Ser | Gly | Gly | Thr | Ala | Ala | Leu | Gly | Cys |
|     |     |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Leu | Val | Lys | Asp | Tyr | Phe | Pro | Glu | Pro | Val | Thr | Val | Ser | Trp | Asn | Ser |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |
| Gly | Ala | Leu | Thr | Ser | Gly | Val | His | Thr | Phe | Pro | Ala | Val | Leu | Gln | Ser |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Ser | Gly | Leu | Tyr | Ser | Leu | Ser | Ser | Val | Val | Thr | Val | Pro | Ser | Ser | Ser |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Leu | Gly | Thr | Gln | Thr | Tyr | Ile | Cys | Asn | Val | Asn | His | Lys | Pro | Ser | Asn |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Thr | Lys | Val | Asp | Lys | Arg | Val | Glu | Pro | Lys | Ser | Cys | Met | Asp | Pro | Lys |
|     |     | 210 |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Asp | Asn | Cys | Ser | Lys | Asp | Ala | Asn | Asp | Thr | Leu | Leu | Gln | Leu | Thr |     |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     | 240 |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asn | Thr | Ser | Ala | Tyr | Tyr | Met | Tyr | Leu | Leu | Leu | Leu | Leu | Lys | Ser | Val |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Val | Tyr | Phe | Ala | Ile | Ile | Thr | Cys | Cys | Leu | Leu | Arg | Arg | Thr | Ala | Phe |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |
| Cys | Cys | Asn | Gly | Glu | Lys | Ser |     |     |     |     |     |     |     |     |     |
|     |     | 275 |     |     |     |     |     |     |     |     |     |     |     |     |     |

<210> 31

<211> 284

<212> PRT

<213> Artificial Sequence

<220>

<223> anti-AFP158/HLA-A\*02:01-abTCR-5MD delta

<400> 31

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gln | Ser | Val | Leu | Thr | Gln | Pro | Ala | Ser | Val | Ser | Gly | Ser | Pro | Gly | Gln |
| 1   |     |     |     | 5   |     |     |     | 10  |     |     |     |     | 15  |     |     |
| Ser | Ile | Thr | Ile | Ser | Cys | Thr | Gly | Thr | Ser | Ser | Asp | Val | Gly | Gly | Tyr |
|     |     |     | 20  |     |     |     | 25  |     |     |     |     | 30  |     |     |     |
| Asn | Tyr | Val | Ser | Trp | Tyr | Gln | Gln | His | Pro | Gly | Lys | Ala | Pro | Lys | Leu |
|     |     | 35  |     |     |     | 40  |     |     |     |     | 45  |     |     |     |     |
| Met | Ile | Tyr | Asp | Val | Asn | Asn | Arg | Pro | Ser | Glu | Val | Ser | Asn | Arg | Phe |
|     | 50  |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |     |
| Ser | Gly | Ser | Lys | Ser | Gly | Asn | Thr | Ala | Ser | Leu | Thr | Ile | Ser | Gly | Leu |
| 65  |     |     |     |     | 70  |     |     |     | 75  |     |     |     |     | 80  |     |
| Gln | Ala | Glu | Asp | Glu | Ala | Asp | Tyr | Tyr | Cys | Ser | Ser | Tyr | Thr | Thr | Gly |
|     |     |     | 85  |     |     |     | 90  |     |     |     |     |     | 95  |     |     |
| Ser | Arg | Ala | Val | Phe | Gly | Gly | Gly | Thr | Lys | Leu | Thr | Val | Leu | Gly | Gln |
|     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |     |
| Pro | Lys | Ala | Asn | Pro | Thr | Val | Thr | Leu | Phe | Pro | Pro | Ser | Ser | Glu | Glu |
|     | 115 |     |     |     |     | 120 |     |     |     |     |     | 125 |     |     |     |
| Leu | Gln | Ala | Asn | Lys | Ala | Thr | Leu | Val | Cys | Leu | Ile | Ser | Asp | Phe | Tyr |
|     | 130 |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |     |
| Pro | Gly | Ala | Val | Thr | Val | Ala | Trp | Lys | Ala | Asp | Gly | Ser | Pro | Val | Lys |
| 145 |     |     |     |     | 150 |     |     |     | 155 |     |     |     |     |     | 160 |
| Ala | Gly | Val | Glu | Thr | Lys | Pro | Ser | Lys | Gln | Ser | Asn | Asn | Lys | Tyr |     |
|     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |     |
| Ala | Ala | Ser | Ser | Tyr | Leu | Ser | Leu | Thr | Pro | Glu | Gln | Trp | Lys | Ser | His |
|     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |     |
| Arg | Ser | Tyr | Ser | Cys | Gln | Val | Thr | His | Glu | Gly | Ser | Thr | Val | Glu | Lys |
|     | 195 |     |     |     |     | 200 |     |     |     |     |     | 205 |     |     |     |
| Thr | Val | Ala | Pro | Thr | Glu | Cys | Ser | Glu | Val | Lys | Thr | Asp | Ser | Thr | Asp |
|     | 210 |     |     |     | 215 |     |     |     |     |     | 220 |     |     |     |     |
| His | Val | Lys | Pro | Lys | Glu | Thr | Glu | Asn | Thr | Lys | Gln | Pro | Ser | Lys | Ser |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Cys | His | Lys | Pro | Lys | Ala | Ile | Val | His | Thr | Glu | Lys | Val | Asn | Met | Met |
|     |     |     | 245 |     |     |     |     | 250 |     |     |     |     |     | 255 |     |
| Ser | Leu | Thr | Val | Leu | Gly | Leu | Arg | Met | Leu | Phe | Ala | Lys | Thr | Val | Ala |
|     |     | 260 |     |     |     |     | 265 |     |     |     |     |     | 270 |     |     |
| Val | Asn | Phe | Leu | Leu | Thr | Ala | Lys | Leu | Phe | Phe | Leu |     |     |     |     |
|     | 275 |     |     |     |     |     | 280 |     |     |     |     |     |     |     |     |

<210> 32  
 <211> 287  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> anti-AFP158/HLA-A\*02:01-abTCR-5MD gamma

<400> 32  
 Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Glu  
 1 5 10 15  
 Ser Leu Thr Ile Ser Cys Lys Ala Ser Gly Tyr Ser Phe Pro Asn Tyr  
 20 25 30  
 Trp Ile Thr Trp Val Arg Gln Met Ser Gly Gly Gly Leu Glu Trp Met  
 35 40 45  
 Gly Arg Ile Asp Pro Gly Asp Ser Tyr Thr Thr Tyr Asn Pro Ser Phe  
 50 55 60  
 Gln Gly His Val Thr Ile Ser Ile Asp Lys Ser Thr Asn Thr Ala Tyr  
 65 70 75 80  
 Leu His Trp Asn Ser Leu Lys Ala Ser Asp Thr Ala Met Tyr Tyr Cys  
 85 90 95  
 Ala Arg Tyr Tyr Val Ser Leu Val Asp Ile Trp Gly Gln Gly Thr Leu  
 100 105 110  
 Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu  
 115 120 125  
 Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys  
 130 135 140  
 Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser  
 145 150 155 160  
 Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser  
 165 170 175  
 Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser  
 180 185 190  
 Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn  
 195 200 205  
 Thr Lys Val Asp Lys Arg Val Glu Pro Lys Ser Cys Pro Ile Lys Thr  
 210 215 220  
 Asp Val Ile Thr Met Asp Pro Lys Asp Asn Cys Ser Lys Asp Ala Asn  
 225 230 235 240  
 Asp Thr Leu Leu Leu Gln Leu Thr Asn Thr Ser Ala Tyr Tyr Met Tyr  
 245 250 255  
 Leu Leu Leu Leu Leu Lys Ser Val Val Tyr Phe Ala Ile Ile Thr Cys  
 260 265 270  
 Cys Leu Leu Arg Arg Thr Ala Phe Cys Cys Asn Gly Glu Lys Ser  
 275 280 285

<210> 33  
 <211> 281  
 <212> PRT  
 <213> Artificial Sequence

<220>

<223> anti-AFP158/HLA-A\*02:01-abTCR-6 delta

<400> 33

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Glu | Val | Gln | Leu | Val | Gln | Ser | Gly | Ala | Glu | Val | Lys | Lys | Pro | Gly | Glu |
| 1   |     |     |     | 5   |     |     |     | 10  |     |     |     |     | 15  |     |     |
| Ser | Leu | Thr | Ile | Ser | Cys | Lys | Ala | Ser | Gly | Tyr | Ser | Phe | Pro | Asn | Tyr |
|     |     |     | 20  |     |     |     | 25  |     |     |     |     | 30  |     |     |     |
| Trp | Ile | Thr | Trp | Val | Arg | Gln | Met | Ser | Gly | Gly | Gly | Leu | Glu | Trp | Met |
|     | 35  |     |     |     |     | 40  |     |     |     |     |     | 45  |     |     |     |
| Gly | Arg | Ile | Asp | Pro | Gly | Asp | Ser | Tyr | Thr | Thr | Tyr | Asn | Pro | Ser | Phe |
| 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |     |
| Gln | Gly | His | Val | Thr | Ile | Ser | Ile | Asp | Lys | Ser | Thr | Asn | Thr | Ala | Tyr |
| 65  |     |     |     |     | 70  |     |     |     | 75  |     |     |     |     | 80  |     |
| Leu | His | Trp | Asn | Ser | Leu | Lys | Ala | Ser | Asp | Thr | Ala | Met | Tyr | Tyr | Cys |
|     |     |     | 85  |     |     |     | 90  |     |     |     |     |     | 95  |     |     |
| Ala | Arg | Tyr | Tyr | Val | Ser | Leu | Val | Asp | Ile | Trp | Gly | Gln | Gly | Thr | Leu |
|     |     |     | 100 |     |     |     | 105 |     |     |     |     | 110 |     |     |     |
| Val | Thr | Val | Ser | Ser | Ala | Ser | Thr | Lys | Gly | Pro | Ser | Val | Phe | Pro | Leu |
|     |     |     | 115 |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Ala | Pro | Ser | Ser | Lys | Ser | Thr | Ser | Gly | Gly | Thr | Ala | Ala | Leu | Gly | Cys |
| 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |     |
| Leu | Val | Lys | Asp | Tyr | Phe | Pro | Glu | Pro | Val | Thr | Val | Ser | Trp | Asn | Ser |
| 145 |     |     |     |     | 150 |     |     |     | 155 |     |     |     |     | 160 |     |
| Gly | Ala | Leu | Thr | Ser | Gly | Val | His | Thr | Phe | Pro | Ala | Val | Leu | Gln | Ser |
|     |     |     | 165 |     |     |     | 170 |     |     |     |     |     | 175 |     |     |
| Ser | Gly | Leu | Tyr | Ser | Leu | Ser | Ser | Val | Val | Thr | Val | Pro | Ser | Ser | Ser |
|     |     |     | 180 |     |     |     | 185 |     |     |     |     | 190 |     |     |     |
| Leu | Gly | Thr | Gln | Thr | Tyr | Ile | Cys | Asn | Val | Asn | His | Lys | Pro | Ser | Asn |
|     |     |     | 195 |     |     |     | 200 |     |     |     | 205 |     |     |     |     |
| Thr | Lys | Val | Asp | Lys | Arg | Val | Glu | Pro | Lys | Ser | Cys | Asp | His | Val | Lys |
|     | 210 |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |     |
| Pro | Lys | Glu | Thr | Glu | Asn | Thr | Lys | Gln | Pro | Ser | Lys | Ser | Cys | His | Lys |
| 225 |     |     |     |     | 230 |     |     |     | 235 |     |     |     |     | 240 |     |
| Pro | Lys | Ala | Ile | Val | His | Thr | Glu | Lys | Val | Asn | Met | Met | Ser | Leu | Thr |
|     |     |     | 245 |     |     |     |     | 250 |     |     |     |     |     | 255 |     |
| Val | Leu | Gly | Leu | Arg | Met | Leu | Phe | Ala | Lys | Thr | Val | Ala | Val | Asn | Phe |
|     |     |     | 260 |     |     |     | 265 |     |     |     |     | 270 |     |     |     |
| Leu | Leu | Thr | Ala | Lys | Leu | Phe | Phe | Leu |     |     |     |     |     |     |     |
|     |     |     | 275 |     |     |     | 280 |     |     |     |     |     |     |     |     |

<210> 34

<211> 275

<212> PRT

<213> Artificial Sequence

<220>

<223> anti-AFP158/HLA-A\*02:01-abTCR-6 gamma

<400> 34

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gln | Ser | Val | Leu | Thr | Gln | Pro | Ala | Ser | Val | Ser | Gly | Ser | Pro | Gly | Gln |
| 1   |     |     |     | 5   |     |     |     | 10  |     |     |     |     | 15  |     |     |
| Ser | Ile | Thr | Ile | Ser | Cys | Thr | Gly | Thr | Ser | Ser | Asp | Val | Gly | Gly | Tyr |
|     |     |     | 20  |     |     |     | 25  |     |     |     |     | 30  |     |     |     |

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

<210> 35

<211> 288

<212> PRT

<213> Artificial Sequence

<220>

<223> anti-AFP158/HLA-A\*02:01-abTCR-6MD delta

<400> 35

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

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

<210> 36

<211> 283

<212> PRT

<213> Artificial Sequence

<220>

<223> anti-AFP158/HLA-A\*02:01-abTCR-6MD gamma

<400> 36

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| Gln | Ser | Val | Leu | Thr | Gln | Pro | Ala | Ser | Val | Ser | Gly | Ser | Pro | Gly | Gln |  |  |
| 1   |     |     |     | 5   |     |     |     | 10  |     |     |     |     | 15  |     |     |  |  |
| Ser | Ile | Thr | Ile | Ser | Cys | Thr | Gly | Thr | Ser | Ser | Asp | Val | Gly | Gly | Tyr |  |  |
|     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |     |  |  |
| Asn | Tyr | Val | Ser | Trp | Tyr | Gln | Gln | His | Pro | Gly | Lys | Ala | Pro | Lys | Leu |  |  |
|     |     | 35  |     |     |     | 40  |     |     |     |     |     | 45  |     |     |     |  |  |
| Met | Ile | Tyr | Asp | Val | Asn | Asn | Arg | Pro | Ser | Glu | Val | Ser | Asn | Arg | Phe |  |  |
|     | 50  |     |     |     |     | 55  |     |     |     | 60  |     |     |     |     |     |  |  |
| Ser | Gly | Ser | Lys | Ser | Gly | Asn | Thr | Ala | Ser | Leu | Thr | Ile | Ser | Gly | Leu |  |  |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |  |  |
| Gln | Ala | Glu | Asp | Glu | Ala | Asp | Tyr | Tyr | Cys | Ser | Ser | Tyr | Thr | Thr | Gly |  |  |
|     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |     |  |  |
| Ser | Arg | Ala | Val | Phe | Gly | Gly | Gly | Thr | Lys | Leu | Thr | Val | Leu | Gly | Gln |  |  |
|     |     | 100 |     |     |     |     |     | 105 |     |     |     |     | 110 |     |     |  |  |
| Pro | Lys | Ala | Asn | Pro | Thr | Val | Thr | Leu | Phe | Pro | Pro | Ser | Ser | Glu | Glu |  |  |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |  |  |
| Leu | Gln | Ala | Asn | Lys | Ala | Thr | Leu | Val | Cys | Leu | Ile | Ser | Asp | Phe | Tyr |  |  |
|     |     | 130 |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |  |  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Pro | Gly | Ala | Val | Thr | Val | Ala | Trp | Lys | Ala | Asp | Gly | Ser | Pro | Val | Lys |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |
| Ala | Gly | Val | Glu | Thr | Thr | Lys | Pro | Ser | Lys | Gln | Ser | Asn | Asn | Lys | Tyr |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Ala | Ala | Ser | Ser | Tyr | Leu | Ser | Leu | Thr | Pro | Glu | Gln | Trp | Lys | Ser | His |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Arg | Ser | Tyr | Ser | Cys | Gln | Val | Thr | His | Glu | Gly | Ser | Thr | Val | Glu | Lys |
|     | 195 |     |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Thr | Val | Ala | Pro | Thr | Glu | Cys | Ser | Pro | Ile | Lys | Thr | Asp | Val | Ile | Thr |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Met | Asp | Pro | Lys | Asp | Asn | Cys | Ser | Lys | Asp | Ala | Asn | Asp | Thr | Leu | Leu |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Leu | Gln | Leu | Thr | Asn | Thr | Ser | Ala | Tyr | Tyr | Met | Tyr | Leu | Leu | Leu | Leu |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Leu | Lys | Ser | Val | Val | Tyr | Phe | Ala | Ile | Ile | Thr | Cys | Cys | Leu | Leu | Arg |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |
| Arg | Thr | Ala | Phe | Cys | Cys | Asn | Gly | Glu | Lys | Ser |     |     |     |     |     |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     |     |     |     |     |

<210> 37

<211> 471

<212> PRT

<213> Artificial Sequence

<220>

<223> anti-AFP158/HLA-A\*02:01-scFv CAR

<400> 37

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



Gln Gly His Val Thr Ile Ser Ile Asp Lys Ser Thr Asn Thr Ala Tyr  
 65 70 75 80  
 Leu His Trp Asn Ser Leu Lys Ala Ser Asp Thr Ala Met Tyr Tyr Cys  
 85 90 95  
 Ala Arg Tyr Tyr Val Ser Leu Val Asp Ile Trp Gly Gln Gly Thr Leu  
 100 105 110  
 Val Thr Val Ser Ser  
 115

<210> 39  
 <211> 103  
 <212> PRT  
 <213> Homo sapiens

<220>  
 <223> IgG1 CH1 domain

<400> 39  
 Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys  
 1 5 10 15  
 Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr  
 20 25 30  
 Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser  
 35 40 45  
 Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser  
 50 55 60  
 Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr  
 65 70 75 80  
 Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys  
 85 90 95  
 Arg Val Glu Pro Lys Ser Cys  
 100

<210> 40  
 <211> 110  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> IgVL domain of AFP158/HLA-A\*02:01 antibody

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

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gln | Ala | Glu | Asp | Glu | Ala | Asp | Tyr | Tyr | Cys | Ser | Ser | Tyr | Thr | Thr | Gly |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Ser | Arg | Ala | Val | Phe | Gly | Gly | Gly | Thr | Lys | Leu | Thr | Val | Leu |     |     |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |

<210> 41  
 <211> 106  
 <212> PRT  
 <213> Homo sapiens

<220>  
 <223> IgCL domain

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Gln | Pro | Lys | Ala | Asn | Pro | Thr | Val | Thr | Leu | Phe | Pro | Pro | Ser | Ser |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Glu | Glu | Leu | Gln | Ala | Asn | Lys | Ala | Thr | Leu | Val | Cys | Leu | Ile | Ser | Asp |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Phe | Tyr | Pro | Gly | Ala | Val | Thr | Val | Ala | Trp | Lys | Ala | Asp | Gly | Ser | Pro |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Val | Lys | Ala | Gly | Val | Glu | Thr | Lys | Pro | Ser | Lys | Gln | Ser | Asn | Asn |     |
|     | 50  |     |     |     |     | 55  |     |     |     | 60  |     |     |     |     |     |
| Lys | Tyr | Ala | Ala | Ser | Ser | Tyr | Leu | Ser | Leu | Thr | Pro | Glu | Gln | Trp | Lys |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |
| Ser | His | Arg | Ser | Tyr | Ser | Cys | Gln | Val | Thr | His | Glu | Gly | Ser | Thr | Val |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Glu | Lys | Thr | Val | Ala | Pro | Thr | Glu | Cys | Ser |     |     |     |     |     |     |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     |     |     |     |

<210> 42  
 <211> 301  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> anti-CD19-abTCR-6MD delta

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Glu | Val | Gln | Leu | Val | Gln | Ser | Gly | Ala | Glu | Val | Lys | Lys | Pro | Gly | Glu |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Ser | Leu | Lys | Ile | Ser | Cys | Lys | Gly | Ser | Gly | Tyr | Ser | Phe | Thr | Ser | Tyr |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Trp | Ile | Gly | Trp | Val | Arg | Gln | Met | Pro | Gly | Lys | Gly | Leu | Glu | Trp | Met |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Gly | Ile | Ile | Tyr | Pro | Gly | Asp | Ser | Asp | Thr | Arg | Tyr | Ser | Pro | Ser | Phe |
|     | 50  |     |     |     |     | 55  |     |     |     | 60  |     |     |     |     |     |
| Gln | Gly | Gln | Val | Thr | Ile | Ser | Ala | Asp | Lys | Ser | Ile | Ser | Thr | Ala | Tyr |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |
| Leu | Gln | Trp | Ser | Ser | Leu | Lys | Ala | Ser | Asp | Thr | Ala | Met | Tyr | Tyr | Cys |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Ala | Arg | Gln | Val | Trp | Gly | Trp | Gln | Gly | Met | Tyr | Pro | Arg | Ser | Asn |     |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Trp | Trp | Tyr | Asn | Met | Asp | Ser | Trp | Gly | Gln | Gly | Thr | Leu | Val | Thr | Val |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Ser | Ser | Ala | Ser | Thr | Lys | Gly | Pro | Ser | Val | Phe | Pro | Leu | Ala | Pro | Ser |
|     |     | 130 |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Ser | Lys | Ser | Thr | Ser | Gly | Gly | Thr | Ala | Ala | Leu | Gly | Cys | Leu | Val | Lys |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |
| Asp | Tyr | Phe | Pro | Glu | Pro | Val | Thr | Val | Ser | Trp | Asn | Ser | Gly | Ala | Leu |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Thr | Ser | Gly | Val | His | Thr | Phe | Pro | Ala | Val | Leu | Gln | Ser | Ser | Gly | Leu |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     |     | 190 |     |
| Tyr | Ser | Leu | Ser | Ser | Val | Val | Thr | Val | Pro | Ser | Ser | Ser | Leu | Gly | Thr |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Gln | Thr | Tyr | Ile | Cys | Asn | Val | Asn | His | Lys | Pro | Ser | Asn | Thr | Lys | Val |
|     |     | 210 |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Asp | Lys | Arg | Val | Glu | Pro | Lys | Ser | Cys | Glu | Val | Lys | Thr | Asp | Ser | Thr |
| 225 |     |     |     |     | 230 |     |     |     | 235 |     |     |     |     |     | 240 |
| Asp | His | Val | Lys | Pro | Lys | Glu | Thr | Glu | Asn | Thr | Lys | Gln | Pro | Ser | Lys |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Ser | Cys | His | Lys | Pro | Lys | Ala | Ile | Val | His | Thr | Glu | Lys | Val | Asn | Met |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |
| Met | Ser | Leu | Thr | Val | Leu | Gly | Leu | Arg | Met | Leu | Phe | Ala | Lys | Thr | Val |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |
| Ala | Val | Asn | Phe | Leu | Leu | Thr | Ala | Lys | Leu | Phe | Phe | Leu |     |     |     |
|     |     | 290 |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |

<210> 43

<211> 281

<212> PRT

<213> Artificial Sequence

<220>

<223> anti-CD19-abTCR-6MD gamma

<400> 43

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Pro | Val | Leu | Thr | Gln | Pro | Pro | Ser | Val | Ser | Val | Ala | Pro | Gly | Lys |
| 1   |     |     |     | 5   |     |     |     | 10  |     |     |     |     |     | 15  |     |
| Thr | Ala | Arg | Ile | Thr | Cys | Gly | Gly | Asn | Asn | Ile | Gly | Ser | Lys | Ser | Val |
|     |     | 20  |     |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| His | Trp | Tyr | Gln | Gln | Lys | Pro | Gly | Gln | Ala | Pro | Val | Leu | Val | Val | Tyr |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Asp | Asp | Ser | Asn | Arg | Pro | Ser | Gly | Ile | Pro | Glu | Arg | Phe | Ser | Gly | Ser |
|     |     | 50  |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Asn | Ser | Gly | Asn | Thr | Ala | Thr | Leu | Thr | Ile | Ser | Arg | Val | Glu | Ala | Gly |
| 65  |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |     |
| Asp | Glu | Ala | Asp | Tyr | Tyr | Cys | Gln | Val | Trp | Asp | Ser | Ser | Ser | Glu | Tyr |
|     |     |     | 85  |     |     |     |     | 90  |     |     |     |     |     | 95  |     |
| Val | Val | Phe | Gly | Gly | Gly | Thr | Lys | Leu | Thr | Val | Leu | Gly | Gln | Pro | Lys |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Ala | Asn | Pro | Thr | Val | Thr | Leu | Phe | Pro | Pro | Ser | Ser | Glu | Glu | Leu | Gln |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Ala | Asn | Lys | Ala | Thr | Leu | Val | Cys | Leu | Ile | Ser | Asp | Phe | Tyr | Pro | Gly |
|     |     | 130 |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Ala | Val | Thr | Val | Ala | Trp | Lys | Ala | Asp | Gly | Ser | Pro | Val | Lys | Ala | Gly |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     | 160 |
| Val | Glu | Thr | Thr | Lys | Pro | Ser | Lys | Gln | Ser | Asn | Asn | Lys | Tyr | Ala |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |
| Ser | Ser | Tyr | Leu | Ser | Leu | Thr | Pro | Glu | Gln | Trp | Lys | Ser | His | Arg |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |
| Tyr | Ser | Cys | Gln | Val | Thr | His | Glu | Gly | Ser | Thr | Val | Glu | Lys | Thr |
|     |     | 195 |     |     |     |     | 200 |     |     |     | 205 |     |     |     |
| Ala | Pro | Thr | Glu | Cys | Ser | Pro | Ile | Lys | Thr | Asp | Val | Ile | Thr | Met |
|     | 210 |     |     |     |     | 215 |     |     |     | 220 |     |     |     | Asp |
| Pro | Lys | Asp | Asn | Cys | Ser | Lys | Asp | Ala | Asn | Asp | Thr | Leu | Leu | Leu |
| 225 |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Leu | Thr | Asn | Thr | Ser | Ala | Tyr | Tyr | Met | Tyr | Leu | Leu | Leu | Leu | Lys |
|     |     |     | 245 |     |     |     |     | 250 |     |     |     |     |     | 255 |
| Ser | Val | Val | Tyr | Phe | Ala | Ile | Ile | Thr | Cys | Cys | Leu | Leu | Arg | Arg |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 | Thr |
| Ala | Phe | Cys | Cys | Asn | Gly | Glu | Lys | Ser |     |     |     |     |     |     |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     |     |     |     |

<210> 44

<211> 482

<212> PRT

<213> Artificial Sequence

<220>

<223> anti-CD19-scFv CAR

<400> 44

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Pro | Val | Leu | Thr | Gln | Pro | Pro | Ser | Val | Ser | Val | Ala | Pro | Gly | Lys |
| 1   |     |     |     | 5   |     |     |     | 10  |     |     |     |     |     | 15  |     |
| Thr | Ala | Arg | Ile | Thr | Cys | Gly | Gly | Asn | Asn | Ile | Gly | Ser | Lys | Ser | Val |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| His | Trp | Tyr | Gln | Gln | Lys | Pro | Gly | Gln | Ala | Pro | Val | Leu | Val | Val | Tyr |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Asp | Asp | Ser | Asn | Arg | Pro | Ser | Gly | Ile | Pro | Glu | Arg | Phe | Ser | Gly | Ser |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Asn | Ser | Gly | Asn | Thr | Ala | Thr | Leu | Thr | Ile | Ser | Arg | Val | Glu | Ala | Gly |
| 65  |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     |     | 80  |
| Asp | Glu | Ala | Asp | Tyr | Tyr | Cys | Gln | Val | Trp | Asp | Ser | Ser | Ser | Glu | Tyr |
|     |     |     | 85  |     |     |     |     | 90  |     |     |     |     |     | 95  |     |
| Val | Val | Phe | Gly | Gly | Gly | Thr | Lys | Leu | Thr | Val | Leu | Gly | Ser | Arg | Gly |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Gly | Gly | Gly | Ser | Gly | Gly | Gly | Gly | Ser | Gly | Gly | Gly | Gly | Ser | Leu | Glu |
|     |     | 115 |     |     |     | 120 |     |     |     |     |     | 125 |     |     |     |
| Met | Ala | Glu | Val | Gln | Leu | Val | Gln | Ser | Gly | Ala | Glu | Val | Lys | Lys | Pro |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Gly | Glu | Ser | Leu | Lys | Ile | Ser | Cys | Lys | Gly | Ser | Gly | Tyr | Ser | Phe | Thr |
| 145 |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     |     | 160 |
| Ser | Tyr | Trp | Ile | Gly | Trp | Val | Arg | Gln | Met | Pro | Gly | Lys | Gly | Leu | Glu |
|     |     |     | 165 |     |     |     |     | 170 |     |     |     |     |     | 175 |     |
| Trp | Met | Gly | Ile | Ile | Tyr | Pro | Gly | Asp | Ser | Asp | Thr | Arg | Tyr | Ser | Pro |
|     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |     |
| Ser | Phe | Gln | Gly | Gln | Val | Thr | Ile | Ser | Ala | Asp | Lys | Ser | Ile | Ser | Thr |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ala | Tyr | Leu | Gln | Trp | Ser | Ser | Leu | Lys | Ala | Ser | Asp | Thr | Ala | Met | Tyr |
| 210 |     |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Tyr | Cys | Ala | Arg | Gln | Val | Trp | Gly | Trp | Gln | Gly | Gly | Met | Tyr | Pro | Arg |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Ser | Asn | Trp | Trp | Tyr | Asn | Met | Asp | Ser | Trp | Gly | Gln | Gly | Thr | Leu | Val |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Thr | Val | Ser | Ser | Ala | Ala | Ala | Ile | Glu | Val | Met | Tyr | Pro | Pro | Pro | Tyr |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |
| Leu | Asp | Asn | Glu | Lys | Ser | Asn | Gly | Thr | Ile | Ile | His | Val | Lys | Gly | Lys |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |
| His | Leu | Cys | Pro | Ser | Pro | Leu | Phe | Pro | Gly | Pro | Ser | Lys | Pro | Phe | Trp |
| 290 |     |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |
| Val | Leu | Val | Val | Val | Gly | Gly | Val | Leu | Ala | Cys | Tyr | Ser | Leu | Leu | Val |
| 305 |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     |     | 320 |
| Thr | Val | Ala | Phe | Ile | Ile | Phe | Trp | Val | Arg | Ser | Lys | Arg | Ser | Arg | Leu |
|     |     |     |     | 325 |     |     |     |     | 330 |     |     |     |     | 335 |     |
| Leu | His | Ser | Asp | Tyr | Met | Asn | Met | Thr | Pro | Arg | Arg | Pro | Gly | Pro | Thr |
|     |     |     | 340 |     |     |     |     | 345 |     |     |     |     | 350 |     |     |
| Arg | Lys | His | Tyr | Gln | Pro | Tyr | Ala | Pro | Pro | Arg | Asp | Phe | Ala | Ala | Tyr |
|     |     | 355 |     |     |     |     | 360 |     |     |     |     | 365 |     |     |     |
| Arg | Ser | Arg | Val | Lys | Phe | Ser | Arg | Ser | Ala | Asp | Ala | Pro | Ala | Tyr | Gln |
| 370 |     |     |     |     |     | 375 |     |     |     |     | 380 |     |     |     |     |
| Gln | Gly | Gln | Asn | Gln | Leu | Tyr | Asn | Glu | Leu | Asn | Leu | Gly | Arg | Arg | Glu |
| 385 |     |     |     |     | 390 |     |     |     |     | 395 |     |     |     |     | 400 |
| Glu | Tyr | Asp | Val | Leu | Asp | Lys | Arg | Arg | Gly | Arg | Asp | Pro | Glu | Met | Gly |
|     |     |     | 405 |     |     |     |     |     | 410 |     |     |     | 415 |     |     |
| Gly | Lys | Pro | Arg | Arg | Lys | Asn | Pro | Gln | Glu | Gly | Leu | Tyr | Asn | Glu | Leu |
|     |     |     | 420 |     |     |     |     | 425 |     |     |     |     | 430 |     |     |
| Gln | Lys | Asp | Lys | Met | Ala | Glu | Ala | Tyr | Ser | Glu | Ile | Gly | Met | Lys | Gly |
|     |     | 435 |     |     |     |     | 440 |     |     |     |     | 445 |     |     |     |
| Glu | Arg | Arg | Arg | Gly | Lys | Gly | His | Asp | Gly | Leu | Tyr | Gln | Gly | Leu | Ser |
| 450 |     |     |     |     |     | 455 |     |     |     |     | 460 |     |     |     |     |
| Thr | Ala | Thr | Lys | Asp | Thr | Tyr | Asp | Ala | Leu | His | Met | Gln | Ala | Leu | Pro |
| 465 |     |     |     |     | 470 |     |     |     |     | 475 |     |     |     |     | 480 |
| Pro | Arg |     |     |     |     |     |     |     |     |     |     |     |     |     |     |

<210> 45

<211> 130

<212> PRT

<213> Artificial Sequence

<220>

<223> IgVH domain of anti-CD19 antibody

<400> 45

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Glu | Val | Gln | Leu | Val | Gln | Ser | Gly | Ala | Glu | Val | Lys | Lys | Pro | Gly | Glu |
| 1   |     |     |     | 5   |     |     |     | 10  |     |     |     |     | 15  |     |     |
| Ser | Leu | Lys | Ile | Ser | Cys | Lys | Gly | Ser | Gly | Tyr | Ser | Phe | Thr | Ser | Tyr |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     | 30  |     |     |     |
| Trp | Ile | Gly | Trp | Val | Arg | Gln | Met | Pro | Gly | Lys | Gly | Leu | Glu | Trp | Met |
|     | 35  |     |     |     |     | 40  |     |     |     |     |     | 45  |     |     |     |
| Gly | Ile | Ile | Tyr | Pro | Gly | Asp | Ser | Asp | Thr | Arg | Tyr | Ser | Pro | Ser | Phe |

|                                                                 |     |    |     |    |
|-----------------------------------------------------------------|-----|----|-----|----|
| 50                                                              |     | 55 |     | 60 |
| Gln Gly Gln Val Thr Ile Ser Ala Asp Lys Ser Ile Ser Thr Ala Tyr |     |    |     |    |
| 65                                                              |     | 70 |     | 75 |
| Leu Gln Trp Ser Ser Leu Lys Ala Ser Asp Thr Ala Met Tyr Tyr Cys |     |    |     |    |
|                                                                 | 85  |    | 90  |    |
| Ala Arg Gln Val Trp Gly Trp Gln Gly Gly Met Tyr Pro Arg Ser Asn |     |    |     |    |
|                                                                 | 100 |    | 105 |    |
| Trp Trp Tyr Asn Met Asp Ser Trp Gly Gln Gly Thr Leu Val Thr Val |     |    |     |    |
|                                                                 | 115 |    | 120 |    |
| Ser Ser                                                         |     |    | 125 |    |
| 130                                                             |     |    |     |    |

<210> 46  
 <211> 108  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> IgVL domain of anti-CD19 antibody

|                                                                 |
|-----------------------------------------------------------------|
| <400> 46                                                        |
| Leu Pro Val Leu Thr Gln Pro Pro Ser Val Ser Val Ala Pro Gly Lys |
| 1 5 10 15                                                       |
| Thr Ala Arg Ile Thr Cys Gly Gly Asn Asn Ile Gly Ser Lys Ser Val |
| 20 25 30                                                        |
| His Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Val Leu Val Val Tyr |
| 35 40 45                                                        |
| Asp Asp Ser Asn Arg Pro Ser Gly Ile Pro Glu Arg Phe Ser Gly Ser |
| 50 55 60                                                        |
| Asn Ser Gly Asn Thr Ala Thr Leu Thr Ile Ser Arg Val Glu Ala Gly |
| 65 70 75 80                                                     |
| Asp Glu Ala Asp Tyr Tyr Cys Gln Val Trp Asp Ser Ser Ser Glu Tyr |
| 85 90 95                                                        |
| Val Val Phe Gly Gly Gly Thr Lys Leu Thr Val Leu                 |
| 100 105                                                         |

<210> 47  
 <211> 107  
 <212> PRT  
 <213> Homo sapiens

<220>  
 <223> fragment of CD28

|                                                                 |
|-----------------------------------------------------------------|
| <400> 47                                                        |
| 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 Phe Trp Val Leu Val Val Val Gly Gly |
| 35 40 45                                                        |
| Val Leu Ala Cys Tyr Ser Leu Leu Val Thr Val Ala Phe Ile Ile Phe |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 50  |     | 55  |     | 60  |     |     |     |     |     |     |     |     |     |     |     |
| Trp | Val | Arg | Ser | Lys | Arg | Ser | Arg | Leu | Leu | His | Ser | Asp | Tyr | Met | Asn |
| 65  |     |     |     | 70  |     |     |     |     |     | 75  |     |     |     |     | 80  |
| Met | Thr | Pro | Arg | Arg | Pro | Gly | Pro | Thr | Arg | Lys | His | Tyr | Gln | Pro | Tyr |
|     |     |     | 85  |     |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Ala | Pro | Pro | Arg | Asp | Phe | Ala | Ala | Tyr | Arg | Ser |     |     |     |     |     |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     |     |     |     |

<210> 48  
 <211> 112  
 <212> PRT  
 <213> Homo sapiens

<220>  
 <223> fragment of CD3-zeta

|                                                                 |
|-----------------------------------------------------------------|
| <400> 48                                                        |
| 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> 49  
 <211> 20  
 <212> PRT  
 <213> Homo sapiens

<220>  
 <223> Signal peptide

|                                                                 |
|-----------------------------------------------------------------|
| <400> 49                                                        |
| Met Glu Thr Asp Thr Leu Leu Leu Trp Val Leu Leu Leu Trp Val Pro |
| 1 5 10 15                                                       |
| Gly Ser Thr Gly                                                 |
| 20                                                              |

<210> 50  
 <211> 9  
 <212> PRT  
 <213> Artificial Sequence

<220>

<223> HA tag

<400> 50

Tyr Pro Tyr Asp Val Pro Asp Tyr Ala  
1 5

<210> 51

<211> 22

<212> PRT

<213> Artificial Sequence

<220>

<223> 3x Flag tag

<400> 51

Asp Tyr Lys Asp His Asp Gly Asp Tyr Lys Asp His Asp Ile Asp Tyr  
1 5 10 15  
Lys Asp Asp Asp Asp Lys  
20

<210> 52

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> myc tag

<400> 52

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

<210> 53

<211> 9

<212> PRT

<213> Homo sapiens

<220>

<223> AFP158

<400> 53

Phe Met Asn Lys Phe Ile Tyr Glu Ile  
1 5

<210> 54

<211> 281

<212> PRT

<213> Artificial Sequence

<220>

<223> anti-CD19 clone 5 abTCR-6MD gamma

<400> 54

```
Leu Pro Val Leu Thr Gln Pro Pro Ser Val Ser Val Ala Pro Gly Lys
 1          5          10          15
Thr Ala Arg Ile Thr Cys Gly Gly Asn Asn Ile Gly Ser Lys Ser Val
 20          25          30
His Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Val Leu Val Val Tyr
 35          40          45
Asp Asp Ser Asp Arg Pro Ser Gly Ile Pro Glu Arg Phe Ser Gly Ser
 50          55          60
Asn Ser Gly Asn Thr Ala Thr Leu Thr Ile Ser Arg Val Glu Ala Gly
 65          70          75          80
Asp Glu Ala Asp Tyr Tyr Cys Gln Val Trp Asp Ser Ser Ser Asp Tyr
 85          90          95
Val Val Phe Gly Gly Gly Thr Lys Leu Thr Val Leu Gly Gln Pro Lys
100          105          110
Ala Asn Pro Thr Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln
115          120          125
Ala Asn Lys Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly
130          135          140
Ala Val Thr Val Ala Trp Lys Ala Asp Gly Ser Pro Val Lys Ala Gly
145          150          155          160
Val Glu Thr Thr Lys Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala
165          170          175
Ser Ser Tyr Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser
180          185          190
Tyr Ser Cys Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val
195          200          205
Ala Pro Thr Glu Cys Ser Pro Ile Lys Thr Asp Val Ile Thr Met Asp
210          215          220
Pro Lys Asp Asn Cys Ser Lys Asp Ala Asn Asp Thr Leu Leu Leu Gln
225          230          235          240
Leu Thr Asn Thr Ser Ala Tyr Tyr Met Tyr Leu Leu Leu Leu Lys
245          250          255
Ser Val Val Tyr Phe Ala Ile Ile Thr Cys Cys Leu Leu Arg Arg Thr
260          265          270
Ala Phe Cys Cys Asn Gly Glu Lys Ser
275          280
```

<210> 55

<211> 301

<212> PRT

<213> Artificial Sequence

<220>

<223> anti-CD19 clone 5-9 abTCR-6MD delta

<400> 55

```
Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Glu
 1          5          10          15
Ser Leu Lys Ile Ser Cys Lys Gly Ser Gly Tyr Ser Phe Thr Ser Tyr
```

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |  |  |
| Trp | Ile | Gly | Trp | Val | Arg | Gln | Met | Pro | Gly | Lys | Gly | Leu | Glu | Trp | Met |  |  |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |  |  |
| Gly | Ile | Ile | Tyr | Pro | Gly | Asp | Ser | Asp | Thr | Arg | Tyr | Ser | Pro | Phe | Phe |  |  |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |  |  |
| Gln | Gly | Gln | Val | Thr | Ile | Ser | Ala | Asp | Lys | Ser | Ile | Ser | Thr | Ala | Tyr |  |  |
| 65  |     |     |     |     | 70  |     |     |     | 75  |     |     |     |     |     | 80  |  |  |
| Leu | Gln | Trp | Ser | Ser | Leu | Lys | Ala | Ser | Asp | Thr | Ala | Met | Tyr | Tyr | Cys |  |  |
|     |     |     | 85  |     |     |     |     |     | 90  |     |     |     | 95  |     |     |  |  |
| Ala | Arg | Gln | Val | Trp | Gly | Trp | Gln | Gly | Gly | Met | Tyr | Pro | Arg | Ser | Asn |  |  |
|     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |     |  |  |
| Trp | Trp | Tyr | Asn | Met | Asp | Ser | Trp | Gly | Gln | Gly | Thr | Leu | Val | Thr | Val |  |  |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |  |  |
| Ser | Ser | Ala | Ser | Thr | Lys | Gly | Pro | Ser | Val | Phe | Pro | Leu | Ala | Pro | Ser |  |  |
|     | 130 |     |     |     |     | 135 |     |     |     | 140 |     |     |     |     |     |  |  |
| Ser | Lys | Ser | Thr | Ser | Gly | Gly | Thr | Ala | Ala | Leu | Gly | Cys | Leu | Val | Lys |  |  |
| 145 |     |     |     |     | 150 |     |     |     | 155 |     |     |     |     |     | 160 |  |  |
| Asp | Tyr | Phe | Pro | Glu | Pro | Val | Thr | Val | Ser | Trp | Asn | Ser | Gly | Ala | Leu |  |  |
|     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |     |  |  |
| Thr | Ser | Gly | Val | His | Thr | Phe | Pro | Ala | Val | Leu | Gln | Ser | Ser | Gly | Leu |  |  |
|     |     | 180 |     |     |     |     | 185 |     |     |     |     |     | 190 |     |     |  |  |
| Tyr | Ser | Leu | Ser | Ser | Val | Val | Thr | Val | Pro | Ser | Ser | Ser | Leu | Gly | Thr |  |  |
|     | 195 |     |     |     |     | 200 |     |     |     |     |     | 205 |     |     |     |  |  |
| Gln | Thr | Tyr | Ile | Cys | Asn | Val | Asn | His | Lys | Pro | Ser | Asn | Thr | Lys | Val |  |  |
|     | 210 |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |     |  |  |
| Asp | Lys | Arg | Val | Glu | Pro | Lys | Ser | Cys | Glu | Val | Lys | Thr | Asp | Ser | Thr |  |  |
| 225 |     |     |     |     | 230 |     |     |     | 235 |     |     |     |     |     | 240 |  |  |
| Asp | His | Val | Lys | Pro | Lys | Glu | Thr | Glu | Asn | Thr | Lys | Gln | Pro | Ser | Lys |  |  |
|     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |     |  |  |
| Ser | Cys | His | Lys | Pro | Lys | Ala | Ile | Val | His | Thr | Glu | Lys | Val | Asn | Met |  |  |
|     |     | 260 |     |     |     | 265 |     |     |     |     |     | 270 |     |     |     |  |  |
| Met | Ser | Leu | Thr | Val | Leu | Gly | Leu | Arg | Met | Leu | Phe | Ala | Lys | Thr | Val |  |  |
|     | 275 |     |     |     | 280 |     |     |     |     |     | 285 |     |     |     |     |  |  |
| Ala | Val | Asn | Phe | Leu | Leu | Thr | Ala | Lys | Leu | Phe | Phe | Leu |     |     |     |  |  |
|     | 290 |     |     |     | 295 |     |     |     |     |     | 300 |     |     |     |     |  |  |

<210> 56

<211> 301

<212> PRT

<213> Artificial Sequence

<220>

<223> anti-CD19 clone 5-13 abTCR-6MD delta

<400> 56

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| Glu | Val | Gln | Leu | Val | Gln | Ser | Gly | Ala | Glu | Val | Lys | Lys | Pro | Gly | Glu |  |  |
| 1   |     |     |     | 5   |     |     |     | 10  |     |     |     |     | 15  |     |     |  |  |
| Ser | Leu | Lys | Ile | Ser | Cys | Lys | Gly | Ser | Gly | Tyr | Ser | Phe | Thr | Ser | Tyr |  |  |
|     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |     |  |  |
| Trp | Ile | Gly | Trp | Val | Arg | Gln | Met | Pro | Gly | Lys | Gly | Leu | Glu | Trp | Met |  |  |
|     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |     |  |  |
| Gly | Ile | Ile | Tyr | Pro | Gly | Asp | Ser | Asp | Thr | Arg | Tyr | Ser | Pro | Ser | Phe |  |  |
|     | 50  |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |     |  |  |

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

<210> 57

<211> 108

<212> PRT

<213> Artificial Sequence

<220>

<223> IgVL domain of anti-CD19 antibody clone 5

<400> 57

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Pro | Val | Leu | Thr | Gln | Pro | Pro | Ser | Val | Ser | Val | Ala | Pro | Gly | Lys |
| 1   |     |     |     | 5   |     |     |     | 10  |     |     |     |     |     | 15  |     |
| Thr | Ala | Arg | Ile | Thr | Cys | Gly | Gly | Asn | Asn | Ile | Gly | Ser | Lys | Ser | Val |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| His | Trp | Tyr | Gln | Gln | Lys | Pro | Gly | Gln | Ala | Pro | Val | Leu | Val | Val | Tyr |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Asp | Asp | Ser | Asp | Arg | Pro | Ser | Gly | Ile | Pro | Glu | Arg | Phe | Ser | Gly | Ser |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Asn | Ser | Gly | Asn | Thr | Ala | Thr | Leu | Thr | Ile | Ser | Arg | Val | Glu | Ala | Gly |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |
| Asp | Glu | Ala | Asp | Tyr | Tyr | Cys | Gln | Val | Trp | Asp | Ser | Ser | Ser | Asp | Tyr |
|     |     |     | 85  |     |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Val | Val | Phe | Gly | Gly | Gly | Thr | Lys | Leu | Thr | Val | Leu |     |     |     |     |

<210> 58  
 <211> 130  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> IgVH domain of anti-CD19 antibody clone 5-9

<400> 58  
 Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Glu  
 1 5 10 15  
 Ser Leu Lys Ile Ser Cys Lys Gly Ser Gly Tyr Ser Phe Thr Ser Tyr  
 20 25 30  
 Trp Ile Gly Trp Val Arg Gln Met Pro Gly Lys Gly Leu Glu Trp Met  
 35 40 45  
 Gly Ile Ile Tyr Pro Gly Asp Ser Asp Thr Arg Tyr Ser Pro Phe Phe  
 50 55 60  
 Gln Gly Gln Val Thr Ile Ser Ala Asp Lys Ser Ile Ser Thr Ala Tyr  
 65 70 75 80  
 Leu Gln Trp Ser Ser Leu Lys Ala Ser Asp Thr Ala Met Tyr Tyr Cys  
 85 90 95  
 Ala Arg Gln Val Trp Gly Trp Gln Gly Gly Met Tyr Pro Arg Ser Asn  
 100 105 110  
 Trp Trp Tyr Asn Met Asp Ser Trp Gly Gln Gly Thr Leu Val Thr Val  
 115 120 125  
 Ser Ser  
 130

<210> 59  
 <211> 130  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> IgVH domain of anti-CD19 antibody clone 5-13

<400> 59  
 Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Glu  
 1 5 10 15  
 Ser Leu Lys Ile Ser Cys Lys Gly Ser Gly Tyr Ser Phe Thr Ser Tyr  
 20 25 30  
 Trp Ile Gly Trp Val Arg Gln Met Pro Gly Lys Gly Leu Glu Trp Met  
 35 40 45  
 Gly Ile Ile Tyr Pro Gly Asp Ser Asp Thr Arg Tyr Ser Pro Ser Phe  
 50 55 60  
 Gln Gly Gln Val Thr Ile Ser Ala Asp Lys Ser Ile Ser Thr Ala Tyr  
 65 70 75 80  
 Leu Gln Trp Ser Ser Leu Lys Ala Ser Asp Thr Ala Met Tyr Tyr Cys  
 85 90 95  
 Ala Arg Gln Val Trp Gly Trp Gln Gly Gly Met Tyr Pro Arg Ser Asn



100

<210> 62  
<211> 103  
<212> PRT  
<213> Homo sapiens

<220>  
<223> IgG2-2C CH1

<400> 62  
Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala Pro Cys Ser Arg  
1 5 10 15  
Ser Thr Ser Glu Ser Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr  
20 25 30  
Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser  
35 40 45  
Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser  
50 55 60  
Leu Ser Ser Val Val Thr Val Pro Ser Ser Asn Phe Gly Thr Gln Thr  
65 70 75 80  
Tyr Thr Cys Asn Val Asp His Lys Pro Ser Asn Thr Lys Val Asp Lys  
85 90 95  
Thr Val Glu Arg Lys Cys Cys  
100

<210> 63  
<211> 103  
<212> PRT  
<213> Homo sapiens

<220>  
<223> IgG3 CH1

<400> 63  
Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala Pro Cys Ser Arg  
1 5 10 15  
Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr  
20 25 30  
Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser  
35 40 45  
Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser  
50 55 60  
Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr  
65 70 75 80  
Tyr Thr Cys Asn Val Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys  
85 90 95  
Arg Val Glu Leu Lys Thr Pro  
100

<210> 64

<211> 103  
<212> PRT  
<213> Homo sapiens

<220>  
<223> IgG4 CH1

<400> 64  
Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala Pro Cys Ser Arg  
1 5 10 15  
Ser Thr Ser Glu Ser Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr  
20 25 30  
Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser  
35 40 45  
Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser  
50 55 60  
Leu Ser Ser Val Val Thr Val Pro Ser Ser Leu Gly Thr Lys Thr  
65 70 75 80  
Tyr Thr Cys Asn Val Asp His Lys Pro Ser Asn Thr Lys Val Asp Lys  
85 90 95  
Arg Val Glu Ser Lys Tyr Gly  
100

<210> 65  
<211> 121  
<212> PRT  
<213> Homo sapiens

<220>  
<223> IgA1 CH1

<400> 65  
Ala Ser Pro Thr Ser Pro Lys Val Phe Pro Leu Ser Leu Cys Ser Thr  
1 5 10 15  
Gln Pro Asp Gly Asn Val Val Ile Ala Cys Leu Val Gln Gly Phe Phe  
20 25 30  
Pro Gln Glu Pro Leu Ser Val Thr Trp Ser Glu Ser Gly Gln Gly Val  
35 40 45  
Thr Ala Arg Asn Phe Pro Pro Ser Gln Asp Ala Ser Gly Asp Leu Tyr  
50 55 60  
Thr Thr Ser Ser Gln Leu Thr Leu Pro Ala Thr Gln Cys Leu Ala Gly  
65 70 75 80  
Lys Ser Val Thr Cys His Val Lys His Tyr Thr Asn Pro Ser Gln Asp  
85 90 95  
Val Thr Val Pro Cys Pro Val Pro Ser Thr Pro Pro Thr Pro Ser Pro  
100 105 110  
Ser Thr Pro Pro Thr Pro Ser Pro Ser  
115 120

<210> 66  
<211> 108  
<212> PRT

<213> Homo sapiens

<220>

<223> IgA2 CH1

<400> 66

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ala | Ser | Pro | Thr | Ser | Pro | Lys | Val | Phe | Pro | Leu | Ser | Leu | Asp | Ser | Thr |
| 1   |     |     |     | 5   |     |     |     | 10  |     |     |     |     |     | 15  |     |
| Pro | Gln | Asp | Gly | Asn | Val | Val | Val | Ala | Cys | Leu | Val | Gln | Gly | Phe | Phe |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Pro | Gln | Glu | Pro | Leu | Ser | Val | Thr | Trp | Ser | Glu | Ser | Gly | Gln | Asn | Val |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Thr | Ala | Arg | Asn | Phe | Pro | Pro | Ser | Gln | Asp | Ala | Ser | Gly | Asp | Leu | Tyr |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Thr | Thr | Ser | Ser | Gln | Leu | Thr | Leu | Pro | Ala | Thr | Gln | Cys | Pro | Asp | Gly |
| 65  |     |     |     |     | 70  |     |     |     | 75  |     |     |     |     |     | 80  |
| Lys | Ser | Val | Thr | Cys | His | Val | Lys | His | Tyr | Thr | Asn | Pro | Ser | Gln | Asp |
|     |     |     |     | 85  |     |     |     | 90  |     |     |     |     |     | 95  |     |
| Val | Thr | Val | Pro | Cys | Pro | Val | Pro | Pro | Pro | Pro | Pro |     |     |     |     |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     |     |     |     |

<210> 67

<211> 159

<212> PRT

<213> Homo sapiens

<220>

<223> IgD CH1

<400> 67

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

<210> 68

<211> 103  
<212> PRT  
<213> Homo sapiens

<220>  
<223> IgE CH1

<400> 68  
Ala Ser Thr Gln Ser Pro Ser Val Phe Pro Leu Thr Arg Cys Cys Lys  
1 5 10 15  
Asn Ile Pro Ser Asn Ala Thr Ser Val Thr Leu Gly Cys Leu Ala Thr  
20 25 30  
Gly Tyr Phe Pro Glu Pro Val Met Val Thr Trp Asp Thr Gly Ser Leu  
35 40 45  
Asn Gly Thr Thr Met Thr Leu Pro Ala Thr Thr Leu Thr Leu Ser Gly  
50 55 60  
His Tyr Ala Thr Ile Ser Leu Leu Thr Val Ser Gly Ala Trp Ala Lys  
65 70 75 80  
Gln Met Phe Thr Cys Arg Val Ala His Thr Pro Ser Ser Thr Asp Trp  
85 90 95  
Val Asp Asn Lys Thr Phe Ser  
100

<210> 69  
<211> 104  
<212> PRT  
<213> Homo sapiens

<220>  
<223> IgM CH1

<400> 69  
Gly Ser Ala Ser Ala Pro Thr Leu Phe Pro Leu Val Ser Cys Glu Asn  
1 5 10 15  
Ser Pro Ser Asp Thr Ser Ser Val Ala Val Gly Cys Leu Ala Gln Asp  
20 25 30  
Phe Leu Pro Asp Ser Ile Thr Leu Ser Trp Lys Tyr Lys Asn Asn Ser  
35 40 45  
Asp Ile Ser Ser Thr Arg Gly Phe Pro Ser Val Leu Arg Gly Gly Lys  
50 55 60  
Tyr Ala Ala Thr Ser Gln Val Leu Leu Pro Ser Lys Asp Val Met Gln  
65 70 75 80  
Gly Thr Asp Glu His Val Val Cys Lys Val Gln His Pro Asn Gly Asn  
85 90 95  
Lys Glu Lys Asn Val Pro Leu Pro  
100

<210> 70  
<211> 41  
<212> PRT  
<213> Homo sapiens



<210> 73  
 <211> 111  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> IgVL domain of anti-NY-ESO-1/HLA-A\*02:01  
 antibody clone 35

<400> 73  
 Gln Ser Val Val Thr Gln Pro Pro Ser Val Ser Ala Ala Pro Gly Gln  
 1 5 10 15  
 Lys Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Asn Ile Gly Asn Asn  
 20 25 30  
 Tyr Val Ser Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu  
 35 40 45  
 Ile Tyr Asp Asn Asn Lys Arg Pro Ser Gly Ile Pro Asp Arg Phe Ser  
 50 55 60  
 Gly Ser Lys Ser Gly Thr Ser Ala Thr Leu Gly Ile Thr Gly Leu Gln  
 65 70 75 80  
 Thr Gly Asp Glu Ala Asp Tyr Tyr Cys Gly Thr Trp Asp Ser Ser Leu  
 85 90 95  
 Ser Ala Trp Val Phe Gly Gly Gly Thr Lys Leu Thr Val Leu Gly  
 100 105 110

<210> 74  
 <211> 21  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> scFv linker

<400> 74  
 Ser Arg Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly  
 1 5 10 15  
 Ser Leu Glu Met Ala  
 20

<210> 75  
 <211> 284  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> anti-CD19-cTCR delta

<400> 75  
 Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Glu

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| 1   |     |     |     | 5   |     |     |     | 10  |     |     |     |     | 15  |     |     |  |
| Ser | Leu | Lys | Ile | Ser | Cys | Lys | Gly | Ser | Gly | Tyr | Ser | Phe | Thr | Ser | Tyr |  |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |  |
| Trp | Ile | Gly | Trp | Val | Arg | Gln | Met | Pro | Gly | Lys | Gly | Leu | Glu | Trp | Met |  |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |  |
| Gly | Ile | Ile | Tyr | Pro | Gly | Asp | Ser | Asp | Thr | Arg | Tyr | Ser | Pro | Ser | Phe |  |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |  |
| Gln | Gly | Gln | Val | Thr | Ile | Ser | Ala | Asp | Lys | Ser | Ile | Ser | Thr | Ala | Tyr |  |
| 65  |     |     |     |     | 70  |     |     |     | 75  |     |     |     |     |     | 80  |  |
| Leu | Gln | Trp | Ser | Ser | Leu | Lys | Ala | Ser | Asp | Thr | Ala | Met | Tyr | Tyr | Cys |  |
|     |     |     | 85  |     |     |     |     |     | 90  |     |     |     | 95  |     |     |  |
| Ala | Arg | Gln | Val | Trp | Gly | Trp | Gln | Gly | Gly | Met | Tyr | Pro | Arg | Ser | Asn |  |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |  |
| Trp | Trp | Tyr | Asn | Leu | Asp | Ser | Trp | Gly | Gln | Gly | Thr | Leu | Val | Thr | Val |  |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |  |
| Ser | Ser | Arg | Ser | Gln | Pro | His | Thr | Lys | Pro | Ser | Val | Phe | Val | Met | Lys |  |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |  |
| Asn | Gly | Thr | Asn | Val | Ala | Cys | Leu | Val | Lys | Glu | Phe | Tyr | Pro | Lys | Asp |  |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |  |
| Ile | Arg | Ile | Asn | Leu | Val | Ser | Ser | Lys | Lys | Ile | Thr | Glu | Phe | Asp | Pro |  |
|     |     |     | 165 |     |     |     |     |     | 170 |     |     |     |     | 175 |     |  |
| Ala | Ile | Val | Ile | Ser | Pro | Ser | Gly | Lys | Tyr | Asn | Ala | Val | Lys | Leu | Gly |  |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |  |
| Lys | Tyr | Glu | Asp | Ser | Asn | Ser | Val | Thr | Cys | Ser | Val | Gln | His | Asp | Asn |  |
|     | 195 |     |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |  |
| Lys | Thr | Val | His | Ser | Thr | Asp | Phe | Glu | Val | Lys | Thr | Asp | Ser | Thr | Asp |  |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |  |
| His | Val | Lys | Pro | Lys | Glu | Thr | Glu | Asn | Thr | Lys | Gln | Pro | Ser | Lys | Ser |  |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |  |
| Cys | His | Lys | Pro | Lys | Ala | Ile | Val | His | Thr | Glu | Lys | Val | Asn | Met | Met |  |
|     |     |     | 245 |     |     |     |     |     | 250 |     |     |     |     | 255 |     |  |
| Ser | Leu | Thr | Val | Leu | Gly | Leu | Arg | Met | Leu | Phe | Ala | Lys | Thr | Val | Ala |  |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |  |
| Val | Asn | Phe | Leu | Leu | Thr | Ala | Lys | Leu | Phe | Phe | Leu |     |     |     |     |  |
|     | 275 |     |     |     |     |     | 280 |     |     |     |     |     |     |     |     |  |

<210> 76

<211> 282

<212> PRT

<213> Artificial Sequence

<220>

<223> anti-CD19-cTCR gamma

<400> 76

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Leu | Pro | Val | Leu | Thr | Gln | Pro | Pro | Ser | Val | Ser | Val | Ala | Pro | Gly | Lys |  |
| 1   |     |     |     | 5   |     |     |     | 10  |     |     |     |     | 15  |     |     |  |
| Thr | Ala | Arg | Ile | Thr | Cys | Gly | Gly | Asn | Asn | Ile | Gly | Ser | Lys | Ser | Val |  |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |  |
| His | Trp | Tyr | Gln | Gln | Lys | Pro | Gly | Gln | Ala | Pro | Val | Leu | Val | Val | Tyr |  |
|     | 35  |     |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |  |
| Asp | Asp | Ser | Asp | Arg | Pro | Ser | Gly | Ile | Pro | Glu | Arg | Phe | Ser | Gly | Ser |  |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |  |

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

<210> 77

<211> 142

<212> PRT

<213> Homo sapiens

<220>

<223> TCRalpha constant domain

<400> 77

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Pro | Asn | Ile | Gln | Asn | Pro | Asp | Pro | Ala | Val | Tyr | Gln | Leu | Arg | Asp | Ser |
| 1   |     |     |     | 5   |     |     |     | 10  |     |     |     |     |     | 15  |     |
| Lys | Ser | Ser | Asp | Lys | Ser | Val | Cys | Leu | Phe | Thr | Asp | Phe | Asp | Ser | Gln |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Thr | Asn | Val | Ser | Gln | Ser | Lys | Asp | Ser | Asp | Val | Tyr | Ile | Thr | Asp | Lys |
|     |     | 35  |     |     |     | 40  |     |     |     |     |     | 45  |     |     |     |
| Thr | Val | Leu | Asp | Met | Arg | Ser | Met | Asp | Phe | Lys | Ser | Asn | Ser | Ala | Val |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Ala | Trp | Ser | Asn | Lys | Ser | Asp | Phe | Ala | Cys | Ala | Asn | Ala | Phe | Asn | Asn |
| 65  |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     |     | 80  |
| Ser | Ile | Ile | Pro | Glu | Asp | Thr | Phe | Phe | Pro | Ser | Pro | Glu | Ser | Ser | Cys |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Asp | Val | Lys | Leu | Val | Glu | Lys | Ser | Phe | Glu | Thr | Asp | Thr | Asn | Leu | Asn |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Phe | Gln | Asn | Leu | Ser | Val | Ile | Gly | Phe | Arg | Ile | Leu | Leu | Leu | Lys | Val |

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<210> 78
<211> 177
<212> PRT
<213> Homo sapiens
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<220>
<223> TCRbeta constant domain
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<210> 79
<211> 153
<212> PRT
<213> Homo sapiens
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<220>
<223> TCRdelta constant domain
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<400> 79  
 Ser Gln Pro His Thr Lys Pro Ser Val Phe Val Met Lys Asn Gly Thr  
 1 5 10 15  
 Asn Val Ala Cys Leu Val Lys Glu Phe Tyr Pro Lys Asp Ile Arg Ile  
 20 25 30  
 Asn Leu Val Ser Ser Lys Lys Ile Thr Glu Phe Asp Pro Ala Ile Val

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|     |     | 35  |     |     |     | 40  |     |     |     | 45  |     |     |     |     |     |
| Ile | Ser | Pro | Ser | Gly | Lys | Tyr | Asn | Ala | Val | Lys | Leu | Gly | Lys | Tyr | Glu |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Asp | Ser | Asn | Ser | Val | Thr | Cys | Ser | Val | Gln | His | Asp | Asn | Lys | Thr | Val |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |
| His | Ser | Thr | Asp | Phe | Glu | Val | Lys | Thr | Asp | Ser | Thr | Asp | His | Val | Lys |
|     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |     |
| Pro | Lys | Glu | Thr | Glu | Asn | Thr | Lys | Gln | Pro | Ser | Lys | Ser | Cys | His | Lys |
|     |     | 100 |     |     |     |     | 105 |     |     |     |     |     | 110 |     |     |
| Pro | Lys | Ala | Ile | Val | His | Thr | Glu | Lys | Val | Asn | Met | Met | Ser | Leu | Thr |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Val | Leu | Gly | Leu | Arg | Met | Leu | Phe | Ala | Lys | Thr | Val | Ala | Val | Asn | Phe |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Leu | Leu | Thr | Ala | Lys | Leu | Phe | Phe | Leu |     |     |     |     |     |     |     |
| 145 |     |     |     |     |     | 150 |     |     |     |     |     |     |     |     |     |

<210> 80

<211> 173

<212> PRT

<213> Homo sapiens

<220>

<223> TCRgamma constant domain

<400> 80

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

<210> 81

<211> 271

<212> PRT

<213> Artificial Sequence

<220>

<223> anti-AFP158/HLA-A\*02:01 abTCR-7 delta

<400> 81

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Glu | Val | Gln | Leu | Val | Gln | Ser | Gly | Ala | Glu | Val | Lys | Lys | Pro | Gly | Glu |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Ser | Leu | Thr | Ile | Ser | Cys | Lys | Ala | Ser | Gly | Tyr | Ser | Phe | Pro | Asn | Tyr |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Trp | Ile | Thr | Trp | Val | Arg | Gln | Met | Ser | Gly | Gly | Gly | Leu | Glu | Trp | Met |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Gly | Arg | Ile | Asp | Pro | Gly | Asp | Ser | Tyr | Thr | Thr | Tyr | Asn | Pro | Ser | Phe |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Gln | Gly | His | Val | Thr | Ile | Ser | Ile | Asp | Lys | Ser | Thr | Asn | Thr | Ala | Tyr |
| 65  |     |     |     |     | 70  |     |     |     | 75  |     |     |     |     | 80  |     |
| Leu | His | Trp | Asn | Ser | Leu | Lys | Ala | Ser | Asp | Thr | Ala | Met | Tyr | Tyr | Cys |
|     |     |     | 85  |     |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Ala | Arg | Tyr | Tyr | Val | Ser | Leu | Val | Asp | Ile | Trp | Gly | Gln | Gly | Thr | Leu |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Val | Thr | Val | Ser | Ser | Arg | Ser | Gln | Pro | His | Thr | Lys | Pro | Ser | Val | Phe |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Val | Met | Lys | Asn | Gly | Thr | Asn | Val | Ala | Cys | Leu | Val | Lys | Glu | Phe | Tyr |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Pro | Lys | Asp | Ile | Arg | Ile | Asn | Leu | Val | Ser | Ser | Lys | Lys | Ile | Thr | Glu |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     | 160 |     |
| Phe | Asp | Pro | Ala | Ile | Val | Ile | Ser | Pro | Ser | Gly | Lys | Tyr | Asn | Ala | Val |
|     |     |     | 165 |     |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Lys | Leu | Gly | Lys | Tyr | Glu | Asp | Ser | Asn | Ser | Val | Thr | Cys | Ser | Val | Gln |
|     |     | 180 |     |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| His | Asp | Asn | Lys | Thr | Val | His | Ser | Thr | Asp | Phe | Glu | Val | Lys | Thr | Asp |
|     | 195 |     |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Ser | Thr | Asp | His | Val | Lys | Pro | Lys | Glu | Thr | Glu | Asn | Thr | Lys | Gln | Pro |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Ser | Lys | Ser | Cys | His | Lys | Pro | Lys | Ala | Ile | Val | His | Thr | Glu | Lys | Val |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     | 240 |     |
| Asn | Met | Met | Ser | Leu | Thr | Val | Leu | Gly | Leu | Arg | Met | Leu | Phe | Ala | Lys |
|     |     |     | 245 |     |     |     |     | 250 |     |     |     |     |     | 255 |     |
| Thr | Val | Ala | Val | Asn | Phe | Leu | Leu | Thr | Ala | Lys | Leu | Phe | Phe | Leu |     |
|     |     | 260 |     |     |     |     |     | 265 |     |     |     |     | 270 |     |     |

<210> 82

<211> 283

<212> PRT

<213> Artificial Sequence

<220>

<223> anti-AFP158/HLA-A\*02:01 abTCR-7 gamma

<400> 82

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gln | Ser | Val | Leu | Thr | Gln | Pro | Ala | Ser | Val | Ser | Gly | Ser | Pro | Gly | Gln |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Ser | Ile | Thr | Ile | Ser | Cys | Thr | Gly | Thr | Ser | Ser | Asp | Val | Gly | Gly | Tyr |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |

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