

JPOXMLDOC01-seq1
SEQUENCE LISTING

<110> JCR PHARMACEUTICALS CO., LTD.
 <120> ANTI-HUMAN TRANSFERRIN RECEPTOR ANTIBODY THAT PASSES THROUGH
 BLOOD-BRAIN BARRIER
 <130> GP185-PCT
 <150> P2015-144379
 <151> 2015-06-24
 <160> 279
 <170> PatentIn version 3.5
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 <212> PRT
 <213> Homo sapiens
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Asn Ser His Val Glu Met Lys Leu Ala Val Asp Glu Glu Glu Asn Ala
 35 40 45

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

Phe Met Ile Gly Tyr Leu Gly Tyr Cys Lys Gly Val Glu Pro Lys Thr
 85 90 95

Glu Cys Glu Arg Leu Ala Gly Thr Glu Ser Pro Val Arg Glu Glu Pro
 100 105 110

Gly Glu Asp Phe Pro Ala Ala Arg Arg Leu Tyr Trp Asp Asp Leu Lys
 115 120 125

Arg Lys Leu Ser Glu Lys Leu Asp Ser Thr Asp Phe Thr Gly Thr Ile
 130 135 140

Lys Leu Leu Asn Glu Asn Ser Tyr Val Pro Arg Glu Ala Gly Ser Gln
 145 150 155 160

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Lys Asp Glu Asn Leu Ala Leu Tyr Val Glu Asn Gln Phe Arg Glu Phe
165 170 175

Lys Leu Ser Lys Val Trp Arg Asp Gln His Phe Val Lys Ile Gln Val
180 185 190

Lys Asp Ser Ala Gln Asn Ser Val Ile Ile Val Asp Lys Asn Gly Arg
195 200 205

Leu Val Tyr Leu Val Glu Asn Pro Gly Gly Tyr Val Ala Tyr Ser Lys
210 215 220

Ala Ala Thr Val Thr Gly Lys Leu Val His Ala Asn Phe Gly Thr Lys
225 230 235 240

Lys Asp Phe Glu Asp Leu Tyr Thr Pro Val Asn Gly Ser Ile Val Ile
245 250 255

Val Arg Ala Gly Lys Ile Thr Phe Ala Glu Lys Val Ala Asn Ala Glu
260 265 270

Ser Leu Asn Ala Ile Gly Val Leu Ile Tyr Met Asp Gln Thr Lys Phe
275 280 285

Pro Ile Val Asn Ala Glu Leu Ser Phe Phe Gly His Ala His Leu Gly
290 295 300

Thr Gly Asp Pro Tyr Thr Pro Gly Phe Pro Ser Phe Asn His Thr Gln
305 310 315 320

Phe Pro Pro Ser Arg Ser Ser Gly Leu Pro Asn Ile Pro Val Gln Thr
325 330 335

Ile Ser Arg Ala Ala Ala Glu Lys Leu Phe Gly Asn Met Glu Gly Asp
340 345 350

Cys Pro Ser Asp Trp Lys Thr Asp Ser Thr Cys Arg Met Val Thr Ser
355 360 365

Glu Ser Lys Asn Val Lys Leu Thr Val Ser Asn Val Leu Lys Glu Ile
370 375 380

Lys Ile Leu Asn Ile Phe Gly Val Ile Lys Gly Phe Val Glu Pro Asp
385 390 395 400

His Tyr Val Val Val Gly Ala Gln Arg Asp Ala Trp Gly Pro Gly Ala
405 410 415

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420 425 430

Phe Ser Asp Met Val Leu Lys Asp Gly Phe Gln Pro Ser Arg Ser Ile
435 440 445

Ile Phe Ala Ser Trp Ser Ala Gly Asp Phe Gly Ser Val Gly Ala Thr
450 455 460

Glu Trp Leu Glu Gly Tyr Leu Ser Ser Leu His Leu Lys Ala Phe Thr
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Tyr Ile Asn Leu Asp Lys Ala Val Leu Gly Thr Ser Asn Phe Lys Val
485 490 495

Ser Ala Ser Pro Leu Leu Tyr Thr Leu Ile Glu Lys Thr Met Gln Asn
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Val Lys His Pro Val Thr Gly Gln Phe Leu Tyr Gln Asp Ser Asn Trp
515 520 525

Ala Ser Lys Val Glu Lys Leu Thr Leu Asp Asn Ala Ala Phe Pro Phe
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Thr Asp Tyr Pro Tyr Leu Gly Thr Thr Met Asp Thr Tyr Lys Glu Leu
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Ile Glu Arg Ile Pro Glu Leu Asn Lys Val Ala Arg Ala Ala Ala Glu
580 585 590

Val Ala Gly Gln Phe Val Ile Lys Leu Thr His Asp Val Glu Leu Asn
595 600 605

Leu Asp Tyr Glu Arg Tyr Asn Ser Gln Leu Leu Ser Phe Val Arg Asp
610 615 620

Leu Asn Gln Tyr Arg Ala Asp Ile Lys Glu Met Gly Leu Ser Leu Gln
625 630 635 640

Trp Leu Tyr Ser Ala Arg Gly Asp Phe Phe Arg Ala Thr Ser Arg Leu
645 650 655

Thr Thr Asp Phe Gly Asn Ala Glu Lys Thr Asp Arg Phe Val Met Lys
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Lys Leu Asn Asp Arg Val Met Arg Val Glu Tyr His Phe Leu Ser Pro
675 680 685

Tyr Val Ser Pro Lys Glu Ser Pro Phe Arg His Val Phe Trp Gly Ser
690 695 700

Gly Ser His Thr Leu Pro Ala Leu Leu Glu Asn Leu Lys Leu Arg Lys
705 710 715 720

Gln Asn Asn Gly Ala Phe Asn Glu Thr Leu Phe Arg Asn Gln Leu Ala
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Val Trp Asp Ile Asp Asn Glu Phe
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20 25 30

Asn Ser His Val Glu Met Lys Leu Ala Val Asp Asp Glu Glu Asn Ala
35 40 45

Asp Asn Asn Thr Lys Ala Asn Gly Thr Lys Pro Lys Arg Cys Gly Gly
50 55 60

Asn Ile Cys Tyr Gly Thr Ile Ala Val Ile Ile Phe Phe Leu Ile Gly
65 70 75 80

Phe Met Ile Gly Tyr Leu Gly Tyr Cys Lys Gly Val Glu Pro Lys Thr
85 90 95

Glu Cys Glu Arg Leu Ala Gly Thr Glu Ser Pro Ala Arg Glu Glu Pro
100 105 110

Glu Glu Asp Phe Pro Ala Ala Pro Arg Leu Tyr Trp Asp Asp Leu Lys
115 120 125

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Arg Lys Leu Ser Glu Lys Leu Asp Thr Thr Asp Phe Thr Ser Thr Ile
130 135 140

Lys Leu Leu Asn Glu Asn Leu Tyr Val Pro Arg Glu Ala Gly Ser Gln
145 150 155 160

Lys Asp Glu Asn Leu Ala Leu Tyr Ile Glu Asn Gln Phe Arg Glu Phe
165 170 175

Lys Leu Ser Lys Val Trp Arg Asp Gln His Phe Val Lys Ile Gln Val
180 185 190

Lys Asp Ser Ala Gln Asn Ser Val Ile Ile Val Asp Lys Asn Gly Gly
195 200 205

Leu Val Tyr Leu Val Glu Asn Pro Gly Gly Tyr Val Ala Tyr Ser Lys
210 215 220

Ala Ala Thr Val Thr Gly Lys Leu Val His Ala Asn Phe Gly Thr Lys
225 230 235 240

Lys Asp Phe Glu Asp Leu Asp Ser Pro Val Asn Gly Ser Ile Val Ile
245 250 255

Val Arg Ala Gly Lys Ile Thr Phe Ala Glu Lys Val Ala Asn Ala Glu
260 265 270

Ser Leu Asn Ala Ile Gly Val Leu Ile Tyr Met Asp Gln Thr Lys Phe
275 280 285

Pro Ile Val Lys Ala Asp Leu Ser Phe Phe Gly His Ala His Leu Gly
290 295 300

Thr Gly Asp Pro Tyr Thr Pro Gly Phe Pro Ser Phe Asn His Thr Gln
305 310 315 320

Phe Pro Pro Ser Gln Ser Ser Gly Leu Pro Asn Ile Pro Val Gln Thr
325 330 335

Ile Ser Arg Ala Ala Ala Glu Lys Leu Phe Gly Asn Met Glu Gly Asp
340 345 350

Cys Pro Ser Asp Trp Lys Thr Asp Ser Thr Cys Lys Met Val Thr Ser
355 360 365

Glu Asn Lys Ser Val Lys Leu Thr Val Ser Asn Val Leu Lys Glu Thr

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370

375

380

Lys Ile Leu Asn Ile Phe Gly Val Ile Lys Gly Phe Val Glu Pro Asp
385 390 395 400

His Tyr Val Val Val Gly Ala Gln Arg Asp Ala Trp Gly Pro Gly Ala
405 410 415

Ala Lys Ser Ser Val Gly Thr Ala Leu Leu Leu Lys Leu Ala Gln Met
420 425 430

Phe Ser Asp Met Val Leu Lys Asp Gly Phe Gln Pro Ser Arg Ser Ile
435 440 445

Ile Phe Ala Ser Trp Ser Ala Gly Asp Phe Gly Ser Val Gly Ala Thr
450 455 460

Glu Trp Leu Glu Gly Tyr Leu Ser Ser Leu His Leu Lys Ala Phe Thr
465 470 475 480

Tyr Ile Asn Leu Asp Lys Ala Val Leu Gly Thr Ser Asn Phe Lys Val
485 490 495

Ser Ala Ser Pro Leu Leu Tyr Thr Leu Ile Glu Lys Thr Met Gln Asp
500 505 510

Val Lys His Pro Val Thr Gly Arg Ser Leu Tyr Gln Asp Ser Asn Trp
515 520 525

Ala Ser Lys Val Glu Lys Leu Thr Leu Asp Asn Ala Ala Phe Pro Phe
530 535 540

Leu Ala Tyr Ser Gly Ile Pro Ala Val Ser Phe Cys Phe Cys Glu Asp
545 550 555 560

Thr Asp Tyr Pro Tyr Leu Gly Thr Thr Met Asp Thr Tyr Lys Glu Leu
565 570 575

Val Glu Arg Ile Pro Glu Leu Asn Lys Val Ala Arg Ala Ala Ala Glu
580 585 590

Val Ala Gly Gln Phe Val Ile Lys Leu Thr His Asp Thr Glu Leu Asn
595 600 605

Leu Asp Tyr Glu Arg Tyr Asn Ser Gln Leu Leu Leu Phe Leu Arg Asp
610 615 620

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Leu Asn Gln Tyr Arg Ala Asp Val Lys Glu Met Gly Leu Ser Leu Gln
625 630 635 640

Trp Leu Tyr Ser Ala Arg Gly Asp Phe Phe Arg Ala Thr Ser Arg Leu
645 650 655

Thr Thr Asp Phe Arg Asn Ala Glu Lys Arg Asp Lys Phe Val Met Lys
660 665 670

Lys Leu Asn Asp Arg Val Met Arg Val Glu Tyr Tyr Phe Leu Ser Pro
675 680 685

Tyr Val Ser Pro Lys Glu Ser Pro Phe Arg His Val Phe Trp Gly Ser
690 695 700

Gly Ser His Thr Leu Ser Ala Leu Leu Glu Ser Leu Lys Leu Arg Arg
705 710 715 720

Gln Asn Asn Ser Ala Phe Asn Glu Thr Leu Phe Arg Asn Gln Leu Ala
725 730 735

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Val Trp Asp Ile Asp Asn Glu Phe
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Trp Thr Ser Thr Arg His Thr
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<223> Amino acid sequence 2 of CDR 2 in the light chain of mouse anti-hTfR antibody No.2

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Tyr Ala Ser Gln Ser Ile Ser
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Gln Gln Ser Asn Ser Trp Pro Arg Thr
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Gln Ser Leu Val His Ser Asn Gly Asn Thr Tyr
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<211> 16

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Lys Val Ser Asn Arg Phe
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Ser Ala Ser Ser Asn Val Asn Tyr Met His
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<210> 27
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Ser Ala Ser Ser Ser Ile Ser Ser Ile His
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<211> 6

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<211> 6

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<223> Amino acid sequence of CDR 3 in the light chain of mouse
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<223> Amino acid sequence 1 of CDR 1 in the light chain of mouse
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Ser Ser Val Asn Tyr
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<210> 37

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<223> Amino acid sequence 2 of CDR 1 in the light chain of mouse
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<223> Amino acid sequence 1 of CDR 2 in the light chain of mouse
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<223> Amino acid sequence 2 of CDR 2 in the light chain of mouse
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<211> 9

<212> PRT

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Ser Ser Val Ser Tyr
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<210> 42

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<223> Amino acid sequence 2 of CDR 1 in the light chain of mouse
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<211> 6
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Gly Thr Ser Asn Leu Ala
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<210> 44
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Gly Thr Ser Asn Leu Ala Ser
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His Gln Trp Ser Ser Tyr Pro Trp Thr
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Ser Ala Ser Ser Ser Val Ser Leu Met Phe
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<210> 48
 <211> 6
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Phe Thr Ser Tyr Arg Ala
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<210> 49
 <211> 7
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Phe Thr Ser Tyr Arg Ala Ser
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<210> 50
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<210> 51
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<213> Artificial Sequence

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Gln Glu Ile Ser Gly Tyr
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<210> 52

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<223> Amino acid sequence 2 of CDR 1 in the light chain of mouse anti-hTfR antibody No.10

<400> 52

Arg Pro Ser Gln Glu Ile Ser Gly Tyr Leu Ser
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<210> 53

<211> 6

<212> PRT

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<223> Amino acid sequence 1 of CDR 2 in the light chain of mouse anti-hTfR antibody No.10

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Ala Ala Ser Thr Leu Asp
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<210> 54

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<223> Amino acid sequence 2 of CDR 2 in the light chain of mouse anti-hTfR antibody No.10

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Ala Ala Ser Thr Leu Asp Ser
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<211> 9

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Leu Gln Tyr Ala Ser Tyr Pro Arg Thr
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Gln Ser Ile Arg Asn Tyr
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<210> 57
<211> 11
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Arg Ala Ser Gln Ser Ile Arg Asn Tyr Leu His
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Tyr Ala Ser Gln Ser Ile
1 5

<210> 59
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Tyr Ala Ser Gln Ser Ile Ser
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<210> 60

<211> 9

<212> PRT

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<223> Amino acid sequence of CDR 3 in the light chain of mouse
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Gln Gln Thr Asn Ser Trp Pro Tyr Thr
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<210> 61

<211> 6

<212> PRT

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<223> Amino acid sequence 1 of CDR 1 in the light chain of mouse
anti-hTfR antibody No.12

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His Asp Val Lys Thr Ala
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<210> 62

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anti-hTfR antibody No.12

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Lys Ala Ser His Asp Val Lys Thr Ala Val Ala
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<210> 63

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Trp Ser Ser Thr Arg His

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Trp Ser Ser Thr Arg His Thr
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 <223> Amino acid sequence of CDR 3 in the light chain of mouse anti-hTfR antibody No.12

<400> 65

Gln Gln His Phe Ser Thr Pro Leu Thr
 1 5

<210> 66
 <211> 6
 <212> PRT
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 <223> Amino acid sequence 1 of CDR 1 in the light chain of mouse anti-hTfR antibody No.13

<400> 66

Gln Ser Ile Arg Asn Tyr
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<210> 67
 <211> 11
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<400> 67

Arg Ala Ser Gln Ser Ile Arg Asn Tyr Leu His
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<210> 68
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<400> 68

Tyr Ala Ser Gln Ser Ile
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<210> 69
 <211> 7
 <212> PRT
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 <223> Amino acid sequence 2 of CDR 2 in the light chain of mouse anti-hTfR antibody No.13

<400> 69

Tyr Ala Ser Gln Ser Ile Ser
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<210> 70
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<400> 70

Gln Gln Thr Asn Ser Trp Pro Tyr Thr
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<400> 71

Ser Asn Ile Asn Ser
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<210> 72
 <211> 10
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<213> Artificial Sequence

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Ser Ala Ser Ser Asn Ile Asn Ser Ile His
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<210> 73

<211> 6

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<400> 73

Asp Thr Ser Asn Leu Ala
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<210> 74

<211> 7

<212> PRT

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Asp Thr Ser Asn Leu Ala Ser
1 5

<210> 75

<211> 9

<212> PRT

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<223> Amino acid sequence of CDR 3 in the light chain of mouse anti-hTfR antibody No.14

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His Gln Arg Ser Gly Tyr Pro Phe Thr
1 5

<210> 76

<211> 5

<212> PRT

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<400> 76

Asn Tyr Gly Met Ser
1 5

<210> 77

<211> 8

<212> PRT

<213> Artificial Sequence

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<223> Amino acid sequence 2 of CDR 1 in the heavy chain of mouse anti-hTfR antibody No.1

<400> 77

Gly Leu Thr Phe Ser Asn Tyr Gly
1 5

<210> 78

<211> 8

<212> PRT

<213> Artificial Sequence

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<223> Amino acid sequence 1 of CDR 2 in the heavy chain of mouse anti-hTfR antibody No.1

<400> 78

Ile Asn Thr Asn Gly Gly Ser Thr
1 5

<210> 79

<211> 17

<212> PRT

<213> Artificial Sequence

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<223> Amino acid sequence 2 of CDR 2 in the heavy chain of mouse anti-hTfR antibody No.1

<400> 79

Asn Ile Asn Thr Asn Gly Gly Ser Thr Tyr Tyr Pro Asp Ser Val Lys
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Gly

<210> 80

<211> 7

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<220>
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<400> 80

Asn Arg Tyr Asp Glu Asp Tyr
 1 5

<210> 81
 <211> 9
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<400> 81

Thr Asn Asn Arg Tyr Asp Glu Asp Tyr
 1 5

<210> 82
 <211> 5
 <212> PRT
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<220>
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<400> 82

Asp Tyr Val Met His
 1 5

<210> 83
 <211> 8
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Amino acid sequence 2 of CDR 1 in the heavy chain of mouse anti-hTfR antibody No.2

<400> 83

Gly Tyr Thr Phe Thr Asp Tyr Val
 1 5

<210> 84
 <211> 8
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Amino acid sequence 1 of CDR 2 in the heavy chain of mouse anti-hTfR antibody No.2

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<400> 84

Ile Ser Thr Tyr Tyr Gly His Gly
1 5

<210> 85

<211> 17

<212> PRT

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<223> Amino acid sequence 2 of CDR 2 in the heavy chain of mouse anti-hTfR antibody No.2

<400> 85

Val Ile Ser Thr Tyr Tyr Gly His Gly Ser Tyr Asn Gln Arg Phe Lys
1 5 10 15

Gly

<210> 86

<211> 14

<212> PRT

<213> Artificial Sequence

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<223> Amino acid sequence 1 of CDR 3 in the heavy chain of mouse anti-hTfR antibody No.2

<400> 86

Gly Gly Tyr Gly Ser Ser Ser Leu Ala Gly Asn Phe Asp Val
1 5 10

<210> 87

<211> 16

<212> PRT

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<220>

<223> Amino acid sequence 2 of CDR 3 in the heavy chain of mouse anti-hTfR antibody No.2

<400> 87

Val Arg Gly Gly Tyr Gly Ser Ser Ser Leu Ala Gly Asn Phe Asp Val
1 5 10 15

<210> 88

<211> 5

<212> PRT

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<220>

<223> Amino acid sequence 1 of CDR 1 in the heavy chain of mouse

anti-hTfR antibody No.3

<400> 88

Asn Tyr Trp Leu Gly
1 5

<210> 89

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 2 of CDR 1 in the heavy chain of mouse
anti-hTfR antibody No.3

<400> 89

Gly Tyr Ser Phe Thr Asn Tyr Trp
1 5

<210> 90

<211> 8

<212> PRT

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<220>

<223> Amino acid sequence 1 of CDR 2 in the heavy chain of mouse
anti-hTfR antibody No.3

<400> 90

Ile Tyr Pro Gly Asp Tyr Pro
1 5

<210> 91

<211> 17

<212> PRT

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<220>

<223> Amino acid sequence 2 of CDR 2 in the heavy chain of mouse
anti-hTfR antibody No.3

<400> 91

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

Val

<210> 92

<211> 9

<212> PRT

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<220>

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<223> Amino acid sequence 1 of CDR 3 in the heavy chain of mouse anti-hTfR antibody No.3

<400> 92

Ser Gly Asn Tyr Asp Glu Val Ala Tyr
1 5

<210> 93

<211> 11

<212> PRT

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<223> Amino acid sequence 2 of CDR 3 in the heavy chain of mouse anti-hTfR antibody No.3

<400> 93

Ala Arg Ser Gly Asn Tyr Asp Glu Val Ala Tyr
1 5 10

<210> 94

<211> 5

<212> PRT

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<223> Amino acid sequence 1 of CDR 1 in the heavy chain of mouse anti-hTfR antibody No.4

<400> 94

Asn Tyr Leu Ile Glu
1 5

<210> 95

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 2 of CDR 1 in the heavy chain of mouse anti-hTfR antibody No.4

<400> 95

Gly Tyr Ala Phe Thr Asn Tyr Leu
1 5

<210> 96

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 1 of CDR 2 in the heavy chain of mouse anti-hTfR antibody No.4

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<400> 96

Ile Asn Pro Gly Ser Gly Gly Ile
1 5

<210> 97

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 2 of CDR 2 in the heavy chain of mouse anti-hTfR antibody No.4

<400> 97

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

<210> 98

<211> 13

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 1 of CDR 3 in the heavy chain of mouse anti-hTfR antibody No.4

<400> 98

Ser Asn Tyr Tyr Gly Thr Thr Tyr Trp His Phe Asp Val
1 5 10

<210> 99

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 2 of CDR 3 in the heavy chain of mouse anti-hTfR antibody No.4

<400> 99

Ala Arg Ser Asn Tyr Tyr Gly Thr Thr Tyr Trp His Phe Asp Val
1 5 10 15

<210> 100

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 1 of CDR 1 in the heavy chain of mouse anti-hTfR antibody No.5

<400> 100

Asn Phe Val Ile His

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<210> 101
<211> 8
<212> PRT
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<220>
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<400> 101

Gly Tyr Thr Phe Thr Asn Phe Val
1 5

<210> 102
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence 1 of CDR 2 in the heavy chain of mouse anti-hTfR antibody No.5

<400> 102

Phe Asn Pro His Lys Asn Gly Ala
1 5

<210> 103
<211> 16
<212> PRT
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<220>
<223> Amino acid sequence 2 of CDR 2 in the heavy chain of mouse anti-hTfR antibody No.5

<400> 103

Phe Asn Pro His Lys Asn Gly Ala Glu Tyr Asn Glu Lys Phe Gln Val
1 5 10 15

<210> 104
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence 1 of CDR 3 in the heavy chain of mouse anti-hTfR antibody No.5

<400> 104

Ser Phe Tyr Tyr Tyr Ser Met Asp Tyr
1 5

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<210> 105
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<400> 105

Ala Arg Ser Phe Tyr Tyr Tyr Ser Met Asp Tyr
 1 5 10

<210> 106
 <211> 5
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Amino acid sequence 1 of CDR 1 in the heavy chain of mouse anti-hTfR antibody No.6

<400> 106

Thr Tyr Gly Val Tyr
 1 5

<210> 107
 <211> 8
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Amino acid sequence 2 of CDR 1 in the heavy chain of mouse anti-hTfR antibody No.6

<400> 107

Gly Phe Ser Leu Ser Thr Tyr Gly
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<210> 108
 <211> 7
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Amino acid sequence of CDR 2 in the heavy chain of mouse anti-hTfR antibody No.6

<400> 108

Ile Trp Gly Asp Gly Ser Thr
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<210> 109
 <211> 4
 <212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 1 of CDR 3 in the heavy chain of mouse anti-hTfR antibody No.6

<400> 109

Pro Asp Asp Val

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<210> 110

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 2 of CDR 3 in the heavy chain of mouse anti-hTfR antibody No.6

<400> 110

Ala Lys Pro Asp Asp Val

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<210> 111

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 1 of CDR 1 in the heavy chain of mouse anti-hTfR antibody No.7

<400> 111

Asn Tyr Phe Met Ser

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<210> 112

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 2 of CDR 1 in the heavy chain of mouse anti-hTfR antibody No.7

<400> 112

Gly Ile Thr Phe Arg Asn Tyr Phe

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<210> 113

<211> 8

<212> PRT

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<223> Amino acid sequence 1 of CDR 2 in the heavy chain of mouse anti-hTfR antibody No.7

<400> 113

Ile Ser Ser Ala Gly Gly Tyr Thr
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<210> 114

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 2 of CDR 2 in the heavy chain of mouse anti-hTfR antibody No.7

<400> 114

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

<210> 115

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 1 of CDR 3 in the heavy chain of mouse anti-hTfR antibody No.7

<400> 115

Gln Glu Val Pro Tyr Pro Tyr Ala Met Asp Tyr
1 5 10

<210> 116

<211> 13

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 2 of CDR 3 in the heavy chain of mouse anti-hTfR antibody No.7

<400> 116

Ala Arg Gln Glu Val Pro Tyr Pro Tyr Ala Met Asp Tyr
1 5 10

<210> 117

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 1 of CDR 1 in the heavy chain of mouse anti-hTfR antibody No.8

<400> 117

Thr Tyr Gly Val Ser
1 5

<210> 118

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 2 of CDR 1 in the heavy chain of mouse
anti-hTfR antibody No.8

<400> 118

Gly Phe Ser Leu Thr Thr Tyr Gly
1 5

<210> 119

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of CDR 2 in the heavy chain of mouse
anti-hTfR antibody No.8

<400> 119

Ile Trp Gly Asp Gly Ser Thr
1 5

<210> 120

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 1 of CDR 3 in the heavy chain of mouse
anti-hTfR antibody No.8

<400> 120

Pro Asp Asp Tyr
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<210> 121

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 2 of CDR 3 in the heavy chain of mouse
anti-hTfR antibody No.8

<400> 121

Ala Lys Pro Asp Asp Tyr

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<210> 122
<211> 5
<212> PRT
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<223> Amino acid sequence 1 of CDR 1 in the heavy chain of mouse anti-hTfR antibody No.9

<400> 122

Asn Tyr Gly Val Ser
1 5

<210> 123
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence 2 of CDR 1 in the heavy chain of mouse anti-hTfR antibody No.9

<400> 123

Gly Tyr Thr Phe Thr Asn Tyr Gly
1 5

<210> 124
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence 1 of CDR 2 in the heavy chain of mouse anti-hTfR antibody No.9

<400> 124

Ile Tyr Thr Phe Thr Gly Glu Ala
1 5

<210> 125
<211> 16
<212> PRT
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<220>
<223> Amino acid sequence 2 of CDR 2 in the heavy chain of mouse anti-hTfR antibody No.9

<400> 125

Ile Tyr Thr Phe Thr Gly Glu Ala Thr Tyr Ile Asp Asp Phe Arg Gly
1 5 10 15

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<210> 126
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 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Amino acid sequence 1 of CDR 3 in the heavy chain of mouse anti-hTfR antibody No.9

<400> 126

Arg Asn Gly Ala Trp Phe Glu Asp
 1 5

<210> 127
 <211> 10
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Amino acid sequence 2 of CDR 3 in the heavy chain of mouse anti-hTfR antibody No.9

<400> 127

Ser Arg Arg Asn Gly Ala Trp Phe Glu Asp
 1 5 10

<210> 128
 <211> 5
 <212> PRT
 <213> Artificial Sequence

<220>
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<400> 128

Asn Tyr Ala Met Ser
 1 5

<210> 129
 <211> 8
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Amino acid sequence 2 of CDR 1 in the heavy chain of mouse anti-hTfR antibody No.10

<400> 129

Gly Ile Thr Phe Arg Asn Tyr Ala
 1 5

<210> 130
 <211> 8
 <212> PRT

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<213> Artificial Sequence

<220>

<223> Amino acid sequence 1 of CDR 2 in the heavy chain of mouse anti-hTfR antibody No.10

<400> 130

Ile Ser Ser Tyr Gly Gly Tyr Thr
1 5

<210> 131

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 2 of CDR 2 in the heavy chain of mouse anti-hTfR antibody No.10

<400> 131

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

<210> 132

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 1 of CDR 3 in the heavy chain of mouse anti-hTfR antibody No.10

<400> 132

Gln Glu Val Pro Tyr Pro Tyr Pro Met Asp Asn
1 5 10

<210> 133

<211> 13

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 2 of CDR 3 in the heavy chain of mouse anti-hTfR antibody No.10

<400> 133

Ala Arg Gln Glu Val Pro Tyr Pro Tyr Pro Met Asp Asn
1 5 10

<210> 134

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

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<223> Amino acid sequence 1 of CDR 1 in the heavy chain of mouse anti-hTfR antibody No.11

<400> 134

Ile Tyr Trp Ile Asn
1 5

<210> 135

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 2 of CDR 1 in the heavy chain of mouse anti-hTfR antibody No.11

<400> 135

Gly Tyr Ala Phe Ser Ile Tyr Trp
1 5

<210> 136

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 1 of CDR 2 in the heavy chain of mouse anti-hTfR antibody No.11

<400> 136

Ile Tyr Pro Gly Asn Gly Asp Thr
1 5

<210> 137

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 2 of CDR 2 in the heavy chain of mouse anti-hTfR antibody No.11

<400> 137

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

<210> 138

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 1 of CDR 3 in the heavy chain of mouse anti-hTfR antibody No.11

<400> 138

Trp Gly Asp Asp Tyr Ala Met Asp Phe
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<210> 139

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 2 of CDR 3 in the heavy chain of mouse anti-hTfR antibody No.11

<400> 139

Gly Arg Trp Gly Asp Asp Tyr Ala Met Asp Phe
 1 5 10

<210> 140

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 1 of CDR 1 in the heavy chain of mouse anti-hTfR antibody No.12

<400> 140

Asn Tyr Leu Ile Glu
 1 5

<210> 141

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 2 of CDR 1 in the heavy chain of mouse anti-hTfR antibody No.12

<400> 141

Gly Tyr Val Phe Ile Asn Tyr Leu
 1 5

<210> 142

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 1 of CDR 2 in the heavy chain of mouse anti-hTfR antibody No.12

<400> 142

Ile His Ser Gly Ser Gly Gly Thr

1

5

<210> 143
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<400> 143

Ile His Ser Gly Ser Gly Gly Thr Asn Tyr Asn Asp Asn Phe Lys Asp
 1 5 10 15

<210> 144
 <211> 10
 <212> PRT
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<220>
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<400> 144

Arg Asn Phe Gly Asn Tyr Tyr Phe Asp Tyr
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<210> 145
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 <212> PRT
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<220>
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<400> 145

Ala Arg Arg Asn Phe Gly Asn Tyr Tyr Phe Asp Tyr
 1 5 10

<210> 146
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 <212> PRT
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<220>
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<400> 146

Ile Tyr Trp Ile Asn
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<210> 147
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<220>
 <223> Amino acid sequence 2 of CDR 1 in the heavy chain of mouse anti-hTfR antibody No.13

<400> 147

Gly Tyr Ala Phe Ser Ile Tyr Trp
 1 5

<210> 148
 <211> 8
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Amino acid sequence 1 of CDR 2 in the heavy chain of mouse anti-hTfR antibody No.13

<400> 148

Ile Tyr Pro Gly Asn Gly Asp Thr
 1 5

<210> 149
 <211> 16
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Amino acid sequence 2 of CDR 2 in the heavy chain of mouse anti-hTfR antibody No.13

<400> 149

Ile Tyr Pro Gly Asn Gly Asp Thr Asn Tyr Asn Gly Lys Phe Lys Gly
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<210> 150
 <211> 9
 <212> PRT
 <213> Artificial Sequence

<220>
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<400> 150

Trp Gly Asp Asp Tyr Ala Met Asp Phe
 1 5

<210> 151
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<213> Artificial Sequence

<220>

<223> Amino acid sequence 2 of CDR 3 in the heavy chain of mouse anti-hTfR antibody No.13

<400> 151

Gly Arg Trp Gly Asp Asp Tyr Ala Met Asp Phe
1 5 10

<210> 152

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 1 of CDR 1 in the heavy chain of mouse anti-hTfR antibody No.14

<400> 152

Gly Tyr Val Ile His
1 5

<210> 153

<211> 8

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<213> Artificial Sequence

<220>

<223> Amino acid sequence 2 of CDR 1 in the heavy chain of mouse anti-hTfR antibody No.14

<400> 153

Gly Tyr Ala Phe Thr Gly Tyr Val
1 5

<210> 154

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 1 of CDR 2 in the heavy chain of mouse anti-hTfR antibody No.14

<400> 154

Leu Asn Pro His Lys Asp Asp Ser
1 5

<210> 155

<211> 16

<212> PRT

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<220>

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<223> Amino acid sequence 2 of CDR 2 in the heavy chain of mouse anti-hTfR antibody No.14

<400> 155

Leu Asn Pro His Lys Asp Asp Ser Glu Tyr Asn Glu Lys Phe Arg Gly
1 5 10 15

<210> 156

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 1 of CDR 3 in the heavy chain of mouse anti-hTfR antibody No.14

<400> 156

Gly Tyr Tyr Tyr Tyr Ser Met Asp Tyr
1 5

<210> 157

<211> 11

<212> PRT

<213> Artificial Sequence

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<223> Amino acid sequence 2 of CDR 3 in the heavy chain of mouse anti-hTfR antibody No.14

<400> 157

Ala Arg Gly Tyr Tyr Tyr Tyr Ser Met Asp Tyr
1 5 10

<210> 158

<211> 107

<212> PRT

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<220>

<223> Amino acid sequence 1 of the variable region of light chain of humanized anti-hTfR antibody No.1

<400> 158

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

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

Val Ala Trp Tyr Gln Gln Lys Pro Gly Gln Pro Pro Lys Leu Leu Ile
35 40 45

Tyr Trp Thr Ser Thr Arg His Thr Gly Val Pro Asp Arg Phe Ser Gly

JPOXMLDOC01-seq1

50

55

60

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Ala
65 70 75 80

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

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

<210> 159

<211> 107

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 2 of the variable region of light chain of humanized anti-hTfR antibody No.1

<400> 159

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

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

Val Ala Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Leu
35 40 45

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

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

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

Thr Phe Gly Gly Gly Thr Lys Val Glu Ile Lys
100 105

<210> 160

<211> 107

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 3 of the variable region of light chain of humanized anti-hTfR antibody No.1

JPOXMLDOC01-seq1

<400> 160

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

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

Val Ala Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
35 40 45

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

Ser Gly Ser Gly Thr Glu Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
65 70 75 80

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

Thr Phe Gly Gly Gly Thr Lys Val Glu Ile Lys
100 105

<210> 161

<211> 107

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 4 of the variable region of light chain of
humanized anti-hTfR antibody No.1

<400> 161

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

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

Val Ala Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
35 40 45

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

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
65 70 75 80

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

JPOXMLDOC01-seq1

Thr Phe Gly Gly Gly Thr Lys Val Glu Ile Lys
100 105

<210> 162
<211> 107
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence 5 of the variable region of light chain of humanized anti-hTfR antibody No.1

<400> 162

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

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

Val Ala Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
35 40 45

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

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
65 70 75 80

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

Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys
100 105

<210> 163
<211> 107
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence 6 of the variable region of light chain of humanized anti-hTfR antibody No.1

<400> 163

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

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

JPOXMLDOC01-seq1

Val Ala Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
35 40 45

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

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
65 70 75 80

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

Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys
100 105

<210> 164

<211> 214

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the light chain of humanized anti-hTfR antibody No.1 containing amino acid sequence 6 as the variable region

<400> 164

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

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

Val Ala Trp Phe Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
35 40 45

Tyr Trp Thr Ser Thr Arg His Thr Gly Val Pro Asp Arg Phe Ser Gly
50 55 60

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

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

Thr Phe Gly Gly Gly Thr Lys Val Glu Ile Lys Arg Thr Val Ala Ala
100 105 110

Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu Gln Leu Lys Ser Gly
115 120 125

JPOXMLDOC01-seq1

Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe Tyr Pro Arg Glu Ala
130 135 140

Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln Ser Gly Asn Ser Gln
145 150 155 160

Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser Thr Tyr Ser Leu Ser
165 170 175

Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu Lys His Lys Val Tyr
180 185 190

Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser Pro Val Thr Lys Ser
195 200 205

Phe Asn Arg Gly Glu Cys
210

<210> 165
<211> 725
<212> DNA
<213> Artificial Sequence

<220>
<223> Nucleotide sequence encoding the amino acid sequence of the light chain of humanized anti-hTfR antibody No.1 containing amino acid sequence 6 as the variable region, synthetic sequence

<400> 165
acgcgtgccg ccaccatggg ctggagctgg attctgctgt tcctcctgag cgtgacagca 60
ggagtgcaca gcgacatcca ggtcacacag tcaccaagtt ttctgagcgc aagcgtgggc 120
gacaggggtca ctatcacatg caaggcaagc caggacgtga actccgcagt ggcctgggttc 180
cagcagaagc cagggaaagc acccaagctg ctgatctatt ggacctctac aaggcacacc 240
ggtgtcccag atcggttctc aggttccggc agcggaacag tgtatactct gaccatttcc 300
agcctgcagc ctgaagactt cgctacttac tattgccagc agcattactc caccccaaga 360
acatttggcg gagggactaa agtggagatc aagaggaccg tggccgctcc ctccgtcttc 420
atttttcccc ctacgacga acagctgaag agtggcacag cctcagtggg ctgtctgctg 480
aacaatttct accctagggg ggctaaaagt cagtggaaag tcgataacgc actgcagtct 540
ggaaatagtc aggagtcagt gacagaacag gactccaaag atagcactta ttctctgtct 600
agtacactga ctctgagcaa ggccgattac gaaaagcaca aagtgtatgc ttgcgaagtc 660
acccatcagg ggctgtcatc accagtcacc aagtcattca atagaggcga gtgctaagcg 720
gccgc 725

JPOXMLDOC01-seq1

<210> 166
 <211> 116
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Amino acid sequence 1 of the variable region of the heavy chain of humanized anti-hTfR antibody No.1

<400> 166

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

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Asn Tyr
 20 25 30

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

Ser Asn Ile Asn Thr Asn Gly Gly Ser Thr Tyr Tyr Pro Asp Ser Val
 50 55 60

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

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

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

Thr Val Ser Ser
 115

<210> 167
 <211> 116
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Amino acid sequence 2 of the variable region of the heavy chain of humanized anti-hTfR antibody No.1

<400> 167

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

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Asn Tyr
 20 25 30

JPOXMLDOC01-seq1

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

Ser Asn Ile Asn Thr Asn Gly Gly Ser Thr Tyr Tyr Pro Asp Ser Val
50 55 60

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

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

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

Thr Val Ser Ser
115

<210> 168

<211> 116

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 3 of the variable region of the heavy chain of humanized anti-hTfR antibody No.1

<400> 168

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

Ser Leu Arg Leu Ser Cys Ser Ala Ser Gly Phe Thr Phe Ser Asn Tyr
20 25 30

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

Ser Asn Ile Asn Thr Asn Gly Gly Ser Thr Tyr Tyr Pro Asp Ser Val
50 55 60

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

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

Val Lys Asn Arg Tyr Asp Glu Asp Tyr Trp Gly Gln Gly Thr Leu Val
100 105 110

JPOXMLDOC01-seq1

Thr Val Ser Ser
115

<210> 169
<211> 116
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence 4 of the variable region of the heavy chain
of humanized anti-hTfR antibody No.1

<400> 169

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

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Asn Tyr
20 25 30

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

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

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

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

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

Thr Val Ser Ser
115

<210> 170
<211> 116
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence 5 of the variable region of the heavy chain
of humanized anti-hTfR antibody No.1

<400> 170

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

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Asn Tyr

JPOXMLDOC01-seq1

20

25

30

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

Ser Asn Ile Asn Thr Asn Gly Gly Ser Thr Tyr Tyr Pro Asp Ser Val
50 55 60

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

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

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

Thr Val Ser Ser
115

<210> 171

<211> 116

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 6 of the variable region of the heavy chain of humanized anti-hTfR antibody No.1

<400> 171

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

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Leu Thr Phe Ser Asn Tyr
20 25 30

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

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

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

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

Thr Asn Asn Arg Tyr Asp Glu Asp Tyr Trp Gly Gln Gly Thr Leu Val
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JPOXMLDOC01-seq1

100 105 110

Thr Val Ser Ser
115

<210> 172
 <211> 446
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Amino acid sequence of the heavy chain of humanized anti-hTfR antibody No.1 containing amino acid sequence 6 as the variable region

<400> 172

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

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Leu Thr Phe Ser Asn Tyr
 20 25 30

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

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

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

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

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

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
 115 120 125

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
 130 135 140

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
 145 150 155 160

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
 165 170 175

JPOXMLDOC01-seq1

Gly Leu Tyr Ser₁₈₀ Leu Ser Ser Val Val₁₈₅ Thr Val Pro Ser Ser₁₉₀ Ser Leu

Gly Thr Gln₁₉₅ Thr Tyr Ile Cys Asn₂₀₀ Val Asn His Lys Pro₂₀₅ Ser Asn Thr

Lys Val₂₁₀ Asp Lys Lys Val₂₁₅ Glu Pro Lys Ser Cys Asp₂₂₀ Lys Thr His Thr

Cys₂₂₅ Pro Pro Cys Pro Ala₂₃₀ Pro Glu Leu Leu Gly₂₃₅ Gly Pro Ser Val₂₄₀ Phe

Leu Phe Pro Pro Lys₂₄₅ Pro Lys Asp Thr Leu₂₅₀ Met Ile Ser Arg Thr₂₅₅ Pro

Glu Val Thr Cys₂₆₀ Val Val Val Asp Val₂₆₅ Ser His Glu Asp Pro₂₇₀ Glu Val

Lys Phe Asn₂₇₅ Trp Tyr Val Asp Gly₂₈₀ Val Glu Val His Asn₂₈₅ Ala Lys Thr

Lys Pro₂₉₀ Arg Glu Glu Gln Tyr₂₉₅ Asn Ser Thr Tyr Arg₃₀₀ Val Val Ser Val

Leu Thr Val₃₀₅ Leu His Gln₃₁₀ Asp Trp Leu Asn Gly₃₁₅ Lys Glu Tyr Lys Cys₃₂₀

Lys Val Ser Asn Lys₃₂₅ Ala Leu Pro Ala Pro₃₃₀ Ile Glu Lys Thr Ile₃₃₅ Ser

Lys Ala Lys Gly₃₄₀ Gln Pro Arg Glu Pro₃₄₅ Gln Val Tyr Thr Leu₃₅₀ Pro Pro

Ser Arg Asp₃₅₅ Glu Leu Thr Lys Asn₃₆₀ Gln Val Ser Leu Thr₃₆₅ Cys Leu Val

Lys Gly₃₇₀ Phe Tyr Pro Ser Asp₃₇₅ Ile Ala Val Glu Trp₃₈₀ Glu Ser Asn Gly

Gln₃₈₅ Pro Glu Asn Asn Tyr₃₉₀ Lys Thr Thr Pro Pro₃₉₅ Val Leu Asp Ser Asp₄₀₀

Gly Ser Phe Phe Leu₄₀₅ Tyr Ser Lys Leu Thr₄₁₀ Val Asp Lys Ser Arg₄₁₅ Trp

Gln Gln Gly Asn₄₂₀ Val Phe Ser Cys Ser₄₂₅ Val Met His Glu Ala₄₃₀ Leu His

JPOXMLDOC01-seq1

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 435 440 445

<210> 173
 <211> 1421
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Nucleotide sequence encoding the amino acid sequence of the heavy chain of humanized anti-hTfR antibody No.1 containing amino acid sequence 6 as the variable region, synthetic sequence

<400> 173
 acgcgtgccg ccaccatggg ctggagctgg attctgctgt tcctcctgag cgtgacagca 60
 ggagtgcaca gcgaagtgca gctggtcgaa tcaggggggg ggctgggtgca gcctggaggc 120
 agcctgagac tgtcctgcgc cgcttctggc ttgaccttta gcaactacgg gatgtcctgg 180
 gtgcggcagg ctctggcaa gggactggag ttggtggcca acatcaatac caacggcgga 240
 agtacatact atcccgattc agtgaagggc cggttcacca tcagcagggg caacgccaaag 300
 aacagcctgt atctgcagat gaactctctg agggccgagg atacagccgt gtactattgc 360
 actaacaacc ggtacgacga ggactattgg ggccagggca ccctggtgac agtgtctagc 420
 gcctctacca agggcccaag cgtgtttcct ctggctccat cctctaaatc cacctctggc 480
 ggcacagccg ctctgggctg tctggtgaag gattacttcc cagagcccgt gacagtgtct 540
 tggaacagcg gcgcccagac ctccggcgtg cacacatttc ctgctgtgct gcagagctcc 600
 ggctgtaca gcctgtctag cgtggtgacc gtgccatcct ctagcctggg caccagaca 660
 tatatctgca acgtgaatca caagcccagc aatacaaagg tggataagaa ggtggagcca 720
 aagtcctgtg acaagacca cacatgcccc cttgtcctg ctccagagct gctgggagga 780
 ccaagcgtgt tcctgtttcc acccaagccc aaggataccc tgatgatctc tcggacccca 840
 gaggtgacat gcgtgggtgt ggatgtgagc cacgaggacc ccgaggtgaa gttcaactgg 900
 tatgtggacg gcgtggaggt gcacaatgct aagaccaagc ccagggagga gcagtacaac 960
 tccacctata gagtgggtgc tgtgctgaca gtgctgcacc aggattggct gaacggcaag 1020
 gagtataagt gcaaggtgtc caataaggcc ctgcccgtc ctatcgagaa gaccatctct 1080
 aaggccaagg gccagcccag agagcctcag gtgtacacac tgcctccatc ccgggatgag 1140
 ctgaccaaga accaggtgtc tctgacatgt ctggtcaagg gcttctatcc ctctgacatc 1200
 gccgtggagt gggagagcaa tggccagcct gagaacaatt acaagaccac accccctgtg 1260
 ctggattccg acggctcttt ctttctgtat agcaagctga ccgtggacaa gtcccgggtg 1320
 cagcagggca acgtgttcag ctgttccgtg atgcacgaag ctctgcataa tcactatact 1380
 cagaaatccc tgtcactgtc acctggtaaa taagcgccg c 1421

JPOXMLDOC01-seq1

<210> 174
 <211> 107
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Amino acid sequence 1 of the variable region of the light chain of humanized anti-hTfR antibody No.2

<400> 174

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

Glu Arg Ala Thr Leu Ser Cys Arg Ala Ser Gln Ser Ile Ser Asn Asn
 20 25 30

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

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

Ser Gly Ser Gly Thr Glu Phe Thr Leu Thr Ile Ser Ser Leu Gln Ser
 65 70 75 80

Glu Asp Phe Ala Val Tyr Tyr Cys Gln Gln Ser Asn Ser Trp Pro Arg
 85 90 95

Thr Phe Gly Gln Gly Thr Lys Val Asp Ile Lys
 100 105

<210> 175
 <211> 107
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Amino acid sequence 2 of the variable region of the light chain of humanized anti-hTfR antibody No.2

<400> 175

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

Glu Arg Ala Thr Leu Ser Cys Arg Ala Ser Gln Ser Ile Ser Asn Asn
 20 25 30

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

JPOXMLDOC01-seq1

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

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

Glu Asp Phe Ala Val Tyr Tyr Cys Gln Gln Ser Asn Ser Trp Pro Arg
85 90 95

Thr Phe Gly Gly Gly Thr Lys Val Glu Ile Lys
100 105

<210> 176

<211> 107

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 3 of the variable region of the light chain
of humanized anti-hTfR antibody No.2

<400> 176

Glu Ile Val Leu Thr Gln Ser Pro Asp Phe Gln Ser Val Thr Pro Lys
1 5 10 15

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

Leu Gln Trp Tyr Gln Gln Lys Pro Asp Gln Ser Pro Lys Leu Leu Ile
35 40 45

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

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

Glu Asp Ala Ala Thr Tyr Tyr Cys Gln Gln Ser Asn Ser Trp Pro Arg
85 90 95

Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys
100 105

<210> 177

<211> 107

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 4 of the variable region of the light chain
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JPOXMLDOC01-seq1
of humanized anti-hTfR antibody No.2

<400> 177

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

Glu Arg Ala Thr Leu Ser Cys Arg Ala Ser Gln Ser Ile Ser Asn Asn
20 25 30

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

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

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

Glu Asp Phe Ala Val Tyr Tyr Cys Gln Gln Ser Asn Ser Trp Pro Arg
85 90 95

Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys
100 105

<210> 178

<211> 107

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 5 of the variable region of the light chain
of humanized anti-hTfR antibody No.2

<400> 178

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

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

Leu Gln Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
35 40 45

Tyr Tyr Ala Ser Gln Ser Ile Ser Gly Val Pro Ser Arg Phe Ser Gly
50 55 60

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
65 70 75 80

JPOXMLDOC01-seq1

Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Gln Ser Asn Ser Trp Pro Arg
85 90 95

Thr Phe Gly Gly Gly Thr Lys Val Glu Ile Lys
100 105

<210> 179

<211> 107

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 6 of the variable region of the light chain of humanized anti-hTfR antibody No.2

<400> 179

Glu Ile Val Leu Thr Gln Ser Pro Asp Phe Gln Ser Val Thr Pro Lys
1 5 10 15

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

Leu Gln Trp Tyr Gln Gln Lys Pro Asp Gln Ser Pro Lys Leu Leu Ile
35 40 45

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

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

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

Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys
100 105

<210> 180

<211> 214

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the light chain of humanized anti-hTfR antibody No.2 containing amino acid sequence 6 as the variable region

<400> 180

Glu Ile Val Leu Thr Gln Ser Pro Asp Phe Gln Ser Val Thr Pro Lys
1 5 10 15

JPOXMLDOC01-seq1

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

Leu Gln Trp Tyr Gln Gln Lys Pro Asp Gln Ser Pro Lys Leu Leu Ile
35 40 45

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

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

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

Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys Arg Thr Val Ala Ala
100 105 110

Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu Gln Leu Lys Ser Gly
115 120 125

Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe Tyr Pro Arg Glu Ala
130 135 140

Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln Ser Gly Asn Ser Gln
145 150 155 160

Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser Thr Tyr Ser Leu Ser
165 170 175

Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu Lys His Lys Val Tyr
180 185 190

Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser Pro Val Thr Lys Ser
195 200 205

Phe Asn Arg Gly Glu Cys
210

<210> 181
<211> 725
<212> DNA
<213> Artificial Sequence

<220>
<223> Nucleotide sequence encoding the amino acid sequence of the light chain of humanized anti-hTfR antibody No.2 containing amino acid sequence 6 as the variable region, synthetic sequence

<400> 181

JPOXMLDOC01-seq1

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 ggagtgcaca gcgaaattgt gctgacccag tctcccgatt tccagtccgt gacccccaag 120
 gagaaagtca ccatcacatg cagagcatca cagtccatta gcaacaatct gcagtggtag 180
 cagcagaagc cagaccagag cccaagctg ctgatcaaat atgcctctca gagtatttca 240
 ggcatacctt ctaggttctc cggtagcggc tctggaaccg actttactct gaccatcaac 300
 agtctggagg ctgaagatgc cgctacatac ttgtgccagc agagtaattc atggcctagg 360
 acctttggcc aggggacaaa ggtggagatc aaaaggactg tggcagcccc aagtgtcttc 420
 atttttcccc cttcagacga acagctgaag agcggcacag catctgtggt ctgtctgctg 480
 aacaatttct acccacggga ggctaagggtg cagtggaaag tcgataacgc actgcagtcc 540
 ggaaatagcc aggagtctgt gactgaacag gacagtaagg attcaaccta ttccctgtcc 600
 agcacactga ctctgagcaa agccgattac gagaagcaca aagtgtatgc ttgcgaagtc 660
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 gccgc 725

<210> 182
 <211> 120
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Amino acid sequence 1 of the variable region of the heavy chain of humanized anti-hTfR antibody No.2

<400> 182

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

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

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

Gly Val Ile Ser Thr Tyr Tyr Gly His Gly Ser Tyr Asn Gln Arg Phe
 50 55 60

Lys Gly Arg Val Thr Met Thr Arg Asp Thr Ser Thr Ser Thr Val Tyr
 65 70 75 80

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

Ala Arg Gly Gly Tyr Gly Ser Ser Ser Leu Ala Gly Asn Phe Asp Val
 Página 62

Trp Gly Gln Gly Thr Leu Val Thr
115 120

<210> 183
<211> 120
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence 2 of the variable region of the heavy chain
of humanized anti-hTfR antibody No.2

<400> 183

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

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

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

Gly Val Ile Ser Thr Tyr Tyr Gly His Gly Ser Tyr Asn Gln Arg Phe
50 55 60

Lys Gly Arg Val Thr Ile Thr Arg Asp Thr Ser Ala Ser Thr Ala Tyr
65 70 75 80

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

Ala Arg Gly Gly Tyr Gly Ser Ser Ser Leu Ala Gly Asn Phe Asp Val
100 105 110

Trp Gly Gln Gly Thr Leu Val Thr
115 120

<210> 184
<211> 120
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence 3 of the variable region of the heavy chain
of humanized anti-hTfR antibody No.2

<400> 184

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

JPOXMLDOC01-seq1

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

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

Gly Val Ile Ser Thr Tyr Tyr Gly His Gly Ser Tyr Asn Gln Arg Phe
50 55 60

Lys Gly Arg Val Thr Met Thr Thr Asp Thr Ser Thr Ser Ala Ala Tyr
65 70 75 80

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

Ala Ser Gly Gly Tyr Gly Ser Ser Ser Leu Ala Gly Asn Phe Asp Val
100 105 110

Trp Gly Gln Gly Thr Leu Val Thr
115 120

<210> 185

<211> 120

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 4 of the variable region of the heavy chain of humanized anti-hTfR antibody No.2

<400> 185

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

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

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

Gly Val Ile Ser Thr Tyr Tyr Gly His Gly Ser Tyr Asn Gln Arg Phe
50 55 60

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

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

JPOXMLDOC01-seq1

Ala Arg Gly Gly Tyr Gly Ser Ser Ser Leu Ala Gly Asn Phe Asp Val
100 105 110

Trp Gly Gln Gly Thr Thr Val Thr
115 120

<210> 186
<211> 120
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence 5 of the variable region of the heavy chain
of humanized anti-hTfR antibody No.2

<400> 186

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

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

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

Gly Val Ile Ser Thr Tyr Tyr Gly His Gly Ser Tyr Asn Gln Arg Phe
50 55 60

Lys Gly Arg Val Thr Ile Thr Ala Asp Lys Ser Thr Ser Thr Ala Tyr
65 70 75 80

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

Ala Arg Gly Gly Tyr Gly Ser Ser Ser Leu Ala Gly Asn Phe Asp Val
100 105 110

Trp Gly Gln Gly Thr Val Val Thr
115 120

<210> 187
<211> 120
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence 6 of the variable region of the heavy chain
of humanized anti-hTfR antibody No.2

<400> 187

JPOXMLDOC01-seq1

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

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

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

Gly Val Ile Ser Thr Tyr Tyr Gly His Gly Ser Tyr Asn Gln Arg Phe
50 55 60

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

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

Val Arg Gly Gly Tyr Gly Ser Ser Ser Leu Ala Gly Asn Phe Asp Val
100 105 110

Trp Gly Gln Gly Thr Thr Val Thr
115 120

<210> 188

<211> 453

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the heavy chain of humanized anti-hTfR antibody No.2 containing amino acid sequence 6 as the variable region

<400> 188

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

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

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

Gly Val Ile Ser Thr Tyr Tyr Gly His Gly Ser Tyr Asn Gln Arg Phe
50 55 60

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

JPOXMLDOC01-seq1

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

Val Arg Gly Gly Tyr Gly Ser Ser Ser Leu Ala Gly Asn Phe Asp Val
100 105 110

Trp Gly Gln Gly Thr Thr Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala

JPOXMLDOC01-seq1

325

330

335

Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 189
<211> 1442
<212> DNA
<213> Artificial Sequence

<220>
<223> Nucleotide sequence encoding the amino acid sequence of the heavy chain of humanized anti-hTfR antibody No.2 containing amino acid sequence 6 as the variable region, synthetic sequence

<400> 189
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ggagtgcaca gccagggtgca gctggtccag tcaggagccg aagtgaaaaa gcccgagacc 120
tcagtcaaag tgtcttgtaa agcatcaggt tatacattta cagactacgt catgcactgg 180
gtgaggcagg cacctggaca gggctctggaa tggatcggcg tgatctccac ttactatggc 240
catggaagct acaaccagag attcaagggc agggcgacaa tgactgtaga caaatcaatt 300
tccactgctt atatggagct ggtaaggctg cgggtccgacg ataccgctgt gtactattgc 360
gtacgaggag gatacggctc cagctctctg gctggtaatt tcgatgtgtg ggggcagggt 420
accacagtca ccgtgagttc agcaagcaca aagggcccat ctgtgtttcc actggccccc 480
tccagcaaaa gcacctctgg gggtagagcc gctctgggat gtctgggtgaa ggattatttc 540

JPOXMLDOC01-seq1

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ccagctgtgc tgcagtctag tgggctgtac tccctgtcat ccgtgggtcac tgtccccagc    660
tctagtctgg gtacccagac atatatctgc aacgtgaatc acaagccatc taataccaaa    720
gtcgacaaga aagtggaacc caagtcctgt gataaaactc atacctgccc cccttgtcct    780
gcaccagagc tgctgggagg accatccgtg ttcctgtttc cacccaagcc taaagacacc    840
ctgatgatta gccgaactcc cgaagtcacc tgcgtggctg tggacgtgtc tcacgaggac    900
cctgaagtca agtttaactg gtacgtggat ggcgtcgagg tgcataatgc taagacaaaa    960
ccccgagagg aacagtacaa cagtacatat cgtgtcgtgt cagtgtgtgac cgtcctgcat   1020
caggactggc tgaacgggaa ggaatataag tgcaaagtgt ccaataaggc actgcccgcc   1080
cctatcgaga aaaccattag caaggccaaa ggacagccta gggaaccaca ggtgtacaca   1140
ctgcctccat cccgggacga gctgactaag aaccagggtc gcctgacctg tctggtgaaa   1200
ggcttctatc cttcagatat cgctgtggag tgggaaagta atggacagcc agagaacaat   1260
tacaagacta cccccctgt gctggactct gatgggagtt tctttctgta ttctaagctg   1320
accgtggata aaagtcggtg gcagcagggt aatgtcttta gttgttcagt gatgcacgaa   1380
gcaactgcaca accactacac ccagaaatca ctgtcactgt caccagggaa ataagcggcc   1440
gc                                                                    1442

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<210> 190
 <211> 112
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Amino acid sequence 1 of the variable region of the light chain
 of humanized anti-hTfR antibody No.3

<400> 190

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

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

Asn Gly Asn Thr Tyr Leu His Trp Phe Gln Gln Arg Pro Gly Gln Ser
 35 40 45

Pro Arg Arg Leu Ile Tyr Lys Val Ser Asn Arg Phe Ser Gly Val Pro
 50 55 60

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

JPOXMLDOC01-seq1

Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr Cys Ser Gln Ser
85 90 95

Thr His Val Pro Trp Thr Phe Gly Gly Thr Lys Val Glu Ile Lys
100 105 110

<210> 191
<211> 112
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence 2 of the variable region of the light chain
of humanized anti-hTfR antibody No.3

<400> 191

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

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

Asn Gly Asn Thr Tyr Leu His Trp Tyr Leu Gln Lys Pro Gly Gln Ser
35 40 45

Pro Gln Leu Leu Ile Tyr Lys Val Ser Asn Arg Phe Ser Gly Val Pro
50 55 60

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

Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr Cys Ser Gln Ser
85 90 95

Thr His Val Pro Trp Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys
100 105 110

<210> 192
<211> 112
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence 3 of the variable region of the light chain
of humanized anti-hTfR antibody No.3

<400> 192

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

JPOXMLDOC01-seq1

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

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

Pro Arg Leu Leu Ile Tyr Lys Val Ser Asn Arg Phe Ser Gly Val Pro
50 55 60

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

Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr Cys Ser Gln Ser
85 90 95

Thr His Val Pro Trp Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys
100 105 110

<210> 193

<211> 112

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 4 of the variable region of the light chain
of humanized anti-hTfR antibody No.3

<400> 193

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

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

Asn Gly Asn Thr Tyr Leu His Trp Tyr Leu Gln Lys Pro Gly Gln Ser
35 40 45

Pro Gln Leu Leu Ile Tyr Lys Val Ser Asn Arg Phe Ser Gly Val Pro
50 55 60

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

Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr Cys Ser Gln Ser
85 90 95

Thr His Val Pro Trp Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys
100 105 110

JPOXMLDOC01-seq1

<210> 194
 <211> 112
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Amino acid sequence 5 of the variable region of the light chain
 of humanized anti-hTfR antibody No.3

<400> 194

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

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

Asn Gly Asn Thr Tyr Leu His Trp Tyr Leu Gln Lys Pro Gly Gln Ser
 35 40 45

Pro Gln Leu Leu Ile Tyr Lys Val Ser Asn Arg Phe Ser Gly Val Pro
 50 55 60

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

Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr Cys Ser Gln Ser
 85 90 95

Thr His Val Pro Trp Thr Phe Gly Gln Gly Thr Arg Leu Glu Ile Lys
 100 105 110

<210> 195
 <211> 112
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Amino acid sequence 6 of the variable region of the light chain
 of humanized anti-hTfR antibody No.3

<400> 195

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

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

Asn Gly Asn Thr Tyr Leu His Trp Tyr Leu Gln Lys Pro Gly Gln Ser
 35 40 45

JPOXMLDOC01-seq1

Pro Gln Leu Leu Ile Tyr Lys Val Ser Asn Arg Phe Ser Gly Val Pro
50 55 60

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

Ser Arg Val Glu Ala Glu Asp Val Gly Val Phe Phe Cys Ser Gln Ser
85 90 95

Thr His Val Pro Trp Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys
100 105 110

<210> 196

<211> 219

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the light chain of humanized anti-hTfR antibody No.3 containing amino acid sequence 2 as the variable region

<400> 196

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

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

Asn Gly Asn Thr Tyr Leu His Trp Tyr Leu Gln Lys Pro Gly Gln Ser
35 40 45

Pro Gln Leu Leu Ile Tyr Lys Val Ser Asn Arg Phe Ser Gly Val Pro
50 55 60

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

Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr Cys Ser Gln Ser
85 90 95

Thr His Val Pro Trp Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys
100 105 110

Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu
115 120 125

Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe
130 135 140

JPOXMLDOC01-seq1

Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln
145 150 155 160

Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser
165 170 175

Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu
180 185 190

Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser
195 200 205

Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
210 215

<210> 197
<211> 740
<212> DNA
<213> Artificial Sequence

<220>
<223> Nucleotide sequence encoding the amino acid sequence of the light chain of humanized anti-hTfR antibody No.3 containing amino acid sequence 2 as the variable region, synthetic sequence

<400> 197
acgcgtgccg ccaccatggg ctggagctgg attctgctgt tcctcctgag cgtgacagca 60
ggagtgcaca gcgacatcgt gatgaccag actcccctga gcctgagcgt gacacctggc 120
cagcctgcca gcatcagctg cagaagctct cagagcctgg tgcacagcaa cggcaacacc 180
tacctgcact ggtatctgca gaagcccggc cagagccctc agctgctgat ctacaagggtg 240
tccaacagat tcagcggcgt gcccagacaga ttctccggca gcggctctgg caccgacttc 300
accctgaaga tttccagagt ggaagccgag gacgtgggcg tgtactactg cagccagagc 360
acccacgtgc cctggacatt cggccagggc accaagggtg aaatcaagag aaccgtggcc 420
gctcccagcg tgttcatctt cccacctagc gacgagcagc tgaagtccgg cacagcctct 480
gtcgtgtgcc tgctgaacaa cttctacccc cgcgaggcca aggtgcagtg gaagggtggac 540
aacgccctgc agagcggcaa cagccaggaa agcgtgaccg agcaggactc caaggacagc 600
acctacagcc tgagcagcac cctgaccctg agcaaggccg actacgagaa gcacaagggtg 660
tacgcctgcg aagtgacca ccagggcctg tctagccccg tgaccaagag cttcaacaga 720
ggcgagtgt aagcggccgc 740

<210> 198
<211> 219
<212> PRT
<213> Artificial Sequence

JPOXMLDOC01-seq1

<220>

<223> Amino acid sequence of the light chain of humanized anti-hTfR antibody No.3 containing amino acid sequence 4 as the variable region

<400> 198

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

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

Asn Gly Asn Thr Tyr Leu His Trp Tyr Leu Gln Lys Pro Gly Gln Ser
35 40 45

Pro Gln Leu Leu Ile Tyr Lys Val Ser Asn Arg Phe Ser Gly Val Pro
50 55 60

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

Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr Cys Ser Gln Ser
85 90 95

Thr His Val Pro Trp Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys
100 105 110

Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu
115 120 125

Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe
130 135 140

Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln
145 150 155 160

Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser
165 170 175

Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu
180 185 190

Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser
195 200 205

Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
210 215

JPOXMLDOC01-seq1

<210> 199
 <211> 740
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Nucleotide sequence encoding the amino acid sequence of the light chain of humanized anti-hTfR antibody No.3 containing amino acid sequence 4 as the variable region, synthetic sequence

<400> 199
 acgcgtgccg ccaccatggg ctggagctgg attctgctgt tcctcctgag cgtgacagca 60
 ggagtgcaca gcgacatcgt gatgaccag agccccctga gcctgcctgt gacacctggc 120
 gagcctgcca gcatcagctg cagatctagc cagagcctgg tgcacagcaa cggcaacacc 180
 tacctgcact ggtatctgca gaagcccggc cagagccctc agctgctgat ctacaagggtg 240
 tccaacagat tcagcggcgt gcccgcagaga ttctccggca gcggctctgg caccgacttc 300
 accctgaaga tctccagagt ggaagccgag gacgtgggag tgtactactg cagccagagc 360
 acccacgtgc cctggacatt cggccagggc accaagggtg aaatcaagag aaccgtggcc 420
 gctcccagcg tggtcatctt cccacctagc gacgagcagc tgaagtccgg cacagcctct 480
 gtcgtgtgcc tgctgaacaa cttctacccc cgcgaggcca aggtgcagtg gaagggtggac 540
 aacgccctgc agagcggcaa cagccaggaa agcgtgaccg agcaggactc caaggacagc 600
 acctacagcc tgagcagcac cctgaccctg agcaaggccg actacgagaa gcacaagggtg 660
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 ggcgagtgct aagcggccgc 740

<210> 200
 <211> 219
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Amino acid sequence of the light chain of humanized anti-hTfR antibody No.3 containing amino acid sequence 5 as the variable region

<400> 200

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

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

Asn Gly Asn Thr Tyr Leu His Trp Tyr Leu Gln Lys Pro Gly Gln Ser
 35 40 45

JPOXMLDOC01-seq1

Pro Gln Leu Leu Ile Tyr Lys Val Ser Asn Arg Phe Ser Gly Val Pro
50 55 60

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

Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr Cys Ser Gln Ser
85 90 95

Thr His Val Pro Trp Thr Phe Gly Gln Gly Thr Arg Leu Glu Ile Lys
100 105 110

Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu
115 120 125

Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe
130 135 140

Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln
145 150 155 160

Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser
165 170 175

Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu
180 185 190

Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser
195 200 205

Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
210 215

<210> 201
<211> 740
<212> DNA
<213> Artificial Sequence

<220>
<223> Nucleotide sequence encoding the amino acid sequence of the light chain of humanized anti-hTfR antibody No.3 containing amino acid sequence 5 as the variable region, synthetic sequence

<400> 201
acgcgtgccg ccaccatggg ctggagctgg attctgctgt tcctcctgag cgtgacagca 60
ggagtgcaca gcgacatcgt gatgaccag acaccctga gcctgcctgt gacacctggc 120
gagcctgcca gcatcagctg cagatctagc cagagcctgg tgcacagcaa cggcaacacc 180
tacctgcact ggtatctgca gaagcccggc cagagccctc agctgctgat ctacaaggtg 240

JPOXMLDOC01-seq1

tccaacagat tcagcggcgt gcccgcacaga ttctccggca gcggctcttg caccgacttc	300
accctgaaga tctccagagt ggaagccgag gacgtgggcg tgtactactg cagccagagc	360
accacgtgc cctggacatt cggccagggc accaggctgg aaatcaagag aaccgtggcc	420
gctcccagcg tgttcatctt cccacctagc gacgagcagc tgaagtccgg cacagcctct	480
gtcgtgtgcc tgctgaacaa cttctacccc cgcgaggcca aggtgcagtg gaaggtggac	540
aacgccctgc agagcggcaa cagccaggaa agcgtgaccg agcaggactc caaggacagc	600
acctacagcc tgagcagcac cctgaccctg agcaaggccg actacgagaa gcacaagggtg	660
tacgcctgcg aagtgaccca ccagggcctg tctagccccg tgaccaagag cttcaacaga	720
ggcgagtgtc aagcggccgc	740

<210> 202
 <211> 219
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Amino acid sequence of the light chain of humanized anti-hTfR antibody No.3 containing amino acid sequence 6 as the variable region

<400> 202

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

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

Asn	Gly	Asn	Thr	Tyr	Leu	His	Trp	Tyr	Leu	Gln	Lys	Pro	Gly	Gln	Ser
		35					40					45			

Pro	Gln	Leu	Leu	Ile	Tyr	Lys	Val	Ser	Asn	Arg	Phe	Ser	Gly	Val	Pro
	50					55					60				

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

Ser	Arg	Val	Glu	Ala	Glu	Asp	Val	Gly	Val	Phe	Phe	Cys	Ser	Gln	Ser
			85						90					95	

Thr	His	Val	Pro	Trp	Thr	Phe	Gly	Gln	Gly	Thr	Lys	Val	Glu	Ile	Lys
			100					105					110		

Arg	Thr	Val	Ala	Ala	Pro	Ser	Val	Phe	Ile	Phe	Pro	Pro	Ser	Asp	Glu
		115					120					125			

JPOXMLDOC01-seq1

Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe
 130 135 140

Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln
 145 150 155 160

Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser
 165 170 175

Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu
 180 185 190

Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser
 195 200 205

Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
 210 215

<210> 203
 <211> 740
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Nucleotide sequence encoding the amino acid sequence of the light chain of humanized anti-hTfR antibody No.3 containing amino acid sequence 6 as the variable region, synthetic sequence

<400> 203
 acgcgtgccg ccaccatggg ctggagctgg attctgctgt tcctcctgag cgtgacagca 60
 ggagtgcaca gcgacatcgt gatgaccag actcccctga gcctgagcgt gacacctggc 120
 cagcctgcca gcatcagctg cagatccagc cagagcctgg tgcacagcaa cggcaacacc 180
 tacctgcact ggtatctgca gaagcccggc cagagccctc agctgctgat ctacaagggtg 240
 tccaacagat tcagcggcgt gcccagacaga ttctccggca gcggctctgg caccgacttc 300
 accctgaaga tttccagagt ggaagccgag gacgtgggag tgttcttctg cagccagagc 360
 acccacgtgc cctggacatt cggccagggc accaagggtg aaatcaagag aaccgtggcc 420
 gctcccagcg tgttcatctt cccacctagc gacgagcagc tgaagtccgg cacagcctct 480
 gtcgtgtgcc tgctgaacaa cttctacccc cgcgaggcca aggtgcagtg gaagggtggac 540
 aacgccctgc agagcggcaa cagccaggaa agcgtgaccg agcaggactc caaggacagc 600
 acctacagcc tgagcagcac cctgaccctg agcaaggccg actacgagaa gcacaagggtg 660
 tacgcctgcg aagtgacca ccagggcctg tctagccccg tgaccaagag cttcaacaga 720
 ggcgagtgt aagcggccgc 740

<210> 204

JPOXMLDOC01-seq1

<211> 118
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Amino acid sequence 1 of the variable region of the heavy chain of humanized anti-hTfR antibody No.3

<400> 204

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

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

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

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

Lys Val Arg Val Thr Met Thr Arg Asp Thr Ser Thr Ser Thr Val Tyr
 65 70 75 80

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

Ala Arg Ser Gly Asn Tyr Asp Glu Val Ala Tyr Trp Gly Gln Gly Thr
 100 105 110

Leu Val Thr Val Ser Ser
 115

<210> 205
 <211> 118
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Amino acid sequence 2 of the variable region of the heavy chain of humanized anti-hTfR antibody No.3

<400> 205

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 Asn Tyr
 20 25 30

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

JPOXMLDOC01-seq1

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

Lys Val 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 Ser Gly Asn Tyr Asp Glu Val Ala Tyr Trp Gly Gln Gly Thr
100 105 110

Leu Val Thr Val Ser Ser
115

<210> 206

<211> 118

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence 3 of the variable region of the heavy chain
of humanized anti-hTfR antibody No.3

<400> 206

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

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

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

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

Lys Val Arg Val Thr Met Thr Arg Asp Thr Ser Ile Ser Thr Ala Tyr
65 70 75 80

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

Ala Arg Ser Gly Asn Tyr Asp Glu Val Ala Tyr Trp Gly Gln Gly Thr
100 105 110

Thr Val Thr Val Ser Ser
115

JPOXMLDOC01-seq1

<210> 207
 <211> 118
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Amino acid sequence 4 of the variable region of the heavy chain of humanized anti-hTfR antibody No.3

<400> 207

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

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

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

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

Lys Val Arg Val Thr Ile Thr Arg Asp Thr Ser Ala Ser Thr Ala Tyr
 65 70 75 80

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

Ala Arg Ser Gly Asn Tyr Asp Glu Val Ala Tyr Trp Gly Gln Gly Thr
 100 105 110

Leu Val Thr Val Ser Ser
 115

<210> 208
 <211> 118
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Amino acid sequence 5 of the variable region of the heavy chain of humanized anti-hTfR antibody No.3

<400> 208

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

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

JPOXMLDOC01-seq1

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

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

Lys Val Arg Val Thr Ile Thr Ala Asp Lys Ser Thr Ser Thr Ala Tyr
65 70 75 80

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

Ala Arg Ser Gly Asn Tyr Asp Glu Val Ala Tyr Trp Gly Gln Gly Thr
100 105 110

Val Val Thr Val Ser Ser
115

<210> 209
<211> 118
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence 6 of the variable region of the heavy chain
of humanized anti-hTfR antibody No.3

<400> 209

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 Met Asn Tyr
20 25 30

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

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

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

Leu Gln Leu Ser Ser Leu Lys Ala Ser Asp Thr Ala Met Tyr Phe Cys
85 90 95

Ala Arg Ser Gly Asn Tyr Asp Glu Val Ala Tyr Trp Gly Gln Gly Thr
100 105 110

JPOXMLDOC01-seq1

Leu Val Thr Val Ser Ser
115

<210> 210
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the heavy chain of humanized anti-hTfR antibody No.3 containing amino acid sequence 2 as the variable region

<400> 210

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 Asn Tyr
20 25 30

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

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

Lys Val 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 Ser Gly Asn Tyr Asp Glu Val Ala Tyr Trp Gly Gln Gly Thr
100 105 110

Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro
115 120 125

Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly
130 135 140

Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn
145 150 155 160

Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln
165 170 175

Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser
180 185 190

JPOXMLDOC01-seq1

Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser
195 200 205

Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr
210 215 220

His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser
225 230 235 240

Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg
245 250 255

Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro
260 265 270

Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala
275 280 285

Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val
290 295 300

Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr
305 310 315 320

Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr
325 330 335

Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu
340 345 350

Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr Cys
355 360 365

Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser
370 375 380

Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp
385 390 395 400

Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser
405 410 415

Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala
420 425 430

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

435 JPOXMLDOC01-seq1
440 445

<210> 211
<211> 1427
<212> DNA
<213> Artificial Sequence

<220>
<223> Nucleotide sequence encoding the amino acid sequence of the heavy chain of humanized anti-hTfR antibody No.3 containing amino acid sequence 2 as the variable region, synthetic sequence

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<400> 211
acgcgtgccg ccaccatggg ctggagctgg attctgctgt tcctcctgag cgtgacagca      60
ggagtgcaca gcgaggtgca actagtgcag tctggagcag aggtgaaaaa gcccggggag      120
tctctgaaga tttcctgtaa gggttctgga tacagcttta ccaactactg gctgggatgg      180
gtgcgccaga tgcccgggaa aggcctggag tggatggggg acatctaccc cggcggagac      240
tacctacat acagcgagaa gttcaaggct caggtcacca tctcagccga caagtccatc      300
agcaccgcct acctgcagtg gagcagcctg aaggcctcgg acaccgccat gtattactgt      360
gcgagatcag gcaattacga cgaagtggcc tactggggcc aaggaaccct ggtcaccgtc      420
tcctcagcta gcaccaaggg cccatcggtc ttccccctgg caccctcctc caagagcacc      480
tctgggggca cagcggccct gggctgcctg gtcaaggact acttccccga accggtgacg      540
gtgtcgtgga actcaggcgc cctgaccagc ggctgcaca ccttcccggc tgccttacag      600
tcctcaggac tctactccct cagcagcgtg gtgaccgtgc cctccagcag cttgggcacc      660
cagacctaca tctgcaacgt gaatcacaag cccagcaaca ccaagggtgga caagaaagtt      720
gagcccaaat cttgtgacaa aactcacacg tgcccaccgt gcccagcacc tgaactcctg      780
ggagggtccgt cagtcttcct cttcccccca aaacccaagg acaccctcat gatctcccgg      840
acccctgagg tcacatgcgt ggtggtggac gtgagccacg aagaccctga ggtcaagttc      900
aactggtacg tggacggcgt ggagggtgcat aatgccaaga caaagccgcg ggaggagcag      960
tacaacagca cgtaccgggt ggtcagcgtc ctcaccgtcc tgcaccagga ctggctgaat     1020
ggcaaggagt acaagtgcaa ggtctccaac aaagccctcc cagcccccat cgagaaaacc     1080
atctccaaag ccaaagggca gccccgagaa ccacagggtgt acaccctgcc cccatcccgg     1140
gatgagctga ccaagaacca ggtcagcctg acctgcctgg tcaaaggctt ctatcccagc     1200
gacatcgccg tggagtggga gagcaatggg cagccggaga acaactacaa gaccacgcct     1260
cccgtgctgg actccgacgg ctcttctctc ctctacagca agctcaccgt ggacaagagc     1320
aggtggcagc aggggaacgt cttctcatgc tccgtgatgc atgaggctct gcacaaccac     1380
tacacgcaga agagcctctc cctgtctccg ggtaaataag cggccgc      1427

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JPOXMLDOC01-seq1

<210> 212
 <211> 445
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Amino acid sequence of the heavy chain (IgG4) of humanized anti-hTfR antibody No.3 containing amino acid sequence 2 as the variable region

<400> 212

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 Asn Tyr
 20 25 30

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

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

Lys Val 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 Ser Gly Asn Tyr Asp Glu Val Ala Tyr Trp Gly Gln Gly Thr
 100 105 110

Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro
 115 120 125

Leu Ala Pro Cys Ser Arg Ser Thr Ser Glu Ser Thr Ala Ala Leu Gly
 130 135 140

Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn
 145 150 155 160

Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln
 165 170 175

Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser
 180 185 190

Ser Leu Gly Thr Lys Thr Tyr Thr Cys Asn Val Asp His Lys Pro Ser
 195 200 205

JPOXMLDOC01-seq1

Asn Thr Lys Val Asp Lys Arg Val Glu Ser Lys Tyr Gly Pro Pro Cys
210 215 220

Pro Pro Cys Pro Ala Pro Glu Phe Leu Gly Gly Pro Ser Val Phe Leu
225 230 235 240

Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu
245 250 255

Val Thr Cys Val Val Val Asp Val Ser Gln Glu Asp Pro Glu Val Gln
260 265 270

Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys
275 280 285

Pro Arg Glu Glu Gln Phe Asn Ser Thr Tyr Arg Val Val Ser Val Leu
290 295 300

Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys
305 310 315 320

Val Ser Asn Lys Gly Leu Pro Ser Ser Ile Glu Lys Thr Ile Ser Lys
325 330 335

Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser
340 345 350

Gln Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys
355 360 365

Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln
370 375 380

Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly
385 390 395 400

Ser Phe Phe Leu Tyr Ser Arg Leu Thr Val Asp Lys Ser Arg Trp Gln
405 410 415

Glu Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn
420 425 430

His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
435 440 445

<210> 213
<211> 1418

JPOXMLDOC01-seq1

<212> DNA
<213> Artificial Sequence

<220>
<223> Nucleotide sequence encoding the amino acid sequence of the heavy chain (IgG4) of humanized anti-hTfR antibody No.3 containing amino acid sequence 2 as the variable region, synthetic sequence

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<400> 213
acgcgtgccg ccaccatggg ctggagctgg attctgctgt tcctcctgag cgtgacagca      60
ggagtgcaca gcgagggtgca actagtgcag tctggagcag aggtgaaaaa gcccggggag      120
tctctgaaga tttcctgtaa gggttctgga tacagcttta ccaactactg gctgggatgg      180
gtgcgccaga tgccccgggaa aggcttggag tggatggggg acatctaccc cggcgggagac      240
taccctacat acagcgagaa gttcaagggtc caggtcacca tctcagccga caagtccatc      300
agcaccgcct acctgcagtg gagcagcctg aaggcctcgg acaccgcat gtattactgt      360
gcgagatcag gcaattacga cgaagtggcc tactggggcc aaggaaccct ggtcaccgtc      420
tcctcagcta gcaccaaggg cccatcggtc ttccccctgg cgccctgctc caggagcacc      480
tccgagagca cagccgccct gggctgcctg gtcaaggact acttccccga accggtgacg      540
gtgtcgtgga actcaggcgc cctgaccagc ggcgtgcaca ccttcccggc tgtcctacag      600
tcctcaggac tctactccct cagcagcgtg gtgaccgtgc cctccagcag cttgggcacg      660
aagacctaca cctgcaacgt agatcacaag cccagcaaca ccaagggtgga caagagagtt      720
gagtccaaat atggtccccc atgccacca tgcccagcac ctgagttcct ggggggtcca      780
tcagtcttcc tgttcccccc aaaacccaag gacactctca tgatctcccg gaccctgag      840
gtcacgtgcy tgggtggtgga cgtgagccag gaagaccccg aggtccagtt caactggtac      900
gtggatggcg tggaggtgca taatgccaaag acaaagccgc gggaggagca gttcaacagc      960
acgtaccgtg tggtcagcgt cctcaccgtc ctgcaccagg actggctgaa cggcaaggag     1020
tacaagtgca aggtctccaa caaaggcctc ccgtcctcca tcgagaaaac catctccaaa     1080
gccaaagggc agccccgaga gccacagggtg tacaccctgc ccccatccca ggaggagatg     1140
accaagaacc aggtcagcct gacctgcctg gtcaaaggct tctaccccag cgacatcgcc     1200
gtggagtggg agagcaatgg gcagccggag aacaactaca agaccacgcc tcccgtgctg     1260
gactccgacg gtccttctt cctctacagc aggtcaccg tggacaagag caggtggcag     1320
gaggggaatg tcttctcatg ctccgtgatg catgaggctc tgcacaacca ctacacacag     1380
aagagcctct ccctgtctcc gggtaaataa gcggccgc                                1418

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<210> 214
<211> 43
<212> DNA
<213> Artificial Sequence

JPOXMLDOC01-seq1

<220>
 <223> Primer hTfR5', synthetic sequence
 <400> 214
 ccgacgcgtc gccaccatga tggatcaagc tagatcagca ttc 43

<210> 215
 <211> 59
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Primer hTfR3', synthetic sequence
 <400> 215
 ataatgcggc cgcttaatga tgatgatgat gatgaaactc attgtcaatg tcccaaacg 59

<210> 216
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Primer Hyg-Sfi5', synthetic sequence
 <400> 216
 gaggccgcct cggcctctga 20

<210> 217
 <211> 29
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Primer Hyg-BstX3', synthetic sequence
 <400> 217
 aaccatcgtg atgggtgcta ttcctttgc 29

<210> 218
 <211> 108
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Amino acid sequence of the variable region of the light chain of anti-hTfR antibody No.1

<400> 218
 Asp Ile Val Leu Thr Gln Ser Ser Lys Phe Met Ser Thr Ser Val Gly
 1 5 10 15

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

Val Ala Trp Phe Gln Gln Lys Pro Gly Gln Ser Pro Lys Leu Leu Ile
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JPOXMLDOC01-seq1

35

40

45

Tyr Trp Thr Ser Thr Arg His Thr Gly Val Pro Asp Arg Phe Thr Gly
50 55 60

Ser Gly Ser Gly Thr Val Tyr Thr Leu Thr Ile Ser Ser Val Gln Ala
65 70 75 80

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

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

<210> 219

<211> 116

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the variable region of the heavy chain of anti-hTfR antibody No.1

<400> 219

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

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

Gly Met Ser Trp Ile Arg Gln Thr Pro Asp Lys Arg Leu Glu Leu Val
35 40 45

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

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

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

Thr Asn Asn Arg Tyr Asp Glu Asp Tyr Trp Gly Gln Gly Thr Ser Val
100 105 110

Thr Val Ser Ser
115

<210> 220

JPOXMLDOC01-seq1

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

<220>
 <223> Amino acid sequence of the variable region of the light chain of anti-hTfR antibody No.2

<400> 220

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

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

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

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

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

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

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

<210> 221
 <211> 123
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Amino acid sequence of the variable region of the heavy chain of anti-hTfR antibody No.2

<400> 221

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

Ser Val Lys Ile Ser Cys Lys Gly Ser Gly Tyr Thr Phe Thr Asp Tyr
 20 25 30

Val Met His Trp Val Arg Gln Ser His Ala Lys Ser Leu Glu Trp Ile
 35 40 45

Gly Val Ile Ser Thr Tyr Tyr Gly His Gly Ser Tyr Asn Gln Arg Phe
 50 55 60

JPOXMLDOC01-seq1

Lys Gly Lys Ala Thr Met Thr Val Asp Lys Ser Ser Ser Thr Ala Tyr
65 70 75 80

Leu Glu Leu Val Arg Leu Thr Ser Glu Asp Ser Ala Ile Tyr Tyr Cys
85 90 95

Val Arg Gly Gly Tyr Gly Ser Ser Ser Leu Ala Gly Asn Phe Asp Val
100 105 110

Trp Gly Ala Gly Thr Thr Val Thr Val Ser Ser
115 120

<210> 222
<211> 113
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the variable region of the light chain of
anti-hTfR antibody No.3

<400> 222

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

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

Asn Gly Asn Thr Tyr Leu His Trp Tyr Leu Gln Lys Pro Gly Gln Ser
35 40 45

Pro Lys Leu Leu Ile Tyr Lys Val Ser Asn Arg Phe Ser Gly Val Pro
50 55 60

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

Ser Arg Val Glu Ala Glu Asp Leu Gly Val Phe Phe Cys Ser Gln Ser
85 90 95

Thr His Val Pro Trp Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys
100 105 110

Arg

<210> 223
<211> 118

JPOXMLDOC01-seq1

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the variable region of the heavy chain of anti-hTfR antibody No.3

<400> 223

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

Ser Val Lys Ile Ser Cys Lys Ala Ser Gly Tyr Thr Phe Met Asn Tyr
20 25 30

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

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

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

Leu His Leu Ser Ser Leu Thr Ser Glu Asp Ser Ala Val Tyr Phe Cys
85 90 95

Ala Arg Ser Gly Asn Tyr Asp Glu Val Ala Tyr Trp Gly Gln Gly Thr
100 105 110

Leu Val Thr Val Ser Thr
115

<210> 224

<211> 106

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the variable region of the light chain of anti-hTfR antibody No.4

<400> 224

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

Glu Lys Val Thr Met Thr Cys Ser Ala Ser Ser Asn Val Asn Tyr Met
20 25 30

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

JPOXMLDOC01-seq1

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

Gly Ser Gly Asn Ser Tyr Ser Leu Thr Ile Ser Ser Met Glu Ala Glu
65 70 75 80

Asp Val Ala Thr Tyr Tyr Cys Phe Gln Gly Asn Gly Asn Pro Tyr Thr
85 90 95

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

<210> 225

<211> 122

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the variable region of the heavy chain of anti-hTfR antibody No.4

<400> 225

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

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

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

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

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

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

Ala Arg Ser Asn Tyr Tyr Gly Thr Thr Tyr Trp His Phe Asp Val Trp
100 105 110

Gly Ala Gly Thr Thr Val Thr Val Ser Ser
115 120

<210> 226

<211> 105

<212> PRT

JPOXMLDOC01-seq1

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the variable region of the light chain of anti-hTfR antibody No.5

<400> 226

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

Glu Lys Val Thr Met Thr Cys Ser Ala Ser Ser Ser Ile Ser Ser Ile
20 25 30

His Trp Tyr Gln Gln Lys Pro Gly Thr Ser Pro Lys Arg Trp Ile Tyr
35 40 45

Asp Thr Ser Thr Leu Ala Ser Gly Val Pro Val Arg Phe Ser Gly Ser
50 55 60

Gly Ser Gly Thr Ser Tyr Ser Leu Thr Ile Ser Ser Met Glu Ala Glu
65 70 75 80

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

Gly Gly Gly Thr Lys Leu Glu Ile Lys
100 105

<210> 227

<211> 118

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the variable region of the heavy chain of anti-hTfR antibody No.5

<400> 227

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

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

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

Gly Phe Phe Asn Pro His Lys Asn Gly Ala Glu Tyr Asn Glu Lys Phe
50 55 60

JPOXMLDOC01-seq1

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

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

Ala Arg Ser Phe Tyr Tyr Tyr Ser Met Asp Tyr Trp Gly Gln Gly Thr
100 105 110

Ser Val Thr Val Ser Ser
115

<210> 228

<211> 107

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the variable region of the light chain of anti-hTfR antibody No.6

<400> 228

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

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

Leu Ser Trp Leu Gln Gln Lys Pro Asp Gly Thr Ile Lys Arg Leu Ile
35 40 45

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

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

Glu Asp Phe Ala Asp Tyr Tyr Cys Leu Gln Tyr Ser Ser Tyr Pro Arg
85 90 95

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

<210> 229

<211> 112

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the variable region of the heavy chain of anti-hTfR antibody No.6

JPOXMLDOC01-seq1

<400> 229

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

Ser Leu Ser Ile Thr Cys Ser Val Ser Gly Phe Ser Leu Ser Thr Tyr
20 25 30

Gly Val Tyr Trp Val Arg Gln Pro Pro Gly Lys Gly Leu Glu Trp Leu
35 40 45

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

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

Lys Leu Asn Ser Leu Gln Thr Ala Asp Thr Ala Thr Tyr Tyr Cys Ala
85 90 95

Lys Pro Asp Asp Val Trp Gly Ala Gly Thr Thr Val Thr Val Ser Ser
100 105 110

<210> 230

<211> 106

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the variable region of the light chain of anti-hTfR antibody No.7

<400> 230

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

Glu Glu Ile Thr Leu Thr Cys Ser Ala Ser Ser Ser Val Asn Tyr Ile
20 25 30

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

Gln Thr Ser Asn Leu Ala Ser Gly Val Pro Ser Arg Phe Ser Gly Ser
50 55 60

Arg Ser Gly Thr Phe Tyr Ser Leu Lys Ile Ser Ser Val Glu Ala Glu
65 70 75 80

Asp Ala Ala Asp Tyr Tyr Cys His Gln Trp Ser Ser Tyr Pro Trp Thr
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Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys
100 105

<210> 231
<211> 120
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the variable region of the heavy chain of anti-hTfR antibody No.7

<400> 231

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

Ser Leu Lys Val Ser Cys Glu Ala Ser Gly Ile Thr Phe Arg Asn Tyr
20 25 30

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

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

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

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

Ala Arg Gln Glu Val Pro Tyr Pro Tyr Ala Met Asp Tyr Trp Gly Gln
100 105 110

Gly Thr Ser Val Ile Val Ser Ser
115 120

<210> 232
<211> 106
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the variable region of the light chain of anti-hTfR antibody No.8

<400> 232

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

JPOXMLDOC01-seq1

Glu Glu Ile Thr Leu Thr Cys Ser Ala Ser Ser Ser Val Ser Tyr Met
20 25 30

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

Gly Thr Ser Asn Leu Ala Ser Glu Val Pro Ser Arg Phe Ser Gly Ser
50 55 60

Gly Ser Gly Thr Phe Tyr Ser Leu Thr Ile Ser Ser Val Glu Ala Glu
65 70 75 80

Asp Ala Ala Asp Tyr Tyr Cys His Gln Trp Ser Ser Tyr Pro Trp Thr
85 90 95

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

<210> 233

<211> 112

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the variable region of the heavy chain of anti-hTfR antibody No.8

<400> 233

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

Ser Leu Ser Ile Thr Cys Thr Val Ser Gly Phe Ser Leu Thr Thr Tyr
20 25 30

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

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

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

Lys Leu Asn Ser Leu Gln Thr Asp Asp Thr Ala Thr Tyr Tyr Cys Ala
85 90 95

Lys Pro Asp Asp Tyr Trp Gly Gln Gly Thr Ser Val Thr Val Ser Ser
100 105 110

JPOXMLDOC01-seq1

<210> 234
 <211> 106
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Amino acid sequence of the variable region of the light chain of anti-hTfR antibody No.9

<400> 234

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

Glu Thr Val Thr Met Thr Cys Ser Ala Ser Ser Ser Val Ser Leu Met
 20 25 30

Phe Trp Tyr Gln Gln Lys Pro Arg Ser Ser Pro Lys Pro Trp Ile Tyr
 35 40 45

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

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

Asp Ala Ala Thr Tyr Tyr Cys Gln Gln Trp Thr Ser Asp Pro Pro Thr
 85 90 95

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

<210> 235
 <211> 117
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Amino acid sequence of the variable region of the heavy chain of anti-hTfR antibody No.9

<400> 235

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

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

Gly Val Ser Trp Val Lys Gln Ala Pro Gly Lys Asp Leu Lys Trp Met
 35 40 45

JPOXMLDOC01-seq1

Gly Trp Ile Tyr Thr Phe Thr Gly Glu Ala Thr Tyr Ile Asp Asp Phe
50 55 60

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

Leu Gln Ile Asn Asn Leu Lys Asn Glu Asp Thr Ala Thr Tyr Phe Cys
85 90 95

Ser Arg Arg Asn Gly Ala Trp Phe Glu Asp Trp Gly Gln Gly Thr Leu
100 105 110

Val Thr Val Ser Ala
115

<210> 236

<211> 107

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the variable region of the light chain of anti-hTfR antibody No.10

<400> 236

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

Glu Arg Val Ser Leu Thr Cys Arg Pro Ser Gln Glu Ile Ser Gly Tyr
20 25 30

Leu Ser Trp Leu Gln Gln Lys Pro Asp Gly Thr Ile Lys Arg Leu Ile
35 40 45

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

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

Glu Asp Phe Ala Asp Tyr Tyr Cys Leu Gln Tyr Ala Ser Tyr Pro Arg
85 90 95

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

<210> 237

<211> 120

<212> PRT

JPOXMLDOC01-seq1

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the variable region of the heavy chain of anti-hTfR antibody No.10

<400> 237

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

Ser Leu Lys Leu Ser Cys Glu Ala Ser Gly Ile Thr Phe Arg Asn Tyr
20 25 30

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

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

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

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

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

Gly Thr Ser Val Ile Val Ser Ser
115 120

<210> 238

<211> 107

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the variable region of the light chain of anti-hTfR antibody No.11

<400> 238

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

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

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

JPOXMLDOC01-seq1

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

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

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

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

<210> 239

<211> 118

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the variable region of the heavy chain of anti-hTfR antibody No.11

<400> 239

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

Ser Val Lys Ile Ser Cys Lys Ala Ser Gly Tyr Ala Phe Ser Ile Tyr
20 25 30

Trp Ile Asn Trp Leu Lys Gln Arg Pro Gly Gln Gly Leu Glu Trp Ile
35 40 45

Gly Gln Ile Tyr Pro Gly Asn Gly Asp Thr Asn Tyr Asn Gly Lys Phe
50 55 60

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

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

Gly Arg Trp Gly Asp Asp Tyr Ala Met Asp Phe Trp Gly Gln Gly Thr
100 105 110

Ser Val Thr Val Ser Ser
115

<210> 240

<211> 107

<212> PRT

<213> Artificial Sequence

JPOXMLDOC01-seq1

<220>

<223> Amino acid sequence of the variable region of the light chain of anti-hTfR antibody No.12

<400> 240

Asp Ile Val Leu Thr Gln Ser His Lys Phe Met Ser Thr Val Ile Gly
1 5 10 15

Asp Arg Val Ser Ile Thr Cys Lys Ala Ser His Asp Val Lys Thr Ala
20 25 30

Val Ala Trp Tyr Gln Gln Thr Pro Gly Gln Ser Pro Lys Leu Leu Thr
35 40 45

Tyr Trp Ser Ser Thr Arg His Thr Gly Val Pro Asp Arg Phe Thr Gly
50 55 60

Ser Gly Ser Gly Thr Asp Tyr Thr Leu Thr Ile Ser Ser Val Gln Ala
65 70 75 80

Glu Asp Leu Ala Leu Tyr Tyr Cys Gln Gln His Phe Ser Thr Pro Leu
85 90 95

Thr Phe Gly Ala Gly Thr Lys Leu Glu Leu Lys
100 105

<210> 241

<211> 119

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the variable region of the heavy chain of anti-hTfR antibody No.12

<400> 241

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

Ser Val Lys Val Ser Cys Lys Ala Ala Gly Tyr Val Phe Ile Asn Tyr
20 25 30

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

Gly Val Ile His Ser Gly Ser Gly Gly Thr Asn Tyr Asn Asp Asn Phe
50 55 60

Lys Asp Lys Ala Thr Leu Thr Arg Asp Val Ser Ser Ser Thr Ala Tyr
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[illegible]

JPOXMLDOC01-seq1

<400> 243

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

Ser Val Lys Ile Ser Cys Lys Ala Ser Gly Tyr Ala Phe Ser Ile Tyr
20 25 30

Trp Ile Asn Trp Leu Lys Gln Arg Pro Gly Gln Gly Leu Glu Trp Ile
35 40 45

Gly Gln Ile Tyr Pro Gly Asn Gly Asp Thr Asn Tyr Asn Gly Lys Phe
50 55 60

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

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

Gly Arg Trp Gly Asp Asp Tyr Ala Met Asp Phe Trp Gly Gln Gly Thr
100 105 110

Ser Val Thr Val Ser Ser
115

<210> 244

<211> 106

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the variable region of the light chain of anti-hTfR antibody No.14

<400> 244

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

Glu Lys Val Thr Leu Thr Cys Ser Ala Ser Ser Asn Ile Asn Ser Ile
20 25 30

His Trp Tyr Gln Gln Lys Pro Gly Thr Ser Pro Lys Arg Trp Ile Tyr
35 40 45

Asp Thr Ser Asn Leu Ala Ser Gly Val Pro Ala Arg Phe Ser Gly Ser
50 55 60

Gly Ser Gly Thr Ser Tyr Ser Leu Thr Ile Ser Ser Met Glu Ala Glu
65 70 75 80

JPOXMLDOC01-seq1

Asp Ala Ala Ser Tyr Tyr Cys His Gln Arg Ser Gly Tyr Pro Phe Thr
85 90 95

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

<210> 245
<211> 118
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the variable region of the heavy chain of anti-hTfR antibody No.14

<400> 245

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

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

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

Gly Phe Leu Asn Pro His Lys Asp Asp Ser Glu Tyr Asn Glu Lys Phe
50 55 60

Arg Gly Lys Ala Thr Leu Thr Ser Asp Lys Ser Ser Ser Thr Ala Tyr
65 70 75 80

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

Ala Arg Gly Tyr Tyr Tyr Tyr Ser Met Asp Tyr Trp Gly Gln Gly Thr
100 105 110

Ser Val Thr Val Ser Ser
115

<210> 246
<211> 525
<212> PRT
<213> Homo sapiens

<400> 246

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

JPOXMLDOC01-seq1

Ile Ile Val Asp Asp Leu Arg Pro Ser Leu Gly Cys Tyr Gly Asp Lys
20 25 30

Leu Val Arg Ser Pro Asn Ile Asp Gln Leu Ala Ser His Ser Leu Leu
35 40 45

Phe Gln Asn Ala Phe Ala Gln Gln Ala Val Cys Ala Pro Ser Arg Val
50 55 60

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

Asn Ser Tyr Trp Arg Val His Ala Gly Asn Phe Ser Thr Ile Pro Gln
85 90 95

Tyr Phe Lys Glu Asn Gly Tyr Val Thr Met Ser Val Gly Lys Val Phe
100 105 110

His Pro Gly Ile Ser Ser Asn His Thr Asp Asp Ser Pro Tyr Ser Trp
115 120 125

Ser Phe Pro Pro Tyr His Pro Ser Ser Glu Lys Tyr Glu Asn Thr Lys
130 135 140

Thr Cys Arg Gly Pro Asp Gly Glu Leu His Ala Asn Leu Leu Cys Pro
145 150 155 160

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

Thr Glu Gln Ala Ile Gln Leu Leu Glu Lys Met Lys Thr Ser Ala Ser
180 185 190

Pro Phe Phe Leu Ala Val Gly Tyr His Lys Pro His Ile Pro Phe Arg
195 200 205

Tyr Pro Lys Glu Phe Gln Lys Leu Tyr Pro Leu Glu Asn Ile Thr Leu
210 215 220

Ala Pro Asp Pro Glu Val Pro Asp Gly Leu Pro Pro Val Ala Tyr Asn
225 230 235 240

Pro Trp Met Asp Ile Arg Gln Arg Glu Asp Val Gln Ala Leu Asn Ile
245 250 255

Ser Val Pro Tyr Gly Pro Ile Pro Val Asp Phe Gln Arg Lys Ile Arg
260 265 270

JPOXMLDOC01-seq1

Gln Ser Tyr Phe Ala Ser Val Ser Tyr Leu Asp Thr Gln Val Gly Arg
275 280 285

Leu Leu Ser Ala Leu Asp Asp Leu Gln Leu Ala Asn Ser Thr Ile Ile
290 295 300

Ala Phe Thr Ser Asp His Gly Trp Ala Leu Gly Glu His Gly Glu Trp
305 310 315 320

Ala Lys Tyr Ser Asn Phe Asp Val Ala Thr His Val Pro Leu Ile Phe
325 330 335

Tyr Val Pro Gly Arg Thr Ala Ser Leu Pro Glu Ala Gly Glu Lys Leu
340 345 350

Phe Pro Tyr Leu Asp Pro Phe Asp Ser Ala Ser Gln Leu Met Glu Pro
355 360 365

Gly Arg Gln Ser Met Asp Leu Val Glu Leu Val Ser Leu Phe Pro Thr
370 375 380

Leu Ala Gly Leu Ala Gly Leu Gln Val Pro Pro Arg Cys Pro Val Pro
385 390 395 400

Ser Phe His Val Glu Leu Cys Arg Glu Gly Lys Asn Leu Leu Lys His
405 410 415

Phe Arg Phe Arg Asp Leu Glu Glu Asp Pro Tyr Leu Pro Gly Asn Pro
420 425 430

Arg Glu Leu Ile Ala Tyr Ser Gln Tyr Pro Arg Pro Ser Asp Ile Pro
435 440 445

Gln Trp Asn Ser Asp Lys Pro Ser Leu Lys Asp Ile Lys Ile Met Gly
450 455 460

Tyr Ser Ile Arg Thr Ile Asp Tyr Arg Tyr Thr Val Trp Val Gly Phe
465 470 475 480

Asn Pro Asp Glu Phe Leu Ala Asn Phe Ser Asp Ile His Ala Gly Glu
485 490 495

Leu Tyr Phe Val Asp Ser Asp Pro Leu Gln Asp His Asn Met Tyr Asn
500 505 510

Asp Ser Gln Gly Gly Asp Leu Phe Gln Leu Leu Met Pro

515 JPOXMLDOC01-seq1 520 525

<210> 247
 <211> 973
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Amino acid sequence of the fusion protein of heavy chain of anti-hTfR antibody No.1 (humanized 6) and hI2S

<400> 247

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

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Leu Thr Phe Ser Asn Tyr
 20 25 30

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

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

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

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

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

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
 115 120 125

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
 130 135 140

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
 145 150 155 160

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
 165 170 175

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
 180 185 190

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
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JPOXMLDOC01-seq1

195 200 205
 Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
 210 215 220
 Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
 225 230 235 240
 Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
 245 250 255
 Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
 260 265 270
 Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 275 280 285
 Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 290 295 300
 Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 305 310 315 320
 Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
 325 330 335
 Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
 340 345 350
 Ser Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
 355 360 365
 Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
 370 375 380
 Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
 385 390 395 400
 Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
 405 410 415
 Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
 420 425 430
 Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys Gly Ser
 435 440 445

JPOXMLDOC01-seq1

Ser Glu Thr Gln Ala Asn Ser Thr Thr Asp Ala Leu Asn Val Leu Leu
450 455 460

Ile Ile Val Asp Asp Leu Arg Pro Ser Leu Gly Cys Tyr Gly Asp Lys
465 470 475 480

Leu Val Arg Ser Pro Asn Ile Asp Gln Leu Ala Ser His Ser Leu Leu
485 490 495

Phe Gln Asn Ala Phe Ala Gln Gln Ala Val Cys Ala Pro Ser Arg Val
500 505 510

Ser Phe Leu Thr Gly Arg Arg Pro Asp Thr Thr Arg Leu Tyr Asp Phe
515 520 525

Asn Ser Tyr Trp Arg Val His Ala Gly Asn Phe Ser Thr Ile Pro Gln
530 535 540

Tyr Phe Lys Glu Asn Gly Tyr Val Thr Met Ser Val Gly Lys Val Phe
545 550 555 560

His Pro Gly Ile Ser Ser Asn His Thr Asp Asp Ser Pro Tyr Ser Trp
565 570 575

Ser Phe Pro Pro Tyr His Pro Ser Ser Glu Lys Tyr Glu Asn Thr Lys
580 585 590

Thr Cys Arg Gly Pro Asp Gly Glu Leu His Ala Asn Leu Leu Cys Pro
595 600 605

Val Asp Val Leu Asp Val Pro Glu Gly Thr Leu Pro Asp Lys Gln Ser
610 615 620

Thr Glu Gln Ala Ile Gln Leu Leu Glu Lys Met Lys Thr Ser Ala Ser
625 630 635 640

Pro Phe Phe Leu Ala Val Gly Tyr His Lys Pro His Ile Pro Phe Arg
645 650 655

Tyr Pro Lys Glu Phe Gln Lys Leu Tyr Pro Leu Glu Asn Ile Thr Leu
660 665 670

Ala Pro Asp Pro Glu Val Pro Asp Gly Leu Pro Pro Val Ala Tyr Asn
675 680 685

Pro Trp Met Asp Ile Arg Gln Arg Glu Asp Val Gln Ala Leu Asn Ile
690 695 700

JPOXMLDOC01-seq1

Ser Val Pro Tyr Gly Pro Ile Pro Val Asp Phe Gln Arg Lys Ile Arg
705 710 715 720

Gln Ser Tyr Phe Ala Ser Val Ser Tyr Leu Asp Thr Gln Val Gly Arg
725 730 735

Leu Leu Ser Ala Leu Asp Asp Leu Gln Leu Ala Asn Ser Thr Ile Ile
740 745 750

Ala Phe Thr Ser Asp His Gly Trp Ala Leu Gly Glu His Gly Glu Trp
755 760 765

Ala Lys Tyr Ser Asn Phe Asp Val Ala Thr His Val Pro Leu Ile Phe
770 775 780

Tyr Val Pro Gly Arg Thr Ala Ser Leu Pro Glu Ala Gly Glu Lys Leu
785 790 795 800

Phe Pro Tyr Leu Asp Pro Phe Asp Ser Ala Ser Gln Leu Met Glu Pro
805 810 815

Gly Arg Gln Ser Met Asp Leu Val Glu Leu Val Ser Leu Phe Pro Thr
820 825 830

Leu Ala Gly Leu Ala Gly Leu Gln Val Pro Pro Arg Cys Pro Val Pro
835 840 845

Ser Phe His Val Glu Leu Cys Arg Glu Gly Lys Asn Leu Leu Lys His
850 855 860

Phe Arg Phe Arg Asp Leu Glu Glu Asp Pro Tyr Leu Pro Gly Asn Pro
865 870 875 880

Arg Glu Leu Ile Ala Tyr Ser Gln Tyr Pro Arg Pro Ser Asp Ile Pro
885 890 895

Gln Trp Asn Ser Asp Lys Pro Ser Leu Lys Asp Ile Lys Ile Met Gly
900 905 910

Tyr Ser Ile Arg Thr Ile Asp Tyr Arg Tyr Thr Val Trp Val Gly Phe
915 920 925

Asn Pro Asp Glu Phe Leu Ala Asn Phe Ser Asp Ile His Ala Gly Glu
930 935 940

Leu Tyr Phe Val Asp Ser Asp Pro Leu Gln Asp His Asn Met Tyr Asn
945 950 955 960

JPOXMLDOC01-seq1

Asp Ser Gln Gly Gly Asp Leu Phe Gln Leu Leu Met Pro
 965 970

<210> 248
 <211> 3002
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Nucleotide sequence encoding the amino acid sequence of fusion protein of heavy chain of anti-hTfR antibody No.1 (humanized 6) and hI2S, synthetic sequence

<400> 248
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 ggagtgcaca gcgaagtgca gctggtcgaa tcaggggggg ggctggtgca gcctggaggc 120
 agcctgagac tgtcctgctg cgcttctggc ttgaccttta gcaactacgg gatgtcctgg 180
 gtgcggcagg ctccctggcaa gggactggag ttggtggcca acatcaatac caacggcgga 240
 agtacatact atcccgattc agtgaagggc cggttcacca tcagcagggg caacgccaag 300
 aacagcctgt atctgcagat gaactctctg agggccgagg atacagccgt gtactattgc 360
 actaacaacc ggtacgacga ggactattgg ggccagggca ccctggtgac agtgtctagc 420
 gcctctacca agggcccaag cgtgtttcct ctggctccat cctctaaatc cacctctggc 480
 ggcacagccg ctctgggctg tctggtgaag gattacttcc cagagcccgt gacagtgtct 540
 tggaacagcg gcgccctgac ctccggcggtg cacacatttc ctgctgtgct gcagagctcc 600
 ggctgttaca gcctgtctag cgtggtgacc gtgccatcct ctagcctggg caccagaca 660
 tatatctgca acgtgaatca caagcccagc aatacaaaagg tggataagaa ggtggagcca 720
 aagtcctgtg acaagaccca cacatgcccc cttgtcctg ctccagagct gctgggagga 780
 ccaagcgtgt tcctgtttcc acccaagccc aaggataccc tgatgatctc tcggacccca 840
 gaggtgacat gcgtgggtgt ggatgtgagc cacgaggacc ccgaggtgaa gttcaactgg 900
 tatgtggacg gcgtggaggt gcacaatgct aagaccaagc ccagggagga gcagtacaac 960
 tccacctata gagtgggtgtc tgtgctgaca gtgctgcacc aggattggct gaacggcaag 1020
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 aaggccaagg gccagcccag agagcctcag gtgtacacac tgcctccatc ccgggatgag 1140
 ctgaccaaga accagggtgtc tctgacatgt ctggtcaagg gcttctatcc ctctgacatc 1200
 gccgtggagt gggagagcaa tggccagcct gagaacaatt acaagaccac accccctgtg 1260
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 cagcagggca acgtgttcag ctgttccgtg atgcacgaag ctctgcataa tcactatact 1380

JPOXMLDOC01-seq1

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tatggggata	agctggtgag	gtccccaat	attgaccaac	tggcatcca	cagcctcctc	1560
ttccagaatg	cctttgcgca	gcaagcagtg	tgcgccccga	gccgcgtttc	tttcctcact	1620
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ggaaacttct	ccaccatccc	ccagtacttc	aaggagaatg	gctatgtgac	catgtcggtg	1740
ggaaaagtct	ttcaccttgg	gatatcttct	aaccataccg	atgattctcc	gtatagctgg	1800
tcttttccac	cttatcatcc	ttcctctgag	aagtatgaaa	acactaagac	atgtcgaggg	1860
ccagatggag	aactccatgc	caacctgctt	tgccctgtgg	atgtgctgga	tgttcccag	1920
ggcaccttgc	ctgacaaaca	gagcactgag	caagccatac	agttgttgga	aaagatgaaa	1980
acgtcagcca	gtccttttct	cctggccgtt	gggtatcata	agccacacat	ccccttcaga	2040
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gaggtccctg	atggcctacc	ccctgtggcc	tacaaccctt	ggatggacat	caggcaacgg	2160
gaagacgtcc	aagccttaaa	catcagtgtg	ccgtatggtc	caattcctgt	ggactttcag	2220
cggaaaatcc	gccagagcta	ctttgcctct	gtgtcatatt	tggatacaca	ggtcggccgc	2280
ctcttgagtg	ctttggacga	tcttcagctg	gccaacagca	ccatcattgc	atttacctcg	2340
gatcatgggt	gggctctagg	tgaacatgga	gaatgggcca	aatacagcaa	ttttgatggt	2400
gctacccatg	ttcccctgat	attctatggt	cctggaagga	cggcttcact	tccggaggca	2460
ggcgagaagc	ttttccctta	cctcgaccct	tttgattccg	cctcacagtt	gatggagcca	2520
ggcaggcaat	ccatggacct	tgtggaactt	gtgtctcttt	ttcccacgct	ggctggactt	2580
gcaggactgc	aggttccacc	tcgctgcccc	gttccttcat	ttcacgttga	gctgtgcaga	2640
gaaggcaaga	accttctgaa	gcattttcga	ttccgtgact	tggaagaaga	tccgtacctc	2700
cctggtaatc	cccgtgaact	gattgcctat	agccagtatc	cccggccttc	agacatccct	2760
cagtgggaatt	ctgacaagcc	gagtttaaaa	gatataaaga	tcatgggcta	ttccatacgc	2820
accatagact	ataggtatac	tgtgtgggtt	ggcttcaatc	ctgatgaatt	tctagctaac	2880
ttttctgaca	tccatgcagg	ggaactgtat	tttgtggatt	ctgaccatt	gcaggatcac	2940
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gc						3002

<210> 249
 <211> 980
 <212> PRT
 <213> Artificial Sequence
 <220>

JPOXMLDOC01-seq1

<223> Amino acid sequence of the fusion protein of heavy chain of anti-hTfR antibody No.2 (humanized 6) and hI2S

<400> 249

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

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

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

Gly Val Ile Ser Thr Tyr Tyr Gly His Gly Ser Tyr Asn Gln Arg Phe
50 55 60

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

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

Val Arg Gly Gly Tyr Gly Ser Ser Ser Leu Ala Gly Asn Phe Asp Val
100 105 110

Trp Gly Gln Gly Thr Thr Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

JPOXMLDOC01-seq1

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

Leu Gly Cys Tyr Gly Asp Lys Leu Val Arg Ser Pro Asn Ile Asp Gln
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JPOXMLDOC01-seq1

485

490

495

Leu Ala Ser His Ser Leu Leu Phe Gln Asn Ala Phe Ala Gln Gln Ala
 500 505 510
 Val Cys Ala Pro Ser Arg Val Ser Phe Leu Thr Gly Arg Arg Pro Asp
 515 520 525
 Thr Thr Arg Leu Tyr Asp Phe Asn Ser Tyr Trp Arg Val His Ala Gly
 530 535 540
 Asn Phe Ser Thr Ile Pro Gln Tyr Phe Lys Glu Asn Gly Tyr Val Thr
 545 550 555 560
 Met Ser Val Gly Lys Val Phe His Pro Gly Ile Ser Ser Asn His Thr
 565 570 575
 Asp Asp Ser Pro Tyr Ser Trp Ser Phe Pro Pro Tyr His Pro Ser Ser
 580 585 590
 Glu Lys Tyr Glu Asn Thr Lys Thr Cys Arg Gly Pro Asp Gly Glu Leu
 595 600 605
 His Ala Asn Leu Leu Cys Pro Val Asp Val Leu Asp Val Pro Glu Gly
 610 615 620
 Thr Leu Pro Asp Lys Gln Ser Thr Glu Gln Ala Ile Gln Leu Leu Glu
 625 630 635 640
 Lys Met Lys Thr Ser Ala Ser Pro Phe Phe Leu Ala Val Gly Tyr His
 645 650 655
 Lys Pro His Ile Pro Phe Arg Tyr Pro Lys Glu Phe Gln Lys Leu Tyr
 660 665 670
 Pro Leu Glu Asn Ile Thr Leu Ala Pro Asp Pro Glu Val Pro Asp Gly
 675 680 685
 Leu Pro Pro Val Ala Tyr Asn Pro Trp Met Asp Ile Arg Gln Arg Glu
 690 695 700
 Asp Val Gln Ala Leu Asn Ile Ser Val Pro Tyr Gly Pro Ile Pro Val
 705 710 715 720
 Asp Phe Gln Arg Lys Ile Arg Gln Ser Tyr Phe Ala Ser Val Ser Tyr
 725 730 735

JPOXMLDOC01-seq1

Leu Asp Thr Gln Val Gly Arg Leu Leu Ser Ala Leu Asp Asp Leu Gln
740 745 750

Leu Ala Asn Ser Thr Ile Ile Ala Phe Thr Ser Asp His Gly Trp Ala
755 760 765

Leu Gly Glu His Gly Glu Trp Ala Lys Tyr Ser Asn Phe Asp Val Ala
770 775 780

Thr His Val Pro Leu Ile Phe Tyr Val Pro Gly Arg Thr Ala Ser Leu
785 790 795 800

Pro Glu Ala Gly Glu Lys Leu Phe Pro Tyr Leu Asp Pro Phe Asp Ser
805 810 815

Ala Ser Gln Leu Met Glu Pro Gly Arg Gln Ser Met Asp Leu Val Glu
820 825 830

Leu Val Ser Leu Phe Pro Thr Leu Ala Gly Leu Ala Gly Leu Gln Val
835 840 845

Pro Pro Arg Cys Pro Val Pro Ser Phe His Val Glu Leu Cys Arg Glu
850 855 860

Gly Lys Asn Leu Leu Lys His Phe Arg Phe Arg Asp Leu Glu Glu Asp
865 870 875 880

Pro Tyr Leu Pro Gly Asn Pro Arg Glu Leu Ile Ala Tyr Ser Gln Tyr
885 890 895

Pro Arg Pro Ser Asp Ile Pro Gln Trp Asn Ser Asp Lys Pro Ser Leu
900 905 910

Lys Asp Ile Lys Ile Met Gly Tyr Ser Ile Arg Thr Ile Asp Tyr Arg
915 920 925

Tyr Thr Val Trp Val Gly Phe Asn Pro Asp Glu Phe Leu Ala Asn Phe
930 935 940

Ser Asp Ile His Ala Gly Glu Leu Tyr Phe Val Asp Ser Asp Pro Leu
945 950 955 960

Gln Asp His Asn Met Tyr Asn Asp Ser Gln Gly Gly Asp Leu Phe Gln
965 970 975

Leu Leu Met Pro
980

JPOXMLDOC01-seq1

<210> 250
 <211> 3023
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Nucleotide sequence encoding the amino acid sequence of fusion protein of heavy chain of anti-hTfR antibody No.2 (humanized 6) and hI2S, synthetic sequence

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<400> 250
acgcgtgccg ccaccatggg ctggagctgg attctgctgt tcctcctgag cgtgacagca      60
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tcagtcaaag tgtcttgtaa agcatcaggt tatacattta cagactacgt catgcactgg      180
gtgaggcagg cacctggaca gggctctggaa tggatcggcg tgatctccac ttactatggc      240
catggaagct acaaccagag attcaagggc agggcgacaa tgactgtaga caaatcaatt      300
tccactgctt atatggagct ggtaaggctg cgggtccgacg ataccgctgt gtactattgc      360
gtacgaggag gatacggctc cagctctctg gctggtaatt tcgatgtgtg ggggcagggt      420
accacagtca ccgtgagttc agcaagcaca aagggcccat ctgtgtttcc actggccccc      480
tccagcaaaa gcacctctgg gggtagagcc gctctgggat gtctggtgaa ggattatttc      540
ccagagccag tcaccgtgtc ctggaacagc ggagccctga catctggagt ccacactttt      600
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gtcgacaaga aagtggaacc caagtcctgt gataaaaactc atacctgccc cccttgtcct      780
gcaccagagc tgctgggagg accatccgtg ttcctgtttc cacccaagcc taaagacacc      840
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cctgaagtca agtttaactg gtacgtggat ggcgtcgagg tgcataatgc taagacaaaa      960
ccccgagagg aacagtacaa cagtacatat cgtgtcgtgt cagtgtgac cgtcctgcat      1020
caggactggc tgaacgggaa ggaatataag tgcaaaagtgt ccaataaggc actgcccgcc      1080
cctatcgaga aaaccattag caaggccaaa ggacagccta gggaaccaca ggtgtacaca      1140
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gcaactgcaca accactacac ccagaaatca ctgtcactgt caccagggaa aggatcttcc      1440
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JPOXMLDOC01-seq1

ctggcatccc acagcctcct cttccagaat gcctttgcg agcaagcagt gtgcgccccg	1620
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gatgattctc cgtatagctg gtctttttcca ccttatcatc cttcctctga gaagtatgaa	1860
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gatgtgctgg atgttcccga gggcaccttg cctgacaaac agagcactga gcaagccata	1980
cagttgttgg aaaagatgaa aacgtcagcc agtcctttct tcctggccgt tgggtatcat	2040
aagccacaca tccccctcag ataccccaag gaatttcaga agttgtatcc cttggagaac	2100
atcaccttg ccccgatcc cgaggtcctt gatggcctac cccctgtggc ctacaacccc	2160
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<210> 251

<211> 975

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of fusion protein of heavy chain of anti-hTfR antibody No.3 (humanized 2) and hI2S, synthetic sequence

<400> 251

JPOXMLDOC01-seq1

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

JPOXMLDOC01-seq1

Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro
260 265 270

Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala
275 280 285

Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val
290 295 300

Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr
305 310 315 320

Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr
325 330 335

Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu
340 345 350

Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr Cys
355 360 365

Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser
370 375 380

Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp
385 390 395 400

Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser
405 410 415

Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala
420 425 430

Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
435 440 445

Gly Ser Ser Glu Thr Gln Ala Asn Ser Thr Thr Asp Ala Leu Asn Val
450 455 460

Leu Leu Ile Ile Val Asp Asp Leu Arg Pro Ser Leu Gly Cys Tyr Gly
465 470 475 480

Asp Lys Leu Val Arg Ser Pro Asn Ile Asp Gln Leu Ala Ser His Ser
485 490 495

Leu Leu Phe Gln Asn Ala Phe Ala Gln Gln Ala Val Cys Ala Pro Ser
500 505 510

JPOXMLDOC01-seq1

Arg Val Ser Phe Leu Thr Gly Arg Arg Pro Asp Thr Thr Arg Leu Tyr
515 520 525

Asp Phe Asn Ser Tyr Trp Arg Val His Ala Gly Asn Phe Ser Thr Ile
530 535 540

Pro Gln Tyr Phe Lys Glu Asn Gly Tyr Val Thr Met Ser Val Gly Lys
545 550 555 560

Val Phe His Pro Gly Ile Ser Ser Asn His Thr Asp Asp Ser Pro Tyr
565 570 575

Ser Trp Ser Phe Pro Pro Tyr His Pro Ser Ser Glu Lys Tyr Glu Asn
580 585 590

Thr Lys Thr Cys Arg Gly Pro Asp Gly Glu Leu His Ala Asn Leu Leu
595 600 605

Cys Pro Val Asp Val Leu Asp Val Pro Glu Gly Thr Leu Pro Asp Lys
610 615 620

Gln Ser Thr Glu Gln Ala Ile Gln Leu Leu Glu Lys Met Lys Thr Ser
625 630 635 640

Ala Ser Pro Phe Phe Leu Ala Val Gly Tyr His Lys Pro His Ile Pro
645 650 655

Phe Arg Tyr Pro Lys Glu Phe Gln Lys Leu Tyr Pro Leu Glu Asn Ile
660 665 670

Thr Leu Ala Pro Asp Pro Glu Val Pro Asp Gly Leu Pro Pro Val Ala
675 680 685

Tyr Asn Pro Trp Met Asp Ile Arg Gln Arg Glu Asp Val Gln Ala Leu
690 695 700

Asn Ile Ser Val Pro Tyr Gly Pro Ile Pro Val Asp Phe Gln Arg Lys
705 710 715 720

Ile Arg Gln Ser Tyr Phe Ala Ser Val Ser Tyr Leu Asp Thr Gln Val
725 730 735

Gly Arg Leu Leu Ser Ala Leu Asp Asp Leu Gln Leu Ala Asn Ser Thr
740 745 750

Ile Ile Ala Phe Thr Ser Asp His Gly Trp Ala Leu Gly Glu His Gly

JPOXMLDOC01-seq1

755

760

765

Glu Trp Ala Lys Tyr Ser Asn Phe Asp Val Ala Thr His Val Pro Leu
770 775 780

Ile Phe Tyr Val Pro Gly Arg Thr Ala Ser Leu Pro Glu Ala Gly Glu
785 790 795 800

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Glu Pro Gly Arg Gln Ser Met Asp Leu Val Glu Leu Val Ser Leu Phe
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Pro Thr Leu Ala Gly Leu Ala Gly Leu Gln Val Pro Pro Arg Cys Pro
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Lys His Phe Arg Phe Arg Asp Leu Glu Glu Asp Pro Tyr Leu Pro Gly
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Asn Pro Arg Glu Leu Ile Ala Tyr Ser Gln Tyr Pro Arg Pro Ser Asp
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Ile Pro Gln Trp Asn Ser Asp Lys Pro Ser Leu Lys Asp Ile Lys Ile
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Met Gly Tyr Ser Ile Arg Thr Ile Asp Tyr Arg Tyr Thr Val Trp Val
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Gly Glu Leu Tyr Phe Val Asp Ser Asp Pro Leu Gln Asp His Asn Met
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<212> DNA

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JPOXMLDOC01-seq1

and hI2S, synthetic sequence

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 cDNA's 3' side, synthetic sequence

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cacttatatt	ctaactagtt	ttctctatcc	tttgggtttt	gttttgtttt	ttatttgttt	4500
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acactctgaa	tctaactatg	aatagcatta	tccatgttca	gatattcttg	tctcaaggct	4680
caggtttatc	ctttgtagct	ttctttttgc	tatcccacct	ctattcagca	tccagtcaag	4740
gatcactgag	ttgggtatca	gtaaattaaa	cattttaatt	aatgtctagg	agacagggtta	4800
tggtatagtt	ctcagtgtg	ggaagttgac	atggtaggat	ctcagttcat	ggccagccag	4860
aactttctgg	tgagatcctg	gttcaagcac	tacagagctt	ttctagaaaa	gtaactatat	4920

JPOXMLDOC01-seq1
ttaggagtaa gtttgatata atgacaatcc catcgtaagc cttcagtaac ctgatgcatt 4980
ggctctctgtt ttaatatcag gta 5003

<210> 255
<211> 2604
<212> DNA
<213> Artificial Sequence

<220>
<223> Nucleotide sequence of the 3'-arm of targeting vector

<400> 255
gcattctcta acttggttaag gtactttcat ctatctgaaa aaatgttcag taaaaaaca 60
aacaaaaaca tgacttcacc cagtgagtac aagatgatac cccaatttt ttttttttt 120
attatatgta tgtacactgt agctgtcttc agacacacca gaagagggcg tcagatctca 180
tcagatgggt gtgagccacc atgtgggtgc tgggacttga aacttgacc tttggaaaag 240
cagttgggta ctcttacc caagctatc acaccagccc caatacccca aattttgacc 300
agcctttttt tttttttttt tttttttttt aaatctgaac taatgggtatt aagggtgaaac 360
agattgcaca aaagaggtag taggtttttc tttgaggcaa ggtctttcta tattgcctca 420
ggttgacctt aaactccaac ttcctttttt tcccaagtg ctggagattg tagacagata 480
tatacaacac ccaaaaaaca atatgtttag tttcgattaa gattcattat gtggggctag 540
agggatgact tagagggtta gaacactgcc tgctcttcca gaggtcctga gttcaattcc 600
cagcaaccac gtggtggctc acaaccatct gtaatgggat ccgatgccct ctttctgggtg 660
tgtttgaaga cagctacagt gtcctcatal ataaaaaaaa taaacaaaca gatcttttaa 720
aaaaaaaaag acagtgtact tatacattat ataatgaat gattctttta aaaattaatt 780
atgggaaata cttatgaaga atagggtagc tttggctgtt ttggaaacgt tatataacaa 840
ggtagaacta aaatgtatgc cagtaatccc agaggaatca ttagccagtc agggctagtc 900
tgagcaatgt ggcaagataa acccatctct ttaaaaaaaaa aaaaaagtat tataaataga 960
aatgttatag gaaacaggaa atagaaaccc tcgaaaggct gaatgaaaga gtattagtgg 1020
gctggagaga tggttcagcg gtaagagca ctatctcctg agttcagttc ccagtgaaca 1080
catggtggct cacagccatc tgtaatgaga tctgacgccc tcttctgggg tgtctgaaga 1140
cagcgacagt gtactcacat aaaataaata cataaagact gttagttagc cttcatctac 1200
catttacaga actgggcaca gaaaggagt catcagttat aaagggtaac tttccatatg 1260
aatgtttgtc atattattat gcatatagta taatgaccaa actactgtaa tgtcttaata 1320
tttgatatctc ttttctcttt tttaaaaata tcagtttggg ggggaaccat tgcatacac 1380
ccggttttagc cttgctcggc aagtagatgg agataacagt catgtggaga tgaaactggc 1440
tgcagatgaa gaagaaaatg ccgacaataa catgaaggct agtgtcagaa aaccaagag 1500

JPOXMLDOC01-seq1

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gaatgagtgg ccattcagaa ggatttctta tgactaacta gttcttagac tagctagttc 1620
ttagactagc tagttcttgt ttcttttggga tgaggagatg ctttgtactt taaatggcac 1680
tggggctccc tacctgccgg cagattaggt cctgcaagat gggaaacggt tacattatgg 1740
atgttttatt agagatatgc aggacatttg gaatagtact aagaaaggct tccagtaaga 1800
caagggtgtgc acccatgtct taaacaggtc actgtaaaat atgacttagt tgtggtaatt 1860
taaattccat taaactcagg ttcataattt tctattagat tctcatagtt taattaaaag 1920
ttttcagggga taagttaaaa atgagttctg tgagtttagc tctaaaactt cctgttttta 1980
ggattcatga gtggctacct gggctattgt aagcgtgtag aacaaaaaga ggagtgtgtg 2040
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atgttacatc ccagagccat taca 2604

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<210> 256
 <211> 166
 <212> PRT
 <213> Homo sapiens

<400> 256

Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1 5 10 15

Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
 20 25 30

Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
 35 40 45

Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
 50 55 60

JPOXMLDOC01-seq1

Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65 70 75 80

Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
85 90 95

Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
100 105 110

Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
115 120 125

Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
130 135 140

Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145 150 155 160

Cys Arg Thr Gly Asp Arg
165

<210> 257

<211> 616

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the fusion protein of heavy chain of anti-hTfR antibody No.3 (humanized 2) and hEPO

<400> 257

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 Asn Tyr
20 25 30

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

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

Lys Val 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

JPOXMLDOC01-seq1

Ala Arg Ser Gly Asn Tyr Asp Glu Val Ala Tyr Trp Gly Gln Gly Thr
100 105 110

Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro
115 120 125

Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly
130 135 140

Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn
145 150 155 160

Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln
165 170 175

Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser
180 185 190

Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser
195 200 205

Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr
210 215 220

His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser
225 230 235 240

Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg
245 250 255

Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro
260 265 270

Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala
275 280 285

Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val
290 295 300

Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr
305 310 315 320

Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr
325 330 335

Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu
340 345 350

JPOXMLDOC01-seq1

Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr Cys
355 360 365

Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser
370 375 380

Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp
385 390 395 400

Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser
405 410 415

Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala
420 425 430

Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
435 440 445

Gly Ser Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg
450 455 460

Tyr Leu Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala
465 470 475 480

Glu His Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val
485 490 495

Asn Phe Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu
500 505 510

Val Trp Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln
515 520 525

Ala Leu Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His
530 535 540

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

Ala Leu Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser
565 570 575

Ala Ala Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe
580 585 590

Arg Val Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly
595 600 605

JPOXMLDOC01-seq1

Glu Ala Cys Arg Thr Gly Asp Arg
610 615

<210> 258
<211> 1931
<212> DNA
<213> Artificial Sequence

<220>
<223> Nucleotide sequence encoding the amino acid sequence of fusion protein of heavy chain of anti-hTfR antibody No. 3 (humanized 2) and HEPO, synthetic sequence

<400> 258
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ggagtgcaca gcgaggtgca actagtgcag tctggagcag aggtgaaaaa gcccggggag 120
tctctgaaga tttcctgtaa gggttctgga tacagcttta ccaactactg gctgggatgg 180
gtgcgccaga tgcccgggaa aggcctggag tggatggggg acatctaccc cggcggagac 240
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gcgagatcag gcaattacga cgaagtggcc tactggggcc aaggaaccct ggtcaccgtc 420
tcctcagcta gcaccaaggg cccatcggtc ttccccctgg caccctcctc caagagcacc 480
tctgggggca cagcggccct gggctgcctg gtcaaggact acttccccga accggtgacg 540
gtgtcgtgga actcaggcgc cctgaccagc ggcgtgcaca cttccccggc tgtcctacag 600
tcctcaggac tctactccct cagcagcgtg gtgaccgtgc cctccagcag cttgggcacc 660
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aactggtacg tggacggcgt ggaggtgcat aatgccaaga caaagccgcg ggaggagcag 960
tacaacagca cgtaccgggt ggtcagcgtc ctcaccgtcc tgcaccagga ctggctgaat 1020
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gacatcgccg tggagtggga gagcaatggg cagccggaga acaactacaa gaccacgcct 1260
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aggtggcagc aggggaacgt cttctcatgc tccgtgatgc atgaggctct gcacaaccac 1380

JPOXMLDOC01-seq1

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 acgggctgtg ctgaacactg cagcttgaat gagaatatca ctgtcccaga caccaaagtt 1560
 aatttctatg cctggaagag gatggaggtc gggcagcagg ccgtagaagt ctggcagggc 1620
 ctggccctgc tgtcgggaagc tgtcctgcgg ggccaggccc tgttgggtcaa ctcttcccag 1680
 ccgtgggagc ccctgcagct gcatgtggat aaagccgtca gtggccttcg cagcctcacc 1740
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 gctgctccac tccgaacaat cactgctgac actttccgca aactcttccg agtctactcc 1860
 aatttctctc ggggaaagct gaagctgtac acaggggagg cctgcaggac aggggacaga 1920
 taagcggccg c 1931

<210> 259
 <211> 489
 <212> PRT
 <213> Homo sapiens

<400> 259

Arg Pro Pro Asn Ile Val Leu Ile Phe Ala Asp Asp Leu Gly Tyr Gly
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Asp Leu Gly Cys Tyr Gly His Pro Ser Ser Thr Thr Pro Asn Leu Asp
 20 25 30

Gln Leu Ala Ala Gly Gly Leu Arg Phe Thr Asp Phe Tyr Val Pro Val
 35 40 45

Ser Leu Cys Thr Pro Ser Arg Ala Ala Leu Leu Thr Gly Arg Leu Pro
 50 55 60

Val Arg Met Gly Met Tyr Pro Gly Val Leu Val Pro Ser Ser Arg Gly
 65 70 75 80

Gly Leu Pro Leu Glu Glu Val Thr Val Ala Glu Val Leu Ala Ala Arg
 85 90 95

Gly Tyr Leu Thr Gly Met Ala Gly Lys Trp His Leu Gly Val Gly Pro
 100 105 110

Glu Gly Ala Phe Leu Pro Pro His Gln Gly Phe His Arg Phe Leu Gly
 115 120 125

Ile Pro Tyr Ser His Asp Gln Gly Pro Cys Gln Asn Leu Thr Cys Phe
 130 135 140

JPOXMLDOC01-seq1

Pro Pro Ala Thr Pro Cys Asp Gly Gly Cys Asp Gln Gly Leu Val Pro
145 150 155 160

Ile Pro Leu Leu Ala Asn Leu Ser Val Glu Ala Gln Pro Pro Trp Leu
165 170 175

Pro Gly Leu Glu Ala Arg Tyr Met Ala Phe Ala His Asp Leu Met Ala
180 185 190

Asp Ala Gln Arg Gln Asp Arg Pro Phe Phe Leu Tyr Tyr Ala Ser His
195 200 205

His Thr His Tyr Pro Gln Phe Ser Gly Gln Ser Phe Ala Glu Arg Ser
210 215 220

Gly Arg Gly Pro Phe Gly Asp Ser Leu Met Glu Leu Asp Ala Ala Val
225 230 235 240

Gly Thr Leu Met Thr Ala Ile Gly Asp Leu Gly Leu Leu Glu Glu Thr
245 250 255

Leu Val Ile Phe Thr Ala Asp Asn Gly Pro Glu Thr Met Arg Met Ser
260 265 270

Arg Gly Gly Cys Ser Gly Leu Leu Arg Cys Gly Lys Gly Thr Thr Tyr
275 280 285

Glu Gly Gly Val Arg Glu Pro Ala Leu Ala Phe Trp Pro Gly His Ile
290 295 300

Ala Pro Gly Val Thr His Glu Leu Ala Ser Ser Leu Asp Leu Leu Pro
305 310 315 320

Thr Leu Ala Ala Leu Ala Gly Ala Pro Leu Pro Asn Val Thr Leu Asp
325 330 335

Gly Phe Asp Leu Ser Pro Leu Leu Leu Gly Thr Gly Lys Ser Pro Arg
340 345 350

Gln Ser Leu Phe Phe Tyr Pro Ser Tyr Pro Asp Glu Val Arg Gly Val
355 360 365

Phe Ala Val Arg Thr Gly Lys Tyr Lys Ala His Phe Phe Thr Gln Gly
370 375 380

Ser Ala His Ser Asp Thr Thr Ala Asp Pro Ala Cys His Ala Ser Ser
385 390 395 400

JPOXMLDOC01-seq1

Ser Leu Thr Ala His Glu Pro Pro Leu Leu Tyr Asp Leu Ser Lys Asp
405 410 415

Pro Gly Glu Asn Tyr Asn Leu Leu Gly Gly Val Ala Gly Ala Thr Pro
420 425 430

Glu Val Leu Gln Ala Leu Lys Gln Leu Gln Leu Leu Lys Ala Gln Leu
435 440 445

Asp Ala Ala Val Thr Phe Gly Pro Ser Gln Val Ala Arg Gly Glu Asp
450 455 460

Pro Ala Leu Gln Ile Cys Cys His Pro Gly Cys Thr Pro Arg Pro Ala
465 470 475 480

Cys Cys His Cys Pro Asp Pro His Ala
485

<210> 260

<211> 939

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the fusion protein of heavy chain of anti-hTfR antibody No.3 (humanized 2) and hARSA

<400> 260

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 Asn Tyr
20 25 30

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

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

Lys Val 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 Ser Gly Asn Tyr Asp Glu Val Ala Tyr Trp Gly Gln Gly Thr
100 105 110

JPOXMLDOC01-seq1

Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro
115 120 125

Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly
130 135 140

Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn
145 150 155 160

Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln
165 170 175

Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser
180 185 190

Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser
195 200 205

Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr
210 215 220

His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser
225 230 235 240

Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg
245 250 255

Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro
260 265 270

Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala
275 280 285

Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val
290 295 300

Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr
305 310 315 320

Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr
325 330 335

Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu
340 345 350

Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr Cys
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JPOXMLDOC01-seq1

355

360

365

Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser
 370 375 380
 Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp
 385 390 395 400
 Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser
 405 410 415
 Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala
 420 425 430
 Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 435 440 445
 Gly Ser Arg Pro Pro Asn Ile Val Leu Ile Phe Ala Asp Asp Leu Gly
 450 455 460
 Tyr Gly Asp Leu Gly Cys Tyr Gly His Pro Ser Ser Thr Thr Pro Asn
 465 470 475 480
 Leu Asp Gln Leu Ala Ala Gly Gly Leu Arg Phe Thr Asp Phe Tyr Val
 485 490 495
 Pro Val Ser Leu Cys Thr Pro Ser Arg Ala Ala Leu Leu Thr Gly Arg
 500 505 510
 Leu Pro Val Arg Met Gly Met Tyr Pro Gly Val Leu Val Pro Ser Ser
 515 520 525
 Arg Gly Gly Leu Pro Leu Glu Glu Val Thr Val Ala Glu Val Leu Ala
 530 535 540
 Ala Arg Gly Tyr Leu Thr Gly Met Ala Gly Lys Trp His Leu Gly Val
 545 550 555 560
 Gly Pro Glu Gly Ala Phe Leu Pro Pro His Gln Gly Phe His Arg Phe
 565 570 575
 Leu Gly Ile Pro Tyr Ser His Asp Gln Gly Pro Cys Gln Asn Leu Thr
 580 585 590
 Cys Phe Pro Pro Ala Thr Pro Cys Asp Gly Gly Cys Asp Gln Gly Leu
 595 600 605

JPOXMLDOC01-seq1

Val₆₁₀ Pro Ile Pro Leu Leu Ala₆₁₅ Asn Leu Ser Val₆₂₀ Glu Ala Gln Pro Pro
 Trp₆₂₅ Leu Pro Gly Leu Glu₆₃₀ Ala Arg Tyr Met Ala₆₃₅ Phe Ala His Asp Leu₆₄₀
 Met Ala Asp Ala Gln₆₄₅ Arg Gln Asp Arg Pro₆₅₀ Phe Phe Leu Tyr Tyr Ala₆₅₅
 Ser His His Thr₆₆₀ His Tyr Pro Gln Phe₆₆₅ Ser Gly Gln Ser Phe₆₇₀ Ala Glu
 Arg Ser Gly₆₇₅ Arg Gly Pro Phe Gly₆₈₀ Asp Ser Leu Met Glu₆₈₅ Leu Asp Ala
 Ala Val₆₉₀ Gly Thr Leu Met Thr₆₉₅ Ala Ile Gly Asp Leu₇₀₀ Gly Leu Leu Glu
 Glu₇₀₅ Thr Leu Val Ile Phe₇₁₀ Thr Ala Asp Asn Gly₇₁₅ Pro Glu Thr Met Arg₇₂₀
 Met Ser Arg Gly₇₂₅ Gly Cys Ser Gly Leu Leu₇₃₀ Arg Cys Gly Lys Gly₇₃₅ Thr
 Thr Tyr Glu Gly₇₄₀ Gly Val Arg Glu Pro₇₄₅ Ala Leu Ala Phe Trp₇₅₀ Pro Gly
 His Ile Ala₇₅₅ Pro Gly Val Thr His₇₆₀ Glu Leu Ala Ser Ser₇₆₅ Leu Asp Leu
 Leu Pro₇₇₀ Thr Leu Ala Ala Leu₇₇₅ Ala Gly Ala Pro Leu₇₈₀ Pro Asn Val Thr
 Leu Asp Gly Phe Asp Leu₇₉₀ Ser Pro Leu Leu Leu₇₉₅ Gly Thr Gly Lys Ser₈₀₀
 Pro Arg Gln Ser Leu₈₀₅ Phe Phe Tyr Pro Ser₈₁₀ Tyr Pro Asp Glu Val₈₁₅ Arg
 Gly Val Phe Ala₈₂₀ Val Arg Thr Gly Lys₈₂₅ Tyr Lys Ala His Phe₈₃₀ Phe Thr
 Gln Gly Ser₈₃₅ Ala His Ser Asp Thr₈₄₀ Thr Ala Asp Pro Ala₈₄₅ Cys His Ala
 Ser Ser₈₅₀ Ser Leu Thr Ala His₈₅₅ Glu Pro Pro Leu Leu₈₆₀ Tyr Asp Leu Ser

JPOXMLDOC01-seq1

Lys Asp Pro Gly Glu Asn Tyr Asn Leu Leu Gly Gly Val Ala Gly Ala
865 870 875 880

Thr Pro Glu Val Leu Gln Ala Leu Lys Gln Leu Gln Leu Leu Lys Ala
885 890 895

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

Glu Asp Pro Ala Leu Gln Ile Cys Cys His Pro Gly Cys Thr Pro Arg
915 920 925

Pro Ala Cys Cys His Cys Pro Asp Pro His Ala
930 935

<210> 261
<211> 2900
<212> DNA
<213> Artificial Sequence

<220>
<223> Nucleotide sequence encoding the amino acid sequence of fusion protein of heavy chain of anti-hTfR antibody No.3 (humanized 2) and hARSA, synthetic sequence

<400> 261
acgcgtgccg ccaccatggg ctggagctgg attctgctgt tcctcctgag cgtgacagca 60
ggagtgcaca gcgaggtgca actagtgcag tctggagcag aggtgaaaaa gcccggggag 120
tctctgaaga tttcctgtaa gggttctgga tacagcttta ccaactactg gctgggatgg 180
gtgcgccaga tgcccgggaa aggcctggag tggatggggg acatctaccc cggcggagac 240
taccctacat acagcgagaa gttcaaggct caggtcacca tctcagccga caagtccatc 300
agcaccgcct acctgcagtg gagcagcctg aaggcctcgg acaccgccat gtattactgt 360
gcgagatcag gcaattacga cgaagtggcc tactggggcc aaggaaccct ggtcaccgtc 420
tcctcagcta gcaccaaggg cccatcggtc ttccccctgg caccctcctc caagagcacc 480
tctgggggca cagcggccct gggctgcctg gtcaaggact acttccccga accggtgacg 540
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tcctcaggac tctactccct cagcagcgtg gtgaccgtgc cctccagcag cttgggcacc 660
cagacctaca tctgcaacgt gaatcacaag cccagcaaca ccaagggtgga caagaaagtt 720
gagcccaaatt cttgtgacaa aactcacacg tgcccaccgt gcccagcacc tgaactcctg 780
ggagggtccgt cagtcttcct cttcccccca aaacccaagg acaccctcat gatctcccgg 840
acccctgagg tcacatgcgt ggtggtggac gtgagccacg aagaccctga ggtcaagttc 900
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JPOXMLDOC01-seq1

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atctccaaag	ccaaagggca	gccccgagaa	ccacaggtgt	acaccctgcc	cccatcccgg	1140
gatgagctga	ccaagaacca	ggtcagcctg	acctgcctgg	tcaaaggctt	ctatcccagc	1200
gacatcgccg	tggagtggga	gagcaatggg	cagccggaga	acaactacaa	gaccacgcct	1260
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aggtggcagc	aggggaacgt	cttctcatgc	tccgtgatgc	atgaggctct	gcacaaccac	1380
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atgggcatgt	accctggcgt	cctggtgccc	agctcccggg	ggggcctgcc	cctggaggag	1680
gtgaccgtgg	ccgaagtcct	ggctgcccga	ggctacctca	caggaatggc	cggcaagtgg	1740
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gccactcctt	gcgacggtgg	ctgtgaccag	ggcctggctc	ccatcccact	gttggccaac	1920
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ataggggacc	tggggctgct	tgaagagacg	ctggtcatct	tactgcaga	caatggacct	2220
gagaccatgc	gtatgtcccg	aggcggctgc	tccggtctct	tgcggtgtgg	aaagggaacg	2280
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ggggtttttg	ctgtgcggac	tggaaaagtac	aaggctcact	tcttcaccca	gggctctgcc	2580
cacagtgata	ccactgcaga	ccctgcctgc	cacgcctcca	gctctctgac	tgctcatgag	2640
ccccgctgc	tctatgacct	gtccaaggac	cctggtgaga	actacaacct	gctggggggg	2700
gtggccgggg	ccaccccaga	ggtgctgcaa	gccctgaaac	agcttcagct	gctcaaggcc	2760
cagttagacg	cagctgtgac	cttcggcccc	agccagggtg	cccggggcga	ggaccccgcc	2820

JPOXMLDOC01-seq1

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cccatgcct aagcggccgc 2900

<210> 262

<211> 279

<212> PRT

<213> Homo sapiens

<400> 262

Asp Pro Pro Ala Pro Leu Pro Leu Val Ile Trp His Gly Met Gly Asp
1 5 10 15

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

Lys Lys Ile Pro Gly Ile Tyr Val Leu Ser Leu Glu Ile Gly Lys Thr
35 40 45

Leu Met Glu Asp Val Glu Asn Ser Phe Phe Leu Asn Val Asn Ser Gln
50 55 60

Val Thr Thr Val Cys Gln Ala Leu Ala Lys Asp Pro Lys Leu Gln Gln
65 70 75 80

Gly Tyr Asn Ala Met Gly Phe Ser Gln Gly Gly Gln Phe Leu Arg Ala
85 90 95

Val Ala Gln Arg Cys Pro Ser Pro Pro Met Ile Asn Leu Ile Ser Val
100 105 110

Gly Gly Gln His Gln Gly Val Phe Gly Leu Pro Arg Cys Pro Gly Glu
115 120 125

Ser Ser His Ile Cys Asp Phe Ile Arg Lys Thr Leu Asn Ala Gly Ala
130 135 140

Tyr Ser Lys Val Val Gln Glu Arg Leu Val Gln Ala Glu Tyr Trp His
145 150 155 160

Asp Pro Ile Lys Glu Asp Val Tyr Arg Asn His Ser Ile Phe Leu Ala
165 170 175

Asp Ile Asn Gln Glu Arg Gly Ile Asn Glu Ser Tyr Lys Lys Asn Leu
180 185 190

Met Ala Leu Lys Lys Phe Val Met Val Lys Phe Leu Asn Asp Ser Ile
195 200 205

JPOXMLDOC01-seq1

Val Asp Pro Val Asp Ser Glu Trp Phe Gly Phe Tyr Arg Ser Gly Gln
210 215 220

Ala Lys Glu Thr Ile Pro Leu Gln Glu Thr Ser Leu Tyr Thr Gln Asp
225 230 235 240

Arg Leu Gly Leu Lys Glu Met Asp Asn Ala Gly Gln Leu Val Phe Leu
245 250 255

Ala Thr Glu Gly Asp His Leu Gln Leu Ser Glu Glu Trp Phe Tyr Ala
260 265 270

His Ile Ile Pro Phe Leu Gly
275

<210> 263

<211> 729

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the fusion protein of heavy chain of anti-hTfR antibody No.3 (humanized 2) and hPPT-1

<400> 263

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 Asn Tyr
20 25 30

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

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

Lys Val 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 Ser Gly Asn Tyr Asp Glu Val Ala Tyr Trp Gly Gln Gly Thr
100 105 110

Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro
115 120 125

JPOXMLDOC01-seq1

Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly
130 135 140

Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn
145 150 155 160

Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln
165 170 175

Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser
180 185 190

Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser
195 200 205

Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr
210 215 220

His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser
225 230 235 240

Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg
245 250 255

Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro
260 265 270

Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala
275 280 285

Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val
290 295 300

Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr
305 310 315 320

Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr
325 330 335

Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu
340 345 350

Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr Cys
355 360 365

Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser
370 375 380

JPOXMLDOC01-seq1

Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp
 385 390 395 400
 Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser
 405 410 415
 Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala
 420 425 430
 Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 435 440 445
 Gly Ser Asp Pro Pro Ala Pro Leu Pro Leu Val Ile Trp His Gly Met
 450 455 460
 Gly Asp Ser Cys Cys Asn Pro Leu Ser Met Gly Ala Ile Lys Lys Met
 465 470 475 480
 Val Glu Lys Lys Ile Pro Gly Ile Tyr Val Leu Ser Leu Glu Ile Gly
 485 490 495
 Lys Thr Leu Met Glu Asp Val Glu Asn Ser Phe Phe Leu Asn Val Asn
 500 505 510
 Ser Gln Val Thr Thr Val Cys Gln Ala Leu Ala Lys Asp Pro Lys Leu
 515 520 525
 Gln Gln Gly Tyr Asn Ala Met Gly Phe Ser Gln Gly Gly Gln Phe Leu
 530 535 540
 Arg Ala Val Ala Gln Arg Cys Pro Ser Pro Pro Met Ile Asn Leu Ile
 545 550 555 560
 Ser Val Gly Gly Gln His Gln Gly Val Phe Gly Leu Pro Arg Cys Pro
 565 570 575
 Gly Glu Ser Ser His Ile Cys Asp Phe Ile Arg Lys Thr Leu Asn Ala
 580 585 590
 Gly Ala Tyr Ser Lys Val Val Gln Glu Arg Leu Val Gln Ala Glu Tyr
 595 600 605
 Trp His Asp Pro Ile Lys Glu Asp Val Tyr Arg Asn His Ser Ile Phe
 610 615 620
 Leu Ala Asp Ile Asn Gln Glu Arg Gly Ile Asn Glu Ser Tyr Lys Lys

JPOXMLDOC01-seq1

625 630 635 640

Asn Leu Met Ala Leu Lys Lys Phe Val Met Val Lys Phe Leu Asn Asp
645 650 655

Ser Ile Val Asp Pro Val Asp Ser Glu Trp Phe Gly Phe Tyr Arg Ser
660 665 670

Gly Gln Ala Lys Glu Thr Ile Pro Leu Gln Glu Thr Ser Leu Tyr Thr
675 680 685

Gln Asp Arg Leu Gly Leu Lys Glu Met Asp Asn Ala Gly Gln Leu Val
690 695 700

Phe Leu Ala Thr Glu Gly Asp His Leu Gln Leu Ser Glu Glu Trp Phe
705 710 715 720

Tyr Ala His Ile Ile Pro Phe Leu Gly
725

<210> 264

<211> 2270

<212> DNA

<213> Artificial Sequence

<220>

<223> Nucleotide sequence encoding the amino acid sequence of fusion protein of heavy chain of anti-hTfR antibody No.3 (humanized 2) and hPPT-1, synthetic sequence

<400> 264

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ggagtgcaca gcgaggtgca actagtgcag tctggagcag aggtgaaaaa gcccggggag	120
tctctgaaga tttcctgtaa gggttctgga tacagcttta ccaactactg gctgggatgg	180
gtgcgccaga tgcccgggaa aggcctggag tggatggggg acatctaccc cggcggagac	240
taccctacat acagcgagaa gttcaaggtc caggtcacca tctcagccga caagtccatc	300
agcaccgcct acctgcagtg gagcagcctg aaggcctcgg acaccgccat gtattactgt	360
gcgagatcag gcaattacga cgaagtggcc tactggggcc aaggaaccct ggtcaccgtc	420
tcctcagcta gcaccaaggg cccatcggtc ttccccctgg caccctcctc caagagcacc	480
tctgggggca cagcggccct gggctgcctg gtcaaggact acttccccga accggtgacg	540
gtgtcgtgga actcaggcgc cctgaccagc ggcgtgcaca cttccccggc tgtcctacag	600
tcctcaggac tctactccct cagcagcgtg gtgaccgtgc cctccagcag cttgggcacc	660
cagacctaca tctgcaacgt gaatcacaag cccagcaaca ccaagggtgga caagaaagtt	720
gagcccaaatt cttgtgacaa aactcacacg tgccccaccgt gccccagcacc tgaactcctg	780

JPOXMLDOC01-seq1

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aactggtacg tggacggcgt ggaggtgcat aatgccaaga caaagccgcg ggaggagcag      960
tacaacagca cgtaccgggt ggtcagcgtc ctcaccgtcc tgcaccagga ctggctgaat     1020
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atctccaaag ccaaagggca gccccgagaa ccacaggtgt acaccctgcc cccatcccgg     1140
gatgagctga ccaagaacca ggtcagcctg acctgcctgg tcaaaggctt ctatcccagc     1200
gacatcgccg tggagtggga gagcaatggg cagccggaga acaactacaa gaccacgcct     1260
cccgtgctgg actccgacgg ctcttcttct ctctacagca agctcaccgt ggacaagagc     1320
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gtgtatcgca accacagcat cttcttggca gatataaatc aggagcgggg tatcaatgag     1980
tcctacaaga aaaacctgat ggccctgaag aagtttgtga tggtgaaaatt cctcaatgat     2040
tccattgtgg acctgtaga ttcggagtgg tttggatttt acagaagtgg ccaagccaag     2100
gaaaccattc cttacagga gacctccctg tacacacagg accgcctggg gctaaaggaa     2160
atggacaatg caggacagct agtgtttctg gctacagaag gggaccatct tcagttgtct     2220
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<210> 265
 <211> 544
 <212> PRT
 <213> Homo sapiens

<400> 265

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JPOXMLDOC01-seq1

Val Ser Leu Gly Arg Ala Asp Pro Glu Glu Glu Leu Ser Leu Thr Phe
20 25 30

Ala Leu Arg Gln Gln Asn Val Glu Arg Leu Ser Glu Leu Val Gln Ala
35 40 45

Val Ser Asp Pro Ser Ser Pro Gln Tyr Gly Lys Tyr Leu Thr Leu Glu
50 55 60

Asn Val Ala Asp Leu Val Arg Pro Ser Pro Leu Thr Leu His Thr Val
65 70 75 80

Gln Lys Trp Leu Leu Ala Ala Gly Ala Gln Lys Cys His Ser Val Ile
85 90 95

Thr Gln Asp Phe Leu Thr Cys Trp Leu Ser Ile Arg Gln Ala Glu Leu
100 105 110

Leu Leu Pro Gly Ala Glu Phe His His Tyr Val Gly Gly Pro Thr Glu
115 120 125

Thr His Val Val Arg Ser Pro His Pro Tyr Gln Leu Pro Gln Ala Leu
130 135 140

Ala Pro His Val Asp Phe Val Gly Gly Leu His His Phe Pro Pro Thr
145 150 155 160

Ser Ser Leu Arg Gln Arg Pro Glu Pro Gln Val Thr Gly Thr Val Gly
165 170 175

Leu His Leu Gly Val Thr Pro Ser Val Ile Arg Lys Arg Tyr Asn Leu
180 185 190

Thr Ser Gln Asp Val Gly Ser Gly Thr Ser Asn Asn Ser Gln Ala Cys
195 200 205

Ala Gln Phe Leu Glu Gln Tyr Phe His Asp Ser Asp Leu Ala Gln Phe
210 215 220

Met Arg Leu Phe Gly Gly Asn Phe Ala His Gln Ala Ser Val Ala Arg
225 230 235 240

Val Val Gly Gln Gln Gly Arg Gly Arg Ala Gly Ile Glu Ala Ser Leu
245 250 255

Asp Val Gln Tyr Leu Met Ser Ala Gly Ala Asn Ile Ser Thr Trp Val
260 265 270

JPOXMLDOC01-seq1

Tyr Ser Ser Pro Gly Arg His Glu Gly Gln Glu Pro Phe Leu Gln Trp
 275 280 285
 Leu Met Leu Leu Ser Asn Glu Ser Ala Leu Pro His Val His Thr Val
 290 295 300
 Ser Tyr Gly Asp Asp Glu Asp Ser Leu Ser Ser Ala Tyr Ile Gln Arg
 305 310 315 320
 Val Asn Thr Glu Leu Met Lys Ala Ala Ala Arg Gly Leu Thr Leu Leu
 325 330 335
 Phe Ala Ser Gly Asp Ser Gly Ala Gly Cys Trp Ser Val Ser Gly Arg
 340 345 350
 His Gln Phe Arg Pro Thr Phe Pro Ala Ser Ser Pro Tyr Val Thr Thr
 355 360 365
 Val Gly Gly Thr Ser Phe Gln Glu Pro Phe Leu Ile Thr Asn Glu Ile
 370 375 380
 Val Asp Tyr Ile Ser Gly Gly Gly Phe Ser Asn Val Phe Pro Arg Pro
 385 390 395 400
 Ser Tyr Gln Glu Glu Ala Val Thr Lys Phe Leu Ser Ser Ser Pro His
 405 410 415
 Leu Pro Pro Ser Ser Tyr Phe Asn Ala Ser Gly Arg Ala Tyr Pro Asp
 420 425 430
 Val Ala Ala Leu Ser Asp Gly Tyr Trp Val Val Ser Asn Arg Val Pro
 435 440 445
 Ile Pro Trp Val Ser Gly Thr Ser Ala Ser Thr Pro Val Phe Gly Gly
 450 455 460
 Ile Leu Ser Leu Ile Asn Glu His Arg Ile Leu Ser Gly Arg Pro Pro
 465 470 475 480
 Leu Gly Phe Leu Asn Pro Arg Leu Tyr Gln Gln His Gly Ala Gly Leu
 485 490 495
 Phe Asp Val Thr Arg Gly Cys His Glu Ser Cys Leu Asp Glu Glu Val
 500 505 510
 Glu Gly Gln Gly Phe Cys Ser Gly Pro Gly Trp Asp Pro Val Thr Gly
 515 520 525

JPOXMLDOC01-seq1

Trp Gly Thr Pro Asn Phe Pro Ala Leu Leu Lys Thr Leu Leu Asn Pro
530 535 540

<210> 266
<211> 994
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the fusion protein of heavy chain of anti-hTfR antibody No.3 (humanized 2) and hTPP-1

<400> 266

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 Asn Tyr
20 25 30

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

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

Lys Val 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 Ser Gly Asn Tyr Asp Glu Val Ala Tyr Trp Gly Gln Gly Thr
100 105 110

Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro
115 120 125

Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly
130 135 140

Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn
145 150 155 160

Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln
165 170 175

Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser
180 185 190

JPOXMLDOC01-seq1

Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser
195 200 205

Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr
210 215 220

His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser
225 230 235 240

Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg
245 250 255

Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro
260 265 270

Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala
275 280 285

Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val
290 295 300

Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr
305 310 315 320

Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr
325 330 335

Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu
340 345 350

Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr Cys
355 360 365

Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser
370 375 380

Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp
385 390 395 400

Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser
405 410 415

Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala
420 425 430

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

JPOXMLDOC01-seq1

435 440 445
 Gly Ser Ser Tyr Ser Pro Glu Pro Asp Gln Arg Arg Thr Leu Pro Pro
 450 455 460
 Gly Trp Val Ser Leu Gly Arg Ala Asp Pro Glu Glu Glu Leu Ser Leu
 465 470 475 480
 Thr Phe Ala Leu Arg Gln Gln Asn Val Glu Arg Leu Ser Glu Leu Val
 485 490 495
 Gln Ala Val Ser Asp Pro Ser Ser Pro Gln Tyr Gly Lys Tyr Leu Thr
 500 505 510
 Leu Glu Asn Val Ala Asp Leu Val Arg Pro Ser Pro Leu Thr Leu His
 515 520 525
 Thr Val Gln Lys Trp Leu Leu Ala Ala Gly Ala Gln Lys Cys His Ser
 530 535 540
 Val Ile Thr Gln Asp Phe Leu Thr Cys Trp Leu Ser Ile Arg Gln Ala
 545 550 555 560
 Glu Leu Leu Leu Pro Gly Ala Glu Phe His His Tyr Val Gly Gly Pro
 565 570 575
 Thr Glu Thr His Val Val Arg Ser Pro His Pro Tyr Gln Leu Pro Gln
 580 585 590
 Ala Leu Ala Pro His Val Asp Phe Val Gly Gly Leu His His Phe Pro
 595 600 605
 Pro Thr Ser Ser Leu Arg Gln Arg Pro Glu Pro Gln Val Thr Gly Thr
 610 615 620
 Val Gly Leu His Leu Gly Val Thr Pro Ser Val Ile Arg Lys Arg Tyr
 625 630 635 640
 Asn Leu Thr Ser Gln Asp Val Gly Ser Gly Thr Ser Asn Asn Ser Gln
 645 650 655
 Ala Cys Ala Gln Phe Leu Glu Gln Tyr Phe His Asp Ser Asp Leu Ala
 660 665 670
 Gln Phe Met Arg Leu Phe Gly Gly Asn Phe Ala His Gln Ala Ser Val
 675 680 685

JPOXMLDOC01-seq1

Ala Arg Val Val Gly Gln Gln Gly Arg Gly Arg Ala Gly Ile Glu Ala
690 695 700

Ser Leu Asp Val Gln Tyr Leu Met Ser Ala Gly Ala Asn Ile Ser Thr
705 710 715 720

Trp Val Tyr Ser Ser Pro Gly Arg His Glu Gly Gln Glu Pro Phe Leu
725 730 735

Gln Trp Leu Met Leu Leu Ser Asn Glu Ser Ala Leu Pro His Val His
740 745 750

Thr Val Ser Tyr Gly Asp Asp Glu Asp Ser Leu Ser Ser Ala Tyr Ile
755 760 765

Gln Arg Val Asn Thr Glu Leu Met Lys Ala Ala Ala Arg Gly Leu Thr
770 775 780

Leu Leu Phe Ala Ser Gly Asp Ser Gly Ala Gly Cys Trp Ser Val Ser
785 790 795 800

Gly Arg His Gln Phe Arg Pro Thr Phe Pro Ala Ser Ser Pro Tyr Val
805 810 815

Thr Thr Val Gly Gly Thr Ser Phe Gln Glu Pro Phe Leu Ile Thr Asn
820 825 830

Glu Ile Val Asp Tyr Ile Ser Gly Gly Gly Phe Ser Asn Val Phe Pro
835 840 845

Arg Pro Ser Tyr Gln Glu Glu Ala Val Thr Lys Phe Leu Ser Ser Ser
850 855 860

Pro His Leu Pro Pro Ser Ser Tyr Phe Asn Ala Ser Gly Arg Ala Tyr
865 870 875 880

Pro Asp Val Ala Ala Leu Ser Asp Gly Tyr Trp Val Val Ser Asn Arg
885 890 895

Val Pro Ile Pro Trp Val Ser Gly Thr Ser Ala Ser Thr Pro Val Phe
900 905 910

Gly Gly Ile Leu Ser Leu Ile Asn Glu His Arg Ile Leu Ser Gly Arg
915 920 925

Pro Pro Leu Gly Phe Leu Asn Pro Arg Leu Tyr Gln Gln His Gly Ala
930 935 940

JPOXMLDOC01-seq1

Gly Leu Phe Asp Val Thr Arg Gly Cys His Glu Ser Cys Leu Asp Glu
945 950 955 960

Glu Val Glu Gly Gln Gly Phe Cys Ser Gly Pro Gly Trp Asp Pro Val
965 970 975

Thr Gly Trp Gly Thr Pro Asn Phe Pro Ala Leu Leu Lys Thr Leu Leu
980 985 990

Asn Pro

<210> 267
<211> 3065
<212> DNA
<213> Artificial Sequence

<220>
<223> Nucleotide sequence encoding the amino acid sequence of fusion protein of heavy chain of anti-hTfR antibody No.3 (humanized 2) and hTPP-1, synthetic sequence

<400> 267
acgcgtgccg ccaccatggg ctggagctgg attctgctgt tcctcctgag cgtgacagca 60
ggagtgcaca gcgagggtgca actagtgcag tctggagcag aggtgaaaaa gcccggggag 120
tctctgaaga tttcctgtaa gggttctgga tacagcttta ccaactactg gctgggatgg 180
gtgcgccaga tgcccgaggaa aggcctggag tggatggggg acatctaccc cggcggagac 240
taccctacat acagcgagaa gttcaagggtc caggtcacca tctcagccga caagtccatc 300
agcaccgcct acctgcagtg gagcagcctg aaggcctcgg acaccgccat gtattactgt 360
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gccgc 3065

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<211> 628
<212> PRT
<213> Homo sapiens
<400> 268

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His Ser Gln Ala Asp Gln Tyr Val Leu Ser Trp Asp Gln Gln Leu Asn
35 40 45

Leu Ala Tyr Val Gly Ala Val Pro His Arg Gly Ile Lys Gln Val Arg
50 55 60

Thr His Trp Leu Leu Glu Leu Val Thr Thr Arg Gly Ser Thr Gly Arg
65 70 75 80

Gly Leu Ser Tyr Asn Phe Thr His Leu Asp Gly Tyr Leu Asp Leu Leu
85 90 95

Arg Glu Asn Gln Leu Leu Pro Gly Phe Glu Leu Met Gly Ser Ala Ser
100 105 110

Gly His Phe Thr Asp Phe Glu Asp Lys Gln Gln Val Phe Glu Trp Lys
115 120 125

Asp Leu Val Ser Ser Leu Ala Arg Arg Tyr Ile Gly Arg Tyr Gly Leu
130 135 140

Ala His Val Ser Lys Trp Asn Phe Glu Thr Trp Asn Glu Pro Asp His
145 150 155 160

His Asp Phe Asp Asn Val Ser Met Thr Met Gln Gly Phe Leu Asn Tyr
165 170 175

Tyr Asp Ala Cys Ser Glu Gly Leu Arg Ala Ala Ser Pro Ala Leu Arg
180 185 190

Leu Gly Gly Pro Gly Asp Ser Phe His Thr Pro Pro Arg Ser Pro Leu
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JPOXMLDOC01-seq1

195 200 205
 Ser Trp Gly Leu Leu Arg His Cys His Asp Gly Thr Asn Phe Phe Thr
 210 215 220
 Gly Glu Ala Gly Val Arg Leu Asp Tyr Ile Ser Leu His Arg Lys Gly
 225 230 235 240
 Ala Arg Ser Ser Ile Ser Ile Leu Glu Gln Glu Lys Val Val Ala Gln
 245 250 255
 Gln Ile Arg Gln Leu Phe Pro Lys Phe Ala Asp Thr Pro Ile Tyr Asn
 260 265 270
 Asp Glu Ala Asp Pro Leu Val Gly Trp Ser Leu Pro Gln Pro Trp Arg
 275 280 285
 Ala Asp Val Thr Tyr Ala Ala Met Val Val Lys Val Ile Ala Gln His
 290 295 300
 Gln Asn Leu Leu Leu Ala Asn Thr Thr Ser Ala Phe Pro Tyr Ala Leu
 305 310 315 320
 Leu Ser Asn Asp Asn Ala Phe Leu Ser Tyr His Pro His Pro Phe Ala
 325 330 335
 Gln Arg Thr Leu Thr Ala Arg Phe Gln Val Asn Asn Thr Arg Pro Pro
 340 345 350
 His Val Gln Leu Leu Arg Lys Pro Val Leu Thr Ala Met Gly Leu Leu
 355 360 365
 Ala Leu Leu Asp Glu Glu Gln Leu Trp Ala Glu Val Ser Gln Ala Gly
 370 375 380
 Thr Val Leu Asp Ser Asn His Thr Val Gly Val Leu Ala Ser Ala His
 385 390 395 400
 Arg Pro Gln Gly Pro Ala Asp Ala Trp Arg Ala Ala Val Leu Ile Tyr
 405 410 415
 Ala Ser Asp Asp Thr Arg Ala His Pro Asn Arg Ser Val Ala Val Thr
 420 425 430
 Leu Arg Leu Arg Gly Val Pro Pro Gly Pro Gly Leu Val Tyr Val Thr
 435 440 445

JPOXMLDOC01-seq1

Arg Tyr Leu Asp Asn Gly Leu Cys Ser Pro Asp Gly Glu Trp Arg Arg
450 455 460

Leu Gly Arg Pro Val Phe Pro Thr Ala Glu Gln Phe Arg Arg Met Arg
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Ala Ala Glu Asp Pro Val Ala Ala Ala Pro Arg Pro Leu Pro Ala Gly
485 490 495

Gly Arg Leu Thr Leu Arg Pro Ala Leu Arg Leu Pro Ser Leu Leu Leu
500 505 510

Val His Val Cys Ala Arg Pro Glu Lys Pro Pro Gly Gln Val Thr Arg
515 520 525

Leu Arg Ala Leu Pro Leu Thr Gln Gly Gln Leu Val Leu Val Trp Ser
530 535 540

Asp Glu His Val Gly Ser Lys Cys Leu Trp Thr Tyr Glu Ile Gln Phe
545 550 555 560

Ser Gln Asp Gly Lys Ala Tyr Thr Pro Val Ser Arg Lys Pro Ser Thr
565 570 575

Phe Asn Leu Phe Val Phe Ser Pro Asp Thr Gly Ala Val Ser Gly Ser
580 585 590

Tyr Arg Val Arg Ala Leu Asp Tyr Trp Ala Arg Pro Gly Pro Phe Ser
595 600 605

Asp Pro Val Pro Tyr Leu Glu Val Pro Val Pro Arg Gly Pro Pro Ser
610 615 620

Pro Gly Asn Pro
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<210> 269
<211> 1078
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the fusion protein of heavy chain of
anti-hTfR antibody No.3 (humanized 2) and hIDUA

<400> 269

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JPOXMLDOC01-seq1

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

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

Lys Val 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 Ser Gly Asn Tyr Asp Glu Val Ala Tyr Trp Gly Gln Gly Thr
100 105 110

Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro
115 120 125

Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly
130 135 140

Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn
145 150 155 160

Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln
165 170 175

Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser
180 185 190

Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser
195 200 205

Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr
210 215 220

His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser
225 230 235 240

Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg
245 250 255

Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro
260 265 270

JPOXMLDOC01-seq1

Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala
 275 280 285
 Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val
 290 295 300
 Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr
 305 310 315 320
 Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr
 325 330 335
 Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu
 340 345 350
 Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr Cys
 355 360 365
 Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser
 370 375 380
 Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp
 385 390 395 400
 Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser
 405 410 415
 Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala
 420 425 430
 Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 435 440 445
 Gly Ser Ala Glu Ala Pro His Leu Val His Val Asp Ala Ala Arg Ala
 450 455 460
 Leu Trp Pro Leu Arg Arg Phe Trp Arg Ser Thr Gly Phe Cys Pro Pro
 465 470 475 480
 Leu Pro His Ser Gln Ala Asp Gln Tyr Val Leu Ser Trp Asp Gln Gln
 485 490 495
 Leu Asn Leu Ala Tyr Val Gly Ala Val Pro His Arg Gly Ile Lys Gln
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 Val Arg Thr His Trp Leu Leu Glu Leu Val Thr Thr Arg Gly Ser Thr
 515 520 525

JPOXMLDOC01-seq1

Gly Arg Gly Leu Ser Tyr Asn Phe Thr His Leu Asp Gly Tyr Leu Asp
530 535 540

Leu Leu Arg Glu Asn Gln Leu Leu Pro Gly Phe Glu Leu Met Gly Ser
545 550 555 560

Ala Ser Gly His Phe Thr Asp Phe Glu Asp Lys Gln Gln Val Phe Glu
565 570 575

Trp Lys Asp Leu Val Ser Ser Leu Ala Arg Arg Tyr Ile Gly Arg Tyr
580 585 590

Gly Leu Ala His Val Ser Lys Trp Asn Phe Glu Thr Trp Asn Glu Pro
595 600 605

Asp His His Asp Phe Asp Asn Val Ser Met Thr Met Gln Gly Phe Leu
610 615 620

Asn Tyr Tyr Asp Ala Cys Ser Glu Gly Leu Arg Ala Ala Ser Pro Ala
625 630 635 640

Leu Arg Leu Gly Gly Pro Gly Asp Ser Phe His Thr Pro Pro Arg Ser
645 650 655

Pro Leu Ser Trp Gly Leu Leu Arg His Cys His Asp Gly Thr Asn Phe
660 665 670

Phe Thr Gly Glu Ala Gly Val Arg Leu Asp Tyr Ile Ser Leu His Arg
675 680 685

Lys Gly Ala Arg Ser Ser Ile Ser Ile Leu Glu Gln Glu Lys Val Val
690 695 700

Ala Gln Gln Ile Arg Gln Leu Phe Pro Lys Phe Ala Asp Thr Pro Ile
705 710 715 720

Tyr Asn Asp Glu Ala Asp Pro Leu Val Gly Trp Ser Leu Pro Gln Pro
725 730 735

Trp Arg Ala Asp Val Thr Tyr Ala Ala Met Val Val Lys Val Ile Ala
740 745 750

Gln His Gln Asn Leu Leu Leu Ala Asn Thr Thr Ser Ala Phe Pro Tyr
755 760 765

Ala Leu Leu Ser Asn Asp Asn Ala Phe Leu Ser Tyr His Pro His Pro

JPOXMLDOC01-seq1
780

770

775

Phe Ala Gln Arg Thr Leu Thr Ala Arg Phe Gln Val Asn Asn Thr Arg
785 790 795 800

Pro Pro His Val Gln Leu Leu Arg Lys Pro Val Leu Thr Ala Met Gly
805 810 815

Leu Leu Ala Leu Leu Asp Glu Glu Gln Leu Trp Ala Glu Val Ser Gln
820 825 830

Ala Gly Thr Val Leu Asp Ser Asn His Thr Val Gly Val Leu Ala Ser
835 840 845

Ala His Arg Pro Gln Gly Pro Ala Asp Ala Trp Arg Ala Ala Val Leu
850 855 860

Ile Tyr Ala Ser Asp Asp Thr Arg Ala His Pro Asn Arg Ser Val Ala
865 870 875 880

Val Thr Leu Arg Leu Arg Gly Val Pro Pro Gly Pro Gly Leu Val Tyr
885 890 895

Val Thr Arg Tyr Leu Asp Asn Gly Leu Cys Ser Pro Asp Gly Glu Trp
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Arg Arg Leu Gly Arg Pro Val Phe Pro Thr Ala Glu Gln Phe Arg Arg
915 920 925

Met Arg Ala Ala Glu Asp Pro Val Ala Ala Ala Pro Arg Pro Leu Pro
930 935 940

Ala Gly Gly Arg Leu Thr Leu Arg Pro Ala Leu Arg Leu Pro Ser Leu
945 950 955 960

Leu Leu Val His Val Cys Ala Arg Pro Glu Lys Pro Pro Gly Gln Val
965 970 975

Thr Arg Leu Arg Ala Leu Pro Leu Thr Gln Gly Gln Leu Val Leu Val
980 985 990

Trp Ser Asp Glu His Val Gly Ser Lys Cys Leu Trp Thr Tyr Glu Ile
995 1000 1005

Gln Phe Ser Gln Asp Gly Lys Ala Tyr Thr Pro Val Ser Arg Lys
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JPOXMLDOC01-seq1

Pro Ser Thr Phe Asn Leu Phe Val Phe Ser Pro Asp Thr Gly Ala
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Val Ser Gly Ser Tyr Arg Val Arg Ala Leu Asp Tyr Trp Ala Arg
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Pro Gly Pro Phe Ser Asp Pro Val Pro Tyr Leu Glu Val Pro Val
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Pro Arg Gly Pro Pro Ser Pro Gly Asn Pro
 1070 1075

<210> 270
 <211> 3317
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Nucleotide sequence encoding the amino acid sequence of fusion protein of heavy chain of anti-hTfR antibody No.3 (humanized 2) and hIDUA, synthetic sequence

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aatccataag cggccgc 3317

<210> 271
<211> 235
<212> PRT
<213> Homo sapiens

<400> 271

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Thr Cys Arg Leu Arg Glu Tyr Tyr Asp Gln Thr Ala Gln Met Cys Cys
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Ser Lys Cys Ser Pro Gly Gln His Ala Lys Val Phe Cys Thr Lys Thr
35 40 45

Ser Asp Thr Val Cys Asp Ser Cys Glu Asp Ser Thr Tyr Thr Gln Leu
50 55 60

Trp Asn Trp Val Pro Glu Cys Leu Ser Cys Gly Ser Arg Cys Ser Ser
65 70 75 80

Asp Gln Val Glu Thr Gln Ala Cys Thr Arg Glu Gln Asn Arg Ile Cys
85 90 95

Thr Cys Arg Pro Gly Trp Tyr Cys Ala Leu Ser Lys Gln Glu Gly Cys
100 105 110

Arg Leu Cys Ala Pro Leu Arg Lys Cys Arg Pro Gly Phe Gly Val Ala
115 120 125

Arg Pro Gly Thr Glu Thr Ser Asp Val Val Cys Lys Pro Cys Ala Pro
130 135 140

Gly Thr Phe Ser Asn Thr Thr Ser Ser Thr Asp Ile Cys Arg Pro His
145 150 155 160

Gln Ile Cys Asn Val Val Ala Ile Pro Gly Asn Ala Ser Met Asp Ala
165 170 175

JPOXMLDOC01-seq1

Val Cys Thr Ser Thr Ser Pro Thr Arg Ser Met Ala Pro Gly Ala Val
180 185 190

His Leu Pro Gln Pro Val Ser Thr Arg Ser Gln His Thr Gln Pro Thr
195 200 205

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210 215 220

Pro Ser Pro Pro Ala Glu Gly Ser Thr Gly Asp
225 230 235

<210> 272
<211> 685
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the fusion protein of heavy chain of
anti-hTfR antibody No.3 (humanized 2) and hTNF-alpha receptor

<400> 272

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

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

Lys Val 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 Ser Gly Asn Tyr Asp Glu Val Ala Tyr Trp Gly Gln Gly Thr
100 105 110

Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro
115 120 125

Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly
130 135 140

JPOXMLDOC01-seq1

Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn
145 150 155 160

Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln
165 170 175

Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser
180 185 190

Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser
195 200 205

Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr
210 215 220

His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser
225 230 235 240

Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg
245 250 255

Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro
260 265 270

Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala
275 280 285

Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val
290 295 300

Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr
305 310 315 320

Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr
325 330 335

Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu
340 345 350

Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr Cys
355 360 365

Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser
370 375 380

Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp
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JPOXMLDOC01-seq1

Ala Val His Leu Pro Gln Pro Val Ser Thr Arg Ser Gln His Thr Gln
645 650 655

Pro Thr Pro Glu Pro Ser Thr Ala Pro Ser Thr Ser Phe Leu Leu Pro
660 665 670

Met Gly Pro Ser Pro Pro Ala Glu Gly Ser Thr Gly Asp
675 680 685

<210> 273
<211> 2138
<212> DNA
<213> Artificial Sequence

<220>
<223> Nucleotide sequence encoding the amino acid sequence of fusion protein of heavy chain of anti-hTfR antibody No.3 (humanized 2) and HTNF-alpha receptor, synthetic sequence

<400> 273
acgcgtgccg ccaccatggg ctggagctgg attctgctgt tcctcctgag cgtgacagca 60
ggagtgcaca gcgaggtgca actagtgcag tctggagcag aggtgaaaaa gcccggggag 120
tctctgaaga tttcctgtaa gggttctgga tacagcttta ccaactactg gctgggatgg 180
gtgcgccaga tgcccgggaa aggcctggag tggatggggg acatctaccc cggcggagac 240
taccctacat acagcgagaa gttcaagggtc caggtcacca tctcagccga caagtccatc 300
agcaccgcct acctgcagtg gagcagcctg aaggcctcgg acaccgccat gtattactgt 360
gcgagatcag gcaattacga cgaagtggcc tactggggcc aaggaaccct ggtcaccgtc 420
tcctcagcta gcaccaaggg cccatcggtc ttccccctgg caccctcctc caagagcacc 480
tctgggggca cagcggccct gggctgcctg gtcaaggact acttccccga accggtgacg 540
gtgtcgtgga actcaggcgc cctgaccagc ggcgtgcaca cttccccggc tgtcctacag 600
tcctcaggac tctactccct cagcagcgtg gtgaccgtgc cctccagcag cttgggcacc 660
cagacctaca tctgcaacgt gaatcacaag cccagcaaca ccaagggtgga caagaaagtt 720
gagcccaaatt cttgtgacaa aactcacacg tgcccaccgt gcccagcacc tgaactcctg 780
ggagggtccgt cagtcttcct cttcccccca aaacccaagg acaccctcat gatctcccgg 840
accctgagg tcacatgcgt ggtggtggac gtgagccacg aagaccctga ggtcaagttc 900
aactggtacg tggacggcgt ggaggtgcat aatgccaaga caaagccgcg ggaggagcag 960
tacaacagca cgtaccgggt ggtcagcgtc ctcaccgtcc tgcaccagga ctggctgaat 1020
ggcaaggagt acaagtgcaa ggtctccaac aaagccctcc cagcccccat cgagaaaacc 1080
atctccaaaag ccaaagggca gccccgagaa ccacaggtgt acaccctgcc cccatccccg 1140
gatgagctga ccaagaacca ggtcagcctg acctgcctgg tcaaaggctt ctatcccagc 1200

JPOXMLDOC01-seq1

gacatcgccg tggagtggga gagcaatggg cagccggaga acaactacaa gaccacgcct 1260
 cccgtgctgg actccgacgg ctcttcttct ctctacagca agctcaccgt ggacaagagc 1320
 aggtggcagc aggggaacgt cttctcatgc tccgtgatgc atgaggctct gcacaaccac 1380
 tacacgcaga agagcctctc cctgtctccg ggtaaaggat ctttgcccgcc ccaggtggca 1440
 ttacaccct acgccccgga gcccgggagc acatgccggc tcagagaata ctatgaccag 1500
 acagctcaga tgtgctgcag caagtgtctg ccgggccaac atgcaaaagt cttctgtacc 1560
 aagacctcgg acaccgtgtg tgactcctgt gaggacagca catacaccca gctctggaac 1620
 tgggttcccc agtgcttgag ctgtggctcc cgctgtagct ctgaccaggt ggaaactcaa 1680
 gcctgcactc gggaacagaa ccgcatctgc acctgcaggc ccggctggta ctgcgcgctg 1740
 agcaagcagg aggggtgccg gctgtgcgcg ccgctgcgca agtgccgccc gggcttcggc 1800
 gtggccagac caggaactga aacatcagac gtggtgtgca agccctgtgc cccggggagc 1860
 ttctccaaca cgacttcac caccgatatt tgcaggcccc accaaatctg taacgtggtg 1920
 gccatccctg ggaatgcaag catggatgca gtctgcacgt ccacgtcccc caccggagt 1980
 atggccccag gggcagtaca cttaccccag ccagtgtcca cacgatccca acacacgcag 2040
 ccaactccag aaccagcac tgctccaagc acctccttcc tgctcccaat gggccccagc 2100
 cccccagctg aaggagcac tggcgactaa gcggccgc 2138

<210> 274
 <211> 482
 <212> PRT
 <213> Homo sapiens

<400> 274

Arg Pro Arg Asn Ala Leu Leu Leu Leu Ala Asp Asp Gly Gly Phe Glu
 1 5 10 15

Ser Gly Ala Tyr Asn Asn Ser Ala Ile Ala Thr Pro His Leu Asp Ala
 20 25 30

Leu Ala Arg Arg Ser Leu Leu Phe Arg Asn Ala Phe Thr Ser Val Ser
 35 40 45

Ser Cys Ser Pro Ser Arg Ala Ser Leu Leu Thr Gly Leu Pro Gln His
 50 55 60

Gln Asn Gly Met Tyr Gly Leu His Gln Asp Val His His Phe Asn Ser
 65 70 75 80

Phe Asp Lys Val Arg Ser Leu Pro Leu Leu Leu Ser Gln Ala Gly Val
 85 90 95

JPOXMLDOC01-seq1

Arg Thr Gly Ile Ile Gly Lys Lys His Val Gly Pro Glu Thr Val Tyr
100 105 110

Pro Phe Asp Phe Ala Tyr Thr Glu Glu Asn Gly Ser Val Leu Gln Val
115 120 125

Gly Arg Asn Ile Thr Arg Ile Lys Leu Leu Val Arg Lys Phe Leu Gln
130 135 140

Thr Gln Asp Asp Arg Pro Phe Phe Leu Tyr Val Ala Phe His Asp Pro
145 150 155 160

His Arg Cys Gly His Ser Gln Pro Gln Tyr Gly Thr Phe Cys Glu Lys
165 170 175

Phe Gly Asn Gly Glu Ser Gly Met Gly Arg Ile Pro Asp Trp Thr Pro
180 185 190

Gln Ala Tyr Asp Pro Leu Asp Val Leu Val Pro Tyr Phe Val Pro Asn
195 200 205

Thr Pro Ala Ala Arg Ala Asp Leu Ala Ala Gln Tyr Thr Thr Val Gly
210 215 220

Arg Met Asp Gln Gly Val Gly Leu Val Leu Gln Glu Leu Arg Asp Ala
225 230 235 240

Gly Val Leu Asn Asp Thr Leu Val Ile Phe Thr Ser Asp Asn Gly Ile
245 250 255

Pro Phe Pro Ser Gly Arg Thr Asn Leu Tyr Trp Pro Gly Thr Ala Glu
260 265 270

Pro Leu Leu Val Ser Ser Pro Glu His Pro Lys Arg Trp Gly Gln Val
275 280 285

Ser Glu Ala Tyr Val Ser Leu Leu Asp Leu Thr Pro Thr Ile Leu Asp
290 295 300

Trp Phe Ser Ile Pro Tyr Pro Ser Tyr Ala Ile Phe Gly Ser Lys Thr
305 310 315 320

Ile His Leu Thr Gly Arg Ser Leu Leu Pro Ala Leu Glu Ala Glu Pro
325 330 335

Leu Trp Ala Thr Val Phe Gly Ser Gln Ser His His Glu Val Thr Met
340 345 350

JPOXMLDOC01-seq1

Ser Tyr Pro Met Arg Ser Val Gln His Arg His Phe Arg Leu Val His
355 360 365

Asn Leu Asn Phe Lys Met Pro Phe Pro Ile Asp Gln Asp Phe Tyr Val
370 375 380

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

Thr Gly Trp Tyr Lys Asp Leu Arg His Tyr Tyr Tyr Arg Ala Arg Trp
405 410 415

Glu Leu Tyr Asp Arg Ser Arg Asp Pro His Glu Thr Gln Asn Leu Ala
420 425 430

Thr Asp Pro Arg Phe Ala Gln Leu Leu Glu Met Leu Arg Asp Gln Leu
435 440 445

Ala Lys Trp Gln Trp Glu Thr His Asp Pro Trp Val Cys Ala Pro Asp
450 455 460

Gly Val Leu Glu Glu Lys Leu Ser Pro Gln Cys Gln Pro Leu His Asn
465 470 475 480

Glu Leu

<210> 275

<211> 932

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the fusion protein of heavy chain of anti-hTfR antibody No.3 (humanized 2) and hSGSH

<400> 275

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 Asn Tyr
20 25 30

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

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

JPOXMLDOC01-seq1

Lys Val 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 Ser Gly Asn Tyr Asp Glu Val Ala Tyr Trp Gly Gln Gly Thr
100 105 110

Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro
115 120 125

Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly
130 135 140

Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn
145 150 155 160

Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln
165 170 175

Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser
180 185 190

Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser
195 200 205

Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr
210 215 220

His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser
225 230 235 240

Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg
245 250 255

Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro
260 265 270

Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala
275 280 285

Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val
290 295 300

Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr
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JPOXMLDOC01-seq1

Val Tyr Pro Phe Asp 565 Phe Ala Tyr Thr Glu 570 Glu Asn Gly Ser Val 575 Leu

Gln Val Gly Arg 580 Asn Ile Thr Arg Ile 585 Lys Leu Leu Val Arg 590 Lys Phe

Leu Gln Thr 595 Gln Asp Asp Arg Pro 600 Phe Phe Leu Tyr Val 605 Ala Phe His

Asp Pro 610 His Arg Cys Gly 615 His Ser Gln Pro Gln Tyr 620 Gly Thr Phe Cys

Glu Lys Phe Gly Asn Gly 630 Glu Ser Gly Met Gly 635 Arg Ile Pro Asp Trp 640

Thr Pro Gln Ala Tyr 645 Asp Pro Leu Asp Val 650 Leu Val Pro Tyr Phe Val 655

Pro Asn Thr Pro 660 Ala Ala Arg Ala Asp 665 Leu Ala Ala Gln Tyr 670 Thr Thr

Val Gly Arg 675 Met Asp Gln Gly Val 680 Gly Leu Val Leu Gln 685 Glu Leu Arg

Asp Ala Gly Val 690 Leu Asn Asp 695 Thr Leu Val Ile Phe 700 Thr Ser Asp Asn

Gly Ile Pro Phe Pro 710 Ser Gly Arg Thr Asn 715 Leu Tyr Trp Pro Gly Thr 720

Ala Glu Pro Leu 725 Leu Val Ser Ser Pro Glu 730 His Pro Lys Arg Trp Gly 735

Gln Val Ser Glu 740 Ala Tyr Val Ser Leu 745 Leu Asp Leu Thr Pro 750 Thr Ile

Leu Asp Trp 755 Phe Ser Ile Pro Tyr 760 Pro Ser Tyr Ala Ile 765 Phe Gly Ser

Lys Thr Ile His Leu Thr Gly 775 Arg Ser Leu Leu Pro 780 Ala Leu Glu Ala

Glu Pro Leu Trp Ala Thr 790 Val Phe Gly Ser Gln 795 Ser His His Glu Val 800

Thr Met Ser Tyr Pro 805 Met Arg Ser Val Gln 810 His Arg His Phe Arg 815 Leu

JPOXMLDOC01-seq1

Val His Asn Leu Asn Phe Lys Met Pro Phe Pro Ile Asp Gln Asp Phe
820 825 830

Tyr Val Ser Pro Thr Phe Gln Asp Leu Leu Asn Arg Thr Thr Ala Gly
835 840 845

Gln Pro Thr Gly Trp Tyr Lys Asp Leu Arg His Tyr Tyr Tyr Arg Ala
850 855 860

Arg Trp Glu Leu Tyr Asp Arg Ser Arg Asp Pro His Glu Thr Gln Asn
865 870 875 880

Leu Ala Thr Asp Pro Arg Phe Ala Gln Leu Leu Glu Met Leu Arg Asp
885 890 895

Gln Leu Ala Lys Trp Gln Trp Glu Thr His Asp Pro Trp Val Cys Ala
900 905 910

Pro Asp Gly Val Leu Glu Glu Lys Leu Ser Pro Gln Cys Gln Pro Leu
915 920 925

His Asn Glu Leu
930

<210> 276
<211> 2879
<212> DNA
<213> Artificial Sequence

<220>
<223> Nucleotide sequence encoding the amino acid sequence of fusion protein of heavy chain of anti-hTfR antibody No.3 (humanized 2) and hSGSH, synthetic sequence

<400> 276
acgcgtgccg ccaccatggg ctggagctgg attctgctgt tcctcctgag cgtgacagca 60
ggagtgcaca gcgagggtgca actagtgcag tctggagcag aggtgaaaaa gcccggggag 120
tctctgaaga tttcctgtaa gggttctgga tacagcttta ccaactactg gctgggatgg 180
gtgcgccaga tgcccgggaa aggcctggag tggatggggg acatctaccc cggcgggagac 240
taccctacat acagcgagaa gttcaaggtc caggtcacca tctcagccga caagtccatc 300
agcaccgcct acctgcagtg gagcagcctg aaggcctcgg acaccgcat gtattactgt 360
gcgagatcag gcaattacga cgaagtggcc tactggggcc aaggaaccct ggtcaccgtc 420
tcctcagcta gcaccaaggg cccatcggtc ttccccctgg caccctcctc caagagcacc 480
tctgggggca cagcggccct gggctgcctg gtcaaggact acttccccga accggtgacg 540
gtgtcgtgga actcaggcgc cctgaccagc ggcgtgcaca ccttcccggc tgtcctacag 600

JPOXMLDOC01-seq1

tcctcaggac	tctactccct	cagcagcgtg	gtgaccgtgc	cctccagcag	cttgggcacc	660
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gagcccaa	attgtgacaa	aactcacacg	tgcccaccgt	gcccagcacc	tgaactcctg	780
ggagggtccg	cagtcttcct	cttcccccca	aaacccaagg	acaccctcat	gatctcccgg	840
acccctgagg	tcacatgcgt	ggtggtggac	gtgagccacg	aagaccctga	ggtcaagttc	900
aactggtacg	tggacggcgt	ggagggtgcat	aatgccaaga	caaagccgcg	ggaggagcag	960
tacaacagca	cgtaccgggt	ggtcagcgtc	ctcaccgtcc	tgaccagga	ctggctgaat	1020
ggcaaggagt	acaagtgcaa	ggtctccaac	aaagccctcc	cagcccccat	cgagaaaacc	1080
atctccaaa	gcaaagggca	gccccgagaa	ccacagggtgt	acaccctgcc	cccatcccgg	1140
gatgagctga	ccaagaacca	ggtcagcctg	acctgcctgg	tcaaaggctt	ctatcccagc	1200
gacatcgccg	tggagtggga	gagcaatggg	cagccggaga	acaactacaa	gaccacgcct	1260
cccgtgctgg	actccgacgg	ctccttcttc	ctctacagca	agctcaccgt	ggacaagagc	1320
agggtggcag	aggggaacgt	cttctcatgc	tccgtgatgc	atgaggctct	gcacaaccac	1380
tacacgcaga	agagcctctc	cctgtctccg	ggtaaaggat	ctcgtccccg	gaacgcactg	1440
ctgctcctcg	cggatgacgg	aggctttgag	agtggcgcgt	acaacaacag	cgccatcgcc	1500
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gggatgtacg	ggctgcacca	ggacgtgcac	cacttcaact	ccttcgacaa	ggtgcggagc	1680
ctgccgctgc	tgctcagcca	agctggtgtg	cgcacaggca	tcatcgggaa	gaagcacgtg	1740
gggccggaga	ccgtgtaccc	gtttgacttt	gcgtacacgg	aggagaatgg	ctccgtcctc	1800
cagggtggggc	ggaacatcac	tagaattaag	ctgctcgtcc	ggaaaattcct	gcagactcag	1860
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cagccccagt	acggaacctt	ctgtgagaag	tttggcaacg	gagagagcgg	catgggtcgt	1980
atcccagact	ggacccccca	ggcctacgac	ccactggacg	tgctggtgcc	ttacttcgtc	2040
cccaacaccc	cggcagcccg	agccgacctg	gccgctcagt	acaccaccgt	cggccgcatg	2100
gaccaaggag	ttggactggg	gctccaggag	ctgcgtgacg	ccggtgtcct	gaacgacaca	2160
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caagtcagcg	aggcctacgt	gagcctccta	gacctcacgc	ccaccatctt	ggattgggtc	2340
tcgatccccgt	accccagcta	cgccatcttt	ggctcgaaga	ccatccacct	cactggcccg	2400
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JPOXMLDOC01-seq1

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 accttcagg acctcctgaa ccgcaccaca gctggtcagc ccacgggctg gtacaaggac 2640
 ctccgtcatt actactaccg ggcgcgctgg gagctctacg accggagccg ggacccccac 2700
 gagaccaga acctggccac cgacccgcgc ttgtctcagc ttctggagat gcttcgggac 2760
 cagctggcca agtggcagtg ggagaccac gaccttggg tgtgcgcccc cgacggcgtc 2820
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<210> 277
 <211> 245
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Amino acid sequence of anti-hTfR single-chain antibody

<400> 277

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 Asn Tyr
 20 25 30

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

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

Lys Val 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 Ser Gly Asn Tyr Asp Glu Val Ala Tyr Trp Gly Gln Gly Thr
 100 105 110

Leu Val Thr Val Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly Ser
 115 120 125

Gly Gly Gly Gly Ser Asp Ile Val Met Thr Gln Thr Pro Leu Ser Leu
 130 135 140

Ser Val Thr Pro Gly Gln Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln
 145 150 155 160

JPOXMLDOC01-seq1

Ser Leu Val His Ser Asn Gly Asn Thr Tyr Leu His Trp Tyr Leu Gln
165 170 175

Lys Pro Gly Gln Ser Pro Gln Leu Leu Ile Tyr Lys Val Ser Asn Arg
180 185 190

Phe Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp
195 200 205

Phe Thr Leu Lys Ile Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr
210 215 220

Tyr Cys Ser Gln Ser Thr His Val Pro Trp Thr Phe Gly Gln Gly Thr
225 230 235 240

Lys Val Glu Ile Lys
245

<210> 278
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence 2 of CDR 2 in the heavy chain of mouse anti-hTfR antibody No. 6

<400> 278

Ile Ile Trp Gly Asp Gly Ser Thr Asn Tyr His Ser Ala Leu Ile Ser
1 5 10 15

<210> 279
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence 2 of CDR 2 in the heavy chain of mouse anti-hTfR antibody No. 8

<400> 279

Ile Ile Trp Gly Asp Gly Ser Thr Asn Tyr Arg Ser Ala Leu Ile Ser
1 5 10 15