

SEQUENCE LISTING

<110> WuXi Biologics (Shanghai) Co.,Ltd.

<120> Novel monoclonal antibodies to cytotoxic
T-lymphocyte-associated protein 4 (CTLA-4)

<130> PCTF1701

<160> 47

<170> PatentIn version 3.3

<210> 1

<211> 114

<212> PRT

<213> Artificial Sequence

<400> 1

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

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

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

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

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

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

Arg Met Glu Arg Ile Pro Thr Trp Gly Gln Gly Val Met Val Thr Val
100 105 110

Ser Ser

<210> 2

<211> 115

<212> PRT
<213> Artificial Sequence

<400> 2

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

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

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

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

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

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

Ala Arg His Leu Trp Phe Ala Tyr Trp Gly Gln Gly Thr Leu Val Thr
100 105 110

Val Ser Ser
115

<210> 3
<211> 120
<212> PRT
<213> Artificial Sequence

<400> 3

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

Ser Leu Ser Leu Thr Cys Ser Val Thr Tyr His Thr Ile Thr Ser Gly
20 25 30

Tyr Asp Trp Thr Trp Ile Arg Lys Phe Pro Gly Asn Gln Met Glu Trp
35 40 45

Met Gly Tyr Ile Ser Tyr Ser Gly Asn Thr Asn Tyr Asn Pro Ser Leu
50 55 60

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

Leu His Leu Asn Ser Val Thr Ser Glu Asp Thr Ala Thr Tyr Tyr Cys
85 90 95

Ala Ser Met Met Val Pro His Tyr Tyr Val Met Asp Ala Trp Gly Gln
100 105 110

Gly Ala Ser Val Thr Val Ser Ser
115 120

<210> 4
<211> 119
<212> PRT
<213> Artificial Sequence

<400> 4

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

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

Phe Met Asn Trp Val Lys Gln Ser Pro Gly Gln Gly Leu Glu Trp Ile
35 40 45

Gly Arg Val Asp Pro Glu Asn Gly Arg Ala Asp Tyr Ala Glu Lys Phe
50 55 60

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

Ile His Leu Ser Ser Leu Thr Ser Glu Asp Thr Ala Thr Tyr Phe Cys
85 90 95

Ala Arg Arg Ala Met Asp Asn Tyr Gly Phe Ala Tyr Trp Gly Gln Gly

100

105

110

Thr Leu Val Thr Val Ser Ser
115

<210> 5

<211> 115

<212> PRT

<213> Artificial Sequence

<400> 5

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 Asp Leu Thr Phe Ser Asn Tyr
20 25 30

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

Ala Ser Ile Ser Pro Ser Gly Gly Asn Thr Tyr Tyr Arg 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 His Leu Trp Phe Ala Tyr Trp Gly Gln Gly Thr Leu Val Thr
100 105 110

Val Ser Ser
115

<210> 6

<211> 120

<212> PRT

<213> Artificial Sequence

<400> 6

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

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Thr	Leu	Ser	Leu
	20		
Thr	Cys	Ser	Val
			25
Thr	Tyr	His	Thr
			30
Ile	Thr	Ser	Gly
Tyr	Asp	Trp	Thr
	35		
Trp	Ile	Arg	Lys
			40
Pro	Pro	Gly	Lys
			45
Gly	Met	Glu	Trp
Ile	Gly	Tyr	Ile
	50		
Ser	Tyr	Ser	Gly
			55
Asn	Thr	Asn	Tyr
			60
Asn	Pro	Ser	Leu
Lys	Ser	Arg	Val
	65		
Thr	Ile	Ser	Arg
	70		
Asp	Thr	Ser	Lys
			75
Asn	Gln	Phe	Phe
			80
Leu	Lys	Leu	Ser
			85
Ser	Val	Thr	Ala
Ala	Ala	Asp	Thr
			90
Ala	Val	Tyr	Tyr
			95
Cys			
Ala	Ser	Met	Met
			100
Val	Pro	His	Tyr
Tyr	Tyr	Val	Met
			105
Asp	Ala	Trp	Gly
			110
Gln			
Gly	Thr	Leu	Val
			115
Thr	Val	Ser	Ser
			120
<210>	7		
<211>	119		
<212>	PRT		
<213>	Artificial Sequence		
<400>	7		
Gln	Val	Gln	Leu
			5
Val	Gln	Ser	Gly
Ala	Glu	Val	Lys
			10
Lys	Lys	Pro	Gly
			15
Ser			
Ser	Val	Lys	Val
			20
Ser	Cys	Lys	Ala
Ser	Gly	Tyr	Thr
			25
Phe	Thr	Asn	Tyr
			30
Phe	Met	Asn	Trp
			35
Val	Arg	Gln	Ala
			40
Pro	Gly	Gln	Gly
Leu	Glu	Trp	Met
			45
Gly	Arg	Val	Asp
			50
Pro	Glu	Gln	Gly
			55
Arg	Ala	Asp	Tyr
			60
Ala	Glu	Lys	Phe

Lys Lys 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 Arg Ala Met Asp Asn Tyr Gly Phe Ala Tyr Trp Gly Gln Gly
100 105 110

Thr Leu Val Thr Val Ser Ser
115

<210> 8
<211> 110
<212> PRT
<213> Artificial Sequence

<400> 8

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

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

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

Leu Leu Ile Tyr Arg Thr Ser Asn Leu Ala Ser Gly Ile Pro Ala Arg
50 55 60

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

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

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

<210> 9
<211> 107
<212> PRT

<213> Artificial Sequence

<400> 9

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

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

Leu Ile Trp Phe Gln Gln Lys Pro Gly Lys Ser Pro Arg Pro Met Ile
35 40 45

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

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

<210> 10

<211> 112

<212> PRT

<213> Artificial Sequence

<400> 10

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

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

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

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

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

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

Thr His Asp Pro Trp Thr Phe Gly Gly Gly Thr Lys Leu Glu Leu Lys
100 105 110

<210> 11
<211> 106
<212> PRT
<213> Artificial Sequence

<400> 11

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

Glu Lys Ile Thr Ile Thr Cys Ser Ala Asn Ser Ser Leu Ser Tyr Met
20 25 30

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

Gly Thr Ser Asn Leu Ala Ser Gly Val Pro Asp Arg Phe Ser Gly Ser
50 55 60

Gly Ser Gly Thr Ser Tyr Tyr Leu Thr Ile Asn Thr Met Glu Ala Glu
65 70 75 80

Asp Ala Ala Thr Tyr Phe Cys His His Trp Ser Asn Thr Gln Trp Thr
85 90 95

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

<210> 12
<211> 107
<212> PRT
<213> Artificial Sequence

<400> 12

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 Gln Ala Ser Gln Asp Ile Gly Ser Asn
20 25 30

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

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

Ser Arg 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 Leu Gln Tyr Lys Gln Tyr Pro Arg
85 90 95

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

<210> 13

<211> 112

<212> PRT

<213> Artificial Sequence

<400> 13

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 Leu Asn Ser
20 25 30

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

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

Asn 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 Val Gln Gly
85 90 95

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

<210> 14
<211> 106
<212> PRT
<213> Artificial Sequence

<400> 14

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 Ser Ala Asn Ser Ala Leu Ser Tyr Met
20 25 30

Tyr Trp Tyr Gln Gln Lys Pro Asp Gln Ser Pro Lys Leu Trp Val His
35 40 45

Gly Thr Ser Asn Leu Ala Ser Gly Val Pro Ser Arg Phe Ser Gly Ser
50 55 60

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

Asp Ala Ala Thr Tyr Tyr Cys His His Trp Ser Asn Thr Gln Trp Thr
85 90 95

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

<210> 15
<211> 6
<212> PRT
<213> Artificial Sequence

<400> 15

Met Glu Arg Ile Pro Thr
1 5

<210> 16
<211> 6
<212> PRT
<213> Artificial Sequence

<400> 16

His Leu Trp Phe Ala Tyr
1 5

<210> 17
<211> 11
<212> PRT
<213> Artificial Sequence

<400> 17

Met Met Val Pro His Tyr Tyr Val Met Asp Ala
1 5 10

<210> 18
<211> 10
<212> PRT
<213> Artificial Sequence

<400> 18

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

<210> 19
<211> 9
<212> PRT
<213> Artificial Sequence

<400> 19

Gln Gln Ser Arg Glu Ser Pro Leu Thr
1 5

<210> 20
<211> 9
<212> PRT
<213> Artificial Sequence

<400> 20

Leu Gln Tyr Lys Gln Tyr Pro Arg Thr

1 5

<210> 21
<211> 9
<212> PRT
<213> Artificial Sequence

<400> 21

Val Gln Gly Thr His Asp Pro Trp Thr
1 5

<210> 22
<211> 9
<212> PRT
<213> Artificial Sequence

<400> 22

His His Trp Ser Asn Thr Gln Trp Thr
1 5

<210> 23
<211> 16
<212> PRT
<213> Artificial Sequence

<400> 23

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

<210> 24
<211> 17
<212> PRT
<213> Artificial Sequence

<400> 24

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

Gly

<210> 25
<211> 16
<212> PRT

<213> Artificial Sequence

<400> 25

Tyr	Ile	Ser	Tyr	Ser	Gly	Asn	Thr	Asn	Tyr	Asn	Pro	Ser	Leu	Lys	Ser
1				5					10					15	

<210> 26

<211> 17

<212> PRT

<213> Artificial Sequence

<400> 26

Arg	Val	Asp	Pro	Glu	Asn	Gly	Arg	Ala	Asp	Tyr	Ala	Glu	Lys	Phe	Lys
1				5					10					15	

Lys

<210> 27

<211> 17

<212> PRT

<213> Artificial Sequence

<400> 27

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

Gly

<210> 28

<211> 17

<212> PRT

<213> Artificial Sequence

<400> 28

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

Lys

<210> 29

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

<400> 29

Arg Thr Ser Asn Leu Ala Ser
1 5

<210> 30
<211> 7
<212> PRT
<213> Artificial Sequence

<400> 30

Tyr Ala Thr His Leu Ala Asp
1 5

<210> 31
<211> 7
<212> PRT
<213> Artificial Sequence

<400> 31

Leu Val Ser Lys Leu Gly Ser
1 5

<210> 32
<211> 7
<212> PRT
<213> Artificial Sequence

<400> 32

Gly Thr Ser Asn Leu Ala Ser
1 5

<210> 33
<211> 5
<212> PRT
<213> Artificial Sequence

<400> 33

Ser Ser Ala Met His
1 5

<210> 34
<211> 5
<212> PRT
<213> Artificial Sequence

<400> 34

Asn Tyr Asp Met Ala
1 5

<210> 35
<211> 6
<212> PRT
<213> Artificial Sequence

<400> 35

Ser Gly Tyr Asp Trp Thr
1 5

<210> 36
<211> 5
<212> PRT
<213> Artificial Sequence

<400> 36

Asn Tyr Phe Met Asn
1 5

<210> 37
<211> 10
<212> PRT
<213> Artificial Sequence

<400> 37

Arg Ala Ser Gln Ser Val Ser Ile Ser Ser Ile Asn Leu Ile His
1 5 10 15

<210> 38
<211> 11
<212> PRT
<213> Artificial Sequence

<400> 38

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

<210> 39
<211> 16
<212> PRT
<213> Artificial Sequence

<400> 39

Arg	Ser	Ser	Gln	Ser	Leu	Leu	Asn	Ser	Asp	Gly	Asn	Thr	Tyr	Leu	Tyr
1				5					10					15	

<210> 40
<211> 10
<212> PRT
<213> Artificial Sequence

<400> 40

Ser	Ala	Asn	Ser	Ser	Leu	Ser	Tyr	Met	Tyr
1				5					10

<210> 41
<211> 10
<212> PRT
<213> Artificial Sequence

<400> 41

Ser	Ala	Asn	Ser	Ala	Leu	Ser	Tyr	Met	Tyr
1				5					10

<210> 42
<211> 345
<212> DNA
<213> Artificial Sequence

<400> 42

gaggtgcagc	tggtggagag	cggcggagga	ctggtgcaac	ctggcggaag	cctgagactg	60
agctgcgccg	ccagcgacct	gaccttcagc	aactacgaca	tggcctgggt	gagacaggcc	120
cctggcaagg	gactggagtg	ggtggccagc	atcagcccca	gcggcggcaa	cacctactac	180
agggacagcg	tgaagggcag	gttcaccatc	agcagggaca	acgccaagaa	cagcctgtac	240
ctgcagatga	acagcctgag	ggccgaggac	accgccgtgt	actactgcgc	caggcacctg	300
tggttcgcct	actggggcca	gggcacactg	gtgaccgtga	gcagc		345

<210> 43
<211> 360
<212> DNA
<213> Artificial Sequence

<400> 43
caggtgcagc tgcaggagag cggacccgga ctggtgaagc cctccgagac cctgagcctg 60
acctgcagcg tgacctacca caccatcacc agcggctacg actggacctg gatcagaaaag 120
ccccccggca aaggcatgga gtggatcggc tacatcagct acagcggcaa caccaactac 180
aaccacagcc tgaagagcag ggtgaccatc agcagggaca ccagcaagaa ccagttcttc 240
ctgaagctga gcagcgtgac agccgccgat accgccgtgt actactgcgc cagcatgatg 300
gtgccccact actacgtgat ggacgcctgg ggacagggca ccctggtgac agtgagcagc 360

<210> 44
<211> 357
<212> DNA
<213> Artificial Sequence

<400> 44
caggtgcagc tggtgcagag cggagccgag gtgaagaagc ccggcagcag cgtgaaggtg 60
agctgcaagg ccagcggcta caccttcacc aactacttca tgaactgggt gaggcaggcc 120
cctggacaag gcctggagtg gatgggcaga gtggatcccg agcagggcag ggccgactac 180
gccgagaagt tcaagaagag ggtgaccatc accgccgaca agagcaccag caccgcctac 240
atggagctga gcagcctgag gagcgaggac accgccgtgt actactgcgc caggagagcc 300
atggacaact acggcttcgc ctactggggc cagggaaccc tggtgaccgt gagcagc 357

<210> 45
<211> 321
<212> DNA
<213> Artificial Sequence

<400> 45
gacatccaga tgaccagag ccctagcagc ctgagcgcca gcgtgggcga tagggtgacc 60
atcacctgcc aggccagcca ggacatcggc agcaacctga tctggttcca gcagaagccc 120
ggcaaggccc ccaagcctat gatctactac gccacccacc tggccgatgg cgtgcctagc 180
agattcagcg gcagcagaag cggcaccgac tacaccctga ccatcagcag cctgcagccc 240
gaggacttcg ccacctacta ctgcctgcag tacaagcagt accccagaac cttcggcggc 300

ggcaccaagg tggagatcaa g 321

<210> 46
<211> 336
<212> DNA
<213> Artificial Sequence

<400> 46
gacatcgtga tgaccagac ccccctgagc ctgagcgtga cacctggaca gcccgccagc 60
atcagctgca ggtccagcca gagcctgctg aacagcgacg gcaacaccta cctgtactgg 120
tacctgcaga agcctggcca gagccccag ctgctgatct acctggtgtc caagctgggc 180
agcggcgtgc ctaacaggtt tagcggcagc ggcagcggca ccgatttcac cctgaagatc 240
agcaggggtgg aggccgagga tgtgggcgtg tactactgcg tgcagggcac ccacgaccc 300
tggaccttcg gcggcggaac caaggtggag atcaag 336

<210> 47
<211> 318
<212> DNA
<213> Artificial Sequence

<400> 47
gagatcgtgc tgaccagag ccccgacttc cagagcgtga cccccaagga gaaggtgacc 60
atcacctgca gcgccaacag cgccctgagc tacatgtact ggtaccagca gaagcccgac 120
cagagcccca agctgtgggt gcacggcacc agcaatctgg ccagcggcgt gcctagcaga 180
tttagcggca gcggcagcgg caccgatttc accctgacca tcaacagcct ggaggccgag 240
gacgccgcta cctactactg ccaccactgg agcaacaccc agtggacctt cggcggcggc 300
accaaggtgg agatcaag 318