

SEQUENCE LISTING

<110> Pieris AG

<120> Novel proteins specific for LAG-3

<130> PIE15433PCT

<150> EP 15 176 740.7

<151> 2015-07-15

<160> 58

<170> PatentIn version 3.5

<210> 1

<211> 158

<212> PRT

<213> Homo sapiens

<220>

<223> Human tear lipocalin

<400> 1

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

Trp	Tyr	Leu	Lys	Ala	Met	Thr	Val	Asp	Arg	Glu	Phe	Pro	Glu	Met	Asn
		20						25					30		

Leu	Glu	Ser	Val	Thr	Pro	Met	Thr	Leu	Thr	Thr	Leu	Glu	Gly	Gly	Asn
		35					40					45			

Leu	Glu	Ala	Lys	Val	Thr	Met	Leu	Ile	Ser	Gly	Arg	Cys	Gln	Glu	Val
	50					55					60				

Lys	Ala	Val	Leu	Glu	Lys	Thr	Asp	Glu	Pro	Gly	Lys	Tyr	Thr	Ala	Asp
65					70					75					80

Gly	Gly	Lys	His	Val	Ala	Tyr	Ile	Ile	Arg	Ser	His	Val	Lys	Asp	His
			85						90					95	

Tyr Ile Phe Tyr Cys Glu Gly Glu Leu His Gly Lys Pro Val Arg Gly
100 105 110

Val Lys Leu Val Gly Arg Asp Pro Lys Asn Asn Leu Glu Ala Leu Glu
115 120 125

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

Leu Ile Pro Arg Gln Ser Glu Thr Cys Ser Pro Gly Ser Asp
145 150 155

<210> 2

<211> 676

<212> PRT

<213> Artificial Sequence

<220>

<223> Fusion protein of Cynomolgus LAG-3 extracellular domain and IgG1
Fc

<400> 2

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

Pro Ala Gln Leu Pro Cys Ser Pro Thr Ile Pro Leu Gln Asp Leu Ser
20 25 30

Leu Leu Arg Arg Ala Gly Val Thr Trp Gln His Gln Pro Asp Ser Gly
35 40 45

Pro Pro Ala Pro Ala Pro Gly His Pro Pro Val Pro Gly His Arg Pro
50 55 60

Ala Ala Pro Tyr Ser Trp Gly Pro Arg Pro Arg Arg Tyr Thr Val Leu
65 70 75 80

Ser Val Gly Pro Gly Gly Leu Arg Ser Gly Arg Leu Pro Leu Gln Pro

85

90

95

Arg Val Gln Leu Asp Glu Arg Gly Arg Gln Arg Gly Asp Phe Ser Leu
 100 105 110

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

Val His Leu Arg Asp Arg Ala Leu Ser Cys Arg Leu Arg Leu Arg Val
 130 135 140

Gly Gln Ala Ser Met Thr Ala Ser Pro Pro Gly Ser Leu Arg Thr Ser
 145 150 155 160

Asp Trp Val Ile Leu Asn Cys Ser Phe Ser Arg Pro Asp Arg Pro Ala
 165 170 175

Ser Val His Trp Phe Arg Ser Arg Gly Gln Gly Arg Val Pro Val Gln
 180 185 190

Gly Ser Pro His His His Leu Ala Glu Ser Phe Leu Phe Leu Pro His
 195 200 205

Val Gly Pro Met Asp Ser Gly Leu Trp Gly Cys Ile Leu Thr Tyr Arg
 210 215 220

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

Glu Pro Ala Thr Pro Leu Thr Val Tyr Ala Gly Ala Gly Ser Arg Val
 245 250 255

Glu Leu Pro Cys Arg Leu Pro Pro Ala Val Gly Thr Gln Ser Phe Leu
 260 265 270

Thr Ala Lys Trp Ala Pro Pro Gly Gly Gly Pro Asp Leu Leu Val Ala
 275 280 285

Gly Asp Asn Gly Asp Phe Thr Leu Arg Leu Glu Asp Val Ser Gln Ala
290 295 300

Gln Ala Gly Thr Tyr Ile Cys His Ile Arg Leu Gln Gly Gln Gln Leu
305 310 315 320

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

Gly Ser Pro Gly Ser Leu Gly Lys Leu Leu Cys Glu Val Thr Pro Ala
340 345 350

Ser Gly Gln Glu His Phe Val Trp Ser Pro Leu Asn Thr Pro Ser Gln
355 360 365

Arg Ser Phe Ser Gly Pro Trp Leu Glu Ala Gln Glu Ala Gln Leu Leu
370 375 380

Ser Gln Pro Trp Gln Cys Gln Leu His Gln Gly Glu Arg Leu Leu Gly
385 390 395 400

Ala Ala Val Tyr Phe Thr Glu Leu Ser Ser Pro Gly Ala Gln Arg Ser
405 410 415

Gly Arg Ala Pro Gly Ala Leu Arg Ala Gly His Leu Ile Glu Gly Arg
420 425 430

Met Asp Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly
435 440 445

Ser Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu
450 455 460

Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu
465 470 475 480

Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser

485

490

495

His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu
 500 505 510

Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr
 515 520 525

Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn
 530 535 540

Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro
 545 550 555 560

Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln
 565 570 575

Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln Val
 580 585 590

Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val
 595 600 605

Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro
 610 615 620

Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr
 625 630 635 640

Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val
 645 650 655

Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu
 660 665 670

Ser Pro Gly Lys
 675

<210> 3
<211> 152
<212> PRT
<213> Artificial Sequence

<220>
<223> negative control 4008wt

<400> 3

Ala Ser Asp Glu Glu Ile Gln Asp Val Ser Gly Thr Trp Tyr Leu Lys
1 5 10 15

Ala Met Thr Val Asp Arg Glu Cys Pro Glu Met Asn Leu Glu Ser Val
20 25 30

Thr Pro Met Thr Leu Thr Thr Leu Glu Gly Gly Asn Leu Glu Ala Lys
35 40 45

Val Thr Met Leu Ile Ser Gly Arg Ser Gln Glu Val Lys Ala Val Leu
50 55 60

Glu Lys Thr Asp Glu Pro Gly Lys Tyr Thr Ala Asp Gly Gly Lys His
65 70 75 80

Val Ala Tyr Ile Ile Arg Ser His Val Lys Asp His Tyr Ile Phe Tyr
85 90 95

Ser Glu Gly Glu Cys His Gly Lys Pro Val Pro Gly Val Trp Leu Val
100 105 110

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

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

Gln Ser Glu Thr Ser Ser Pro Gly
145 150

<210> 4
<211> 152
<212> PRT
<213> Artificial Sequence

<220>
<223> negative control 4009wt

<400> 4

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

Ala Met Thr Val Asp Arg Glu Phe Pro Glu Met Asn Leu Glu Ser Val
20 25 30

Thr Pro Met Thr Leu Thr Thr Leu Glu Gly Gly Asn Leu Glu Ala Lys
35 40 45

Val Thr Met Leu Ile Ser Gly Arg Cys Gln Glu Val Lys Ala Val Leu
50 55 60

Glu Lys Thr Asp Glu Pro Gly Lys Tyr Thr Ala Asp Gly Gly Lys His
65 70 75 80

Val Ala Tyr Ile Ile Arg Ser His Val Lys Asp His Tyr Ile Phe Tyr
85 90 95

Ser Glu Gly Glu Leu His Gly Lys Pro Val Arg Gly Val Lys Leu Val
100 105 110

Gly Arg Asp Pro Thr Asn Asn Leu Glu Ala Leu Glu Asp Phe Glu Lys
115 120 125

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

Gln Ser Glu Thr Cys Ser Pro Gly
145 150

<210> 5
<211> 447
<212> PRT
<213> Artificial Sequence

<220>
<223> benchmark antibody heavy chain

<400> 5

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

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

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

Gly Glu Ile Asn His Arg Gly Ser Thr Asn Ser Asn Pro Ser Leu Lys
50 55 60

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

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

Phe Gly Tyr Ser Asp Tyr Glu Tyr Asn Trp Phe Asp Pro Trp Gly Gln
100 105 110

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Pro Ser Gln Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu

355

360

365

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

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

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

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

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

<210> 6

<211> 214

<212> PRT

<213> Artificial Sequence

<220>

<223> benchmark antibody light chain

<400> 6

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 Ser Tyr
 20 25 30

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

Tyr Asp Ala Ser Asn Arg Ala Thr 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 Arg Ser Asn Trp Pro Leu	85		90		95	
Thr Phe Gly Gln Gly Thr Asn Leu 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> 7
 <211> 152
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> lipocalin mutein

<400> 7

Ala Ser Asp Glu Glu Ile Gln Asp Val Ser Gly Thr Trp Tyr Leu Lys

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

<210> 8
 <211> 152
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> lipocalin mutein

<400> 8

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

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

<210> 9
 <211> 152
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> lipocalin mutein

<400> 9

Ala Ser Asp Glu Glu Ile Gln Asp Val Ser Gly Thr Trp Tyr Leu Lys

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

<210> 10
 <211> 152
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> lipocalin mutein

<400> 10

Ala Ser Asp Glu Glu Ile Gln Asp Val Ser Gly Thr Trp Tyr Leu Lys

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

<210> 11
 <211> 152
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> lipocalin mutein

<400> 11

Ala Ser Asp Glu Glu Ile Gln Asp Val Ser Gly Thr Trp Tyr Leu Lys

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

<210> 12
 <211> 152
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> lipocalin mutein

<400> 12

Ala Ser Asp Glu Glu Ile Gln Asp Val Ser Gly Thr Trp Tyr Leu Lys

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

<210> 13
 <211> 152
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> lipocalin mutein

<400> 13

Ala Ser Asp Glu Glu Ile Gln Asp Val Ser Gly Thr Trp Tyr Leu Lys

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

<210> 14
 <211> 152
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> lipocalin mutein

<400> 14

Ala Ser Asp Glu Glu Ile Gln Asp Val Ser Gly Thr Trp Tyr Leu Lys

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

<210> 15
 <211> 152
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> lipocalin mutein

<400> 15

Ala Ser Asp Glu Glu Ile Gln Asp Val Ser Gly Thr Trp Tyr Leu Lys

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

<210> 16
 <211> 152
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> lipocalin mutein

<400> 16

Ala Ser Asp Glu Glu Ile Gln Asp Val Ser Gly Thr Trp Tyr Leu Lys

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

<210> 17
 <211> 152
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> lipocalin mutein

<400> 17

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

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

<210> 18
 <211> 152
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> lipocalin mutein

<400> 18

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

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

<210> 19
 <211> 152
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> lipocalin mutein

<400> 19

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

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

<210> 20
 <211> 152
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> lipocalin mutein

<400> 20

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

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

<210> 21
 <211> 152
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> lipocalin mutein

<400> 21

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

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

<210> 22
 <211> 152
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> lipocalin mutein

<400> 22

Ala Ser Asp Glu Glu Ile Gln Asp Val Ser Gly Thr Trp Tyr Leu Lys

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

<210> 23
 <211> 637
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> lipocalin mutein

<400> 23
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gaaggcggca atctggaggc taaggtcacc atggatatat ttgggttctg gcaggagggtg	180
aaagcagtgt tagagaagac agatgaaccg ggtaaataata cggccgatgg cggtaaacad	240
gttgccctata tcattcgcag ccatgtgaaa gatcattaca tcttttatag cgagggcgag	300
tgcgcagggt ttccggttcc aggggtgtgg ctctgtgggca gagaccccaa gaacaacctg	360
gaagccttgg aggactttga gaaagccgca ggagcccgcg gactcagcac ggagagcatc	420
ctcatcccca ggcagagcga aaccagctct ccagggagcg cttggtctca cccgcagttc	480
gaaaaataat aagcttgacc tgtgaagtga aaaatggcgc acattgtgcg acattttttt	540
tgtctgccgt ttaccgctac tgcgtcacgg atctccacgc gccctgtagc ggcgcattaa	600
gcgcggcggg tgtggtggtt acgcgcagcg tgaccgc	637

<210> 24
 <211> 637
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> lipocalin mutein

<400> 24	
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tctggggaag atcctgagat gactctggaa tcagttacgc caatgactct gactaccctt	120
gaaggcggca atctggaggc taacgtcacc gcactgatcg atgggcgctg tcaagaagtg	180
aagaatgtgc tcgagaagac agatgaaccg ggtaaataca cggaggacgg cggtaaacad	240
gtggattata tcattagatc tcatgtgaaa gatcattaca tcttctactt tgagggcgag	300
gggcatggca ctccggcacg tactgtggca ctggtgggca gagaccccac caataatctg	360
gaagccttgg aggactttga gaaagccgca ggagcccgcg gactcagcac ggagagcatc	420
ctcatcccca ggcagagcga aacctgctct ccagggagcg cttggtctca cccgcagttc	480
gaaaaataat aagcttgacc tgtgaagtga aaaatggcgc acattgtgcg acattttttt	540
tgtctgccgt ttaccgctac tgcgtcacgg atctccacgc gccctgtagc ggcgcattaa	600

gcgcggcggg tgtggtggtt acgcgcagcg tgaccgc 637

<210> 25
<211> 637
<212> DNA
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 25
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gatttttgtgt gtctgtatga tgtgcctgag tcagttacgc caatgactct gactaccctt 120
gaaggcggca atctggaggc taaggtcacc atgcaaatat ggggggagct gcaagagggtg 180
aaagcagtgt tagagaagac agatgaaccg ggtaaataata cggccgatgg cggtaaacad 240
gttgccctata tcattcgcag ccatgtgaaa gatcattaca tcttttatag cgagggttat 300
tgtgtgggggt atcctgttcc aggggtgtgg ctctgtgggca gagaccccaa gaacaacctg 360
gaagccttgg aggactttga gaaagccgca ggagcccgcg gactcagcac ggagagcatc 420
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gaaaaataat aagcttgacc tgtgaagtga aaaatggcgc acattgtgcg acattttttt 540
tgtctgccgt ttaccgctac tgcgtcacgg atctccacgc gccctgtagc ggcgcatata 600
gcgcggcggg tgtggtggtt acgcgcagcg tgaccgc 637

<210> 26
<211> 456
<212> DNA
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 26
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gatgagactt gttgggtggt tgtggatcat tcagttacgc caatgactct gactaccctt 120
gaaggcggca atctggaggc taaggtcacc atgaatctct ggggggttctg gcaggagggtg 180

aaagcagtgt tagagaagac agatgaaccg ggtaaataata cggccgatgg cggtaaacad	240
gttgccctata tcattcgcag ccatgtgaaa gatcattaca tcttttatag cgaggagag	300
tgccaagggt ggccggttcc aggggtgtgg ctctgtgggca gagaccccaa gaacaacctg	360
gaagccttgg aggactttga gaaagccgca ggagcccgcg gactcagcac ggagagcatc	420
ctcatcccca ggcagagcga aaccagctct ccaggg	456

<210> 27
 <211> 637
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> lipocalin mutein

<400> 27	
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gattctgatt gcttttggat tgatgatgtg tcagttacgc caatgactct gactaccctt	120
gaaggcggca atctggaggc taaggtcacc atggatattt ttggcttttg gcaggaagtg	180
aaagcagtgt tagagaagac agatgaaccg ggtaaataata cggccgatgg cggcaaacad	240
gttgccctata tcattcgcag ccatgtgaaa gatcattaca tcttttatag cgaggcgaa	300
tgcgctggct atccggttcc aggggtgtgg ctctgtgggca gagaccccaa gaacaacctg	360
gaagccttgg aggactttga gaaagccgca ggagcccgcg gactcagcac ggagagcatc	420
ctcatcccca ggcagagcga aaccagctct ccaggagcgc cttggtctca cccgcagttc	480
gaaaaataat aagcttgacc tgtgaagtga aaaatggcgc acattgtgcg acattttttt	540
tgtctgccgt ttaccgctac tgcgtcacgg atctccacgc gccctgtagc ggcgcatata	600
gcgcggcggg tgtggtggtt acgcgcagcg tgaccgc	637

<210> 28
 <211> 637
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> lipocalin mutein

<400> 28
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gattcggatt gcttttggat tgatgagggtg tcagttacgc caatgactct gactaccctt 120
gaaggcggca atctggaggc taaggtcacc atggatattt ttggcttttg gcaggaagtg 180
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gttgccata tcattcgcag ccatgtgaaa gatcattaca tcttttatag cgagggcgaa 300
tgcgctggct atccggttcc aggggtgtgg ctctgtgggca gagaccccaa gaacaacctg 360
gaagccttgg aggactttga gaaagccgca ggagcccgcg gactcagcac ggagagcatc 420
ctcatcccca ggcagagcga aaccagctct ccaggggagcg cttggtctca cccgcagttc 480
gaaaaataat aagcttgacc tgtgaagtga aaaaatggcgc acattgtgcg acattttttt 540
tgtctgccgt ttaccgctac tgcgtcacgg atctccacgc gccctgtagc ggcgcatata 600
gcgcggcggg tgtggtggtt acgcgcagcg tgaccgc 637

<210> 29
<211> 637
<212> DNA
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 29
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gattctgatt gtttttggat agaggagtgg tcagctacgc caatgactct gactaccctt 120
gaagggtggcg atctggaggc taaggtcacc atggatatata tcgggttctg gcaggagggtg 180
aaagcagtgt tagagaagac agatgaaccg ggtaaataata cggccgatgg cggtaaacad 240
gctgcctata tcattcgcag ccatgtgaaa gatcattaca tcttttatag cgagggcgag 300
tgcgcagggt ttccggtccc gggggtgtgg ctctgtgggca gagaccccaa gaacaacctg 360
gaagccttgg aggactttga gaaagccgca ggagcccgcg gactcggcac ggagagcatc 420
ctcatcccca ggcagagcga aaccagctct ccaggggcaa gcgcttggtc tcacccgcag 480

ttcgaataat aataagcttg acctgtgaag tgaaaaatgg cgcacattgt gcgacatttt	540
ttttgtctgc cgtttaccgc tactgcgtca cggatctcca cgcgccctgt agcggcgcgcat	600
taagcgcggc ggggtgtgggtg gttacgcgca gcgtgac	637

<210> 30
 <211> 637
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> lipocalin mutein

<400> 30	
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gattcggatt gcttttggat tgatgagggtg tcagttacgc caatgactct gactaccctt	120
gaaggcggca atctggaggc taaggtcacc atggatattt ttggcttttg gcaggaagtg	180
aaagcagtgt tagagaagac agatgaaccg ggtaaataata cggccgatgg cggcaaacad	240
gttgccctata tcattcgcag ccatgtgaaa gatcattaca tcttttatag cgagggcgaa	300
tgcgagggct ttccggttcc aggggtgtgg ctctgtgggca gagaccccaa gaacaacctg	360
gaagccttgg aggactttga gaaagccgca ggagcccgcg gactcagcac ggagagcatc	420
ctcatcccca ggcagagcga aaccagctct ccaggagcgc cttggtctca cccgcagttc	480
gaaaaataat aagcttgacc tgtgaagtga aaaatggcgc acattgtgcg acattttttt	540
tgtctgccgt ttaccgctac tgcgtcacgg atctccacgc gccctgtagc ggcgcatata	600
gcgcggcggg tgtggtggtt acgcgcagcg tgaccgc	637

<210> 31
 <211> 637
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> lipocalin mutein

<400> 31	
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gattctgatt gtttttggat agaggagtgg tcagctacgc caatgactct gactaccctt	120
gaaggcggca atctggaggc tgaggccacc atggatatat ttgggttctg gcaggagggtg	180
aaagcagtgt tggagaagac agacgaaccg ggtaaataata cggccgatgg cggtaaacad	240
gttgccctata tcattcgcag ccatgtgaaa gatcattaca tcttttatag cgagggcgag	300
tgcgcagggt ttccgggtccc gggggtgtgg ctcgtgggca gagaccccaa gaacaacctg	360
gaagccttgg aggactttga gaaagccgca ggagcccgcg gactcagcac ggagagcatc	420
ctcatcccca ggcagagcga aaccagctct ccaggggccaa gcgcttggtc tcacccgcag	480
ttcgaaaaat aataagcttg acctgtgaag tgaaaaatgg cgcacattgt gcgacatttt	540
ttttgtctgc cgtttaccgc tactgcgtca cggatctcca cgcgccctgt agcggcgcat	600
taagcgcggc ggggtgtggtg gttacgcgca gcgtgac	637

<210> 32
 <211> 637
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> lipocalin mutein

<400> 32	
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gattcggatt gcttttgggt ggatgagggt tcagttacgc caatgactct gactaccctt	120
gaaggcggca atctggaggc taaggtcacc atggatatat ttggcttttg gcaggaagtg	180
aaagcagtgt tagagaagac agatgaaccg ggtaaataata cggccgatgg cggcaaacat	240
gttgccctata tcattcgcag ccatgtgaaa gatcattaca tcttttatag cgagggcgaa	300
tgcgctggct ttccggttcc aggggtgtgg ctcgtgggca gagaccccaa gaacaacctg	360
gaagccttgg aggactttga gaaagccgca ggagcccgcg gactcagcac ggagagcatc	420
ctcatcccca ggcagagcga aaccagctct ccagggagcg cttggtctca cccgcagttc	480
gaaaaataat aagcttgacc tgtgaagtga aaaatggcgc acattgtgcg acattttttt	540
tgtctgccgt ttaccgctac tgcgtcacgg atctccacgc gccctgtagc ggcgcatata	600

gcgcggcggg tgtggtggtt acgcgcagcg tgaccgc 637

<210> 33
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<212> DNA
<213> Artificial Sequence

<220>
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<400> 33
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gaaggcggca atctggaggc tagtgtgacc gctctgattg atggccgctg ccaggaagtg 180
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gtggattata tcattagatc tcatgtgaaa gatcattaca tcttctactt tgaaggcgaa 300
ggttatggca cgccgggtcg catggtggct ctggtgggca gagacccac caataatctg 360
gaagccttgg aggactttga gaaagccgca ggagcccgcg gactcagcac ggagagcatc 420
ctcatcccca ggcagagcga aacctgctct ccaggagcg cttggtctca cccgcagttc 480
gaaaaataat aagcttgacc tgtgaagtga aaaatggcgc acattgtgcg acattttttt 540
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gcgcggcggg tgtggtggtt acgcgcagcg tgaccgc 637

<210> 34
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<213> Artificial Sequence

<220>
<223> lipocalin mutein

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gaaggcggca atctggaggc ttctgtgacc gcgctgattg atggccgctg ccaggaagtg 180

aaaaatgtgc tcgagaagac agatgaaccg ggtaaataca cggaggatgg cggcaaacat	240
gtggattata tcattagatc tcatgtgaaa gatcattaca tcttctactt tgaaggcgaa	300
ggtcattggca ctccggctcg cacggtggct ctggtgggca gagacccac caataatctg	360
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ctcatcccca ggcagagcga aacctgctct ccaggagcg cttggtctca cccgcagttc	480
gaaaaataat aagcttgacc tgtgaagtga aaaatggcgc acattgtgcg acattttttt	540
tgtctgccgt ttaccgctac tgcgtcacgg atctccacgc gccctgtagc ggcgcattaa	600
gcgcggcggg tgtggtggtt acgcgcagcg tgaccgc	637

<210> 35
 <211> 637
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> lipocalin mutein

<400> 35	
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tctgatgaag atcctgagat gacgctggaa tcagttacgc caatgactct gactaccctt	120
gaaggcggca atctggaggc tagtgtgacc gcgctgattg atggccgctg ccaggaagtg	180
aaaaatgtgc tcgagaagac agatgaaccg ggtaaataca cggaggatgg cggcaaacat	240
gtggattata tcattagatc tcatgtgaaa gatcattaca tcttctactt tgaaggcgaa	300
ggtcagggca cgccgggtcg catggtggct ctggtgggca gagacccac caataatctg	360
gaagccttgg aggactttga gaaagccgca ggagcccgcg gactcagcac ggagagcatc	420
ctcatcccca ggcagagcga aacctgctct ccaggagcg cttggtctca cccgcagttc	480
gaaaaataat aagcttgacc tgtgaagtga aaaatggcgc acattgtgcg acattttttt	540
tgtctgccgt ttaccgctac tgcgtcacgg atctccacgc gccctgtagc ggcgcattaa	600
gcgcggcggg tgtggtggtt acgcgcagcg tgaccgc	637

<210> 36

<211> 637
<212> DNA
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 36
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<210> 37
<211> 637
<212> DNA
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 37
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gggcagggca cgccgggtcg catggtggct ctggtgggca gagacccac caataatctg	360
gaagccttgg aggactttga gaaagccgca ggagcccgcg gactcagcac ggagagcatc	420
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gaaaaataat aagcttgacc tgtgaagtga aaaatggcgc acattgtgcg acattttttt	540
tgtctgccgt ttaccgctac tgcgtcacgg atctccacgc gccctgtagc ggcgcattaa	600
gcgcggcggg tgtggtgggtt acgcgcagcg tgaccgc	637

<210> 38
 <211> 637
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> lipocalin mutein

<400> 38	
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gaaggcggca atctggaggc taaggtcacc atgcagattt ggggcgagcc gcaggaagtg	180
aaagcagtgt tagagaagac agatgaaccg ggtaaataata cggccgatgg cggcaaacat	240
gttgccata tcatcgcag ccatgtgaaa gatcattaca tcttttatag cgagggtat	300
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ctcatcccca ggcagagcga aaccagctct ccaggggagcg cttggtctca cccgcagttc	480
gaaaaataat aagcttgacc tgtgaagtga aaaatggcgc acattgtgcg acattttttt	540
tgtctgccgt ttaccgctac tgcgtcacgg atctccacgc gccctgtagc ggcgcattaa	600
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<210> 39
 <211> 456
 <212> DNA
 <213> Artificial Sequence

<220>

<223> lipocalin mutein

<400> 39

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gaaggcggca atctggaggc taaggtcacc atggatatat ttgggttctg gcaggaggtg	180
aaagcagtgt tagagaagac agatgaaccg ggtaaataata cggccgatgg cggtaaacat	240
gttgccata tcattcgcag ccatgtgaaa gatcattaca tcttttatag cgagggcgag	300
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gaagccttgg aggactttga gaaagccgca ggagcccgcg gactcagcac ggagagcatc	420
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<210> 40

<211> 456

<212> DNA

<213> Artificial Sequence

<220>

<223> lipocalin mutein

<400> 40

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gaaggcggca atctggaggc taacgtcacc gcactgatcg atgggcgctg tcaagaagtg	180
aagaatgtgc tcgagaagac agatgaaccg ggtaaataca cggaggacgg cggtaaacat	240
gtggattata tcattagatc tcatgtgaaa gatcattaca tcttctactt tgagggcgag	300
gggcatggca ctccggcacg tactgtggca ctggtgggca gagaccccac caataatctg	360
gaagccttgg aggactttga gaaagccgca ggagcccgcg gactcagcac ggagagcatc	420
ctcatcccca ggcagagcga aacctgctct ccaggg	456

<210> 41

<211> 456

<212> DNA

<213> Artificial Sequence

<220>

<223> lipocalin mutein

<400> 41

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gattttgtgt gtctgtatga tgtgcctgag tcagttacgc caatgactct gactaccctt	120
gaaggcggca atctggaggc taaggtcacc atgcaaatat ggggggagct gcaagagggtg	180
aaagcagtgt tagagaagac agatgaaccg ggtaaataata cggccgatgg cggtaaacat	240
gttgccata tcattcgcag ccatgtgaaa gatcattaca tcttttatag cgagggctat	300
tgtgtggggt atcctgttcc aggggtgtgg ctctgtgggca gagaccccaa gaacaacctg	360
gaagccttgg aggactttga gaaagccgca ggagcccgcg gactcagcac ggagagcatc	420
ctcatcccca ggcagagcga aaccagctct ccaggg	456

<210> 42

<211> 456

<212> DNA

<213> Artificial Sequence

<220>

<223> lipocalin mutein

<400> 42

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gatgagactt gttggtggta tgtggatcat tcagttacgc caatgactct gactaccctt	120
gaaggcggca atctggaggc taaggtcacc atgaatctct gggggttctg gcaggagggtg	180
aaagcagtgt tagagaagac agatgaaccg ggtaaataata cggccgatgg cggtaaacat	240
gttgccata tcattcgcag ccatgtgaaa gatcattaca tcttttatag cgagggagag	300
tgccaagggt ggccggttcc aggggtgtgg ctctgtgggca gagaccccaa gaacaacctg	360
gaagccttgg aggactttga gaaagccgca ggagcccgcg gactcagcac ggagagcatc	420
ctcatcccca ggcagagcga aaccagctct ccaggg	456

<210> 43

<211> 456
<212> DNA
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 43
gcctcagacg aggagattca ggatgtgtca gggacgtggt atctgaaggc catgacggtg 60
gattctgatt gcttttggat tgatgatgtg tcagttacgc caatgactct gactaccctt 120
gaaggcggca atctggaggc taaggtcacc atggatattt ttggcttttg gcaggaagtg 180
aaagcagtgt tagagaagac agatgaaccg ggtaaataata cggccgatgg cggcaaacaat 240
gttgccctata tcattcgcag ccatgtgaaa gatcattaca tcttttatag cgagggcgaa 300
tgcgctggct atccggttcc aggggtgtgg ctctgtgggca gagaccccaa gaacaacctg 360
gaagccttgg aggactttga gaaagccgca ggagcccgcg gactcagcac ggagagcatc 420
ctcatcccca ggcagagcga aaccagctct ccaggg 456

<210> 44
<211> 456
<212> DNA
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 44
gcctcagacg aggagattca ggatgtgtca gggacgtggt atctgaaggc catgacggtg 60
gattcggatt gcttttggat tgatgagggtg tcagttacgc caatgactct gactaccctt 120
gaaggcggca atctggaggc taaggtcacc atggatattt ttggcttttg gcaggaagtg 180
aaagcagtgt tagagaagac agatgaaccg ggtaaataata cggccgatgg cggcaaacaat 240
gttgccctata tcattcgcag ccatgtgaaa gatcattaca tcttttatag cgagggcgaa 300
tgcgctggct atccggttcc aggggtgtgg ctctgtgggca gagaccccaa gaacaacctg 360
gaagccttgg aggactttga gaaagccgca ggagcccgcg gactcagcac ggagagcatc 420
ctcatcccca ggcagagcga aaccagctct ccaggg 456

<210> 45
<211> 456
<212> DNA
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 45
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gaagggtggcg atctggaggc taaggtcacc atggatatat tcgggttctg gcaggagggtg 180
aaagcagtgt tagagaagac agatgaaccg ggtaaataata cggccgatgg cggtaaacad 240
gctgcctata tcattcgcag ccatgtgaaa gatcattaca tcttttatag cgagggcgag 300
tgcgcagggt ttccgggtccc ggggggtgtgg ctctgtgggca gagaccccaa gaacaacctg 360
gaagccttgg aggactttga gaaagccgca ggagcccgcg gactcggcac ggagagcatc 420
ctcatcccca ggcagagcga aaccagctct ccaggg 456

<210> 46
<211> 456
<212> DNA
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 46
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gaaggcggca atctggaggc taaggtcacc atggatatatt ttggcttttg gcaggaagtg 180
aaagcagtgt tagagaagac agatgaaccg ggtaaataata cggccgatgg cggcaaacad 240
gttgcctata tcattcgcag ccatgtgaaa gatcattaca tcttttatag cgagggcgaa 300
tgcgagggtt ttccgggttcc aggggtgtgg ctctgtgggca gagaccccaa gaacaacctg 360
gaagccttgg aggactttga gaaagccgca ggagcccgcg gactcagcac ggagagcatc 420

ctcatcccca ggcagagcga aaccagctct ccaggg 456

<210> 47
<211> 456
<212> DNA
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 47
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gattctgatt gtttttggat agaggagtgg tcagctacgc caatgactct gactaccctt 120
gaaggcggca atctggaggc tgaggccacc atggatatat ttgggttctg gcaggagggtg 180
aaagcagtgt tggagaagac agacgaaccg ggtaaataata cggccgatgg cggtaaacaat 240
gttgccata tcattcgcag ccatgtgaaa gatcattaca tcttttatag cgagggcgag 300
tgcgcagggt ttccgggtccc ggggggtgtgg ctctgtgggca gagaccccaa gaacaacctg 360
gaagccttgg aggactttga gaaagccgca ggagcccgcg gactcagcac ggagagcatc 420
ctcatcccca ggcagagcga aaccagctct ccaggg 456

<210> 48
<211> 456
<212> DNA
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 48
gcctcagacg aggagattca ggatgtgtca gggacgtggt atctgaaggc catgacgggtg 60
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gaaggcggca atctggaggc taaggtcacc atggatatat ttggcttttg gcaggaagtg 180
aaagcagtgt tagagaagac agatgaaccg ggtaaataata cggccgatgg cggcaaacaat 240
gttgccata tcattcgcag ccatgtgaaa gatcattaca tcttttatag cgagggcgaa 300
tgcgctggct ttccgggtcc aggggtgtgg ctctgtgggca gagaccccaa gaacaacctg 360

gaagccttgg aggactttga gaaagccgca ggagcccgcg gactcagcac ggagagcatc	420
ctcatcccca ggcagagcga aaccagctct ccaggg	456

<210> 49
 <211> 456
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> lipocalin mutein

<400> 49	
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gaaggcggca atctggaggc tagtgtgacc gctctgattg atggccgctg ccaggaagtg	180
aaaaatgtgc tcgagaagac agatgaaccg ggtaaataca cggaggatgg cggcaaacat	240
gtggattata tcattagatc tcatgtgaaa gatcattaca tcttctactt tgaaggcgaa	300
ggttatggca cgccgggtcg catggtggct ctggtgggca gagacccac caataatctg	360
gaagccttgg aggactttga gaaagccgca ggagcccgcg gactcagcac ggagagcatc	420
ctcatcccca ggcagagcga aacctgctct ccaggg	456

<210> 50
 <211> 456
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> lipocalin mutein

<400> 50	
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gaaggcggca atctggaggc ttctgtgacc gcgctgattg atggccgctg ccaggaagtg	180
aaaaatgtgc tcgagaagac agatgaaccg ggtaaataca cggaggatgg cggcaaacat	240
gtggattata tcattagatc tcatgtgaaa gatcattaca tcttctactt tgaaggcgaa	300

ggtcattggca ctccggctcg cacggtggct ctggtgggca gagacccac caataatctg	360
gaagccttgg aggactttga gaaagccgca ggagcccgcg gactcagcac ggagagcatc	420
ctcatcccca ggcagagcga aacctgctct ccaggg	456

<210> 51
 <211> 456
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> lipocalin mutein

<400> 51	
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gaaggcggca atctggaggc tagtgtgacc gcgctgattg atggccgctg ccaggaagtg	180
aaaaatgtgc tcgagaagac agatgaaccg ggtaaataca cggaggatgg cggcaaacat	240
gtggattata tcattagatc tcatgtgaaa gatcattaca tcttctactt tgaaggcgaa	300
ggtcagggca cgccgggtcg catggtggct ctggtgggca gagacccac caataatctg	360
gaagccttgg aggactttga gaaagccgca ggagcccgcg gactcagcac ggagagcatc	420
ctcatcccca ggcagagcga aacctgctct ccaggg	456

<210> 52
 <211> 456
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> lipocalin mutein

<400> 52	
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gaaggcggca atctggaggc tagtgtgacc gctctgattg atggccgctg ccaggaagtg	180
aaaaatgtgc tcgagaagac agatgaaccg ggtaaataca cggaggatgg cggcaaacat	240

gtggattata tcattagatc tcatgtgaaa gatcattaca tcttctactt tgaaggcgaa	300
ggatcatggca cgccgggtcg catggtggct ctggtgggca gagacccac caataatctg	360
gaagccttgg aggactttga gaaagccgca ggagcccgcg gactcagcac ggagagcatc	420
ctcatcccca ggcagagcga aacctgctct ccaggg	456

<210> 53
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 <212> DNA
 <213> Artificial Sequence

<220>
 <223> lipocalin mutein

<400> 53	
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gaaggcggca atctggaggc tcgtgtgacc gttctgattg atggccgctg ccaggaagtg	180
aaaaatgtgc tcgagaagac agatgaaccg ggtaaataca cggaggatgg cggcaaacat	240
gtggattata tcattagatc tcatgtgaaa gatcattaca tcttctactt tgaaggcgaa	300
gggcagggca cgccgggtcg catggtggct ctggtgggca gagacccac caataatctg	360
gaagccttgg aggactttga gaaagccgca ggagcccgcg gactcagcac ggagagcatc	420
ctcatcccca ggcagagcga aacctgctct ccaggg	456

<210> 54
 <211> 456
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> lipocalin mutein

<400> 54	
gcctcagacg aggagattca ggatgtgtca gggacgtggt atctgaaggc catgacggtg	60
gattttgtgt gcctgaatga ttatcctgag tcagttacgc caatgactct gactaccctt	120
gaaggcggca atctggaggc taaggtcacc atgcagattt ggggcgagcc gcaggaagtg	180

aaagcagtgt tagagaagac agatgaaccg ggtaaataata cggccgatgg cggcaaacat	240
gttgccata tcatcgcag ccatgtgaaa gatcattaca tcttttatag cgagggtat	300
tgcacgggct atccgggtcc aggggtgtgg ctctgtgggca gagaccccaa gaacaacctg	360
gaagccttgg aggactttga gaaagccgca ggagcccgcg gactcagcac ggagagcatc	420
ctcatcccca ggcagagcga aaccagctct ccaggg	456

<210> 55
 <211> 4
 <212> PRT
 <213> Homo sapiens

<220>
 <223> N-terminal sequence of human tear lipocalin

<400> 55

His His Leu Leu
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<210> 56
 <211> 4
 <212> PRT
 <213> Artificial sequence

<220>
 <223> Factor Xa cleavage site

<400> 56

Ile Glu Gly Arg
 1

<210> 57
 <211> 10
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> SA linker and strep-tag II fusion peptide

<400> 57

Ser Ala Trp Ser His Pro Gln Phe Glu Lys
1 5 10

<210> 58

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Strep-tag II peptide

<400> 58

Trp Ser His Pro Gln Phe Glu Lys
1 5