

IP-1198-PCT_SequenceListing
SEQUENCE LISTING

<110> Illumina, Inc.

<120> MODIFIED TRANSPOSASES FOR IMPROVED INSERTION SEQUENCE BIAS

<130> IP-1198-PCT

<160> 26

<170> PatentIn version 3.5

<210> 1

<211> 476

<212> PRT

<213> Unknown

<220>

<223> Transposase Tn5

<400> 1

Met	Ile	Thr	Ser	Ala	Leu	His	Arg	Ala	Ala	Asp	Trp	Ala	Lys	Ser	Val
1				5				10					15		

Phe	Ser	Ser	Ala	Ala	Leu	Gly	Asp	Pro	Arg	Arg	Thr	Ala	Arg	Leu	Val
			20					25				30			

Asn	Val	Ala	Ala	Gln	Leu	Ala	Lys	Tyr	Ser	Gly	Lys	Ser	Ile	Thr	Ile
		35					40					45			

Ser	Ser	Glu	Gly	Ser	Glu	Ala	Met	Gln	Glu	Gly	Ala	Tyr	Arg	Phe	Ile
	50					55					60				

Arg	Asn	Pro	Asn	Val	Ser	Ala	Glu	Ala	Ile	Arg	Lys	Ala	Gly	Ala	Met
65					70					75					80

Gln	Thr	Val	Lys	Leu	Ala	Gln	Glu	Phe	Pro	Glu	Leu	Leu	Ala	Ile	Glu
			85						90					95	

Asp	Thr	Thr	Ser	Leu	Ser	Tyr	Arg	His	Gln	Val	Ala	Glu	Glu	Leu	Gly
			100					105					110		

IP-1198-PCT_SequenceListing

Lys Leu Gly Ser Ile Gln Asp Lys Ser Arg Gly Trp Trp Val His Ser
115 120 125

Val Leu Leu Leu Glu Ala Thr Thr Phe Arg Thr Val Gly Leu Leu His
130 135 140

Gln Glu Trp Trp Met Arg Pro Asp Asp Pro Ala Asp Ala Asp Glu Lys
145 150 155 160

Glu Ser Gly Lys Trp Leu Ala Ala Ala Ala Thr Ser Arg Leu Arg Met
165 170 175

Gly Ser Met Met Ser Asn Val Ile Ala Val Cys Asp Arg Glu Ala Asp
180 185 190

Ile His Ala Tyr Leu Gln Asp Lys Leu Ala His Asn Glu Arg Phe Val
195 200 205

Val Arg Ser Lys His Pro Arg Lys Asp Val Glu Ser Gly Leu Tyr Leu
210 215 220

Tyr Asp His Leu Lys Asn Gln Pro Glu Leu Gly Gly Tyr Gln Ile Ser
225 230 235 240

Ile Pro Gln Lys Gly Val Val Asp Lys Arg Gly Lys Arg Lys Asn Arg
245 250 255

Pro Ala Arg Lys Ala Ser Leu Ser Leu Arg Ser Gly Arg Ile Thr Leu
260 265 270

Lys Gln Gly Asn Ile Thr Leu Asn Ala Val Leu Ala Glu Glu Ile Asn
275 280 285

Pro Pro Lys Gly Glu Thr Pro Leu Lys Trp Leu Leu Leu Thr Ser Glu
290 295 300

IP-1198-PCT_SequenceListing

Pro Val Glu Ser Leu Ala Gln Ala Leu Arg Val Ile Asp Ile Tyr Thr
305 310 315 320

His Arg Trp Arg Ile Glu Glu Phe His Lys Ala Trp Lys Thr Gly Ala
325 330 335

Gly Ala Glu Arg Gln Arg Met Glu Glu Pro Asp Asn Leu Glu Arg Met
340 345 350

Val Ser Ile Leu Ser Phe Val Ala Val Arg Leu Leu Gln Leu Arg Glu
355 360 365

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

Ala Glu His Val Glu Ser Gln Ser Ala Glu Thr Val Leu Thr Pro Asp
385 390 395 400

Glu Cys Gln Leu Leu Gly Tyr Leu Asp Lys Gly Lys Arg Lys Arg Lys
405 410 415

Glu Lys Ala Gly Ser Leu Gln Trp Ala Tyr Met Ala Ile Ala Arg Leu
420 425 430

Gly Gly Phe Met Asp Ser Lys Arg Thr Gly Ile Ala Ser Trp Gly Ala
435 440 445

Leu Trp Glu Gly Trp Glu Ala Leu Gln Ser Lys Leu Asp Gly Phe Leu
450 455 460

Ala Ala Lys Asp Leu Met Ala Gln Gly Ile Lys Ile
465 470 475

<210> 2

<211> 476

IP-1198-PCT_SequenceListing

<212> PRT

<213> Unknown

<220>

<223> Transposase Tn5

<220>

<221> Variant

<222> (248)..(248)

<223> X = Y, T, K, S, L, A, W, P, G, R, F, H

<400> 2

Met Ile Thr Ser Ala Leu His Arg Ala Ala Asp Trp Ala Lys Ser Val
1 5 10 15

Phe Ser Ser Ala Ala Leu Gly Asp Pro Arg Arg Thr Ala Arg Leu Val
20 25 30

Asn Val Ala Ala Gln Leu Ala Lys Tyr Ser Gly Lys Ser Ile Thr Ile
35 40 45

Ser Ser Glu Gly Ser Glu Ala Met Gln Glu Gly Ala Tyr Arg Phe Ile
50 55 60

Arg Asn Pro Asn Val Ser Ala Glu Ala Ile Arg Lys Ala Gly Ala Met
65 70 75 80

Gln Thr Val Lys Leu Ala Gln Glu Phe Pro Glu Leu Leu Ala Ile Glu
85 90 95

Asp Thr Thr Ser Leu Ser Tyr Arg His Gln Val Ala Glu Glu Leu Gly
100 105 110

Lys Leu Gly Ser Ile Gln Asp Lys Ser Arg Gly Trp Trp Val His Ser
115 120 125

Val Leu Leu Leu Glu Ala Thr Thr Phe Arg Thr Val Gly Leu Leu His
130 135 140

IP-1198-PCT_SequenceListing

Gln Glu Trp Trp Met Arg Pro Asp Asp Pro Ala Asp Ala Asp Glu Lys
145 150 155 160

Glu Ser Gly Lys Trp Leu Ala Ala Ala Ala Thr Ser Arg Leu Arg Met
165 170 175

Gly Ser Met Met Ser Asn Val Ile Ala Val Cys Asp Arg Glu Ala Asp
180 185 190

Ile His Ala Tyr Leu Gln Asp Lys Leu Ala His Asn Glu Arg Phe Val
195 200 205

Val Arg Ser Lys His Pro Arg Lys Asp Val Glu Ser Gly Leu Tyr Leu
210 215 220

Tyr Asp His Leu Lys Asn Gln Pro Glu Leu Gly Gly Tyr Gln Ile Ser
225 230 235 240

Ile Pro Gln Lys Gly Val Val Xaa Lys Arg Gly Lys Arg Lys Asn Arg
245 250 255

Pro Ala Arg Lys Ala Ser Leu Ser Leu Arg Ser Gly Arg Ile Thr Leu
260 265 270

Lys Gln Gly Asn Ile Thr Leu Asn Ala Val Leu Ala Glu Glu Ile Asn
275 280 285

Pro Pro Lys Gly Glu Thr Pro Leu Lys Trp Leu Leu Leu Thr Ser Glu
290 295 300

Pro Val Glu Ser Leu Ala Gln Ala Leu Arg Val Ile Asp Ile Tyr Thr
305 310 315 320

His Arg Trp Arg Ile Glu Glu Phe His Lys Ala Trp Lys Thr Gly Ala
325 330 335

IP-1198-PCT_SequenceListing

Gly Ala Glu Arg Gln Arg Met Glu Glu Pro Asp Asn Leu Glu Arg Met
340 345 350

Val Ser Ile Leu Ser Phe Val Ala Val Arg Leu Leu Gln Leu Arg Glu
355 360 365

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

Ala Glu His Val Glu Ser Gln Ser Ala Glu Thr Val Leu Thr Pro Asp
385 390 395 400

Glu Cys Gln Leu Leu Gly Tyr Leu Asp Lys Gly Lys Arg Lys Arg Lys
405 410 415

Glu Lys Ala Gly Ser Leu Gln Trp Ala Tyr Met Ala Ile Ala Arg Leu
420 425 430

Gly Gly Phe Met Asp Ser Lys Arg Thr Gly Ile Ala Ser Trp Gly Ala
435 440 445

Leu Trp Glu Gly Trp Glu Ala Leu Gln Ser Lys Leu Asp Gly Phe Leu
450 455 460

Ala Ala Lys Asp Leu Met Ala Gln Gly Ile Lys Ile
465 470 475

<210> 3
<211> 476
<212> PRT
<213> Unknown

<220>
<223> Transposase Tn5

<220>

IP-1198-PCT_SequenceListing

<221> Variant

<222> (119)..(119)

<223> X = L, M, S, A, V

<400> 3

Met Ile Thr Ser Ala Leu His Arg Ala Ala Asp Trp Ala Lys Ser Val
1 5 10 15

Phe Ser Ser Ala Ala Leu Gly Asp Pro Arg Arg Thr Ala Arg Leu Val
20 25 30

Asn Val Ala Ala Gln Leu Ala Lys Tyr Ser Gly Lys Ser Ile Thr Ile
35 40 45

Ser Ser Glu Gly Ser Glu Ala Met Gln Glu Gly Ala Tyr Arg Phe Ile
50 55 60

Arg Asn Pro Asn Val Ser Ala Glu Ala Ile Arg Lys Ala Gly Ala Met
65 70 75 80

Gln Thr Val Lys Leu Ala Gln Glu Phe Pro Glu Leu Leu Ala Ile Glu
85 90 95

Asp Thr Thr Ser Leu Ser Tyr Arg His Gln Val Ala Glu Glu Leu Gly
100 105 110

Lys Leu Gly Ser Ile Gln Xaa Lys Ser Arg Gly Trp Trp Val His Ser
115 120 125

Val Leu Leu Leu Glu Ala Thr Thr Phe Arg Thr Val Gly Leu Leu His
130 135 140

Gln Glu Trp Trp Met Arg Pro Asp Asp Pro Ala Asp Ala Asp Glu Lys
145 150 155 160

Glu Ser Gly Lys Trp Leu Ala Ala Ala Ala Thr Ser Arg Leu Arg Met
165 170 175

IP-1198-PCT_SequenceListing

Gly Ser Met Met Ser Asn Val Ile Ala Val Cys Asp Arg Glu Ala Asp
180 185 190

Ile His Ala Tyr Leu Gln Asp Lys Leu Ala His Asn Glu Arg Phe Val
195 200 205

Val Arg Ser Lys His Pro Arg Lys Asp Val Glu Ser Gly Leu Tyr Leu
210 215 220

Tyr Asp His Leu Lys Asn Gln Pro Glu Leu Gly Gly Tyr Gln Ile Ser
225 230 235 240

Ile Pro Gln Lys Gly Val Val Asp Lys Arg Gly Lys Arg Lys Asn Arg
245 250 255

Pro Ala Arg Lys Ala Ser Leu Ser Leu Arg Ser Gly Arg Ile Thr Leu
260 265 270

Lys Gln Gly Asn Ile Thr Leu Asn Ala Val Leu Ala Glu Glu Ile Asn
275 280 285

Pro Pro Lys Gly Glu Thr Pro Leu Lys Trp Leu Leu Leu Thr Ser Glu
290 295 300

Pro Val Glu Ser Leu Ala Gln Ala Leu Arg Val Ile Asp Ile Tyr Thr
305 310 315 320

His Arg Trp Arg Ile Glu Glu Phe His Lys Ala Trp Lys Thr Gly Ala
325 330 335

Gly Ala Glu Arg Gln Arg Met Glu Glu Pro Asp Asn Leu Glu Arg Met
340 345 350

Val Ser Ile Leu Ser Phe Val Ala Val Arg Leu Leu Gln Leu Arg Glu
355 360 365

IP-1198-PCT_SequenceListing

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

Ala Glu His Val Glu Ser Gln Ser Ala Glu Thr Val Leu Thr Pro Asp
385 390 395 400

Glu Cys Gln Leu Leu Gly Tyr Leu Asp Lys Gly Lys Arg Lys Arg Lys
405 410 415

Glu Lys Ala Gly Ser Leu Gln Trp Ala Tyr Met Ala Ile Ala Arg Leu
420 425 430

Gly Gly Phe Met Asp Ser Lys Arg Thr Gly Ile Ala Ser Trp Gly Ala
435 440 445

Leu Trp Glu Gly Trp Glu Ala Leu Gln Ser Lys Leu Asp Gly Phe Leu
450 455 460

Ala Ala Lys Asp Leu Met Ala Gln Gly Ile Lys Ile
465 470 475

<210> 4
<211> 476
<212> PRT
<213> Unknown

<220>
<223> Transposase Tn5

<400> 4

Met Ile Thr Ser Ala Leu His Arg Ala Ala Asp Trp Ala Lys Ser Val
1 5 10 15

Phe Ser Ser Ala Ala Leu Gly Asp Pro Arg Arg Thr Ala Arg Leu Val
20 25 30

IP-1198-PCT_SequenceListing

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

IP-1198-PCT_SequenceListing

Tyr Asp His Leu Lys Asn Gln Pro Glu Leu Gly Gly Tyr Gln Ile Ser
225 230 235 240

Ile Pro Gln Lys Gly Val Val Asp Lys Arg Gly Lys Arg Lys Asn Arg
245 250 255

Pro Ala Arg Lys Ala Ser Leu Ser Leu Arg Ser Gly Arg Ile Thr Leu
260 265 270

Lys Gln Gly Asn Ile Thr Leu Asn Ala Val Leu Ala Glu Glu Ile Asn
275 280 285

Pro Pro Lys Gly Glu Thr Pro Leu Lys Trp Leu Leu Leu Thr Ser Glu
290 295 300

Pro Val Glu Ser Leu Ala Gln Ala Leu Arg Val Ile Asp Ile Tyr Thr
305 310 315 320

His Arg Trp Arg Ile Glu Glu Phe His Lys Ala Trp Lys Thr Gly Ala
325 330 335

Gly Ala Glu Arg Gln Arg Met Glu Glu Pro Asp Asn Leu Glu Arg Met
340 345 350

Val Ser Ile Leu Ser Phe Val Ala Val Arg Leu Leu Gln Leu Arg Glu
355 360 365

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

Ala Glu His Val Glu Ser Gln Ser Ala Glu Thr Val Leu Thr Pro Asp
385 390 395 400

Glu Cys Gln Leu Leu Gly Tyr Leu Asp Lys Gly Lys Arg Lys Arg Lys
405 410 415

IP-1198-PCT_SequenceListing

Glu Lys Ala Gly Ser Leu Gln Trp Ala Tyr Met Ala Ile Ala Arg Leu
420 425 430

Gly Gly Phe Met Asp Ser Lys Arg Thr Gly Ile Ala Ser Trp Gly Ala
435 440 445

Leu Trp Glu Gly Trp Glu Ala Leu Gln Ser Lys Leu Asp Gly Phe Leu
450 455 460

Ala Ala Lys Asp Leu Met Ala Gln Gly Ile Lys Ile
465 470 475

<210> 5
<211> 477
<212> PRT
<213> Unknown

<220>
<223> Transposase Tn5

<400> 5

Met Ile Thr Ser Ala Leu His Arg Ala Ala Asp Trp Ala Lys Ser Val
1 5 10 15

Phe Ser Ser Ala Ala Leu Gly Asp Pro Arg Arg Thr Ala Arg Leu Val
20 25 30

Asn Val Ala Ala Gln Leu Ala Lys Tyr Ser Gly Lys Ser Ile Thr Ile
35 40 45

Ser Ser Glu Gly Ser Glu Ala Met Gln Glu Gly Ala Tyr Arg Phe Ile
50 55 60

Arg Asn Pro Asn Val Ser Ala Glu Ala Ile Arg Lys Ala Gly Ala Met
65 70 75 80

Gln Thr Val Lys Leu Ala Gln Glu Phe Pro Glu Leu Leu Ala Ile Glu
85 90 95

IP-1198-PCT_SequenceListing

Asp Thr Thr Ser Leu Ser Tyr Arg His Gln Val Ala Glu Glu Leu Gly
100 105 110

Lys Leu Gly Ser Ile Gln Asp Lys Ser Arg Gly Trp Trp Val His Ser
115 120 125

Val Leu Leu Leu Glu Ala Thr Thr Phe Arg Thr Val Gly Leu Leu His
130 135 140

Gln Glu Trp Trp Met Arg Pro Asp Asp Pro Ala Asp Ala Asp Glu Lys
145 150 155 160

Glu Ser Gly Lys Trp Leu Ala Ala Ala Thr Ser Arg Leu Arg Met
165 170 175

Gly Ser Met Met Ser Asn Val Ile Ala Val Cys Asp Arg Glu Ala Asp
180 185 190

Ile His Ala Tyr Leu Gln Asp Lys Leu Ala His Asn Glu Arg Phe Val
195 200 205

Val Arg Ser Lys His Pro Arg Lys Asp Val Glu Ser Gly Leu Tyr Leu
210 215 220

Tyr Asp His Leu Lys Asn Gln Pro Glu Leu Gly Gly Tyr Gln Ile Ser
225 230 235 240

Ile Pro Gln Lys Gly Val Val Asp Val Lys Arg Gly Lys Arg Lys Asn
245 250 255

Arg Pro Ala Arg Lys Ala Ser Leu Ser Leu Arg Ser Gly Arg Ile Thr
260 265 270

Leu Lys Gln Gly Asn Ile Thr Leu Asn Ala Val Leu Ala Glu Glu Ile
275 280 285

IP-1198-PCT_SequenceListing

Asn Pro Pro Lys Gly Glu Thr Pro Leu Lys Trp Leu Leu Leu Thr Ser
290 295 300

Glu Pro Val Glu Ser Leu Ala Gln Ala Leu Arg Val Ile Asp Ile Tyr
305 310 315 320

Thr His Arg Trp Arg Ile Glu Glu Phe His Lys Ala Trp Lys Thr Gly
325 330 335

Ala Gly Ala Glu Arg Gln Arg Met Glu Glu Pro Asp Asn Leu Glu Arg
340 345 350

Met Val Ser Ile Leu Ser Phe Val Ala Val Arg Leu Leu Gln Leu Arg
355 360 365

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

Glu Ala Glu His Val Glu Ser Gln Ser Ala Glu Thr Val Leu Thr Pro
385 390 395 400

Asp Glu Cys Gln Leu Leu Gly Tyr Leu Asp Lys Gly Lys Arg Lys Arg
405 410 415

Lys Glu Lys Ala Gly Ser Leu Gln Trp Ala Tyr Met Ala Ile Ala Arg
420 425 430

Leu Gly Gly Phe Met Asp Ser Lys Arg Thr Gly Ile Ala Ser Trp Gly
435 440 445

Ala Leu Trp Glu Gly Trp Glu Ala Leu Gln Ser Lys Leu Asp Gly Phe
450 455 460

Leu Ala Ala Lys Asp Leu Met Ala Gln Gly Ile Lys Ile
465 470 475

IP-1198-PCT_SequenceListing

<210> 6
 <211> 476
 <212> PRT
 <213> Unknown

<220>
 <223> Transposase Tn5

<220>
 <221> Variant
 <222> (120)..(120)
 <223> X = Y, F, W, E

<400> 6

Met Ile Thr Ser Ala Leu His Arg Ala Ala Asp Trp Ala Lys Ser Val
 1 5 10 15

Phe Ser Ser Ala Ala Leu Gly Asp Pro Arg Arg Thr Ala Arg Leu Val
 20 25 30

Asn Val Ala Ala Gln Leu Ala Lys Tyr Ser Gly Lys Ser Ile Thr Ile
 35 40 45

Ser Ser Glu Gly Ser Glu Ala Met Gln Glu Gly Ala Tyr Arg Phe Ile
 50 55 60

Arg Asn Pro Asn Val Ser Ala Glu Ala Ile Arg Lys Ala Gly Ala Met
 65 70 75 80

Gln Thr Val Lys Leu Ala Gln Glu Phe Pro Glu Leu Leu Ala Ile Glu
 85 90 95

Asp Thr Thr Ser Leu Ser Tyr Arg His Gln Val Ala Glu Glu Leu Gly
 100 105 110

Lys Leu Gly Ser Ile Gln Asp Xaa Ser Arg Gly Trp Trp Val His Ser
 115 120 125

IP-1198-PCT_SequenceListing

Val Leu Leu Leu Glu Ala Thr Thr Phe Arg Thr Val Gly Leu Leu His
130 135 140

Gln Glu Trp Trp Met Arg Pro Asp Asp Pro Ala Asp Ala Asp Glu Lys
145 150 155 160

Glu Ser Gly Lys Trp Leu Ala Ala Ala Ala Thr Ser Arg Leu Arg Met
165 170 175

Gly Ser Met Met Ser Asn Val Ile Ala Val Cys Asp Arg Glu Ala Asp
180 185 190

Ile His Ala Tyr Leu Gln Asp Lys Leu Ala His Asn Glu Arg Phe Val
195 200 205

Val Arg Ser Lys His Pro Arg Lys Asp Val Glu Ser Gly Leu Tyr Leu
210 215 220

Tyr Asp His Leu Lys Asn Gln Pro Glu Leu Gly Gly Tyr Gln Ile Ser
225 230 235 240

Ile Pro Gln Lys Gly Val Val Asp Lys Arg Gly Lys Arg Lys Asn Arg
245 250 255

Pro Ala Arg Lys Ala Ser Leu Ser Leu Arg Ser Gly Arg Ile Thr Leu
260 265 270

Lys Gln Gly Asn Ile Thr Leu Asn Ala Val Leu Ala Glu Glu Ile Asn
275 280 285

Pro Pro Lys Gly Glu Thr Pro Leu Lys Trp Leu Leu Leu Thr Ser Glu
290 295 300

Pro Val Glu Ser Leu Ala Gln Ala Leu Arg Val Ile Asp Ile Tyr Thr
305 310 315 320

IP-1198-PCT_SequenceListing

His Arg Trp Arg Ile Glu Glu Phe His Lys Ala Trp Lys Thr Gly Ala
325 330 335

Gly Ala Glu Arg Gln Arg Met Glu Glu Pro Asp Asn Leu Glu Arg Met
340 345 350

Val Ser Ile Leu Ser Phe Val Ala Val Arg Leu Leu Gln Leu Arg Glu
355 360 365

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

Ala Glu His Val Glu Ser Gln Ser Ala Glu Thr Val Leu Thr Pro Asp
385 390 395 400

Glu Cys Gln Leu Leu Gly Tyr Leu Asp Lys Gly Lys Arg Lys Arg Lys
405 410 415

Glu Lys Ala Gly Ser Leu Gln Trp Ala Tyr Met Ala Ile Ala Arg Leu
420 425 430

Gly Gly Phe Met Asp Ser Lys Arg Thr Gly Ile Ala Ser Trp Gly Ala
435 440 445

Leu Trp Glu Gly Trp Glu Ala Leu Gln Ser Lys Leu Asp Gly Phe Leu
450 455 460

Ala Ala Lys Asp Leu Met Ala Gln Gly Ile Lys Ile
465 470 475

<210> 7
<211> 476
<212> PRT
<213> Unknown

<220>

IP-1198-PCT_SequenceListing

<223> Transposase Tn5

<220>

<221> Variant

<222> (119)..(119)

<223> X = L, M, S, A, V

<220>

<221> Variant

<222> (120)..(120)

<223> X = Y, F, W, E

<220>

<221> Variant

<222> (248)..(248)

<223> X = Y, T, K, S, L, A, W, P, G, R, F, H

<400> 7

Met	Ile	Thr	Ser	Ala	Leu	His	Arg	Ala	Ala	Asp	Trp	Ala	Lys	Ser	Val
1				5				10					15		

Phe	Ser	Ser	Ala	Ala	Leu	Gly	Asp	Pro	Arg	Arg	Thr	Ala	Arg	Leu	Val
			20					25				30			

Asn	Val	Ala	Ala	Gln	Leu	Ala	Lys	Tyr	Ser	Gly	Lys	Ser	Ile	Thr	Ile
		35					40					45			

Ser	Ser	Glu	Gly	Ser	Glu	Ala	Met	Gln	Glu	Gly	Ala	Tyr	Arg	Phe	Ile
		50				55					60				

Arg	Asn	Pro	Asn	Val	Ser	Ala	Glu	Ala	Ile	Arg	Lys	Ala	Gly	Ala	Met
65					70					75				80	

Gln	Thr	Val	Lys	Leu	Ala	Gln	Glu	Phe	Pro	Glu	Leu	Leu	Ala	Ile	Glu
			85						90					95	

Asp	Thr	Thr	Ser	Leu	Ser	Tyr	Arg	His	Gln	Val	Ala	Glu	Glu	Leu	Gly
			100					105					110		

IP-1198-PCT_SequenceListing

Lys Leu Gly Ser Ile Gln Xaa Xaa Ser Arg Gly Trp Met Val His Ser
115 120 125

Val Leu Leu Leu Glu Ala Thr Thr Phe Arg Thr Val Gly Leu Leu His
130 135 140

Gln Glu Trp Trp Met Arg Pro Asp Asp Pro Ala Asp Ala Asp Glu Lys
145 150 155 160

Glu Ser Gly Lys Trp Leu Ala Ala Ala Ala Thr Ser Arg Leu Arg Met
165 170 175

Gly Ser Met Met Ser Asn Val Ile Ala Val Cys Asp Arg Glu Ala Asp
180 185 190

Ile His Ala Tyr Leu Gln Asp Lys Leu Ala His Asn Glu Arg Phe Val
195 200 205

Val Arg Ser Lys His Pro Arg Lys Asp Val Glu Ser Gly Leu Tyr Leu
210 215 220

Tyr Asp His Leu Lys Asn Gln Pro Glu Leu Gly Gly Tyr Gln Ile Ser
225 230 235 240

Ile Pro Gln Lys Gly Val Val Xaa Lys Arg Gly Lys Arg Lys Asn Arg
245 250 255

Pro Ala Arg Lys Ala Ser Leu Ser Leu Arg Ser Gly Arg Ile Thr Leu
260 265 270

Lys Gln Gly Asn Ile Thr Leu Asn Ala Val Leu Ala Glu Glu Ile Asn
275 280 285

Pro Pro Lys Gly Glu Thr Pro Leu Lys Trp Leu Leu Leu Thr Ser Glu
290 295 300

IP-1198-PCT_SequenceListing

Pro Val Glu Ser Leu Ala Gln Ala Leu Arg Val Ile Asp Ile Tyr Thr
305 310 315 320

His Arg Trp Arg Ile Glu Glu Phe His Lys Ala Trp Lys Thr Gly Ala
325 330 335

Gly Ala Glu Arg Gln Arg Met Glu Glu Pro Asp Asn Leu Glu Arg Met
340 345 350

Val Ser Ile Leu Ser Phe Val Ala Val Arg Leu Leu Gln Leu Arg Glu
355 360 365

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

Ala Glu His Val Glu Ser Gln Ser Ala Glu Thr Val Leu Thr Pro Asp
385 390 395 400

Glu Cys Gln Leu Leu Gly Tyr Leu Asp Lys Gly Lys Arg Lys Arg Lys
405 410 415

Glu Lys Ala Gly Ser Leu Gln Trp Ala Tyr Met Ala Ile Ala Arg Leu
420 425 430

Gly Gly Phe Met Asp Ser Lys Arg Thr Gly Ile Ala Ser Trp Gly Ala
435 440 445

Leu Trp Glu Gly Trp Glu Ala Leu Gln Ser Lys Leu Asp Gly Phe Leu
450 455 460

Ala Ala Lys Asp Leu Met Ala Gln Gly Ile Lys Ile
465 470 475

<210> 8
<211> 476
<212> PRT
<213> Unknown

IP-1198-PCT_SequenceListing

<220>

<223> Transposase Tn5

<400> 8

Met Ile Thr Ser Ala Leu His Arg Ala Ala Asp Trp Ala Lys Ser Val
1 5 10 15

Phe Ser Ser Ala Ala Leu Gly Asp Pro Arg Arg Thr Ala Arg Leu Val
20 25 30

Asn Val Ala Ala Gln Leu Ala Lys Tyr Ser Gly Lys Ser Ile Thr Ile
35 40 45

Ser Ser Glu Gly Ser Glu Ala Met Gln Glu Gly Ala Tyr Arg Phe Ile
50 55 60

Arg Asn Pro Asn Val Ser Ala Glu Ala Ile Arg Lys Ala Gly Ala Met
65 70 75 80

Gln Thr Val Lys Leu Ala Gln Glu Phe Pro Glu Leu Leu Ala Ile Glu
85 90 95

Asp Thr Thr Ser Leu Ser Tyr Arg His Gln Val Ala Glu Glu Leu Gly
100 105 110

Lys Leu Gly Ser Ile Gln Asp Lys Ser Arg Gly Trp Trp Val His Ser
115 120 125

Val Leu Leu Leu Glu Ala Thr Thr Phe Arg Thr Val Gly Leu Leu His
130 135 140

Gln Glu Trp Trp Met Arg Pro Asp Asp Pro Ala Asp Ala Asp Glu Lys
145 150 155 160

Glu Ser Gly Lys Trp Leu Ala Ala Ala Ala Thr Ser Arg Leu Arg Met
165 170 175

IP-1198-PCT_SequenceListing

Gly Ser Met Met Ser Asn Val Ile Ala Val Cys Asp Arg Glu Ala Asp
180 185 190

Ile His Ala Tyr Leu Gln Asp Lys Leu Ala His Asn Glu Arg Phe Val
195 200 205

Val Arg Ser Arg His Arg Arg Lys Asp Val Glu Ser Gly Leu Tyr Leu
210 215 220

Tyr Asp His Leu Lys Asn Gln Pro Glu Leu Gly Gly Tyr Gln Ile Ser
225 230 235 240

Ile Pro Gln Lys Gly Val Val Asp Lys Arg Gly Lys Arg Lys Asn Arg
245 250 255

Pro Ala Arg Lys Ala Ser Leu Ser Leu Arg Ser Gly Arg Ile Thr Leu
260 265 270

Lys Gln Gly Asn Ile Thr Leu Asn Ala Val Leu Ala Glu Glu Ile Asn
275 280 285

Pro Pro Lys Gly Glu Thr Pro Leu Lys Trp Leu Leu Leu Thr Ser Glu
290 295 300

Pro Val Glu Ser Leu Ala Gln Ala Leu Arg Val Ile Asp Ile Tyr Thr
305 310 315 320

His Arg Trp Arg Ile Glu Glu Phe His Lys Ala Trp Lys Thr Gly Ala
325 330 335

Gly Val Glu Arg Gln Arg Met Glu Glu Pro Asp Asn Leu Glu Arg Met
340 345 350

Val Ser Ile Leu Ser Phe Val Ala Val Arg Leu Leu Gln Leu Arg Glu
355 360 365

IP-1198-PCT_SequenceListing

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

Ala Glu His Val Glu Ser Gln Ser Ala Glu Thr Val Leu Thr Pro Asp
385 390 395 400

Glu Cys Gln Leu Leu Gly Tyr Leu Asp Lys Gly Lys Arg Lys Arg Lys
405 410 415

Glu Lys Ala Gly Ser Leu Gln Trp Ala Tyr Met Ala Ile Ala Arg Leu
420 425 430

Gly Gly Phe Met Asp Ser Lys Arg Thr Gly Ile Ala Ser Trp Gly Ala
435 440 445

Leu Trp Glu Gly Trp Glu Ala Leu Gln Ser Lys Leu Asp Gly Phe Leu
450 455 460

Ala Ala Lys Asp Leu Met Ala Gln Gly Ile Lys Ile
465 470 475

<210> 9
<211> 476
<212> PRT
<213> Unknown

<220>
<223> Transposase Tn5

<400> 9

Met Ile Thr Ser Ala Leu His Arg Ala Ala Asp Trp Ala Lys Ser Val
1 5 10 15

Phe Ser Ser Ala Ala Leu Gly Asp Pro Arg Arg Thr Ala Arg Leu Val
20 25 30

IP-1198-PCT_SequenceListing

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

IP-1198-PCT_SequenceListing

Tyr Asp His Leu Lys Asn Gln Pro Glu Leu Gly Gly Tyr Gln Ile Ser
225 230 235 240

Ile Pro Gln Lys Gly Val Val Asp Lys Arg Arg Lys Arg Lys Asn Arg
245 250 255

Pro Ala Arg Lys Ala Ser Leu Ser Leu Arg Ser Gly Arg Ile Thr Leu
260 265 270

Lys Gln Gly Asn Ile Thr Leu Asn Ala Val Leu Ala Glu Glu Ile Asn
275 280 285

Pro Pro Lys Gly Glu Thr Pro Leu Lys Trp Leu Leu Leu Thr Ser Glu
290 295 300

Pro Val Glu Ser Leu Ala Gln Ala Leu Arg Val Ile Asp Ile Tyr Thr
305 310 315 320

His Arg Trp Arg Ile Glu Glu Phe His Lys Ala Trp Lys Thr Gly Ala
325 330 335

Gly Val Glu Arg Gln Arg Met Glu Glu Pro Asp Asn Leu Glu Arg Met
340 345 350

Val Ser Ile Leu Ser Phe Val Ala Val Arg Leu Leu Gln Leu Arg Glu
355 360 365

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

Ala Glu His Val Glu Ser Gln Ser Ala Glu Thr Val Leu Thr Pro Asp
385 390 395 400

Glu Cys Gln Leu Leu Gly Tyr Leu Asp Lys Gly Lys Arg Lys Arg Lys
405 410 415

IP-1198-PCT_SequenceListing

Glu Lys Ala Gly Ser Leu Gln Trp Ala Tyr Met Ala Ile Ala Arg Leu
420 425 430

Gly Gly Phe Met Asp Ser Lys Arg Thr Gly Ile Ala Ser Trp Gly Ala
435 440 445

Leu Trp Glu Gly Trp Glu Ala Leu Gln Ser Lys Leu Asp Gly Phe Leu
450 455 460

Ala Ala Lys Asp Leu Met Ala Gln Gly Ile Lys Ile
465 470 475

<210> 10
<211> 476
<212> PRT
<213> Unknown

<220>
<223> Transposase Tn5

<400> 10

Met Ile Thr Ser Ala Leu His Arg Ala Ala Asp Trp Ala Lys Ser Val
1 5 10 15

Phe Ser Ser Ala Ala Leu Gly Asp Pro Arg Arg Thr Ala Arg Leu Val
20 25 30

Asn Val Ala Ala Gln Leu Ala Lys Tyr Ser Gly Lys Ser Ile Thr Ile
35 40 45

Ser Ser Glu Gly Ser Glu Ala Met Gln Glu Gly Ala Tyr Arg Phe Ile
50 55 60

Arg Asn Pro Asn Val Ser Ala Glu Ala Ile Arg Lys Ala Gly Ala Met
65 70 75 80

Gln Thr Val Lys Leu Ala Gln Glu Phe Pro Glu Leu Leu Ala Ile Glu
85 90 95

IP-1198-PCT_SequenceListing

Asp Thr Thr Ser Leu Ser Tyr Arg His Gln Val Ala Glu Glu Leu Gly
100 105 110

Lys Leu Gly Ser Ile Gln Asp Lys Ser Arg Gly Trp Trp Val His Ser
115 120 125

Val Leu Leu Leu Glu Ala Thr Thr Phe Arg Thr Val Gly Leu Leu His
130 135 140

Gln Gln Trp Trp Met Arg Pro Asp Asp Pro Ala Asp Ala Asp Glu Lys
145 150 155 160

Glu Ser Gly Lys Trp Leu Ala Ala Ala Ala Thr Ser Arg Leu Arg Met
165 170 175

Gly Ser Met Met Ser Asn Val Ile Ala Val Cys Asp Arg Gly Ala Asp
180 185 190

Ile His Ala Tyr Leu Gln Asp Lys Leu Ala His Asn Glu Arg Phe Val
195 200 205

Val Arg Ser Lys His Pro Arg Lys Asp Val Glu Ser Gly Leu Tyr Leu
210 215 220

Tyr Asp His Leu Lys Asn Gln Pro Glu Leu Gly Gly Tyr Gln Ile Ser
225 230 235 240

Ile Pro Gln Lys Gly Val Val Asp Lys Arg Arg Lys Arg Lys Asn Arg
245 250 255

Pro Ala Arg Lys Ala Ser Leu Ser Leu Arg Ser Gly Arg Ile Thr Leu
260 265 270

Lys Gln Gly Asn Ile Thr Leu Asn Ala Val Leu Ala Glu Glu Ile Asn
275 280 285

IP-1198-PCT_SequenceListing

Pro Pro Lys Gly Glu Thr Pro Leu Lys Trp Leu Leu Leu Thr Ser Glu
290 295 300

Pro Val Glu Ser Leu Ala Gln Ala Leu Arg Val Ile Asp Ile Tyr Thr
305 310 315 320

His Arg Trp Arg Ile Glu Glu Phe His Lys Ala Trp Lys Thr Gly Ala
325 330 335

Gly Ala Glu Arg Gln Arg Met Glu Glu Pro Asp Asn Leu Glu Arg Met
340 345 350

Val Ser Ile Leu Ser Phe Val Ala Val Arg Leu Leu Gln Leu Arg Glu
355 360 365

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

Ala Glu His Val Glu Ser Gln Ser Ala Glu Thr Val Leu Thr Pro Asp
385 390 395 400

Glu Cys Gln Leu Leu Gly Tyr Leu Asp Lys Gly Lys Arg Lys Arg Lys
405 410 415

Glu Lys Ala Gly Ser Leu Gln Trp Ala Tyr Met Ala Ile Ala Arg Leu
420 425 430

Gly Gly Phe Met Asp Ser Lys Arg Thr Gly Ile Ala Ser Trp Gly Ala
435 440 445

Leu Trp Glu Gly Trp Glu Ala Leu Gln Ser Lys Leu Asp Gly Phe Leu
450 455 460

Ala Ala Lys Asp Leu Met Ala Gln Gly Ile Lys Ile
465 470 475

IP-1198-PCT_SequenceListing

<210> 11
 <211> 476
 <212> PRT
 <213> Unknown

<220>
 <223> Transposase Tn5

<400> 11

Met Ile Thr Ser Ala Leu His Arg Ala Ala Asp Trp Ala Lys Ser Val
 1 5 10 15

Phe Ser Ser Ala Ala Leu Gly Asp Pro Arg Arg Thr Ala Arg Leu Val
 20 25 30

Asn Val Ala Ala Gln Leu Ala Lys Tyr Ser Gly Lys Ser Ile Thr Ile
 35 40 45

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

Arg Asn Pro Asn Val Ser Ala Glu Ala Ile Arg Lys Ala Gly Ala Met
 65 70 75 80

Gln Thr Val Lys Leu Ala Gln Glu Phe Pro Glu Leu Leu Ala Ile Glu
 85 90 95

Asp Thr Thr Ser Leu Ser Tyr Arg His Gln Val Ala Glu Glu Leu Gly
 100 105 110

Lys Leu Gly Ser Ile Gln Asp Lys Ser Arg Gly Trp Trp Val His Ser
 115 120 125

Val Leu Leu Leu Glu Ala Thr Thr Phe Arg Thr Val Gly Leu Leu His
 130 135 140

IP-1198-PCT_SequenceListing

Gln Glu Trp Trp Met Arg Pro Asp Asp Pro Ala Asp Ala Asp Glu Lys
145 150 155 160

Glu Ser Gly Lys Trp Leu Ala Ala Ala Ala Thr Ser Arg Leu Arg Met
165 170 175

Gly Ser Met Met Ser Asn Val Ile Ala Val Cys Asp Arg Glu Ala Asp
180 185 190

Ile His Ala Tyr Leu Gln Asp Lys Leu Ala His Asn Glu Arg Phe Val
195 200 205

Val Arg Ser Lys His Pro Arg Lys Asp Val Glu Ser Gly Leu Tyr Leu
210 215 220

Tyr Asp His Leu Lys Asn Gln Pro Glu Leu Gly Gly Tyr Gln Ile Ser
225 230 235 240

Ile Pro Gln Lys Gly Val Val Asp Lys Arg Gly Lys Arg Lys Asn Arg
245 250 255

Pro Ala Arg Lys Ala Ser Leu Ser Leu Arg Ser Gly Arg Ile Thr Leu
260 265 270

Lys Gln Gly Asn Ile Thr Leu Asn Ala Val Leu Ala Glu Glu Ile Asn
275 280 285

Pro Pro Lys Gly Glu Thr Pro Leu Lys Trp Leu Leu Leu Thr Ser Glu
290 295 300

Pro Val Glu Ser Leu Ala Gln Ala Leu Arg Val Ile Asp Ile Tyr Thr
305 310 315 320

His Arg Trp Arg Ile Glu Glu Phe His Lys Ala Trp Lys Thr Gly Ala
325 330 335

IP-1198-PCT_SequenceListing

Gly Ala Glu Arg Gln Arg Met Glu Glu Pro Asp Asn Leu Glu Arg Met
 340 345 350

Val Ser Ile Leu Ser Phe Val Ala Val Arg Leu Leu Gln Leu Arg Glu
 355 360 365

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

Ala Glu His Val Glu Ser Gln Ser Ala Glu Thr Val Leu Thr Pro Asp
 385 390 395 400

Glu Cys Gln Leu Leu Gly Tyr Leu Asp Lys Gly Lys Arg Lys Arg Lys
 405 410 415

Glu Lys Ala Gly Ser Leu Gln Trp Ala Tyr Met Ala Ile Ala Arg Leu
 420 425 430

Gly Gly Phe Met Asp Ser Lys Arg Thr Gly Ile Ala Ser Trp Gly Ala
 435 440 445

Leu Trp Glu Gly Trp Glu Ala Leu Gln Ser Lys Leu Asp Gly Phe Leu
 450 455 460

Ala Ala Lys Asp Leu Met Ala Gln Gly Ile Lys Ile
 465 470 475

<210> 12
 <211> 476
 <212> PRT
 <213> Unknown

<220>
 <223> Transposase Tn5

<220>
 <221> VARIANT
 <222> (248)..(248)

IP-1198-PCT_SequenceListing

<223> X = Y, T, K, S, L, A, W, P, G, R, F, H

<400> 12

Met Ile Thr Ser Ala Leu His Arg Ala Ala Asp Trp Ala Lys Ser Val
1 5 10 15

Phe Ser Ser Ala Ala Leu Gly Asp Pro Arg Arg Thr Ala Arg Leu Val
20 25 30

Asn Val Ala Ala Gln Leu Ala Lys Tyr Ser Gly Lys Ser Ile Thr Ile
35 40 45

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

Arg Asn Pro Asn Val Ser Ala Glu Ala Ile Arg Lys Ala Gly Ala Met
65 70 75 80

Gln Thr Val Lys Leu Ala Gln Glu Phe Pro Glu Leu Leu Ala Ile Glu
85 90 95

Asp Thr Thr Ser Leu Ser Tyr Arg His Gln Val Ala Glu Glu Leu Gly
100 105 110

Lys Leu Gly Ser Ile Gln Asp Lys Ser Arg Gly Trp Trp Val His Ser
115 120 125

Val Leu Leu Leu Glu Ala Thr Thr Phe Arg Thr Val Gly Leu Leu His
130 135 140

Gln Glu Trp Trp Met Arg Pro Asp Asp Pro Ala Asp Ala Asp Glu Lys
145 150 155 160

Glu Ser Gly Lys Trp Leu Ala Ala Ala Ala Thr Ser Arg Leu Arg Met
165 170 175

IP-1198-PCT_SequenceListing

Gly Ser Met Met Ser Asn Val Ile Ala Val Cys Asp Arg Glu Ala Asp
180 185 190

Ile His Ala Tyr Leu Gln Asp Lys Leu Ala His Asn Glu Arg Phe Val
195 200 205

Val Arg Ser Lys His Pro Arg Lys Asp Val Glu Ser Gly Leu Tyr Leu
210 215 220

Tyr Asp His Leu Lys Asn Gln Pro Glu Leu Gly Gly Tyr Gln Ile Ser
225 230 235 240

Ile Pro Gln Lys Gly Val Val Xaa Lys Arg Gly Lys Arg Lys Asn Arg
245 250 255

Pro Ala Arg Lys Ala Ser Leu Ser Leu Arg Ser Gly Arg Ile Thr Leu
260 265 270

Lys Gln Gly Asn Ile Thr Leu Asn Ala Val Leu Ala Glu Glu Ile Asn
275 280 285

Pro Pro Lys Gly Glu Thr Pro Leu Lys Trp Leu Leu Leu Thr Ser Glu
290 295 300

Pro Val Glu Ser Leu Ala Gln Ala Leu Arg Val Ile Asp Ile Tyr Thr
305 310 315 320

His Arg Trp Arg Ile Glu Glu Phe His Lys Ala Trp Lys Thr Gly Ala
325 330 335

Gly Ala Glu Arg Gln Arg Met Glu Glu Pro Asp Asn Leu Glu Arg Met
340 345 350

Val Ser Ile Leu Ser Phe Val Ala Val Arg Leu Leu Gln Leu Arg Glu
355 360 365

IP-1198-PCT_SequenceListing

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

Ala Glu His Val Glu Ser Gln Ser Ala Glu Thr Val Leu Thr Pro Asp
385 390 395 400

Glu Cys Gln Leu Leu Gly Tyr Leu Asp Lys Gly Lys Arg Lys Arg Lys
405 410 415

Glu Lys Ala Gly Ser Leu Gln Trp Ala Tyr Met Ala Ile Ala Arg Leu
420 425 430

Gly Gly Phe Met Asp Ser Lys Arg Thr Gly Ile Ala Ser Trp Gly Ala
435 440 445

Leu Trp Glu Gly Trp Glu Ala Leu Gln Ser Lys Leu Asp Gly Phe Leu
450 455 460

Ala Ala Lys Asp Leu Met Ala Gln Gly Ile Lys Ile
465 470 475

<210> 13
<211> 476
<212> PRT
<213> Unknown

<220>
<223> Transposase Tn5

<220>
<221> Variant
<222> (119)..(119)
<223> X = L, M, S, A, V

<400> 13

Met Ile Thr Ser Ala Leu His Arg Ala Ala Asp Trp Ala Lys Ser Val
1 5 10 15

IP-1198-PCT_SequenceListing

Phe Ser Ser Ala Ala Leu Gly Asp Pro Arg Arg Thr Ala Arg Leu Val
20 25 30

Asn Val Ala Ala Gln Leu Ala Lys Tyr Ser Gly Lys Ser Ile Thr Ile
35 40 45

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

Arg Asn Pro Asn Val Ser Ala Glu Ala Ile Arg Lys Ala Gly Ala Met
65 70 75 80

Gln Thr Val Lys Leu Ala Gln Glu Phe Pro Glu Leu Leu Ala Ile Glu
85 90 95

Asp Thr Thr Ser Leu Ser Tyr Arg His Gln Val Ala Glu Glu Leu Gly
100 105 110

Lys Leu Gly Ser Ile Gln Xaa Lys Ser Arg Gly Trp Trp Val His Ser
115 120 125

Val Leu Leu Leu Glu Ala Thr Thr Phe Arg Thr Val Gly Leu Leu His
130 135 140

Gln Glu Trp Trp Met Arg Pro Asp Asp Pro Ala Asp Ala Asp Glu Lys
145 150 155 160

Glu Ser Gly Lys Trp Leu Ala Ala Ala Ala Thr Ser Arg Leu Arg Met
165 170 175

Gly Ser Met Met Ser Asn Val Ile Ala Val Cys Asp Arg Glu Ala Asp
180 185 190

Ile His Ala Tyr Leu Gln Asp Lys Leu Ala His Asn Glu Arg Phe Val
195 200 205

IP-1198-PCT_SequenceListing															
Val 210	Arg	Ser	Lys	His	Pro	Arg 215	Lys	Asp	Val	Glu	Ser 220	Gly	Leu	Tyr	Leu
Tyr 225	Asp	His	Leu	Lys	Asn 230	Gln	Pro	Glu	Leu	Gly 235	Gly	Tyr	Gln	Ile	Ser 240
Ile	Pro	Gln	Lys	Gly 245	Val	Val	Asp	Lys	Arg 250	Gly	Lys	Arg	Lys	Asn 255	Arg
Pro	Ala	Arg	Lys 260	Ala	Ser	Leu	Ser	Leu 265	Arg	Ser	Gly	Arg	Ile 270	Thr	Leu
Lys	Gln	Gly 275	Asn	Ile	Thr	Leu	Asn 280	Ala	Val	Leu	Ala 285	Glu	Glu	Ile	Asn
Pro 290	Pro	Lys	Gly	Glu	Thr	Pro 295	Leu	Lys	Trp	Leu	Leu 300	Leu	Thr	Ser	Glu
Pro 305	Val	Glu	Ser	Leu	Ala 310	Gln	Ala	Leu	Arg	Val 315	Ile	Asp	Ile	Tyr	Thr 320
His	Arg	Trp	Arg	Ile 325	Glu	Glu	Phe	His	Lys 330	Ala	Trp	Lys	Thr	Gly 335	Ala
Gly	Ala	Glu	Arg 340	Gln	Arg	Met	Glu	Glu 345	Pro	Asp	Asn	Leu	Glu 350	Arg	Met
Val	Ser	Ile 355	Leu	Ser	Phe	Val	Ala 360	Val	Arg	Leu	Leu	Gln 365	Leu	Arg	Glu
Ser	Phe 370	Thr	Pro	Pro	Gln	Ala 375	Leu	Arg	Ala	Gln	Gly 380	Leu	Leu	Lys	Glu
Ala 385	Glu	His	Val	Glu	Ser 390	Gln	Ser	Ala	Glu	Thr 395	Val	Leu	Thr	Pro	Asp 400

IP-1198-PCT_SequenceListing

Glu Cys Gln Leu Leu Gly Tyr Leu Asp Lys Gly Lys Arg Lys Arg Lys
405 410 415

Glu Lys Ala Gly Ser Leu Gln Trp Ala Tyr Met Ala Ile Ala Arg Leu
420 425 430

Gly Gly Phe Met Asp Ser Lys Arg Thr Gly Ile Ala Ser Trp Gly Ala
435 440 445

Leu Trp Glu Gly Trp Glu Ala Leu Gln Ser Lys Leu Asp Gly Phe Leu
450 455 460

Ala Ala Lys Asp Leu Met Ala Gln Gly Ile Lys Ile
465 470 475

<210> 14
<211> 476
<212> PRT
<213> Unknown

<220>
<223> Transposase Tn5

<400> 14

Met Ile Thr Ser Ala Leu His Arg Ala Ala Asp Trp Ala Lys Ser Val
1 5 10 15

Phe Ser Ser Ala Ala Leu Gly Asp Pro Arg Arg Thr Ala Arg Leu Val
20 25 30

Asn Val Ala Ala Gln Leu Ala Lys Tyr Ser Gly Lys Ser Ile Thr Ile
35 40 45

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

Arg Asn Pro Asn Val Ser Ala Glu Ala Ile Arg Lys Ala Gly Ala Met
65 70 75 80

IP-1198-PCT_SequenceListing

Gln Thr Val Lys Leu Ala Gln Glu Phe Pro Glu Leu Leu Ala Ile Glu
85 90 95

Asp Thr Thr Ser Leu Ser Tyr Arg His Gln Val Ala Glu Glu Leu Gly
100 105 110

Lys Leu Gly Ser Ile Gln Asp Lys Ser Arg Gly Trp Met Val His Ser
115 120 125

Val Leu Leu Leu Glu Ala Thr Thr Phe Arg Thr Val Gly Leu Leu His
130 135 140

Gln Glu Trp Trp Met Arg Pro Asp Asp Pro Ala Asp Ala Asp Glu Lys
145 150 155 160

Glu Ser Gly Lys Trp Leu Ala Ala Ala Ala Thr Ser Arg Leu Arg Met
165 170 175

Gly Ser Met Met Ser Asn Val Ile Ala Val Cys Asp Arg Glu Ala Asp
180 185 190

Ile His Ala Tyr Leu Gln Asp Lys Leu Ala His Asn Glu Arg Phe Val
195 200 205

Val Arg Ser Lys His Pro Arg Lys Asp Val Glu Ser Gly Leu Tyr Leu
210 215 220

Tyr Asp His Leu Lys Asn Gln Pro Glu Leu Gly Gly Tyr Gln Ile Ser
225 230 235 240

Ile Pro Gln Lys Gly Val Val Asp Lys Arg Gly Lys Arg Lys Asn Arg
245 250 255

Pro Ala Arg Lys Ala Ser Leu Ser Leu Arg Ser Gly Arg Ile Thr Leu
260 265 270

IP-1198-PCT_SequenceListing

Lys Gln Gly Asn Ile Thr Leu Asn Ala Val Leu Ala Glu Glu Ile Asn
275 280 285

Pro Pro Lys Gly Glu Thr Pro Leu Lys Trp Leu Leu Leu Thr Ser Glu
290 295 300

Pro Val Glu Ser Leu Ala Gln Ala Leu Arg Val Ile Asp Ile Tyr Thr
305 310 315 320

His Arg Trp Arg Ile Glu Glu Phe His Lys Ala Trp Lys Thr Gly Ala
325 330 335

Gly Ala Glu Arg Gln Arg Met Glu Glu Pro Asp Asn Leu Glu Arg Met
340 345 350

Val Ser Ile Leu Ser Phe Val Ala Val Arg Leu Leu Gln Leu Arg Glu
355 360 365

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

Ala Glu His Val Glu Ser Gln Ser Ala Glu Thr Val Leu Thr Pro Asp
385 390 395 400

Glu Cys Gln Leu Leu Gly Tyr Leu Asp Lys Gly Lys Arg Lys Arg Lys
405 410 415

Glu Lys Ala Gly Ser Leu Gln Trp Ala Tyr Met Ala Ile Ala Arg Leu
420 425 430

Gly Gly Phe Met Asp Ser Lys Arg Thr Gly Ile Ala Ser Trp Gly Ala
435 440 445

Leu Trp Glu Gly Trp Glu Ala Leu Gln Ser Lys Leu Asp Gly Phe Leu
450 455 460

IP-1198-PCT_SequenceListing

Ala Ala Lys Asp Leu Met Ala Gln Gly Ile Lys Ile
465 470 475

<210> 15
<211> 477
<212> PRT
<213> Unknown

<220>
<223> Transposase Tn5

<400> 15

Met Ile Thr Ser Ala Leu His Arg Ala Ala Asp Trp Ala Lys Ser Val
1 5 10 15

Phe Ser Ser Ala Ala Leu Gly Asp Pro Arg Arg Thr Ala Arg Leu Val
20 25 30

Asn Val Ala Ala Gln Leu Ala Lys Tyr Ser Gly Lys Ser Ile Thr Ile
35 40 45

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

Arg Asn Pro Asn Val Ser Ala Glu Ala Ile Arg Lys Ala Gly Ala Met
65 70 75 80

Gln Thr Val Lys Leu Ala Gln Glu Phe Pro Glu Leu Leu Ala Ile Glu
85 90 95

Asp Thr Thr Ser Leu Ser Tyr Arg His Gln Val Ala Glu Glu Leu Gly
100 105 110

Lys Leu Gly Ser Ile Gln Asp Lys Ser Arg Gly Trp Trp Val His Ser
115 120 125

IP-1198-PCT_SequenceListing

Val Leu Leu Leu Glu Ala Thr Thr Phe Arg Thr Val Gly Leu Leu His
130 135 140

Gln Glu Trp Trp Met Arg Pro Asp Asp Pro Ala Asp Ala Asp Glu Lys
145 150 155 160

Glu Ser Gly Lys Trp Leu Ala Ala Ala Ala Thr Ser Arg Leu Arg Met
165 170 175

Gly Ser Met Met Ser Asn Val Ile Ala Val Cys Asp Arg Glu Ala Asp
180 185 190

Ile His Ala Tyr Leu Gln Asp Lys Leu Ala His Asn Glu Arg Phe Val
195 200 205

Val Arg Ser Lys His Pro Arg Lys Asp Val Glu Ser Gly Leu Tyr Leu
210 215 220

Tyr Asp His Leu Lys Asn Gln Pro Glu Leu Gly Gly Tyr Gln Ile Ser
225 230 235 240

Ile Pro Gln Lys Gly Val Val Asp Val Lys Arg Gly Lys Arg Lys Asn
245 250 255

Arg Pro Ala Arg Lys Ala Ser Leu Ser Leu Arg Ser Gly Arg Ile Thr
260 265 270

Leu Lys Gln Gly Asn Ile Thr Leu Asn Ala Val Leu Ala Glu Glu Ile
275 280 285

Asn Pro Pro Lys Gly Glu Thr Pro Leu Lys Trp Leu Leu Leu Thr Ser
290 295 300

Glu Pro Val Glu Ser Leu Ala Gln Ala Leu Arg Val Ile Asp Ile Tyr
305 310 315 320

IP-1198-PCT_SequenceListing

Thr His Arg Trp Arg Ile Glu Glu Phe His Lys Ala Trp Lys Thr Gly
325 330 335

Ala Gly Ala Glu Arg Gln Arg Met Glu Glu Pro Asp Asn Leu Glu Arg
340 345 350

Met Val Ser Ile Leu Ser Phe Val Ala Val Arg Leu Leu Gln Leu Arg
355 360 365

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

Glu Ala Glu His Val Glu Ser Gln Ser Ala Glu Thr Val Leu Thr Pro
385 390 395 400

Asp Glu Cys Gln Leu Leu Gly Tyr Leu Asp Lys Gly Lys Arg Lys Arg
405 410 415

Lys Glu Lys Ala Gly Ser Leu Gln Trp Ala Tyr Met Ala Ile Ala Arg
420 425 430

Leu Gly Gly Phe Met Asp Ser Lys Arg Thr Gly Ile Ala Ser Trp Gly
435 440 445

Ala Leu Trp Glu Gly Trp Glu Ala Leu Gln Ser Lys Leu Asp Gly Phe
450 455 460

Leu Ala Ala Lys Asp Leu Met Ala Gln Gly Ile Lys Ile
465 470 475

<210> 16

<211> 476

<212> PRT

<213> Unknown

<220>

<223> Transposase Tn5

IP-1198-PCT_SequenceListing

<220>

<221> Variant

<222> (120)..(120)

<223> X = Y, F, W, E

<400> 16

Met Ile Thr Ser Ala Leu His Arg Ala Ala Asp Trp Ala Lys Ser Val
1 5 10 15

Phe Ser Ser Ala Ala Leu Gly Asp Pro Arg Arg Thr Ala Arg Leu Val
20 25 30

Asn Val Ala Ala Gln Leu Ala Lys Tyr Ser Gly Lys Ser Ile Thr Ile
35 40 45

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

Arg Asn Pro Asn Val Ser Ala Glu Ala Ile Arg Lys Ala Gly Ala Met
65 70 75 80

Gln Thr Val Lys Leu Ala Gln Glu Phe Pro Glu Leu Leu Ala Ile Glu
85 90 95

Asp Thr Thr Ser Leu Ser Tyr Arg His Gln Val Ala Glu Glu Leu Gly
100 105 110

Lys Leu Gly Ser Ile Gln Asp Xaa Ser Arg Gly Trp Trp Val His Ser
115 120 125

Val Leu Leu Leu Glu Ala Thr Thr Phe Arg Thr Val Gly Leu Leu His
130 135 140

Gln Glu Trp Trp Met Arg Pro Asp Asp Pro Ala Asp Ala Asp Glu Lys
145 150 155 160

IP-1198-PCT_SequenceListing

Glu Ser Gly Lys Trp Leu Ala Ala Ala Thr Ser Arg Leu Arg Met
165 170 175

Gly Ser Met Met Ser Asn Val Ile Ala Val Cys Asp Arg Glu Ala Asp
180 185 190

Ile His Ala Tyr Leu Gln Asp Lys Leu Ala His Asn Glu Arg Phe Val
195 200 205

Val Arg Ser Lys His Pro Arg Lys Asp Val Glu Ser Gly Leu Tyr Leu
210 215 220

Tyr Asp His Leu Lys Asn Gln Pro Glu Leu Gly Gly Tyr Gln Ile Ser
225 230 235 240

Ile Pro Gln Lys Gly Val Val Asp Lys Arg Gly Lys Arg Lys Asn Arg
245 250 255

Pro Ala Arg Lys Ala Ser Leu Ser Leu Arg Ser Gly Arg Ile Thr Leu
260 265 270

Lys Gln Gly Asn Ile Thr Leu Asn Ala Val Leu Ala Glu Glu Ile Asn
275 280 285

Pro Pro Lys Gly Glu Thr Pro Leu Lys Trp Leu Leu Leu Thr Ser Glu
290 295 300

Pro Val Glu Ser Leu Ala Gln Ala Leu Arg Val Ile Asp Ile Tyr Thr
305 310 315 320

His Arg Trp Arg Ile Glu Glu Phe His Lys Ala Trp Lys Thr Gly Ala
325 330 335

Gly Ala Glu Arg Gln Arg Met Glu Glu Pro Asp Asn Leu Glu Arg Met
340 345 350

IP-1198-PCT_SequenceListing

Val Ser Ile Leu Ser Phe Val Ala Val Arg Leu Leu Gln Leu Arg Glu
355 360 365

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

Ala Glu His Val Glu Ser Gln Ser Ala Glu Thr Val Leu Thr Pro Asp
385 390 395 400

Glu Cys Gln Leu Leu Gly Tyr Leu Asp Lys Gly Lys Arg Lys Arg Lys
405 410 415

Glu Lys Ala Gly Ser Leu Gln Trp Ala Tyr Met Ala Ile Ala Arg Leu
420 425 430

Gly Gly Phe Met Asp Ser Lys Arg Thr Gly Ile Ala Ser Trp Gly Ala
435 440 445

Leu Trp Glu Gly Trp Glu Ala Leu Gln Ser Lys Leu Asp Gly Phe Leu
450 455 460

Ala Ala Lys Asp Leu Met Ala Gln Gly Ile Lys Ile
465 470 475

<210> 17
<211> 476
<212> PRT
<213> Unknown

<220>
<223> Transposase Tn5

<220>
<221> Variant
<222> (119)..(119)
<223> X = L, M, S, A, V

<220>
<221> Variant

IP-1198-PCT_SequenceListing

<222> (120)..(120)

<223> X = Y, F, W, E

<220>

<221> Variant

<222> (248)..(248)

<223> X = Y, T, K, S, L, A, W, P, G, R, F, H

<400> 17

Met Ile Thr Ser Ala Leu His Arg Ala Ala Asp Trp Ala Lys Ser Val
1 5 10 15

Phe Ser Ser Ala Ala Leu Gly Asp Pro Arg Arg Thr Ala Arg Leu Val
20 25 30

Asn Val Ala Ala Gln Leu Ala Lys Tyr Ser Gly Lys Ser Ile Thr Ile
35 40 45

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

Arg Asn Pro Asn Val Ser Ala Glu Ala Ile Arg Lys Ala Gly Ala Met
65 70 75 80

Gln Thr Val Lys Leu Ala Gln Glu Phe Pro Glu Leu Leu Ala Ile Glu
85 90 95

Asp Thr Thr Ser Leu Ser Tyr Arg His Gln Val Ala Glu Glu Leu Gly
100 105 110

Lys Leu Gly Ser Ile Gln Xaa Xaa Ser Arg Gly Trp Met Val His Ser
115 120 125

Val Leu Leu Leu Glu Ala Thr Thr Phe Arg Thr Val Gly Leu Leu His
130 135 140

Gln Glu Trp Trp Met Arg Pro Asp Asp Pro Ala Asp Ala Asp Glu Lys
145 150 155 160

IP-1198-PCT_SequenceListing

Glu Ser Gly Lys Trp Leu Ala Ala Ala Thr Ser Arg Leu Arg Met
165 170 175

Gly Ser Met Met Ser Asn Val Ile Ala Val Cys Asp Arg Glu Ala Asp
180 185 190

Ile His Ala Tyr Leu Gln Asp Lys Leu Ala His Asn Glu Arg Phe Val
195 200 205

Val Arg Ser Lys His Pro Arg Lys Asp Val Glu Ser Gly Leu Tyr Leu
210 215 220

Tyr Asp His Leu Lys Asn Gln Pro Glu Leu Gly Gly Tyr Gln Ile Ser
225 230 235 240

Ile Pro Gln Lys Gly Val Val Xaa Lys Arg Gly Lys Arg Lys Asn Arg
245 250 255

Pro Ala Arg Lys Ala Ser Leu Ser Leu Arg Ser Gly Arg Ile Thr Leu
260 265 270

Lys Gln Gly Asn Ile Thr Leu Asn Ala Val Leu Ala Glu Glu Ile Asn
275 280 285

Pro Pro Lys Gly Glu Thr Pro Leu Lys Trp Leu Leu Leu Thr Ser Glu
290 295 300

Pro Val Glu Ser Leu Ala Gln Ala Leu Arg Val Ile Asp Ile Tyr Thr
305 310 315 320

His Arg Trp Arg Ile Glu Glu Phe His Lys Ala Trp Lys Thr Gly Ala
325 330 335

Gly Ala Glu Arg Gln Arg Met Glu Glu Pro Asp Asn Leu Glu Arg Met
340 345 350

IP-1198-PCT_SequenceListing

Val Ser Ile Leu Ser Phe Val Ala Val Arg Leu Leu Gln Leu Arg Glu
355 360 365

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

Ala Glu His Val Glu Ser Gln Ser Ala Glu Thr Val Leu Thr Pro Asp
385 390 395 400

Glu Cys Gln Leu Leu Gly Tyr Leu Asp Lys Gly Lys Arg Lys Arg Lys
405 410 415

Glu Lys Ala Gly Ser Leu Gln Trp Ala Tyr Met Ala Ile Ala Arg Leu
420 425 430

Gly Gly Phe Met Asp Ser Lys Arg Thr Gly Ile Ala Ser Trp Gly Ala
435 440 445

Leu Trp Glu Gly Trp Glu Ala Leu Gln Ser Lys Leu Asp Gly Phe Leu
450 455 460

Ala Ala Lys Asp Leu Met Ala Gln Gly Ile Lys Ile
465 470 475

<210> 18
<211> 476
<212> PRT
<213> Unknown

<220>
<223> Transposase Tn5

<400> 18

Met Ile Thr Ser Ala Leu His Arg Ala Ala Asp Trp Ala Lys Ser Val
1 5 10 15

IP-1198-PCT_SequenceListing

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

IP-1198-PCT_SequenceListing

Val	Arg	Ser	Arg	His	Arg	Arg	Lys	Asp	Val	Glu	Ser	Gly	Leu	Tyr	Leu	210	215	220	
Tyr	Asp	His	Leu	Lys	Asn	Gln	Pro	Glu	Leu	Gly	Gly	Tyr	Gln	Ile	Ser	225	230	235	240
Ile	Pro	Gln	Lys	Gly	Val	Val	Asp	Lys	Arg	Gly	Lys	Arg	Lys	Asn	Arg	245	250	255	
Pro	Ala	Arg	Lys	Ala	Ser	Leu	Ser	Leu	Arg	Ser	Gly	Arg	Ile	Thr	Leu	260	265	270	
Lys	Gln	Gly	Asn	Ile	Thr	Leu	Asn	Ala	Val	Leu	Ala	Glu	Glu	Ile	Asn	275	280	285	
Pro	Pro	Lys	Gly	Glu	Thr	Pro	Leu	Lys	Trp	Leu	Leu	Leu	Thr	Ser	Glu	290	295	300	
Pro	Val	Glu	Ser	Leu	Ala	Gln	Ala	Leu	Arg	Val	Ile	Asp	Ile	Tyr	Thr	305	310	315	320
His	Arg	Trp	Arg	Ile	Glu	Glu	Phe	His	Lys	Ala	Trp	Lys	Thr	Gly	Ala	325	330	335	
Gly	Val	Glu	Arg	Gln	Arg	Met	Glu	Glu	Pro	Asp	Asn	Leu	Glu	Arg	Met	340	345	350	
Val	Ser	Ile	Leu	Ser	Phe	Val	Ala	Val	Arg	Leu	Leu	Gln	Leu	Arg	Glu	355	360	365	
Ser	Phe	Thr	Pro	Pro	Gln	Ala	Leu	Arg	Ala	Gln	Gly	Leu	Leu	Lys	Glu	370	375	380	
Ala	Glu	His	Val	Glu	Ser	Gln	Ser	Ala	Glu	Thr	Val	Leu	Thr	Pro	Asp	385	390	395	400

IP-1198-PCT_SequenceListing

Glu Cys Gln Leu Leu Gly Tyr Leu Asp Lys Gly Lys Arg Lys Arg Lys
405 410 415

Glu Lys Ala Gly Ser Leu Gln Trp Ala Tyr Met Ala Ile Ala Arg Leu
420 425 430

Gly Gly Phe Met Asp Ser Lys Arg Thr Gly Ile Ala Ser Trp Gly Ala
435 440 445

Leu Trp Glu Gly Trp Glu Ala Leu Gln Ser Lys Leu Asp Gly Phe Leu
450 455 460

Ala Ala Lys Asp Leu Met Ala Gln Gly Ile Lys Ile
465 470 475

<210> 19
<211> 476
<212> PRT
<213> Unknown

<220>
<223> Transposase Tn5

<400> 19

Met Ile Thr Ser Ala Leu His Arg Ala Ala Asp Trp Ala Lys Ser Val
1 5 10 15

Phe Ser Ser Ala Ala Leu Gly Asp Pro Arg Arg Thr Ala Arg Leu Val
20 25 30

Asn Val Ala Ala Gln Leu Ala Lys Tyr Ser Gly Lys Ser Ile Thr Ile
35 40 45

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

Arg Asn Pro Asn Val Ser Ala Glu Ala Ile Arg Lys Ala Gly Ala Met
65 70 75 80

IP-1198-PCT_SequenceListing

Gln Thr Val Lys Leu Ala Gln Glu Phe Pro Glu Leu Leu Ala Ile Glu
85 90 95

Asp Thr Thr Ser Leu Ser Tyr Arg His Gln Val Ala Glu Glu Leu Gly
100 105 110

Lys Leu Gly Ser Ile Gln Asp Lys Ser Arg Gly Trp Trp Val His Ser
115 120 125

Val Leu Leu Leu Glu Ala Thr Thr Phe Arg Thr Val Gly Leu Leu His
130 135 140

Gln Glu Trp Trp Met Arg Pro Asp Asp Pro Ala Asp Ala Asp Glu Lys
145 150 155 160

Glu Ser Gly Lys Trp Leu Ala Ala Ala Ala Thr Ser Arg Leu Arg Met
165 170 175

Gly Ser Met Met Ser Asn Val Ile Ala Val Cys Asp Arg Glu Ala Asp
180 185 190

Ile His Ala Tyr Leu Gln Asp Lys Leu Ala His Asn Glu Arg Phe Val
195 200 205

Val Arg Ser Arg His Arg Arg Lys Asp Val Glu Ser Gly Leu Tyr Leu
210 215 220

Tyr Asp His Leu Lys Asn Gln Pro Glu Leu Gly Gly Tyr Gln Ile Ser
225 230 235 240

Ile Pro Gln Lys Gly Val Val Asp Lys Arg Arg Lys Arg Lys Asn Arg
245 250 255

Pro Ala Arg Lys Ala Ser Leu Ser Leu Arg Ser Gly Arg Ile Thr Leu
260 265 270

IP-1198-PCT_SequenceListing

Lys Gln Gly Asn Ile Thr Leu Asn Ala Val Leu Ala Glu Glu Ile Asn
275 280 285

Pro Pro Lys Gly Glu Thr Pro Leu Lys Trp Leu Leu Leu Thr Ser Glu
290 295 300

Pro Val Glu Ser Leu Ala Gln Ala Leu Arg Val Ile Asp Ile Tyr Thr
305 310 315 320

His Arg Trp Arg Ile Glu Glu Phe His Lys Ala Trp Lys Thr Gly Ala
325 330 335

Gly Val Glu Arg Gln Arg Met Glu Glu Pro Asp Asn Leu Glu Arg Met
340 345 350

Val Ser Ile Leu Ser Phe Val Ala Val Arg Leu Leu Gln Leu Arg Glu
355 360 365

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

Ala Glu His Val Glu Ser Gln Ser Ala Glu Thr Val Leu Thr Pro Asp
385 390 395 400

Glu Cys Gln Leu Leu Gly Tyr Leu Asp Lys Gly Lys Arg Lys Arg Lys
405 410 415

Glu Lys Ala Gly Ser Leu Gln Trp Ala Tyr Met Ala Ile Ala Arg Leu
420 425 430

Gly Gly Phe Met Asp Ser Lys Arg Thr Gly Ile Ala Ser Trp Gly Ala
435 440 445

Leu Trp Glu Gly Trp Glu Ala Leu Gln Ser Lys Leu Asp Gly Phe Leu
450 455 460

IP-1198-PCT_SequenceListing

Ala Ala Lys Asp Leu Met Ala Gln Gly Ile Lys Ile
465 470 475

<210> 20
<211> 476
<212> PRT
<213> Unknown

<220>
<223> Transposase Tn5

<400> 20

Met Ile Thr Ser Ala Leu His Arg Ala Ala Asp Trp Ala Lys Ser Val
1 5 10 15

Phe Ser Ser Ala Ala Leu Gly Asp Pro Arg Arg Thr Ala Arg Leu Val
20 25 30

Asn Val Ala Ala Gln Leu Ala Lys Tyr Ser Gly Lys Ser Ile Thr Ile
35 40 45

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

Arg Asn Pro Asn Val Ser Ala Glu Ala Ile Arg Lys Ala Gly Ala Met
65 70 75 80

Gln Thr Val Lys Leu Ala Gln Glu Phe Pro Glu Leu Leu Ala Ile Glu
85 90 95

Asp Thr Thr Ser Leu Ser Tyr Arg His Gln Val Ala Glu Glu Leu Gly
100 105 110

Lys Leu Gly Ser Ile Gln Asp Lys Ser Arg Gly Trp Trp Val His Ser
115 120 125

IP-1198-PCT_SequenceListing

Val	Leu	Leu	Leu	Glu	Ala	Thr	Thr	Phe	Arg	Thr	Val	Gly	Leu	Leu	His
130						135					140				
Gln	Gln	Trp	Trp	Met	Arg	Pro	Asp	Asp	Pro	Ala	Asp	Ala	Asp	Glu	Lys
145					150					155					160
Glu	Ser	Gly	Lys	Trp	Leu	Ala	Ala	Ala	Ala	Thr	Ser	Arg	Leu	Arg	Met
				165					170					175	
Gly	Ser	Met	Met	Ser	Asn	Val	Ile	Ala	Val	Cys	Asp	Arg	Gly	Ala	Asp
			180					185					190		
Ile	His	Ala	Tyr	Leu	Gln	Asp	Lys	Leu	Ala	His	Asn	Glu	Arg	Phe	Val
		195					200					205			
Val	Arg	Ser	Lys	His	Pro	Arg	Lys	Asp	Val	Glu	Ser	Gly	Leu	Tyr	Leu
	210					215					220				
Tyr	Asp	His	Leu	Lys	Asn	Gln	Pro	Glu	Leu	Gly	Gly	Tyr	Gln	Ile	Ser
225					230					235					240
Ile	Pro	Gln	Lys	Gly	Val	Val	Asp	Lys	Arg	Arg	Lys	Arg	Lys	Asn	Arg
				245					250					255	
Pro	Ala	Arg	Lys	Ala	Ser	Leu	Ser	Leu	Arg	Ser	Gly	Arg	Ile	Thr	Leu
			260					265					270		
Lys	Gln	Gly	Asn	Ile	Thr	Leu	Asn	Ala	Val	Leu	Ala	Glu	Glu	Ile	Asn
		275					280					285			
Pro	Pro	Lys	Gly	Glu	Thr	Pro	Leu	Lys	Trp	Leu	Leu	Leu	Thr	Ser	Glu
	290					295					300				
Pro	Val	Glu	Ser	Leu	Ala	Gln	Ala	Leu	Arg	Val	Ile	Asp	Ile	Tyr	Thr
305					310					315					320

IP-1198-PCT_SequenceListing

His Arg Trp Arg Ile Glu Glu Phe His Lys Ala Trp Lys Thr Gly Ala
325 330 335

Gly Ala Glu Arg Gln Arg Met Glu Glu Pro Asp Asn Leu Glu Arg Met
340 345 350

Val Ser Ile Leu Ser Phe Val Ala Val Arg Leu Leu Gln Leu Arg Glu
355 360 365

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

Ala Glu His Val Glu Ser Gln Ser Ala Glu Thr Val Leu Thr Pro Asp
385 390 395 400

Glu Cys Gln Leu Leu Gly Tyr Leu Asp Lys Gly Lys Arg Lys Arg Lys
405 410 415

Glu Lys Ala Gly Ser Leu Gln Trp Ala Tyr Met Ala Ile Ala Arg Leu
420 425 430

Gly Gly Phe Met Asp Ser Lys Arg Thr Gly Ile Ala Ser Trp Gly Ala
435 440 445

Leu Trp Glu Gly Trp Glu Ala Leu Gln Ser Lys Leu Asp Gly Phe Leu
450 455 460

Ala Ala Lys Asp Leu Met Ala Gln Gly Ile Lys Ile
465 470 475

<210> 21

<211> 10

<212> PRT

<213> Unknown

<220>

<223> Transposase Tn5

IP-1198-PCT_SequenceListing

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<222> (1)..(1)
<223> x= W, R, K, P, T

<220>
<221> Variant
<222> (2)..(2)
<223> x= W, N, V, K, M

<220>
<221> Variant
<222> (3)..(3)
<223> x= V, F, I, T, L

<220>
<221> Variant
<222> (4)..(4)
<223> x= H, L, W, C

<220>
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<222> (5)..(5)
<223> x= S, G, V, F

<220>
<221> Variant
<222> (6)..(6)
<223> x= V, A, W

<220>
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<222> (7)..(7)
<223> x= L, T, V, Q, W

<220>
<221> Variant
<222> (8)..(8)
<223> x= L, H, D

<220>
<221> Variant
<222> (9)..(9)
<223> x= L, H, V

<220>
<221> Variant

IP-1198-PCT_SequenceListing

<222> (10)..(10)

<223> x= E, Y, A, K, Q

<400> 21

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1 5 10

<210> 22

<211> 852

<212> DNA

<213> Escherichia coli

<400> 22

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atgcgtaagt ccggtgctat taaagcagcg aaaaagcag gcaacgttgc tgctgacggc      180
gtgatcaaaa ccaaaatcga cggcaactac ggcatcattc tggaagttaa ctgccagact      240
gacttcgttg caaaagacgc tggtttccag gcgttcgcag acaaagttct ggacgcagct      300
gttgctggca aaatcactga cgttgaagtt ctgaaagcac agttcgaaga agaacgtggt      360
gcgctggtag cgaaaattgg tgaaaacatc aacattcgcc gcgttgctgc gctggaaggc      420
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gctgacgaag agctgggtta acacatcgct atgcacgttg ctgcaagcaa gccagaattc      540
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aagaaattca ccggcgaagt ttctctgacc ggtcagccgt tcgttatgga accaagcaaa      720
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<210> 23

<211> 283

IP-1198-PCT_SequenceListing

<212> PRT

<213> Escherichia coli

<400> 23

Met Ala Glu Ile Thr Ala Ser Leu Val Lys Glu Leu Arg Glu Arg Thr
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Gly Ala Gly Met Met Asp Cys Lys Lys Ala Leu Thr Glu Ala Asn Gly
20 25 30

Asp Ile Glu Leu Ala Ile Glu Asn Met Arg Lys Ser Gly Ala Ile Lys
35 40 45

Ala Ala Lys Lys Ala Gly Asn Val Ala Ala Asp Gly Val Ile Lys Thr
50 55 60

Lys Ile Asp Gly Asn Tyr Gly Ile Ile Leu Glu Val Asn Cys Gln Thr
65 70 75 80

Asp Phe Val Ala Lys Asp Ala Gly Phe Gln Ala Phe Ala Asp Lys Val
85 90 95

Leu Asp Ala Ala Val Ala Gly Lys Ile Thr Asp Val Glu Val Leu Lys
100 105 110

Ala Gln Phe Glu Glu Glu Arg Val Ala Leu Val Ala Lys Ile Gly Glu
115 120 125

Asn Ile Asn Ile Arg Arg Val Ala Ala Leu Glu Gly Asp Val Leu Gly
130 135 140

Ser Tyr Gln His Gly Ala Arg Ile Gly Val Leu Val Ala Ala Lys Gly
145 150 155 160

Ala Asp Glu Glu Leu Val Lys His Ile Ala Met His Val Ala Ala Ser
165 170 175

IP-1198-PCT_SequenceListing

Lys Pro Glu Phe Ile Lys Pro Glu Asp Val Ser Ala Glu Val Val Glu
180 185 190

Lys Glu Tyr Gln Val Gln Leu Asp Ile Ala Met Gln Ser Gly Lys Pro
195 200 205

Lys Glu Ile Ala Glu Lys Met Val Glu Gly Arg Met Lys Lys Phe Thr
210 215 220

Gly Glu Val Ser Leu Thr Gly Gln Pro Phe Val Met Glu Pro Ser Lys
225 230 235 240

Thr Val Gly Gln Leu Leu Lys Glu His Asn Ala Glu Val Thr Gly Phe
245 250 255

Ile Arg Phe Glu Val Gly Glu Gly Ile Glu Lys Val Glu Thr Asp Phe
260 265 270

Ala Ala Glu Val Ala Ala Met Ser Lys Gln Ser
275 280

<210> 24
<211> 2283
<212> DNA
<213> Unknown

<220>
<223> TS-Tn5 nucleic acid sequence

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atgcgtaagt ccggtgctat taaagcagcg aaaaaagcag gcaacgttgc tgctgacggc 180
gtgatcaaaa ccaaaatcga cggcaactac ggcatcattc tggaagttaa ctgccagact 240
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IP-1198-PCT_SequenceListing

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gctggcgcca tgcaaacagt caagttggct caggagtttc ccgaactgct ggccattgag	1140
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ccagccccgca aggcgagctt gagcctgcgc agtgggcgca tcacgctaaa acaggggaat	1680
atcacgctca acgcggtgct ggccgaggag attaaccgcg ccaagggtga gaccccgttg	1740

IP-1198-PCT_SequenceListing

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<210> 25
<211> 760
<212> PRT
<213> Unknown

<220>
<223> TS-Tn5 Fusion Protein Amino Acid Sequence

<400> 25

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Gly Ala Gly Met Met Asp Cys Lys Lys Ala Leu Thr Glu Ala Asn Gly
20 25 30

Asp Ile Glu Leu Ala Ile Glu Asn Met Arg Lys Ser Gly Ala Ile Lys
35 40 45

Ala Ala Lys Lys Ala Gly Asn Val Ala Ala Asp Gly Val Ile Lys Thr
50 55 60

Lys Ile Asp Gly Asn Tyr Gly Ile Ile Leu Glu Val Asn Cys Gln Thr

IP-1198-PCT_SequenceListing

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

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260

265

270

Ala Ala Glu Val Ala Ala Met Ser Lys Gln Ser Gly Thr Ile Thr Ser
 275 280 285

Ala Leu His Arg Ala Ala Asp Trp Ala Lys Ser Val Phe Ser Ser Ala
 290 295 300

Ala Leu Gly Asp Pro Arg Arg Thr Ala Arg Leu Val Asn Val Ala Ala
 305 310 315 320

Gln Leu Ala Lys Tyr Ser Gly Lys Ser Ile Thr Ile Ser Ser Glu Gly
 325 330 335

Ser Lys Ala Ala Gln Glu Gly Ala Tyr Arg Phe Ile Arg Asn Pro Asn
 340 345 350

Val Ser Ala Glu Ala Ile Arg Lys Ala Gly Ala Met Gln Thr Val Lys
 355 360 365

Leu Ala Gln Glu Phe Pro Glu Leu Leu Ala Ile Glu Asp Thr Thr Ser
 370 375 380

Leu Ser Tyr Arg His Gln Val Ala Glu Glu Leu Gly Lys Leu Gly Ser
 385 390 395 400

Ile Gln Asp Lys Ser Arg Gly Trp Trp Val His Ser Val Leu Leu Leu
 405 410 415

Glu Ala Thr Thr Phe Arg Thr Val Gly Leu Leu His Gln Glu Trp Trp
 420 425 430

Met Arg Pro Asp Asp Pro Ala Asp Ala Asp Glu Lys Glu Ser Gly Lys
 435 440 445

Trp Leu Ala Ala Ala Ala Thr Ser Arg Leu Arg Met Gly Ser Met Met

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450

455

460

Ser Asn Val Ile Ala Val Cys Asp Arg Glu Ala Asp Ile His Ala Tyr
 465 470 475 480

Leu Gln Asp Lys Leu Ala His Asn Glu Arg Phe Val Val Arg Ser Lys
 485 490 495

His Pro Arg Lys Asp Val Glu Ser Gly Leu Tyr Leu Tyr Asp His Leu
 500 505 510

Lys Asn Gln Pro Glu Leu Gly Gly Tyr Gln Ile Ser Ile Pro Gln Lys
 515 520 525

Gly Val Val Asp Lys Arg Gly Lys Arg Lys Asn Arg Pro Ala Arg Lys
 530 535 540

Ala Ser Leu Ser Leu Arg Ser Gly Arg Ile Thr Leu Lys Gln Gly Asn
 545 550 555 560

Ile Thr Leu Asn Ala Val Leu Ala Glu Glu Ile Asn Pro Pro Lys Gly
 565 570 575

Glu Thr Pro Leu Lys Trp Leu Leu Leu Thr Ser Glu Pro Val Glu Ser
 580 585 590

Leu Ala Gln Ala Leu Arg Val Ile Asp Ile Tyr Thr His Arg Trp Arg
 595 600 605

Ile Glu Glu Phe His Lys Ala Trp Lys Thr Gly Ala Gly Ala Glu Arg
 610 615 620

Gln Arg Met Glu Glu Pro Asp Asn Leu Glu Arg Met Val Ser Ile Leu
 625 630 635 640

Ser Phe Val Ala Val Arg Leu Leu Gln Leu Arg Glu Ser Phe Thr Pro

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645

650

655

Pro Gln Ala Leu Arg Ala Gln Gly Leu Leu Lys Glu Ala Glu His Val
660 665 670

Glu Ser Gln Ser Ala Glu Thr Val Leu Thr Pro Asp Glu Cys Gln Leu
675 680 685

Leu Gly Tyr Leu Asp Lys Gly Lys Arg Lys Arg Lys Glu Lys Ala Gly
690 695 700

Ser Leu Gln Trp Ala Tyr Met Ala Ile Ala Arg Leu Gly Gly Phe Met
705 710 715 720

Asp Ser Lys Arg Thr Gly Ile Ala Ser Trp Gly Ala Leu Trp Glu Gly
725 730 735

Trp Glu Ala Leu Gln Ser Lys Leu Asp Gly Phe Leu Ala Ala Lys Asp
740 745 750

Leu Met Ala Gln Gly Ile Lys Ile
755 760

<210> 26
<211> 760
<212> PRT
<213> unknown

<220>
<223> TS-Tn mutant protein

<400> 26

Met Ala Glu Ile Thr Ala Ser Leu Val Lys Glu Leu Arg Glu Arg Thr
1 5 10 15

Gly Ala Gly Met Met Asp Cys Lys Lys Ala Leu Thr Glu Ala Asn Gly
20 25 30

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Asp Ile Glu Leu Ala Ile Glu Asn Met Arg Lys Ser Gly Ala Ile Lys
35 40 45

Ala Ala Lys Lys Ala Gly Asn Val Ala Ala Asp Gly Val Ile Lys Thr
50 55 60

Lys Ile Asp Gly Asn Tyr Gly Ile Ile Leu Glu Val Asn Cys Gln Thr
65 70 75 80

Asp Phe Val Ala Lys Asp Ala Gly Phe Gln Ala Phe Ala Asp Lys Val
85 90 95

Leu Asp Ala Ala Val Ala Gly Lys Ile Thr Asp Val Glu Val Leu Lys
100 105 110

Ala Gln Phe Glu Glu Glu Arg Val Ala Leu Val Ala Lys Ile Gly Glu
115 120 125

Asn Ile Asn Ile Arg Arg Val Ala Ala Leu Glu Gly Asp Val Leu Gly
130 135 140

Ser Tyr Gln His Gly Ala Arg Ile Gly Val Leu Val Ala Ala Lys Gly
145 150 155 160

Ala Asp Glu Glu Leu Val Lys His Ile Ala Met His Val Ala Ala Ser
165 170 175

Lys Pro Glu Phe Ile Lys Pro Glu Asp Val Ser Ala Glu Val Val Glu
180 185 190

Lys Glu Tyr Gln Val Gln Leu Asp Ile Ala Met Gln Ser Gly Lys Pro
195 200 205

Lys Glu Ile Ala Glu Lys Met Val Glu Gly Arg Met Lys Lys Phe Thr
210 215 220

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Gly Glu Val Ser Leu Thr Gly Gln Pro Phe Val Met Glu Pro Ser Lys
225 230 235 240

Thr Val Gly Gln Leu Leu Lys Glu His Asn Ala Glu Val Thr Gly Phe
245 250 255

Ile Arg Phe Glu Val Gly Glu Gly Ile Glu Lys Val Glu Thr Asp Phe
260 265 270

Ala Ala Glu Val Ala Ala Met Ser Lys Gln Ser Gly Thr Ile Thr Ser
275 280 285

Ala Leu His Arg Ala Ala Asp Trp Ala Lys Ser Val Phe Ser Ser Ala
290 295 300

Ala Leu Gly Asp Pro Arg Arg Thr Ala Arg Leu Val Asn Val Ala Ala
305 310 315 320

Gln Leu Ala Lys Tyr Ser Gly Lys Ser Ile Thr Ile Ser Ser Glu Gly
325 330 335

Ser Lys Ala Ala Gln Glu Gly Ala Tyr Arg Phe Ile Arg Asn Pro Asn
340 345 350

Val Ser Ala Glu Ala Ile Arg Lys Ala Gly Ala Met Gln Thr Val Lys
355 360 365

Leu Ala Gln Glu Phe Pro Glu Leu Leu Ala Ile Glu Asp Thr Thr Ser
370 375 380

Leu Ser Tyr Arg His Gln Val Ala Glu Glu Leu Gly Lys Leu Gly Ser
385 390 395 400

Ile Gln Asp Lys Ser Arg Gly Trp Trp Val His Ser Val Leu Leu Leu
405 410 415

IP-1198-PCT_SequenceListing

Glu Ala Thr Thr Phe Arg Thr Val Gly Leu Leu His Gln Glu Trp Trp
420 425 430

Met Arg Pro Asp Asp Pro Ala Asp Ala Asp Glu Lys Glu Ser Gly Lys
435 440 445

Trp Leu Ala Ala Ala Ala Thr Ser Arg Leu Arg Met Gly Ser Met Met
450 455 460

Ser Asn Val Ile Ala Val Cys Asp Arg Glu Ala Asp Ile His Ala Tyr
465 470 475 480

Leu Gln Asp Lys Leu Ala His Asn Glu Arg Phe Val Val Arg Ser Arg
485 490 495

His Arg Arg Lys Asp Val Glu Ser Gly Leu Tyr Leu Tyr Asp His Leu
500 505 510

Lys Asn Gln Pro Glu Leu Gly Gly Tyr Gln Ile Ser Ile Pro Gln Lys
515 520 525

Gly Val Val Asp Lys Arg Arg Lys Arg Lys Asn Arg Pro Ala Arg Lys
530 535 540

Ala Ser Leu Ser Leu Arg Ser Gly Arg Ile Thr Leu Lys Gln Gly Asn
545 550 555 560

Ile Thr Leu Asn Ala Val Leu Ala Glu Glu Ile Asn Pro Pro Lys Gly
565 570 575

Glu Thr Pro Leu Lys Trp Leu Leu Leu Thr Ser Glu Pro Val Glu Ser
580 585 590

Leu Ala Gln Ala Leu Arg Val Ile Asp Ile Tyr Thr His Arg Trp Arg
595 600 605

IP-1198-PCT_SequenceListing

Ile Glu Glu Phe His Lys Ala Trp Lys Thr Gly Ala Gly Val Glu Arg
610 615 620

Gln Arg Met Glu Glu Pro Asp Asn Leu Glu Arg Met Val Ser Ile Leu
625 630 635 640

Ser Phe Val Ala Val Arg Leu Leu Gln Leu Arg Glu Ser Phe Thr Pro
645 650 655

Pro Gln Ala Leu Arg Ala Gln Gly Leu Leu Lys Glu Ala Glu His Val
660 665 670

Glu Ser Gln Ser Ala Glu Thr Val Leu Thr Pro Asp Glu Cys Gln Leu
675 680 685

Leu Gly Tyr Leu Asp Lys Gly Lys Arg Lys Arg Lys Glu Lys Ala Gly
690 695 700

Ser Leu Gln Trp Ala Tyr Met Ala Ile Ala Arg Leu Gly Gly Phe Met
705 710 715 720

Asp Ser Lys Arg Thr Gly Ile Ala Ser Trp Gly Ala Leu Trp Glu Gly
725 730 735

Trp Glu Ala Leu Gln Ser Lys Leu Asp Gly Phe Leu Ala Ala Lys Asp
740 745 750

Leu Met Ala Gln Gly Ile Lys Ile
755 760