

Figure 1

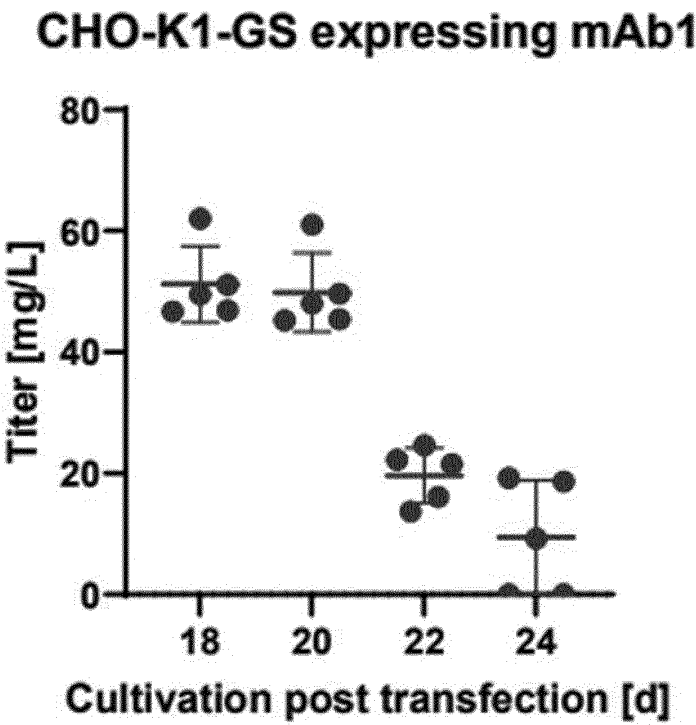
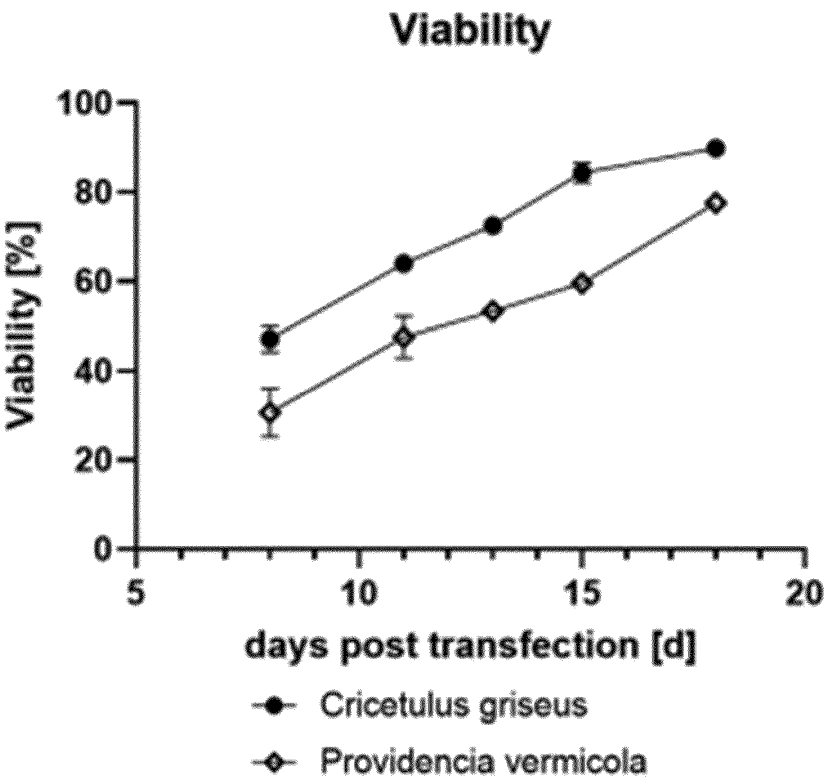


Figure 2

A



B

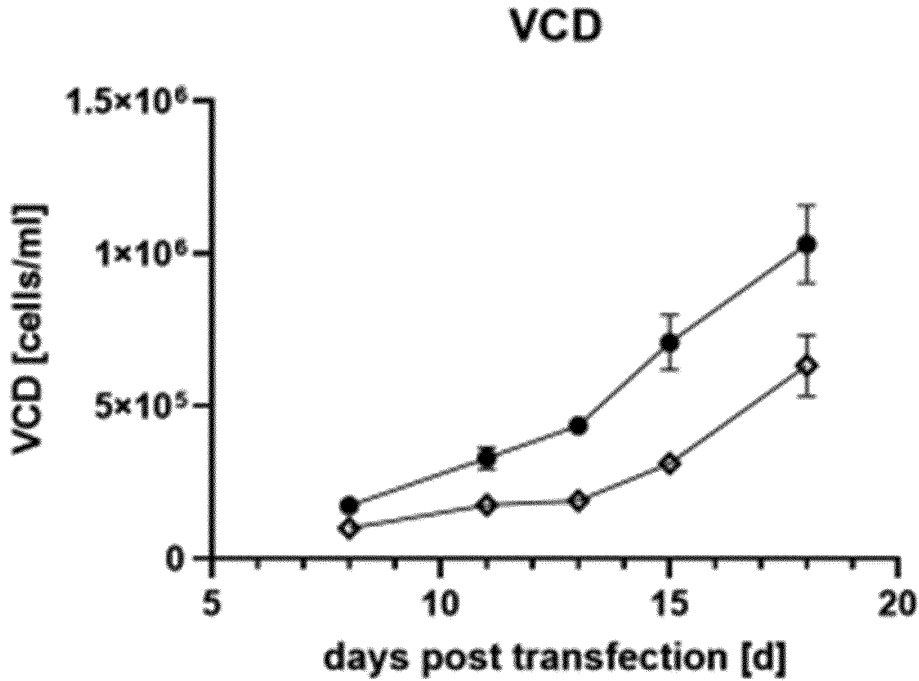
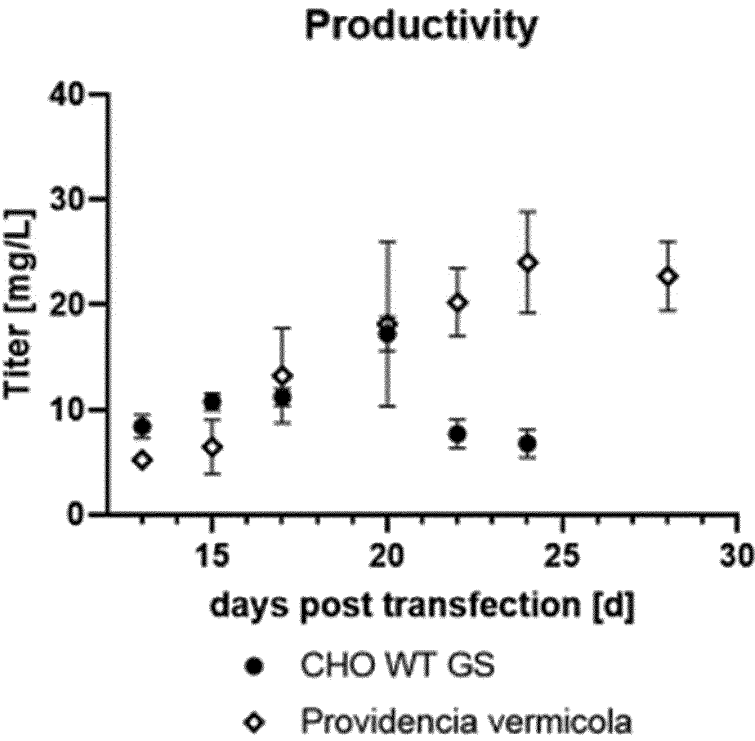


Figure 3

A



B

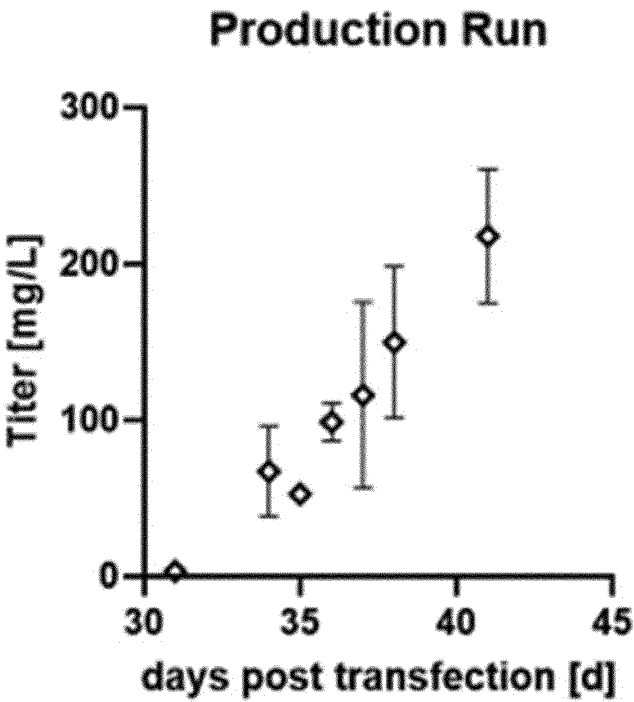


Figure 4

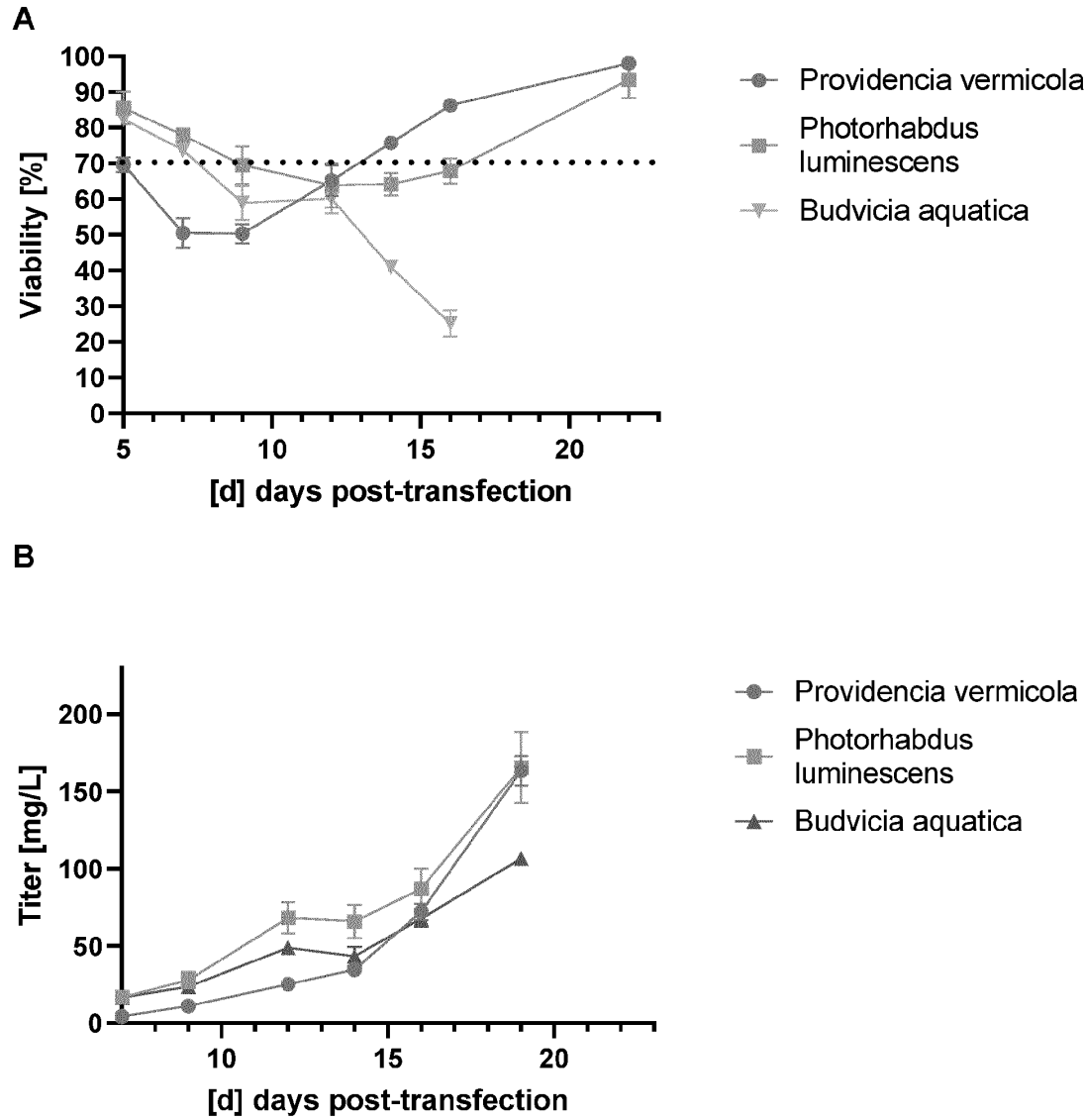


Figure 5

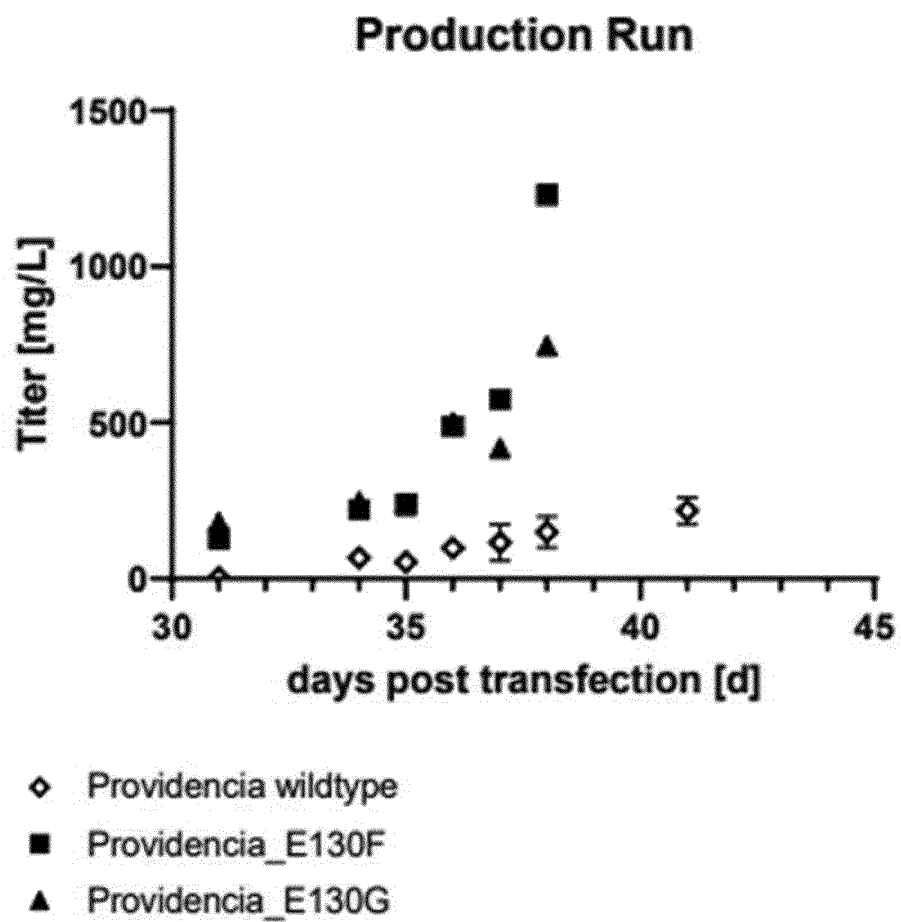


Figure 6

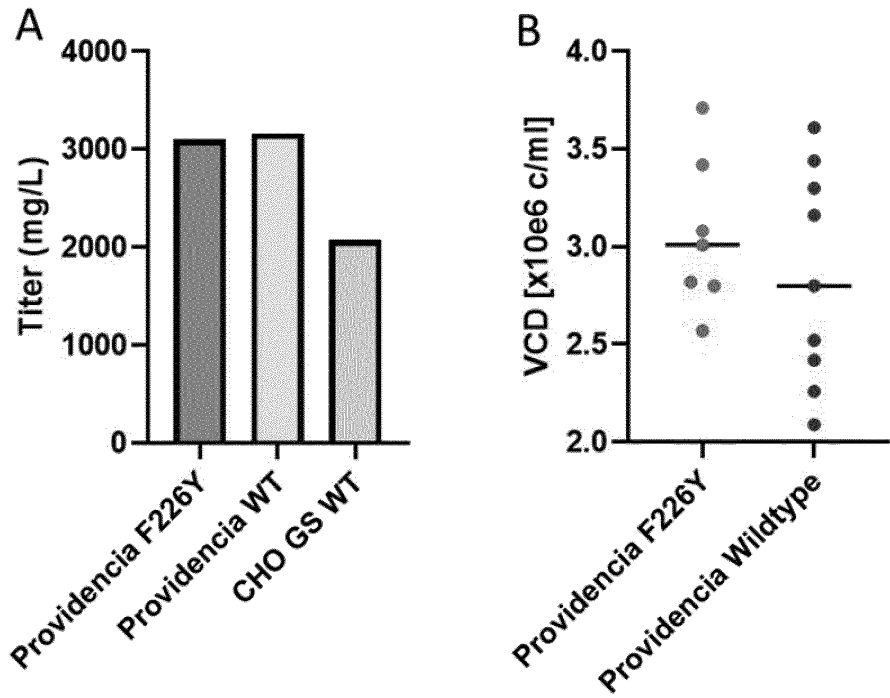
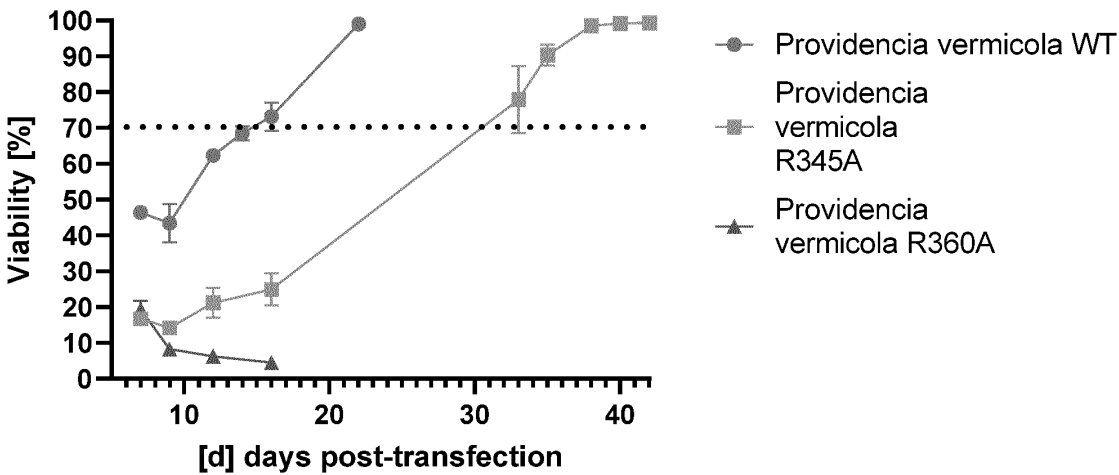


Figure 7

A



B

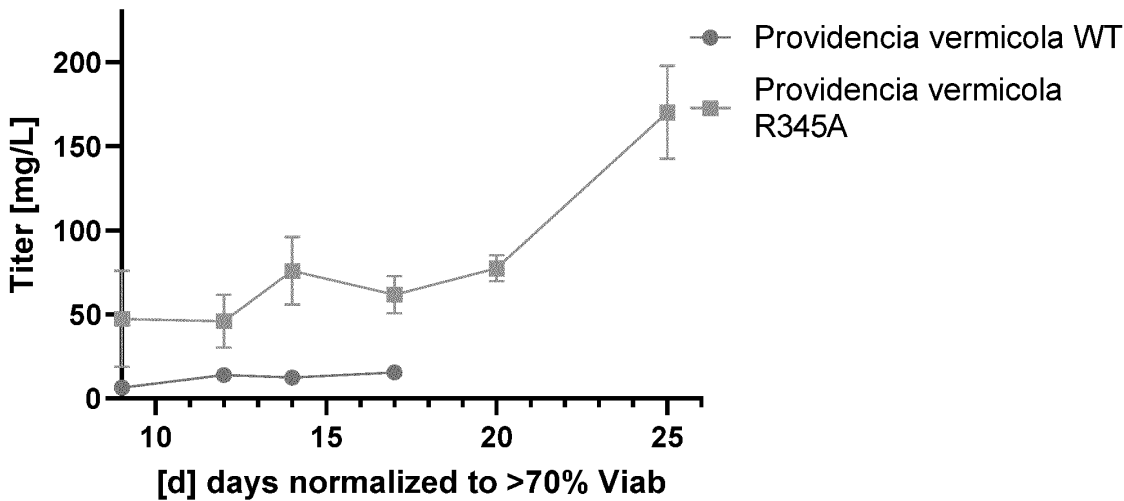


Figure 8

<210> 1
 <211> 469
 <212> PRT
 <213> *Providencia vermicola*

<220>
 <223> Wild type *Providencia vermicola* glutamine synthetase

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

Figure 8 (cont.)

Met	Ser	Leu	Ser	Lys	Asp	Gly	Val	Asn	Leu	Phe	Ala	Gly	Asp	Lys	Tyr
		275					280					285			
Gly	Gly	Leu	Ser	Glu	Met	Ala	Leu	Tyr	Tyr	Ile	Gly	Gly	Ile	Ile	Lys
	290					295					300				
His	Ala	Arg	Ala	Leu	Asn	Ala	Phe	Thr	Asn	Pro	Thr	Thr	Asn	Ser	Tyr
305					310					315					320
Lys	Arg	Leu	Val	Pro	Gly	Phe	Glu	Ala	Pro	Val	Met	Leu	Ala	Tyr	Ser
				325					330					335	
Ala	Arg	Asn	Arg	Ser	Ala	Ser	Ile	Arg	Ile	Pro	Val	Val	Ala	Ser	Thr
			340					345					350		
Lys	Ala	Arg	Arg	Ile	Glu	Val	Arg	Phe	Pro	Asp	Pro	Ala	Ala	Asn	Pro
		355					360					365			
Tyr	Leu	Ala	Phe	Ala	Ala	Gln	Leu	Met	Ala	Gly	Leu	Asp	Gly	Ile	Ile
	370					375					380				
Asn	Lys	Ile	His	Pro	Gly	Asp	Ala	Met	Asp	Lys	Asn	Leu	Tyr	Asp	Leu
385					390					395					400
Pro	Pro	Glu	Glu	Ala	Lys	Glu	Ile	Pro	Thr	Val	Ala	Gly	Ser	Leu	Glu
				405					410					415	
Glu	Ala	Leu	Ala	Glu	Leu	Asp	Lys	Asn	Arg	Glu	Phe	Leu	Thr	Arg	Gly
			420					425					430		
Gly	Val	Phe	Thr	Asp	Asp	Ala	Ile	Asp	Gly	Tyr	Ile	Glu	Leu	Leu	Arg
		435				440						445			
Ser	Asp	Ile	Gln	Arg	Val	Arg	Met	Thr	Pro	His	Pro	Leu	Glu	Phe	Glu
	450					455						460			
Met	Tyr	Tyr	Ser	Val											
465															

Figure 9

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<210> 2
<211> 373
<212> PRT
<213> Cricetulus griseus

<220>
<223> Wild type Cricetulus griseus glutamine synthetase

<400> 2
Met Ala Thr Ser Ala Ser Ser His Leu Asn Lys Asn Ile Lys Gln Met
1      5      10      15
Tyr Leu Cys Leu Pro Gln Gly Glu Lys Val Gln Ala Met Tyr Ile Trp
20      25      30
Val Asp Gly Thr Gly Glu Gly Leu Arg Cys Lys Thr Arg Thr Leu Asp
35      40      45
Cys Glu Pro Lys Cys Val Glu Glu Leu Pro Glu Trp Asn Phe Asp Gly
50      55      60
Ser Ser Thr Phe Gln Ser Glu Gly Ser Asn Ser Asp Met Tyr Leu Ser
65      70      75      80
Pro Val Ala Met Phe Arg Asp Pro Phe Arg Arg Asp Pro Asn Lys Leu
85      90      95
Val Phe Cys Glu Val Phe Lys Tyr Asn Arg Lys Pro Ala Glu Thr Asn
100     105     110
Leu Arg His Ser Cys Lys Arg Ile Met Asp Met Val Ser Asn Gln His
115     120     125
Pro Trp Phe Gly Met Glu Gln Glu Tyr Thr Leu Met Gly Thr Asp Gly
130     135     140
His Pro Phe Gly Trp Pro Ser Asn Gly Phe Pro Gly Pro Gln Gly Pro
145     150     155     160
Tyr Tyr Cys Gly Val Gly Ala Asp Lys Ala Tyr Gly Arg Asp Ile Val
165     170     175
Glu Ala His Tyr Arg Ala Cys Leu Tyr Ala Gly Val Lys Ile Thr Gly
180     185     190
Thr Asn Ala Glu Val Met Pro Ala Gln Trp Glu Phe Gln Ile Gly Pro
195     200     205
Cys Glu Gly Ile Arg Met Gly Asp His Leu Trp Val Ala Arg Phe Ile
210     215     220
Leu His Arg Val Cys Glu Asp Phe Gly Val Ile Ala Thr Phe Asp Pro
225     230     235     240
Lys Pro Ile Pro Gly Asn Trp Asn Gly Ala Gly Cys His Thr Asn Phe
245     250     255
Ser Thr Lys Ala Met Arg Glu Glu Asn Gly Leu Lys His Ile Glu Glu
260     265     270
Ala Ile Glu Lys Leu Ser Lys Arg His Arg Tyr His Ile Arg Ala Tyr
275     280     285
Asp Pro Lys Gly Gly Leu Asp Asn Ala Arg Arg Leu Thr Gly Phe His
290     295     300
Glu Thr Ser Asn Ile Asn Asp Phe Ser Ala Gly Val Ala Asn Arg Ser
305     310     315     320
Ala Ser Ile Arg Ile Pro Arg Thr Val Gly Gln Glu Lys Lys Gly Tyr
325     330     335
Phe Glu Asp Arg Arg Pro Ser Ala Asn Cys Asp Pro Phe Ala Val Thr
340     345     350
Glu Ala Ile Val Arg Thr Cys Leu Leu Asn Glu Thr Gly Asp Glu Pro
355     360     365
Phe Gln Tyr Lys Asn
370

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Figure 10

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<210> 14
<211> 469
<212> PRT
<213> Photorhabdus luminescens

<220>
<223> Wild type Photorhabdus luminescens glutamine synthetase

<400> 14
Met Ser Val Glu His Val Leu Thr Met Ile Glu Glu His Gln Val Lys
1          5          10          15
Phe Ile Asp Leu Arg Phe Thr Asp Thr Lys Gly Lys Glu Gln His Met
20          25          30
Thr Ile Pro Ala His Gln Val Asn Ala Asp Phe Phe Glu Asp Gly Lys
35          40          45
Met Phe Asp Gly Ser Ser Ile Ser Gly Trp Lys Gly Ile Asn Glu Ser
50          55          60
Asp Met Val Leu Met Pro Asp Thr Ser Thr Ala Met Leu Asp Pro Phe
65          70          75          80
Phe Asp Asp Ala Thr Leu Ile Leu Arg Cys Asp Ile Leu Glu Pro Gly
85          90          95
Thr Met Gln Gly Tyr Asp Arg Asp Pro Arg Ser Ile Ser Lys Arg Ala
100         105         110
Glu Asn Phe Leu Arg Ser Ser Gly Ile Ala Asp Thr Val Leu Cys Gly
115         120         125
Pro Glu Pro Glu Phe Phe Leu Phe Asp Asp Val Arg Phe Ser Ser Ala
130         135         140
Met Ser His Ser Tyr Tyr His Ile Asp Asp Ile Glu Ala Ala Trp Asn
145         150         155         160
Ser Gly Thr Gln Tyr Glu Gly Gly Asn Lys Gly His Arg Pro Ala Val
165         170         175
Lys Gly Gly Tyr Ala Pro Leu Pro Pro Val Asp Ser Ser Gln Asp Leu
180         185         190
Arg Ser Ala Met Cys Leu Thr Met Glu Glu Met Gly Leu Val Val Glu
195         200         205
Ala His His His Glu Val Gly Thr Ala Gly Gln Asn Glu Ile Ala Thr
210         215         220
Arg Phe Asn Thr Met Thr Lys Lys Ala Asp Glu Thr Gln Ile Tyr Lys
225         230         235         240
Tyr Val Val His Asn Val Ala His Asn Phe Gly Lys Thr Ala Thr Phe
245         250         255
Met Pro Lys Pro Leu Val Gly Asp Asn Gly Ser Gly Met His Cys His
260         265         270
Met Ser Leu Ser Lys Asn Gly Thr Asn Leu Phe Ala Gly Asp Lys Tyr
275         280         285
Gly Gly Leu Ser Glu Leu Ala Leu Phe Tyr Ile Gly Gly Ile Ile Lys
290         295         300
His Ala Arg Ala Leu Asn Ala Phe Thr Asn Pro Thr Thr Asn Ser Tyr
305         310         315         320
Lys Arg Leu Val Pro Gly Tyr Glu Ala Pro Val Met Leu Ala Tyr Ser
325         330         335
Ala Arg Asn Arg Ser Ala Ser Ile Arg Ile Pro Val Val Ala Ser Thr
340         345         350
Lys Ala Arg Arg Ile Glu Ile Arg Phe Pro Asp Pro Ala Ala Asn Pro
355         360         365
Tyr Leu Ala Phe Ala Ala Gln Leu Met Ala Gly Leu Asp Gly Ile Ile
370         375         380
Asn Lys Ile His Pro Gly Asp Ala Met Asp Lys Asn Leu Tyr Asp Leu
385         390         395         400
Pro Pro Glu Glu Ala Lys Glu Ile Pro Thr Val Ala Ser Ser Leu Glu
405         410         415
Asp Ala Leu Ala Ala Leu Asp Ala Asp Arg Glu Phe Leu Thr Arg Gly
420         425         430
Gly Val Phe Thr Asp Asp Ala Ile Asp Ala Tyr Ile Asp Leu Lys Asn
435         440         445
Ser Glu Ile Glu Arg Val Arg Leu Thr Pro His Pro Leu Glu Phe Glu
450         455         460
Leu Tyr Tyr Ser Val
465

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