

PhoenixTemp12232.tmp.txt  
SEQUENCE LISTING

<110> Evonik Degussa GmbH

<120> Production process for methionine using microorganisms with reduced isocitrate dehydrogenase activity

<130> B 8668 / DB

<160> 9

<170> PatentIn version 3.3

<210> 1

<211> 2217

<212> DNA

<213> Corynebacterium glutamicum

<220>

<221> misc\_feature

<222> (1)..(2217)

<223> coding sequence of isocitrate dehydrogenase

<400> 1

atggctaaga tcacatctggac ccgcaccgac gaagcaccgc tgctcgcgac ctactcgctg	60
aagccggtcg tcgaggcatt tgctgctacc gcgggcattg aggtcgagac ccgggacatt	120
tcactcgctg gacgcaccc cgcacagttc ccagagcgcc tcaccgaaga tcagaaggta	180
ggcaacgcac tcgcagaact cggcgagctt gctaagactc ctgaagcaaa catcattaag	240
cttccaaaca tctccgcttc tgttccacag ctcaaggctg ctattaagga actgcaggac	300
cagggctacg acatcccaga actgcctgat aacgccacca ccgacgagga aaaagacatc	360
ctcgcacgct acaacgctgt taagggttcc gctgtgaacc cagtgcgcg tgaaggcaac	420
tctgaccgcc gcgcaccaat cgctgtcaag aactttgtta agaagttccc acaccgcatg	480
ggcgagtggc ctgcagattc caagaccaac gttgcaacca tggatgcaaa cgacttccgc	540
cacaacgaga agtccatcat cctcgacgct gctgatgaag ttcagatcaa gcacatcgca	600
gctgacggca ccgagaccat cctcaaggac agcctcaagc ttcttgaagg cgaagttcta	660
gacggaaccg ttctgtccgc aaaggcactg gacgcattcc ttctcgagca ggctcgctcg	720
gcaaaggcag aaggatccct cttctccgca cacctgaagg ccacatgat gaaggctctcc	780
gacccaatca tcttcggcca cgctgtgcgc gcttacttcg cagacgtttt cgcacagtac	840
ggtgagcagc tgctcgcagc tggcctcaac ggcgaaaacg gcctcgctgc aatcctctcc	900
ggcttgaggt ccctggacaa cggcgaagaa atcaaggctg cattcgagaa gggcttgga	960
gacggcccag acctggccat ggttaactcc gctcgcggca tcaccaacct gcatgtccct	1020
tccgatgtca tcgtggacgc ttccatgcca gcaatgattc gtacctccgg ccacatgtgg	1080
aacaaagacg accaggagca ggacaccctg gcaatcatcc cagactcctc ctacgctggc	1140
gtctaccaga ccgttatcga agactgccgc aagaacggcg cattcgatcc aaccaccatg	1200
ggtaccgtcc ctaacgttgg tctgatggct cagaaggctg aagagtacgg ctcccatgac	1260
aagaccttcc gcatcgaagc agacgggtgtg gttcaggttg tttcctccaa cggcgacgtt	1320

## PhoenixTemp12232.tmp.txt

```

ctcatcgagc acgacgttga ggcaaatgac atctggcgtg catgccaggt caaggatgcc 1380
ccaatccagg attgggtaaa gcttgctgtc acccgctccc gtctctccgg aatgcctgca 1440
gtgttctggt tggatccaga gcgcgcacac gaccgcaacc tggcttccct cgttgagaag 1500
tacctggctg accacgacac cgagggcctg gacatccaga tcctctcccc tgttgaggca 1560
accagctct ccatcgaccg catccgccgt ggcgaggaca ccatctctgt caccggtaac 1620
gttctgcgtg actacaacac cgacctcttc ccaatcctgg agctgggcac ctctgcaaag 1680
atgctgtctg tcgttccttt gatggctggc ggcggactgt tcgagaccgg tgctggtgga 1740
tctgtccta agcacgtcca gcaggttcag gaagaaaacc acctgcgttg ggattccctc 1800
ggtgagttcc tcgcactggc tgagtccttc cgccacgagc tcaacaacaa cggcaacacc 1860
aaggccggcg ttctggctga cgctctggac aaggcaactg agaagctgct gaacgaagag 1920
aagtcctcat cccgcaaggt tggcgagatc gacaaccgtg gctcccactt ctggctgacc 1980
aagttctggg ctgacgagct cgctgctcag accgaggacg cagatctggc tgctaccttc 2040
gcaccagtcg cagaagcact gaacacaggc gctgcagaca tcgatgctgc actgctcgca 2100
gttcagggtg gagcaactga ccttggtggc tactactccc ctaacgagga gaagctcacc 2160
aacatcatgc gccagtcgc acagttcaac gagatcgttg acgcactgaa gaagtaa 2217

```

```

<210> 2
<211> 3217
<212> DNA
<213> Corynebacterium glutamicum

```

```

<220>
<221> gene
<222> (1)..(3217)
<223> isocitrate dehydrogenase gene including 500 nt upstream and
downstream native regions

```

```

<220>
<221> promoter
<222> (1)..(500)
<223> presumed promoter region

```

```

<220>
<221> CDS
<222> (501)..(2717)
<223> coding region of isocitrate dehydrogenase from Corynebacterium
glutamicum

```

```

<220>
<221> misc_signal
<222> (2718)..(3217)
<223> downstream region of the isocitrate dehydrogenase gene of
Corynebacterium glutamicum

```

```

<400> 2
gcgcgcatcc tcgaagacct cgcagattcc gatattccag gaaccgccat gatcgaaatc 60
ccctcagatg acgatgcact tgccatcgag ggaccttccct ccatcgatgt gaaatggctg 120
ccccgcaacg gccgcaagca cggatgaattg ttgatggaaa ccttggccct ccaccatgaa 180

```

gaaacagaag ctgcagccac ctccgaaggc gaacttgtgt gggagactcc tgtgtttctcc	240
gccactggcg aacagatcac agaatccaac ccacgttcag gcgactacta ctggattgct	300
ggcgaaaagtg gtgtcgtgac cagcattcgt cgatctctag tgaaagagaa aggcctcgac	360
cgttcccaag tggcattcat ggggtattgg aaacacggcg tttccatgcg gggctgaaac	420
tgccaccata ggcgccagca attagtagaa cactgtattc taggtagctg aacaaaagag	480
cccatcaacc aaggagactc atg gct aag atc atc tgg acc cgc acc gac gaa	533
Met Ala Lys Ile Ile Trp Thr Arg Thr Asp Glu	
1 5 10	
gca ccg ctg ctc gcg acc tac tgc ctg aag ccg gtc gtc gag gca ttt	581
Ala Pro Leu Leu Ala Thr Tyr Ser Leu Lys Pro Val Val Glu Ala Phe	
15 20 25	
gct gct acc gcg ggc att gag gtc gag acc ccg gac att tca ctc gct	629
Ala Ala Thr Ala Gly Ile Glu Val Glu Thr Arg Asp Ile Ser Leu Ala	
30 35 40	
gga cgc atc ctc gcc cag ttc cca gag cgc ctc acc gaa gat cag aag	677
Gly Arg Ile Leu Ala Gln Phe Pro Glu Arg Leu Thr Glu Asp Gln Lys	
45 50 55	
gta ggc aac gca ctc gca gaa ctc ggc gag ctt gct aag act cct gaa	725
Val Gly Asn Ala Leu Ala Glu Leu Gly Glu Leu Ala Lys Thr Pro Glu	
60 65 70 75	
gca aac atc att aag ctt cca aac atc tcc gct tct gtt cca cag ctc	773
Ala Asn Ile Ile Lys Leu Pro Asn Ile Ser Ala Ser Val Pro Gln Leu	
80 85 90	
aag gct gct att aag gaa ctg cag gac cag ggc tac gac atc cca gaa	821
Lys Ala Ala Ile Lys Glu Leu Gln Asp Gln Gly Tyr Asp Ile Pro Glu	
95 100 105	
ctg cct gat aac gcc acc acc gac gag gaa aaa gac atc ctc gca cgc	869
Leu Pro Asp Asn Ala Thr Thr Asp Glu Glu Lys Asp Ile Leu Ala Arg	
110 115 120	
tac aac gct gtt aag ggt tcc gct gtg aac cca gtg ctg cgt gaa ggc	917
Tyr Asn Ala Val Lys Gly Ser Ala Val Asn Pro Val Leu Arg Glu Gly	
125 130 135	
aac tct gac cgc cgc gca cca atc gct gtc aag aac ttt gtt aag aag	965
Asn Ser Asp Arg Arg Ala Pro Ile Ala Val Lys Asn Phe Val Lys Lys	
140 145 150 155	
ttc cca cac cgc atg ggc gag tgg tct gca gat tcc aag acc aac gtt	1013
Phe Pro His Arg Met Gly Glu Trp Ser Ala Asp Ser Lys Thr Asn Val	
160 165 170	
gca acc atg gat gca aac gac ttc cgc cac aac gag aag tcc atc atc	1061
Ala Thr Met Asp Ala Asn Asp Phe Arg His Asn Glu Lys Ser Ile Ile	
175 180 185	
ctc gac gct gct gat gaa gtt cag atc aag cac atc gca gct gac ggc	1109
Leu Asp Ala Ala Asp Glu Val Gln Ile Lys His Ile Ala Ala Asp Gly	
190 195 200	
acc gag acc atc ctc aag gac agc ctc aag ctt ctt gaa ggc gaa gtt	1157
Thr Glu Thr Ile Leu Lys Asp Ser Leu Lys Leu Leu Glu Gly Glu Val	
205 210 215	
cta gac gga acc gtt ctg tcc gca aag gca ctg gac gca ttc ctt ctc	1205
Leu Asp Gly Thr Val Leu Ser Ala Lys Ala Leu Asp Ala Phe Leu Leu	

## PhoenixTemp12232.tmp.txt

220		225		230		235										
gag Glu	cag Gln	gtc Val	gct Ala	cgc Arg 240	gca Ala	aag Lys	gca Ala	gaa Glu	ggc Gly 245	atc Ile	ctc Leu	ttc Phe	tcc Ser	gca Ala 250	cac His	1253
ctg Leu	aag Lys	gcc Ala	acc Thr 255	atg Met	atg Met	aag Lys	gtc Val	tcc Ser 260	gac Asp	cca Pro	atc Ile	atc Ile	ttc Phe 265	ggc Gly	cac His	1301
gtt Val	gtg Val	cgc Arg 270	gct Ala	tac Tyr	ttc Phe	gca Ala	gac Asp 275	gtt Val	ttc Phe	gca Ala	cag Gln	tac Tyr 280	ggc Gly	gag Glu	cag Gln	1349
ctg Leu	ctc Leu 285	gca Ala	gct Ala	ggc Gly	ctc Leu	aac Asn 290	ggc Gly	gaa Glu	aac Asn	ggc Gly	ctc Leu 295	gct Ala	gca Ala	atc Ile	ctc Leu	1397
tcc Ser 300	ggc Gly	ttg Leu	gag Glu	tcc Ser	ctg Leu 305	gac Asp	aac Asn	ggc Gly	gaa Glu	gaa Glu 310	atc Ile	aag Lys	gct Ala	gca Ala	ttc Phe 315	1445
gag Glu	aag Lys	ggc Gly	ttg Leu	gaa Glu 320	gac Asp	ggc Gly	cca Pro	gac Asp	ctg Leu 325	ggc Ala	atg Met	gtt Val	aac Asn	tcc Ser 330	gct Ala	1493
cgc Arg	ggc Gly	atc Ile	acc Thr 335	aac Asn	ctg Leu	cat His	gtc Val	cct Pro 340	tcc Ser	gat Asp	gtc Val	atc Ile	gtg Val 345	gac Asp	gct Ala	1541
tcc Ser	atg Met	cca Pro 350	gca Ala	atg Met	att Ile	cgt Arg	acc Thr 355	tcc Ser	ggc Gly	cac His	atg Met	tgg Trp 360	aac Asn	aaa Lys	gac Asp	1589
gac Asp 365	cag Gln	gag Glu	cag Gln	gac Asp	acc Thr 370	ctg Leu	gca Ala	atc Ile	atc Ile	cca Pro	gac Asp 375	tcc Ser	tcc Ser	tac Tyr	gct Ala	1637
ggc Gly 380	gtc Val	tac Tyr	cag Gln	acc Thr	gtt Val 385	atc Ile	gaa Glu	gac Asp	tgc Cys	cgc Arg 390	aag Lys	aac Asn	ggc Gly	gca Ala	ttc Phe 395	1685
gat Asp	cca Pro	acc Thr	acc Thr	atg Met 400	ggc Gly	acc Thr	gtc Val	cct Pro	aac Asn 405	gtt Val	ggc Gly	ctg Leu	atg Met	gct Ala 410	cag Gln	1733
aag Lys	gct Ala	gaa Glu	gag Glu 415	tac Tyr	ggc Gly	tcc Ser	cat His	gac Asp 420	aag Lys	acc Thr	ttc Phe	cgc Arg 425	atc Ile	gaa Glu 425	gca Ala	1781
gac Asp	ggc Gly	gtg Val 430	gtt Val	cag Gln	gtt Val	gtt Val	tcc Ser 435	tcc Ser	aac Asn	ggc Gly	gac Asp	gtt Val 440	ctc Leu	atc Ile	gag Glu	1829
cac His 445	gac Asp	gtt Val	gag Glu	gca Ala	aac Asn	gac Asp 450	atc Ile	tgg Trp	cgt Arg	gca Ala	tgc Cys 455	cag Gln	gtc Val	aag Lys	gat Asp	1877
gcc Ala 460	cca Pro	atc Ile	cag Gln	gat Asp	tgg Trp 465	gta Val	aag Lys	ctt Leu	gct Ala	gtc Val 470	acc Thr	cgc Arg	tcc Ser	cgt Arg	ctc Leu 475	1925
tcc Ser	gga Gly	atg Met	cct Pro	gca Ala 480	gtg Val	ttc Phe	tgg Trp	ttg Leu	gat Asp 485	cca Pro	gag Glu	cgc Arg	gca Ala	cac His 490	gac Asp	1973
cgc Arg	aac Asn	ctg Leu	gct Ala	tcc Ser	ctc Leu	gtt Val	gag Glu	aag Lys	tac Tyr	ctg Leu	gct Ala	gac Asp	cac His	gac Asp	acc Thr	2021

## PhoenixTemp12232.tmp.txt

															495																500																505	
															gag	ggc	ctg	gac	atc	cag	atc	ctc	tcc	cct	gtt	gag	gca	acc	cag	ctc																2069		
															Glu	Gly	Leu	Asp	Ile	Gln	Ile	Leu	Ser	Pro	Val	Glu	Ala	Thr	Gln	Leu																		
															510						515						520																					
															tcc	atc	gac	cgc	atc	cgc	cgt	ggc	gag	gac	acc	atc	tct	gtc	acc	ggc																2117		
															Ser	Ile	Asp	Arg	Ile	Arg	Arg	Gly	Glu	Asp	Thr	Ile	Ser	Val	Thr	Gly																		
															525						530						535																					
															aac	gtt	ctg	cgt	gac	tac	aac	acc	gac	ctc	ttc	cca	atc	ctg	gag	ctg																2165		
															Asn	Val	Leu	Arg	Asp	Tyr	Asn	Thr	Asp	Leu	Phe	Pro	Ile	Leu	Glu	Leu																		
															540			545						550			555																					
															ggc	acc	tct	gca	aag	atg	ctg	tct	gtc	gtt	cct	ttg	atg	gct	ggc	ggc																2213		
															Gly	Thr	Ser	Ala	Lys	Met	Leu	Ser	Val	Val	Pro	Leu	Met	Ala	Gly	Gly																		
																		560						565			570																					
															gga	ctg	ttc	gag	acc	ggc	gct	ggc	gga	tct	gct	cct	aag	cac	gtc	cag																2261		
															Gly	Leu	Phe	Glu	Thr	Gly	Ala	Gly	Gly	Ser	Ala	Pro	Lys	His	Val	Gln																		
																		575			580						585																					
															cag	gtt	cag	gaa	gaa	aac	cac	ctg	cgt	tgg	gat	tcc	ctc	ggc	gag	ttc																2309		
															Gln	Val	Gln	Glu	Glu	Asn	His	Leu	Arg	Trp	Asp	Ser	Leu	Gly	Glu	Phe																		
																		590			595						600																					
															ctc	gca	ctg	gct	gag	tcc	ttc	cgc	cac	gag	ctc	aac	aac	aac	ggc	aac																2357		
															Leu	Ala	Leu	Ala	Glu	Ser	Phe	Arg	His	Glu	Leu	Asn	Asn	Asn	Gly	Asn																		
															605						610						615																					
															acc	aag	gcc	ggc	gtt	ctg	gct	gac	gct	ctg	gac	aag	gca	act	gag	aag																2405		
															Thr	Lys	Ala	Gly	Val	Leu	Ala	Asp	Ala	Leu	Asp	Lys	Ala	Thr	Glu	Lys																		
															620			625			630			635																								
															ctg	ctg	aac	gaa	gag	aag	tcc	cca	tcc	cgc	aag	gtt	ggc	gag	atc	gac																2453		
															Leu	Leu	Asn	Glu	Glu	Lys	Ser	Pro	Ser	Arg	Lys	Val	Gly	Glu	Ile	Asp																		
																		640			645						650																					
															aac	cgt	ggc	tcc	cac	ttc	tgg	ctg	acc	aag	ttc	tgg	gct	gac	gag	ctc																2501		
															Asn	Arg	Gly	Ser	His	Phe	Trp	Leu	Thr	Lys	Phe	Trp	Ala	Asp	Glu	Leu																		
																		655			660						665																					
															gct	gct	cag	acc	gag	gac	gca	gat	ctg	gct	gct	acc	ttc	gca	cca	gtc																2549		
															Ala	Ala	Gln	Thr	Glu	Asp	Ala	Asp	Leu	Ala	Ala	Thr	Phe	Ala	Pro	Val																		
															670						675						680																					
															gca	gaa	gca	ctg	aac	aca	ggc	gct	gca	gac	atc	gat	gct	gca	ctg	ctc																2597		
															Ala	Glu	Ala	Leu	Asn	Thr	Gly	Ala	Ala	Asp	Ile	Asp	Ala	Ala	Leu	Leu																		
															685			690						695																								
															gca	gtt	cag	ggc	gga	gca	act	gac	ctt	ggc	ggc	tac	tac	tcc	cct	aac																2645		
															Ala	Val	Gln	Gly	Gly	Ala	Thr	Asp	Leu	Gly	Gly	Tyr	Tyr	Ser	Pro	Asn																		
															700			705			710			715																								
															gag	gag	aag	ctc	acc	aac	atc	atg	cgc	cca	gtc	gca	cag	ttc	aac	gag																2693		
															Glu	Glu	Lys	Leu	Thr	Asn	Ile	Met	Arg	Pro	Val	Ala	Gln	Phe	Asn	Glu																		
																		720			725						730																					
															atc	gtt	gac	gca	ctg	aag	aag	taa	agtctcttca	caaaaagcgc	tgtgcttcct																2747							
															Ile	Val	Asp	Leu	Lys	Lys																												
															735																																	
															cacatggaag	cacagcgctt	tttcatat	ttt	ttattgccat	aatgggcaca	tgcgtttttc																2807											
															tcgagttctt	cccgacttc	ttatcaccac	cgccgtgagc	atcccaacag	catctgctgc																2867												
															cacactcacc	gccgacaccg	acaaggaatt	gtgcatcgcc	agcaacaccg	acgattccgc																2927												

## PhoenixTemp12232.tmp.txt

ggtggttacc ttctggaact ccattgaaga ctccgtgcgc gaacaacgcc tgcacgaact 2987  
 agacgccc aa gatccaggaa tcaaagcggc gattgaaagc tacatcgccc aagatgacaa 3047  
 cgccccaaact gctgctgaac tgcaagtacg cctcgatgcc atcgaatccg gcgaaggcct 3107  
 agccatgctc ctcccagacg atcccacgct ggcagacccc aacgccgagg aaagtttcaa 3167  
 aacggagtac acatacgacg aagccaaaga catcatcagc ggattctcca 3217

<210> 3  
 <211> 738  
 <212> PRT  
 <213> Corynebacterium glutamicum

<400> 3

Met Ala Lys Ile Ile Trp Thr Arg Thr Asp Glu Ala Pro Leu Leu Ala  
1 5 10 15

Thr Tyr Ser Leu Lys Pro Val Val Glu Ala Phe Ala Ala Thr Ala Gly  
20 25 30

Ile Glu Val Glu Thr Arg Asp Ile Ser Leu Ala Gly Arg Ile Leu Ala  
35 40 45

Gln Phe Pro Glu Arg Leu Thr Glu Asp Gln Lys Val Gly Asn Ala Leu  
50 55 60

Ala Glu Leu Gly Glu Leu Ala Lys Thr Pro Glu Ala Asn Ile Ile Lys  
65 70 75 80

Leu Pro Asn Ile Ser Ala Ser Val Pro Gln Leu Lys Ala Ala Ile Lys  
85 90 95

Glu Leu Gln Asp Gln Gly Tyr Asp Ile Pro Glu Leu Pro Asp Asn Ala  
100 105 110

Thr Thr Asp Glu Glu Lys Asp Ile Leu Ala Arg Tyr Asn Ala Val Lys  
115 120 125

Gly Ser Ala Val Asn Pro Val Leu Arg Glu Gly Asn Ser Asp Arg Arg  
130 135 140

Ala Pro Ile Ala Val Lys Asn Phe Val Lys Lys Phe Pro His Arg Met  
145 150 155 160

Gly Glu Trp Ser Ala Asp Ser Lys Thr Asn Val Ala Thr Met Asp Ala  
165 170 175

Asn Asp Phe Arg His Asn Glu Lys Ser Ile Ile Leu Asp Ala Ala Asp  
180 185 190

Glu Val Gln Ile Lys His Ile Ala Ala Asp Gly Thr Glu Thr Ile Leu  
195 200 205

## PhoenixTemp12232.tmp.txt

Lys Asp Ser Leu Lys Leu Leu Glu Gly Glu Val Leu Asp Gly Thr Val  
 210 215 220  
 Leu Ser Ala Lys Ala Leu Asp Ala Phe Leu Leu Glu Gln Val Ala Arg  
 225 230 235 240  
 Ala Lys Ala Glu Gly Ile Leu Phe Ser Ala His Leu Lys Ala Thr Met  
 245 250 255  
 Met Lys Val Ser Asp Pro Ile Ile Phe Gly His Val Val Arg Ala Tyr  
 260 265 270  
 Phe Ala Asp Val Phe Ala Gln Tyr Gly Glu Gln Leu Leu Ala Ala Gly  
 275 280 285  
 Leu Asn Gly Glu Asn Gly Leu Ala Ala Ile Leu Ser Gly Leu Glu Ser  
 290 295 300  
 Leu Asp Asn Gly Glu Glu Ile Lys Ala Ala Phe Glu Lys Gly Leu Glu  
 305 310 315 320  
 Asp Gly Pro Asp Leu Ala Met Val Asn Ser Ala Arg Gly Ile Thr Asn  
 325 330 335  
 Leu His Val Pro Ser Asp Val Ile Val Asp Ala Ser Met Pro Ala Met  
 340 345 350  
 Ile Arg Thr Ser Gly His Met Trp Asn Lys Asp Asp Gln Glu Gln Asp  
 355 360 365  
 Thr Leu Ala Ile Ile Pro Asp Ser Ser Tyr Ala Gly Val Tyr Gln Thr  
 370 375 380  
 Val Ile Glu Asp Cys Arg Lys Asn Gly Ala Phe Asp Pro Thr Thr Met  
 385 390 395 400  
 Gly Thr Val Pro Asn Val Gly Leu Met Ala Gln Lys Ala Glu Glu Tyr  
 405 410 415  
 Gly Ser His Asp Lys Thr Phe Arg Ile Glu Ala Asp Gly Val Val Gln  
 420 425 430  
 Val Val Ser Ser Asn Gly Asp Val Leu Ile Glu His Asp Val Glu Ala  
 435 440 445  
 Asn Asp Ile Trp Arg Ala Cys Gln Val Lys Asp Ala Pro Ile Gln Asp  
 450 455 460  
 Trp Val Lys Leu Ala Val Thr Arg Ser Arg Leu Ser Gly Met Pro Ala  
 465 470 475 480

Val Phe Trp Leu Asp Pro Glu Arg Ala His Asp Arg Asn Leu Ala Ser  
 485 490 495  
 Leu Val Glu Lys Tyr Leu Ala Asp His Asp Thr Glu Gly Leu Asp Ile  
 500 505 510  
 Gln Ile Leu Ser Pro Val Glu Ala Thr Gln Leu Ser Ile Asp Arg Ile  
 515 520 525  
 Arg Arg Gly Glu Asp Thr Ile Ser Val Thr Gly Asn Val Leu Arg Asp  
 530 535 540  
 Tyr Asn Thr Asp Leu Phe Pro Ile Leu Glu Leu Gly Thr Ser Ala Lys  
 545 550 555 560  
 Met Leu Ser Val Val Pro Leu Met Ala Gly Gly Gly Leu Phe Glu Thr  
 565 570 575  
 Gly Ala Gly Gly Ser Ala Pro Lys His Val Gln Gln Val Gln Glu Glu  
 580 585 590  
 Asn His Leu Arg Trp Asp Ser Leu Gly Glu Phe Leu Ala Leu Ala Glu  
 595 600 605  
 Ser Phe Arg His Glu Leu Asn Asn Asn Gly Asn Thr Lys Ala Gly Val  
 610 615 620  
 Leu Ala Asp Ala Leu Asp Lys Ala Thr Glu Lys Leu Leu Asn Glu Glu  
 625 630 635 640  
 Lys Ser Pro Ser Arg Lys Val Gly Glu Ile Asp Asn Arg Gly Ser His  
 645 650 655  
 Phe Trp Leu Thr Lys Phe Trp Ala Asp Glu Leu Ala Ala Gln Thr Glu  
 660 665 670  
 Asp Ala Asp Leu Ala Ala Thr Phe Ala Pro Val Ala Glu Ala Leu Asn  
 675 680 685  
 Thr Gly Ala Ala Asp Ile Asp Ala Ala Leu Leu Ala Val Gln Gly Gly  
 690 695 700  
 Ala Thr Asp Leu Gly Gly Tyr Tyr Ser Pro Asn Glu Glu Lys Leu Thr  
 705 710 715 720  
 Asn Ile Met Arg Pro Val Ala Gln Phe Asn Glu Ile Val Asp Ala Leu  
 725 730 735  
 Lys Lys

<210> 4  
 <211> 2217  
 <212> DNA  
 <213> *Corynebacterium glutamicum*

<220>  
 <221> mutation  
 <222> (1)..(1)  
 <223> isocitrate dehydrogenase carrying an ATG-GTG mutation in the start codon

<400> 4  
 gtggctaaga tcactctggac cgcaccgac gaagcaccgc tgctcgcgac ctactcgctg 60  
 aagccggctcg tcgaggcatt tgctgctacc gcgggcattg aggtcgagac ccgggacatt 120  
 tcactcgctg gacgcatcct cggccagttc ccagagcgcc tcaccgaaga tcagaaggta 180  
 ggcaacgcac tcgcagaact cggcgagctt gctaagactc ctgaagcaaa catcattaag 240  
 cttccaaaca tctccgcttc tgttccacag ctcaaggctg ctattaagga actgcaggac 300  
 cagggctacg acatcccaga actgcctgat aacgccacca ccgacgagga aaaagacatc 360  
 ctcgcacgct acaacgctgt taagggttcc gctgtgaacc cagtgcctgcg tgaaggcaac 420  
 tctgaccgcc gcgcaccaat cgctgtcaag aactttgtta agaagttccc acaccgcatg 480  
 ggcgagtggc ctgcagattc caagaccaac gttgcaacca tggatgcaaa cgacttccgc 540  
 cacaacgaga agtccatcat cctcgacgct gctgatgaag ttcagatcaa gcacatcgca 600  
 gctgacggca ccgagaccat cctcaaggac agcctcaagc ttcttgaagg cgaagttcta 660  
 gacggaaccg ttctgtccgc aaaggcactg gacgcattcc ttctcgagca ggtcgctcgc 720  
 gcaaaggcag aaggtatcct cttctccgca cacctgaagg ccaccatgat gaaggctctcc 780  
 gacccaatca tcttcggcca cgttgtgcgc gcttacttcg cagacgtttt cgcacagtac 840  
 ggtgagcagc tgctcgcagc tggcctcaac ggcgaaaacg gcctcgctgc aatcctctcc 900  
 ggcttgaggc ccctggacaa cggcgaagaa atcaaggctg cattcgagaa gggcttgga 960  
 gacggcccag acctggccat ggttaactcc gctcgcggca tcaccaacct gcatgtccct 1020  
 tccgatgtca tcgtggacgc ttccatgcca gcaatgattc gtacctccgg ccacatgtgg 1080  
 aacaaagacg accaggagca ggacaccctg gcaatcatcc cagactcctc ctacgctggc 1140  
 gtctaccaga ccgttatcga agactgccgc aagaacggcg cattcgatcc aaccaccatg 1200  
 ggtaccgtcc ctaacgttgg tctgatggct cagaaggctg aagagtacgg ctcccatgac 1260  
 aagaccttcc gcatcgaagc agacggtgtg gttcaggttg tttcctccaa cggcgacggt 1320  
 ctcacgcagc acgacgttga ggcaaatgac atctggcgtg catgccaggt caaggatgcc 1380  
 ccaatccagg attgggtaaa gcttgctgtc acccgctccc gtctctccgg aatgcctgca 1440  
 gtgttctggc tggatccaga gcgcgcacac gaccgcaacc tggcttccct cgttgagaag 1500  
 tacctggctg accacgacac cgagggcctg gacatccaga tcctctcccc tgttgaggca 1560  
 acccagctct ccacgcaccg catccgccgt ggcgaggaca ccacgtctgt caccggtaac 1620

## PhoenixTemp12232.tmp.txt

```

gttctgctg actacaacac cgacctcttc ccaatcctgg agctgggcac ctctgcaaag 1680
atgctgtctg tcgttccttt gatggctggc ggcggactgt tcgagaccgg tgctgggtgga 1740
tctgtccta agcacgtcca gcaggttcag gaagaaaacc acctgcgttg ggattccctc 1800
ggtgagttcc tcgcactggc tgagtccttc cgccacgagc tcaacaacaa cggcaacacc 1860
aaggccggcg ttctggctga cgctctggac aaggcaactg agaagctgct gaacgaagag 1920
aagtcccat cccgcaaggt tggcgagatc gacaaccgtg gctcccactt ctggctgacc 1980
aagttctggg ctgacgagct cgctgctcag accgaggacg cagatctggc tgctaccttc 2040
gcaccagtgc cagaagcact gaacacaggc gctgcagaca tcgatgctgc actgctcgca 2100
gttcagggtg gagcaactga ccttgggtggc tactactccc ctaacgagga gaagctcacc 2160
aacatcatgc gcccagtcgc acagttcaac gagatcggtg acgcactgaa gaagtaa 2217

```

```

<210> 5
<211> 1002
<212> DNA
<213> Artificial

```

```

<220>
<223> DNA sequence

```

```

<220>
<221> misc_feature
<222> (1)..(1002)
<223> vector insert with isocitrate dehydrogenase of Corynebacterium
glutamicum carrying an ATG-GTG mutation in the start codon

```

```

<400> 5
ctcgagcgaa gacctcgag attccgatat tccaggaacc gccatgatcg aaatcccctc 60
agatgacgat gcacttgcca tcgagggacc ttctccatc gatgtgaaat ggctgccccg 120
caacggccgc aagcacggtg aattgttgat ggaaaccctg gccctccacc atgaagaaac 180
agaagctgca gccacctccg aaggcgaact tgtgtgggag actcctgtgt tctccgccac 240
tggcgaacag atcacagaat ccaaccacg ttcaggcgac tactactgga ttgctggcga 300
aagtgggtgc gtgaccagca ttcgtcgatc tctagtgaag gagaaaggcc tcgaccgttc 360
ccaagtggca ttcattgggt attggaaaca cggcggtttc atgcgggggt gaaactgcc 420
ccataggcgc cagcaattag tagaactctg tattctaggt agctgaacaa aagagcccat 480
caaccaagga gactcgtggc taagatcatc tggaccgcga ccgacgaagc accgctgctc 540
gcgacctact cgctgaagcc ggtcgtcgag gcatttgctg ctaccgcggg cattgaggtc 600
gagaccggg acatttcact cgctggacgc atcctcgccc agttcccaga gcgcctcacc 660
gaagatcaga aggtaggcaa cgcactcgca gaactcggcg agcttgctaa gactcctgaa 720
gcaaacatca ttaagcttc aaacatctcc gcttctgttc cacagctcaa ggctgctatt 780
aaggaactgc aggaccaggg ctacgacatc ccagaactgc ctgataacgc caccaccgac 840
gaggaaaaag acatcctcgc acgctacaac gctgttaagg gttccgctgt gaaccagtg 900

```

ctgCGTgaag gcaactctga ccgCCgcgca ccaatCGctg tcaagaactt tgTTaagaag 960  
 ttcccaCacc gcatgggcga gtGGTctgca gattccacgc gt 1002

<210> 6  
 <211> 2217  
 <212> DNA  
 <213> *Corynebacterium glutamicum*

<220>  
 <221> misc\_feature  
 <222> (1)..(2217)  
 <223> codon usage amended isocitrate dehydrogenase (icd) CA2 carrying a mutation from GGC (Gly) ATT (Ile) into GGG ATA at amino acid positions 32 and 33

<400> 6  
 atggctaaga tcatctggac ccgcaccgac gaagcaccgc tgctcgcgac ctactCGctg 60  
 aagccggtcg tcgaggcatt tgctgctacc gcggggatag aggtcgagac ccgggacatt 120  
 tcactCGctg gacgcacCct cgcCCagttc ccagagcgcc tcaccgaaga tcagaaggta 180  
 ggcaacgcac tcgcagaact cggcgagctt gctaagactc ctgaagcaaa catcattaag 240  
 cttccaaaca tctccgcttc tgttccacag ctcaaggctg ctattaagga actgcaggac 300  
 cagggctacg acatcccaga actgCctgat aacgccacca ccgacgagga aaaagacatc 360  
 ctCGcacgct acaacgctgt taagggttcc gctgtgaacc cagtGctgcg tgaaggcaac 420  
 tctgaccgcc gcgcaccaat cGctgtcaag aactttgtta agaagttccc acaccgcatg 480  
 ggcgagtggT ctgcagattc caagaccaac gttgcaacca tggatgcaaa cGacttccgc 540  
 cacaacgaga agtccatcat cctCGacgct gctgatgaag ttCagatcaa gcacatcgca 600  
 gctgacggca ccgagaccat cctcaaggac agcctcaagc ttcttgaagg cgaagttcta 660  
 gacggaaccg ttctgtccgc aaaggcactg gacgcattcc ttctCGagca ggTCgtcgc 720  
 gcaaaggcag aaggTatcct cttctccgca cacctgaagg ccaccatgat gaaggTctcc 780  
 gacccaatca tcttcggcca cgttGtgCgc gcttacttcg cagacgtttt cgcacagtac 840  
 ggtgagcagc tgctCGcagc tggcctcaac ggCGaaaacg gcctCGctgc aatcctctcc 900  
 ggcttggagt ccctggacaa cggcgaagaa atcaaggctg cattCGagaa gggcttggaa 960  
 gacggcccag acctggccat ggttaactcc gctCGcgga tcaccaacct gcatgtccct 1020  
 tccgatgtca tcgtggacgc ttccatgcca gcaatgattc gtacctccgg ccacatgtgg 1080  
 aacaaagacg accaggagca ggacaccctg gcaatcatcc cagactcctc ctacgctggc 1140  
 gtctaccaga ccgttatcga agactgccgc aagaacggcg cattcgatcc aaccaccatg 1200  
 ggtaccgtcc ctaacgttgg tctgatggct cagaaggctg aagagtacgg ctcccatgac 1260  
 aagaccttcc gcatcgaagc agacgggtgtg gttcaggttg tttcctccaa cggcgacgtt 1320  
 ctcatcgagc acgacgttga ggcaaatgac atctggcgtg catgccaggt caaggatgcc 1380  
 ccaatccagg attgggtaaa gcttGctgtc acccgctccc gtctctccgg aatgcctgca 1440  
 gtgttctggT tggatccaga gcgcgcacac gaccgcaacc tggcttccct cgttgagaag 1500

## PhoenixTemp12232.tmp.txt

```

tacctggctg accacgacac cgagggcctg gacatccaga tcctctcccc tgttgaggca 1560
accagctct ccatcgaccg catccgccgt ggcgaggaca ccatctctgt caccggtaac 1620
gttctgcgtg actacaacac cgacctcttc ccaatcctgg agctgggcac ctctgcaaag 1680
atgctgtctg tcgttccttt gatggctggc ggcggactgt tcgagaccgg tgctggtgga 1740
tctgtccta agcacgtcca gcaggttcag gaagaaaacc acctgcgttg ggattccctc 1800
ggtgagttcc tcgactggc tgagtccttc cgccacgagc tcaacaacaa cggcaacacc 1860
aaggccggcg ttctggctga cgctctggac aaggcaactg agaagctgct gaacgaagag 1920
aagtccccat cccgcaaggt tggcgagatc gacaaccgtg gctcccactt ctggctgacc 1980
aagttctggg ctgacgagct cgctgctcag accgaggacg cagatctggc tgctaccttc 2040
gcaccagtcg cagaagcact gaacacaggc gctgcagaca tcgatgctgc actgctcgca 2100
gttcagggtg gagcaactga ccttggtggc tactactccc ctaacgagga gaagctcacc 2160
aacatcatgc gccagtcgc acagttcaac gagatcgttg acgcactgaa gaagtaa 2217

```

```

<210> 7
<211> 1002
<212> DNA
<213> Artificial

```

```

<220>
<223> DNA sequence

```

```

<220>
<221> misc_feature
<223> vector insert with codon usage amended isocitrate dehydrogenase
      (icd) CA2 of Corynebacterium glutamicum carrying a mutation from
      GGC (Gly) ATT (Ile) into GGG ATA at amino acid positions 32 and
      33

```

```

<400> 7
ctcgagcgaa gacctcgag attccgatat tccaggaacc gccatgatcg aaatcccctc 60
agatgacgat gcacttgcca tcgagggacc ttctccatc gatgtgaaat ggctgccccg 120
caacggccgc aagcacggtg aattgttgat ggaaaccctg gccctccacc atgaagaaac 180
agaagctgca gccacctccg aaggcgaact tgtgtgggag actcctgtgt tctccgccac 240
tggcgaacag atcacagaat ccaaccacg ttcaggcgac tactactgga ttgctggcga 300
aagtgggtgtc gtgaccagca ttcgtcgatc tctagtgaag gagaaaggcc tcgaccgttc 360
ccaagtggca ttcattgggt attggaaaca cggcgtttcc atgcggggct gaaactgcc 420
ccataggcgc cagcaattag tagaactctg tattctaggt agctgaacaa aagagcccat 480
caaccaagga gactcatggc taagatcatc tggaccgcga ccgacgaagc accgctgctc 540
gcgacctact cgctgaagcc ggtcgtcgag gcatttgctg ctaccgcggg gatagaggtc 600
gagaccggg acatttcact cgctggacgc atcctcgccc agttcccaga gcgcctcacc 660
gaagatcaga aggtaggcaa cgcactcgca gaactcggcg agcttgctaa gactcctgaa 720
gcaaacatca ttaagcttcc aaacatctcc gcttctgttc cacagctcaa ggctgctatt 780

```

## PhoenixTemp12232.tmp.txt

```

aaggaactgc aggaccaggg ctacgacatc ccagaactgc ctgataacgc caccaccgac      840
gaggaaaaaag acatcctcgc acgctacaac gctgttaagg gttccgctgt gaaccagtg      900
ctgcgtgaag gcaactctga ccgccgcgca ccaatcgctg tcaagaactt tgtaagaag      960
ttccacacc gcatgggcga gtggtctgca gattccacgc gt                          1002

```

```

<210> 8
<211> 5364
<212> DNA
<213> Artificial

```

```

<220>
<223> DNA sequence

```

```

<220>
<221> misc_feature
<223> plasmid pClik int sacB delta icd

```

```

<400> 8
tcgagaggcc tgacgtcggg cccggtacca cgcgtaaacc gcagcaccgc caatcgcgcg      60
catcctcgaa gacctcgcag attccgatat tccaggaacc gccatgatcg aaatcccctc      120
agatgacgat gcacttgcca tcgagggacc ttcctccatc gatgtgaaat ggctgccccg      180
caacggccgc aagcacggtg aattgttgat ggaaaccctg gccctccacc atgaagaaac      240
agaagctgca gccacctccg aaggcgaact tgtgtgggag actcctgtgt tctccgccac      300
tggcgaacag atcacagaat ccaaccacg ttcaggcgac tactactgga ttgctggcga      360
aagtgggtgc gtgaccagca ttcgtcgatc tctagtgaag gagaaaggcc tcgaccgttc      420
ccaagtggca ttcatggggg attggaaaca cggcgtttcc atgcgggggt gaaactgccca      480
ccataggcgc cagcaattag tagaactctg tattctaggt agctgaacaa aagagcccat      540
caaccaagga gactcagtct cttcacaaaa agcgtgtgtc ttcctcacat ggaagcacag      600
cgctttttca tatttttatt gccataatgg gcacatgcgt ttttctcgag ttcttccgcg      660
acttcttata accaccgccc tgagcatccc aacagcatct gctgccacac tcaccgccga      720
caccgacaag gaattgtgca tcgccagcaa caccgacgat tccgcggtgg ttaccttctg      780
gaactccatt gaagactccg tgcgcgaaca acgcctcgac gaactagacg cccaagatcc      840
aggaatcaaa gcggcgattg aaagctacat cgcccaagat gacaacgccc caactgctgc      900
tgaactgcaa gtacgcctcg atgccatcga atccggcgaa ggcttagcca tgctcctccc      960
agacgatccc acgctggcag accccaacgc cgaggaaagt ttcaaaacgg agtacacata     1020
cgacgaagcc aaagacatca tcagcggatt ctccagcgat ccagccagcg atgtactcac     1080
tagttcggac ctagggatat cgtcgacatc gatgctcttc tgcgttaatt aacaattggg     1140
atcctctaga cccgggattt aaatgatccg ctagcgggct gctaaaggaa gcggaacacg     1200
tagaaagcca gtccgcagaa acggtgctga ccccgatga atgtcagcta ctgggctatc     1260
tggacaaggg aaaacgcaag cgcaaagaga aagcaggtag cttgcagtgg gcttacatgg     1320

```

## PhoenixTemp12232.tmp.txt

cgatagctag	actgggcggt	tttatggaca	gcaagcgaac	cggaattgcc	agctggggcg	1380
ccctctggta	aggttgggaa	gccctgcaaa	gtaaaactgga	tggctttctt	gccgccaagg	1440
atctgatggc	gcaggggatc	aagatctgat	caagagacag	gatgaggatc	gtttcgcgatg	1500
attgaacaag	atggattgca	cgcaggttct	ccggccgctt	gggtggagag	gctattcggc	1560
tatgactggg	cacaacagac	aatcggctgc	tctgatgccg	ccgtgttcg	gctgtcagcg	1620
caggggcgcc	cggttctttt	tgtcaagacc	gacctgtccg	gtgccctgaa	tgaactgcag	1680
gacgaggcag	cgcggctatc	gtggctggcc	acgacgggcg	ttccttgccg	agctgtgctc	1740
gacgttgtca	ctgaagcggg	aagggactgg	ctgctattgg	gcgaagtgcc	ggggcaggat	1800
ctcctgtcat	ctcaccttgc	tcctgccgag	aaagtatcca	tcattggctga	tgcaatgcgg	1860
cggctgcata	cgttgatcc	ggctacctgc	ccattcgacc	accaagcgaa	acatcgcac	1920
gagcgagcac	gtactcggat	ggaagccggt	cttgtcgatc	aggatgatct	ggacgaagag	1980
catcaggggc	tcgcgccagc	cgaactgttc	gccaggtcca	aggcgcgcac	gcccgcggc	2040
gaggatctcg	tcgtgaccca	tggcgatgcc	tgcttgccga	atatcatggg	ggaaaatggc	2100
cgtttttctg	gattcatcga	ctgtggccgg	ctgggtgtgg	cggaccgcta	tcaggacata	2160
gcgttggtta	cccgtgatat	tgctgaagag	cttggcgggc	aatgggctga	ccgcttcctc	2220
gtgctttacg	gtatcgccgc	tcccgatctg	cagcgcacgc	ccttctatcg	ccttcttgac	2280
gagttcttct	gagcgggact	ctgggggttc	aaatgaccga	ccaagcgacg	cccaacctgc	2340
catcacgaga	tttcgattcc	accgccgcct	tctatgaaag	gttgggcttc	ggaatcgttt	2400
tccgggacgc	cggctggatg	atcctccagc	gcggggatct	catgctggag	ttcttcgccc	2460
acgctagcgg	cgcgccggcc	ggccccggtg	gaaataccgc	acagatgcgt	aaggagaaaa	2520
taccgcatca	ggcgctcttc	cgttcctctg	ctcactgact	cgtgcgcctc	ggcgttcgg	2580
ctgcggcgag	cggtatcagc	tcactcaaag	gcggtaatac	ggttatccac	agaatcaggg	2640
gataacgcag	gaaagaacat	gtgagcaaaa	ggccagcaaa	aggccaggaa	ccgtaaaaag	2700
gccgcgttgc	tggcgttttt	ccataggctc	cgcggccctg	acgagcatca	caaaaatcga	2760
cgtcaagtc	agaggtggcg	aaacccgaca	ggactataaa	gataccaggc	gtttccccct	2820
ggaagctccc	tcgtgcgctc	tcctgttcg	accctgccgc	ttaccggata	cctgtccgcc	2880
tttctccctt	cgggaagcgt	ggcgctttct	catagctcac	gctgtaggta	tctcagttcg	2940
gtgtaggctg	ttcgctccaa	gctgggctgt	gtgcacgaac	cccccgttca	gcccgcggc	3000
tgcgcttat	ccggtaaact	tcgtcttgag	tccaacccgg	taagacacga	cttatcgcca	3060
ctggcagcag	ccactggtaa	caggattagc	agagcgaggt	atgtaggcgg	tgctacagag	3120
ttcttgaagt	ggtggcctaa	ctacggctac	actagaagga	cagtatttgg	tatctgcgct	3180
ctgctgaagc	cagttacctt	cggaaaaaga	gttggtagct	cttgatccgg	caaaacaaacc	3240
accgctggta	gcgggtggtt	ttttgtttgc	aagcagcaga	ttacgcgcag	aaaaaaagga	3300
tctcaagaag	atcctttgat	cttttctacg	gggtctgacg	ctcagtggaa	cgaaaactca	3360

## PhoenixTemp12232.tmp.txt

cgtaaagggga	ttttggatcat	gagattatca	aaaaggatct	tcacctagat	ccttttaaag	3420
gccggccgcg	gccgccatcg	gcatttttctt	ttgcgttttt	atttggtaac	tgtaattgt	3480
ccttggtcaa	ggatgctgtc	tttgacaaca	gatgttttct	tgcccttgat	gttcagcagg	3540
aagctcggcg	caaacgttga	ttgtttgtct	gcgtagaatc	ctctgtttgt	catatagctt	3600
gtaatcacga	cattgtttcc	tttcgcttga	ggtacagcga	agtgtgagta	agtaaagggt	3660
acatcgtag	gatcaagatc	catttttaac	acaaggccag	ttttgttcag	cggcttgat	3720
gggccagtta	aagaattaga	aacataacca	agcatgtaaa	tatcgtaga	cgtaatgccg	3780
tcaatcgta	ttttgatcc	gcgggagtc	gtgaacagg	accatttgcc	gttcatttta	3840
aagacgttcg	cgcgttcaat	ttcatctgtt	actgtgttag	atgcaatcag	cggtttcac	3900
acttttttca	gtgtgtaatc	atcgtttagc	tcaatcatac	cgagagcgcc	gtttgctaac	3960
tcagccgtgc	gttttttatc	gctttgcaga	agtttttgac	tttcttgacg	gaagaatgat	4020
gtgcttttgc	catagtatgc	tttgttaaat	aaagattcct	cgccttggt	gccatcttca	4080
gttccagtgt	ttgcttcaaa	tactaagtat	ttgtggcctt	tatcttctac	gtagtgagga	4140
tctctcagcg	tatggttgtc	gcctgagctg	tagttgcctt	catcgatgaa	ctgctgtaca	4200
ttttgatacg	tttttccgtc	accgtcaaag	attgatttat	aatcctctac	accgttgatg	4260
ttcaaagagc	tgtctgatgc	tgatacgtta	acttgtgcag	ttgtcagtgt	ttgtttgccg	4320
taatgtttac	cggagaaatc	agtgtagaat	aaacggattt	ttccgtcaga	tgtaaagtgt	4380
gctgaacctg	accattcttg	tgtttggtct	tttaggatag	aatcatttgc	atcgaatttg	4440
tcgctgtctt	taaagacgcg	gccagcgttt	ttccagctgt	caatagaagt	ttcgccgact	4500
ttttgataga	acatgtaaat	cgatgtgtca	ttcgcatttt	taggatctcc	ggctaataca	4560
aagacgatgt	ggtagccgtg	atagtttgcg	acagtgccgt	cagcgttttg	taatggccag	4620
ctgtcccaaa	cgtccaggcc	ttttgcagaa	gagatatttt	taattgtgga	cgaatcaaat	4680
tcagaaaactt	gatatttttc	atttttttgc	tgttcaggg	tttgagcat	atcatggcgt	4740
gtaatatggg	aaatgccgta	tgtttcctta	tatggctttt	ggttcgtttc	tttcgcaaac	4800
gcttgagttg	cgcctcctgc	cagcagtgcg	gtagttaaag	ttaatactgt	tgcttgtttt	4860
gcaaactttt	tgatgttcat	cgttcatgtc	tcctttttta	tgtactgtgt	tagcgggtctg	4920
cttcttccag	ccctcctgtt	tgaagatggc	aagttagtta	cgcacaataa	aaaaagacct	4980
aaaatatgta	aggggtgacg	ccaaagtata	cactttgccc	tttacacatt	ttaggtcttg	5040
cctgctttat	cagtaacaaa	cccgcgcgat	ttacttttcg	acctcattct	attagactct	5100
cgtttgatt	gcaactggtc	tattttcctc	ttttgtttga	tagaaaatca	taaaaggatt	5160
tgagactac	gggcctaaag	aactaaaaaa	tctatctgtt	tcttttcatt	ctctgtattt	5220
tttatagttt	ctgttgcatg	ggcataaagt	tgccctttta	atcacaattc	agaaaatatc	5280
ataatatctc	atttcactaa	ataatagtga	acggcaggta	tatgtgatgg	gttaaaaagg	5340
atcggcggcc	gctcgattta	aatc				5364

<210> 9  
 <211> 1055  
 <212> DNA  
 <213> Artificial

<220>  
 <223> DNA sequence

<220>  
 <221> misc\_feature  
 <223> insert of pClik int sacB delta icd

<400> 9  
 acgcgtaa ac cgcagcacc gcaatcgcg gcacccctcga agaccccgca gattccgata 60  
 ttccaggaac cgccatgatc gaaatcccct cagatgacga tgcacttgcc atcgagggac 120  
 cttcctccat cgatgtgaaa tggctgcccc gcaacggccg caagcacggt gaattgttga 180  
 tggaaaccct ggccctccac catgaagaaa cagaagctgc agccacctcc gaaggcgaac 240  
 ttgtgtggga gactcctgtg ttctccgcca ctggcgaaca gatcacagaa tccaaccac 300  
 gttcaggcga ctactactgg attgctggcg aaagtgggtg cgtgaccagc attcgtcgat 360  
 ctctagtga agagaaaggc ctcgaccgtt cccaagtggc attcatgggg tattggaaac 420  
 acggcgtttc catgcggggc tgaaactgcc accataggcg ccagcaatta gtagaacact 480  
 gtattctagg tagctgaaca aaagagccca tcaaccaagg agactcagtc tcttcacaaa 540  
 aagcgctgtg cttcctcaca tggaagcaca gcgctttttc atatttttat tgccataatg 600  
 ggcacatgcg tttttctcga gttcttcccg cacttcttat caccaccgcc gtgagcatcc 660  
 caacagcatc tgctgccaca ctcaccgccc acaccgacaa ggaattgtgc atcgccagca 720  
 acaccgacga ttccgcgggtg gttaccttct ggaactccat tgaagactcc gtgcgcgaac 780  
 aacgcctcga cgaactagac gcccaagatc caggaatcaa agcggcgatt gaaagctaca 840  
 tcgcccaga tgacaacgcc ccaactgctg ctgaactgca agtacgcctc gatgccatcg 900  
 aatccggcga aggcctagcc atgctcctcc cagacgatcc cacgctggca gaccccaacg 960  
 ccgaggaaaag tttcaaaacg gagtacacat acgacgaagc caaagacatc atcagcggat 1020  
 tctccagcga tccagccagc gatgtactca ctagt 1055