

1405797ENSP_Sequences
LISTA DE SECUENCIAS

<110> Novozymes A/S

<120> VARIANTES DE ALFA-AMILASA Y POLINUCLEÓTIDOS QUE CODIFICAN A LAS MISMAS

<130> 13064-WO-PCT

<160> 17

<170> PatentIn versión 3.5

<210> 1

<211> 1458

<212> ADN

<213> Bacillus sp.

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1405797ENSP_Sequences

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gtatgggtga aacgataa 1458

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<212> ADN
<213> Alicyclobacillus sp.

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1405797ENSP_Sequences

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 <212> ADN
 <213> *Bacillus amyloliquefaciens*

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1405797ENSP_Sequences

<212> PRT
<213> Bacillus sp.

<220>
<221> mat_peptide
<222> (30)..(514)

<400> 4

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5 10 15

Asp Gly Gln His Trp Asn Arg Leu His Asn Asn Ala Gln Asn Leu Lys
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Asn Ala Gly Ile Thr Ala Ile Trp Ile Pro Pro Ala Trp Lys Gly Thr
40 45 50

Ser Gln Asn Asp Val Gly Tyr Gly Ala Tyr Asp Leu Tyr Asp Leu Gly
55 60 65

Glu Phe Asn Gln Lys Gly Thr Val Arg Thr Lys Tyr Gly Thr Lys Ala
70 75 80

Glu Leu Glu Arg Ala Ile Arg Ser Leu Lys Ala Asn Gly Ile Gln Val
85 90 95

Tyr Gly Asp Val Val Met Asn His Lys Gly Gly Ala Asp Phe Thr Glu
100 105 110 115

Arg Val Gln Ala Val Glu Val Asn Pro Gln Asn Arg Asn Gln Glu Val
120 125 130

Ser Gly Thr Tyr Gln Ile Glu Ala Trp Thr Gly Phe Asn Phe Pro Gly
135 140 145

Arg Gly Asn Gln His Ser Ser Phe Lys Trp Arg Trp Tyr His Phe Asp
150 155 160

Gly Thr Asp Trp Asp Gln Ser Arg Gln Leu Ala Asn Arg Ile Tyr Lys
165 170 175

Phe Arg Gly Asp Gly Lys Ala Trp Asp Trp Glu Val Asp Thr Glu Asn
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1405797ENSP_Sequences

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				Asp ₂₀₅	Val	Asp
					Met	Asp
						His
						Pro
Glu	Val	Ile	Asn ₂₁₅	Glu	Leu	Asn
					Arg	Trp ₂₂₀
						Gly
					Val	Trp
						Tyr
						Ala
						Asn
						Thr
Leu	Asn	Leu ₂₃₀	Asp	Gly	Phe	Arg
						Leu
						Asp
						Ala
						Val
						Lys
						His
						Ile
						Lys
						Phe
Ser	Phe ₂₄₅	Met	Arg	Asp	Trp	Leu
						Gly
						His
						Val
						Arg
						Gly
						Gln
						Thr
						Gly
						Lys
Asn	Leu	Phe	Ala	Val	Ala ₂₆₅	Glu
₂₆₀						Tyr
						Trp
						Lys
						Asn
						Asp
						Leu
						Gly
						Ala
						Leu
₂₇₅						
Glu	Asn	Tyr	Leu	Ser ₂₈₀	Lys	Thr
						Asn
						Trp
						Thr
						Met
						Ser
						Ala
						Phe
						Asp
						Val
₂₉₀						
Pro	Leu	His	Tyr ₂₉₅	Asn	Leu	Tyr
						Gln
						Ala
						Ser
						Asn
						Ser
						Ser
						Gly
						Asn
						Tyr
₃₀₀						
Asp	Met	Arg	Asn	Leu	Leu	Asn
						Gly
						Thr
						Leu
						Val
						Gln
						Arg
						His
						Pro
						Ser
₃₁₀						
His	Ala	Val	Thr	Phe	Val	Asp
						Asn
						His
						Asp
						Thr
						Gln
						Pro
						Gly
						Glu
						Ala
₃₂₅						
Leu	Glu	Ser	Phe	Val	Gln	Gly
						Trp
						Phe
						Lys
						Pro
						Leu
						Ala
						Tyr
						Ala
						Thr
₃₄₀						
Ile	Leu	Thr	Arg	Glu	Gln	Gly
						Tyr
						Pro
						Gln
						Val
						Phe
						Tyr
						Gly
						Asp
						Tyr
₃₆₀						
Tyr	Gly	Ile	Pro	Ser	Asp	Gly
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						Pro
						Ser
						Tyr
						Arg
						Gln
						Gln
						Ile
						Asp
₃₇₅						
Pro	Leu	Leu	Lys	Ala	Arg	Gln
						Gln
						Tyr
						Ala
						Tyr
						Gly
						Arg
						Gln
						His
						Asp
₃₉₀						
Tyr	Phe	Asp	His	Trp	Asp	Val
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						Gly
						Trp
						Thr
						Arg
						Glu
						Gly
						Asn
						Ala
₄₀₅						
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						Ala
						Thr
						Ile
						Met
						Ser
						Asp
						Gly
						Pro
						Gly
₄₂₀						

1405797ENSP_Sequences

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His Asp Met Thr Gly Asn Arg Ser Gly Thr Val Thr Ile Asn Gln Asp
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Lys Arg
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<212> PRT
<213> Alicyclobacillus sp.

<220>
<221> mat_peptide
<222> (28)..(513)

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-10 -5 -1 1 5

Asn Gly Thr Met Met Gln Tyr Phe Glu Trp Tyr Leu Pro Asn Asp Gly
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Thr Leu Trp Thr Lys Met Gly Ser Asp Ala Ser His Leu Lys Ser Ile
25 30 35

Gly Ile Thr Gly Val Trp Phe Pro Pro Ala Tyr Lys Gly Gln Ser Gln
40 45 50

Ser Asp Val Gly Tyr Gly Val Tyr Asp Met Tyr Asp Leu Gly Glu Phe
55 60 65

Asn Gln Lys Gly Thr Val Arg Thr Lys Tyr Gly Thr Lys Ala Gln Leu
70 75 80 85

Gln Ser Ala Ile Thr Ser Leu His Asn Asn Gly Ile Gln Ala Tyr Gly
90 95 100

Asp Val Val Leu Asn His Arg Met Gly Ala Asp Ala Thr Glu Thr Ile
105 110 115

1405797ENSP_Sequences

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120 125 130

Ala Tyr Asn Ile Ser Ala Trp Thr Asp Phe Glu Phe Pro Gly Arg Gly
135 140 145

Asn Thr Tyr Ser Ser Phe Lys Trp His Ser Tyr Tyr Phe Asp Gly Val
150 155 160 165

Asp Trp Asp Gln Ser Arg Gln Leu Ser Gly Lys Ile Tyr Gln Ile Gln
170 175 180

Gly Thr Gly Lys Ala Trp Asp Trp Glu Val Asp Ser Glu Asn Gly Asn
185 190 195

Tyr Asp Tyr Leu Met Gly Ala Asp Ile Asp Tyr Asp His Pro Asp Val
200 205 210

Gln Thr Glu Val Lys Asn Trp Gly Lys Trp Phe Val Asn Thr Leu Asn
215 220 225

Leu Asp Gly Val Arg Leu Asp Ala Val Lys His Ile Lys Phe Asp Tyr
230 235 240 245

Met Ser Ser Trp Leu Ser Ser Val Lys Ser Thr Thr Gly Lys Ser Asn
250 255 260

Leu Phe Ala Val Gly Glu Tyr Trp Asn Thr Ser Leu Gly Ala Leu Glu
265 270 275

Asn Tyr Glu Asn Lys Thr Asn Trp Ser Met Ser Leu Phe Asp Val Pro
280 285 290

Leu His Met Asn Phe Gln Ala Ala Ala Asn Gly Gly Gly Tyr Tyr Asp
295 300 305

Met Arg Asn Leu Leu Asn Asn Thr Met Met Lys Asn His Pro Ile Gln
310 315 320 325

Ala Val Thr Phe Val Asp Asn His Asp Thr Glu Pro Gly Gln Ala Leu
330 335 340

Gln Ser Trp Val Ser Asp Trp Phe Lys Pro Leu Ala Tyr Ala Thr Ile
345 350 355

Leu Thr Arg Gln Glu Gly Tyr Pro Cys Val Phe Tyr Gly Asp Tyr Tyr
360 365 370

1405797ENSP_Sequences

Gly Ile Pro Ser Gln Ser Val Ser Ala Lys Ser Thr Trp Leu Asp Lys
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Gln Leu Ser Ala Arg Lys Ser Tyr Ala Tyr Gly Thr Gln His Asp Tyr
390 395 400 405

Leu Asp Asn Gln Asp Val Ile Gly Trp Thr Arg Glu Gly Asp Ser Ala
410 415 420

His Ala Gly Ser Gly Leu Ala Thr Val Met Ser Asp Gly Pro Gly Gly
425 430 435

Ser Lys Thr Met Tyr Val Gly Thr Ala His Ala Gly Gln Val Phe Lys
440 445 450

Asp Ile Thr Gly Asn Arg Thr Asp Thr Val Thr Ile Asn Ser Ala Gly
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Asn Gly Thr Phe Pro Cys Asn Gly Gly Ser Val Ser Ile Trp Val Lys
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Gln

<210> 6
<211> 514
<212> PRT
<213> Bacillus amyloliquefaciens

<220>
<221> mat_peptide
<222> (32)..(514)

<400> 6

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-15 -10 -5 -1 1

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5 10 15

Gln His Trp Lys Arg Leu Gln Asn Asp Ala Glu His Leu Ser Asp Ile
20 25 30

Gly Ile Thr Ala Val Trp Ile Pro Pro Ala Tyr Lys Gly Leu Ser Gln
Página 8

1405797ENSP_Sequences

35

40

45

Ser Asp Asn Gly Tyr Gly Pro Tyr Asp Leu Tyr Asp Leu Gly Glu Phe
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Gln Gln Lys Gly Thr Val Arg Thr Lys Tyr Gly Thr Lys Ser Glu Leu
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Gln Asp Ala Ile Gly Ser Leu His Ser Arg Asn Val Gln Val Tyr Gly
85 90 95

Asp Val Val Leu Asn His Lys Ala Gly Ala Asp Ala Thr Glu Asp Val
100 105 110

Thr Ala Val Glu Val Asn Pro Ala Asn Arg Asn Gln Glu Thr Ser Glu
115 120 125

Glu Tyr Gln Ile Lys Ala Trp Thr Asp Phe Arg Phe Pro Gly Arg Gly
130 135 140 145

Asn Thr Tyr Ser Asp Phe Lys Trp His Trp Tyr His Phe Asp Gly Ala
150 155 160

Asp Trp Asp Glu Ser Arg Lys Ile Ser Arg Ile Phe Lys Phe Arg Gly
165 170 175

Glu Gly Lys Ala Trp Asp Trp Glu Val Ser Ser Glu Asn Gly Asn Tyr
180 185 190

Asp Tyr Leu Met Tyr Ala Asp Val Asp Tyr Asp His Pro Asp Val Val
195 200 205

Ala Glu Thr Lys Lys Trp Gly Ile Trp Tyr Ala Asn Glu Leu Ser Leu
210 215 220 225

Asp Gly Phe Arg Ile Asp Ala Ala Lys His Ile Lys Phe Ser Phe Leu
230 235 240

Arg Asp Trp Val Gln Ala Val Arg Gln Ala Thr Gly Lys Glu Met Phe
245 250 255

Thr Val Ala Glu Tyr Trp Gln Asn Asn Ala Gly Lys Leu Glu Asn Tyr
260 265 270

Leu Asn Lys Thr Ser Phe Asn Gln Ser Val Phe Asp Val Pro Leu His
275 280 285

1405797ENSP_Sequences

Phe Asn Leu Gln Ala Ala Ser Ser Gln Gly Gly Gly Tyr Asp Met Arg
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Arg Leu Leu Asp Gly Thr Val Val Ser Arg His Pro Glu Lys Ala Val
310 315 320

Thr Phe Val Glu Asn His Asp Thr Gln Pro Gly Gln Ser Leu Glu Ser
325 330 335

Thr Val Gln Thr Trp Phe Lys Pro Leu Ala Tyr Ala Phe Ile Leu Thr
340 345 350

Arg Glu Ser Gly Tyr Pro Gln Val Phe Tyr Gly Asp Met Tyr Gly Thr
355 360 365

Lys Gly Thr Ser Pro Lys Glu Ile Pro Ser Leu Lys Asp Asn Ile Glu
370 375 380 385

Pro Ile Leu Lys Ala Arg Lys Glu Tyr Ala Tyr Gly Pro Gln His Asp
390 395 400

Tyr Ile Asp His Pro Asp Val Ile Gly Trp Thr Arg Glu Gly Asp Ser
405 410 415

Ser Ala Ala Lys Ser Gly Leu Ala Ala Leu Ile Thr Asp Gly Pro Gly
420 425 430

Gly Ser Lys Arg Met Tyr Ala Gly Leu Lys Asn Ala Gly Glu Thr Trp
435 440 445

Tyr Asp Ile Thr Gly Asn Arg Ser Asp Thr Val Lys Ile Gly Ser Asp
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Gly Trp Gly Glu Phe His Val Asn Asp Gly Ser Val Ser Ile Tyr Val
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Gln Lys

<210> 7
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<212> PRT
<213> Bacillus sp.

<400> 7

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1405797ENSP_Sequences

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Asn Leu Lys Asn Ala Gly Ile Thr Ala Ile Trp Ile Pro Pro Ala Trp
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Lys Gly Thr Ser Gln Asn Asp Val Gly Tyr Gly Ala Tyr Asp Leu Tyr
50 55 60

Asp Leu Gly Glu Phe Asn Gln Lys Gly Thr Val Arg Thr Lys Tyr Gly
65 70 75 80

Thr Lys Ala Glu Leu Glu Arg Ala Ile Arg Ser Leu Lys Ala Asn Gly
85 90 95

Ile Gln Val Tyr Gly Asp Val Val Met Asn His Lys Gly Gly Ala Asp
100 105 110

Phe Thr Glu Arg Val Gln Ala Val Glu Val Asn Pro Gln Asn Arg Asn
115 120 125

Gln Glu Val Ser Gly Thr Tyr Gln Ile Glu Ala Trp Thr Gly Phe Asn
130 135 140

Phe Pro Gly Arg Gly Asn Gln His Ser Ser Phe Lys Trp Arg Trp Tyr
145 150 155 160

His Phe Asp Gly Thr Asp Trp Asp Gln Ser Arg Gln Leu Ala Asn Arg
165 170 175

Ile Tyr Lys Phe Arg Gly Asp Gly Lys Ala Trp Asp Trp Glu Val Asp
180 185 190

Thr Glu Asn Gly Asn Tyr Asp Tyr Leu Met Tyr Ala Asp Val Asp Met
195 200 205

Asp His Pro Glu Val Ile Asn Glu Leu Asn Arg Trp Gly Val Trp Tyr
210 215 220

Ala Asn Thr Leu Asn Leu Asp Gly Phe Arg Leu Asp Ala Val Lys His
225 230 235 240

Ile Lys Phe Ser Phe Met Arg Asp Trp Leu Gly His Val Arg Gly Gln
245 250 255

Thr Gly Lys Asn Leu Phe Ala Val Ala Glu Tyr Trp Lys Asn Asp Leu
260 265 270

1405797ENSP_Sequences

Gly Ala Leu Glu Asn Tyr Leu Ser Lys Thr Asn Trp Thr Met Ser Ala
275 280 285

Phe Asp Val Pro Leu His Tyr Asn Leu Tyr Gln Ala Ser Asn Ser Ser
290 295 300

Gly Asn Tyr Asp Met Arg Asn Leu Leu Asn Gly Thr Leu Val Gln Arg
305 310 315 320

His Pro Ser His Ala Val Thr Phe Val Asp Asn His Asp Thr Gln Pro
325 330 335

Gly Glu Ala Leu Glu Ser Phe Val Gln Gly Trp Phe Lys Pro Leu Ala
340 345 350

Tyr Ala Thr Ile Leu Thr Arg Glu Gln Gly Tyr Pro Gln Val Phe Tyr
355 360 365

Gly Asp Tyr Tyr Gly Ile Pro Ser Asp Gly Val Pro Ser Tyr Arg Gln
370 375 380

Gln Ile Asp Pro Leu Leu Lys Ala Arg Gln Gln Tyr Ala Tyr Gly Arg
385 390 395 400

Gln His Asp Tyr Phe Asp His Trp Asp Val Ile Gly Trp Thr Arg Glu
405 410 415

Gly Asn Ala Ser His Pro Asn Ser Gly Leu Ala Thr Ile Met Ser Asp
420 425 430

Gly Pro Gly Gly Ser Lys Trp Met Tyr Val Gly Arg Gln Lys Ala Gly
435 440 445

Glu Val Trp His Asp Met Thr Gly Asn Arg Ser Gly Thr Val Thr Ile
450 455 460

Asn Gln Asp Gly Trp Gly His Phe Phe Val Asn Gly Gly Ser Val Ser
465 470 475 480

Val Trp Val Lys Arg
485

<210> 8
<211> 486
<212> PRT
<213> Alicyclobacillus sp.

<400> 8

1405797ENSP_Sequences

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

1405797ENSP_Sequences

Thr Gly Lys Ser Asn Leu Phe Ala Val Gly Glu Tyr Trp Asn Thr Ser
260 265 270

Leu Gly Ala Leu Glu Asn Tyr Glu Asn Lys Thr Asn Trp Ser Met Ser
275 280 285

Leu Phe Asp Val Pro Leu His Met Asn Phe Gln Ala Ala Ala Asn Gly
290 295 300

Gly Gly Tyr Tyr Asp Met Arg Asn Leu Leu Asn Asn Thr Met Met Lys
305 310 315 320

Asn His Pro Ile Gln Ala Val Thr Phe Val Asp Asn His Asp Thr Glu
325 330 335

Pro Gly Gln Ala Leu Gln Ser Trp Val Ser Asp Trp Phe Lys Pro Leu
340 345 350

Ala Tyr Ala Thr Ile Leu Thr Arg Gln Glu Gly Tyr Pro Cys Val Phe
355 360 365

Tyr Gly Asp Tyr Tyr Gly Ile Pro Ser Gln Ser Val Ser Ala Lys Ser
370 375 380

Thr Trp Leu Asp Lys Gln Leu Ser Ala Arg Lys Ser Tyr Ala Tyr Gly
385 390 395 400

Thr Gln His Asp Tyr Leu Asp Asn Gln Asp Val Ile Gly Trp Thr Arg
405 410 415

Glu Gly Asp Ser Ala His Ala Gly Ser Gly Leu Ala Thr Val Met Ser
420 425 430

Asp Gly Pro Gly Gly Ser Lys Thr Met Tyr Val Gly Thr Ala His Ala
435 440 445

Gly Gln Val Phe Lys Asp Ile Thr Gly Asn Arg Thr Asp Thr Val Thr
450 455 460

Ile Asn Ser Ala Gly Asn Gly Thr Phe Pro Cys Asn Gly Gly Ser Val
465 470 475 480

Ser Ile Trp Val Lys Gln
485

<210> 9

1405797ENSP_Sequences

<211> 483

<212> PRT

<213> Bacillus amyloliquefaciens

<400> 9

Val Asn Gly Thr Leu Met Gln Tyr Phe Glu Trp Tyr Thr Pro Asn Asp
 1 5 10 15

Gly Gln His Trp Lys Arg Leu Gln Asn Asp Ala Glu His Leu Ser Asp
 20 25 30

Ile Gly Ile Thr Ala Val Trp Ile Pro Pro Ala Tyr Lys Gly Leu Ser
 35 40 45

Gln Ser Asp Asn Gly Tyr Gly Pro Tyr Asp Leu Tyr Asp Leu Gly Glu
 50 55 60

Phe Gln Gln Lys Gly Thr Val Arg Thr Lys Tyr Gly Thr Lys Ser Glu
 65 70 75 80

Leu Gln Asp Ala Ile Gly Ser Leu His Ser Arg Asn Val Gln Val Tyr
 85 90 95

Gly Asp Val Val Leu Asn His Lys Ala Gly Ala Asp Ala Thr Glu Asp
 100 105 110

Val Thr Ala Val Glu Val Asn Pro Ala Asn Arg Asn Gln Glu Thr Ser
 115 120 125

Glu Glu Tyr Gln Ile Lys Ala Trp Thr Asp Phe Arg Phe Pro Gly Arg
 130 135 140

Gly Asn Thr Tyr Ser Asp Phe Lys Trp His Trp Tyr His Phe Asp Gly
 145 150 155 160

Ala Asp Trp Asp Glu Ser Arg Lys Ile Ser Arg Ile Phe Lys Phe Arg
 165 170 175

Gly Glu Gly Lys Ala Trp Asp Trp Glu Val Ser Ser Glu Asn Gly Asn
 180 185 190

Tyr Asp Tyr Leu Met Tyr Ala Asp Val Asp Tyr Asp His Pro Asp Val
 195 200 205

Val Ala Glu Thr Lys Lys Trp Gly Ile Trp Tyr Ala Asn Glu Leu Ser
 210 215 220

Leu Asp Gly Phe Arg Ile Asp Ala Ala Lys His Ile Lys Phe Ser Phe
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1405797ENSP_Sequences

225		230		235		240									
Leu	Arg	Asp	Trp	Val ₂₄₅	Gln	Ala	Val	Arg	Gln	Ala	Thr	Gly	Lys	Glu	Met
Phe	Thr	Val	Ala	Glu	Tyr	Trp	Gln	Asn ₂₆₅	Asn	Ala	Gly	Lys	Leu	Glu	Asn
Tyr	Leu	Asn ₂₇₅	Lys	Thr	Ser	Phe	Asn	Gln	Ser	Val	Phe	Asp	Val	Pro	Leu
His	Phe ₂₉₀	Asn	Leu	Gln	Ala	Ala ₂₉₅	Ser	Ser	Gln	Gly	Gly ₃₀₀	Gly	Tyr	Asp	Met
Arg	Arg	Leu	Leu	Asp	Gly ₃₁₀	Thr	Val	Val	Ser	Arg	His	Pro	Glu	Lys	Ala ₃₂₀
Val	Thr	Phe	Val	Glu ₃₂₅	Asn	His	Asp	Thr	Gln	Pro	Gly	Gln	Ser	Leu	Glu
Ser	Thr	Val	Gln	Thr	Trp	Phe	Lys	Pro ₃₄₅	Leu	Ala	Tyr	Ala	Phe	Ile	Leu
Thr	Arg	Glu ₃₅₅	Ser	Gly	Tyr	Pro	Gln	Val	Phe	Tyr	Gly	Asp	Met	Tyr	Gly
Thr	Lys ₃₇₀	Gly	Thr	Ser	Pro	Lys ₃₇₅	Glu	Ile	Pro	Ser	Leu	Lys	Asp	Asn	Ile
Glu	Pro	Ile	Leu	Lys	Ala	Arg	Lys	Glu	Tyr	Ala	Tyr	Gly	Pro	Gln	His ₄₀₀
Asp	Tyr	Ile	Asp	His ₄₀₅	Pro	Asp	Val	Ile	Gly ₄₁₀	Trp	Thr	Arg	Glu	Gly ₄₁₅	Asp
Ser	Ser	Ala	Ala ₄₂₀	Lys	Ser	Gly	Leu	Ala ₄₂₅	Ala	Leu	Ile	Thr	Asp	Gly	Pro
Gly	Gly	Ser ₄₃₅	Lys	Arg	Met	Tyr	Ala	Gly	Leu	Lys	Asn	Ala	Gly	Glu	Thr
Trp	Tyr	Asp	Ile	Thr	Gly	Asn	Arg	Ser	Asp	Thr	Val ₄₆₀	Lys	Ile	Gly	Ser
Asp	Gly	Trp	Gly	Glu	Phe ₄₇₀	His	Val	Asn	Asp	Gly ₄₇₅	Ser	Val	Ser	Ile	Tyr ₄₈₀

1405797ENSP_Sequences

Val Gln Lys

<210> 10
 <211> 399
 <212> PRT
 <213> Bacillus sp.

<400> 10

His His Asp Gly Thr Asn Gly Thr Ile Met Gln Tyr Phe Glu Trp Asn
 1 5 10 15

Val Pro Asn Asp Gly Gln His Trp Asn Arg Leu His Asn Asn Ala Gln
 20 25 30

Asn Leu Lys Asn Ala Gly Ile Thr Ala Ile Trp Ile Pro Pro Ala Trp
 35 40 45

Lys Gly Thr Ser Gln Asn Asp Val Gly Tyr Gly Ala Tyr Asp Leu Tyr
 50 55 60

Asp Leu Gly Glu Phe Asn Gln Lys Gly Thr Val Arg Thr Lys Tyr Gly
 65 70 75 80

Thr Lys Ala Glu Leu Glu Arg Ala Ile Arg Ser Leu Lys Ala Asn Gly
 85 90 95

Ile Gln Val Tyr Gly Asp Val Val Met Asn His Lys Gly Gly Ala Asp
 100 105 110

Phe Thr Glu Arg Val Gln Ala Val Glu Val Asn Pro Gln Asn Arg Asn
 115 120 125

Gln Glu Val Ser Gly Thr Tyr Gln Ile Glu Ala Trp Thr Gly Phe Asn
 130 135 140

Phe Pro Gly Arg Gly Asn Gln His Ser Ser Phe Lys Trp Arg Trp Tyr
 145 150 155 160

His Phe Asp Gly Thr Asp Trp Asp Gln Ser Arg Gln Leu Ala Asn Arg
 165 170 175

Ile Tyr Lys Phe Arg Gly Asp Gly Lys Ala Trp Asp Trp Glu Val Asp
 180 185 190

Thr Glu Asn Gly Asn Tyr Asp Tyr Leu Met Tyr Ala Asp Val Asp Met
 195 200 205

1405797ENSP_Sequences

Asp His Pro Glu Val Ile Asn Glu Leu Asn Arg Trp Gly Val Trp Tyr
210 215 220

Ala Asn Thr Leu Asn Leu Asp Gly Phe Arg Leu Asp Ala Val Lys His
225 230 235 240

Ile Lys Phe Ser Phe Met Arg Asp Trp Leu Gly His Val Arg Gly Gln
245 250 255

Thr Gly Lys Asn Leu Phe Ala Val Ala Glu Tyr Trp Lys Asn Asp Leu
260 265 270

Gly Ala Leu Glu Asn Tyr Leu Ser Lys Thr Asn Trp Thr Met Ser Ala
275 280 285

Phe Asp Val Pro Leu His Tyr Asn Leu Tyr Gln Ala Ser Asn Ser Ser
290 295 300

Gly Asn Tyr Asp Met Arg Asn Leu Leu Asn Gly Thr Leu Val Gln Arg
305 310 315 320

His Pro Ser His Ala Val Thr Phe Val Asp Asn His Asp Thr Gln Pro
325 330 335

Gly Glu Ala Leu Glu Ser Phe Val Gln Gly Trp Phe Lys Pro Leu Ala
340 345 350

Tyr Ala Thr Ile Leu Thr Arg Glu Gln Gly Tyr Pro Gln Val Phe Tyr
355 360 365

Gly Asp Tyr Tyr Gly Ile Pro Ser Asp Gly Val Pro Ser Tyr Arg Gln
370 375 380

Gln Ile Asp Pro Leu Leu Lys Ala Arg Gln Gln Tyr Ala Tyr Gly
385 390 395

<210> 11
<211> 86
<212> PRT
<213> Alicyclobacillus sp.

<400> 11

Thr Gln His Asp Tyr Leu Asp Asn Gln Asp Val Ile Gly Trp Thr Arg
1 5 10 15

Glu Gly Asp Ser Ala His Ala Gly Ser Gly Leu Ala Thr Val Met Ser
20 25 30

1405797ENSP_Sequences

Asp Gly Pro Gly Gly Ser Lys Thr Met Tyr Val Gly Thr Ala His Ala
35 40 45

Gly Gln Val Phe Lys Asp Ile Thr Gly Asn Arg Thr Asp Thr Val Thr
50 55 60

Ile Asn Ser Ala Gly Asn Gly Thr Phe Pro Cys Asn Gly Gly Ser Val
65 70 75 80

Ser Ile Trp Val Lys Gln
85

<210> 12
<211> 86
<212> PRT
<213> Bacillus amyloliquefaciens

<400> 12

Pro Gln His Asp Tyr Ile Asp His Pro Asp Val Ile Gly Trp Thr Arg
1 5 10 15

Glu Gly Asp Ser Ser Ala Ala Lys Ser Gly Leu Ala Ala Leu Ile Thr
20 25 30

Asp Gly Pro Gly Gly Ser Lys Arg Met Tyr Ala Gly Leu Lys Asn Ala
35 40 45

Gly Glu Thr Trp Tyr Asp Ile Thr Gly Asn Arg Ser Asp Thr Val Lys
50 55 60

Ile Gly Ser Asp Gly Trp Gly Glu Phe His Val Asn Asp Gly Ser Val
65 70 75 80

Ser Ile Tyr Val Gln Lys
85

<210> 13
<211> 485
<212> PRT
<213> Secuencia artificial

<220>
<223> Proteína de fusión 1

<400> 13

His His Asp Gly Thr Asn Gly Thr Ile Met Gln Tyr Phe Glu Trp Asn
1 5 10 15

Val Pro Asn Asp Gly Gln His Trp Asn Arg Leu His Asn Asn Ala Gln
20 25 30

1405797ENSP_Sequences

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

Phe Asp Val Pro Leu His Tyr Asn Leu Tyr Gln Ala Ser Asn Ser Ser
290 295 300

Gly Asn Tyr Asp Met Arg Asn Leu Leu Asn Gly Thr Leu Val Gln Arg
305 310 315 320

His Pro Ser His Ala Val Thr Phe Val Asp Asn His Asp Thr Gln Pro
325 330 335

Gly Glu Ala Leu Glu Ser Phe Val Gln Gly Trp Phe Lys Pro Leu Ala
340 345 350

Tyr Ala Thr Ile Leu Thr Arg Glu Gln Gly Tyr Pro Gln Val Phe Tyr
355 360 365

Gly Asp Tyr Tyr Gly Ile Pro Ser Asp Gly Val Pro Ser Tyr Arg Gln
370 375 380

Gln Ile Asp Pro Leu Leu Lys Ala Arg Gln Gln Tyr Ala Tyr Gly Thr
385 390 395 400

Gln His Asp Tyr Leu Asp Asn Gln Asp Val Ile Gly Trp Thr Arg Glu
405 410 415

Gly Asp Ser Ala His Ala Gly Ser Gly Leu Ala Thr Val Met Ser Asp
420 425 430

Gly Pro Gly Gly Ser Lys Thr Met Tyr Val Gly Thr Ala His Ala Gly
435 440 445

Gln Val Phe Lys Asp Ile Thr Gly Asn Arg Thr Asp Thr Val Thr Ile
450 455 460

Asn Ser Ala Gly Asn Gly Thr Phe Pro Cys Asn Gly Gly Ser Val Ser
465 470 475 480

Ile Trp Val Lys Gln
485

<210> 14
<211> 485
<212> PRT
<213> Secuencia artificial

<220>
<223> Proteína de fusión 2

1405797ENSP_Sequences

<400> 14

His His Asp Gly Thr Asn Gly Thr Ile Met Gln Tyr Phe Glu Trp Asn
 1 5 10 15

Val Pro Asn Asp Gly Gln His Trp Asn Arg Leu His Asn Asn Ala Gln
 20 25 30

Asn Leu Lys Asn Ala Gly Ile Thr Ala Ile Trp Ile Pro Pro Ala Trp
 35 40 45

Lys Gly Thr Ser Gln Asn Asp Val Gly Tyr Gly Ala Tyr Asp Leu Tyr
 50 55 60

Asp Leu Gly Glu Phe Asn Gln Lys Gly Thr Val Arg Thr Lys Tyr Gly
 65 70 75 80

Thr Lys Ala Glu Leu Glu Arg Ala Ile Arg Ser Leu Lys Ala Asn Gly
 85 90 95

Ile Gln Val Tyr Gly Asp Val Val Met Asn His Lys Gly Gly Ala Asp
 100 105 110

Phe Thr Glu Arg Val Gln Ala Val Glu Val Asn Pro Gln Asn Arg Asn
 115 120 125

Gln Glu Val Ser Gly Thr Tyr Gln Ile Glu Ala Trp Thr Gly Phe Asn
 130 135 140

Phe Pro Gly Arg Gly Asn Gln His Ser Ser Phe Lys Trp Arg Trp Tyr
 145 150 155 160

His Phe Asp Gly Thr Asp Trp Asp Gln Ser Arg Gln Leu Ala Asn Arg
 165 170 175

Ile Tyr Lys Phe Arg Gly Asp Gly Lys Ala Trp Asp Trp Glu Val Asp
 180 185 190

Thr Glu Asn Gly Asn Tyr Asp Tyr Leu Met Tyr Ala Asp Val Asp Met
 195 200 205

Asp His Pro Glu Val Ile Asn Glu Leu Asn Arg Trp Gly Val Trp Tyr
 210 215 220

Ala Asn Thr Leu Asn Leu Asp Gly Phe Arg Leu Asp Ala Val Lys His
 225 230 235 240

Ile Lys Phe Ser Phe Met Arg Asp Trp Leu Gly His Val Arg Gly Gln
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1405797ENSP_Sequences

245

250

255

Thr Gly Lys Asn₂₆₀ Leu Phe Ala Val₂₆₅ Ala Glu Tyr Trp Lys Asn₂₇₀ Asp Leu

Gly Ala Leu₂₇₅ Glu Asn Tyr Leu Ser₂₈₀ Lys Thr Asn Trp Thr₂₈₅ Met Ser Ala

Phe Asp Val₂₉₀ Pro Leu His Tyr₂₉₅ Asn Leu Tyr Gln Ala₃₀₀ Ser Asn Ser Ser

Gly Asn Tyr Asp Met Arg₃₁₀ Asn Leu Leu Asn Gly₃₁₅ Thr Leu Val Gln Arg₃₂₀

His Pro Ser His Ala₃₂₅ Val Thr Phe Val₃₃₀ Asp Asn His Asp Thr Gln₃₃₅ Pro

Gly Glu Ala Leu₃₄₀ Glu Ser Phe Val₃₄₅ Gln Gly Trp Phe Lys Pro₃₅₀ Leu Ala

Tyr Ala Thr₃₅₅ Ile Leu Thr Arg Glu₃₆₀ Gln Gly Tyr Pro Gln₃₆₅ Val Phe Tyr

Gly Asp Tyr Tyr Gly Ile Pro₃₇₅ Ser Asp Gly Val₃₈₀ Pro Ser Tyr Arg Gln

Gln Ile Asp Pro Leu Leu₃₉₀ Lys Ala Arg Gln Gln₃₉₅ Tyr Ala Tyr Gly Pro₄₀₀

Gln His Asp Tyr Ile₄₀₅ Asp His Pro Asp Val₄₁₀ Ile Gly Trp Thr Arg₄₁₅ Glu

Gly Asp Ser Ser₄₂₀ Ala Ala Lys Ser Gly₄₂₅ Leu Ala Ala Leu Ile₄₃₀ Thr Asp

Gly Pro Gly₄₃₅ Gly Ser Lys Arg Met₄₄₀ Tyr Ala Gly Leu Lys₄₄₅ Asn Ala Gly

Glu Thr Trp Tyr Asp Ile Thr₄₅₅ Gly Asn Arg Ser Asp₄₆₀ Thr Val Lys Ile

Gly Ser Asp Gly Trp Gly₄₇₀ Glu Phe His Val₄₇₅ Asn Asp Gly Ser Val₄₈₀ Ser

Ile Tyr Val Gln Lys₄₈₅

1405797ENSP_Sequences

<210> 15

<211> 483

<212> PRT

<213> Bacillus sp.

<400> 15

His His Asp Gly Thr Asn Gly Thr Ile Met Gln Tyr Phe Glu Trp Asn
 1 5 10 15

Val Pro Asn Asp Gly Gln His Trp Asn Arg Leu His Asn Asn Ala Gln
 20 25 30

Asn Leu Lys Asn Ala Gly Ile Thr Ala Ile Trp Ile Pro Pro Ala Trp
 35 40 45

Lys Gly Thr Ser Gln Asn Asp Val Gly Tyr Gly Ala Tyr Asp Leu Tyr
 50 55 60

Asp Leu Gly Glu Phe Asn Gln Lys Gly Thr Val Arg Thr Lys Tyr Gly
 65 70 75 80

Thr Lys Ala Glu Leu Glu Arg Ala Ile Arg Ser Leu Lys Ala Asn Gly
 85 90 95

Ile Gln Val Tyr Gly Asp Val Val Met Asn His Lys Gly Gly Ala Asp
 100 105 110

Phe Thr Glu Arg Val Gln Ala Val Glu Val Asn Pro Gln Asn Arg Asn
 115 120 125

Gln Glu Val Ser Gly Thr Tyr Gln Ile Glu Ala Trp Thr Gly Phe Asn
 130 135 140

Phe Pro Gly Arg Gly Asn Gln His Ser Ser Phe Lys Trp Arg Trp Tyr
 145 150 155 160

His Phe Asp Gly Thr Asp Trp Asp Gln Ser Arg Gln Leu Ala Asn Arg
 165 170 175

Ile Tyr Lys Phe Arg Gly Lys Ala Trp Asp Trp Glu Val Asp Thr Glu
 180 185 190

Asn Gly Asn Tyr Asp Tyr Leu Met Tyr Ala Asp Val Asp Met Asp His
 195 200 205

Pro Glu Val Ile Asn Glu Leu Asn Arg Trp Gly Val Trp Tyr Ala Asn
 210 215 220

1405797ENSP_Sequences

Thr Leu Asn Leu Asp Gly Phe Arg Leu Asp Ala Val Lys His Ile Lys
225 230 235 240

Phe Ser Phe Met Arg Asp Trp Leu Gly His Val Arg Gly Gln Thr Gly
245 250 255

Lys Asn Leu Phe Ala Val Ala Glu Tyr Trp Lys Asn Asp Leu Gly Ala
260 265 270

Leu Glu Asn Tyr Leu Ser Lys Thr Asn Trp Thr Met Ser Ala Phe Asp
275 280 285

Val Pro Leu His Tyr Asn Leu Tyr Gln Ala Ser Asn Ser Ser Gly Asn
290 295 300

Tyr Asp Met Arg Asn Leu Leu Asn Gly Thr Leu Val Gln Arg His Pro
305 310 315 320

Ser His Ala Val Thr Phe Val Asp Asn His Asp Thr Gln Pro Gly Glu
325 330 335

Ala Leu Glu Ser Phe Val Gln Gly Trp Phe Lys Pro Leu Ala Tyr Ala
340 345 350

Thr Ile Leu Thr Arg Glu Gln Gly Tyr Pro Gln Val Phe Tyr Gly Asp
355 360 365

Tyr Tyr Gly Ile Pro Ser Asp Gly Val Pro Ser Tyr Arg Gln Gln Ile
370 375 380

Asp Pro Leu Leu Lys Ala Arg Gln Gln Tyr Ala Tyr Gly Arg Gln His
385 390 395 400

Asp Tyr Phe Asp His Trp Asp Val Ile Gly Trp Thr Arg Glu Gly Asn
405 410 415

Ala Ser His Pro Asn Ser Gly Leu Ala Thr Ile Met Ser Asp Gly Pro
420 425 430

Gly Gly Ser Lys Trp Met Tyr Val Gly Arg Gln Lys Ala Gly Glu Val
435 440 445

Trp His Asp Met Thr Gly Asn Arg Ser Gly Thr Val Thr Ile Asn Gln
450 455 460

Asp Gly Trp Gly His Phe Phe Val Asn Gly Gly Ser Val Ser Val Trp
465 470 475 480

1405797ENSP_Sequences

Val Lys Arg

<210> 16
 <211> 27
 <212> ADN
 <213> Secuencia artificial

<220>
 <223> Secuencia artificial

<400> 16
 caatccaaga gaaccctgat acggatg 27

<210> 17
 <211> 23
 <212> ADN
 <213> Secuencia artificial

<220>
 <223> Secuencia artificial

<400> 17
 cggaacgcct ggctgacaac acg 23