

附件：

修正  
補充

A8  
B8  
C8  
D8

公告本

六、申請專利範圍

第 84110496 號專利申請案

中文申請專利範圍更正本

民國 93 年 1 月 14 日修正

1. 一種重組型酵素，其能將麥芽糖轉化成海藻糖，並且於超過 55℃ 之溫度下靜置反應卻實質上不被去活化，該酵素具有 SEQ ID NO: 3 所示之胺基酸序列，

SEQ ID NO:3:

Met	Asp	Pro	Leu	Trp	Tyr	Lys	Asp	Ala	Val	Ile	Tyr	Gln	Leu	His	Val
1				5					10					15	
Arg	Ser	Phe	Phe	Asp	Ala	Asn	Asn	Asp	Gly	Tyr	Gly	Asp	Phe	Glu	Gly
			20					25					30		
Leu	Arg	Arg	Lys	Leu	Pro	Tyr	Leu	Glu	Glu	Leu	Gly	Val	Asn	Thr	Leu
			35				40					45			
Trp	Leu	Met	Pro	Phe	Phe	Gln	Ser	Pro	Leu	Arg	Asp	Asp	Gly	Tyr	Asp
		50				55					60				
Ile	Ser	Asp	Tyr	Tyr	Gln	Ile	Leu	Pro	Val	His	Gly	Thr	Leu	Glu	Asp
					70					75					80
Phe	Thr	Val	Asp	Glu	Ala	His	Gly	Arg	Gly	Met	Lys	Val	Ile	Ile	Glu
				85					90					95	
Leu	Val	Leu	Asn	His	Thr	Ser	Ile	Asp	His	Pro	Trp	Phe	Gln	Glu	Ala
			100					105					110		
Arg	Lys	Pro	Asn	Ser	Pro	Met	Arg	Asp	Trp	Tyr	Val	Trp	Ser	Asp	Thr
			115					120					125		
Pro	Glu	Lys	Tyr	Lys	Gly	Val	Arg	Val	Ile	Phe	Lys	Asp	Phe	Glu	Thr
						135					140				
Ser	Asn	Trp	Thr	Phe	Asp	Pro	Val	Ala	Lys	Ala	Tyr	Tyr	Trp	His	Arg
					150				155						160
Phe	Tyr	Trp	His	Gln	Pro	Asp	Leu	Asn	Trp	Asp	Ser	Pro	Glu	Val	Glu
				165					170					175	
Lys	Ala	Ile	His	Gln	Val	Met	Phe	Phe	Trp	Ala	Asp	Leu	Gly	Val	Asp
			180					185						190	

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裝

訂

線

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## 六、申請專利範圍

Gly Phe Arg Leu Asp Ala Ile Pro Tyr Leu Tyr Glu Arg Glu Gly Thr  
 195 200 205  
 Ser Cys Glu Asn Leu Pro Glu Thr Ile Glu Ala Val Lys Arg Leu Arg  
 210 215 220  
 Lys Ala Leu Glu Glu Arg Tyr Gly Pro Gly Lys Ile Leu Leu Ala Glu  
 225 230 235 240  
 Ala Asn Met Trp Pro Glu Glu Thr Leu Pro Tyr Phe Gly Asp Gly Asp  
 245 250 255  
 Gly Val His Met Ala Tyr Asn Phe Pro Leu Met Pro Arg Ile Phe Met  
 260 265 270  
 Ala Leu Arg Arg Glu Asp Arg Gly Pro Ile Glu Thr Met Leu Lys Glu  
 275 280 285  
 Ala Glu Gly Ile Pro Glu Thr Ala Gln Trp Ala Leu Phe Leu Arg Asn  
 290 295 300  
 His Asp Glu Leu Thr Leu Glu Lys Val Thr Glu Glu Glu Arg Glu Phe  
 305 310 315 320  
 Met Tyr Glu Ala Tyr Ala Pro Asp Pro Lys Phe Arg Ile Asn Leu Gly  
 325 330 335  
 Ile Arg Arg Arg Leu Met Pro Leu Leu Gly Gly Asp Arg Arg Arg Tyr  
 340 345 350  
 Glu Leu Leu Thr Ala Leu Leu Leu Thr Leu Lys Gly Thr Pro Ile Val  
 355 360 365  
 Tyr Tyr Gly Asp Glu Ile Gly Met Gly Asp Asn Pro Phe Leu Gly Asp  
 370 375 380  
 Arg Asn Gly Val Arg Thr Pro Met Gln Trp Ser Gln Asp Arg Ile Val  
 385 390 395 400  
 Ala Phe Ser Arg Ala Pro Tyr His Ala Leu Phe Leu Pro Pro Val Ser  
 405 410 415  
 Glu Gly Pro Tyr Ser Tyr His Phe Val Asn Val Glu Ala Gln Arg Glu  
 420 425 430  
 Asn Pro His Ser Leu Leu Ser Phe Asn Arg Arg Phe Leu Ala Leu Arg  
 435 440 445  
 Asn Gln His Ala Lys Ile Phe Gly Arg Gly Ser Leu Thr Leu Leu Pro  
 450 455 460  
 Val Glu Asn Arg Arg Val Leu Ala Tyr Leu Arg Glu His Glu Gly Glu  
 465 470 475 480  
 Arg Val Leu Val Val Ala Asn Leu Ser Arg Tyr Thr Gln Ala Phe Asp  
 485 490 495  
 Leu Pro Leu Glu Ala Tyr Gln Gly Leu Val Pro Val Glu Leu Phe Ser  
 500 505 510  
 Gln Gln Pro Phe Pro Pro Val Glu Gly Arg Tyr Arg Leu Thr Leu Gly  
 515 520 525  
 Pro His Gly Phe Ala Leu Phe Ala Leu Lys Pro Val Glu Ala Val Leu  
 530 535 540

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裝

訂

線

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His Leu Pro Ser Pro Asp Trp Ala Glu Glu Pro Ala Pro Glu Glu Ala  
545 550 555 560  
Asp Leu Pro Arg Val His Met Pro Gly Gly Pro Glu Val Leu Leu Val  
565 570 575  
Asp Thr Leu Val His Glu Arg Gly Arg Glu Leu Leu Asn Ala Leu  
580 585 590  
Ala Gln Thr Leu Lys Glu Lys Ser Trp Leu Ala Leu Lys Pro Gln Lys  
595 600 605  
Val Ala Leu Leu Asp Ala Leu Arg Phe Gln Lys Asp Pro Pro Leu Tyr  
610 615 620  
Leu Thr Leu Leu Gln Leu Glu Asn His Arg Thr Leu Gln Val Ser Leu  
625 630 635 640  
Pro Leu Leu Trp Ser Pro Gln Arg Arg Glu Gly Pro Gly Leu Phe Ala  
645 650 655  
Arg Thr His Gly Gln Pro Gly Tyr Phe Tyr Glu Leu Ser Leu Asp Pro  
660 665 670  
Gly Phe Tyr Arg Leu Leu Leu Ala Arg Leu Lys Glu Gly Phe Glu Gly  
675 680 685  
Arg Ser Leu Arg Ala Tyr Tyr Arg Gly Arg His Pro Gly Pro Val Pro  
690 695 700  
Glu Ala Val Asp Leu Leu Arg Pro Gly Leu Ala Ala Gly Glu Gly Val  
705 710 715 720  
Trp Val Gln Leu Gly Leu Val Gln Asp Gly Gly Leu Asp Arg Thr Glu  
725 730 735  
Arg Val Leu Pro Arg Leu Asp Leu Pro Trp Val Leu Arg Pro Glu Gly  
740 745 750  
Gly Leu Phe Trp Glu Arg Gly Ala Ser Arg Arg Val Leu Ala Leu Thr  
755 760 765  
Gly Ser Leu Pro Pro Gly Arg Pro Gln Asp Leu Phe Ala Ala Leu  
770 775 780  
Val Arg Leu Leu Glu Ser Leu Pro Arg Leu Arg Gly His Ala  
785 790 795  
Thr Pro Gly Leu Leu Pro Gly Ala Leu His Glu Thr Glu Ala Leu  
805 810 815  
Arg Leu Leu Gly Val Arg Leu Ala Leu Leu His Arg Ala Leu Gly Glu  
820 825 830  
Val Glu Gly Val Val Gly Gly His Pro Leu Leu Gly Arg Gly Leu Gly  
835 840 845  
Ala Phe Leu Glu Leu Glu Gly Glu Val Tyr Leu Val Ala Leu Gly Ala  
850 855 860  
Glu Lys Arg Gly Thr Val Glu Glu Asp Leu Ala Arg Leu Ala Tyr Asp  
865 870 875 880  
Val Glu Arg Ala Val His Leu Ala Leu Glu Ala Leu Glu Ala Glu Leu  
885 890 895  
Trp Ala Phe Ala Glu Glu Val Ala Asp His Leu His Ala Ala Phe Leu  
900 905 910  
Gln Ala Tyr Arg Ser Ala Leu Pro Glu Glu Ala Leu Glu Glu Ala Gly  
915 920 925  
Trp Thr Arg His Met Ala Glu Val Ala Ala Glu His Leu His Arg Glu  
930 935 940  
Glu Arg Pro Ala Arg Lys Arg Ile His Glu Arg Trp Gln Ala Lys Ala  
945 950 955 960  
Gly Lys Ala

2. 如申請專利範圍第 1 項之重組型酵素，其具有如下之理化性質：

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裝

訂

線

## 六、申請專利範圍

### (1) 作用

作用於麥芽糖時，形成海藻糖，且作用於海藻糖時，形成麥芽糖；

### (2) 單元體分子量 (MW)

以十二烷硫酸鈉聚丙烯醯胺膠體電泳分析 (SDS-PAGE) 得其分子量約 100,000 - 110,000 道耳吞；

### (3) 等電點 (pI)

以等電電泳分析得其等電點約 3.8 - 4.8；

### (4) 最適溫度

在 pH 7.0 下靜置反應 60 分鐘，其最適溫度約 65 °C；

### (5) 最適 pH

在 60 °C 下靜置反應 60 分鐘，其最適 pH 約 6.0 - 6.7；

### (6) 對熱安定性

於 pH 7.0 下靜置反應 60 分鐘，其溫度升高至 80 °C 仍然安定；及

### (7) pH 安定性

於 60 °C 下靜置反應 60 分鐘，其 pH 在 5.5 - 9.5 之間仍然安定。

3. 一種編碼如申請專利範圍第 1 項之重組型酵素的 DNA。

4. 如申請專利範圍第 3 項的 DNA，其具有選自下列之鹼基序列，包括 SEQ ID NO: 4 所示鹼基序列，及其互補鹼基序列：

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裝

訂

線

六、申請專利範圍

SEQ ID NO: 4:

GTGGACCCCC	TCTGGTACAA	GGACGCGGTG	ATCTACCAGC	TCCACGTCCG	CTCCTTCTTT	60
GACGCCAACA	ACGACGGCTA	CGGGGACTTT	GAGGGCCTGA	GGCGGAAGCT	TCCCTACCTG	120
GAGGAGCTCG	GGGTCAACAC	CCTCTGGCTC	ATGCCCTTCT	TCCAGTCCCC	CTTGAGGGAC	180
GACGGGTACG	ATATCTCCGA	CTACTACCAG	ATCCTCCCCG	TCCACGGGAC	CCTGGAGGAC	240
TTCACCGTGG	ACGAGGCCCA	CGGCCGGGGG	ATGAAGGTGA	TCATTGAGCT	CGTCTGAAC	300
CACACCTCCA	TTGACCACCC	TTGGTTCCAG	GAGGCGAGGA	AGCCGAATAG	CCCCATGCGG	360
GACTGGTACG	TGTGGAGCGA	CACCCCGGAG	AAGTACAAGG	GGGTCCGGGT	CATCTTCAAG	420
GACTTTGAAA	CCTCCAAC TG	GACCTTTGAC	CCCGTGGCCA	AGGCCTACTA	CTGGCACCCG	480
TTCTACTGGC	ACCAGCCCCG	CCTCAACTGG	GACAGCCCCG	AGGTGGAGAA	GGCCATCCAC	540
CAGGTCATGT	TCTTCTGGGC	CGACCTGGGG	GTGGACGGCT	TCCGCCTGGA	CGCCATCCCC	600
TACCTCTACG	AGCGGGAGGG	GACCTCCTGC	GAGAACCTCC	CCGAGACCAT	TGAGGCGGTG	660
AAGCGCCTGA	GGAAAGCCCT	GGAGGAGCGC	TACGGCCCCG	GGAAGATCCT	CCTCGCCGAG	720
GCCAACATGT	GGCCGGAGGA	GACCTCCCC	TACTTCGGGG	ACGGGGACGG	GGTCCACATG	780
GCCTACAAC T	TCCCCCTGAT	GCCCCGGATC	TTTCATGGCCC	TAAGGCGGGA	GGACCGGGGT	840
CCCATTGAAA	CCATGCTCAA	GGAGGCGGAG	GGGATCCCCG	AAACCGCCCA	GTGGGCCCTC	900
TTCCTCCGCA	ACCACGACGA	GCTCACCTTG	GAGAAGGTCA	CGGAGGAGGA	GCGGGAGTTC	960
ATGTACGAGG	CCTACGCCCC	CGACCCCAAG	TTCCGCATCA	ACCTGGGGAT	CCGCCGCCGC	1020
CTCATGCCCC	TCTTCGGGGG	CGACCGCAGG	CGGTACGAGC	TCCTCACCCG	CCTCCTCCTC	1080
ACCTAAAGG	GCACGCCCAT	CGTCTACTAG	GGGACGAGA	TCGGCATGGG	GGACAACCCC	1140
TTCTCGGGG	ACCGGAACGG	TGTCAGGACC	CCCATGCAGT	GGTCCCAAGA	CCGCATCGTC	1200
GCCTTCTCCC	GCGCCCCCTA	CCACGCCCTC	TTCTTCCCC	CCGTGAGCGA	GGGGCCCTAC	1260
AGTACCAC T	TCGTCAACGT	GGAGGCCCAG	CGGGAAAACC	CCCCTCCCT	CCTGAGCTTC	1320
AACCGCCGCT	TCCTCGCCCT	GAGGAACCGA	CACGCCAAGA	TCTTCGGCCG	GGGGAGCCTC	1380
ACCTTCTCC	CCGTGGAGAA	CCGGCGCGTC	CTCGCCTACC	TGAGGGAGCA	CGAGGGGGAG	1440
CGGGTCTTGG	TGGTGGCCAA	CCTCTCCCGC	TACACCCAGG	CCTTTGACCT	CCCCTTGGAG	1500
GCCTACCAAG	GCCTCGTCCC	CGTGGAGCTC	TTCTCGCAGC	AACCTTCCC	CCCGGTGGAG	1560
GGGCGCTACC	GCTTGACCTT	GGGCCCCAC	GGCTTCGCC	TCTTCGCCCT	GAAGCCCGTG	1620
GAGGCGGTGC	TCCACCTCCC	CTCCCCGAC	TGGGCCGAGG	AGCCCGCCCC	CGAGGAGGCC	1680
GACCTGCCCT	GGGTCCACAT	GCCTGGGGGG	CCGGAGGTCC	TCCTGGTGGA	CACCTGGTTC	1740
CACGAAAGGG	GGCGGGAGGA	GTCCTAAAC	GCCCTCGCCC	AGACCCTGAA	GGAGAAGAGC	1800
TGGCTCGCCC	TCAAGCCGCA	GAAGGTGGCC	CTCCTGGACG	CCCTCCGCTT	CCAGAAGGAC	1860
CCGCCCTTT	ACCTCACCTT	GCTCCAGCTG	GAGAACCACA	GGACCCCTCA	GGTCTCCCTC	1920
CCCCTCCTCT	GGTCCCCCCA	GAGGCGGGAA	GGCCCCGGCC	TCTTCGCCCG	CACCCACGGC	1980
CAGCCCGGCT	ACTTCTACGA	GCTCTCCTTG	GACCCAGGCT	TCTACCGCCT	CCTCCTCGCC	2040
CGCCTTAAGG	AGGGGTTTGA	GGGCGGGAGC	CTCCGGGCC T	ACTACCGCGG	CCGCCACCCG	2100
GGTCCCCTGC	CCGAGGCCGT	GGACCTCCTC	CGCCGGGAC	TCGCGGCGGG	GGAGGGGGTC	2160
TGGGTCCAGC	TCGGCCTCGT	CCAAGACGGG	GGCCTGGACC	GCACGGAGCG	GGTCTTCCCC	2220
CGCCTGGACC	TCCCCTGGGT	TCTCCGGCCC	GAAGGGGGCC	TCTTCTGGGA	GCGGGGCGCC	2280
TCCAGAAAGG	TCCTCGCCCT	CACGGGAAGC	CTCCCCCGG	GCCGCCCCCA	GGACCTCTTC	2340
GCCGCCCTGG	AGGTCCGGCT	CCTGGAAAGC	CTTCCCCGCC	TCCGGGGGCA	CGCCCCGGGG	2400
ACCCACAGGCC	TCCTTCCC GG	GGCCCTGCAC	GAGACCGAAG	CCCTGGTCCG	CCTCCTCGGG	2460
GTGCGCCTCG	CCCTCCTCCA	CCGGGCCCTT	GGGGAGGTGG	AGGGGGTGGT	GGGGGGCCAC	2520
CCCCTCCTAG	GCCGCGGCC T	CGGGGCCTTC	CTGGAGCTGG	AGGGGGAGGT	GTACCTCGTG	2580
GCCCTGGGGC	CGGAAAAGCG	GGGCACGGTG	GAGGAGGACC	TGGCCCGCCT	GGCCTACGAC	2640
GTGGAGCGGG	CCGTGCACCT	CGCCCTCGAG	GCCCTGGAGG	CGGAGCTTTG	GGCCTTTGCC	2700
GAGGAGGTGG	CCGACCACCT	CCACGCCGCC	TTCCTCCAAG	CCTACCGCTC	CGCCCTCCCC	2760
GAGGAGGCC	TGGAGGAGGC	GGGCTGGACG	CGGCACATGG	CCGAGGTGGC	GGCGGAGCAC	2820
CTCCACCGGG	AGGAAAGGCC	CGCCCGCAAG	CGCATCCACC	AGCGCTGGCA	GGCCAAGGCC	2880
GGAAAAGCC						2889

5. 如申請專利範圍第4項的DNA，其中SEQ ID NO: 4中一或多個鹼基藉著基因密碼的簡併性以其他鹼基取代，但不改變SEQ ID NO: 3的胺基酸序列。

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裝

訂

線

### 六、申請專利範圍

6. 如申請專利範圍第3項的DNA，其具有SEQ ID NO: 5的鹼基序列：

SEQ ID NO:5:

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GCCCTCCCT CCCCCAACCG GGCCTTCCCG TGGGGGGGGG GCACAGCCTG GAGGAAGGGG 60
TGCTCGACGG GGAGGTGCGG CCCCTCTTGC GCCGTGGGCC GTGACCCCTT GCGGGCCAGG 120
CTTCCCTCCT ACCCCGGGGT GCGGGTGGAG GACAAGGGCT TCGCCCTGGC CCTGCACTAC 180
CGGGGGGCGG AGGGCGAGGA GAAGGCCCGG GCCTGCCTCG AGGCCTGGCT TAAGGCGGTG 240
GAGGGGCTCC TGGGGGCCTT GGGCCTCGAG GCCCTCCCCG GCAAGAGGGT CCTGGAGCTC 300
AAGCCCAAGG-GGGTGGACAA GGGCCAAGCG GTCCTCAGGC TCCTCGGACG CCACCCGGAC 360
CACACCCCGG TTTACATCGG GGACGACACC ACCGACGAGG CCGCCTTCCT CGCCTTAAGG 420
GGCCGGGGCC TCACCTTCAA GGTGGGGGAA GGCCCCACGG CGGCCCAAGG CCGGCTCAAG 480
GACGTGGAGG AGGTCCTGGC CTACTTGCAA ACCTACCTCC GACCCACTAG CCTTTAGGCC 540
GTG GAC CCC CTC TGG TAC AAG GAC GCG GTG ATC TAC CAG CTC CAC GTC 588
Met Asp Pro Leu Trp Tyr Lys Asp Ala Val Ile Tyr Gln Leu His Val
1 5 10 15
CGC TCC TTC TTT GAC GCC AAC AAC GAC GGC TAC GGG GAC TTT GAG GGC 636
Arg Ser Phe Phe Asp Ala Asn Asn Asp Gly Tyr Gly Asp Phe Glu Gly
20 25 30
CTG AGG CGG AAG CTT CCC TAC CTG GAG GAG CTC GGG GTC AAC ACC CTC 684
Leu Arg Arg Lys Leu Pro Tyr Leu Glu Glu Leu Gly Val Asn Thr Leu
35 40 45
TGG CTC ATG CCC TTC TTC CAG TCC CCC TTG AGG GAC GAG GGG TAC GAT 732
Trp Leu Met Pro Phe Phe Gln Ser Pro Leu Arg Asp Asp Gly Tyr Asp
50 55 60
ATC TCC GAC TAC TAC CAG ATC CTC CCC GTC CAC GGG ACC CTG GAG GAC 780
Ile Ser Asp Tyr Tyr Gln Ile Leu Pro Val His Gly Thr Leu Glu Asp
65 70 75 80
TTC ACC GTG GAC GAG GCC CAC GGC CGG GGG ATG AAG GTG ATC ATT GAG 828
Phe Thr Val Asp Glu Ala His Gly Arg Gly Met Lys Val Ile Ile Glu
85 90 95
CTC GTC CTG AAC CAC ACC TCC ATT GAC CAC CCT TGG TTC CAG GAG GCG 876
Leu Val Leu Asn His Thr Ser Ile Asp His Pro Trp Phe Gln Glu Ala
100 105 110
AGG AAG CCG AAT AGC CCC ATG CGG GAC TGG TAC GTG TGG AGC GAC ACC 924
Arg Lys Pro Asn Ser Pro Met Arg Asp Trp Tyr Val Trp Ser Asp Thr
115 120 125
CCG GAG AAG TAC AAG GGG GTC CGG GTC ATC TTC AAG GAC TTT GAA ACC 972
Pro Glu Lys Tyr Lys Gly Val Arg Val Ile Phe Lys Asp Phe Glu Thr
130 135 140
TCC AAC TGG ACC TTT GAC CCC GTG GCC AAG GCC TAC TAC TGG CAC CGC 1020
Ser Asn Trp Thr Phe Asp Pro Val Ala Lys Ala Tyr Tyr Trp His Arg
145 150 155 160

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裝

訂

線

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六、申請專利範圍

TTC	TAC	TGG	CAC	CAG	CCC	GAC	CTC	AAC	TGG	GAC	AGC	CCC	GAG	GTG	GAG	1068
Phe	Tyr	Trp	His	Gln	Pro	Asp	Leu	Asn	Trp	Asp	Ser	Pro	Glu	Val	Glu	
				165					170					175		
AAG	GCC	ATC	CAC	CAG	GTC	ATG	TTC	TTC	TGG	GCC	GAC	CTG	GGG	GTG	GAC	1116
Lys	Ala	Ile	His	Gln	Val	Met	Phe	Phe	Trp	Ala	Asp	Leu	Gly	Val	Asp	
			180					185					190			
GGC	TTC	CGC	CTG	GAC	GCC	ATC	CCC	TAC	CTC	TAC	GAG	CGG	GAG	GGG	ACC	1164
Gly	Phe	Arg	Leu	Asp	Ala	Ile	Pro	Tyr	Leu	Tyr	Glu	Arg	Glu	Gly	Thr	
		195					200					205				
TCC	TGC	GAG	AAC	CTC	CCC	GAG	ACC	ATT	GAG	GCG	GTG	AAG	CGC	CTG	AGG	1212
Ser	Cys	Glu	Asn	Leu	Pro	Glu	Thr	Ile	Glu	Ala	Val	Lys	Arg	Leu	Arg	
	210					215					220					
AAG	GCC	CTG	GAG	GAG	CGC	TAC	GGC	CCC	GGG	AAG	ATC	CTC	CTC	GCC	GAG	1260
Lys	Ala	Leu	Glu	Glu	Arg	Tyr	Gly	Pro	Gly	Lys	Ile	Leu	Leu	Ala	Glu	
	225				230				235					240		
GCC	AAC	ATG	TGG	CCG	GAG	GAG	ACC	CTC	CCC	TAC	TTC	GGG	GAC	GGG	GAC	1308
Ala	Asn	Met	Trp	Pro	Glu	Glu	Thr	Leu	Pro	Tyr	Phe	Gly	Asp	Gly	Asp	
			245					250						255		
GGG	GTC	CAC	ATG	GCC	TAC	AAC	TTC	CCC	CTG	ATG	CCC	CGG	ATC	TTC	ATG	135
Gly	Val	His	Met	Ala	Tyr	Asn	Phe	Pro	Leu	Met	Pro	Arg	Ile	Phe	Met	
			260				265						270			
GCC	CTA	AGG	CGG	GAG	GAC	CGG	GGT	CCC	ATT	GAA	ACC	ATG	CTC	AAG	GAG	1404
Ala	Leu	Arg	Arg	Glu	Asp	Arg	Gly	Pro	Ile	Glu	Thr	Met	Leu	Lys	Glu	
	275						280					285				
GCG	GAG	GGG	ATC	CCC	GAA	ACC	GCC	CAG	TGG	GCC	CTC	TTC	CTC	CGC	AAC	1452
Ala	Glu	Gly	Ile	Pro	Glu	Thr	Ala	Gln	Trp	Ala	Leu	Phe	Leu	Arg	Asn	
	290					295			300							
CAC	GAC	GAG	CTC	ACC	CTG	GAG	AAG	GTC	ACG	GAG	GAG	GAG	CGG	GAG	TTC	1500
His	Asp	Glu	Leu	Thr	Leu	Glu	Lys	Val	Thr	Glu	Glu	Glu	Arg	Glu	Phe	
	305			310					315					320		
ATG	TAC	GAG	GCC	TAC	GCC	CCC	GAC	CCC	AAG	TTC	CGC	ATC	AAC	CTG	GGG	1548
Met	Tyr	Glu	Ala	Tyr	Ala	Pro	Asp	Pro	Lys	Phe	Arg	Ile	Asn	Leu	Gly	
			325						330					335		
ATC	CGC	CGC	CGC	CTC	ATG	CCC	CTC	CTC	GGG	GGC	GAC	CGC	AGG	CGG	TAC	1596
Ile	Arg	Arg	Arg	Leu	Met	Pro	Leu	Leu	Gly	Gly	Asp	Arg	Arg	Arg	Tyr	
			340					345					350			
GAG	CTC	CTC	ACC	GCC	CTC	CTC	CTC	ACC	CTA	AAG	GGC	ACG	CCC	ATC	GTC	1644
Glu	Leu	Leu	Thr	Ala	Leu	Leu	Leu	Thr	Leu	Lys	Gly	Thr	Pro	Ile	Val	
			355				360					365				
TAC	TAC	GGG	GAC	GAG	ATC	GGC	ATG	GGG	GAC	AAC	CCC	TTC	CTC	GGG	GAC	1692
Tyr	Tyr	Gly	Asp	Glu	Ile	Gly	Met	Gly	Asp	Asn	Pro	Phe	Leu	Gly	Asp	
	370					375					380					
CGG	AAC	GGT	GTC	AGG	ACC	CCC	ATG	CAG	TGG	TCC	CAA	GAC	CGC	ATC	GTC	1740
Arg	Asn	Gly	Val	Arg	Thr	Pro	Met	Gln	Trp	Ser	Gln	Asp	Arg	Ile	Val	
	385				390					395				400		
GCC	TTC	TCC	CGC	GCC	CCC	TAC	CAC	GCC	CTC	TTC	CTT	CCC	CCC	GTG	AGC	1788
Ala	Phe	Ser	Arg	Ala	Pro	Tyr	His	Ala	Leu	Phe	Leu	Pro	Pro	Val	Ser	
			405					410						415		
GAG	GGG	CCC	TAC	AGC	TAC	CAC	TTC	GTC	AAC	GTG	GAG	GCC	CAG	CGG	GAA	1836
Glu	Gly	Pro	Tyr	Ser	Tyr	His	Phe	Val	Asn	Val	Glu	Ala	Gln	Arg	Glu	
			420					425					430			
AAC	CCC	CAC	TCC	CTC	CTG	AGC	TTC	AAC	CGC	CGC	TTC	CTC	GCC	CTG	AGG	1884
Asn	Phe	His	Ser	Leu	Leu	Ser	Phe	Asn	Arg	Arg	Phe	Leu	Ala	Leu	Arg	
		435					440						445			

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裝

訂

線

六、申請專利範圍

AAC Asn 450	CAG Gln His	CAC Ala Lys	GCC Gly Arg	AAG Ile Phe	ATC Ile Phe	TTC Gly Arg	GGC Gly Arg	CGG Gly Arg	GGG Gly Ser	AGC Ser Leu	CTC Ser Leu	ACC Thr Leu	CTT Leu Leu	CTC Leu Leu	CCC Pro Pro	1932
GTG Val 465	GAG Glu Asn	AAC Asn Arg	CGG Arg Arg	CGC Arg Val	GTC Val Leu	CTC Leu Ala	GCC Ala Tyr	TAC Tyr Leu	CTG Leu Arg	AGG Arg Glu	GAG Glu His	CAC His Glu	GAG Glu Gly	GGG Gly Glu	GAG Glu Glu	1980
CGG Arg	GTC Val	CTG Leu	GTG Val	GTG Val	GCC Ala	AAC Asn	CTC Leu	TCC Ser	CGC Arg	TAC Tyr	ACC Thr	CAG Gln	GCC Ala	TTT Phe	GAC Asp	2028
CTC Leu	CCC Pro	TTG Leu	GAG Glu	GCC Ala	TAC Tyr	CAA Gln	GGC Gly	CTC Leu	GTC Val	CCC Pro	GTG Val	GAG Glu	CTC Leu	TTC Phe	TCG Ser	2076
CAG Gln	CAA Gln	CCC Pro	TTC Phe	CCC Pro	CCG Pro	GTG Val	GAG Glu	GGG Gly	CGC Arg	TAC Tyr	CGC Arg	TTG Leu	ACC Thr	CTG Leu	GGC Gly	2124
CCC Pro	CAC His	GGC Gly	TTC Phe	GCC Ala	CTC Leu	TTC Phe	GCC Ala	CTG Leu	AAG Lys	CCC Pro	GTG Val	GAG Glu	GCC Ala	GTG Val	CTC Leu	2172
CAC His	CTC Leu	CCC Pro	TCC Ser	CCC Pro	GAC Asp	TGG Trp	GCC Ala	GAG Glu	GAG Glu	CCC Pro	GCC Ala	CCC Pro	GAG Glu	GAG Glu	GCC Ala	2220
GAC Asp	CTG Leu	CCC Pro	CGG Arg	GTC Val	CAC His	ATG Met	CCC Pro	GGG Gly	GGG Gly	CCG Pro	GAG Glu	GTC Val	CTC Leu	CTG Leu	GTG Val	2268
GAC Asp	ACC Thr	CTG Leu	GTC Val	CAC His	GAA Glu	AGG Arg	GGG Gly	CGG Arg	GAG Glu	GAG Glu	CTC Leu	CTA Leu	AAC Asn	GCC Ala	CTC Leu	2316
GCC Ala	CAG Gln	ACC Thr	CTG Leu	AAG Lys	GAG Glu	AAG Lys	AGC Ser	TGG Trp	CTC Leu	GCC Ala	CTC Leu	AAG Lys	CCG Pro	CAG Gln	AAG Lys	2364
GTG Val	GCC Ala	CTC Leu	CTG Leu	GAC Asp	GCC Ala	CTC Leu	CGC Arg	TTC Phe	CAG Gln	AAG Lys	GAC Asp	CCG Pro	CCC Pro	CTT Lys	TAC Tyr	2412
CTC Leu	ACC Thr	CTG Leu	CTC Leu	CAG Gln	CTG Leu	GAG Glu	AAC Asn	CAC His	AGG Arg	ACC Thr	CTC Leu	CAG Gln	GTC Val	TCC Ser	CTC Leu	2460
CCC Pro	CTC Leu	CTC Leu	TGG Trp	TCC Ser	CCC Pro	CAG Gln	AGG Arg	CGG Arg	GAA Glu	GGC Gly	CCC Pro	GGC Gly	CTC Leu	TTC Phe	GCC Ala	2508
CGC Arg	ACC Thr	CAC His	GGC Gly	CAG Gln	CCC Pro	GGC Gly	TAC Tyr	TTC Phe	TAC Tyr	GAG Glu	CTC Leu	TCC Ser	TTG Leu	GAC Asp	CCA Pro	2556
GGC Gly	TTC Phe	TAC Tyr	CGC Arg	CTC Leu	CTC Leu	CTC Leu	GCC Ala	CGC Arg	CTT Leu	AAG Lys	GAG Glu	GGG Gly	TTT Phe	GAG Glu	GGG Gly	2604
CGG Arg	AGC Ser	CTC Leu	CGG Arg	GCC Ala	TAC Tyr	TAC Tyr	CGC Arg	GGC Gly	CGC Arg	CAC His	CCG Pro	GGT Pro	CCC Val	GTG Val	CCC Pro	2652
GAG Glu	GCC Ala	GTG Val	GAC Asp	CTC Leu	CTC Leu	CTC Arg	CGG Pro	GGA Gly	CTC Leu	GCG Ala	GCG Ala	GGG Gly	GAG Glu	GGG Gly	GTC Val	2700
TGG Trp	GTC Val	CAG Gln	CTC Leu	GGC Gly	CTC Leu	GTC Val	CAA Gln	GAC Asp	GGG Gly	GGC Gly	CTG Leu	GAC Asp	CGC Arg	ACG Thr	GAG Glu	2748
CGG Arg	GTC Val	CTC Leu	CCC Pro	CGC Arg	CTG Leu	GAC Asp	CTC Leu	CCC Pro	TGG Trp	GTT Val	CTC Leu	CGG Arg	CCC Pro	GAA Glu	GGG Gly	2796

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六、申請專利範圍

GGC CTC TTC TGG GAG CGG GGC GCC TCC AGA AGG GTC CTC GCC CTC ACG	2844
Gly Leu Phe Trp Glu Arg Gly Ala Ser Arg Arg Val Leu Ala Leu Thr	
755 760 765	
GGA AGC CTC CCC CCG GGC CGC CCC CAG GAC CTC TTC GCC GCC CTG GAG	2892
Gly Ser Leu Pro Pro Gly Arg Pro Gln Asp Leu Phe Ala Ala Leu Glu	
770 775 780	
GTC CGG CTC CTG GAA AGC CTT CCC CGC CTC CGG GGG CAC GCC CCC GGG	2940
Val Arg Leu Leu Glu Ser Leu Pro Arg Leu Arg Gly His Ala Pro Gly	
785 790 795 800	
ACC CCA GGC CTC CTT CCC GGG GCC CTG CAC GAG ACC GAA GCC CTG GTC	2988
Thr Pro Gly Leu Leu Pro Gly Ala Leu His Glu Thr Glu Ala Leu Val	
805 810 815	
CGC CTC CTC GGG GTG CGC CTC GCC CTC CTC CAC CGG GCC CTT GGG GAG	3036
Arg Leu Leu Gly Val Arg Leu Ala Leu Leu His Arg Ala Leu Gly Glu	
820 825 830	
GTG GAG GGG GTG GTG GGG GGC CAC CCC CTC CTA GGC CGC GGC CTC GGG	3084
Val Glu Gly Val Val Gly Gly His Pro Leu Leu Gly Arg Gly Leu Gly	
835 840 845	
GCC TTC CTG GAG CTG GAG GGG GAG GTG TAC CTC GTG GCC CTG GGC GCG	3132
Ala Phe Leu Glu Leu Glu Gly Glu Val Tyr Leu Val Ala Leu Gly Ala	
850 855 860	
GAA AAG CGG GGC ACG GTG GAG GAG GAC CTG GCC CGC CTG GCC TAC GAC	3180
Glu Lys Arg Gly Thr Val Glu Glu Asp Leu Ala Arg Leu Ala Tyr Asp	
865 870 875 880	
GTG GAG CGG GCC GTG CAC CTC GCC CTC GAG GCC CTG GAG GCG GAG CTT	3228
Val Glu Arg Ala Val His Leu Ala Leu Glu Ala Leu Glu Ala Glu Leu	
885 890 895	
TGG GCC TTT GCC GAG GAG GTG GCC GAC CAC CTC CAC GCC GCC TTC CTC	3276
Trp Ala Phe Ala Glu Glu Val Ala Asp His Leu His Ala Ala Phe Leu	
900 905 910	
CAA GCC TAC CGC TCC GCC CTC CCC GAG GAG GCC CTG GAG GAG GCG GGC	3324
Gln Ala Tyr Arg Ser Ala Leu Pro Glu Glu Ala Leu Glu Ala Gly	
915 920 925	
TGG ACG CGG CAC ATG GCC GAG GTG GCG GCG GAG CAC CTC CAC CGG GAG	3372
Trp Thr Arg His Met Ala Glu Val Ala Ala Glu His Leu His Arg Glu	
930 935 940	
GAA AGG CCC GCC CGC AAG CGC ATC CAC GAG CGC TGG CAG GCC AAG GCC	3420
Glu Arg Pro Ala Arg Lys Arg Ile His Glu Arg Trp Gln Ala Lys Ala	
945 950 955 960	
GGA AAA GCC	3429
Gly Lys Ala	
963	
TAGGCGCCCG GTAGCCCTTC AGCCCCGGGC CACGGGGGCC TTGGGGTGGG AGACGGCCTC	3489
CTCGGGGAGG AGGCGGCGCT TCTTGCCCG GCGGTAGACG GCGTCCCACA TGCGGCAGAA	3549
GGCGCACACC GCCCCCGTGG TGGGGTAGCC GCACCGCTCG CACTCCCTAA G	3600

7 . 如申請專利範圍第 3 項之 D N A , 其係源自 Thermus 屬微生物。

8 . 一種藉酵素將麥芽糖轉化為海藻糖之方法, 它包含以如申請專利範圍第 1 項之重組型酵素作用於麥芽糖以形成海藻糖之步驟。

9 . 如申請專利範圍第 8 項的方法, 其中該步驟包含

(請先閱讀背面之注意事項再填寫本頁)

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## 六、申請專利範圍

在膠體培養基中同時含有最多 50 w / w % 之麥芽糖及有效量的重組型酵素，並且將所得之混合物在超過 55 °C 之溫度及 pH 5 - 10 之條件下進行酵素反應。

10. 如申請專利範圍第 8 項的方法，其中所生成之反應物含有至少約 50 w / w % 之海藻糖（按乾固重計）。

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