

Sequence Listing.txt

SEQUENCE LISTING

<110> Oxyrane UK Limited

<120> Mannosidases Capable of Uncapping
Mannose-1-Phospho-6-Mannose Linkages and Demannosylating
Phosphorylated N-glycans and Methods of Facilitating
Mammalian Cellular Uptake of Glycoproteins

<130> 18990-0032wo1

<140> PCT/IB2011/002770

<141> 2011-09-29

<150> US 61/477,014

<151> 2011-04-19

<150> US 61/387,940

<151> 2010-09-29

<160> 11

<170> FastSEQ for windows Version 4.0

<210> 1

<211> 2743

<212> DNA

<213> Artificial Sequence

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<223> Yarrowia codon optimized sequence encoding alpha
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<400> 1

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Sequence Listing.txt

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<210> 2

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<212> PRT

<213> Artificial Sequence

<220>

<223> Fusion of Yarrowia LIP2 signal sequence to human
alpha glucosidaseglucosidase

<400> 2

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 65          70          75          80
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 85          90          95
Tyr Lys Leu Glu Asn Leu Ser Ser Ser Glu Met Gly Tyr Thr Ala Thr
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Sequence Listing.txt

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Sequence Listing.txt
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 <212> DNA
 <213> Artificial Sequence
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 <223> Yarrowia lipolytica nucleotide sequence encoding
 AMS1 with C-terminal His-tag

<400> 3

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Sequence Listing.txt
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3258

<210> 4

<211> 3258

<212> DNA

<213> Artificial Sequence

<220>

<223> Yarrowia lipolytica nucleotide sequence encoding
AMS1 with N-terminal His-tag

<400> 4

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ctcaggtccagg tttaagaggg agtttctaaa agtttctaaa agtttctaaa agtttctaaa 4740
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ctcaggtccagg tttaagaggg agtttctaaa agtttctaaa agtttctaaa agtttctaaa 5880
ctcaggtccagg tttaagaggg agtttctaaa agtttctaaa agtttctaaa agtttctaaa 5940
ctcaggtccagg tttaagaggg agtttctaaa agtttctaaa agtttctaaa agtttctaaa 6000

Sequence Listing.txt

aagagcgagg gtgtcacttc tgtagacatt tctctacgtg cttttgaggt tgccacctac 3240
 aaggttgagt tggcttag 3258

<210> 5

<211> 1079

<212> PRT

<213> Yarrowia lipolytica

<400> 5

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

Sequence Listing.txt

```

465          470          475          480
Leu Met Leu Tyr Gly His Gly Asp Gly Gly Gly Gly Pro Thr Ala Glu
          485          490          495
Met Leu Glu Lys Leu Arg Arg Cys Arg Gly Val Ser Asn Thr Val Gly
          500          505          510
Glu Leu Pro Val Ile Gln Gly Gln Ser Val Thr Asp Phe Tyr Asn
          515          520          525
Glu Leu Leu Asp Gln Thr Asn Asn Gly Lys Asp Leu Val Thr Trp Val
          530          535          540
Gly Glu Leu Tyr Phe Glu Phe His Arg Gly Thr Tyr Thr Ser Gln Ala
545          550          555          560
Gln Thr Lys Lys Gly Asn Arg Val Ser Glu Asn Leu Leu His Asp Val
          565          570          575
Glu Leu Leu Ala Thr Leu Ala Ser Ile Arg Asp Ser Ser Tyr Lys Tyr
          580          585          590
Pro Phe Ala Gln Leu Glu Ser Leu Trp Glu Asp Val Cys Leu Cys Gln
          595          600          605
Phe His Asp Val Leu Pro Gly Ser Cys Ile Glu Met Val Tyr Lys Asp
610          615          620
Val Lys Lys Ile His Gly Arg Val Ile Asp Thr Ala Ser His Leu Ile
625          630          635          640
Asp Lys Ala Ala Ser Ala Leu Gly Leu Ser Gly His Pro Ser Lys Asp
          645          650          655
Ser Phe Asp Cys Thr Pro Val Ala Leu Asn Thr Met Pro Trp Ser Arg
          660          665          670
Thr Glu Val Val Ala Val Pro Gln Pro His Trp Asp Ala Thr Val Glu
          675          680          685
Leu Ala Glu Gly Val Glu Ile Gln Glu Asp Ser Gly Asn Ala Leu Val
690          695          700
Met Met Ser Glu Ser Gly Pro Val Val Thr Thr Gln Ser Val Asp Leu
705          710          715          720
Phe Lys Ser Glu Asp Ala Tyr Ile Leu Glu Asn Ser Gln Val Lys Val
          725          730          735
Thr Ile Cys Lys Asp Asp Gly Thr Leu Thr Ser Ile Tyr Asp Lys Glu
          740          745          750
Asn Asp Arg Arg Val Leu Ser Gly Thr Gly Asn Arg Leu Val Leu Phe
          755          760          765
Asp Asp Gln Pro Leu Ser Trp Gln Ala Trp Asp Thr Glu Val Phe Ser
          770          775          780
Leu Gly Lys Lys Gln Tyr Ile Gly Ala Glu Asn Val Thr Arg His Ser
785          790          795          800
Ile Val Ser Ser Gly Pro Leu Arg Ser Thr Val Ala Phe Thr Tyr Glu
          805          810          815
Phe Asn Lys Ser Val Val Thr Thr Glu Ile Ser Leu Asp Ala Asn Ser
          820          825          830
Pro Leu Val Thr Phe Asn Thr Arg Ala Asp Trp His Glu Thr Cys Lys
          835          840          845
Phe Leu Lys Val Glu Phe Pro Val Asp Val His Ser Glu Ser Ala Ser
          850          855          860
Tyr Glu Ser Gln Phe Gly Val Val Lys Arg Pro Thr His Tyr Asn Thr
865          870          875          880
Ser Trp Asp Val Ala Lys Phe Glu Val Cys Cys His Lys Phe Ala Asp
          885          890          895
Leu Ser Glu Leu Asp Tyr Gly Val Ser Ile Leu Asn Asp Cys Lys Tyr
          900          905          910
Gly Phe Ala Thr His Gly Asn Leu Met Arg Leu Ser Leu Leu Arg Ala
          915          920          925
Pro Lys Ala Pro Asp Ala His Ala Asp Met Gly His His Glu Phe Lys
          930          935          940
Tyr Gly Val Leu Ala His Lys Gly Pro Leu Gly Ala Thr Thr Val Arg
945          950          955          960
Ala Ala Tyr Asn Phe Asn Asn Pro Leu Arg Val Lys Tyr Val Gly Leu
          965          970          975
Ser Glu Val Ser Thr Lys Gln Ala Phe Ser Leu Lys Gly Pro Ala Asn
          980          985          990
Leu Val Leu Ser Gln Val Lys Arg Ala Glu Val Asp Arg Ser Lys Lys
          995          1000          1005
Ser Thr Asn Val Ile Leu Arg Val Tyr Glu Ala Leu Gly Gly Arg Thr

```

[illegible]

Sequence Listing.txt

2820 cgcctgcgtc tgaagcgttc aagcgcagac cgtgatgcac tggcagcact ggttgatgat 2880
 2940 tgaacaaagc acaggaagca ctgggcagac cagcatggca ctgcgttttg 2940
 3000 cagcagatcg tctgggtgca gacgcagatg cactggatct gaccgggtgt ggttatcgta 3000
 3060 cccggaaagc agaagcagtc gaagcagatg ctgggtggtga actgaaaatg gaagccaata 3060
 3120 gacagcagtc taatctggtg ggtgtcgtga ggttcagatg ggttcagatg cgcgatatga 3120
 3180 cctttgaaac cgcagccgtg gatacacctc cgcgttttct gaccgttctg tatgatacca 3180
 3240 gctttgcaac gaccgatacc ctgaagcacc ttcgtgttca tgcgggtgat gtttctgttc 3240
 3300 cggttgttgc aaccgttgat ctgaagcaca ccaagcgttg ggttaaatat accgaagtta 3300
 3360 ccgcagaact ggttgatgtt caggtccctg ttgatgccca ggttgttacc ttgaaactgc 3360
 3420 tggaccagag cgttcgtgat ttggttggtg atttttgatg gtttcgcttt agcgcagaag 3420
 3480 atccggctcag accggttgaa gccgttgatg taccatggaa gccgaagt 3480
 3540 ggaaccgcaag cagcgttctg ggtctgaaaa aagaagcag caccctggac agcgttccgg 3540
 3600 tgaaccaatg ttgttggtaca gcatgtgttg attgattgc ctatgttgaa gttgatcttg 3600
 3660 gtgaacttgc gctgggcgaa ctgagcgttc atatgtgca taatagcaat cgcagcgtta 3660
 3720 ataatagcgc actgagcgtt tatctggatg catttgatcc ggttaaatccg ggtgaaaccgt 3720
 3780 ttgtttaccgt tccgcttgctg accacccgtta gcatgttgac cgcagatggc acagccaccg 3780
 3840 cgtatgcaga tcatccgtat gttgcaaatc tggatagcct gaccttgcga ccgggtgttc 3840
 3900 cgaaccagcgt ttgtgttgaa agcgaagcct ggaaccagca ttcgtgtcgt ggccttgaaa 3900
 3960 atgaacttct tacttgacc tctgttccgg ttcaaatgt ggttgaccac gctgatggcg 4020
 4080 attgcttgcg atatgvcgaa atgatcttg gacgcgcagc actgatatg actgtctgtc 4080
 4140 taattcttca taattcttgc cgtctgtgta actgtctgtg tacccttgga tatcttgatg 4140
 4200 ccttgatcc ggaacaatccg gttgaaccgt ttgtgacagt gccgttgga aataccgcta 4200
 4260 gctcttgac caccgatgtt actgcatgtg ttgatcttgc gttaccgtt cgttgtaaac 4260
 4320 atcaggttgg gtttcttctg tctaccgaag catatgccga tcatccgtat gtggccaatc 4320
 4380 tggattctat gcctttttt accgatgcac atgatgttga agttccctcg accgatacag 4380
 4440 cagcacttgc agccgttgtt gatgcagcag gtacacccgga agcagaatat gcaagttatg 4440
 4500 gtttatctga ttaccctgtg tttaaccgtg aactggcagc agcagttagc gttcttgccg 4500
 4560 atgcctgtgc aacacagcga cagcagatg aacgttctcg tctgttgggt ctggcaaccg 4560
 4620 atcagctgtt tccgcagaa cgttcttctg tggaaaatct ggttgccagc gcagaagcac 4620
 4680 tgaaccgca agtttatct cggaaagct ggcaggaact tctgaaccga ctggttcttg 4680
 4740 caaccggcac cctgatgat gacgcagcat ctgatgaagc actgcatgat gcaagcttgg 4740
 4800 cgcctgcagg tgcagtgtat gcactgggaag aaccggcaga ttgttcttg gttgaagttg 4800
 4860 aagttctcc gcgttcttgc gcaagttaac cgttcgttgc gttcgttga gttaatgttt 4860
 4920 ctgatgcag cgttgatgtt gaacttgcaa gcttcttggg caccgtagc ttgttgggtg 4920
 4980 ttgcaccggg tgcgagcga taccagatg ttgcagatg gttgcagccg gttgatctgg 5040
 5060 atgttaacct gaccgcaacc gttgcagatg gttgcagac cgttgaaacag gttgtgaccg 5060

<210> 7
 <211> 1665
 <212> PRT
 <213> Cellulosemicrobium cellulans

<400> 7
 Ala Leu Ala Val Val Gly Leu Ala Pro Ala Thr Ala Ser Ala Ala
 1 5 10 15
 Pro Glu Pro Ser Ala Asp Tyr Ala Ser Leu Val Asp Val Phe Val
 20 25 30 35
 Gly Thr Glu Gly Asp Phe Gly Asn Asp Met Pro Ala Ala Pro
 40 45 50 55
 Asn Gly Leu Ala Lys Val Asn Pro Arg Thr Thr Pro Gly Arg Asn Asn
 60 65 70 75
 Thr Gly Tyr Asp Tyr Ala Glu Ser Lys Ile Ser Gly Phe Thr His Thr
 80 85 90 95
 Asn Leu Asp Asp Gly Val Gly Ser Gly Gly Ser Gly Asp Leu Val
 100 105 110 115
 Val Pro Thr Ser Ser Gly Ser Tyr Thr Ala Arg Pro Gly Thr Tyr
 120 125 130 135
 Ala His Pro Phe Ser His Asp Asp Glu Asp Ala Gly Pro Gly Phe Tyr
 140 145 150 155
 Ser Val Gly Leu Gly Asn Val Ala Gly Thr Asp Gly Ala Ile Thr Gly
 160 165 170 175
 Ala Pro Gly Thr Ile Glu Ala Glu Val Ala Ala Thr Arg Ser Gly

Sequence Listing.txt

```

Val His Arg Tyr Ala Phe Pro Ala Gly Ser Thr Pro Ser Leu Val Val
165 170 175
Asp Leu Glu Thr Asn Asn Thr Ser Arg Arg Ser Ser Ser Val Gln Val
180 185 190
Glu Thr Arg Ala Asp Gly Thr Val Glu Leu Ser Gly Gln Val Thr Gly
195 200 205
Tyr Phe Tyr Asn Ala Ala Tyr Thr Leu Tyr Tyr Thr Ala Arg Thr Leu
210 215 220
Gln Pro Ala Thr Val Gln Thr Trp Gly Asp Asp Asp Arg Leu Val Asp
225 230 235 240
Ala Thr Ala Gln Asp Gly Val Asp Thr Gly Ala Ile Leu Thr Phe Asp
245 250 255
Pro Ala Asp Ala Gly Glu Ile Gly Leu Gln Val Thr Leu Ser Pro Val
260 265 270
ser Val Glu Gln Ala Arg Ile Asp Gln Gln Val Glu Leu Gly Asp Leu
275 280 285
Ser Phe Asp Ala Ile Arg Asp Arg Thr Arg Ala Glu Trp Asn Ala Thr
290 295 300
Leu Gly Arg Val Ala Ile Asp Ala Ser Thr Ala Thr Asp Pro Thr Gly
305 310 315 320
Glu Leu Gln Arg Leu Phe Tyr Thr His Leu Tyr Arg Met Phe Ala Met
325 330 335
Pro Met Asn Ala Thr Ser Thr Ser Gly Thr Tyr Arg Gly Val Asp Gly
340 345 350
Ala Val His Ala Ala Gln Gly Phe Thr Tyr Tyr Asp Ser Trp Ala Thr
355 360 365
Trp Asp Asp Phe Arg Lys Phe Ser Val Ile Ala Tyr Ile Asp Pro Ala
370 375 380
Leu Tyr Arg Asp Met Val Gln Ser Leu Val Tyr Leu Phe Ala Asp Ala
385 390 395 400
Glu Ala Thr Gly Thr Gly Gly Gly Leu Gly Gly Phe Val His Ser Val
405 410 415
Pro Thr Val Arg Trp Glu Arg Ser Ser Val Val Val Ala Asp Ala Ile
420 425 430
Ala Lys Gly Phe Asp Gly Phe Asp Arg Leu Asp Glu Ala Tyr Pro Ala
435 440 445
Leu Gln Arg Leu Val Gly Gln Tyr Ser Ala Asp Glu Leu Arg Arg Gly
450 455 460
Tyr Val Ala Gly Asn Pro Gly Ala Ser Val Gln Arg Gly Tyr Asp Gln
465 470 475 480
Tyr Gly Leu Ser Val Ile Ala Asp Glu Leu Gly Leu Thr Glu Glu Ala
485 490 495
Glu Thr Leu Arg Glu Gln Ala Ser Trp Pro Ile Glu Lys Leu Thr Lys
500 505 510
Pro Gly Ala Trp Thr Ala Ala Asp Gly Thr Gln Val Gly Leu Leu Thr
515 520 525
Pro Arg Ala Ala Asp Gly Ser Trp Gln Ser Ala Asp His Ala Lys Phe
530 535 540
Glu Ala Ala Gly Leu Tyr Gln Gly Thr Leu Trp Gln Tyr His Trp Tyr
545 550 555 560
Asp Ala Tyr Asp Met Asp Ala Leu Val Glu Ala Met Gly Gly His Glu
565 570 575
Ala Ala Arg Leu Gly Met Arg His Met Phe Gly Glu His Ala Pro Asp
580 585 590
Asp Gly Lys Ala Met Leu His Ser Asn Ala Asn Glu Ile Asp Leu Gln
595 600 605
Ala Pro Tyr Leu Phe Asn Tyr Thr Gly Glu Pro Ser Leu Thr Gln Lys
610 615 620
Trp Ala Arg Ala Ile Tyr Thr Lys Glu Thr Trp Asn Arg Tyr Ile Ala
625 630 635 640
Thr Gly Ser Ser Ser Ala Val Pro Ser Gly Gly Gly Glu Phe Thr Pro
645 650 655
Pro Leu Lys Thr Lys Val Tyr Arg Leu Asp Pro Arg Gly Met Leu Pro
660 665 670
Thr Met Asp Asn Asp Ala Gly Thr Met Ser Thr Met Phe Val Ala Ala
675 680 685
Ala Val Gly Leu Phe Pro Val Thr Ala Gly Ser Ser Gln Phe Gln Val
690 695 700

```

Sequence Listing.txt

Gly Ser Pro Phe Phe Asp Ser Thr Thr Ile Thr Tyr Asp Asp Gly Ser
 705 710 715 720
 Ala Phe Thr Val Thr Ala Asp Gly Val Ser Glu Asp Ala Phe Tyr Val
 725 730 735
 Gln Ser Ala Thr Leu Asp Gly Ala Thr Phe Gly Asn Thr Trp Val Asp
 740 745 750
 Tyr Ala Thr Val Val Gly Gly Ala Asp Leu Ala Phe Arg Met Gly Glu
 755 760 765
 Gln Pro Ser Asp Trp Gly Thr Asp Thr Ala Pro Ala Phe Ser Met Ser
 770 775 780
 Thr Ala Thr Asp Glu Pro Ala Glu Gly Pro Arg Val Ser Ala Glu Pro
 785 790 795 800
 Thr Thr Val Gln Thr Gly Asp Gly Gly Ala Leu Asp Ala Thr Val Thr
 805 810 815
 Leu Thr Leu Asp Gly Ala Arg Leu Ala Ala Pro Ala Gly Thr Asp Leu
 820 825 830
 Val Thr Ser Gly Ala Ala Ser Val Val Gly Leu Pro Asp Gly Val Thr
 835 840 845
 Ala Ala Val Thr Val Ala Ser Pro Thr Ala Leu Thr Val Ser Leu Thr
 850 855 860
 Gly Thr Ala Ser Ala Asp Ala Arg Phe Phe Val His Leu Arg Asp Ala
 865 870 875 880
 Ala Leu Ala Asp Gly Val Ala Ala Ala Ser Leu Gln Gly Gln Gly Val
 885 890 895
 Ser Val Arg Ser Pro Leu Arg Leu Ser Val Ala Ser Ala Glu Arg Asp
 900 905 910
 Ala Leu Ala Ala Leu Val Asp Asp Ala Val Leu Val Arg His Gly Asn
 915 920 925
 Tyr Ser Ser Val Thr Phe Asp Arg Phe Ser Thr Ala Leu Thr Lys Ala
 930 935 940
 Gln Glu Ala Leu Gly Asp Glu Ala Ala Thr Ser Ile Ala Leu Arg Phe
 945 950 955 960
 Ala Ala Asp Arg Leu Gly Ala Ala Ala Asp Ala Leu Asp Leu Thr Gly
 965 970 975
 Gly Gly Tyr Arg Thr Leu Glu Ala Glu Gln Ser Glu Ala Trp Ser Gly
 980 985 990
 Gly Glu Leu Lys Asn Glu Ala Asn Ser Ser Ser Gly Asn Leu Gly Gly
 995 1000 1005
 Val Arg Ser Gly Ser Trp Val Gln Tyr Arg Asp Met Thr Phe Glu Thr
 1010 1015 1020
 Ala Ala Gly Asp Thr Pro Arg Phe Leu Thr Val Arg Tyr Asp Thr
 1025 1030 1035 1040
 Ser Phe Ala Pro Thr Asp Thr Pro Ser Thr Val Arg Val His Ala Gly
 1045 1050 1055
 Asp Val Ser Gly Pro Val Val Ala Thr Val Asp Leu Lys Gly Thr Ser
 1060 1065 1070
 Gly Trp Gly Lys Tyr Thr Glu Val Thr Ala Glu Leu Gly Asp Val Gln
 1075 1080 1085
 Ala Leu Val Asp Ala Gln Val Val Thr Phe Glu Leu Leu Ala Pro Ser
 1090 1095 1100
 Gly Arg Ser Trp Val Gly Asn Phe Asp Trp Phe Arg Phe Ser Ala Glu
 1105 1110 1115 1120
 Asp Pro Ala Ala Pro Gly Gln Pro Gly Glu Ser Pro Thr Val Thr Ile
 1125 1130 1135
 Glu Ala Glu Asp Trp Thr Ala Ser Ser Gly Arg Gly Leu Lys Lys Glu
 1140 1145 1150
 Ser Ser Thr Trp Thr Ser Gly Pro Val Thr Asn Val Gly Gly Thr Ala
 1155 1160 1165
 Asp Gly Asp Trp Ile Ala Tyr Gly Glu Val Asp Leu Gly Glu Leu Pro
 1170 1175 1180
 Leu Gly Glu Leu Ser Val His Tyr Val His Asn Ser Asn Arg Ser Gly
 1185 1190 1195 1200
 Asn Asn Ser Ala Leu Ser Val Tyr Leu Asp Ala Phe Asp Pro Ala Asn
 1205 1210 1215
 Pro Gly Glu Pro Phe Val Thr Val Pro Leu Pro Thr Thr Gly Ser Ser
 1220 1225 1230
 Trp Thr Ala Asp Gly Thr Ala Thr Val Val Leu Pro Glu Thr Val Gln
 1235 1240 1245

Sequence Listing.txt

Gly Thr His Glu Val Phe Val Arg Leu Ser Thr Glu Pro Tyr Ala Asp
 1250 1255 1260
 His Pro Tyr Val Ala Asn Leu Asp Ser Leu Thr Phe Ala Pro Gly Gly
 1265 1270 1275 1280
 Pro Thr Ser Val Val Val Glu Ser Glu Ala Trp Thr Ser Asn Ser Gly
 1285 1290 1295
 Arg Gly Leu Lys Asn Glu Ser Ser Thr Trp Thr Ser Gly Pro Val Thr
 1300 1305 1310
 Asn Val Gly Gly Thr Ala Asp Gly Asp Trp Leu Ala Tyr Gly Glu Ile
 1315 1320 1325
 Asp Leu Gly Ser Ala Ala Leu Asp Gln Leu Ser Val His Tyr Val His
 1330 1335 1340
 Asn Ser Asn Arg Ser Gly Arg Asn Ser Ala Leu Ser Val Tyr Leu Asp
 1345 1350 1355 1360
 Ala Phe Asp Pro Ala Asn Pro Gly Glu Pro Phe Val Thr Val Pro Leu
 1365 1370 1375
 Ala Asn Thr Gly Ser Ser Trp Thr Thr Asp Gly Thr Ala Val Val Asp
 1380 1385 1390
 Leu Pro Ser Thr Val Arg Gly Lys His Gln Val Trp Val Arg Leu Ser
 1395 1400 1405
 Thr Glu Ala Tyr Ala Asp His Pro Tyr Val Ala Asn Leu Asp Ser Met
 1410 1415 1420
 Arg Phe Phe Thr Asp Ala Tyr Asp Val Glu Val Pro Pro Thr Asp Thr
 1425 1430 1435 1440
 Ala Ala Leu Ala Ala Val Val Asp Ala Ala Gly Thr Pro Glu Ala Glu
 1445 1450 1455
 Ile Ala Arg Tyr Gly Arg Ile Asp Ala Arg Val Phe Thr Arg Glu Leu
 1460 1465 1470
 Ala Ala Ala Arg Ser Val Leu Ala Asp Ala Gly Ala Thr Gln Ala Gln
 1475 1480 1485
 Ala Asp Glu Arg Ala Arg Arg Leu Gly Leu Ala Thr Asp Gln Leu Val
 1490 1495 1500
 Pro Ala Glu Arg Arg Arg Leu Glu Asn Leu Val Ala Ser Ala Glu Ala
 1505 1510 1515 1520
 Leu Thr Asp Glu Gly Tyr Ser Pro Glu Ser Trp Gln Ala Phe Arg Thr
 1525 1530 1535
 Ala Leu Ala Ala Ala Thr Gly Thr Leu Asp Asp Ala Ala Ala Ser Asp
 1540 1545 1550
 Glu Ala Leu His Asp Ala Arg Leu Ala Leu Gln Gly Ala Val Asp Ala
 1555 1560 1565
 Leu Glu Glu Pro Ala Asp Val Val Leu Val Glu Val Glu Val Ser Pro
 1570 1575 1580
 Arg Cys Leu Ala Gly Lys Pro Tyr Val Ala Val Arg Ala Val Asn Val
 1585 1590 1595 1600
 Ser Asp Ala Ala Val Asp Val Glu Leu Ala Ser Ser Leu Gly Thr Arg
 1605 1610 1615
 Ser Phe Val Gly Val Ala Pro Gly Ala Ser Ala Tyr Gln Ser Phe Ala
 1620 1625 1630
 Ala Arg Ser Ala Thr Gly Asp Leu Asp Val Thr Val Thr Ala Thr Gly
 1635 1640 1645
 Ala Asp Gly Thr Gln Thr Val Glu Gln Val Val Thr Val Pro Ser Cys
 1650 1655 1660
 Ser
 1665

<210> 8

<211> 1650

<212> PRT

<213> Cellulosimicrobium cellulans

<400> 8

Ala Pro Glu Pro Pro Ser Ala Asp Tyr Ala Ser Leu Val Asp Val Phe
 1 5 10 15
 Val Gly Thr Glu Gly Asp Phe Gly Asn Asp Met Pro Ala Ala Gln Ala
 20 25 30
 Pro Asn Gly Leu Ala Lys Val Asn Pro Arg Thr Thr Pro Gly Arg Asn
 35 40 45

Sequence Listing.txt

```

Asn Thr Gly Tyr Asp Tyr Ala Gln Ser Lys Ile Ser Gly Phe Thr His
50      55      60
Thr Asn Leu Asp Gly Val Gly Gly Ser Gly Gly Gly Gly Asp Leu Leu
65      70      75      80
Val Val Pro Thr Ser Gly Ser Tyr Thr Ala Arg Pro Gly Thr Gly Thr
85      90      95
Tyr Ala His Pro Phe Ser His Asp Asp Glu Asp Ala Gly Pro Gly Phe
100     105
Tyr Ser Val Gly Leu Gly Asn Val Ala Gly Thr Asp Gly Ala Ile Thr
115     120     125
Gly Ala Pro Gly Thr Ile Glu Ala Glu Val Ala Ala Thr Arg Ser
130     135     140
Gly Val His Arg Tyr Ala Phe Pro Ala Gly Ser Thr Pro Ser Leu Val
145     150     155     160
Val Asp Leu Glu Thr Asn Asn Thr Ser Arg Arg Ser Ser Ser Val Gln
165     170     175
Val Glu Thr Arg Ala Asp Gly Thr Val Glu Leu Ser Gly Gln Val Thr
180     185     190
Gly Tyr Phe Tyr Asn Ala Ala Tyr Thr Leu Tyr Tyr Thr Ala Arg Thr
195     200     205
Leu Gln Pro Ala Thr Val Gln Thr Trp Gly Asp Asp Asp Arg Leu Val
210     215     220
Asp Ala Thr Ala Gln Asp Gly Val Asp Thr Gly Ala Ile Leu Thr Phe
225     230     235     240
Asp Pro Ala Asp Ala Gly Glu Ile Gly Leu Gln Val Thr Leu Ser Pro
245     250     255
Val Ser Val Glu Gln Ala Arg Ile Asp Gln Gln Val Glu Leu Gly Asp
260     265     270
Leu Ser Phe Asp Ala Ile Arg Asp Arg Thr Arg Ala Glu Trp Asn Ala
275     280     285
Thr Leu Gly Arg Val Ala Ile Asp Ala Ser Thr Ala Thr Asp Pro Thr
290     295     300
Gly Glu Leu Gln Arg Leu Phe Tyr Thr His Leu Tyr Arg Met Phe Ala
305     310     315     320
Met Pro Met Asn Ala Thr Ser Thr Ser Gly Thr Tyr Arg Gly Val Asp
325     330     335
Gly Ala Val His Ala Ala Gln Gly Phe Thr Tyr Tyr Asp Ser Trp Ala
340     345     350
Thr Trp Asp Asp Phe Arg Lys Phe Ser Val Ile Ala Tyr Ile Asp Pro
355     360     365
Ala Leu Tyr Arg Asp Met Val Gln Ser Leu Val Tyr Leu Phe Ala Asp
370     375     380
Ala Glu Ala Thr Gly Thr Gly Gly Gly Leu Gly Gly Phe Val His Ser
385     390     395     400
Val Pro Thr Val Arg Trp Glu Arg Ser Ser Val Val Val Ala Asp Ala
405     410     415
Ile Ala Lys Gly Phe Asp Gly Phe Asp Arg Leu Asp Glu Ala Tyr Pro
420     425     430
Ala Leu Gln Arg Leu Val Gly Gln Tyr Ser Ala Asp Glu Leu Arg Arg
435     440     445
Gly Tyr Val Ala Gly Asn Pro Gly Ala Ser Val Gln Arg Gly Tyr Asp
450     455     460
Gln Tyr Gly Leu Ser Val Ile Ala Asp Glu Leu Gly Leu Thr Glu Glu
465     470     475     480
Ala Glu Thr Leu Arg Glu Gln Ala Ser Trp Pro Ile Glu Lys Leu Thr
485     490     495
Lys Pro Gly Ala Trp Thr Ala Ala Asp Gly Thr Gln Val Gly Leu Leu
500     505     510
Thr Pro Arg Ala Ala Asp Gly Ser Trp Gln Ser Ala Asp His Ala Lys
515     520     525
Phe Glu Ala Ala Gly Leu Tyr Gln Gly Thr Leu Trp Gln Tyr His Trp
530     535     540
Tyr Asp Ala Tyr Asp Met Asp Ala Leu Val Glu Ala Met Gly Gly His
545     550     555     560
Glu Ala Ala Arg Leu Gly Met Arg His Met Phe Gly Glu His Ala Pro
565     570     575
Asp Asp Gly Lys Ala Met Leu His Ser Asn Ala Asn Glu Ile Asp Leu
580     585     590

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Sequence Listing.txt

Gln Ala Pro Tyr Leu Phe Asn Tyr Thr Gly Glu Pro Ser Leu Thr Gln
 595 600 605
 Lys Trp Ala Arg Ala Ile Tyr Thr Lys Glu Thr Trp Asn Arg Tyr Ile
 610 615 620
 Ala Thr Gly Ser Ser Ser Ala Val Pro Ser Gly Gly Gly Glu Phe Thr
 625 630 635 640
 Pro Pro Leu Lys Thr Lys Val Tyr Arg Leu Asp Pro Arg Gly Met Leu
 645 650 655
 Pro Thr Met Asp Asn Asp Ala Gly Thr Met Ser Thr Met Phe Val Ala
 660 665 670
 Ala Ala Val Gly Leu Phe Pro Val Thr Ala Gly Ser Ser Gln Phe Gln
 675 680 685
 Val Gly Ser Pro Phe Phe Asp Ser Thr Thr Ile Thr Tyr Asp Asp Gly
 690 695 700
 Ser Ala Phe Thr Val Thr Ala Asp Gly Val Ser Glu Asp Ala Phe Tyr
 705 710 715 720
 Val Gln Ser Ala Thr Leu Asp Gly Ala Thr Phe Gly Asn Thr Trp Val
 725 730 735
 Asp Tyr Ala Thr Val Val Gly Gly Ala Asp Leu Ala Phe Arg Met Gly
 740 745 750
 Glu Gln Pro Ser Asp Trp Gly Thr Asp Thr Ala Pro Ala Phe Ser Met
 755 760 765
 Ser Thr Ala Thr Asp Glu Pro Ala Glu Gly Pro Arg Val Ser Ala Glu
 770 775 780
 Pro Thr Thr Val Gln Thr Gly Asp Gly Gly Ala Leu Asp Ala Thr Val
 785 790 795 800
 Thr Leu Thr Leu Asp Gly Ala Arg Leu Ala Ala Pro Ala Gly Thr Asp
 805 810 815
 Leu Val Thr Ser Gly Ala Ala Ser Val Val Gly Leu Pro Asp Gly Val
 820 825 830
 Thr Ala Ala Val Thr Val Ala Ser Pro Thr Ala Leu Thr Val Ser Leu
 835 840 845
 Thr Gly Thr Ala Ser Ala Asp Ala Arg Phe Phe Val His Leu Arg Asp
 850 855 860
 Ala Ala Leu Ala Asp Gly Val Ala Ala Ala Ser Leu Gln Gly Gln Gly
 865 870 875 880
 Val Ser Val Arg Ser Pro Leu Arg Leu Ser Val Ala Ser Ala Glu Arg
 885 890 895
 Asp Ala Leu Ala Ala Leu Val Asp Asp Ala Val Leu Val Arg His Gly
 900 905 910
 Asn Tyr Ser Ser Val Thr Phe Asp Arg Phe Ser Thr Ala Leu Thr Lys
 915 920 925
 Ala Gln Glu Ala Leu Gly Asp Glu Ala Ala Thr Ser Ile Ala Leu Arg
 930 935 940
 Phe Ala Ala Asp Arg Leu Gly Ala Ala Ala Asp Ala Leu Asp Leu Thr
 945 950 955 960
 Gly Gly Gly Tyr Arg Thr Leu Glu Ala Glu Gln Ser Glu Ala Trp Ser
 965 970 975
 Gly Gly Glu Leu Lys Asn Glu Ala Asn Ser Ser Ser Gly Asn Leu Gly
 980 985 990
 Gly Val Arg Ser Gly Ser Trp Val Gln Tyr Arg Asp Met Thr Phe Glu
 995 1000 1005
 Thr Ala Ala Gly Asp Thr Pro Pro Arg Phe Leu Thr Val Arg Tyr Asp
 1010 1015 1020
 Thr Ser Phe Ala Pro Thr Asp Thr Pro Ser Thr Val Arg Val His Ala
 1025 1030 1035 1040
 Gly Asp Val Ser Gly Pro Val Val Ala Thr Val Asp Leu Lys Gly Thr
 1045 1050 1055
 Ser Gly Trp Gly Lys Tyr Thr Glu Val Thr Ala Glu Leu Gly Asp Val
 1060 1065 1070
 Gln Ala Leu Val Asp Ala Gln Val Val Thr Phe Glu Leu Leu Ala Pro
 1075 1080 1085
 Ser Gly Arg Ser Trp Val Gly Asn Phe Asp Trp Phe Arg Phe Ser Ala
 1090 1095 1100
 Glu Asp Pro Ala Ala Pro Gly Gln Pro Gly Glu Ser Pro Thr Val Thr
 1105 1110 1115 1120
 Ile Glu Ala Glu Asp Trp Thr Ala Ser Ser Gly Arg Gly Leu Lys Lys
 1125 1130 1135

Sequence Listing.txt

Glu Ser Ser Thr Trp Thr Ser Gly Pro Val Thr Asn Val Gly Gly Thr
 1140 1145 1150
 Ala Asp Gly Asp Trp Ile Ala Tyr Gly Glu Val Asp Leu Gly Glu Leu
 1155 1160 1165
 Pro Leu Gly Glu Leu Ser Val His Tyr Val His Asn Ser Asn Arg Ser
 1170 1175 1180
 Gly Asn Asn Ser Ala Leu Ser Val Tyr Leu Asp Ala Phe Asp Pro Ala
 1185 1190 1195 1200
 Asn Pro Gly Glu Pro Phe Val Thr Val Pro Leu Pro Thr Thr Gly Ser
 1205 1210 1215
 Ser Trp Thr Ala Asp Gly Thr Ala Thr Val Val Leu Pro Glu Thr Val
 1220 1225 1230
 Gln Gly Thr His Glu Val Phe Val Arg Leu Ser Thr Glu Pro Tyr Ala
 1235 1240 1245
 Asp His Pro Tyr Val Ala Asn Leu Asp Ser Leu Thr Phe Ala Pro Gly
 1250 1255 1260
 Gly Pro Thr Ser Val Val Val Glu Ser Glu Ala Trp Thr Ser Asn Ser
 1265 1270 1275 1280
 Gly Arg Gly Leu Lys Asn Glu Ser Ser Thr Trp Thr Ser Gly Pro Val
 1285 1290 1295
 Thr Asn Val Gly Gly Thr Ala Asp Gly Asp Trp Leu Ala Tyr Gly Glu
 1300 1305 1310
 Ile Asp Leu Gly Ser Ala Ala Leu Asp Gln Leu Ser Val His Tyr Val
 1315 1320 1325
 His Asn Ser Asn Arg Ser Gly Arg Asn Ser Ala Leu Ser Val Tyr Leu
 1330 1335 1340
 Asp Ala Phe Asp Pro Ala Asn Pro Gly Glu Pro Phe Val Thr Val Pro
 1345 1350 1355 1360
 Leu Ala Asn Thr Gly Ser Ser Trp Thr Thr Asp Gly Thr Ala Val Val
 1365 1370 1375
 Asp Leu Pro Ser Thr Val Arg Gly Lys His Gln Val Trp Val Arg Leu
 1380 1385 1390
 Ser Thr Glu Ala Tyr Ala Asp His Pro Tyr Val Ala Asn Leu Asp Ser
 1395 1400 1405
 Met Arg Phe Phe Thr Asp Ala Tyr Asp Val Glu Val Pro Pro Thr Asp
 1410 1415 1420
 Thr Ala Ala Leu Ala Ala Val Val Asp Ala Ala Gly Thr Pro Glu Ala
 1425 1430 1435 1440
 Glu Ile Ala Arg Tyr Gly Arg Ile Asp Ala Arg Val Phe Thr Arg Glu
 1445 1450 1455
 Leu Ala Ala Ala Arg Ser Val Leu Ala Asp Ala Gly Ala Thr Gln Ala
 1460 1465 1470
 Gln Ala Asp Glu Arg Ala Arg Arg Leu Gly Leu Ala Thr Asp Gln Leu
 1475 1480 1485
 Val Pro Ala Glu Arg Arg Arg Leu Glu Asn Leu Val Ala Ser Ala Glu
 1490 1495 1500
 Ala Leu Thr Asp Glu Gly Tyr Ser Pro Glu Ser Trp Gln Ala Phe Arg
 1505 1510 1515 1520
 Thr Ala Leu Ala Ala Ala Thr Gly Thr Leu Asp Asp Ala Ala Ala Ser
 1525 1530 1535
 Asp Glu Ala Leu His Asp Ala Arg Leu Ala Leu Gln Gly Ala Val Asp
 1540 1545 1550
 Ala Leu Glu Glu Pro Ala Asp Val Val Leu Val Glu Val Glu Val Ser
 1555 1560 1565
 Pro Arg Cys Leu Ala Gly Lys Pro Tyr Val Ala Val Arg Ala Val Asn
 1570 1575 1580
 Val Ser Asp Ala Ala Val Asp Val Glu Leu Ala Ser Ser Leu Gly Thr
 1585 1590 1595 1600
 Arg Ser Phe Val Gly Val Ala Pro Gly Ala Ser Ala Tyr Gln Ser Phe
 1605 1610 1615
 Ala Ala Arg Ser Ala Thr Gly Asp Leu Asp Val Thr Val Thr Ala Thr
 1620 1625 1630
 Gly Ala Asp Gly Thr Gln Thr Val Glu Gln Val Val Thr Val Pro Ser
 1635 1640 1645
 Cys Ser
 1650

<210> 9
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<212> DNA
<213> Artificial Sequence
<220>
<223> nucleotide sequence encoding fusion of Dsba signal
sequence to Cellulostimicrobium cellulans
mannosidase 4

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catcaccc	atcacccg	ggggccgg	tcggacgg	tcggacgg	ggggccgg	tcggacgg	atcgccgg	120
tttagcag	gcttgagc	gcttgagc	gcagccag	gcagccag	gcttgagc	gcagccag	tttagcag	180
ctgggtcag	ctgggtcag	ctgggtcag	ttgcaggc	ttgcaggc	ctgggtcag	ttgcaggc	ctgggtcag	240
aattggcag	aattggcag	aattggcag	ttgcaggc	ttgcaggc	aattggcag	ttgcaggc	aattggcag	300
aatctggc	aatctggc	aatctggc	ttgcaggc	ttgcaggc	aatctggc	ttgcaggc	aatctggc	360
cgtttagat	ttgcaggc	cgtttagat	ttgcaggc	ttgcaggc	cgtttagat	ttgcaggc	cgtttagat	420
gcccaggtc	gcccaggtc	gcccaggtc	ttgcaggc	ttgcaggc	gcccaggtc	ttgcaggc	gcccaggtc	480
ggaatggat	ttgcaggc	ggaatggat	ttgcaggc	ttgcaggc	ggaatggat	ttgcaggc	ggaatggat	540
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ggccgtgtg	gttttagc	ggccgtgtg	gttttagc	gttttagc	ggccgtgtg	gttttagc	ggccgtgtg	780
gggtgaacct	atggcaacct	gggtgaacct	atggcaacct	atggcaacct	gggtgaacct	atggcaacct	gggtgaacct	840
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tatgcaag	ttgatgtt	tatgcaag	ttgatgtt	ttgatgtt	tatgcaag	ttgatgtt	tatgcaag	960
gatgcacat	aaacgttgc	gatgcacat	aaacgttgc	aaacgttgc	gatgcacat	aaacgttgc	gatgcacat	1020
gatacgtga	atagcttgc	gatacgtga	atagcttgc	atagcttgc	gatacgtga	atagcttgc	gatacgtga	1080
cagttcttc	ttgattatg	cagttcttc	ttgattatg	ttgattatg	cagttcttc	ttgattatg	cagttcttc	1140
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gttatgtag	ttgaaggtc	gttatgtag	ttgaaggtc	ttgaaggtc	gttatgtag	ttgaaggtc	gttatgtag	2040
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tatctttac	ttgatccga	tatctttac	ttgatccga	ttgatccga	tatctttac	ttgatccga	tatctttac	2160
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ccgacacac	tttaaacag	ccgacacac	tttaaacag	tttaaacag	ccgacacac	tttaaacag	ccgacacac	2520
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ctgcgttat	ttgatcgt	ctgcgttat	ttgatcgt	ttgatcgt	ctgcgttat	ttgatcgt	ctgcgttat	2700
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Sequence Listing.txt

3480 ggtgaagatg atgcacctcc gtcactgac gaagtgagc aacctcgac accgttgccg atggtgatgc caccacctct 3540
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 gccgttgtag tcaacgttag caccgttc gttgacccgt aagcatatgt ttgagttcgt 5160
 gcaaaaatg ttgaagatgt tccgttcga atctgtcgt ttacccgt ttgcaaccaa 5220
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 gtagttgca gtagttgca gtagttgca gtagttgca gtagttgca gtagttgca 5340
 accgccaaga ttacagccag ttatgcagcc gttacccgtg gttacccgtg gttacccgtg 5388

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 <212> PRT
 <213> Cellulostimicum cellulans

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 20
 Pro Leu Gly Val Pro Leu Ala Ala Pro Ala Gly Ala Leu Ala Ala
 35
 Pro Ala Ala Ala Ala Gly Pro Gly Asp Phe Ser Ser Ser Phe Gly Ser
 50
 Gly Asp Pro Ala Ala Leu Pro Thr Thr Val Ala Gly Arg Asp Gly Ala
 65
 Pro Thr Gly Ala Asn Val Gly Ser Phe Thr Ala Gly Leu Pro Gly Ser
 80
 Val Leu Gly Gly Leu Lys Gly Val Thr Ala Ser Ala Gly Asn Leu Pro
 95
 Asn Gly Ala Asn Leu Ala Asp Gly Ser Ser Ser Gly Thr Lys Thr
 110
 Leu Ala Phe Ala Ser Thr Gly Thr Val Arg Tyr Gly Phe Ala Gly Pro
 125
 Val Ser Phe Val Ala Tyr Thr Met Thr Ser Gly Asp Ala Ala Gly
 140
 Val Ser Phe Val Ala Tyr Thr Met Thr Ser Gly Asp Ala Ala Gly
 145
 Arg Asp Pro Lys Thr Thr Val Gly Ser Asn Asp Gly Ser Thr
 160
 Trp Ala Ala Leu Asp Arg Thr Asp Gly Asp Phe Pro Asn Arg Gly
 175
 Thr Thr Arg Thr Phe Gly Leu Gly Ala Tyr Thr Tyr
 190
 Gly Thr Arg Thr Phe Gly Leu Gly Ala Tyr Thr Tyr
 205

Sequence Listing.txt

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Leu Arg Leu Asn Val Thr Ala Asn Ser Gly Asp Ser Ile Val Gln Leu
210 215 220
Ala Gly Trp Asp Leu Ser Ala Asp Leu Ser Ala Gly Pro Ser Ala Ala
225 230 235 240
Pro Met Thr Thr Lys Val Gly Thr Gly Pro Arg Val Ser Phe Thr Asn
245 250 255
Lys Ala Gly Val Gly Phe Ser Gly Leu His Ser Leu Arg Tyr Asp Gly
260 265 270
Ser His Leu Ala Asp Gly Glu Thr Tyr Ala Thr Asn Val Leu Tyr Asp
275 280 285
Asp Val Asp Val Val Val Gly Glu Asp Thr Arg Leu Ser Tyr Thr Ile
290 295 300
Phe Pro Glu Leu Leu Asp Asp Leu Gln Tyr Pro Ser Thr Tyr Ala Ala
305 310 315 320
Val Asp Val Leu Phe Thr Asp Gly Thr Tyr Leu Ser Asp Leu Gly Ala
325 330 335
Arg Asp Ala His Glu Thr Val Ala Thr Ala Gln Ala Gln Gly Glu Gly
340 345 350
Lys Ile Leu Tyr Ala Asp Gln Trp Asn Ser Val Arg Val Asp Leu Gly
355 360 365
Asp Val Ala Glu Gly Lys Thr Val Asp Gln Val Leu Leu Gly Tyr Asp
370 375 380
Asn Pro Gly Gly His Ala Gly Thr Lys Phe Ala Gly Trp Leu Asp Asp
385 390 395 400
Val Glu Ile Thr Ala Glu Pro Ala Thr Ile Asp Gly Ser Ser Leu Ala
405 410 415
Asn Tyr Val Asp Thr Arg Arg Gly Thr Leu Ala Ser Gly Ser Phe Ser
420 425 430
Arg Gly Asn Asn Ile Pro Ala Thr Ala Thr Pro Asn Gly Phe Asn Phe
435 440 445
Trp Thr Pro Tyr Thr Asn Ala Ser Ser Gln Ser Trp Leu Tyr Glu Tyr
450 455 460
His Lys Ala Asn Asn Ala Asn Asn Lys Pro Val Leu Gln Gly Phe Gly
465 470 475 480
Ile Ser His Glu Pro Ser Pro Trp Met Gly Asp Arg Asn Gln Leu Thr
485 490 495
Phe Leu Pro Ser Thr Ala Ser Gly Thr Pro Asp Ala Thr Leu Ser Thr
500 505 510
Arg Gly Leu Glu Phe Asp His Ala Asp Glu Thr Ala Arg Pro Asp Tyr
515 520 525
Tyr Gly Val Thr Phe Thr Asn Gly Ser Ala Ile Glu Ala Thr Pro Thr
530 535 540
Asp His Gly Ala Val Leu Arg Phe Ser Tyr Pro Gly Ala Lys Gly His
545 550 555 560
Val Leu Val Asp Lys Val Asp Gly Ser Ser Lys Leu Thr Tyr Asp Gln
565 570 575
Ala Thr Gly Thr Ile Ser Gly Trp Val Glu Asn Gly Ser Gly Leu Ser
580 585 590
Val Gly Arg Thr Arg Met Phe Val Ala Gly Thr Phe Asp Arg Ser Pro
595 600 605
Thr Ala Val Gly Thr Ala Ala Gly Asn Arg Ala Asp Ala Arg Phe Ala
610 615 620
Thr Phe Glu Thr Ser Ser Asp Lys Thr Val Glu Leu Arg Val Ala Thr
625 630 635 640
Ser Phe Ile Ser Leu Asp Gln Ala Arg Lys Asn Leu Asp Leu Glu Val
645 650 655
Thr Gly Lys Thr Phe Thr Glu Val Lys Ala Ala Ala Ala Gln Ala Trp
660 665 670
Asn Asp Arg Leu Gly Val Ile Glu Val Glu Gly Ala Ser Glu Asp Gln
675 680 685
Leu Val Thr Leu Tyr Ser Asn Leu Tyr Arg Leu Asn Leu Tyr Pro Asn
690 695 700
Ser Gln Phe Glu Asn Thr Gly Thr Ala Gln Glu Pro Val Tyr Arg Tyr
705 710 715 720
Ala Ser Pro Val Ser Ala Thr Thr Gly Ser Ala Thr Asp Thr Gln Thr
725 730 735
Asn Ala Lys Ile Val Asp Gly Lys Ile Tyr Val Asn Asn Gly Phe Trp
740 745 750

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Sequence Listing.txt

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Asp Thr Tyr Arg Thr Ala Trp Pro Ala Tyr Ser Leu Leu Tyr Pro Glu
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Leu Ala Ala Glu Leu Val Asp Gly Phe Val Gln Gln Tyr Arg Asp Gly
770 775 780
Gly Trp Ile Ala Arg Trp Ser Ser Pro Gly Tyr Ala Asp Leu Met Thr
785 790 800
Gly Thr Ser Ser Asp Val Ala Phe Ala Asp Ala Tyr Leu Lys Gly Ser
805 810 815
Leu Pro Thr Gly Thr Ala Leu Glu Ala Tyr Asp Ala Ala Leu Arg Asn
820 825 830
Ala Thr Val Ala Pro Pro Ser Asn Ala Val Gly Arg Lys Gly Leu Gln
835 840 845
Thr Ser Pro Phe Leu Gly Phe Thr Pro Glu Ser Thr His Glu Ser Val
850 855 860
Ser Trp Gly Leu Glu Gly Leu Val Asn Asp Phe Gly Ile Gly Asn Met
865 870 875 880
Ala Ala Ala Leu Ala Glu Asp Pro Ala Thr Pro Glu Glu Arg Arg Glu
885 890 895
Thr Leu Arg Glu Glu Ser Ala Tyr Phe Leu Glu Arg Ala Thr His Tyr
900 905 910
Val Glu Leu Phe Asp Pro Glu Val Asp Phe Phe Val Pro Arg His Glu
915 920 925
Asp Gly Thr Trp Ala Val Asp Pro Glu Thr Tyr Asp Pro Glu Ala Trp
930 935 940
Gly Gly Gly Tyr Thr Glu Thr Asn Gly Trp Asn Phe Ala Phe His Ala
945 950 955 960
Pro Gln Asp Gly Gln Gly Leu Ala Asn Leu Tyr Gly Gly Lys Gln Gly
965 970 975
Leu Glu Asp Lys Leu Asp Glu Phe Phe Ser Thr Pro Glu Lys Gly Ala
980 985 990
Gly Asn Gly Gly Ile His Glu Gln Arg Glu Ala Arg Asp Val Arg Met
995 1000 1005
Gly Gln Trp Gly Met Ser Asn Gln Val Ser His His Ile Pro Trp Leu
1010 1015 1020
Tyr Asp Ala Ala Gly Ala Pro Ser Lys Ala Gln Glu Lys Val Arg Glu
1025 1030 1035 1040
Val Thr Arg Arg Leu Phe Val Gly Ser Glu Ile Gly Gln Gly Tyr Pro
1045 1050 1055
Gly Asp Glu Asp Asn Gly Glu Met Ser Ser Trp Trp Ile Phe Ala Ser
1060 1065 1070
Leu Gly Phe Tyr Pro Leu Gln Val Gly Ser Asp Gln Tyr Ala Val Gly
1075 1080 1085
Ser Pro Leu Phe Asp Lys Ala Thr Val His Leu Pro Asp Gly Asp Leu
1090 1095 1100
Val Val Asn Ala Glu Asn Asn Ser Val Asp Asn Val Tyr Val Gln Ser
1105 1110 1115 1120
Leu Ala Val Asp Gly Glu Ala Arg Thr Ser Thr Ser Leu Ser Gln Ala
1125 1130 1135
Asp Leu Ser Gly Gly Thr Thr Leu Asp Phe Val Met Gly Pro Glu Pro
1140 1145 1150
Ser Asp Trp Gly Thr Gly Glu Asp Asp Ala Pro Pro Ser Leu Thr Glu
1155 1160 1165
Gly Asp Glu Pro Pro Thr Pro Val Gln Asp Ala Thr Thr Ala Gly Leu
1170 1175 1180
Gly Thr Thr Thr Val Ala Asp Gly Asp Ala Thr Thr Ser Ala Ala Ala
1185 1190 1195 1200
Leu Thr Asp Asn Thr Ser Gly Thr Arg Thr Thr Phe Ala Thr Thr Thr
1205 1210 1215
Pro Ser Ile Thr Trp Ala Gly Asn Gly Ile Arg Pro Thr Val Gly Ser
1220 1225 1230
Tyr Thr Leu Thr Ser Gly Ala Ser Gly Thr Ala Ser Pro Ser Ala Trp
1235 1240 1245
Thr Leu Glu Gly Ser Asp Asp Gly Glu Thr Trp Thr Thr Leu Asp Glu
1250 1255 1260
Arg Ser Gly Glu Gln Phe Arg Trp Ala Leu Gln Thr Arg Pro Phe Thr
1265 1270 1275 1280
Val Ala Glu Pro Thr Ala Phe Ala Arg Tyr Arg Val Thr Val Thr Ala
1285 1290 1295

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Sequence Listing.txt

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Thr Ser Gly Ser Gly Ala Leu Ser Leu Ala Glu Val Glu Leu Leu Ala
1300 1305 1310
Asp Pro Lys Glu Ser Gly Ala Glu Glu Leu Thr Leu Ser Ala Ala Pro
1315 1320 1325
Asp Arg Asp Gly Val Thr Gly Arg Glu Val Ser Gly Ser Phe Ala Thr
1330 1335 1340
Leu Thr Gly Val Glu Gly Asp Val Ala Ala Leu Asp Val Gln Val Ala
1345 1350 1355 1360
Phe Gly Asp Gly Ser Glu Pro Val Ala Gly Thr Leu Arg Ala Gly Ala
1365 1370 1375
Phe Gly Gly Tyr Ala Val Asp Ala Ala His Thr Trp Thr Ala Pro Gly
1380 1385 1390
Val Tyr Pro Val Thr Val Thr Val Ser Gly Glu Gly Ile Glu Thr Val
1395 1400 1405
Ser Ala Ser Ser Tyr Val Ser Val Ser Leu Leu Arg Glu Gly Ser Leu
1410 1415 1420
Leu Ala Ala Tyr Asp Asn Val Cys Ile Gly Asp Ala Gly Thr Thr Val
1425 1430 1435 1440
Gly Ser Cys Asp Gly Gln Gly Val Phe Phe Asp Arg Ala Gln Leu Ala
1445 1450 1455
Ala Lys Gly Phe Val Gln Gly Glu Arg Ala Thr Val Pro Gly Thr Asp
1460 1465 1470
Leu Ala Phe Asp Val Pro Ala Val Pro Ala Gly Gln Pro Asp Asn Ala
1475 1480 1485
Thr Gly Asp Gly Gln Thr Ile Glu Leu Asp Val Pro Ala Asp Ala Glu
1490 1495 1500
Gln Leu Ser Val Ile Gly Thr Gly Thr Glu Lys Asn Gln Gln Ala Thr
1505 1510 1515 1520
Gly Thr Leu Thr Phe Asp Asp Gly Ser Thr Gln Pro Ile Asp Leu Ser
1525 1530 1535
Phe Gly Asp Trp Ser Gly Ala Ala Arg Asn Pro Val Phe Gly Asn Ile
1540 1545 1550
Pro Val Ala Val Thr Asp Ser Arg Leu Arg Gly Gly Ser Pro Gln Thr
1555 1560 1565
Gly Thr Pro Ala Ala Phe Phe Ala Thr Ala Pro Ile Thr Leu Pro Glu
1570 1575 1580
Gly Lys Arg Pro Val Ser Leu Thr Leu Pro Asp Gln Pro Gly Glu Leu
1585 1590 1595 1600
Ser Arg Asp Gly Arg Ile His Val Val Ala Val Ala His Asp Gly Thr
1605 1610 1615
Phe Ala Glu His Pro Ala Leu Glu Val Thr Ala Ala Glu Gly Val Thr
1620 1625 1630
Leu Ala Val Gly Gln Thr Ser Asp Val Ala Leu Ala Gln Val Ala Gly
1635 1640 1645
Gly Arg Glu Gly Ala Asp Leu Arg Ala Ala Val Thr Trp Gly Asp Gly
1650 1655 1660
Ser Asp Val Ala Ala Gly Ala Val Thr Asp Gly Ser Val Ser Gly Ser
1665 1670 1675 1680
His Ala Tyr Thr Ala Ala Gly Thr Tyr Thr Ala Tyr Val Val Val Asp
1685 1690 1695
Asp Gly Trp Thr Ser Gln Val Val Glu Val Pro Val Thr Val Thr Glu
1700 1705 1710
Ala Glu Pro Ala Leu Ala Val Asp Val Thr Val Ser Thr Arg Cys Leu
1715 1720 1725
Ala Gly Lys Ala Tyr Val Ala Val Arg Ala Glu Asn Gly Glu Asp Val
1730 1735 1740
Pro Leu Ala Ile Arg Leu Val Thr Pro Phe Gly Thr Lys Glu Val Ala
1745 1750 1755 1760
Ala Val Ala Pro Gly Ala Asn Ala Tyr Gln Ser Phe Ala Thr Arg Val
1765 1770 1775
Thr Ala Val Glu Ala Gly Thr Val Thr Val Glu Ala Thr Arg Gly Thr
1780 1785 1790
Gly Asp Glu Glu Val Thr Ala Ser Ile Gln Ala Asp Tyr Ala Ala Val
1795 1800 1805
Thr Cys Gly Met Thr Arg Pro Leu Pro Pro Gly Arg Ala Val Ala Arg
1810 1815 1820
Ser Gly Ser Gly Arg Ala Arg Pro Leu Gly Leu Val Leu Ala Ala Ala
1825 1830 1835 1840

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Sequence Listing.txt

Leu Ala Val Pro Leu Gly Val Pro Leu Ala Ala Pro Ala Gly Ala Leu
 1845 1850 1855
 Ala Ala Ala Pro Ala Ala Ala Ala Glu Pro Gly Asp Phe Ser Ser Ser
 1860 1865 1870
 Phe Glu Ser Gly Asp Pro Ala Ala Leu Pro Thr Thr Val Ala Glu Arg
 1875 1880 1885
 Asp Gly Ala Pro Trp Gln Ala Asn Val Gly Ser Phe Thr Ala Gly Leu
 1890 1895 1900
 Pro Gly Ser Val Leu Gly Gln Leu Lys Gly Val Thr Ala Ser Ala Gln
 1905 1910 1915 1920
 Asn Leu Pro Asn Glu Gly Ala Ala Asn Leu Ala Asp Gly Ser Ser Gly
 1925 1930 1935
 Thr Lys Trp Leu Ala Phe Ala Ser Thr Gly Trp Val Arg Tyr Glu Phe
 1940 1945 1950
 Ala Glu Pro Val Ser Phe Val Ala Tyr Thr Met Thr Ser Gly Asp Asp
 1955 1960 1965
 Ala Ala Gly Arg Asp Pro Lys Thr Trp Thr Val Glu Gly Ser Asn Asp
 1970 1975 1980
 Gly Ser Thr Trp Ala Ala Leu Asp Arg Arg Thr Asp Glu Asp Phe Pro
 1985 1990 1995 2000
 Asn Arg Gln Gln Thr Arg Thr Phe Glu Leu Glu Ala Pro Thr Ala Ala
 2005 2010 2015
 Tyr Thr Tyr Leu Arg Leu Asn Val Thr Ala Asn Ser Gly Asp Ser Ile
 2020 2025 2030
 Val Gln Leu Ala Gly Trp Asp Leu Ser Ala Asp Leu Ser Ala Gly Pro
 2035 2040 2045
 Ser Ala Ala Pro Met Thr Thr Lys Val Gly Thr Gly Pro Arg Val Ser
 2050 2055 2060
 Phe Thr Asn Lys Ala Gly Val Gly Phe Ser Gly Leu His Ser Leu Arg
 2065 2070 2075 2080
 Tyr Asp Gly Ser His Leu Ala Asp Gly Glu Thr Tyr Ala Thr Asn Val
 2085 2090 2095
 Leu Tyr Asp Asp Val Asp Val Val Val Gly Glu Asp Thr Arg Leu Ser
 2100 2105 2110
 Tyr Thr Ile Phe Pro Glu Leu Leu Asp Asp Leu Gln Tyr Pro Ser Thr
 2115 2120 2125
 Tyr Ala Ala Val Asp Val Leu Phe Thr Asp Gly Thr Tyr Leu Ser Asp
 2130 2135 2140
 Leu Gly Ala Arg Asp Ala His Glu Thr Val Ala Thr Ala Gln Ala Gln
 2145 2150 2155 2160
 Gly Glu Gly Lys Ile Leu Tyr Ala Asp Gln Trp Asn Ser Val Arg Val
 2165 2170 2175
 Asp Leu Gly Asp Val Ala Glu Gly Lys Thr Val Asp Gln Val Leu Leu
 2180 2185 2190
 Gly Tyr Asp Asn Pro Gly Gly His Ala Gly Thr Lys Phe Ala Gly Trp
 2195 2200 2205
 Leu Asp Asp Val Glu Ile Thr Ala Glu Pro Ala Thr Ile Asp Gly Ser
 2210 2215 2220
 Ser Leu Ala Asn Tyr Val Asp Thr Arg Arg Gly Thr Leu Ala Ser Gly
 2225 2230 2235 2240
 Ser Phe Ser Arg Gly Asn Asn Ile Pro Ala Thr Ala Thr Pro Asn Gly
 2245 2250 2255
 Phe Asn Phe Trp Thr Pro Tyr Thr Asn Ala Ser Ser Gln Ser Trp Leu
 2260 2265 2270
 Tyr Glu Tyr His Lys Ala Asn Asn Ala Asn Asn Lys Pro Val Leu Gln
 2275 2280 2285
 Gly Phe Gly Ile Ser His Glu Pro Ser Pro Trp Met Gly Asp Arg Asn
 2290 2295 2300
 Gln Leu Thr Phe Leu Pro Ser Thr Ala Ser Gly Thr Pro Asp Ala Thr
 2305 2310 2315 2320
 Leu Ser Thr Arg Gly Leu Glu Phe Asp His Ala Asp Glu Thr Ala Arg
 2325 2330 2335
 Pro Asp Tyr Tyr Gly Val Thr Phe Thr Asn Gly Ser Ala Ile Glu Ala
 2340 2345 2350
 Thr Pro Thr Asp His Gly Ala Val Leu Arg Phe Ser Tyr Pro Gly Ala
 2355 2360 2365
 Lys Gly His Val Leu Val Asp Lys Val Asp Gly Ser Ser Lys Leu Thr
 2370 2375 2380

Sequence Listing.txt

Tyr Asp Gln Ala Thr Gly Thr Ile Ser Gly Trp Val Glu Asn Gly Ser
 2385 2390 2395 2400
 Gly Leu Ser Val Gly Arg Thr Arg Met Phe Val Ala Gly Thr Phe Asp
 2405 2410 2415
 Arg Ser Pro Thr Ala Val Gly Thr Ala Ala Gly Asn Arg Ala Asp Ala
 2420 2425 2430
 Arg Phe Ala Thr Phe Glu Thr Ser Ser Asp Lys Thr Val Glu Leu Arg
 2435 2440 2445
 Val Ala Thr Ser Phe Ile Ser Leu Asp Gln Ala Arg Lys Asn Leu Asp
 2450 2455 2460
 Leu Glu Val Thr Gly Lys Thr Phe Thr Glu Val Lys Ala Ala Ala Ala
 2465 2470 2475 2480
 Gln Ala Trp Asn Asp Arg Leu Gly Val Ile Glu Val Glu Gly Ala Ser
 2485 2490 2495
 Glu Asp Gln Leu Val Thr Leu Tyr Ser Asn Leu Tyr Arg Leu Asn Leu
 2500 2505 2510
 Tyr Pro Asn Ser Gln Phe Glu Asn Thr Gly Thr Ala Gln Glu Pro Val
 2515 2520 2525
 Tyr Arg Tyr Ala Ser Pro Val Ser Ala Thr Thr Gly Ser Ala Thr Asp
 2530 2535 2540
 Thr Gln Thr Asn Ala Lys Ile Val Asp Gly Lys Ile Tyr Val Asn Asn
 2545 2550 2555 2560
 Gly Phe Trp Asp Thr Tyr Arg Thr Ala Trp Pro Ala Tyr Ser Leu Leu
 2565 2570 2575
 Tyr Pro Glu Leu Ala Ala Glu Leu Val Asp Gly Phe Val Gln Gln Tyr
 2580 2585 2590
 Arg Asp Gly Gly Trp Ile Ala Arg Trp Ser Ser Pro Gly Tyr Ala Asp
 2595 2600 2605
 Leu Met Thr Gly Thr Ser Ser Asp Val Ala Phe Ala Asp Ala Tyr Leu
 2610 2615 2620
 Lys Gly Ser Leu Pro Thr Gly Thr Ala Leu Glu Ala Tyr Asp Ala Ala
 2625 2630 2635 2640
 Leu Arg Asn Ala Thr Val Ala Pro Pro Ser Asn Ala Val Gly Arg Lys
 2645 2650 2655
 Gly Leu Gln Thr Ser Pro Phe Leu Gly Phe Thr Pro Glu Ser Thr His
 2660 2665 2670
 Glu Ser Val Ser Trp Gly Leu Glu Gly Leu Val Asn Asp Phe Gly Ile
 2675 2680 2685
 Gly Asn Met Ala Ala Ala Leu Ala Glu Asp Pro Ala Thr Pro Glu Glu
 2690 2695 2700
 Arg Arg Glu Thr Leu Arg Glu Glu Ser Ala Tyr Phe Leu Glu Arg Ala
 2705 2710 2715 2720
 Thr His Tyr Val Glu Leu Phe Asp Pro Glu Val Asp Phe Phe Val Pro
 2725 2730 2735
 Arg His Glu Asp Gly Thr Trp Ala Val Asp Pro Glu Thr Tyr Asp Pro
 2740 2745 2750
 Glu Ala Trp Gly Gly Gly Tyr Thr Glu Thr Asn Gly Trp Asn Phe Ala
 2755 2760 2765
 Phe His Ala Pro Gln Asp Gly Gln Gly Leu Ala Asn Leu Tyr Gly Gly
 2770 2775 2780
 Lys Gln Gly Leu Glu Asp Lys Leu Asp Glu Phe Phe Ser Thr Pro Glu
 2785 2790 2795 2800
 Lys Gly Ala Gly Asn Gly Gly Ile His Glu Gln Arg Glu Ala Arg Asp
 2805 2810 2815
 Val Arg Met Gly Gln Trp Gly Met Ser Asn Gln Val Ser His His Ile
 2820 2825 2830
 Pro Trp Leu Tyr Asp Ala Ala Gly Ala Pro Ser Lys Ala Gln Glu Lys
 2835 2840 2845
 Val Arg Glu Val Thr Arg Arg Leu Phe Val Gly Ser Glu Ile Gly Gln
 2850 2855 2860
 Gly Tyr Pro Gly Asp Glu Asp Asn Gly Glu Met Ser Ser Trp Trp Ile
 2865 2870 2875 2880
 Phe Ala Ser Leu Gly Phe Tyr Pro Leu Gln Val Gly Ser Asp Gln Tyr
 2885 2890 2895
 Ala Val Gly Ser Pro Leu Phe Asp Lys Ala Thr Val His Leu Pro Asp
 2900 2905 2910
 Gly Asp Leu Val Val Asn Ala Glu Asn Asn Ser Val Asp Asn Val Tyr
 2915 2920 2925

Sequence Listing.txt

Val Gln Ser Leu Ala Val Asp Gly Glu Ala Arg Thr Ser Thr Ser Leu
 2930 2935 2940
 Ser Gln Ala Asp Leu Ser Gly Gly Thr Thr Leu Asp Phe Val Met Gly
 2945 2950 2955 2960
 Pro Glu Pro Ser Asp Trp Gly Thr Gly Glu Asp Asp Ala Pro Pro Ser
 2965 2970 2975
 Leu Thr Glu Gly Asp Glu Pro Pro Thr Pro Val Gln Asp Ala Thr Thr
 2980 2985 2990
 Ala Gly Leu Gly Thr Thr Thr Val Ala Asp Gly Asp Ala Thr Thr Ser
 2995 3000 3005
 Ala Ala Ala Leu Thr Asp Asn Thr Ser Gly Thr Arg Thr Thr Phe Ala
 3010 3015 3020
 Thr Thr Thr Pro Ser Ile Thr Trp Ala Gly Asn Gly Ile Arg Pro Thr
 3025 3030 3035 3040
 Val Gly Ser Tyr Thr Leu Thr Ser Gly Ala Ser Gly Thr Ala Ser Pro
 3045 3050 3055
 Ser Ala Trp Thr Leu Glu Gly Ser Asp Asp Gly Glu Thr Trp Thr Thr
 3060 3065 3070
 Leu Asp Glu Arg Ser Gly Glu Gln Phe Arg Trp Ala Leu Gln Thr Arg
 3075 3080 3085
 Pro Phe Thr Val Ala Glu Pro Thr Ala Phe Ala Arg Tyr Arg Val Thr
 3090 3095 3100
 Val Thr Ala Thr Ser Gly Ser Gly Ala Leu Ser Leu Ala Glu Val Glu
 3105 3110 3115 3120
 Leu Leu Ala Asp Pro Lys Glu Ser Gly Ala Glu Glu Leu Thr Leu Ser
 3125 3130 3135
 Ala Ala Pro Asp Arg Asp Gly Val Thr Gly Arg Glu Val Ser Gly Ser
 3140 3145 3150
 Phe Ala Thr Leu Thr Gly Val Glu Gly Asp Val Ala Ala Leu Asp Val
 3155 3160 3165
 Gln Val Ala Phe Gly Asp Gly Ser Glu Pro Val Ala Gly Thr Leu Arg
 3170 3175 3180
 Ala Gly Ala Phe Gly Gly Tyr Ala Val Asp Ala Ala His Thr Trp Thr
 3185 3190 3195 3200
 Ala Pro Gly Val Tyr Pro Val Thr Val Thr Val Ser Gly Glu Gly Ile
 3205 3210 3215
 Glu Thr Val Ser Ala Ser Ser Tyr Val Ser Val Ser Leu Leu Arg Glu
 3220 3225 3230
 Gly Ser Leu Leu Ala Ala Tyr Asp Asn Val Cys Ile Gly Asp Ala Gly
 3235 3240 3245
 Thr Thr Val Gly Ser Cys Asp Gly Gln Gly Val Phe Phe Asp Arg Ala
 3250 3255 3260
 Gln Leu Ala Ala Lys Gly Phe Val Gln Gly Glu Arg Ala Thr Val Pro
 3265 3270 3275 3280
 Gly Thr Asp Leu Ala Phe Asp Val Pro Ala Val Pro Ala Gly Gln Pro
 3285 3290 3295
 Asp Asn Ala Thr Gly Asp Gly Gln Thr Ile Glu Leu Asp Val Pro Ala
 3300 3305 3310
 Asp Ala Glu Gln Leu Ser Val Ile Gly Thr Gly Thr Glu Lys Asn Gln
 3315 3320 3325
 Gln Ala Thr Gly Thr Leu Thr Phe Asp Asp Gly Ser Thr Gln Pro Ile
 3330 3335 3340
 Asp Leu Ser Phe Gly Asp Trp Ser Gly Ala Ala Arg Asn Pro Val Phe
 3345 3350 3355 3360
 Gly Asn Ile Pro Val Ala Val Thr Asp Ser Arg Leu Arg Gly Gly Ser
 3365 3370 3375
 Pro Gln Thr Gly Thr Pro Ala Ala Phe Phe Ala Thr Ala Pro Ile Thr
 3380 3385 3390
 Leu Pro Glu Gly Lys Arg Pro Val Ser Leu Thr Leu Pro Asp Gln Pro
 3395 3400 3405
 Gly Glu Leu Ser Arg Asp Gly Arg Ile His Val Val Ala Val Ala His
 3410 3415 3420
 Asp Gly Thr Phe Ala Glu His Pro Ala Leu Glu Val Thr Ala Ala Glu
 3425 3430 3435 3440
 Gly Val Thr Leu Ala Val Gly Gln Thr Ser Asp Val Ala Leu Ala Gln
 3445 3450 3455
 Val Ala Gly Gly Arg Glu Gly Ala Asp Leu Arg Ala Ala Val Thr Trp
 3460 3465 3470

Sequence Listing.txt

Gly Asp Gly Ser Asp Val Ala Ala Gly Ala Val Thr Asp Gly Ser Val
 3475 3480 3485
 Ser Gly Ser His Ala Tyr Thr Ala Ala Gly Thr Tyr Thr Ala Tyr Val
 3490 3495 3500
 Val Val Asp Asp Gly Trp Thr Ser Gln Val Val Glu Val Pro Val Thr
 3505 3510 3515 3520
 Val Thr Glu Ala Glu Pro Ala Leu Ala Val Asp Val Thr Val Ser Thr
 3525 3530 3535
 Arg Cys Leu Ala Gly Lys Ala Tyr Val Ala Val Arg Ala Glu Asn Gly
 3540 3545 3550
 Glu Asp Val Pro Leu Ala Ile Arg Leu Val Thr Pro Phe Gly Thr Lys
 3555 3560 3565
 Glu Val Ala Ala Val Ala Pro Gly Ala Asn Ala Tyr Gln Ser Phe Ala
 3570 3575 3580
 Thr Arg Val Thr Ala Val Glu Ala Gly Thr Val Thr Val Glu Ala Thr
 3585 3590 3595 3600
 Arg Gly Thr Gly Asp Glu Glu Val Thr Ala Ser Ile Gln Ala Asp Tyr
 3605 3610 3615
 Ala Ala Val Thr Cys Gly
 3620

<210> 11
 <211> 513
 <212> PRT
 <213> Aspergillus saitoi

<400> 11
 Met His Leu Pro Ser Leu Ser Leu Ser Leu Thr Ala Leu Ala Ile Ala
 1 5 10 15
 Ser Pro Ser Ala Ala Tyr Pro His Phe Gly Ser Ser Gln Pro Val Leu
 20 25 30
 His Ser Ser Ser Asp Thr Thr Gln Ser Arg Ala Asp Ala Ile Lys Ala
 35 40 45
 Ala Phe Ser His Ala Trp Asp Gly Tyr Leu Gln Tyr Ala Phe Pro His
 50 55 60
 Asp Glu Leu His Pro Val Ser Asn Gly Tyr Gly Asp Ser Arg Asn Gly
 65 70 75 80
 Trp Gly Ala Ser Ala Val Asp Ala Leu Ser Thr Ala Val Ile Met Arg
 85 90 95
 Asn Ala Thr Ile Val Asn Gln Ile Leu Asp His Val Gly Lys Ile Asp
 100 105 110
 Tyr Ser Lys Thr Asn Thr Thr Val Ser Leu Phe Glu Thr Thr Ile Arg
 115 120 125
 Tyr Leu Gly Gly Met Leu Ser Gly Tyr Asp Leu Leu Lys Gly Pro Val
 130 135 140
 Ser Asp Leu Val Gln Asn Ser Ser Lys Ile Asp Val Leu Leu Thr Gln
 145 150 155 160
 Ser Lys Asn Leu Ala Asp Val Leu Lys Phe Ala Phe Asp Thr Pro Ser
 165 170 175
 Gly Val Pro Tyr Asn Asn Leu Asn Ile Thr Ser Gly Gly Asn Asp Gly
 180 185 190
 Ala Lys Thr Asn Gly Leu Ala Val Thr Gly Thr Leu Ala Leu Glu Trp
 195 200 205
 Thr Arg Leu Ser Asp Leu Thr Gly Asp Thr Thr Tyr Ala Asp Leu Ser
 210 215 220
 Gln Lys Ala Glu Ser Tyr Leu Leu Asn Pro Gln Pro Lys Ser Ala Glu
 225 230 235 240
 Pro Phe Pro Gly Leu Val Gly Ser Asn Ile Asn Ile Ser Asn Gly Gln
 245 250 255
 Phe Thr Asp Ala Gln Val Ser Trp Asn Gly Gly Asp Asp Ser Tyr Tyr
 260 265 270
 Glu Tyr Leu Ile Lys Met Tyr Val Tyr Asp Pro Lys Arg Phe Gly Leu
 275 280 285
 Tyr Lys Asp Arg Trp Val Ala Ala Gln Ser Thr Met Gln His Leu
 290 295 300
 Ala Ser His Pro Ser Ser Arg Pro Asp Leu Thr Phe Leu Ala Ser Tyr
 305 310 315 320

Sequence Listing.txt

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Asn Asn Gly Thr Leu Gly Leu Ser Ser Gln His Leu Thr Cys Phe Asp
325 330 335
Gly Gly Ser Phe Leu Leu Gly Gly Thr Val Leu Asn Arg Thr Asp Phe
340 345 350
Ile Asn Phe Gly Leu Asp Leu Val Ser Gly Cys His Asp Thr Tyr Asn
355 360 365
Ser Thr Leu Thr Gly Ile Gly Pro Glu Ser Phe Ser Trp Asp Thr Ser
370 375 380
Asp Ile Pro Ser Ser Gln Gln Ser Leu Tyr Glu Lys Ala Gly Phe Tyr
385 390 395 400
Ile Thr Ser Gly Ala Tyr Ile Leu Arg Pro Glu Val Ile Glu Ser Phe
405 410 415
Tyr Tyr Ala Trp Arg Val Thr Gly Gln Glu Thr Tyr Arg Asp Trp Ile
420 425 430
Trp Ser Ala Phe Ser Ala Val Asn Asp Tyr Cys Arg Thr Ser Ser Gly
435 440 445
Phe Ser Gly Leu Thr Asp Val Asn Ala Ala Asn Gly Gly Ser Arg Tyr
450 455 460
Asp Asn Gln Glu Ser Phe Leu Phe Ala Glu Val Met Lys Tyr Ser Tyr
465 470 475 480
Met Ala Phe Ala Glu Asp Ala Ala Trp Gln Val Gln Pro Gly Ser Gly
485 490 495
Asn Gln Phe Val Phe Asn Thr Glu Ala His Pro Val Arg Val Ser Ser
500 505 510
Thr

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