

PCTAU2014000619-seq1-000001-EN-20140618
SEQUENCE LISTING

<110> Commonwealth Scientific and Industrial Research
Organisation
Grain Research and Development Corporation

<120> Barley with very low levels of hordeins

<130> 515268

<150> AU 2013902140

<151> 2013-06-13

<150> AU 2013902565

<151> 2013-07-11

<160> 85

<170> PatentIn version 3.5

<210> 1

<211> 16

<212> PRT

<213> Triticum aestivum

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Glu Leu Gln Pro Phe Pro Gln Pro Glu Leu Pro Tyr Pro Gln Pro Gln
1 5 10 15

<210> 2

<211> 15

<212> PRT

<213> Hordeum vulgare

<400> 2

Glu Gln Pro Phe Pro Gln Pro Glu Gln Pro Phe Pro Trp Gln Pro
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<210> 3

<211> 16

<212> PRT

<213> Hordeum vulgare

<400> 3

Glu Pro Glu Gln Pro Ile Pro Glu Gln Pro Gln Pro Tyr Pro Gln Gln
1 5 10 15

<210> 4
<211> 17
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<213> Triticum aestivum

<400> 4

Gln Leu Gln Pro Phe Pro Gln Pro Gln Leu Pro Tyr Pro Gln Pro Gln
1 5 10 15

Ser

<210> 5
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<212> PRT
<213> Triticum aestivum

<400> 5

Gln Gln Cys Cys Gln Pro Leu Ala Gln Ile Ser Glu Gln Ala Arg
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<210> 6
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<400> 6

Met Val Leu Gln Thr Leu Pro Ser Met Cys Arg
1 5 10

<210> 7
<211> 8
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<400> 7

Pro Gln Gln Pro Phe Pro Gln Gln
1 5

<210> 8
<211> 16
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<400> 8

Phe Val Gln Pro Gln Gln Gln Pro Phe Pro Leu Gln Pro His Gln Pro
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<210> 9
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<212> PRT
<213> Hordeum vulgare

<400> 9

Tyr Pro Glu Gln Pro Gln Gln Pro Phe Pro Trp Gln Gln Pro Thr
1 5 10 15

<210> 10
<211> 19
<212> PRT
<213> Hordeum vulgare

<400> 10

Leu Glu Arg Pro Gln Gln Leu Phe Pro Gln Trp Gln Pro Leu Pro Gln
1 5 10 15

Gln Pro Pro

<210> 11
<211> 18
<212> PRT
<213> Hordeum vulgare

<400> 11

Leu Ile Ile Pro Gln Gln Pro Gln Gln Pro Phe Pro Leu Gln Pro His
 1 5 10 15

Gln Pro

<210> 12
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 <213> Secale cereale

<400> 12

Gln Gln Pro Phe Pro
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<210> 13
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<400> 13

Gln Gln Gln Phe Pro
 1 5

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 <212> PRT
 <213> Secale cereale

<400> 14

Leu Gln Pro Phe Pro
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<210> 15
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 <212> PRT
 <213> Secale cereale

<400> 15

Gln Leu Pro Phe Pro
1 5

<210> 16
<211> 16
<212> PRT
<213> Hordeum vulgare

<400> 16

Arg Val Val Asp Gln Gln Leu Val Gly Gln Leu Pro Trp Ser Thr Gly
1 5 10 15

<210> 17
<211> 16
<212> PRT
<213> Hordeum vulgare

<400> 17

Val Val Asp Gln Gln Leu Val Gly Gln Leu Pro Trp Ser Thr Gly Leu
1 5 10 15

<210> 18
<211> 15
<212> PRT
<213> Hordeum vulgare

<400> 18

Val Val Asp Gln Gln Leu Val Gly Gln Leu Pro Trp Ser Thr Gly
1 5 10 15

<210> 19
<211> 12
<212> PRT
<213> Hordeum vulgare

<400> 19

Val Val Asp Gln Gln Leu Val Gly Gln Leu Pro Trp
1 5 10

<210> 20
 <211> 12
 <212> PRT
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<400> 20

Gln	Leu	Val	Gly	Gln	Leu	Pro	Trp	Ser	Thr	Gly	Leu
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<210> 21
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<400> 21

Gln	Leu	Val	Gly	Gln	Leu	Pro	Trp	Ser	Thr	Gly
1				5						10

<210> 22
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 <213> Hordeum vulgare

<400> 22

Leu	Val	Gly	Gln	Leu	Pro	Trp	Ser	Thr	Gly	Leu	Gln	Met
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<210> 23
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<400> 23

Leu	Val	Gly	Gln	Leu	Pro	Trp	Ser	Thr	Gly	Leu
1				5						10

<210> 24
 <211> 10
 <212> PRT

<213> Hordeum vulgare

<400> 24

Leu Val Gly Gln Leu Pro Trp Ser Thr Gly
1 5 10

<210> 25

<211> 12

<212> PRT

<213> Hordeum vulgare

<400> 25

Val Gly Gln Leu Pro Trp Ser Thr Gly Leu Gln Met
1 5 10

<210> 26

<211> 10

<212> PRT

<213> Hordeum vulgare

<400> 26

Val Gly Gln Leu Pro Trp Ser Thr Gly Leu
1 5 10

<210> 27

<211> 15

<212> PRT

<213> Hordeum vulgare

<220>

<221> MOD_RES

<222> (1)..(1)

<223> Pyroglutamic acid

<220>

<221> MOD_RES

<222> (15)..(15)

<223> HexNAc

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<210> 28
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 <213> Hordeum vulgare

<400> 28

Val Val Arg Gln Tyr Glu Gln Gln Thr Glu Val Pro Ser Lys Gly Gly
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Ser Phe Tyr Pro Gly Gly Thr Ala Pro Pro
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<210> 29
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 <212> PRT
 <213> Hordeum vulgare

<400> 29

Phe Val Leu Pro Gln Gln Gln Ala Gln Phe Lys Val Val Gly Ser
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<210> 30
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 <213> Hordeum vulgare

<400> 30

Phe Val Leu Pro Gln Gln Gln Ala Gln Phe
 1 5 10

<210> 31
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 <212> PRT
 <213> Hordeum vulgare

<400> 31

Ala Ile Val Met Gln Gln Gln Val Gln Gln Gln Val Gly His Gly Phe
1 5 10 15

<210> 32
<211> 19
<212> PRT
<213> Hordeum vulgare

<400> 32

Leu Glu Arg Pro Gln Gln Leu Phe Pro Gln Trp Gln Pro Leu Pro Gln
1 5 10 15

Gln Pro Pro

<210> 33
<211> 13
<212> PRT
<213> Hordeum vulgare

<400> 33

Leu Phe Pro Gln Trp Gln Pro Leu Pro Gln Gln Pro Pro
1 5 10

<210> 34
<211> 12
<212> PRT
<213> Hordeum vulgare

<400> 34

Leu Gln Gln Leu Gly Gln Gly Met Pro Ile Gln Leu
1 5 10

<210> 35
<211> 9
<212> PRT
<213> Hordeum vulgare

<400> 35

Val Val Gly Ser Leu Val Ile Gln Thr
1 5

<210> 36
<211> 19
<212> PRT
<213> Hordeum vulgare

<400> 36

Leu Gln Gln Pro Gln His Gln Phe Pro Gln Pro Thr Gln Gln Phe Pro
1 5 10 15

Gln Arg Pro

<210> 37
<211> 15
<212> PRT
<213> Hordeum vulgare

<400> 37

Tyr Pro Glu Gln Pro Gln Gln Pro Phe Pro Trp Gln Gln Pro Thr
1 5 10 15

<210> 38
<211> 12
<212> PRT
<213> Hordeum vulgare

<400> 38

Gly Val Val Gln Pro Gln Gln Leu Ala Gln Met Glu
1 5 10

<210> 39
<211> 17
<212> PRT
<213> Hordeum vulgare

<220>

<221> MOD_RES
 <222> (1)..(1)
 <223> Pyroglutamic acid

<400> 39

Gln	Pro	Gln	His	Gln	Phe	Pro	Gln	Pro	Thr	Gln	Gln	Phe	Pro	Gln	Arg
1				5					10					15	

Pro

<210> 40
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 <212> PRT
 <213> Hordeum vulgare

<400> 40

Phe	Val	Gln	Pro	Gln	Gln	Gln	Val	Pro	Val	Glu	Ile	Thr	Arg
1				5					10				

<210> 41
 <211> 12
 <212> PRT
 <213> Hordeum vulgare

<400> 41

Phe	Val	Gln	Pro	Gln	Gln	Gln	Val	Pro	Val	Glu	Ile
1				5					10		

<210> 42
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 <212> PRT
 <213> Hordeum vulgare

<400> 42

Leu	Ile	Ile	Pro	Gln	Gln	Pro	Gln	Gln	Pro	Phe	Pro	Leu	Gln	Pro	His
1				5					10					15	

Gln Pro

<210> 43
 <211> 17
 <212> PRT
 <213> Hordeum vulgare

<400> 43

Ile	Ile	Pro	Gln	Gln	Pro	Gln	Gln	Pro	Phe	Pro	Leu	Gln	Pro	His	Gln
1				5					10					15	

Pro

<210> 44
 <211> 12
 <212> PRT
 <213> Hordeum vulgare

<400> 44

Val	Gln	Val	Gln	Ile	Pro	Phe	Val	His	Pro	Ser	Ile
1				5					10		

<210> 45
 <211> 15
 <212> PRT
 <213> Hordeum vulgare

<400> 45

Ser	Phe	Gly	Gln	Pro	Gln	Gln	Gln	Val	Pro	Val	Glu	Val	Met	Arg
1				5					10					15

<210> 46
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 <212> PRT
 <213> Hordeum vulgare

<400> 46

Ile Ile Pro Gln Gln Pro Phe Pro Leu Gln Pro Gln Pro Phe Pro Gln

1 5 10 15

Gln Pro Gln Gln Pro Leu Pro Gln Pro Gln Gln Pro
20 25

<210> 47
<211> 14
<212> PRT
<213> Hordeum vulgare

<220>
<221> MOD_RES
<222> (6)..(6)
<223> dansyl-glutamic acid (DEA)

<400> 47

Ile Pro Leu Gln Pro Gln Gln Pro Phe Pro Gln Gln Pro Pro
1 5 10

<210> 48
<211> 14
<212> PRT
<213> Hordeum vulgare

<400> 48

Thr Leu Pro Thr Met Cys Ser Val Asn Val Pro Leu Tyr Arg
1 5 10

<210> 49
<211> 16
<212> PRT
<213> Hordeum vulgare

<400> 49

Asp Val Ser Pro Glu Cys Arg Pro Val Ala Leu Ser Gln Val Val Arg
1 5 10 15

<210> 50
<211> 15

<212> PRT

<213> Hordeum vulgare

<400> 50

Gln	Gln	Cys	Cys	Gln	Gln	Leu	Ala	Asn	Ile	Asn	Glu	Gln	Ser	Arg
1				5					10					15

<210> 51

<211> 17

<212> PRT

<213> Hordeum vulgare

<400> 51

Cys	Thr	Ala	Ile	Asp	Ser	Ile	Val	His	Ala	Ile	Phe	Met	Gln	Gln	Gly
1				5					10						15

Arg

<210> 52

<211> 15

<212> PRT

<213> Hordeum vulgare

<400> 52

Gln	Gln	Cys	Cys	Gln	Pro	Leu	Ala	Gln	Ile	Ser	Glu	Gln	Ala	Arg
1				5					10					15

<210> 53

<211> 11

<212> PRT

<213> Hordeum vulgare

<400> 53

Val	Phe	Leu	Gln	Gln	Gln	Cys	Ser	Pro	Val	Arg
1				5					10	

<210> 54

<211> 15

<212> PRT

<213> Hordeum vulgare

<400> 54

Val	Phe	Leu	Gln	Gln	Gln	Cys	Ser	Pro	Val	Pro	Met	Pro	Gln	Arg
1				5					10				15	

<210> 55

<211> 18

<212> PRT

<213> Hordeum vulgare

<400> 55

Gln	Leu	Asn	Pro	Ser	His	Gln	Glu	Leu	Gln	Ser	Pro	Gln	Gln	Pro	Phe
1				5					10					15	

Leu Lys

<210> 56

<211> 11

<212> PRT

<213> Hordeum vulgare

<400> 56

Glu	Leu	Gln	Glu	Ser	Ser	Leu	Glu	Ala	Cys	Arg
1				5					10	

<210> 57

<211> 13

<212> PRT

<213> Hordeum vulgare

<400> 57

Ala	Pro	Phe	Val	Gly	Val	Val	Thr	Gly	Val	Gly	Gly	Gln
1				5					10			

<210> 58

<211> 15

<212> PRT

<213> Hordeum vulgare

<400> 58

Gln	Gln	Cys	Cys	Gln	Gln	Leu	Ala	Asn	Ile	Asn	Glu	Gln	Ser	Arg
1				5					10					15

<210> 59

<211> 13

<212> PRT

<213> Hordeum vulgare

<400> 59

Ala	Pro	Phe	Val	Gly	Val	Val	Thr	Gly	Val	Gly	Gly	Gln
1				5					10			

<210> 60

<211> 23

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide primer

<400> 60

gacacatatt ctgccaaaac ccc 23

<210> 61

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide primer

<400> 61

acgagggcga cgattaccgc 20

<210> 62

<211> 25

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide primer

<400> 62

gagatcaatt cattgacagt ccacc

25

<210> 63

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide primer

<400> 63

cttgtcctga ctgctgcgga gaaa

24

<210> 64

<211> 25

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide primer

<400> 64

gcaacaagga cactacccaa gtatg

25

<210> 65

<211> 25

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide primer

<400> 65

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<210> 66

<211> 19

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide primer

<400> 66

ggcaatacga gcagcaaac

19

<210> 67

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide primer

<400> 67

cctctgtcct ggttggtg

20

<210> 68

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide primer

<400> 68

tcgcaggatc ctgtacaacg

20

<210> 69

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide primer

<400> 69

caacaatgaa gaccttcctc

20

<210> 70

<211> 22

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide primer

<400> 70

cgagaaggta ccattactcc ag

22

<210> 71

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide primer

<400> 71

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21

<210> 72

<211> 2838

<212> DNA

<213> Hordeum vulgare

<400> 72

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acgcggcttt agcagaccgt ccaaaaaaac tgttttgcaa agctccaatt cctccttgct 180

tatccaattt cttttgtggt ggcaaactgc acttgtccaa ccgattttgt tcttcccgtg 240

tttcttctta ggctaactaa cacagccgtg cacatagcca tgggtccggaa tcttcacctc 300

gtccctataa aagcccagcc aatctccaca atctcatcat caccgagaac accgagaacc 360

acaaaactag agatcaattc attgacagtc caccgagatg gctaagcggc tggtcctctt 420

tgtggcggta atcgtcgccc tcgtggctct caccaccgct gaacgtgaga tcaatgggaa 480

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ctcgctcgag gcgtgccggc gggtcgtgga ccaacagctg gttggccagc tgccatggag 600

cacggggctc cagatgcagt gctgccagca gcttcggggac gtcagccccg agtgccgccc 660

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ctctgtaaaa tgggtactacc cagaccaaac ttcttcgcaa cagtcatggc aagggaaca	840
agggtaccac caaagcgtaa cttcttccca gcagccagga caagggcagc aagggtccta	900
cccaggttca actttcccg c agcagccagg acaaggacaa caaccaggac agaggcagcc	960
atggtcctat ccaagtgc aa ctttcccaca acagccaggg caagggaag ggcaacaagg	1020
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<210> 73

<211> 2724

<212> DNA

<213> Hordeum vulgare

<400> 73

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ttctccgctg caccagcaag ggggagggtt cggcggcggg ttaacgacgg agcaaccgca	1980
gggaggaaaag cagccattcc attgccagca aaccactgtc tcccctcacc agggtcagca	2040
aaccactgtc tcccctcatc agggtcagca aaccactgtc tcccctcatc agggtcagca	2100
aaccactgtc tcccctcacc agggtcagca aaccactgtc tcccctcatc cgggtcagca	2160
aaccactgtc tcccctcatc agggtcagca aaccactgtc tcccctcatc cgggtcagca	2220
aaccaccgtc tcccctcatc agggtcagca aaccaccgtc tcccctcatc agggtcagca	2280
aaccaccgtc tcccctcacc agggtcagca gcccggcgag cagccttgcg gtttccctgg	2340
ccagcaaacc accgtgtctc tgcacatgg tcagcagtcc aacgagttgt actacggcag	2400
cccataccat gttagcgtgg agcagccgtc ggccagccta aaggtagcaa aggcgcagca	2460
gctcgcggca cagctgccgg caatgtgtcg gctggagggc ggccggcggcc tgttgccag	2520
ccagtagtag aactctggca gctcgcattg tgcttgggca tgcattgcacc ttagctatac	2580
aataaacgtg acgtgtgctt gcagtttttc atgtaactag ggtaaaaccc aacaataatg	2640
caaacggaa agcttctcca tccaaaaaaa gaacaaaact ggtgctatat atagtatgcg	2700
ctacatgtct cagctcattg tcag	2724

<210> 74
 <211> 747
 <212> PRT
 <213> Hordeum vulgare

<400> 74

Met	Ala	Lys	Arg	Leu	Val	Leu	Phe	Val	Ala	Val	Ile	Val	Ala	Leu	Val
1				5				10					15		

Ala	Leu	Thr	Thr	Ala	Glu	Arg	Glu	Ile	Asn	Gly	Asn	Asn	Ile	Phe	Leu
		20						25					30		

Asp	Ser	Arg	Ser	Arg	Gln	Leu	Gln	Cys	Glu	Arg	Glu	Leu	Gln	Glu	Ser
		35					40					45			

Ser Leu Glu Ala Cys Arg Arg Val Val Asp Gln Gln Leu Val Gly Gln
50 55 60

Leu Pro Trp Ser Thr Gly Leu Gln Met Gln Cys Cys Gln Gln Leu Arg
65 70 75 80

Asp Val Ser Pro Glu Cys Arg Pro Val Ala Leu Ser Gln Val Val Arg
85 90 95

Gln Tyr Glu Gln Gln Thr Glu Val Pro Ser Lys Gly Gly Ser Phe Tyr
100 105 110

Pro Gly Gly Thr Ala Pro Pro Leu Gln Gln Gly Gly Trp Trp Gly Thr
115 120 125

Ser Val Lys Trp Tyr Tyr Pro Asp Gln Thr Ser Ser Gln Gln Ser Trp
130 135 140

Gln Gly Gln Gln Gly Tyr His Gln Ser Val Thr Ser Ser Gln Gln Pro
145 150 155 160

Gly Gln Gly Gln Gln Gly Ser Tyr Pro Gly Ser Thr Phe Pro Gln Gln
165 170 175

Pro Gly Gln Gly Gln Gln Pro Gly Gln Arg Gln Pro Trp Ser Tyr Pro
180 185 190

Ser Ala Thr Phe Pro Gln Gln Pro Gly Gln Gly Gln Gly Gln Gln Gly
195 200 205

Tyr Tyr Pro Gly Ala Thr Ser Leu Leu Gln Pro Gly Gln Gly Gln Gln
210 215 220

Gly Pro Tyr Gln Ser Ala Thr Ser Pro Gln Gln Pro Gly Gln Gly Gln
225 230 235 240

Gly His Gln Glu Thr Tyr Gln Phe Ala Thr Ser Pro His Gln Pro Gly
245 250 255

Gln Trp Gln Gln Pro Gly Gln Gly Gln Gln Gly Tyr Tyr Pro Ser Val
260 265 270

Thr Ser Pro Gln Gln Ser Gly Gln Gly Gln Thr Gly Tyr Pro Ser Thr
275 280 285

Thr Ser Pro Gln Gln Ser Gly Gln Gly Gln Gln Leu Gly Gln Gly Gln
290 295 300

Gln Pro Gly Gln Gly Gln Gln Gly Tyr Pro Ser Ala Thr Phe Pro Gln
305 310 315 320

Gln Pro Gly Gln Trp Gln Gln Gly Ser Tyr Pro Ser Thr Thr Ser Pro
325 330 335

Gln Gln Ser Gly Gln Gly Gln Gln Gly Tyr Asn Pro Ser Gly Thr Ser
340 345 350

Thr Gln Gln Pro Gly Gln Val Gln Gln Leu Gly Gln Gly Gln Gln Gly
355 360 365

Tyr Tyr Pro Ile Ala Thr Ser Pro Gln Gln Pro Gly Gln Gly Gln Gln
370 375 380

Leu Gly Gln Gly Gln Gln Pro Gly His Gly Gln Gln Leu Val Gln Gly
385 390 395 400

Gln Gln Gln Gly Gln Gly Gln Gln Gly His Tyr Pro Ser Met Thr Ser
405 410 415

Pro His Gln Thr Gly Gln Gly Gln Lys Gly Tyr Tyr Pro Ser Ala Ile
420 425 430

Ser Pro Gln Gln Ser Gly Gln Gly Gln Gln Gly Tyr Gln Pro Ser Gly
435 440 445

Ala Ser Ser Gln Gly Ser Val Gln Gly Ala Cys Gln His Ser Thr Ser
450 455 460

Ser Pro Gln Gln Gln Ala Gln Gly Cys Gln Ala Ser Ser Pro Lys Gln
465 470 475 480

Gly Leu Gly Ser Leu Tyr Tyr Pro Ser Gly Ala Tyr Thr Gln Gln Lys
485 490 495

Pro Gly Gln Gly Tyr Asn Pro Gly Gly Thr Ser Pro Leu His Gln Gln
500 505 510

Gly Gly Gly Phe Gly Gly Gly Leu Thr Thr Glu Gln Pro Gln Gly Gly
515 520 525

Lys Gln Pro Phe His Cys Gln Gln Thr Thr Val Ser Pro His Gln Gly
530 535 540

Gln Gln Thr Thr Val Ser Pro His Gln Gly Gln Gln Thr Thr Val Ser
545 550 555 560

Pro His Gln Gly Gln Gln Thr Thr Val Ser Pro His Gln Gly Gln Gln
565 570 575

Thr Thr Val Ser Pro His Gln Gly Gln Gln Thr Thr Val Ser Pro His
580 585 590

Gln Gly Gln Gln Thr Thr Val Ser Pro His Pro Gly Gln Gln Thr Thr
595 600 605

Val Ser Pro His Gln Gly Gln Gln Thr Thr Val Ser Pro His Pro Gly
610 615 620

Gln Gln Thr Thr Val Ser Pro His Gln Gly Gln Gln Thr Thr Val Ser
625 630 635 640

Pro His Gln Gly Gln Gln Thr Thr Val Ser Pro His Gln Gly Gln Gln
645 650 655

Thr Thr Val Ser Pro His Gln Gly Gln Gln Thr Thr Val Ser Pro His
660 665 670

Gln Gly Gln Gln Pro Gly Glu Gln Pro Cys Gly Phe Pro Gly Gln Gln
675 680 685

Thr Thr Val Ser Leu His His Gly Gln Gln Ser Asn Glu Leu Tyr Tyr
690 695 700

Gly Ser Pro Tyr His Val Ser Val Glu Gln Pro Ser Ala Ser Leu Lys
705 710 715 720

Val Ala Lys Ala Gln Gln Leu Ala Ala Gln Leu Pro Ala Met Cys Arg
725 730 735

Leu Glu Gly Gly Gly Gly Leu Leu Ala Ser Gln
740 745

<210> 75
<211> 149
<212> PRT
<213> Hordeum vulgare

<400> 75

Met Ala Lys Arg Leu Val Leu Phe Val Ala Val Ile Val Ala Leu Val
1 5 10 15

Ala Leu Thr Thr Ala Glu Pro Glu Ile Asn Gly Asn Asn Ile Phe Leu
20 25 30

Asp Ser Arg Ser Gly Gln Leu Gln Cys Glu Arg Glu Leu Gln Glu Ser
 35 40 45

Ser Leu Glu Ala Cys Arg Arg Val Val Asp Gln Gln Leu Val Gly Gln
 50 55 60

Leu Pro Trp Ser Thr Gly Leu Gln Met Gln Cys Cys Gln Gln Leu Arg
 65 70 75 80

Asp Val Ser Pro Glu Cys Arg Pro Val Ala Leu Ser Gln Val Val Arg
 85 90 95

Gln Tyr Glu Gln Gln Thr Glu Val Pro Ser Lys Gly Gly Ser Phe Tyr
 100 105 110

Pro Gly Gly Thr Ala Pro Pro Leu Gln Gln Gly Gly Trp Trp Gly Thr
 115 120 125

Ser Val Lys Trp Tyr Tyr Pro Asp Gln Thr Ser Ser Gln Gln Ser Trp
 130 135 140

Gln Gly Gln Gln Gly
 145

<210> 76

<211> 2244

<212> DNA

<213> Hordeum vulgare

<400> 76

atggctaagc ggctggtcct ctttgtggcg gtaatcgctc ccctcgtggc tctcaccacc 60

gctgaacgtg agatcaatgg gaacaacatt ttccttgata gccgctctag gcagctacag 120

tgtgagcgcg agctccagga gagctcgctc gaggcgtgcc ggagggtcgt ggaccaacag 180

ctggttggcc agctgccatg gagcacgggg ctccagatgc agtgctgcca gcagcttcgg 240

gacgtcagcc ccgagtgccg ccccgctgcc ctcagccagg tcgtgaggca atacgagcag 300

caaaccgagg tgccatccaa gggaggatcc ttctacccgg gcgggaccgc accgccgctg	360
cagcaaggag gatggtgggg aacctctgta aaatggtact acccagacca aacttcttcg	420
caacagtcac ggcaagggca acaaggggtac caccaaagcg taacttcttc ccagcagcca	480
ggacaagggc agcaagggtc ctacccaggt tcaactttcc cgcagcagcc aggacaagga	540
caacaaccag gacagaggca gccatggtcc tatccaagt caactttccc acaacagcca	600
gggcaagggc aagggaaca aggggtactac ccaggcgcaa cttccctgct gcagccagga	660
caagggaac aagggcccta ccagagtga acttctccac agcagccagg acaaggacag	720
ggacaccaag agacctatca atttgcaact tccccgcatc agccaggaca atggcaacaa	780
ccaggacaag ggcaacaagg gtactaccca agtgtaactt ctccacaaca gtcgggacaa	840
gggcaaacag ggtacccaag tacaacttct ccacaacaat cggggcaagg gcaacagctg	900
ggacaagggc aacaaccagg acaaggga caagggtacc caagtgaac ttttccacaa	960
cagccaggac aatggcaaca aggggtctac ccaagtacaa cttctccgca gcagtcagga	1020
caagggaac aagggtacaa cccaagtga acttctacgc agcagccggg acaagtga	1080
cagttgggac aagggaaca aggggtactac ccaattgcaa cttctccgca gcagccagga	1140
caagggaac agctaggaca aggggaacaa ccaggacatg ggcaacagct agtgcaaggg	1200
caacaacaag gacaagggca acaaggacac tacccaagta tgacttctcc gcaccaaca	1260
ggacaagggc aaaaaggata ctacccaagt gcaatttctc cgcagcagtc aggacaagga	1320
caacaaggat accagcctag tggagcttct tcacaggggt cggtgcaagg ggcgtgccag	1380
cacagcacat cttctccgca gcagcaagca caagggtgcc aagcttcttc accaaagcaa	1440
gggctagggt cgttgacta cccgagtga gcttatacac aacagaaacc agggcaaggg	1500
tacaaccag gtggaacttc tccgctgcac cagcaagggg gagggttcgg cggcgggtta	1560
acgacggagc aaccgcaggg aggaagcag ccattccatt gccagcaaac cactgtctcc	1620
cctcaccagg gtcagcaaac cactgttctc cctcatcagg gtcagcaaac cactgtctcc	1680
cctcatcagg gtcagcaaac cactgtctcc cctcaccagg gtcagcaaac caccgtctcc	1740

cctcaccagg gtcagcaaac caccgtctcc cctcatcagg gtcagcaaac cactgtctcc	1800
cctcatccgg gtcagcaaac cactgtctcc cctcatcagg gtcagcaaac cactgtctcc	1860
cctcatccgg gtcagcaaac cactgtctcc cctcatcagg gtcagcaaac cactgtctcc	1920
cctcatcagg gtcagcaaac caccgtctcc cctcatcagg gtcagcaaac caccgtctcc	1980
cctcatcagg gtcagcaaac caccgtctcc cctcatcagg gtcagcagcc cggcgagcag	2040
ccttgcggtt tccctggcca gcaaaccacc gtgtctctgc accatgggtca gcagtccaac	2100
gagttgtact acggcagccc ataccatgtt agcgtggagc agccgtcggc cagcctaaag	2160
gtagcaaagg cgcagcagct cgcggcgag ctgccggcaa tgtgtcggct ggagggcggc	2220
ggcggcctgt tggccagcca gtag	2244

<210> 77
 <211> 450
 <212> DNA
 <213> Hordeum vulgare

<400> 77 atggctaagc ggctggctct ctttgtggcg gtaatcgctc cctcgtggc tctcaccacc	60
gctgaacctg agatcaatgg gaacaacatt ttccttgata gccgctctgg gcagctacag	120
tgtgagcgcg agctccagga gagctcgctc gaggcgtgcc ggagggtcgt ggaccaacag	180
ctggttggcc agctgccatg gagcacgggg ctccagatgc agtgctgcca gcagcttcgg	240
gacgtcagcc ccgagtgccg ccccgctgcc ctccagcagg tcgtgaggca atacgagcag	300
caaaccgagg tgccatcaa gggaggatcc ttctacccgg gcgggaccgc accgccgtg	360
cagcaaggag gatgggtgggg aacctctgta aaatgggtact acccagacca aacttcttcg	420
caacagtcac ggcaagggca acaagggtag	450

<210> 78
 <211> 181
 <212> PRT
 <213> Hordeum vulgare

<400> 78

Leu Ala Cys Glu Val Leu Lys Glu Arg Ser Val Cys Ile Leu Gln Leu
1 5 10 15

His Tyr Val Gln Pro Ser Ile Leu Gln Gln Leu Asn Pro Cys Lys Val
20 25 30

Phe Leu Gln Gln Gln Cys Ser Pro Val Arg Met Pro Gln Leu Ile Ala
35 40 45

Arg Ser Gln Met Leu Gln Gln Ser Ser Cys His Val Leu Gln Gln Gln
50 55 60

Cys Cys Gln Gln Leu Pro Gln Ile Pro Glu Gln Phe Arg His Glu Ala
65 70 75 80

Ile Arg Ala Ile Val Tyr Ser Ile Phe Leu Gln Glu Gln Pro Gln Gln
85 90 95

Ser Val Gln Gly Ala Ser Gln Pro Gln Gln Gln Leu Gln Glu Glu Gln
100 105 110

Val Gly Gln Cys Tyr Phe Gln Gln Pro Gln Pro Gln Gln Leu Gly Gln
115 120 125

Pro Gln Gln Val Pro Gln Ser Val Phe Leu Gln Pro His Gln Ile Ala
130 135 140

Gln Leu Glu Ala Thr Asn Ser Ile Ala Leu Arg Thr Leu Pro Thr Met
145 150 155 160

Cys Asn Val Asn Val Pro Leu Tyr Asp Ile Met Pro Phe Gly Val Gly
165 170 175

Thr Arg Val Gly Val
180

<210> 79
 <211> 274
 <212> PRT
 <213> Hordeum vulgare

<400> 79

Met Lys Thr Phe Leu Ile Phe Ala Leu Leu Ala Ile Ala Ala Thr Asn
 1 5 10 15

Thr Ile Ala Gln Gln Gln Pro Phe Pro Gln Gln Pro Gln Pro Tyr Pro
 20 25 30

Gln Gln Pro Gln Pro Tyr Pro Gln Gln Pro Phe Pro Pro Gln Gln Pro
 35 40 45

Phe Pro Gln Gln Pro Pro Phe Trp Trp Gln Gln Pro Val Gln Ser Gln
 50 55 60

Gln Gln Pro Cys Gln Gln Gln Gln Thr Pro Leu Pro Gln Gly Gln Gln
 65 70 75 80

Tyr Gln Pro Leu Leu Gln Gln Gln Ile Pro Phe Val His Pro Ser Val
 85 90 95

Leu Gln Gln Leu Asn Pro Cys Lys Val Phe Leu Gln Gln Gln Cys Ser
 100 105 110

Pro Val Pro Met Pro Gln Arg Ile Ala Arg Ser Gln Met Leu Gln Gln
 115 120 125

Ser Ser Cys His Val Leu Gln Gln Gln Cys Cys Lys Gln Leu Pro Gln
 130 135 140

Ile Pro Glu Gln Phe Arg His Glu Ala Ile Arg Ala Ile Ile Tyr Ser
 145 150 155 160

Ile Ile Leu Gln Glu Gln Gln Gln Val Gln Asp Phe Val Gln Pro Gln
165 170 175

Gln Gln Gln Pro Gln Gln Ser Val Gln Gly Val Ser Gln Ser Gln Gln
180 185 190

Gln Ser Gln Gln Pro Gln Leu Gly Gln Cys Ser Phe Gln Gln Pro Gln
195 200 205

Leu Gln Gln Leu Gly Gln Gln Pro Gln Gln Gln Gln Val Pro Leu Trp
210 215 220

Ala Phe Leu Gln Pro Gln Gln Met Ala Gln Leu Glu Val Met Thr Ser
225 230 235 240

Val Ala Leu Arg Thr Leu Pro Thr Met Cys Asn Val Asn Val Pro Leu
245 250 255

Tyr Gly Ile Thr Thr Ser Val Pro Leu Ser Val Gly Thr Gly Val Gly
260 265 270

Pro Tyr

<210> 80
<211> 347
<212> PRT
<213> Hordeum vulgare

<220>
<221> misc_feature
<222> (161)..(161)
<223> Xaa can be any naturally occurring amino acid

<400> 80

Met Lys Thr Phe Leu Thr Phe Val Leu Leu Ala Met Ala Met Ser Ile
1 5 10 15

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

Pro Leu Gln Pro Gln Gln Pro Phe Pro Gln Gln Pro Gln Gln Pro Leu
210 215 220

Pro Gln Gln Pro Gln Gln Ile Ile Ser Gln Gln Pro Gln Gln Pro Phe
225 230 235 240

Pro Leu Gln Pro Gln Gln Pro Phe Pro Gln Pro Gln Pro Phe Pro Gln
245 250 255

Glu Gln Pro Gln Gln Ala Phe Pro Leu Gln Pro Gln Gln Pro Phe Pro
260 265 270

Glu Glu Ser Glu Gln Ile Ile Thr Gln Gln Pro Phe Pro Leu Gln Pro
275 280 285

Gln Gln Leu Phe Pro Gln Gln Pro Gln Gln Pro Leu Pro Gln Pro Gln
290 295 300

Gln Pro Phe Arg Gln Leu Pro Lys Tyr Ile Ile Pro Gln Gln Pro Gln
305 310 315 320

Gln Pro Phe Leu Leu Gln Pro His Gln Pro Gln Gln Pro Tyr Ala Gln
325 330 335

Gln Asp Ile Trp Ser Asp Ile Ala Leu Leu Gly
340 345

<210> 81

<211> 305

<212> PRT

<213> Hordeum vulgare

<400> 81

Met Lys Ile Leu Ile Ile Leu Thr Ile Leu Ala Met Ala Thr Thr Phe
1 5 10 15

Ala Thr Ser Glu Met Gln Val Asn Pro Ser Val Gln Val Gln Pro Thr
 20 25 30

Gln Gln Gln Pro Tyr Pro Glu Ser Gln Gln Pro Phe Ile Ser Gln Ser
 35 40 45

Gln Gln Gln Phe Pro Gln Pro Gln Gln Pro Phe Pro Gln Gln Pro Gln
 50 55 60

Gln Pro Phe Pro Gln Ser Gln Gln Gln Cys Leu Gln Gln Pro Gln His
 65 70 75 80

Gln Phe Pro Gln Pro Thr Gln Gln Phe Pro Gln Arg Pro Leu Leu Pro
 85 90 95

Phe Thr His Pro Phe Leu Thr Phe Pro Asp Gln Leu Leu Pro Gln Pro
 100 105 110

Pro His Gln Ser Phe Pro Gln Pro Pro Gln Ser Tyr Pro Gln Pro Pro
 115 120 125

Leu Gln Pro Phe Pro Gln Pro Pro Gln Gln Lys Tyr Pro Glu Gln Pro
 130 135 140

Gln Gln Pro Phe Pro Trp Gln Gln Pro Thr Ile Gln Leu Tyr Leu Gln
 145 150 155 160

Gln Gln Leu Asn Pro Cys Lys Glu Phe Leu Leu Gln Gln Cys Arg Pro
 165 170 175

Val Ser Leu Leu Ser Tyr Ile Trp Ser Lys Ile Val Gln Gln Ser Ser
 180 185 190

Cys Arg Val Met Gln Gln Gln Cys Cys Leu Gln Leu Ala Gln Ile Pro
 195 200 205

Glu Gln Tyr Lys Cys Thr Ala Ile Asp Ser Ile Val His Ala Ile Phe
210 215 220

Met Gln Gln Gly Gln Arg Gln Gly Val Gln Ile Val Gln Gln Gln Pro
225 230 235 240

Gln Pro Gln Gln Val Gly Gln Cys Val Leu Val Gln Gly Gln Gly Val
245 250 255

Val Gln Pro Gln Gln Leu Ala Gln Met Glu Ala Ile Arg Thr Leu Val
260 265 270

Leu Gln Ser Val Pro Ser Met Cys Asn Phe Asn Val Pro Pro Asn Cys
275 280 285

Ser Thr Ile Lys Ala Pro Phe Val Gly Val Val Thr Gly Val Gly Gly
290 295 300

Gln
305

<210> 82
<211> 255
<212> PRT
<213> Hordeum vulgare

<400> 82

Met Gln Val Asn Pro Ser Val Gln Val Gln Pro Thr Gln Gln Gln Pro
1 5 10 15

Tyr Pro Glu Ser Gln Gln Pro Phe Ile Ser Gln Ser Gln Gln Gln Phe
20 25 30

Pro Gln Pro Gln Gln Pro Phe Pro Gln Arg Pro Leu Leu Pro Phe Thr
35 40 45

His Pro Phe Leu Thr Phe Pro Asp Gln Leu Leu Pro Gln Pro Pro His

50

55

60

Gln Ser Phe Pro Gln Pro Pro Gln Ser Tyr Pro Gln Pro Pro Leu Gln
65 70 75 80

Pro Phe Pro Gln Pro Pro Gln Gln Lys Tyr Pro Glu Gln Pro Gln Gln
85 90 95

Pro Phe Pro Trp Gln Gln Pro Thr Ile Gln Leu Tyr Leu Gln Gln Gln
100 105 110

Leu Asn Pro Tyr Lys Glu Phe Leu Leu Gln Gln Cys Arg Pro Val Ser
115 120 125

Leu Leu Ser Tyr Leu Trp Ser Lys Ile Val Gln Gln Ser Ser Cys Arg
130 135 140

Val Met Leu Gln Gln Cys Cys Leu Gln Leu Ala Gln Ile Pro Glu Gln
145 150 155 160

Tyr Lys Cys Thr Ala Ile Asp Ser Ile Val His Ala Ile Phe Met Gln
165 170 175

Gln Gly Gln Arg Gln Gly Val Gln Ile Val Gln Gln Gln Pro Gln Pro
180 185 190

Gln Gln Val Gly Gln Cys Val Leu Val Gln Gly Gln Gly Val Val Gln
195 200 205

Pro Gln Gln Leu Ala Gln Met Glu Ala Ile Arg Thr Leu Val Leu Gln
210 215 220

Ser Val Pro Ser Met Cys Asn Phe Asn Val Pro Pro Asn Cys Ser Thr
225 230 235 240

Ile Lys Ala Pro Phe Val Gly Val Val Thr Gly Val Gly Gly Gln

245

250

255

<210> 83

<211> 289

<212> PRT

<213> Hordeum vulgare

<400> 83

Ile Thr Thr Thr Thr Met Gln Phe Asn Pro Ser Gly Leu Glu Leu Glu
1 5 10 15

Arg Pro Gln Gln Leu Phe Pro Gln Trp Gln Pro Leu Pro Gln Gln Pro
20 25 30

Pro Phe Leu Gln Gln Glu Pro Glu Gln Pro Tyr Pro Gln Gln Gln Pro
35 40 45

Leu Pro Gln Gln Gln Pro Phe Pro Gln Gln Pro Gln Leu Pro His Gln
50 55 60

His Gln Phe Pro Gln Gln Leu Pro Gln Gln Gln Phe Pro Gln Gln Met
65 70 75 80

Pro Leu Gln Pro Gln Gln Gln Phe Pro Gln Gln Met Pro Leu Gln Pro
85 90 95

Gln Gln Gln Pro Gln Phe Pro Gln Gln Lys Pro Phe Gly Gln Tyr Gln
100 105 110

Gln Pro Leu Thr Gln Gln Pro Tyr Pro Gln Gln Gln Pro Leu Ala Gln
115 120 125

Gln Gln Pro Ser Ile Glu Glu Gln His Gln Leu Asn Leu Cys Lys Glu
130 135 140

Phe Leu Leu Gln Gln Cys Thr Leu Asp Glu Lys Val Pro Leu Leu Gln
145 150 155 160

Ser Val Ile Ser Phe Leu Arg Pro His Ile Ser Gln Gln Asn Ser Cys
165 170 175

Gln Leu Lys Arg Gln Gln Cys Cys Gln Gln Leu Ala Asn Ile Asn Glu
180 185 190

Gln Ser Arg Cys Pro Ala Ile Gln Thr Ile Val His Ala Ile Val Met
195 200 205

Gln Gln Gln Val Gln Gln Gln Val Gly His Gly Phe Val Gln Ser Gln
210 215 220

Leu Gln Gln Leu Gly Gln Gly Met Pro Ile Gln Leu Gln Gln Gln Pro
225 230 235 240

Gly Gln Ala Phe Val Leu Pro Gln Gln Gln Ala Gln Phe Lys Val Val
245 250 255

Gly Ser Leu Val Ile Gln Thr Leu Pro Met Leu Cys Asn Val His Val
260 265 270

Pro Pro Tyr Cys Ser Pro Phe Gly Ser Met Ala Thr Gly Ser Gly Gly
275 280 285

Gln

<210> 84
<211> 173
<212> PRT
<213> Hordeum vulgare

<400> 84

Met Lys Thr Met Leu Ile Leu Ala Leu Ile Ala Phe Ala Ala Thr Ser
1 5 10 15

PCTAU2014000619-seql-000001-EN-20140618

Ala Val Ala Gln Leu Asp Thr Thr Cys Ser Gln Gly Tyr Gly Gln Cys
20 25 30

Gln Gln Gln Pro Gln Gln Gln Met Asn Thr Cys Ala Ala Phe Leu Gln
35 40 45

Gln Cys Ser Arg Thr Pro Tyr Val Gln Ser Gln Met Trp Gln Ala Ser
50 55 60

Gly Cys Gln Leu Met Arg Gln Gln Cys Cys Gln Pro Leu Ala Gln Ile
65 70 75 80

Ser Glu Gln Ala Arg Cys Gln Ala Val Cys Ser Met Ala Gln Val Ile
85 90 95

Met Arg Gln Gln Gln Gly Gln Ser Phe Thr Gln Pro Gln Gln Gln Gln
100 105 110

Ser Gln Ser Phe Gly Gln Pro Gln Gln Gln Val Pro Val Glu Val Met
115 120 125

Arg Met Val Leu Gln Thr Leu Pro Ser Met Cys Ser Val Asn Ile Pro
130 135 140

Gln Tyr Cys Thr Thr Thr Pro Cys Ser Thr Ile Thr Pro Thr Ile Tyr
145 150 155 160

Ser Ile Pro Met Ala Ala Thr Cys Ala Gly Gly Val Cys
165 170

<210> 85

<211> 13

<212> PRT

<213> Hordeum vulgare

<400> 85

PCTAU2014000619-seql-000001-EN-20140618

Ala Gln Gln Leu Ala Ala Gln Leu Pro Ala Met Cys Arg
1 5 10