

PCT_18977_HZI_sequence listing.ST25.txt
SEQUENCE LISTING

<110> Helmholtz-Zentrum für Infektionsforschung GmbH

<120> PROBE COMPOUND FOR DETECTING AND ISOLATING ENNZYMES AND MEANS AND METHODS USING THE SAME

<130> 18977-PCT

<140> new PCT application based on EP 09 003 977.7

<141> 2010-03-19

<160> 59

<170> PatentIn version 3.3

<210> 1

<211> 20

<212> DNA

<213> artificial

<220>

<223> PCR amplification primer

<400> 1
agagtttgat cmtggctcag 20

<210> 2

<211> 19

<212> DNA

<213> artificial

<220>

<223> PCR amplification primer

<400> 2
tccgtgccag cagccgccg 19

<210> 3

<211> 20

<212> DNA

<213> artificial

<220>

<223> PCR amplification primer

<400> 3
cggytacctt gttacgactt 20

<210> 4

<211> 22

<212> DNA

<213> artificial

<220>

<223> PCR amplification primer

<400> 4
gacgttgtaa aacgacggcc ag 22

<210> 5

<211> 21

<212> DNA

<213> artificial

PCT_18977_HZI_sequence listing.ST25.txt

```

<220>
<223> PCR amplification primer

<400> 5
gaggaaacag ctatgaccat g                                21

<210> 6
<211> 11
<212> PRT
<213> artificial

<220>
<223> target (no.914) peptide available from Sigma-Aldrich-Fluka

<400> 6
Arg Pro Lys Pro Gln Gln Phe Phe Gly Leu Met
1          5          10

<210> 7
<211> 49
<212> DNA
<213> artificial

<220>
<223> target (no. 1256) DNA resolvase substrate available from Sigma
Genosys

<400> 7
gacgctgccg aattctggct tgctaggaca tctttgccca cgttgaccc        49

<210> 8
<211> 35
<212> DNA
<213> artificial

<220>
<223> target (no. 1261) DNA substrate available from Sigma Genosys

<400> 8
taagctccgg attgtccggg aggtaaagcc ctgat                        35

<210> 9
<211> 25
<212> DNA
<213> artificial

<220>
<223> target (no. 1262) DNA substrate available from Sigma Genosys

<400> 9
cacaggaagc tctacaggta ctccg                                    25

<210> 10
<211> 70
<212> DNA
<213> artificial

<220>
<223> target (no. 1263) DNA substrate available from Sigma Genosys

<400> 10

```

PCT_18977_HZI_sequence listing.ST25.txt

tggtcatcag ggctttacct cccggacaat ccggagctta cggagtacct gtagagcttc 60
ctgtgcaagc 70

<210> 11
<211> 20
<212> DNA
<213> artificial

<220>
<223> target (no. 1265) DNA Helicase substrate dsDNA available from Sigma Genosys

<400> 11
gcactggccg tcgttttacc 20

<210> 12
<211> 4
<212> PRT
<213> artificial

<220>
<223> target (no. 1921) peptide substrate available from Sigma-Aldrich-Fluka

<220>
<221> misc_feature Ala
<222> (1)..(1)
<223> protected by succinyl group

<220>
<221> misc_feature Phe
<222> (4)..(4)
<223> protected by 4-nitroanilide group

<400> 12
Ala Ala Pro Phe
1

<210> 13
<211> 405
<212> DNA
<213> unknown

<220>
<223> isolated from unknown organism from coastal seawater of Kolguev Island, Barents Sea, Russia (KOL)

<400> 13
atgtggatag ctcgcaacaa ggctaagtcg agtgccagta aaggcaaac cggatgtagc 60
agtcacgtg ccgcaggcga acgccgagaa ttagacgccg aagagtggct gatacaacgt 120
ggctttgtac ccataacccg caattaccgc acgcgcggcg gcgaaatcga tctgattatg 180
cgcgacgccg atacccttgt gtttgtagaa gtacgttatc gtaaaaccac ggagcacggc 240
acggggggcag aaaccattac ctatcaciaa cagcagcgac tacgtcgtgc tgccctacac 300
tacctgcaaa agcattttgg tagccgcgaa ccgccttgct gatttgatgt tatgtcaggt 360
actggcgacc cagttatctt cgattggatt agtaatgcgt tttaa 405

PCT_18977_HZI_sequence_listing.ST25.txt

<210> 14
 <211> 134
 <212> PRT
 <213> unknown

<220>
 <223> isolated from unknown organism from coastal seawater of Kolguev Island, Barents Sea, Russia (KOL)

<400> 14

Met Trp Ile Pro Arg Asn Lys Ala Lys Ser Ser Ala Ser Lys Gly Lys
 1 5 10 15

Thr Gly Asp Ser Ser His Arg Ala Ala Gly Glu Arg Arg Glu Leu Asp
 20 25 30

Ala Glu Glu Trp Leu Ile Gln Arg Gly Phe Val Pro Ile Thr Arg Asn
 35 40 45

Tyr Arg Thr Arg Gly Gly Glu Ile Asp Leu Ile Met Arg Asp Ala Asp
 50 55 60

Thr Leu Val Phe Val Glu Val Arg Tyr Arg Lys Thr Thr Glu His Gly
 65 70 75 80

Thr Gly Ala Glu Thr Ile Thr Tyr His Lys Gln Gln Arg Leu Arg Arg
 85 90 95

Ala Ala Leu His Tyr Leu Gln Lys His Phe Gly Ser Arg Glu Pro Pro
 100 105 110

Cys Arg Phe Asp Val Met Ser Gly Thr Gly Asp Pro Val Ile Phe Asp
 115 120 125

Trp Ile Ser Asn Ala Phe
 130

<210> 15
 <211> 8
 <212> PRT
 <213> unknown

<220>
 <223> isolated from unknown organism from coastal seawater of Kolguev Island, Barents Sea, Russia (KOL)

<400> 15

Thr Thr Glu His Gly Thr Gly Ala
 1 5

<210> 16
 <211> 8
 <212> PRT
 <213> unknown

PCT_18977_HZI_sequence listing.ST25.txt

<220>
<223> isolated from unknown organism from coastal seawater of Kolguev Island, Barents Sea, Russia (KOL)

<400> 16

Pro Pro Cys Arg Phe Asp Val Met
1 5

<210> 17
<211> 23
<212> DNA
<213> artificial

<220>
<223> PCR amplification primer

<220>
<221> misc_feature
<222> (3)..(3)
<223> n is inosine and is represented by 'i' in Table 4

<220>
<221> misc_feature
<222> (6)..(6)
<223> n is inosine and is represented by 'i' in Table 4

<220>
<221> misc_feature
<222> (15)..(15)
<223> n is inosine and is represented by 'i' in Table 4

<220>
<221> misc_feature
<222> (18)..(18)
<223> n is inosine and is represented by 'i' in Table 4

<220>
<221> misc_feature
<222> (21)..(21)
<223> n is inosine and is represented by 'i' in Table 4

<400> 17
acnacngarg arggnacngg ngc

23

<210> 18
<211> 24
<212> DNA
<213> artificial

<220>
<223> PCR amplification primer

<220>
<221> misc_feature
<222> (4)..(4)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (7)..(7)
<223> n is a, c, g, or t

<220>

PCT_18977_HZI_sequence_listing.ST25.txt

```

<221> misc_feature
<222> (10)..(10)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (13)..(13)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (19)..(19)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (22)..(22)
<223> n is a, c, g, or t

<400> 18
catnacntcn aanckrcang gngg                                     24

<210> 19
<211> 30
<212> DNA
<213> artificial

<220>
<223> PCR amplification primer

<400> 19
atgtggatac ctgcaacaa ggctaagtcg                                     30

<210> 20
<211> 36
<212> DNA
<213> artificial

<220>
<223> PCR amplification primer

<400> 20
ttaaaacgca ttactaatcc aatcgaagat aactgg                               36

<210> 21
<211> 519
<212> DNA
<213> unknown

<220>
<223> isolated from unknown organism from coastal seawater of Kolguev
Island, Barents Sea, Russia (KOL)

<400> 21
atgcatcagt tggcagtcac cggcaagcag gcagctgatg tggctgtgct gctgggcggt      60
caacagcttg aggtgcaccg gatagagcgg gatgacgtct tgatccagca cctgatcgag      120
ctggaacgtc agttctggca ttacgttgaa accgacacac cgccaccagc cgacggctct      180
gattccgctg acatggcact gcgtctgctc taccggaag acacaggtat ggttattgac      240
ctctctcagg atcagtcctt gaacgagtcc tataccgagc tcaagcaggt acggcagtca      300
ctctctgatc tgagcacccg agaatctgtt ctcaagcagc gtcttcaaga gtccatgggg      360

```

PCT_18977_HZI_sequence listing.ST25.txt

tcagccagta aagccgtggt tgccaatggc tctatcactt ggaagaaagc caaggatggc 420
atcgccatgg atatggaggc cctgttcaag ggcgaccctg acctgaaaac ccaataccag 480
atcagcaagc ctggcagcag gcgctttctg gtcaattaa 519

<210> 22
<211> 172
<212> PRT
<213> unknown

<220>
<223> isolated from unknown organism from coastal seawater of Kolguev
Island, Barents Sea, Russia (KOL)

<400> 22

Met His Gln Leu Ala Val Thr Gly Lys Gln Ala Ala Asp Val Ala Val
1 5 10 15

Leu Leu Gly Gly Gln Gln Leu Glu Val His Arg Ile Glu Arg Asp Asp
20 25 30

Val Leu Ile Gln His Leu Ile Glu Leu Glu Arg Gln Phe Trp His Tyr
35 40 45

Val Glu Thr Asp Thr Pro Pro Ala Asp Gly Ser Asp Ser Ala Asp
50 55 60

Met Ala Leu Arg Leu Leu Tyr Pro Glu Asp Thr Gly Met Val Ile Asp
65 70 75 80

Leu Ser Gln Asp Gln Ser Leu Asn Glu Ser Tyr Thr Glu Leu Lys Gln
85 90 95

Val Arg Gln Ser Leu Ser Asp Leu Ser Thr Arg Glu Ser Val Leu Lys
100 105 110

Gln Arg Leu Gln Glu Ser Met Gly Ser Ala Ser Lys Ala Val Phe Ala
115 120 125

Asn Gly Ser Ile Thr Trp Lys Lys Ala Lys Asp Gly Ile Ala Met Asp
130 135 140

Met Glu Ala Leu Phe Lys Ala His Pro Asp Leu Lys Thr Gln Tyr Gln
145 150 155 160

Ile Ser Lys Pro Gly Ser Arg Arg Phe Leu Val Asn
165 170

<210> 23
<211> 11
<212> PRT
<213> unknown

PCT_18977_HZI_sequence_listing.ST25.txt

<220>
<223> isolated from unknown organism from coastal seawater of Kolguev Island, Barents Sea, Russia (KOL)

<400> 23

Gly Val Pro Lys Tyr Val Glu Val Gln Val Met
1 5 10

<210> 24
<211> 6
<212> PRT
<213> unknown

<220>
<223> isolated from unknown organism from coastal seawater of Kolguev Island, Barents Sea, Russia (KOL)

<400> 24

Ala Ser Lys Ala Val Phe
1 5

<210> 25
<211> 33
<212> DNA
<213> artificial

<220>
<223> PCR amplification primer

<220>
<221> misc_feature
<222> (3)..(3)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (6)..(6)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (9)..(9)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (12)..(12)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (15)..(15)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (18)..(18)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (24)..(24)
<223> n is a, c, g, or t

PCT_18977_HZI_sequence listing.ST25.txt

```

<220>
<221> misc_feature
<222> (30)..(30)
<223> n is a, c, g, or t

<400> 25
ggngtncna antangtnga rgtncargtn atg
33

<210> 26
<211> 18
<212> DNA
<213> artificial

<220>
<223> PCR amplification primer

<220>
<221> misc_feature
<222> (4)..(4)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (7)..(7)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (10)..(10)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (13)..(13)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (16)..(16)
<223> n is a, c, g, or t

<400> 26
raanacngcn tttnswngc
18

<210> 27
<211> 24
<212> DNA
<213> artificial

<220>
<223> PCR amplification primer

<400> 27
atgcatcagt tggcagtcac cggc
24

<210> 28
<211> 27
<212> DNA
<213> artificial

<220>
<223> PCR amplification primer

```

PCT_18977_HZI_sequence listing.ST25.txt

<400> 28
ttaaattgacc agaaagcgcc tgctgcc 27

<210> 29
<211> 888
<212> DNA
<213> unknown

<220>
<223> isolated from unknown organism from coastal seawater of Kolguev Island, Barents Sea, Russia (KOL)

<400> 29
attgtaatac gactcactat agggcggaatt gggcccgacg tcgcatgctc ccggccgcca 60
tggcggccgc gggaattcga ttatgtggcc agctatcgct tcggccatca gatttacacc 120
cccgatgaca tcgaaatagc gtcattgata gaagacgacg gcccttatgc gggcctagcc 180
tatgctggcc tgcgatcctt ccaatcccgg gaccaggggc aatggcgcgga tagtcgtgcc 240
tggcacatgg atctgggcct agtcggcccg ggtgccggag gccagcgctt ccagagtgtc 300
gtccatggtg ctaccggcag tgatgagccc aaagggttggg acaatcagct tgagaatgaa 360
cccttcttca acgtggccta cgggcagcgt tgggtggcggc agtcccgcct gggatctttg 420
gagcttgaat acgggcctgc aatggcgcg gcggtggca atctttacac ctatgcttcc 480
agcggccttg gcttgcgctt tggcaaaggg ctggaacaca gcttgggggtt accgtctatc 540
aaccggggct atggtagcgg cgcctacttc gagccggggc aatcgttcgc ctggttcggt 600
tacgtcaatg ttgatggccg ttacatggct cataacatgc tgctggacgg aaacaccttc 660
agcaacagcc attccgtaga ccgggagcaa tgggtcggcg atctgcaggc gggatatgcc 720
ctgacctggg agcgtggca agtgagcttt gccagtgtgt ggcgcacccg ggagttcaag 780
ggccagactg aaccgatca atttgggtcg ctggtggaat cactagtga ttcgcggccg 840
cctgcaggtc gaccatatgg gagagctccc aacgcgttgg atgcatga 888

<210> 30
<211> 295
<212> PRT
<213> unknown

<220>
<223> isolated from unknown organism from coastal seawater of Kolguev Island, Barents Sea, Russia (KOL)

<400> 30
Ile Val Ile Arg Leu Thr Ile Gly Arg Ile Gly Pro Asp Val Ala Cys
1 5 10 15
Ser Arg Pro Pro Trp Arg Pro Arg Glu Phe Asp Tyr Val Ala Ser Tyr
20 25 30
Arg Phe Gly His Gln Ile Tyr Thr Pro Asp Asp Ile Glu Ile Ala Ser
35 40 45

PCT_18977_HZI_sequence listing.ST25.txt

Leu Ile Glu Asp Asp Arg Pro Tyr Ala Gly Leu Ala Tyr Ala Gly Leu
50 55 60

Ser Ile Phe Gln Ser Arg Asp Gln Gly Gln Trp Arg Asp Ser Arg Ala
65 70 75 80

Trp His Met Asp Leu Gly Leu Val Gly Pro Gly Ala Gly Gly Gln Arg
85 90 95

Phe Gln Ser Ala Val His Gly Ala Thr Gly Ser Asp Glu Pro Lys Gly
100 105 110

Trp Asp Asn Gln Leu Glu Asn Glu Pro Phe Phe Asn Val Ala Tyr Gly
115 120 125

Gln Arg Trp Trp Arg Gln Ser Arg Leu Gly Ser Leu Glu Leu Glu Tyr
130 135 140

Gly Pro Ala Met Gly Ala Ala Ala Gly Asn Leu Tyr Thr Tyr Ala Ser
145 150 155 160

Ser Gly Leu Gly Leu Arg Phe Gly Lys Gly Leu Glu His Ser Leu Gly
165 170 175

Leu Pro Ser Ile Asn Pro Gly Tyr Gly Ser Gly Ala Tyr Phe Glu Pro
180 185 190

Gly Gln Ser Phe Ala Trp Phe Gly Tyr Val Asn Val Asp Gly Arg Tyr
195 200 205

Met Ala His Asn Met Leu Leu Asp Gly Asn Thr Phe Ser Asn Ser His
210 215 220

Ser Val Asp Arg Glu Gln Trp Val Gly Asp Leu Gln Ala Gly Ile Ala
225 230 235 240

Leu Thr Trp Glu Arg Trp Gln Val Ser Phe Ala Ser Val Trp Arg Thr
245 250 255

Arg Glu Phe Lys Gly Gln Thr Glu Pro Asp Gln Phe Gly Ser Leu Val
260 265 270

Glu Ser Leu Val Asn Ser Arg Pro Pro Ala Gly Arg Pro Tyr Gly Arg
275 280 285

Ala Pro Asn Ala Leu Asp Ala
290 295

<210> 31
<211> 9
<212> PRT
<213> unknown

PCT_18977_HZI_sequence_listing.ST25.txt

<220>
<223> isolated from unknown organism from coastal seawater of Kolguev Island, Barents Sea, Russia (KOL)

<400> 31

Pro Tyr Ala Gly Leu Ala Tyr Ala Gly
1 5

<210> 32
<211> 10
<212> PRT
<213> unknown

<220>
<223> isolated from unknown organism from coastal seawater of Kolguev Island, Barents Sea, Russia (KOL)

<400> 32

Trp Val Gly Asp Leu Gln Ala Gly Ile Ala
1 5 10

<210> 33
<211> 26
<212> DNA
<213> artificial

<220>
<223> PCR amplification primer

<220>
<221> misc_feature
<222> (3)..(3)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (6)..(6)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (9)..(9)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (12)..(12)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (15)..(15)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (18)..(18)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (24)..(24)

<223> n is a, c, g, or t

<400> 33

ccntangcng gnytngcnta ygcngg

26

<210> 34

<211> 26

<212> PRT

<213> artificial

<220>

<223> PCR amplification primer

<400> 34

Ala Ala Asn Gly Ala Asn Gly Ala Asn Gly Ala Asn Met Gly Asn Cys
1 5 10 15

Cys Asn Thr Ala Tyr Gly Cys Asn Gly Gly
20 25

<210> 35

<211> 28

<212> DNA

<213> artificial

<220>

<223> PCR amplification primer

<220>

<221> misc_feature

<222> (3)..(3)

<223> n is a, c, g, or t

<220>

<221> misc_feature

<222> (6)..(6)

<223> n is a, c, g, or t

<220>

<221> misc_feature

<222> (9)..(9)

<223> n is a, c, g, or t

<220>

<221> misc_feature

<222> (15)..(15)

<223> n is a, c, g, or t

<220>

<221> misc_feature

<222> (21)..(21)

<223> n is a, c, g, or t

<220>

<221> misc_feature

<222> (24)..(24)

<223> n is a, c, g, or t

<400> 35

gcnatnccng cytgmarytc nccnacc

28

<210> 36

PCT_18977_HZI_sequence_listing.ST25.txt

<211> 24
 <212> DNA
 <213> artificial
 <220>
 <223> PCR amplification primer
 <400> 36
 atgtggccag ctatcgcttc ggcc 24

<210> 37
 <211> 24
 <212> DNA
 <213> artificial
 <220>
 <223> PCR amplification primer
 <400> 37
 tcaaaacgcc cgagccacca ccag 24

<210> 38
 <211> 474
 <212> DNA
 <213> unknown
 <220>
 <223> isolated from unknown organism from acidic of Porto Levante,
 Vulcanic Island, Italy (VUL)
 <400> 38
 atgttgcgct tggcgcaggg gggattcagt aatatggcag caccgattca gaaagtcac 60
 cgacaggaac cccgtcaaaaa tccgcttgag tctgggagcc cgtcggcttc ggaggaactt 120
 caactattgg ttgaagaact gcatcagagc ggggttctcg aggctgcacg gtcgatgctt 180
 ggagcaaagg attccatcgc caaaatcctg gtcgagcaac tgctgagaaa ggatgtactg 240
 acgcttatca acaatttgat ggcggcaggg accgttctga caaagctcga tccagcgcag 300
 ctcgagcgct tgaccgaagg actgagtgcc ggggtaacag aggcacatca gacaatcgaa 360
 gcgaatcagt caatcagtat catgggactt ttgaagacat tgcaagaccc cgatgtaaac 420
 cgggcactcc agtttgccat cgggttcctc aggggtctcg ggaaaactat ctga 474

<210> 39
 <211> 157
 <212> PRT
 <213> unknown
 <220>
 <223> isolated from unknown organism from acidic of Porto Levante,
 Vulcanic Island, Italy (VUL)
 <400> 39
 Met Leu Arg Leu Val Gln Gly Gly Phe Ser Asn Met Ala Ala Pro Ile
 1 5 10 15
 Gln Lys Val Ile Arg Gln Glu Pro Val Lys Asn Pro Leu Glu Ser Gly
 20 25 30

PCT_18977_HZI_sequence listing.ST25.txt

Ser Pro Ser Ala Ser Glu Glu Leu Gln Leu Leu Val Glu Glu Leu His
35 40 45

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

Ser Ile Ala Lys Ile Leu Val Glu Gln Leu Leu Arg Lys Asp Val Leu
65 70 75 80

Thr Leu Ile Asn Asn Leu Met Ala Ala Gly Thr Val Leu Thr Lys Leu
85 90 95

Asp Pro Ala Gln Leu Glu Arg Leu Thr Glu Gly Leu Ser Ala Gly Val
100 105 110

Thr Glu Ala His Gln Thr Ile Glu Ala Asn Gln Ser Ile Ser Ile Met
115 120 125

Gly Leu Leu Lys Thr Leu Gln Asp Pro Asp Val Asn Arg Ala Leu Gln
130 135 140

Phe Ala Ile Gly Phe Leu Arg Gly Leu Gly Lys Thr Ile
145 150 155

<210> 40
<211> 8
<212> PRT
<213> unknown

<220>
<223> isolated from unknown organism from acidic of Porto Levante,
vulcanic Island, Italy (VUL)

<400> 40

Val Glu Glu Leu His Gln Ser Gly
1 5

<210> 41
<211> 6
<212> PRT
<213> unknown

<220>
<223> isolated from unknown organism from acidic of Porto Levante,
vulcanic Island, Italy (VUL)

<400> 41

Glu Ala Ala Arg Ser Met
1 5

<210> 42
<211> 6
<212> PRT
<213> unknown

PCT_18977_HZI_sequence_listing.ST25.txt

<220>
<223> isolated from unknown organism from acidic of Porto Levante,
Vulcanic Island, Italy (VUL)

<400> 42

Pro Asp Val Asn Arg Ala
1 5

<210> 43
<211> 6
<212> PRT
<213> unknown

<220>
<223> isolated from unknown organism from acidic of Porto Levante,
Vulcanic Island, Italy (VUL)

<400> 43

Gln Phe Ala Ile Gly Phe
1 5

<210> 44
<211> 23
<212> DNA
<213> artificial

<220>
<223> PCR amplification primer

<220>
<221> misc_feature
<222> (3)..(3)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (6)..(6)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (9)..(10)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (12)..(12)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (15)..(15)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (21)..(21)
<223> n is a, c, g, or t

<400> 44
gtngangann tncancarws ngg

PCT_18977_HZI_sequence_listing.ST25.txt

<210> 45
<211> 18
<212> DNA
<213> artificial

<220>
<223> PCR amplification primer

<220>
<221> misc_feature
<222> (3)..(3)
<223> n is inosine and is represented by 'i' in Table 4

<220>
<221> misc_feature
<222> (6)..(6)
<223> n is inosine and is represented by 'i' in Table 4

<220>
<221> misc_feature
<222> (9)..(9)
<223> n is inosine and is represented by 'i' in Table 4

<220>
<221> misc_feature
<222> (12)..(12)
<223> n is inosine and is represented by 'i' in Table 4

<220>
<221> misc_feature
<222> (15)..(15)
<223> n is inosine and is represented by 'i' in Table 4

<400> 45
gangcngcnm gnwgnatg

18

<210> 46
<211> 16
<212> DNA
<213> artificial

<220>
<223> PCR amplification primer

<220>
<221> misc_feature
<222> (2)..(2)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (5)..(5)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (8)..(8)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (14)..(14)
<223> n is a, c, g, or t

<400> 46

cncknttnac rtcngg 16

<210> 47
 <211> 18
 <212> DNA
 <213> artificial

<220>
 <223> PCR amplification primer

<220>
 <221> misc_feature
 <222> (4)..(4)
 <223> n is a, c, g, or t

<220>
 <221> misc_feature
 <222> (7)..(7)
 <223> n is a, c, g, or t

<220>
 <221> misc_feature
 <222> (10)..(10)
 <223> n is a, c, g, or t

<400> 47
 raanccnatn gcraaytg 18

<210> 48
 <211> 21
 <212> DNA
 <213> artificial

<220>
 <223> PCR amplification primer

<400> 48
 atgttgcgct tgggtgcaggg g 21

<210> 49
 <211> 21
 <212> DNA
 <213> artificial

<220>
 <223> PCR amplification primer

<400> 49
 ctagatagtt ttcccagagac c 21

<210> 50
 <211> 486
 <212> DNA
 <213> unknown

<220>
 <223> isolated from unknown organism from brine-seawater interface
 above hypersaline anoxic basin L'Atalante, Eastern Mediterranean
 Sea (L'A)

<400> 50
 ttattgatgg cagagatgac agaagaaaaa ttagctgagt atttagaacc tttatcagaa 60

PCT_18977_HZI_sequence listing.ST25.txt

```

attttatcac gctatgaaaa aaaagagaga tatttaattc cggttttaca ggaagctcag      120
gaggaatatg gttatttacc ggaagaagta atgaaagaaa tagcattggg cttaaattctt      180
tctttaagtc aggtatatgg ggttgtaaca ttttacagtc agtttcatca ggagccaaga      240
ggtaataata ttattcgggt ttgtctggga acagcctgtc atgttagagg tggagatgga      300
atcttaaatg ctattaaaga tgaactggga attgatgcag gagaaacaac tgatgattta      360
gaatttacac ttgaatctgt ggcctgtatt ggtgcctgtg gtctggctcc agttataatg      420
gtcaatgatg ataccacagg ccgtttaact ccggaaaaag ttcctgaaat tatggcaaag      480
tataaa                                         486

```

```

<210> 51
<211> 162
<212> PRT
<213> unknown

```

```

<220>
<223> isolated from unknown organism from brine-seawater interface
      above hypersaline anoxic basin L'Atalante, Eastern Mediterranean
      Sea (L'A)

```

```

<400> 51

```

```

Leu Leu Met Ala Glu Met Thr Glu Glu Lys Leu Ala Glu Tyr Leu Glu
1          5          10          15

```

```

Pro Leu Ser Glu Ile Leu Ser Arg Tyr Glu Lys Lys Glu Arg Tyr Leu
          20          25          30

```

```

Ile Pro Val Leu Gln Glu Ala Gln Glu Glu Tyr Gly Tyr Leu Pro Glu
          35          40          45

```

```

Glu Val Met Lys Glu Ile Ala Leu Gly Leu Asn Leu Ser Leu Ser Gln
          50          55          60

```

```

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

```

```

Gly Asn Asn Ile Ile Arg Val Cys Leu Gly Thr Ala Cys His Val Arg
          85          90          95

```

```

Gly Gly Asp Gly Ile Leu Asn Ala Ile Lys Asp Glu Leu Gly Ile Asp
          100          105          110

```

```

Ala Gly Glu Thr Thr Asp Asp Leu Glu Phe Thr Leu Glu Ser Val Ala
          115          120          125

```

```

Cys Ile Gly Ala Cys Gly Leu Ala Pro Val Ile Met Val Asn Asp Asp
          130          135          140

```

```

Thr His Gly Arg Leu Thr Pro Glu Lys Val Pro Glu Ile Met Ala Lys
          145          150          155          160

```

PCT_18977_HZI_sequence_listing.ST25.txt

Tyr Lys

<210> 52
<211> 11
<212> PRT
<213> unknown

<220>
<223> isolated from unknown organism from brine-seawater interface
above hypersaline anoxic basin L'Atalante, Eastern Mediterranean
Sea (L'A)

<400> 52

Leu Leu Met Ala Glu Met Thr Glu Glu Lys Leu
1 5 10

<210> 53
<211> 14
<212> PRT
<213> unknown

<220>
<223> isolated from unknown organism from brine-seawater interface
above hypersaline anoxic basin L'Atalante, Eastern Mediterranean
Sea (L'A)

<400> 53

Lys Glu Ile Ala Leu Gly Leu Asn Leu Ser Leu Ser Gln Val
1 5 10

<210> 54
<211> 12
<212> PRT
<213> unknown

<220>
<223> isolated from unknown organism from brine-seawater interface
above hypersaline anoxic basin L'Atalante, Eastern Mediterranean
Sea (L'A)

<400> 54

Pro Glu Lys Val Pro Glu Ile Met Ala Lys Tyr Lys
1 5 10

<210> 55
<211> 40
<212> DNA
<213> artificial

<220>
<223> PCR amplification primer

<400> 55
gacgacgaca agatgatgtt attgatggca gagatgacag

40

<210> 56
<211> 44
<212> DNA

PCT_18977_HZI_sequence listing.ST25.txt

<213> artificial

<220>

<223> PCR amplification primer

<400> 56

gaggagaagc ccggttatTT atactttgcc ataatttcag gaac

44

<210> 57

<211> 5210

<212> DNA

<213> unknown

<220>

<223> multifunctional alpha/beta-hydrolase mined from a metagenome library of a microbial community in seawater contaminated with petroleum hydrocarbons

<220>

<221> misc_feature

<222> (3298)..(3298)

<223> n is a, c, g, or t

<400> 57

cgctcccgca cgaatatgaa cgctgtgaaa ttccggtgta tatgcgcaa caaggaccaa	60
atcatgccag tcaagccaaa ctatggccta ataaggtctg ggtttacgag taccgcctaa	120
gtactattgg ccatcgtcga atcctaacag gtgactacac atctgtttat ccacccatcg	180
ataacaataa ggtttactga tgaatctcgt taaaagcctg ataatactgc ttgtgatcgc	240
agtgatcgga atatttgcta gcgtccactt tgctccgttc gaaacagctt cttgtcttgt	300
cgatattaaa cgcaatatcg ccggcctaga gcgcaaaagc atttccctcg ccgatggtaa	360
ccaatatggt tatcttgaag gcggcaaggg tgaaaccttg gtattacttc acggttttgg	420
tgccgataaa gataacttta ccgaagttag cccttactta acgggcgact tccatgttat	480
tgctcccgac cacattggct ttggtgaatc ctctaagcca acaggcgag attatagccc	540
tatcgctcaa gcgcagcgtt tgcattgaatt gggtgcgcgc ctcggtttag agcgcttcca	600
cttaggtgga agctcaatgg gtggccacat agcgatgaca tacgccacgc tatacccgca	660
tgaagttaag agcttatggt tactcgaccc aggtggtggt ttggtccgctc cggaagccga	720
aatgcgcact atcattcgta aaactggggg gaatccgtta acagctaaaa cccagaaga	780
gttccgtaaa gtattcgata tcgtgatgag caagccccct ttcattccag gctttgtact	840
cgatgaaatg gcgaaaaagc gtatcgctaa cttcgattta gaacagaata tttttgcca	900
actatctgca gacaatgtcg aagaacgcgt ccgcggccta accacccta ctttgctagt	960
atggggcgct gaagatcgag tactcaaccc agaagcagca ccattcttg aaggactttt	1020
gaccaatggt aaaacgatta tcatgccagg tattggtcac ctgcctatgc tagaagcgcc	1080
aaagcaaaca gcaaccgact taaaagcatt tattgctgat ttgcctgaat aaaactaata	1140
ggcgttgaat ttaacagcgc ccagaaaaaa gcggccctct gcaaataaac aggggccgct	1200
ttttttatac ttaaaaggct ggattaatta gcttcaatgc tcacatctaa agacatttca	1260

PCT_18977_HZI_sequence listing.ST25.txt

ccaccgttct	catccgtacc	ggacgccgaa	aaagccagtt	gatcatcact	cgttgcggta	1320
atttcaaacg	cataagtcgc	cgtgctctga	caggcatcat	cactctcatc	acacgtacct	1380
tcgccataaa	tatcactttg	accggaaata	atatacctgcg	agaaggtggt	gtcgtaaacc	1440
aaagttacgt	tcaatccgat	tgtgctcgca	tcgccagaaa	acgctgcctt	ctcccccgcc	1500
agcgtcatga	tttcagcgta	attgacagcg	gatatagagg	tgttgctatt	caccacaccg	1560
gcaccaactc	ccttcgaagc	accaacacac	gctaacgaat	cacttaattc	tgcaaagggtg	1620
gactggcg	aacccacagt	aaaatcgaca	cctatcgcg	attcactagc	ggcatcggtg	1680
aacgaagtgg	catcgctaac	cttcacaccc	accatgcgcg	tattttgcgc	aatgctgtac	1740
ccgtcccccg	tcgcatcagt	ctgcaagctg	ccagacaagc	tcggttggtt	gggttactat	1800
cagactccaa	ttgtaagagt	cctcaaccga	gccacttaat	gtgccatcag	caagcggttaa	1860
cgtgatatcg	gtaaaatcta	attcgtgagc	aatattacat	gccccaaagc	ggtactcacc	1920
ttcggtttct	aatgcgctca	gtaataccag	ttggcgacct	tgatagtagt	tggtggtatc	1980
actgctatcg	gtcacttcat	aatcaaactt	cgaactggta	tttatcagcc	ataagccttc	2040
aggggtatct	gaacttaatg	ccgcatccgc	tgctggaaga	tctgccccca	attcagctaa	2100
ggtttgttgc	gcaagttgcg	tggtagggc	aacgtcgatc	acggtagcga	cattggtact	2160
gctactgtta	ccactgcagg	ccgataccag	tcgagcaacg	accaagcaat	aggccgactt	2220
tttgaattgg	gagtgcata	tgatttcctt	ttgatattct	tatttaatcc	tagaagggga	2280
tcatagcaga	cgcaattgca	gacctaagg	caattcgggc	ccattaccaa	tacgattatc	2340
cccacttacc	ttggcctcct	agcgttcacg	ccgttataat	cgcccgcaga	aattcatcct	2400
cctatcctca	cgggactatc	tcatgacctc	taaaaccgtc	gtttccgaac	gcctgtatga	2460
tggttacgcc	caatccttca	ctgtgagcga	actgctgttt	gaagtgaaaa	cggaacacca	2520
acatctggaa	atcttcgaaa	cgccgtttct	aggccgcggt	atgctgctgg	atggagtgg	2580
acaaaccacc	gagaaagacg	aatttattta	ccacgaaagc	atggtccatg	tgcttttgtt	2640
tgcccaccca	gcccctaacg	tgtgctaatt	attggtggcg	gcgacggcgg	catcttgcgt	2700
gaagtgttgc	gccacaaaaa	cgtagaacac	gtaaccgaag	ttgaaatcga	cggcagcgctc	2760
atcgacatgt	gcaaagaata	cttcccacgt	cattctaattg	gtgccttcga	tgaccgcgc	2820
gccactatcg	tgatcgccga	tggcaaagaa	ttcgctcgcca	actgccaaga	caaatacgac	2880
gtcatcatct	ccgactccac	cgaccctatc	ggcccaggcg	aagtgctgtt	tacctccgat	2940
ttctatgccg	acgaaaaaac	ctgcctgaac	gaaggcggca	tcatggtggc	acagaacggc	3000
gtgccgttta	tgcaaggcca	agaaatcacc	aataccttcc	agcgcctaag	caaactgtac	3060
gcggacaaca	gcttctacgt	tgcccccg	ccaacctatg	caggtgggtt	tatgacctta	3120
gcctgggcaa	ccgacgacgc	ctcattgcgc	aagcaaagcg	ttgaacagat	tcaagcgct	3180
tacgacgccg	cagggtttag	cacacgttat	tacaaccag	agattcatgt	tcgggcattt	3240
gcattgccga	attatgtgaa	agctttgatg	gtgtgatttt	atgcttgaag	tcaaatgnct	3300

PCT_18977_HZI_sequence listing.ST25.txt

tcgaccaatc	ttgtaggagg	gagtcagcga	acgttttttg	ttcgtactcc	cgattactgc	3360
agttttcgtc	actgctcgct	gtcgtctcct	gagtgactcc	tacagaaaga	tccacccttg	3420
gttttaagtc	cgtgttgcg	aaagaactcg	cggcgtcagc	cgaaaaaccc	accaatagct	3480
acaaaatccc	accgtcactg	ttataatctc	gcgtctttta	attttcgaac	gttgcataac	3540
gcacgcaaac	aggaatcctc	gctgtgagcc	agagtcgcc	taacgtcaaa	acattccaag	3600
gcttaatcgc	tgccttgag	gaatactggt	ccgaacaggg	ctgtgtaatc	aaccaaccac	3660
tcgatatgga	agtcggtgcc	ggtactttcc	ataccgcgac	gtttttgctg	gctattggcc	3720
cagaaaactg	gagtgctgct	tatgttcaac	caagccgccg	tcctactgat	ggccgctatg	3780
gtgaaaaccc	gaaccgcttg	caacattact	accaatttca	ggtagtgatg	aagccaaacc	3840
cagtggatat	tcaagaaaag	taccttgagt	cgctgcgcgt	gatgggcgtt	gatcctttgg	3900
ttcacgatat	tcgtttcggt	gaagacaact	gggaatcacc	aacgctaggg	gcttgggggt	3960
tgggctggga	agtttggtt	aacggtatgg	aagtgactca	gttcacttac	ttccagcaag	4020
ttggcggttt	ggaatgtttc	cccgtaaccc	gcgaaatcac	ttacggtctt	gagcgtatcg	4080
ccatgtacct	gcaagaagtg	gattctgtct	acgacttagt	ttggacttac	ggcccagacg	4140
gcaaagctgt	gacctacggc	gatgtgttcc	atcaaaacga	agtagaacag	tcggcctata	4200
acttcgaaca	cgccgatgtc	gatttcttat	tcaaagcctt	cgaccaatac	gagaaagact	4260
gcaaacgtct	gatcgaagtt	ggcttgccgc	taccgcgtta	cgagcaggta	ttgaaaggct	4320
cgcatacctt	taacttactc	gatgctcgcg	gcgcgatttc	tgtgactgag	cgtcagggct	4380
atatcttgcg	tgtacgtacc	ttagcgcgct	cggttgctga	agcttacttc	aacagccgtg	4440
ccgaaaaagg	cttcccgtg	gcgaccgaag	caaaccgcgc	cgaagtatta	gcgaagtacg	4500
aagcagccaa	ggcgaaaaaa	gccgataaag	acgctgcccc	gcaggagacc	aaataatgag	4560
cactcgtgat	ttcttagtag	agctaggcac	cgaagagctg	ccaccgaaag	cgcttaaaaa	4620
tctgtctaac	gcgtttgccc	agggcattga	acaaggtttg	aaagacgccg	gtttaaccat	4680
gggtgcgatt	gaacaattcg	ccgcgccacg	tcgttttagcc	gtgcgcattt	cggagttacc	4740
agagcagcaa	gccgatcaag	aagaagtgct	atacgccccg	ccagccaaca	tcgcctttga	4800
cgccgatggt	aagccaacca	aagccgcctt	aggctttgcg	gcccgcgccg	gtgccgatgc	4860
gtctgaatta	aaaacagcgc	cagattctga	caaaaagaat	gccggtaagc	taatgctcga	4920
acgtacgatc	aaaggcaaaa	ataccactga	gctattggcc	gctattgtgc	aaaacagctt	4980
agataagttg	ccgattccta	agcgtatgcg	ctgggggttcg	tcacgtattg	aattcgtgcg	5040
ccccgtacag	tggttagtca	tgctgttttg	taacgacgtg	gtcgatgccg	aagcgcttgg	5100
cttaaaagcc	ggcaacacca	gccgtggtca	ccgcttccat	gcgccgggcg	agatccaaag	5160
aattcaaaaa	gcttctcgag	agtacttcta	gagcggccgc	gggcccacgc		5210

<210> 58
 <211> 933
 <212> DNA

PCT_18977_HZI_sequence listing.ST25.txt

<213> unknown

<220>

<223> multifunctional alpha/beta-hydrolase mined from a metagenome library of a microbial community in seawater contaminated with petroleum hydrocarbons

<400> 58

```
atgaatctcg ttaaaagcct gataatactg cttgtgatcg cagtgatcgg aatatttgct    60
agcgtccact ttgctccggt cgaaacagct tcttgtcttg tcgatattaa acgcaatatc    120
gccggcctag agcgcaaaag catttccttc gccgatggta accaatatgt ttatcttgaa    180
ggcggcaagg gtgaaacctt ggtattactt cacgggttttg gtgccgataa agataacttt    240
accgaagtta gcccttactt aacgggcgac ttccatgtta ttgctcccga ccacattggc    300
tttgggtgaat cctctaagcc aacaggcgca gattatagcc ctatcgctca agcgcagcgt    360
ttgcatgaat tggttgcgcg cctcggttta gagcgcttcc acttaggtgg aagctcaatg    420
ggtggccaca tagcgatgac atacgccacg ctataccgcg atgaagttaa gagcttatgg    480
ttactcgacc caggtggtgt ttggtccgct ccggaagccg aaatgcgcac tatcattcgt    540
aaaactgggg tgaatccggt aacagctaaa accccagaag agttccgtaa agtattcgat    600
atcgtgatga gcaagcccc tttcatcca ggctttgtac tcgatgaaat ggcgaaaaag    660
cgtatcgcta acttcgattt agaacagaat atttttgccc aactatctgc agacaatgtc    720
gaagaacgcg tccgcggcct aaccaccctt accttgctag tatggggcgc tgaagatcga    780
gtactcaacc cagaagcagc acccattctg gaaggacttt tgaccaatgt taaaacgatt    840
atcatgccag gtattggtca cctgcctatg ctagaagcgc caaagcaaac agcaaccgac    900
ttaaaagcat ttattgctga tttgcctgaa taa                                933
```

<210> 59

<211> 310

<212> PRT

<213> unknown

<220>

<223> multifunctional alpha/beta-hydrolase mined from a metagenome library of a microbial community in seawater contaminated with petroleum hydrocarbons

<400> 59

```
Met Asn Leu Val Lys Ser Leu Ile Ile Leu Leu Val Ile Ala Val Ile
1          5          10          15

Gly Ile Phe Ala Ser Val His Phe Ala Pro Phe Glu Thr Ala Ser Cys
          20          25          30

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

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

PCT_18977_HZI_sequence_listing.ST25.txt

Glu Thr Leu Val Leu Leu His Gly Phe Gly Ala Asp Lys Asp Asn Phe
 65 70 75 80
 Thr Glu Val Ser Pro Tyr Leu Thr Gly Asp Phe His Val Ile Ala Pro
 85 90
 Asp His Ile Gly Phe Gly Glu Ser Ser Lys Pro Thr Gly Ala Asp Tyr
 100 105 110
 Ser Pro Ile Ala Gln Ala Gln Arg Leu His Glu Leu Val Ala Arg Leu
 115 120 125
 Gly Leu Glu Arg Phe His Leu Gly Gly Ser Ser Met Gly Gly His Ile
 130 135 140
 Ala Met Thr Tyr Ala Thr Leu Tyr Pro His Glu Val Lys Ser Leu Trp
 145 150 155 160
 Leu Leu Asp Pro Gly Gly Val Trp Ser Ala Pro Glu Ala Glu Met Arg
 165 170 175
 Thr Ile Ile Arg Lys Thr Gly Val Asn Pro Leu Thr Ala Lys Thr Pro
 180 185 190
 Glu Glu Phe Arg Lys Val Phe Asp Ile Val Met Ser Lys Pro Pro Phe
 195 200 205
 Ile Pro Gly Phe Val Leu Asp Glu Met Ala Lys Lys Arg Ile Ala Asn
 210 215 220
 Phe Asp Leu Glu Gln Asn Ile Phe Ala Gln Leu Ser Ala Asp Asn Val
 225 230 235 240
 Glu Glu Arg Val Arg Gly Leu Thr Thr Pro Thr Leu Leu Val Trp Gly
 245 250 255
 Ala Glu Asp Arg Val Leu Asn Pro Glu Ala Ala Pro Ile Leu Glu Gly
 260 265 270
 Leu Leu Thr Asn Val Lys Thr Ile Ile Met Pro Gly Ile Gly His Leu
 275 280 285
 Pro Met Leu Glu Ala Pro Lys Gln Thr Ala Thr Asp Leu Lys Ala Phe
 290 295 300
 Ile Ala Asp Leu Pro Glu
 305 310