

SEQUENCE LISTING

<110> Temasek Life Sciences Laboratory Limited
 Liu, Yanbin
 Koh, Chong Mei John
 Sun, Longhua
 Ji, Lianghui

<120> Genetic Manipulation and Expression Systems for Pucciniomycotina
 and Ustilaginomycotina Subphyla

<130> FP5913

<150> US 61/495,619
 <151> 2011-06-10

<160> 58

<170> PatentIn version 3.5

<210> 1
 <211> 597
 <212> DNA
 <213> Ustilago maydis

<400> 1
 gattagatct tgctgatagg caggtttgct tggagaatgg ggggaaaaga ctgaccgaag 60
 aaacagcgag atctagaagt gataagcgga aagaatctga cttgctgtga tcagcagcca 120
 attttttttt cgtttttttt ttttcaactcc acatcgtcgt gcgtgcacgg tctgcatgtg 180
 taaattgtat tcatcgaaag ccacagttga atacatcagc ccgatgtgga tttcgaaaac 240
 caattaatct tggaattcac gcgctcagat cagtccatag agtcgacttc ggctgtttcc 300
 aagagcttct tctctgcgag gtggttgccc gtgtttctcg ctgggaaaaa aggatcgatt 360
 attattcgct tctacctcgc tcgcaccctt ggctgtgta aggaaacagc gccgagactc 420
 ggtcacggtt gctgggctcc gtgttgatgc tgggacggcg caaagtgggg cccgcgcact 480
 cttcgagcca aggacctcac tcttcaagaa caagcgtgtg cgccatcgtc ttcttctttc 540
 tgctccacca tcgaatcttt ctttctcgtt tcgaaaccaa aacactcttc caccatg 597

<210> 2
 <211> 1434
 <212> DNA
 <213> Rhodosporidium toruloides

<400> 2
 ctgcagaact acgccctctc acacccaact tccgactcga ccggcggtac gagcacgacc 60
 tactttact gcctgccatc gacatccggg cgggtcgtg cctaccctgt gcgttctgcg 120
 ccctccctcg tctcgggagg cagtgtctga cagaagcttt gcgcgcagta cccgtcaag 180
 atgcaactct acgcaacgtt cggcacagaa gtcgccaagc tccgcgcacg gccgcctcaa 240
 gctctcgcgc tgcccgcagg tgcgtctat tacgaggcgg agaagctcga gttgccggct 300
 ttgccagcgg cggtaagggt tgagggtgag acggagaagg cgggagtagc gggggaggac 360
 aatgaggcga aggggtgagat ggtgctggtg gagactctta cgggtggagca ggaggagatt 420
 gaattgggct cgggagtcgt gcagattgag gagtcgttgc tcgtcaagct ggaggtcagc 480
 ggctgatcct tccgttcgtt gcaaggatcg tctgcatggt tcgcttctct caatgacaca 540

acctggagag cgtcccgctc agcgaagatc gaggacatc cgcagctcgt gagcaagcgg 600
aggtgcgagg ctcctcgaa agctgcgcct cttcagagg cttgttctct cctgcctcgg 660
tggcctggcc tgacatgtaa tgtctccgc cgaagctcc tctcgtctc caattcgacg 720
ttgaagggc atagcgcaag gaagaacct ctcgggacat gcagaattac tggctcgcc 780
gtccttcgt ctacttgaa atgtcctgtc tegttaagc cccaagtcg ttttcgacg 840
tttgaaggc gcaagaggtg ctatggcta cgaaggagc tgaaggaca tagaagtcgg 900
gggaggagc ggcagagcg gcagttcggg aagcatggg aaagcgagac ggtccagcat 960
ctgcagcgcc aatccgcaat ctctgttg agcctgcac ggaagcgtc gaaagtatg 1020
cgagagtcg aacgaagta agaaagcgc acctcacac tgccttact cgaagcatac 1080
aacgatcaa agctgcgcgt atctcgctt gtaaggccg gaagcaacc tcgagatgg 1140
acagttaca tcaaccaat atcgatctc gccgtcgacg tcgagagag ggcgagagaa 1200
gcgtggaag agggaaaca cccctcgaga gcatgatccg accgaatcg cagcgcagga 1260
agcgttaca agcccgctc gagcgaggt cgggtccagc cgggggacga aacgcgcgag 1320
gctgattcgt gagcggaagg agccgcacg acaagttcg tccctttgc cctcttccc 1380
atacccggt ctgccttac ccgctcagaa caaaccaaga tcactcaaa tgtc 1434

<210> 3
<211> 888
<212> DNA
<213> Aspergillus nidulans

ctgtacagt accgttgact cttctgca tcgagagaga cgaagcggc cagagagaag 60
ggtgagtaa taagcgccac tgcgcagac agctctggcg gctctgaggt gcagtggatg 120
atatataac cgggaccggc cgccctccg cccggaagtg gaaaggctgg tgtgccccctc 180
gttgaccag aatctatgc atcatcgag aatatggagc ttcatcgaa caccggcagt 240
gaagcaagg gaatgtgaag ccagggtgt atagccgtc gcaaatagc atgccatcaa 300
cctaggtaca gaagttcaat tgcctcgat ctggttaaa attcacgaga tagtaacctc 360
tcgaagtag gtagagcggc taccggcgc gtaagctccc taattgccc atccggcatc 420
tgtaggcgt ccaatatcg tgcctctcct gctttgccc gttatgaaa ccggaaggc 480
cgtcagga ctygcagcg gcgcagacg ggaacacaag ctggcagtcg acccatccgg 540
tgcctcgac tcgaacctc gaggtccctc agtccctggt aggcagctt gcccgctc 600
tcggcccggt gttgcggcg gttgacaag gtcgttgctc agttccaaca ttgttgcca 660
tatttctc cttccccc cagctgctt tttctttct ctttctttc ccatcttcag 720
tatattatc tttccatca agaacctta tttccctaa gtaagtact tgcataccc 780
atactcatc tttccatc ctatctct tgaaccttc agttcagct tttccacttc 840
atcgagctt gactaacag taccgcgt gagcagacat caccatgg 888

<210> 4

<211> 617
 <212> DNA
 <213> Aspergillus niger

<400> 4
 gtgcagaga tcgtaggagt gattaccgg cgtgatggag ggggagcag ctattgtc
 60
 cgtacggcag ctgcgaggag gagcaggag atccaatat cgttagctc ctgctttgcc
 120
 cgggtatga aaccggaaag gactgctgg gaaactggga gcggcgcaag ccgggaatcc
 180
 cagctgacaa tgaaccatc ctatgccgt ggacagagct gaggtagct ttgccccgtc
 240
 tgtctcccg gtgtgcgat tcgactgggc ggcgcactg tgcctcctc aggagcggag
 300
 gaccagtag taagtggcc tgaactgtc gtgtgcgtcag tcagaggtt cctcccta
 360
 cccctttct acttccctc cccgcgcgt caactttct ttcccttta ctttctct
 420
 ctctctct tcattccatc tctcttcat acttccctt tcccttcat caattcatc
 480
 tccaagtga tcttctccc catctgtccc tccatcttc ccatcatcat cttccctccc
 540
 agtctctccc ctctctcgt ctctcacga agcttgacta accattaccc cgccacatag
 600
 acacatctaa accatgg

<210> 5
 <211> 388
 <212> DNA
 <213> Ashibia gossippi

<400> 5
 caatacgt gctcgtccc gcgcgggtca ccggccagc gacatggag ccagaatac
 60
 cctcctgac agtcttgacg tgcgcagctc agggcatga tgtgactgtc gccgtacat
 120
 ttagcccata catcccatg tataatcat tgcattcata cattttgatg gccgcacggc
 180
 gcgaagcaaa aattacgct cctgcgtga gacctgcgag cagggaacg ctccctcac
 240
 agacgcgtg aattgtccc acgcgcgc cctgtagaga aatataaag gttagattt
 300
 gccactgagg ttcttcttc atatactcc ttttaaatc ttgctaggat acagttctca
 360
 catcacatcc gaacataaac aacctgg

<210> 6
 <211> 1026
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> synthetic hpt-2 coding sequence

<400> 6
 atgaagaac cagacttac cgcacacag gtggagaagt tctcatcga gaatttcgat
 60
 agcgtgagc atctcatga gctcagcgag ggcgaggaga gcaaggcctt cagcttcgat
 120
 gtgggcgga ggggtacgt gctcaggtg aacagctgc ccgatggctt ctacaaggat
 180
 aggtacgtgt acaggcatct cgcagcgcc gccctccaa tccagaggt gctcgacatc
 240
 ggcagttca gcgaagcct cactactgc atcagcagga ggcctcagg cgtgacccctc
 300
 cagatctcc cagagaccga gcttccagc gtgtccagc cagtggccga ggctatggat
 360

gacatcgccg ccgcgatct cagccagacc agcgcttcg gccattcgg cccacagggc
 420 atcgccagt accaccacct gaggatctc atctgcgcca tcgcccgatc acatgtgtac
 480 cattgycaga cgtgatgga tgataccgtg agcgccagcg tggcccaggc cctcgatgag
 540 ctatgtctt ggcccgagga ttgcccagag gtgaggcatc tcgtccatgc cgaattcggc
 600 agcaacaacg tgcaccaga taacgycag atcacggcg tgatcgactg gagcgaggcc
 660 atgttcggcg atagccagta cgaagtggcc aacatcttct tctggaggcc ctgctcggcc
 720 tgcattgagc agcagaccag gtaactcga aggaggcacc ctgacttcg tggaaagcca
 780 aggtcaggg cctacatgt cagatcggc ctgatcagc tctaccagag cctcgttgat
 840 ggcaacttcg atgatgctgc ttggctcag gtaggtgcg atgccatcgt gaggaagcga
 900 gccggcaccg tggcagagc ccagatcgcc aggaggagcg ccgccgttg gaccgatggc
 960 tgcgtggagg tgcctcgga tagcgcaac aggagccaa gcaaccaggc aagggccaaag
 1020 aagtgag

<210> 7
 <211> 1026
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> synthetic hpt-3 coding sequence

<400> 7
 atgaagaagc cggagctcac cgcacactcg gtccagagaat tccatcga gaattcgaac
 60 tgcgtcctcg acctcatgca gctctcgaag gtcgaagagt cgcgcgctt ctgcttcgac
 120 gtccggcgcc gcggtacgt cctcgcgtc aactcgtcgg aactcgtcgg ccgaagcctt ctaagaagac
 180 cgtacgtctt accgccactt cgcctcggcc gccctccgga tcccgaggt cctcgacatc
 240 ggcgagtctt cggagtctgt cactactgc atctcgcgc gccgccaggc cgtcacccctc
 300 caggacctcc cggagaaccga gctcccggcc gtccctccagc cgttcgcca ggcgatggac
 360 gccatcgccg ccgcggacct ctgcagagacc tcgggcttcg gccgcttcg ccgcagggc
 420 atcgccagt acaccacctg gcgcgacttc atctgcgcca tcgcccagcc gcaagtctac
 480 cactggcaga cgtcatgga cgaaccgtc tcggcctcgg tcgcccaggc cctcgacgag
 540 ctcatgtctt ggcccgagga ctgcccggag gtccgcgcca tcgtccacgc cgaattcggc
 600 tcgaacaacg tccctacaga caacggcgcc atcacggcg tgatcgactg gtccgaggcc
 660 atgttcggcg actcgcagta cgaagtggcc aacatcttct tctggcgccc gtgctcggcc
 720 tgcattgagc agcagacccg ctactcgaag cgcgcgccaac cggagctcgc cgcctcggcg
 780 cgcctccggc cctacatgt cgcacatcgg ctgcacagc tctaccagatc gctcgttcgac
 840 ggcaacttcg acgaaccgcg ctgggcgca ggtggcgtcag gccgctcgg acccactcgt ccgctcgggc
 900 gccggcaccg tccgcccagc ccagatcggc cgcgcgtcgg ccgcccgttg gaccgagcgc
 960 tgcgtcgaag tccctcgga ctccgccaac ctccggccga cgcgcgctgt cgaagccaaag
 1020 gagtag

<210> 8
<211> 573
<212> DNA
<213> Unknown
<220>
<223> nat coding sequence
<400> 8
atgggtacca ctcttgacga caggcttac cgtaccga ccaagtgtcc gggggacacc
60
gaggccatcg aggcactgga tgggtcttc accaccga cagcttcg cgtaccgccc
120
gagggagcg gcttcacccg gcgggaggtg ccggttgacc cggccctgac caaggtgttc
180
cccgaacgag aatcggacga cgaatcggac gacggggagg acggcgacc ggaatccgg
240
acgttcgtcg cgtacgggga cgaacgggac ctggcgggct tctgtgtcgt ctgtactcc
300
ggctggaaac gccgctgac cgtcggagac atcgaagtcg cccggagca ccgggggacac
360
ggggtcgggc gcgcgttgat ggggcctcgcg acggagttcg cagcgagcg gggcgcggg
420
caccctcggc tggaggtcac caagtcacac gcaacggcga tcacgcgctg ccggcggatg
480
gggttcaacc tctgcggcct ggaacccgc ctgtacgacg gcaaccgctc ggaacggcga
540
caggcgtct acatgggcat gccctgcccc taa
573

<400> 9
atgaaaaagc ctgaactcac cgcgacgtct gtcgagaagt ttctgatcga aaatttcgac
60
agcgtctccg acctgatgca gctctcggag ggcgaagaat ctggtgctt cagcttcgat
120
gtagggagcg gtggtatatgt cctgcgggta aatagctcgc ccgatgttt ctacaagat
180
cgttatgttt atcggcactt tgcactcggc gcgtcccgga ttccgggaagt gcttgacatt
240
ggggagtta gcgagagcct gacctatgc atctccgcg gtgcacaggg tgtcacgttg
300
caagaacctgc ctgaaaccga actgcgcgt gttctacaac cgttcgcgga ggtatggat
360
gcgatcgtcg cggccgatct tagccagacg agcgggttcg gcccattcg accgcaagg
420
atcgttcaat acactacatg gcgtgatctc atatgcgcga ttgctgatcc ccattgttat
480
cactggcaaa ctgtgatgga cgacaccgtc agtgcgtccg tcgcgcaggc tctcgatgag
540
ctgatgcttt gggccggaga ctgcccggaa gtcgggcacc tcgtgcacgc ggaatttcggc
600
tccaacaatg tccctgacga caatggccgc ataacagcgg tcattgactg gagcgaggcg
660
atgttcgggg atcccccata cgaggtcgc aacatcttct tctggaggcc gtgttggt
720
tgtatggagc agcagagcgc ctacttcgag cggagggcatc cggagcttgc aggatcgcca
780
cgactccggg cgtatatgtc ccgatitgt cttgaccac tcctatcagag ctgtgttgac
840
ggcaattcg atgatgcagc ttgggcgacg ggtcgtatcg acgcaatcgt ccgatccgga
900
gccgggactg tcgggcgtac acaaatcgc ccgagaagcg cggccgttcg gaccgatggc
960
tgtttagaag tactcgcga tagtggaac cgacgcccc gcactcgtcc gagggcaag
1020

aaatag

1026

<210> 10
 <211> 1181
 <212> DNA
 <213> Rhodosporidium toruloides

<400> 10
 atcacccggt ctcgccttac ccgctcagaa caacaccaga tcactcacia tgtctgccgg 60
 aaagggatct gtcaacgtcg gaatcaacgg cttcggtcgc atcggccgca tcgtcctccg 120
 caacgccatt gagcacggcg atgctcgcgt tgttgccatc aacgaccctt tcatcgacct 180
 tgagtacatg gtctacatgt tcaagtacga ctcgaccac ggtcgcttca agggcaccat 240
 tgaggccaag gacggcaagc tcgtcgtcga cggccacgct atcgacgtct acaacgagaa 300
 ggaccccgcc tcgatccccct ggtccaagtc gggcgccgac tacgtcgtcg agtcgaccgg 360
 tgtcttcacc accaaggaga aggctggcct tcacttgaag ggcggtgcca agaaggctcg 420
 catctcggcg ccttccgctg acgcccccat gtacgtctgc ggtgtcaacc tcgacaagta 480
 caaccccgcc gactcgggtca tctcgaacgc ctcgtgcacc accaactgcc ttgcgcccct 540
 cgccaagggtc atcaacgaca agttcggcat cgtcgagggt ctcatgacca ccgtccacgc 600
 cacgaccgcg acgcagaaga ccgtcgacgg cccttcggcc aaggactggc gcggtggccg 660
 cgctgcgggt gccaacatca tccccctcgtc gaccggtgcc gccaaaggcc tcggcaagggt 720
 catccccgag ctcaacggca agctcaccgg catggctttc cgcgtcccca ccaccgacgt 780
 ctcggttgtc gacctaccg tccgccttga gaagggcgcc tcgtacgacc agatcaagca 840
 gaccatccgc gaggccgcca acggtgagct caagggcatc ctcgagtaca ccgaggacgc 900
 gctcgtctca accgactttg tcggccacac cgcctcgtcc atcttcgacg cgtcggctgg 960
 tatcgccctc aacgacaact ttgtcaagct cgtctcgtgg tacgacaacg agtacgggta 1020
 ctcccgccgc gttgtcgacc tcctcgtttt cgtggctaag caggacgccg ccggtggcaa 1080
 gctctaagcg gtttctgtag actcccgctt tcctctagcc tagcctcttc gtttcttcca 1140
 ctgcgcagtt tgagtgaatg cgtaaaattc agttcacagc c 1181

<210> 11
 <211> 89
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> oligonucleotide containing LoxP site

<400> 11
 aattcaataa ataacttcgt ataattgatg ctatacgaag ttatctcgag atatcataac 60
 ttcgtataat gtatgctata cgaagttat 89

<210> 12
 <211> 89
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> oligonucleotide containing LoxP site
 <400> 12
 ctagataact tcgtatagca tacattatac gaagttatga tatctcgaga taacttcgta 60
 tagcatacat tatacgaagt tatttattg 89

<210> 13
 <211> 20
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> oligonucleotide PCR primer
 <400> 13
 cctgtggttg gcatgcacat 20

<210> 14
 <211> 48
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> oligonucleotide PCR primer
 <400> 14
 aaaggcgcgc cttaattaag gactagtcaa tgtactgaat taacgccg 48

<210> 15
 <211> 30
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> oligonucleotide PCR primer
 <400> 15
 aaagtcgacg agatcgtagg agtgagtacc 30

<210> 16
 <211> 31
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> oligonucleotide PCR primer
 <400> 16
 aaaaccatgg tttagatgtg tctatgtggc g 31

<210> 17
 <211> 43
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> oligonucleotide PCR primer
 <400> 17
 aaactcgaga ctagtcacta tacgtgcctc gtccccgccg ggt 43

<210> 18

<211> 36
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> oligonucleotide PCR primer

 <400> 18
 aaaccatggt gacggttgatg aatgaactcg aagttc 36

<210> 19
 <211> 28
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> oligonucleotide PCR primer

 <400> 19
 aaaatcatga agaagccaga gcttaccg 28

<210> 20
 <211> 33
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> oligonucleotide PCR primer

 <400> 20
 aaaactagtt aattcggggg atctggattt tag 33

<210> 21
 <211> 23
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> oligonucleotide PCR primer

<220>
 <221> misc_feature
 <222> (6)..(6)
 <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> 21
 aayggnattyg gncgnathgg ncg 23

<210> 22
 <211> 23

<212> DNA
 <213> Artificial Sequence
 <220>
 <223> oligonucleotide PCR 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> (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> (21)..(21)
 <223> n is a, c, g, or t

<400> 22
 ccnacngcyt tngcngcncc ng

23

<210> 23
 <211> 8
 <212> PRT
 <213> Rhodosporidium toruloides

<400> 23

Asn Gly Phe Gly Arg Ile Gly Arg
 1 5

<210> 24
 <211> 8
 <212> PRT
 <213> Rhodosporidium toruloides

<400> 24

Thr Gly Ala Ala Lys Ala Val Gly
 1 5

<210> 25
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> oligonucleotide PCR primer

<400> 25
 tgtcttcacc accaaggaga 20

<210> 26
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> oligonucleotide PCR primer

<400> 26
 agctatcgag cgagaaacgt 20

<210> 27
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> oligonucleotide PCR primer

<400> 27
 tgagtacaac gagttccac a 21

<210> 28
 <211> 19
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> oligonucleotide PCR primer

<400> 28
 agccatgccg gtgagcttg 19

<210> 29
 <211> 29
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> oligonucleotide PCR primer

<400> 29
 ttccatggc gaagtcaccc tgcctcat 29

<210> 30
 <211> 28
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> oligonucleotide PCR primer

<400> 30
 ttttaagcttc ttgccaagt tcgacctg 28

<210> 31
 <211> 31
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> oligonucleotide PCR primer
 <400> 31
 aaattaatta aacgccatag tgttccatgt c 31

<210> 32
 <211> 29
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> oligonucleotide PCR primer
 <400> 32
 aaaggtaccg tcgacatgga taggcacga 29

<210> 33
 <211> 29
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> oligonucleotide PCR primer
 <400> 33
 ttccatggc gtcgctctta catcacgaa 29

<210> 34
 <211> 29
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> oligonucleotide PCR primer
 <400> 34
 ttttaagctta ggacgcttga tatggttgg 29

<210> 35
 <211> 30
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> oligonucleotide PCR primer
 <400> 35
 ttttaattaa caagctcttt tgcaaccctc 30

<210> 36
 <211> 29
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> oligonucleotide PCR primer
 <400> 36
 tttggtacca gcagtttcgc ttccgaata 29

<210> 37
 <211> 22
 <212> DNA

<213> Artificial Sequence
 <220>
 <223> oligonucleotide PCR primer
 <400> 37
 ggcaggatat attgtggtgt aa 22

<210> 38
 <211> 21
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> oligonucleotide PCR primer
 <400> 38
 gagtcgctca cctactgcat c 21

<210> 39
 <211> 20
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> oligonucleotide PCR primer
 <400> 39
 agcgactggt agagctgggtc 20

<210> 40
 <211> 19
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> oligonucleotide PCR primer
 <400> 40
 caggccgcag aggggtgaac 19

<210> 41
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> oligonucleotide PCR primer
 <400> 41
 gggttcagggg gagatgtggg ag 22

<210> 42
 <211> 19
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> oligonucleotide PCR primer
 <400> 42
 gtaccggcgc gccacctg 19

<210> 43

<211> 33
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> oligonucleotide PCR primer

<220>
 <221> misc_feature
 <222> (25)..(25)
 <223> n is a, c, g, or t

<220>
 <221> misc_feature
 <222> (27)..(29)
 <223> n is a, c, g, or t

<400> 43
 acgatggact ccagagcggc cgcvnvnng gaa 33

<210> 44
 <211> 34
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> oligonucleotide PCR primer

<220>
 <221> misc_feature
 <222> (26)..(26)
 <223> n is a, c, g, or t

<220>
 <221> misc_feature
 <222> (28)..(30)
 <223> n is a, c, g, or t

<400> 44
 acgatggact ccagagcggc cgcdbnbnnn cggt 34

<210> 45
 <211> 16
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> oligonucleotide PCR primer

<400> 45
 acgatggact ccagag 16

<210> 46
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> oligonucleotide PCR primer

<400> 46
 agatctcgct gtttcttcgg 20

<210> 47

<211> 30
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> oligonucleotide PCR primer

<400> 47
 tttccgcggt cgaatttccc cgatcgttca 30

<210> 48
 <211> 807
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> coding sequence for eGFP with C-terminal 2X HA and 6X His tag

<400> 48
 atggcggatc ctgtgagcaa gggcgaggag ctgttcaccg gggtggtgcc catcctggtc 60
 gagctggacg gcgacgtaaa cggccacaag ttcagcgtgt ccggcgaggg cgagggcgat 120
 gccacctacg gcaagctgac cctgaagttc atctgcacca ccggcaagct gcccgtgccc 180
 tggcccaccc tcgtgaccac cctgacctac ggcgtgcagt gcttcagccg ctaccccgac 240
 cacatgaagc agcacgactt cttcaagtcc gccatgcccg aaggctacgt ccaggagcgc 300
 accatcttct tcaaggacga cggcaactac aagaccgcg ccgaggtgaa gttcgagggc 360
 gacaccctgg tgaaccgcat cgagctgaag ggcctcgact tcaaggagga cggcaacatc 420
 ctggggcaca agctggagta caactacaac agccacaacg tctatatcat ggccgacaag 480
 cagaagaacg gcatcaaggt gaacttcaag atccgccaca acatcgagga cggcagcgtg 540
 cagctcgccg accactacca gcagaacacc cccatcggcg acggccccgt gctgctgccc 600
 gacaaccact acctgagcac ccagtccgcc ctgagcaaag accccaacga gaagcgcgat 660
 cacatgggtc tgctggagtt cgtgaccgcc gccgggatca ctctcggcat ggacgagctg 720
 tacaagttaa ttaactaccc ctatgatgta cctgactatg cataccctta tgatgtacca 780
 gactatgctc accatcacca ccatcac 807

<210> 49
 <211> 32
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> oligonucleotide PCR primer

<400> 49
 aaaggcgcgc ctacgtctac gtcaagggca at 32

<210> 50
 <211> 29
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> oligonucleotide PCR primer

<400> 50

aaaccatggt tcgagctgga gaaaggtgg

<210>—51

<211> 963

<212> DNA

<213> Rhodoturnula grammis

<400> 51

ggcgcccta cgtctacgtc aaggcgaatg ccgacgtgac caaggccatc ggccaaggacc

60

tcgccttctt ctgcgtccct gtcgagctcg gcgtgcgctc cgcgccttc tctctctt

120

tctctcgcc gcgcctcacg tgatccacga cgtcgtactg accttgcg acccttgccg

180

ccgcagccca acggcgtcga gaagtgacac ccgctcgccg acctgacggc gttcgagaag

240

gagctcctcg aggcgtgcct cggcgagctg ccgggtcca tctccaagg cgagtcgttc

300

atccagggt ccaagctctg actcgccggc gcatcgacgg gcgcgagcca caaggcgagg

360

atgtgagagg aggcgttcc tcacacttg acccacttg cgcctcctt tctctctt

420

tcttttctt tctctctt ctctctct ctctctct ctgttctc tcttctgg cctctcgac

480

cctctcctcg ccgtcgactc gtgaatatc agtgcgcgtt tctgtacct gtcctcgag

540

agaatcttg ttcctcgagg gtagtctgt gccctggccg tggcacgcct cgcgcgacg

600

agaagagaaga ggcacagtc cagacgacg acgacgagga ggaagcgcaa aagcgagac

660

accgagtcc atgatccc cgctcgacc tgctcacggc tgtcgaaagc ggtgcgccac

720

ggtgcttgcg ggaagcgaag caagctggcg tgcctctt gaactggttc ggtccgtga

780

gggcggcgac gagaactcag gcgaggtgt cggttcgga caagccggc ttgtgtcga

840

gggagcgaga gcgagcgac gcgttcgtcg ccgagcgcaag agcggtcag acaagtggc

900

ccgtcgcttc tcgctccctc ttctccctt cccaccacca ctttctca gttcgaaacca

960

tgg

963

<210> 52

<211> 720

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic egfp coding sequence

<400> 52

atgtctcga agggcgagga gctcttacc gggtcgtcc cgatcctcgt cgagctcgac

60

ggcgagtcga acggccacaa gtctcgttc tcggcgaggg gcgagggcga cgccaactac

120

ggcaagtcga cctcaagtt catctgcacc accgcaagc tcccggtccc gttgccgacc

180

ctcgtcacca cctcaccta cggcgtccag tgccttctgc gtaaccggga ccaatgaag

240

cagcacgact tcttcaagtc ggcatgccc gagggtacg tccaggagcg caccatctt

300

ttcaaggacg acggcaacta caagacccgc gccgaggtca agttcgaggg cgacacctt

360

gtcaaccgca tcgagtcga ggcatcgac ttcaaggagg acggcaacat cctggccac

420

aagctcgagt acaactacaa ctgcacaaac gtctacatca tggccgacaa gcagaagaac

480

ggcatcaagg tcaactcaa gatccgccac aacatcgagg acggtcgtgt ccagctcgcc

540

600 gaccatacc agcagaacac ccgatcgc gacgcgccg tcctcctccc ggaacaaccac
 660 ~~taccttcga cccagtcgc ccttcgaag gacccgaag agaagcgga ccaatgttc~~
 720 ctcctcgaat tcgtcacgc gcgcgcac accctcgga tggacgaat ctacaagtag

<210> 53
 <211> 40
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> oligonucleotide PCR primer

<400> 53
 aaagcgcg cgaagtata cctcagagt ctcaaaaacg

40

<210> 54
 <211> 35
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> oligonucleotide PCR primer

<400> 54
 aaaccatgt gttttaga gaagagtag aggg

35

<210> 55
 <211> 1009
 <212> DNA
 <213> Sporobolomyces roseus

<400> 55
 ggcgcgcga agtatact cagaggttc aaaaacgaag aagtcatgca agaattcct
 60 ttgacgtgag gttattct cttcctcag tagtctacga gaatcgcaaa gatcggaaaa
 120 ctgatgcac ttgtgtcca cgggttagc attgatctt tcgatccc aaatcgtat
 180 cgttcctgc gcagggaat acgtcaag cgcacact gatcatcacg ggaagtgaat
 240 ttgactct ccttatgag agtcgaagt tcgtcgctga tgtgttaac cgtcatgcc
 300 ttgactct ccttcctt tgtccatt ctctactacg gttgtcacat cttccttc
 360 cgacagacc cgacggaat tggagcgtac tcgaatcctc cgaaattct caaggaacga
 420 gactctca ggttcgaat ctgggaagc atcgggaat tgtcaacaa gatcgaatat
 480 gaaaagtaga taatccgtta ctagggtcaa tgtatgct tcgaagatgc tgaatcagc
 540 cggaaacga agctggagag aaaaatcgag atgcgaac gtgcgatgtc attcgttc
 600 gactcgcaa ccatctgta tccctctgag ctacatacaa acgtcactac ggcctcggag
 660 tgactccctc gagcggat gaaggagat acgtcgaat cagctagacc tcgcaacgt
 720 tticgcctc gacgttct atcgatctac tgagatgac tcgaaaaagt cttctctac
 780 ggtcattga acttgaat aactcaggt tgcgcgaga gccaatacga gccgaaccaga
 840 ggaattcgg agcttcccg aacgttccaa ggaagggat ttccggag attacgattg
 900 cgagatagaa aaaagctag cttcgatt cgagagagat tactttcaag ttgcgtctt
 960

ccaactcttg ctccaacccc ctccactcct tctctacaac aacacatgg 1009

<210> 56
<211> 2148
<212> DNA
<213> Rhodotorula glutinis ATCC 204091

<400> 56
ggcgcgccac catctccctcg tcgctctctc cctctccttc ggcgcccaca ccgcttcgca 60
gggctcacgg actgctcacca tcgtttgtgt gcgctcgctgt gcatgtccac gcaaccactcc 120
cagccccccac gagcgccctca aagacgcgag acgcagacgc ccgcccgaacg acggcacgcc 180
cctctctca ctagcgcgac gaaccagctg cgaagattcg tgcgcttatg ttagccggac 240
ttcttgcttg ctttgcgctg cttgctccgt cttgttgttg ggatcgctc gatgggggtt 300
tgtctgcttg ctgggagacg gtcgcccctc cctcctcttc ttcactctc gttagcttc 360
tagctcatg ggttcgca accatctaca tcagctcgc tgcctatgt cgtactacga 420
tcaacacccc tgcctgctgt gcttccctc cttccgctc tctcgccgc gtcacagcgac 480
ttgcccagcc aactcccc gcacgcccgt gattctccca cattccttg cgaacccaac 540
ccagcatctg acatccgat cagcagccc tcgcgcttc cactctcc ctctcacg 600
actctctc ctctccct gattcctgt cctcaaac ccgcagct ctctctca 660
aaatcaagcg ccccgctcg ctgaacaa tgacgcagaa cctcggaag agcctgcca 720
agcgcgcgca ggaaggagt aagacgga ggttgcgctt tgcctagag agtcgacgg 780
cggcgagtgc ggttgaca gttgagcg ggaacgggag ggcgacgag cgcgttacgg 840
ggggaggag cagaggtgca ggaaggcg gaggaggtg cgcgctgct cagcctgccc 900
cttgactac ccagacgtc gagaagct ctaagatgt ctgaactgt ctctgacgg 960
tagctcgc gtcgacgca gatggaag ggcggaagtc caccaggtc gagaagcct 1020
cctcaggggt atgtaccac agcagcgcg gagcgcgag ttacgcgcg gcgctcggaag 1080
tcgctagcgc acagcgagcg gagcgagct cgaatacga catgatcagc ggaagacgg 1140
cggctgcgcg gatttaagc agtatgctg cggagagagt tgcgggtgca gccctgatcc 1200
tctcctgctg gtagcaggc gaagcagga gctcatgtag atacgata gacagtatat 1260
atcgccagga tagcttgcaa cagccgccc tcgctttat ccatgtctt cgaacccatg 1320
cgaaagcgag ctctgctgt cagcttgcca agctggccag cagaagcg tgggggtgcg 1380
ggaaacgcca cggcatggag taagcagcc gtaggagatga cggagagct cggcggaagt 1440
gatgggatt ctagcagga cagcagagcg gcgagagaga gaggaacgg aagcacagt 1500
tcgtgcccgt tctgtgca tccagtgct gctaagtgct tcgtcgtcat cagagcgagt 1560
gaacaaagcg atgcccctga gaacgatga cgaatgagtc gaagcgcgct ctaccggtga 1620
actcgggtg tggcaaatga gcgagacgag gattgcccgc cagaattgccc agtccgaccc 1680
cagctcggaa tcgacgttga tagagtgaac gaagccattg cagaacccacg aagttgcca 1740
tgttgtgaa gcgagggcag gagcgaggg agaaagccgag gaggaaggag ggcctgggaa 1800
gcccgctccg gaatggcgca gctgggtgcc ggggatgtg gcgagtgcg gaggaagtcga 1860

gcgtgagagt tctggaacac ggggcgcgca caagggtcga gggccgtgac gagttcgccg 1920
~~ggcggtggtc gggctgaggg cgagcgcgcg ttggggacga cgacgcccga cgccctcgct 1980~~
 cttcgtcctc accgcttccc ggagaacttt gctgtactct gcttctccct tcacactctc 2040
 acacccactc acacaccctt ccatccacac acaagctatc cgcacacctc tcacacccga 2100
 ccccagctcg ccccatcctc ttcgcaccg gctcatcgaa aaccatgg 2148

<210> 57
 <211> 30
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> oligonucleotide PCR primer

<400> 57
 ggcgcgccac catctcctcg tcgcttcttc 30

<210> 58
 <211> 28
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> oligonucleotide PCR primer

<400> 58
 ccatggtttt cgatgagccg ggtgcgaa 28