

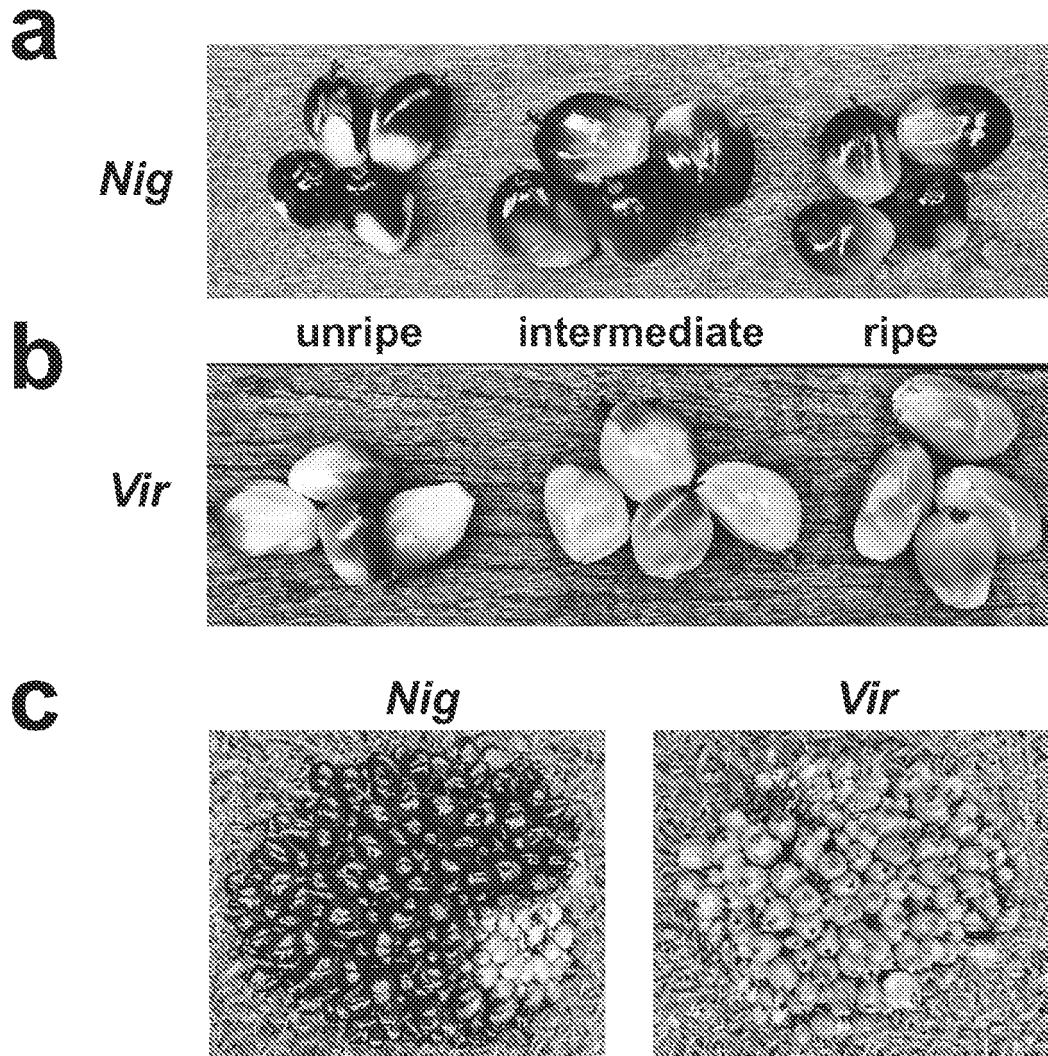


FIG. 1

MET16/*Bam*HI

318	319	320	337	338	339	466	T128 (P)
(N)	(V)	(N)	(V)	(-)	(V)	(N)	(V)

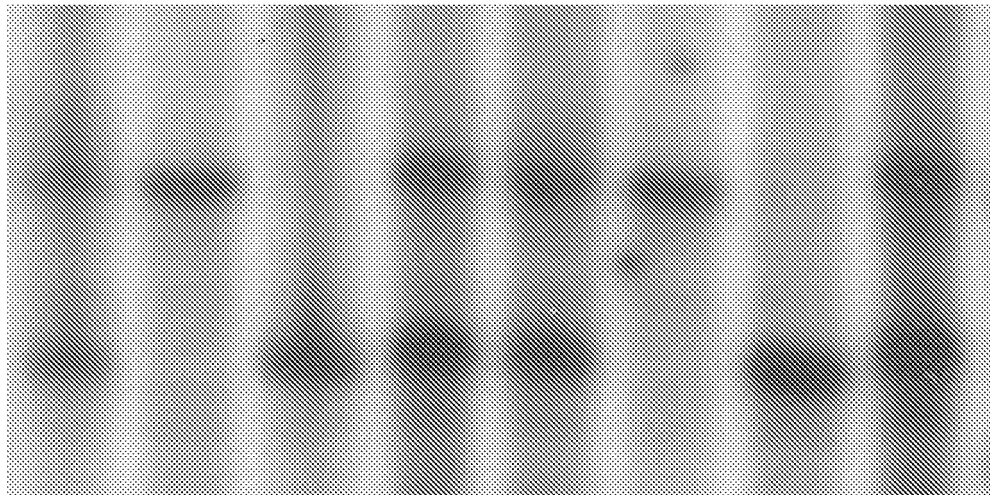


FIG. 2

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T128_LG1_Vir[1]

0.0	SNPM00368
5.1	SNPM03276
6.3	SNPM01129
7.5	SNPM00157
	SNPM04508
13.0	SNPM00197_1
	SNPM00419
16.1	SNPM01388
16.4	SNPM00461
	SNPM04032
17.2	SNPM02318
	SNPM00269
	SNPM02596
18.1	SNPM03685
	SNPM04284
18.6	SNPM00268
19.1	SNPM01012
19.6	SNPM00155
20.0	SNPM00224
	SNPM01475
21.2	SNPM03935
23.2	SNPM04247
29.2	SNPM01470
	SNPM03471
33.4	SNPM00498
33.9	SNPM02459
36.0	SNPM02817
38.5	SNPM01653
41.4	SNPM04690
42.1	sEg00035
	sPSc00220
45.6	SNPM04365
	SNPM04665
47.4	sPSc00242
47.5	sPSc00234
47.6	sPSc00251
48.0	sPSc00232
	sPSc00245
48.1	sPSc00250
	sPSc00246
	SNPM02234
48.3	sPSc00241
48.6	sPSc00239
48.8	sPSc00249
50.0	SNPM04251
52.3	SNPE00175
52.6	SNPM04206
52.8	sPSc00215

T128_LG1_Vir[2]

52.9	SNPE00171
53.0	SNPE00148
	SNPE00204
	SNPE00203
	SNPE00201
	SNPE00200
	SNPE00174
	SNPM02400
	SNPE00177
53.2	SNPE00168
	SNPE00169
	SNPE00170
	SNPE00172
	SNPE00152
	SNPE00156
	SNPE00146
	SNPE00147
53.4	sPSc00214
53.8	SNPE00149
	SNPE00150
54.4	SNPM03287
	SNPE00151
	SNPE00153
	SNPE00154
	SNPE00155
54.9	SNPE00157
	SNPE00158
	SNPE00159
	SNPE00160
	SNPE00142
55.5	SNPE00141
	SNPE00139
55.6	SNPE00138
56.1	SNPE00137
56.6	VIR
56.7	SNPE00136
57.2	MET16
	SNPE00134
	SNPE00133
57.3	SNPE00132
	SNPE00131
	SNPM01237
	SNPE00129
	SNPE00128
	SNPE00124
58.3	SNPM01250
	SNPM03010
	SNPE00123
58.5	SNPE00127
58.9	SNPE00121
	SNPE00119
	SNPE00118
60.7	SNPM02708
	SNPM02867
	SNPE00113

T128_LG1_Vir[3]

60.7	SNPE00116
60.8	SNPE00115
60.9	SNPE00214
	SNPM00572
	SNPE00112
	SNPE00111
	SNPE00108
61.8	SNPE00107
	SNPM04941
	SNPE00106
	SNPE00109
	SNPE00099
	SNPE00102
62.4	SNPE00101
	SNPE00213
	SNPE00105
	SNPE00097
62.9	SNPE00096
63.5	SNPE00145
	SNPE00143
	SNPM00387
64.7	SNPE00135
	SNPE00126
	SNPE00104
65.1	SNPE00120
65.9	SNPM02655
67.2	SNPM01582
71.6	SNPM00366
75.5	SNPM00257_1
76.1	SNPM00066
81.0	SNPM02251
84.2	SNPM03563
86.6	SNPM02176
89.3	SNPM04083
93.3	SNPM04010
96.1	SNPM00235
104.9	SNPE00173
105.5	SNPM01649
	sMg00039
	SNPM02359
111.0	SNPM00316
	SNPM03539
111.7	SNPM03091
115.5	SNPM03226
121.0	SNPM02004
125.9	SNPM01135
126.6	SNPM00339
	SNPM04052
	SNPM01410
128.7	SNPM01968
129.3	SNPM03491
136.2	SNPM01818
138.6	SNPM04780
	SNPM00906

FIG. 3

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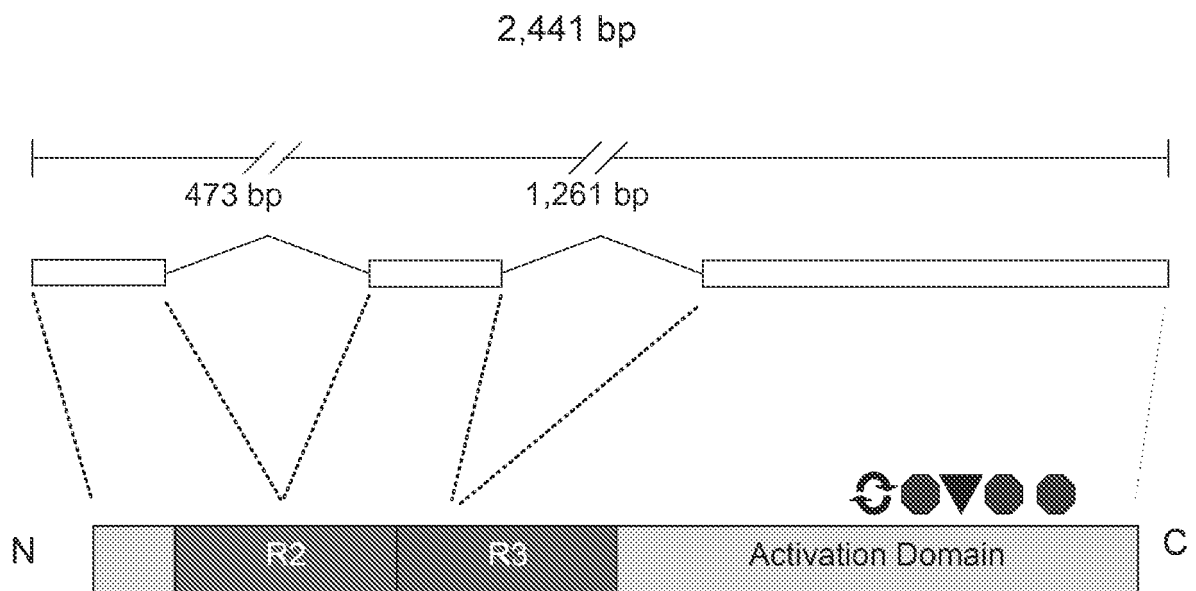


FIG. 4

a. Wild-type *VIR* cDNA sequence

ATGGGTAATTTGCGTGCCGAAGTCCAACGTCCAGCTGGTGTTCGCAAAGGAGCATGGAGTGAAGAGGAGG
ACAGGCTTCTGAGAAAAGTGCCTTGAGAAATATGGCGAAGGGAACTGGCGCCATGTTCCCCAAAGGGCAGG
CCTCAGAAGGTGCCGAAAGAGCTGCCGACTACGGTGGTTGAACTATCTCAGCCCTAGGATCAACAGGGAG
AAATTTTCGGAGGAAGAAAACAGATCTTATCATCAGGCTTCATAAGCTCTTGGGCAACAGGTGGTCATTAA
TTGCAGGTAGGCTTCCAGGCAGGACAGCAAATGACATCAAGAAGTACTGGAACACTCACCTGGGCAAGAA
AGTAGAAGTTGAAAACAAGAAGGCGGAGCCCACTGCTGATGCCAAAGTAATTAAGCCACGGCCATGGAAA
GTACCGTTGCAATGGTTATGGTCAGAAGATCAGCAATCATGTGGAAGCCAGCAGCCGCAAGAAAAGTTTG
GGATACCAGAAGTACCGACAATCTCAGAGAACGATGAAGCGTGGCTGAATTGTATAATGAATGGAGATAG
AGAGAACAGTGCAGTGCCAGACGTTGGAAACGGGAGCACAATGAACCTGCAGAATGAATTTGGAATCGGA
GGCTTGGAGGAAAATAGAGATGGGGCAGTGTCTTCTGGAAGGAGTTCTAGGATGGGATGACTTGCTTTGGG
CCACTATATAGTGCTCATATATGGTAGTGCAATAGTTGCCATTATAAGTTGTTTCGAACTTTAATGCTCC
TGAAATTCCCATGCAAGTATTTAGAGCTTCATATCCTACAAAAAGACAGGAAACGAGACCTTGAAAAAG
ACTCAGTACCAGAAGGCATCCACTTATTGATTGCTTTTATACTTGCAACATGAAGGAAGCACGCTTTCTC
ACCAAAAAAAAAA

b. Event 1 Exon 3 sequence

GTGGTCATTAATTGCAGGTAGGCTTCCAGGCAGGACAGCAAATGACATCAAGAAGTACTGGAACACTCACCTGGGCA
AGAAAGTAGAAGTTGAAAACAAGAAGGCGGAGCCCACTGCTGATGCCAAAGTAATTAAGCCACGGCCATGGAAAGTA
CCGTTGCAATGGTTATGGTCAGAAGATCAGCAATCATGTGGAAGCCAGCAGCCGCAAGAAAAGTTTGGGATACCAGA
ACTACCGACAATCTCAGAGAACGATGAAGCGTGGCTGAATTGTATAATGAATGGAGATAGAGAGAACAGTGCAGTGC
CAGACGTTTGGAAACGGGAGCACAATGAACCTGCAGAATGAATTTGGAATCGGAGGCTTGGAGGAAAATTCGATGGG
GCAGTGTCTTCTGGAAGGAGTTCTAGGATGGGATGACTTGCTTTGGGCCACTATATAGTGCTCATATATGGTAGTGCA
ATAGTTGCCATTATAAGTTGTTTCGAACTTTAATGCTCCTGAAATTTCCCATGCAAGTATTTAGAGCTTCATATCCTA
CAAAAAGACAGGAAACGAGACCTTGAAAAAGAGCTCAGTACCAGAAGGCATCCACTTATTGATTGCTTTTATACTTG
CAACATGAAGGAAGCACGCTTTCTCACCAAAAAAAAAA

c. Event 2 Exon 3 sequence

GTGGTCATTAATTGCAGGTAGGCTTCCAGGCAGGACAGCAAATGACATCAAGAAGTACTGGAACACTCACCTGGGCA
AGAAAGTAGAAGTTGAAAACAAGAAGGCGGAGCCCACTGCTGATGCCAAAGTAATTAAGCCACGGCCATGGAAAGTA
CCGTTGCAATGGTTATGGTCAGAAGATCAGCAATCATGTGGAAGCCAGCAGCCGCAAGAAAAGTTTGGGATACCAGA
ACTACCGACAATCTCAGAGAACGATGAAGCGTGGCTGAATTGTATAATGAATGGAGATAGAGAGAACAGTGCAGTGC
CAGACGTTTGGAAACGGGAGCACAATGAACCTGCAGAATTAATTTGGAATCGGAGGCTTGGAGGAAAATAGAGATGGG
GCAGTGTCTTCTGGAAGGAGTTCTAGGATGGGATGACTTGCTTTGGGCCACTATATAGTGCTCATATATGGTAGTGCA
ATAGTTGCCATTATAAGTTGTTTCGAACTTTAATGCTCCTGAAATTTCCCATGCAAGTATTTAGAGCTTCATATCCTA
CAAAAAGACAGGAAACGAGACCTTGAAAAAGAGCTCAGTACCAGAAGGCATCCACTTATTGATTGCTTTTATACTTG
CAACATGAAGGAAGCACGCTTTCTCACCAAAAAAAAAA

d. Event 3 Exon 3 sequence

GTGGTCATTAATTGCAGGTAGGCTTCCAGGCAGGACAGCAAATGACATCAAGAAGTACTGGAACACTCACCTGGGCA
AGAAAGTAGAAGTTGAAAACAAGAAGGCGGAGCCCACTGCTGATGCCAAAGTAATTAAGCCACGGCCATGGAAAGTA
CCGTTGCAATGGTTATGGTCAGAAGATCAGCAATCATGTGGAAGCCAGCAGCCGCAAGAAAAGTTTGGGATACCAGA
ACTACCGACAATCTCAGAGAACGATGAAGCGTGGCTGAATTGTATAATGAATGGAGATAGAGAGAACAGTGCAGTGC
CAGACGTTTGGAAACGGGAGCACAATGAACCTGCAGAATGAATTTGGAATCGGAGGCTTGGAGGAAAATAGAGATGGG
GCAGTGTCTTCTGGAAGGAGTTCTAGGATGGGATGACTTGCTTTGGGCCACTATATAGTGCTCATATATGGTAGTGCA
ATAGTTGCCATTATAAGTTGTTTCGAACTTTAATGCTCCTGAAATTTCCCATGCAAGTATTTAGAGCTTCATATCCTA
CAAAAAGACAGGAAACGAGACCTTGAAAAAGAGCTCAGTACCAGAAGGCATCCACTTATTGATTGCTTTTATACTTG
CAACATGAAGGAAGCACGCTTTCTCACCAAAAAAAAAA

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e. Event 4 Exon 3 sequence

GTGGTCATTAATTGCAGGTAGGCTTCCAGGCAGGACAGCAAATGACATCAAGAACTACTGGAACACTCACCTGGGCA
AGAAAGTAGAAGTTGAAAAAACAAGAAGGCGGAGCCCAAGTGCTGATGCCAAAGTAATTAAGCCACGGCCATGGAAAGTA
CCGTTGCAATGGTTATGGTCAGAAGATCAGCAATCATGTGGAAGCCAGCAGCCGCAAGAAAAGTTTGGGATACCAGA
ACTACCGACAATCTCAGAGAACGATGAAGCGTGGCTGAATTGT - -
AATGAATGGAGA TAGAGAGAACAGTGCACTGCCAGACGTTGGAAACGGGAGCACAATGAACCTGCAGAATGAATTTG
GAATCGGAGGCTTGGAGGAAAAATAGAGATGGGGCAGTCTTTCTGGAAGGAGTTCTAGGATGGGATGACTTGCTTTGG
GCCACTATATAGTGCTCATATATGGTAGTGCAATAGTTGCCATTATAAGTTGTTTCGAACTTTAATGCTCCTGAAAT
TCCCATGCAAGTATTTAGAGCTTCATATCCTACAAAAAGACAGGAAACGAGACCTTGAAAAAAGACTCAGTACCAGA
AGGCATCCACTTATTGATTGCTTTTATACTTGCAACATGAAGGAAGCACGCTTTCTCACCACAAAAA

f. Event 5 Exon 3 sequence

GTGGTCATTAATTGCAGGTAGGCTTCCAGGCAGGACAGCAAATGACATCAAGAACTACTGGAACACTCAC
CTGGGCAAGAAAGTAGAAGTTGAAAAACAAGAAGGCGGAGCCCAAGTGCTGATGCCAAAGTAATTAAGCCAC
GGCCATGGAAAGTACCGTTGCAATGGTTTGGTCAGAAGATCAGCAATCATGTGGAAGCCAGCAGCCGCA
AGAAGAT TAA TGCTTTGGGCCACTATATAGTGCTTATATATGGGATGACTTGCTTTGGGCCACTATATAG
TGCTTATATATGGTAGTGCAATAG

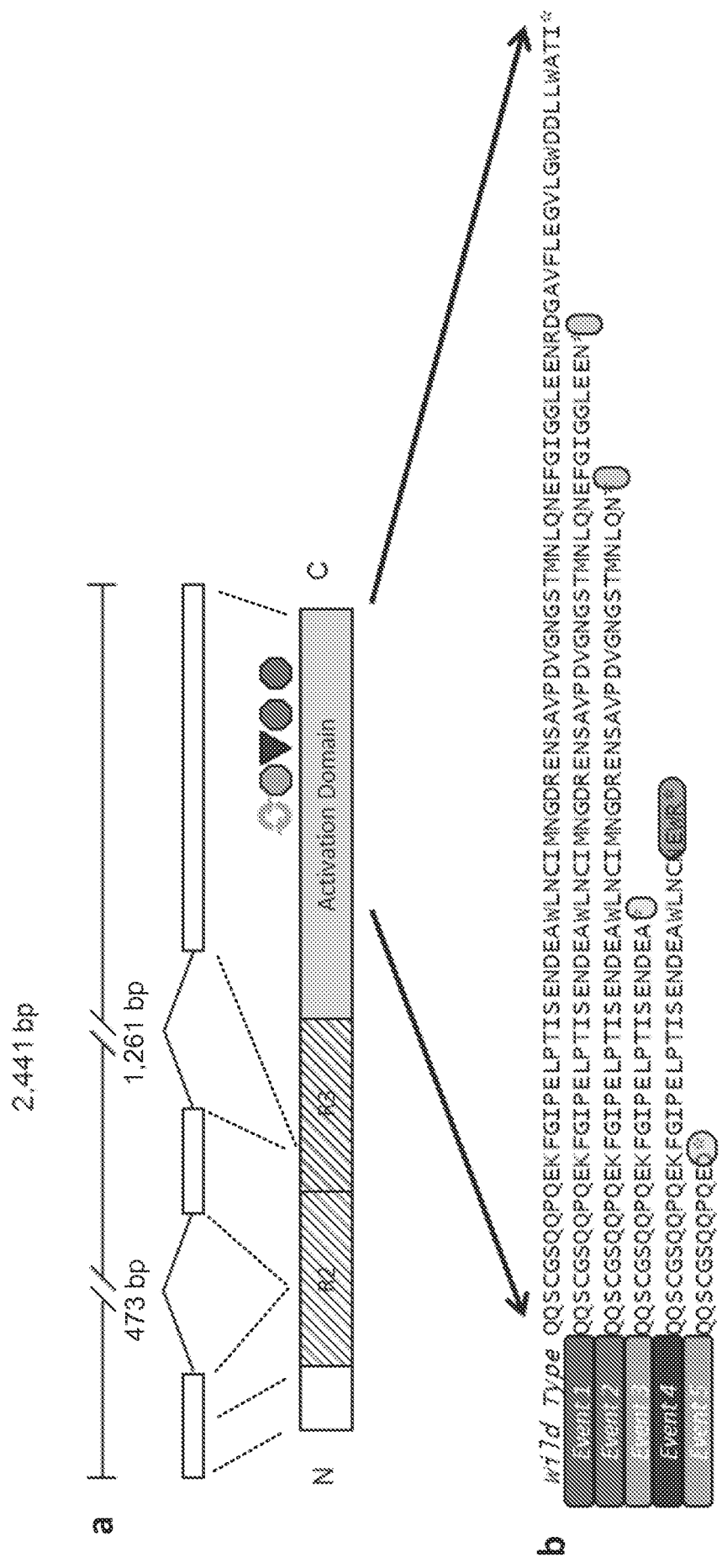


FIG. 6

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FIG. 7

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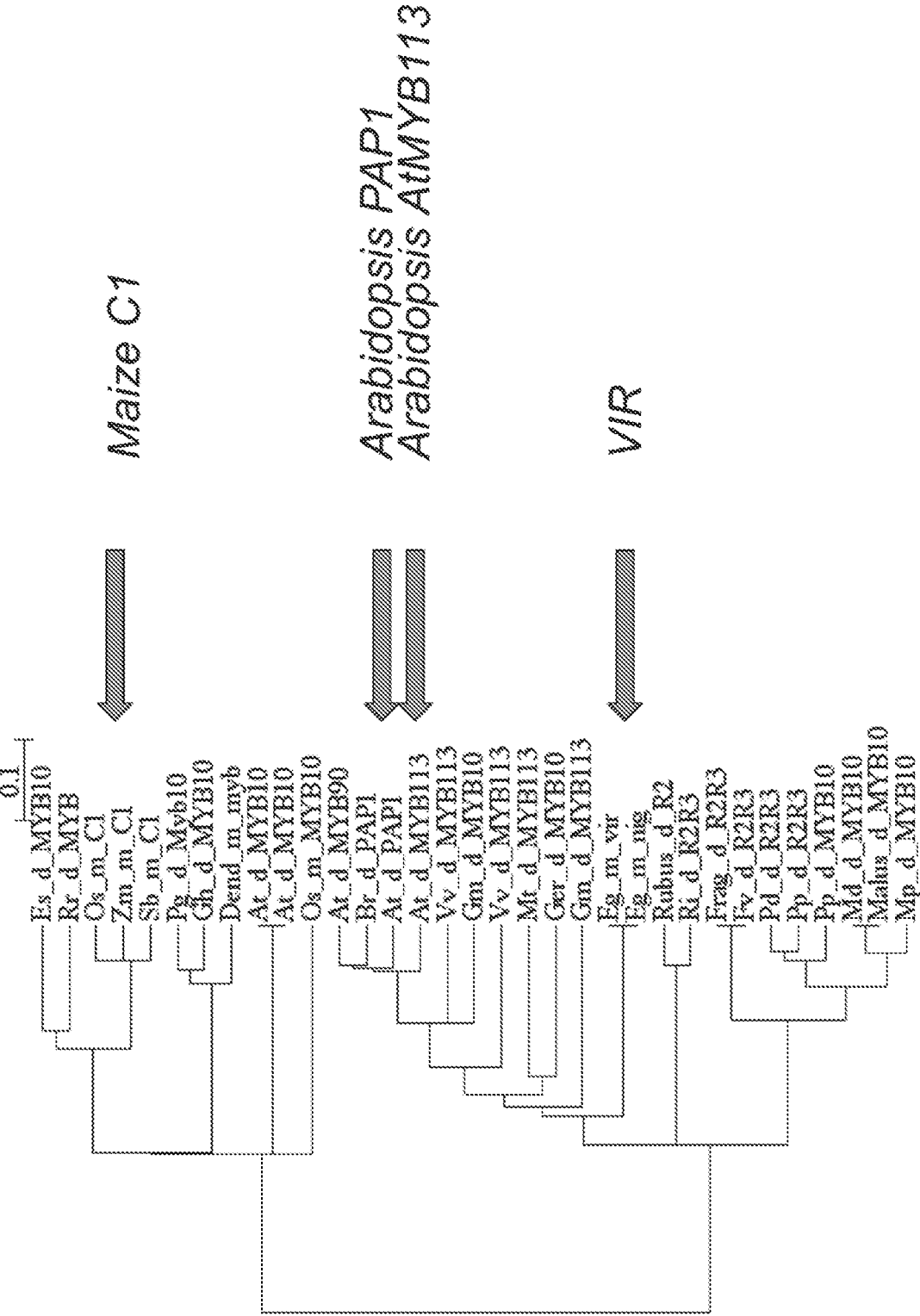


FIG. 8

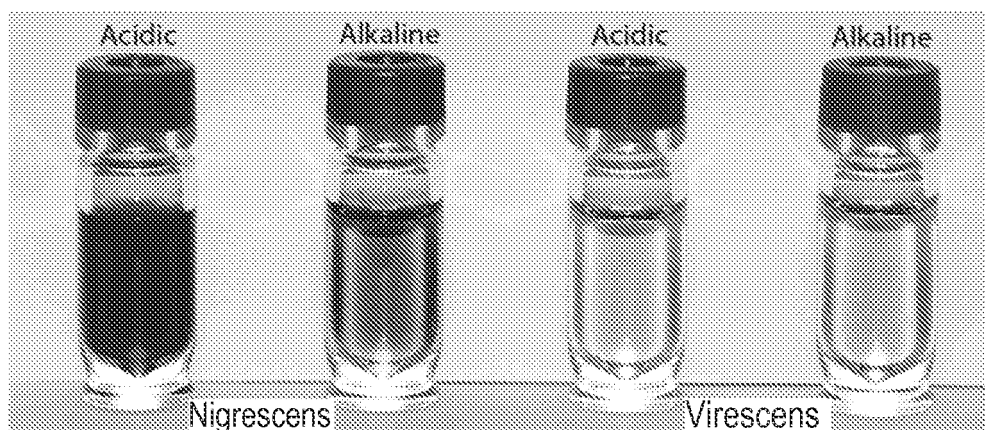
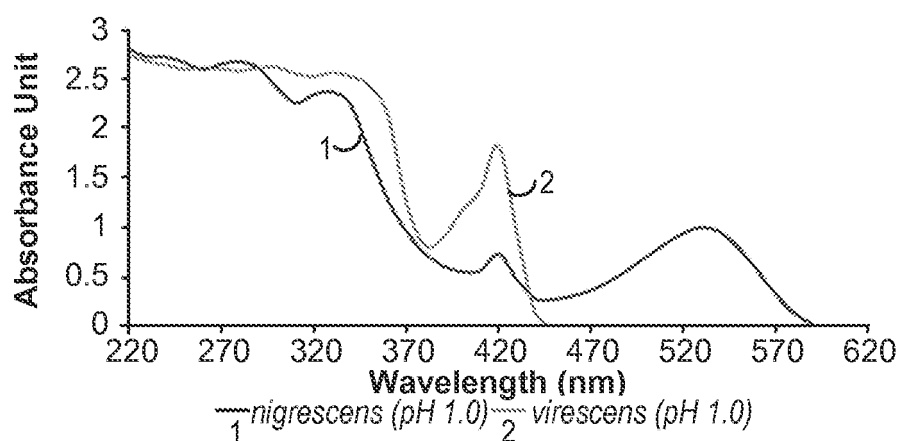
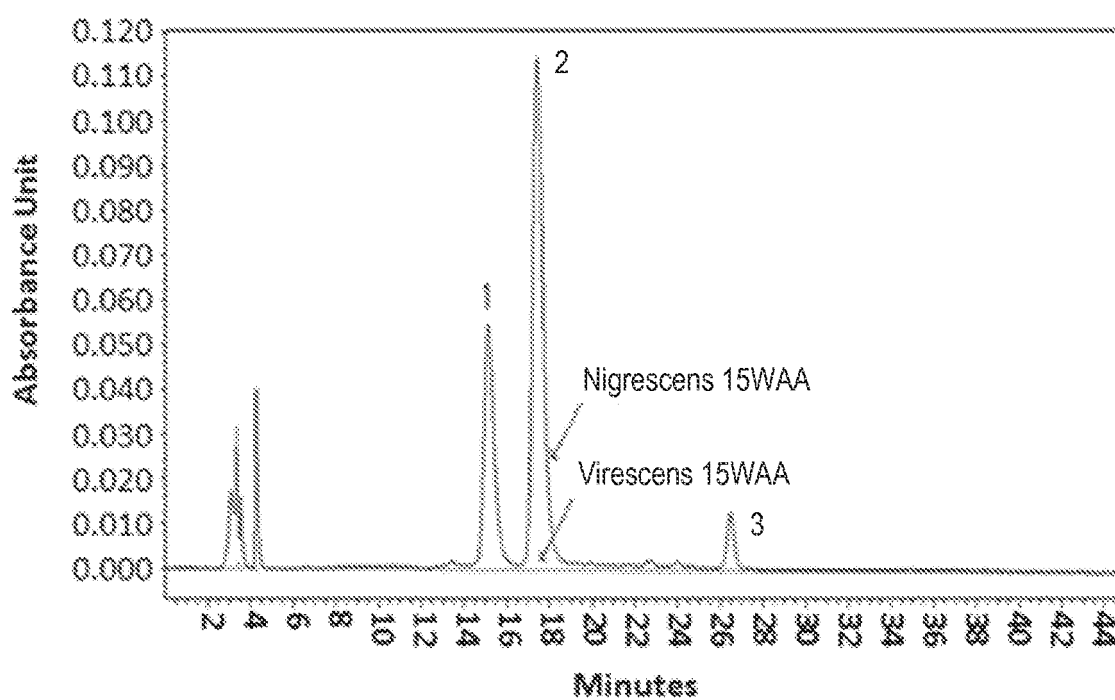
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Zm	m	C1	-----MGRRA--CCAKEGVKRGAWTSKEDD
Sb	m	C1	-----MGRRA--CCAKEGVKRGAWTAKEDD
Os	m	C1	-----MGRRA--CCAKEGMKRGAWTSKEDD
Es	d	MYB10	-----MGRSP--CCSKEGLNRGAWTSTED
Rr	d	MYB	-----MGRSS--RCDKEGANKGAWTAHED
Rbus	d	R2R3	-----MEVRKGAWTKEEDHLLRNYIEKH
Rr	d	R2R3	-----MEVRKGAWTKEEDHLLRNYIEKH
Pp	d	R2R3	-----MEGY--DLNVRKGAWTREEDD
Pd	d	R2R3	-----MEGY--NLGVRKGAWTREEDD
Pp	d	MYB10	-----MEGY--NLGVRKGAWTREEDD
Md	d	MYB10	-----MEGY--NLGVRKGAWTREEDD
Malus	d	MYB10	-----MEGY--NLGVRKGAWTREEDD
Mmp	d	MYB10	-----MEGY--NLGVRKGAWTREEDD
Frag	d	R2R3	-----MEGY--NLGVRKGAWTREEDD
Fv	d	R2R3	-----MEGY--NLGVRKGAWTREEDD
Ger	d	MYB10	-----MEGY--NLGVRKGAWTREEDD
Mt	d	MYB113	-----MEGY--NLGVRKGAWTREEDD
Gm	d	MYB10	-----MEGY--NLGVRKGAWTREEDD
Vv	d	MYB113a	-----MEGY--NLGVRKGAWTREEDD
At	d	PAP1	-----MEGY--NLGVRKGAWTREEDD
At	d	MYB90	-----MEGY--NLGVRKGAWTREEDD
Br	d	PAP1	-----MEGY--NLGVRKGAWTREEDD
At	d	MYB113	-----MEGY--NLGVRKGAWTREEDD
Vv	d	MYB113	-----MEGY--NLGVRKGAWTREEDD
Gm	d	MYB113	-----MEGY--NLGVRKGAWTREEDD
Eg	m	vir	-----MEGY--NLGVRKGAWTREEDD
Eg	m	nig	-----MEGY--NLGVRKGAWTREEDD
Pg	d	MYB10	-----MEGY--NLGVRKGAWTREEDD
Gh	d	MYB10	-----MEGY--NLGVRKGAWTREEDD
Dend	m	myb10	-----MEGY--NLGVRKGAWTREEDD
Os	m	MYB10	-----MEGY--NLGVRKGAWTREEDD
At	d	MYB10	-----MEGY--NLGVRKGAWTREEDD
At	d	MYB10b	-----MEGY--NLGVRKGAWTREEDD

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[illegible]

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**FIG. 10A****FIG. 10B****FIG. 10C**

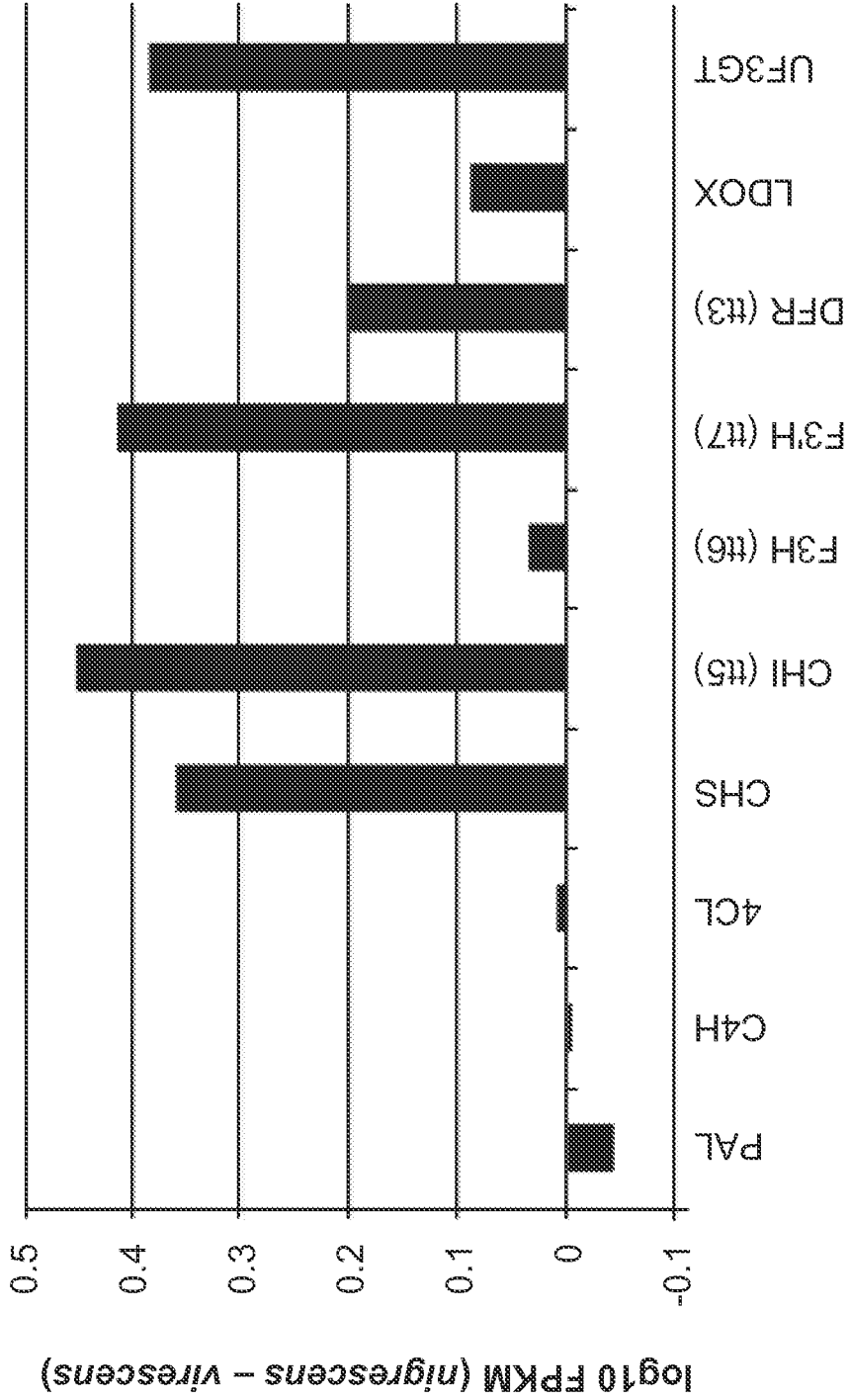


FIG. 10D

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Figure: Alignment of Wild Type and Five Mutant Alleles

RTPAP1_mrna	0	ATGGGTAATTTGCGTGCCGAAGTCCAACGTCCAGCTGGTGTTCGCAAAGG
SNP_1	0	ATGGGTAATTTGCGTGCCGAAGTCCAACGTCCAGCTGGTGTTCGCAAAGG
SNP_2	0	ATGGGTAATTTGCGTGCCGAAGTCCAACGTCCAGCTGGTGTTCGCAAAGG
SNP_3	0	ATGGGTAATTTGCGTGCCGAAGTCCAACGTCCAGCTGGTGTTCGCAAAGG
SNP_4	0	ATGGGTAATTTGCGTGCCGAAGTCCAACGTCCAGCTGGTGTTCGCAAAGG
SNP_5	0	ATGGGTAATTTGCGTGCCGAAGTCCAACGTCCAGCTGGTGTTCGCAAAGG
RTPAP1_mrnaAA	0	MetGlyAsnLeuArgAlaGluValGlnArgProAlaGlyValArgLysG1
SNP_1AA	0	MetGlyAsnLeuArgAlaGluValGlnArgProAlaGlyValArgLysG1
SNP_2AA	0	MetGlyAsnLeuArgAlaGluValGlnArgProAlaGlyValArgLysG1
SNP_3AA	0	MetGlyAsnLeuArgAlaGluValGlnArgProAlaGlyValArgLysG1
SNP_4AA	0	MetGlyAsnLeuArgAlaGluValGlnArgProAlaGlyValArgLysG1
SNP_5AA	0	MetGlyAsnLeuArgAlaGluValGlnArgProAlaGlyValArgLysG1
		----- ----- ----- ----- -----
		1 11 21 31 41
RTPAP1_mrna	50	AGCATGGAGTGAAGAGGAGGACAGGCTTCTGAGAAAAGTGCCTTGAGAAAT
SNP_1	50	AGCATGGAGTGAAGAGGAGGACAGGCTTCTGAGAAAAGTGCCTTGAGAAAT
SNP_2	50	AGCATGGAGTGAAGAGGAGGACAGGCTTCTGAGAAAAGTGCCTTGAGAAAT
SNP_3	50	AGCATGGAGTGAAGAGGAGGACAGGCTTCTGAGAAAAGTGCCTTGAGAAAT
SNP_4	50	AGCATGGAGTGAAGAGGAGGACAGGCTTCTGAGAAAAGTGCCTTGAGAAAT
SNP_5	50	AGCATGGAGTGAAGAGGAGGACAGGCTTCTGAGAAAAGTGCCTTGAGAAAT
RTPAP1_mrnaAA	50	yAlaTrpSerGluGluGluAspArgLeuLeuArgLysCysValGluLysT
SNP_1AA	50	yAlaTrpSerGluGluGluAspArgLeuLeuArgLysCysValGluLysT
SNP_2AA	50	yAlaTrpSerGluGluGluAspArgLeuLeuArgLysCysValGluLysT
SNP_3AA	50	yAlaTrpSerGluGluGluAspArgLeuLeuArgLysCysValGluLysT
SNP_4AA	50	yAlaTrpSerGluGluGluAspArgLeuLeuArgLysCysValGluLysT
SNP_5AA	50	yAlaTrpSerGluGluGluAspArgLeuLeuArgLysCysValGluLysT
		----- ----- ----- ----- -----
		51 61 71 81 91
RTPAP1_mrna	100	ATGGCGAAGGGAAGTGGCGCCATGTTCCCCAAAGGGCAGGCCCTCAGAAAGG
SNP_1	100	ATGGCGAAGGGAAGTGGCGCCATGTTCCCCAAAGGGCAGGCCCTCAGAAAGG
SNP_2	100	ATGGCGAAGGGAAGTGGCGCCATGTTCCCCAAAGGGCAGGCCCTCAGAAAGG
SNP_3	100	ATGGCGAAGGGAAGTGGCGCCATGTTCCCCAAAGGGCAGGCCCTCAGAAAGG
SNP_4	100	ATGGCGAAGGGAAGTGGCGCCATGTTCCCCAAAGGGCAGGCCCTCAGAAAGG
SNP_5	100	ATGGCGAAGGGAAGTGGCGCCATGTTCCCCAAAGGGCAGGCCCTCAGAAAGG
RTPAP1_mrnaAA	100	yrGlyGluGlyAsnTrpArgHisValProGlnArgAlaGlyLeuArgArg
SNP_1AA	100	yrGlyGluGlyAsnTrpArgHisValProGlnArgAlaGlyLeuArgArg
SNP_2AA	100	yrGlyGluGlyAsnTrpArgHisValProGlnArgAlaGlyLeuArgArg
SNP_3AA	100	yrGlyGluGlyAsnTrpArgHisValProGlnArgAlaGlyLeuArgArg
SNP_4AA	100	yrGlyGluGlyAsnTrpArgHisValProGlnArgAlaGlyLeuArgArg
SNP_5AA	100	yrGlyGluGlyAsnTrpArgHisValProGlnArgAlaGlyLeuArgArg
		----- ----- ----- ----- -----
		101 111 121 131 141
RTPAP1_mrna	150	TGCCGAAAGAGCTGCCGACTACGGTGGTTGAACTATCTCAGCCCTAGGAT
SNP_1	150	TGCCGAAAGAGCTGCCGACTACGGTGGTTGAACTATCTCAGCCCTAGGAT
SNP_2	150	TGCCGAAAGAGCTGCCGACTACGGTGGTTGAACTATCTCAGCCCTAGGAT
SNP_3	150	TGCCGAAAGAGCTGCCGACTACGGTGGTTGAACTATCTCAGCCCTAGGAT
SNP_4	150	TGCCGAAAGAGCTGCCGACTACGGTGGTTGAACTATCTCAGCCCTAGGAT
SNP_5	150	TGCCGAAAGAGCTGCCGACTACGGTGGTTGAACTATCTCAGCCCTAGGAT
RTPAP1_mrnaAA	150	CysArgLysSerCysArgLeuArgTrpLeuAsnTyrLeuSerProArgI1
SNP_1AA	150	CysArgLysSerCysArgLeuArgTrpLeuAsnTyrLeuSerProArgI1
SNP_2AA	150	CysArgLysSerCysArgLeuArgTrpLeuAsnTyrLeuSerProArgI1
SNP_3AA	150	CysArgLysSerCysArgLeuArgTrpLeuAsnTyrLeuSerProArgI1
SNP_4AA	150	CysArgLysSerCysArgLeuArgTrpLeuAsnTyrLeuSerProArgI1
SNP_5AA	150	CysArgLysSerCysArgLeuArgTrpLeuAsnTyrLeuSerProArgI1
		----- ----- ----- ----- -----
		151 161 171 181 191

FIG. 11

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RTPAP1_mrna	200	CAACAGGGAGAAAATTTTCGGAGGAAGAAACAGATCTTATCATCAGGCTTC
SNP_1	200	CAACAGGGAGAAAATTTTCGGAGGAAGAAACAGATCTTATCATCAGGCTTC
SNP_2	200	CAACAGGGAGAAAATTTTCGGAGGAAGAAACAGATCTTATCATCAGGCTTC
SNP_3	200	CAACAGGGAGAAAATTTTCGGAGGAAGAAACAGATCTTATCATCAGGCTTC
SNP_4	200	CAACAGGGAGAAAATTTTCGGAGGAAGAAACAGATCTTATCATCAGGCTTC
SNP_5	200	CAACAGGGAGAAAATTTTCGGAGGAAGAAACAGATCTTATCATCAGGCTTC
RTPAP1_mrnaAA	200	eAsnArgGluLysPheSerGluGluGluThrAspLeuIleIleArgLeuH
SNP_1AA	200	eAsnArgGluLysPheSerGluGluGluThrAspLeuIleIleArgLeuH
SNP_2AA	200	eAsnArgGluLysPheSerGluGluGluThrAspLeuIleIleArgLeuH
SNP_3AA	200	eAsnArgGluLysPheSerGluGluGluThrAspLeuIleIleArgLeuH
SNP_4AA	200	eAsnArgGluLysPheSerGluGluGluThrAspLeuIleIleArgLeuH
SNP_5AA	200	eAsnArgGluLysPheSerGluGluGluThrAspLeuIleIleArgLeuH
		----- ----- ----- ----- -----
		201 211 221 231 241
RTPAP1_mrna	250	ATAAGCTCTTGGGCAACAGGTGGTCATTAATTGCAGGTAGGCTTCCAGGC
SNP_1	250	ATAAGCTCTTGGGCAACAGGTGGTCATTAATTGCAGGTAGGCTTCCAGGC
SNP_2	250	ATAAGCTCTTGGGCAACAGGTGGTCATTAATTGCAGGTAGGCTTCCAGGC
SNP_3	250	ATAAGCTCTTGGGCAACAGGTGGTCATTAATTGCAGGTAGGCTTCCAGGC
SNP_4	250	ATAAGCTCTTGGGCAACAGGTGGTCATTAATTGCAGGTAGGCTTCCAGGC
SNP_5	250	ATAAGCTCTTGGGCAACAGGTGGTCATTAATTGCAGGTAGGCTTCCAGGC
RTPAP1_mrnaAA	250	isLysLeuLeuGlyAsnArgTrpSerLeuIleAlaGlyArgLeuProGly
SNP_1AA	250	isLysLeuLeuGlyAsnArgTrpSerLeuIleAlaGlyArgLeuProGly
SNP_2AA	250	isLysLeuLeuGlyAsnArgTrpSerLeuIleAlaGlyArgLeuProGly
SNP_3AA	250	isLysLeuLeuGlyAsnArgTrpSerLeuIleAlaGlyArgLeuProGly
SNP_4AA	250	isLysLeuLeuGlyAsnArgTrpSerLeuIleAlaGlyArgLeuProGly
SNP_5AA	250	isLysLeuLeuGlyAsnArgTrpSerLeuIleAlaGlyArgLeuProGly
		----- ----- ----- ----- -----
		251 261 271 281 291
RTPAP1_mrna	300	AGGACAGCAAATGACATCAAGAACTACTGGAACACTCACCTGGGCAAGAA
SNP_1	300	AGGACAGCAAATGACATCAAGAACTACTGGAACACTCACCTGGGCAAGAA
SNP_2	300	AGGACAGCAAATGACATCAAGAACTACTGGAACACTCACCTGGGCAAGAA
SNP_3	300	AGGACAGCAAATGACATCAAGAACTACTGGAACACTCACCTGGGCAAGAA
SNP_4	300	AGGACAGCAAATGACATCAAGAACTACTGGAACACTCACCTGGGCAAGAA
SNP_5	300	AGGACAGCAAATGACATCAAGAACTACTGGAACACTCACCTGGGCAAGAA
RTPAP1_mrnaAA	300	ArgThrAlaAsnAspIleLysAsnTyrTrpAsnThrHisLeuGlyLysLy
SNP_1AA	300	ArgThrAlaAsnAspIleLysAsnTyrTrpAsnThrHisLeuGlyLysLy
SNP_2AA	300	ArgThrAlaAsnAspIleLysAsnTyrTrpAsnThrHisLeuGlyLysLy
SNP_3AA	300	ArgThrAlaAsnAspIleLysAsnTyrTrpAsnThrHisLeuGlyLysLy
SNP_4AA	300	ArgThrAlaAsnAspIleLysAsnTyrTrpAsnThrHisLeuGlyLysLy
SNP_5AA	300	ArgThrAlaAsnAspIleLysAsnTyrTrpAsnThrHisLeuGlyLysLy
		----- ----- ----- ----- -----
		301 311 321 331 341
RTPAP1_mrna	350	AGTAGAAGTTGAAAAACAAGAAGCGGAGCCCAGTGCTGATGCCAAAGTAA
SNP_1	350	AGTAGAAGTTGAAAAACAAGAAGCGGAGCCCAGTGCTGATGCCAAAGTAA
SNP_2	350	AGTAGAAGTTGAAAAACAAGAAGCGGAGCCCAGTGCTGATGCCAAAGTAA
SNP_3	350	AGTAGAAGTTGAAAAACAAGAAGCGGAGCCCAGTGCTGATGCCAAAGTAA
SNP_4	350	AGTAGAAGTTGAAAAACAAGAAGCGGAGCCCAGTGCTGATGCCAAAGTAA
SNP_5	350	AGTAGAAGTTGAAAAACAAGAAGCGGAGCCCAGTGCTGATGCCAAAGTAA
RTPAP1_mrnaAA	350	sValGluValGluAsnLysLysAlaGluProSerAlaAspAlaLysValI
SNP_1AA	350	sValGluValGluAsnLysLysAlaGluProSerAlaAspAlaLysValI
SNP_2AA	350	sValGluValGluAsnLysLysAlaGluProSerAlaAspAlaLysValI
SNP_3AA	350	sValGluValGluAsnLysLysAlaGluProSerAlaAspAlaLysValI
SNP_4AA	350	sValGluValGluAsnLysLysAlaGluProSerAlaAspAlaLysValI
SNP_5AA	350	sValGluValGluAsnLysLysAlaGluProSerAlaAspAlaLysValI
		----- ----- ----- ----- -----
		351 361 371 381 391

FIG. 11 (cont'd)

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RTPAP1_mrna 400 TTAAGCCACGGCCATGGAAAGTACCGTTGCAATGGTTATGGTCAGAAGAT
SNP_1 400 TTAAGCCACGGCCATGGAAAGTACCGTTGCAATGGTTATGGTCAGAAGAT
SNP_2 400 TTAAGCCACGGCCATGGAAAGTACCGTTGCAATGGTTATGGTCAGAAGAT
SNP_3 400 TTAAGCCACGGCCATGGAAAGTACCGTTGCAATGGTTATGGTCAGAAGAT
SNP_4 400 TTAAGCCACGGCCATGGAAAGTACCGTTGCAATGGTTATGGTCAGAAGAT
SNP_5 400 TTAAGCCACGGCCATGGAAAGTACCGTTGCAATGGTTATGGTCAGAAGAT
RTPAP1_mrnaAA 400 leLysProArgProTrpLysValProLeuGlnTrpLeuTrpSerGluAsp
SNP_1AA 400 leLysProArgProTrpLysValProLeuGlnTrpLeuTrpSerGluAsp
SNP_2AA 400 leLysProArgProTrpLysValProLeuGlnTrpLeuTrpSerGluAsp
SNP_3AA 400 leLysProArgProTrpLysValProLeuGlnTrpLeuTrpSerGluAsp
SNP_4AA 400 leLysProArgProTrpLysValProLeuGlnTrpLeuTrpSerGluAsp
SNP_5AA 400 leLysProArgProTrpLysValProLeuGlnTrpLeuTrpSerGluAsp
|-----|-----|-----|-----|-----|
401 411 421 431 441

RTPAP1_mrna 450 CAGCAATCATGTGGAAGCCAGCAGCCGCAAGAAAAGTTTGGGATACCAGA
SNP_1 450 CAGCAATCATGTGGAAGCCAGCAGCCGCAAGAAAAGTTTGGGATACCAGA
SNP_2 450 CAGCAATCATGTGGAAGCCAGCAGCCGCAAGAAAAGTTTGGGATACCAGA
SNP_3 450 CAGCAATCATGTGGAAGCCAGCAGCCGCAAGAAAAGTTTGGGATACCAGA
SNP_4 450 CAGCAATCATGTGGAAGCCAGCAGCCGCAAGAAAAGTTTGGGATACCAGA
SNP_5 450 CAGCAATCATGTGGAAGCCAGCAGCCGCAAGAA-----GAT-----
RTPAP1_mrnaAA 450 GlnGlnSerCysGlySerGlnGlnProGlnGluLysPheGlyIleProGln
SNP_1AA 450 GlnGlnSerCysGlySerGlnGlnProGlnGluLysPheGlyIleProGln
SNP_2AA 450 GlnGlnSerCysGlySerGlnGlnProGlnGluLysPheGlyIleProGln
SNP_3AA 450 GlnGlnSerCysGlySerGlnGlnProGlnGluLysPheGlyIleProGln
SNP_4AA 450 GlnGlnSerCysGlySerGlnGlnProGlnGluLysPheGlyIleProGln
SNP_5AA 450 GlnGlnSerCysGlySerGlnGlnProGlnGluLysAspTer
|-----|-----|-----|-----|-----|
451 461 471 481 491

RTPAP1_mrna 500 ACTACCGACAATCTCAGAGAACGATGAAGCGTGGCTGAATTGTATAATGA
SNP_1 500 ACTACCGACAATCTCAGAGAACGATGAAGCGTGGCTGAATTGTATAATGA
SNP_2 500 ACTACCGACAATCTCAGAGAACGATGAAGCGTGGCTGAATTGTATAATGA
SNP_3 500 ACTACCGACAATCTCAGAGAACGATGAAGCGTaGCTGAATTGTATAATGA
SNP_4 500 ACTACCGACAATCTCAGAGAACGATGAAGCGTGGCTGAATTGTATGA---ATGA
SNP_5 486 -----TAATG---
RTPAP1_mrnaAA 500 uLeuProThrIleSerGluAsnAspGluAlaTrpLeuAsnCysIleMetA
SNP_1AA 500 uLeuProThrIleSerGluAsnAspGluAlaTrpLeuAsnCysIleMetA
SNP_2AA 500 uLeuProThrIleSerGluAsnAspGluAlaTrpLeuAsnCysIleMetA
SNP_3AA 500 uLeuProThrIleSerGluAsnAspGluAlaTer
SNP_4AA 500 uLeuProThrIleSerGluAsnAspGluAlaTrpLeuAsnCysAsn-Gl
SNP_5AA 486
|-----|-----|-----|-----|-----|
501 511 521 531 541

RTPAP1_mrna 550 ATGGAGATAGAGAGAACAGTGCAGTGCCAGACGTTGGAAACGGGAGCACA
SNP_1 550 ATGGAGATAGAGAGAACAGTGCAGTGCCAGACGTTGGAAACGGGAGCACA
SNP_2 550 ATGGAGATAGAGAGAACAGTGCAGTGCCAGACGTTGGAAACGGGAGCACA
SNP_3 550 ATGGAGATAGAGAGAACAGTGCAGTGCCAGACGTTGGAAACGGGAGCACA
SNP_4 548 ATGGAGATAGAGAGAACAGTGCAGTGCCAGACGTTGGAAACGGGAGCACA
SNP_5 491 -----CtTTGGGC-----CACT
RTPAP1_mrnaAA 550 snGlyAspArgGluAsnSerAlaValProAspValGlyAsnGlySerThr
SNP_1AA 550 snGlyAspArgGluAsnSerAlaValProAspValGlyAsnGlySerThr
SNP_2AA 550 snGlyAspArgGluAsnSerAlaValProAspValGlyAsnGlySerThr
SNP_3AA 550
SNP_4AA 548 uTrpArgTer
SNP_5AA 491
|-----|-----|-----|-----|-----|
551 561 571 581 591

```

FIG. 11 (cont'd)

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RTPAP1_mrna	600	ATGAACCTGCAGAATGAATTTGGAATCGGAGGCTTGGAGGAAAATAGAGA
SNP_1	600	ATGAACCTGCAGAATGAATTTGGAATCGGAGGCTTGGAGGAAAATtGAGA
SNP_2	600	ATGAACCTGCAGAATtAATTTGGAATCGGAGGCTTGGAGGAAAATAGAGA
SNP_3	600	ATGAACCTGCAGAATGAATTTGGAATCGGAGGCTTGGAGGAAAATAGAGA
SNP_4	598	ATGAACCTGCAGAATGAATTTGGAATCGGAGGCTTGGAGGAAAATAGAGA
SNP_5	503	ATa-----
RTPAP1_mrnaAA	600	MetAsnLeuGlnAsnGluPheGlyIleGlyGlyLeuGluGluAsnArgAs
SNP_1AA	600	MetAsnLeuGlnAsnGluPheGlyIleGlyGlyLeuGluGluAsn <u>Ter</u>
SNP_2AA	600	MetAsnLeuGlnAsn <u>Ter</u>
SNP_3AA	600	
SNP_4AA	598	
SNP_5AA	503	
		----- ----- ----- ----- -----
		601 611 621 631 641
RTPAP1_mrna	650	TGGGGCAGTGTTTCTGGAAGGAGTTCTAGGATGGGATGACTTGCTTTGGG
SNP_1	650	TGGGGCAGTGTTTCTGGAAGGAGTTCTAGGATGGGATGACTTGCTTTGGG
SNP_2	650	TGGGGCAGTGTTTCTGGAAGGAGTTCTAGGATGGGATGACTTGCTTTGGG
SNP_3	650	TGGGGCAGTGTTTCTGGAAGGAGTTCTAGGATGGGATGACTTGCTTTGGG
SNP_4	648	TGGGGCAGTGTTTCTGGAAGGAGTTCTAGGATGGGATGACTTGCTTTGGG
SNP_5	506	-----tAGTGeTTaTata-----TGGGATGACTTGCTTTGGG
RTPAP1_mrnaAA	650	pGlyAlaValPheLeuGluGlyValLeuGlyTrpAspAspLeuLeuTrpA
SNP_1AA	650	
SNP_2AA	650	
SNP_3AA	650	
SNP_4AA	648	
SNP_5AA	506	
		----- ----- ----- ----- -----
		651 661 671 681 691
RTPAP1_mrna	700	CCACTATATAGTGCTCATATATGGTAGTGCAATAGTTGCCATTATAAGTT
SNP_1	700	CCACTATATAGTGCTCATATATGGTAGTGCAATAGTTGCCATTATAAGTT
SNP_2	700	CCACTATATAGTGCTCATATATGGTAGTGCAATAGTTGCCATTATAAGTT
SNP_3	700	CCACTATATAGTGCTCATATATGGTAGTGCAATAGTTGCCATTATAAGTT
SNP_4	698	CCACTATATAGTGCTCATATATGGTAGTGCAATAGTTGCCATTATAAGTT
SNP_5	538	CCACTATATAGTGCTtATATATGGTAGTGCAATAGTTGCCATTATAAGTT
RTPAP1_mrnaAA	700	laThrIle <u>Ter</u>
SNP_1AA	700	
SNP_2AA	700	
SNP_3AA	700	
SNP_4AA	698	
SNP_5AA	538	
		----- ----- ----- ----- -----
		701 711 721 731 741
RTPAP1_mrna	750	GTTTCGAACTTTAATGCTCCTGAAATTCCCATGCAAGTATTTAGAGCTTC
SNP_1	750	GTTTCGAACTTTAATGCTCCTGAAATTCCCATGCAAGTATTTAGAGCTTC
SNP_2	750	GTTTCGAACTTTAATGCTCCTGAAATTCCCATGCAAGTATTTAGAGCTTC
SNP_3	750	GTTTCGAACTTTAATGCTCCTGAAATTCCCATGCAAGTATTTAGAGCTTC
SNP_4	748	GTTTCGAACTTTAATGCTCCTGAAATTCCCATGCAAGTATTTAGAGCTTC
SNP_5	588	GTTTCGAACTTTAATGCTCCTGAAATTCCCATGCAAGTATTTAGAGCTTC
RTPAP1_mrnaAA	750	
SNP_1AA	750	
SNP_2AA	750	
SNP_3AA	750	
SNP_4AA	748	
SNP_5AA	588	
		----- ----- ----- ----- -----
		751 761 771 781 791

FIG. 11 (cont'd)

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RTPAP1_mrna 800 ATATCCTACAAAAAGACAGGAAACGAGACCTTGAAAAAAGACTCAGTACC
SNP_1 800 ATATCCTACAAAAAGACAGGAAACGAGACCTTGAAAAAAGACTCAGTACC
SNP_2 800 ATATCCTACAAAAAGACAGGAAACGAGACCTTGAAAAAAGACTCAGTACC
SNP_3 800 ATATCCTACAAAAAGACAGGAAACGAGACCTTGAAAAAAGACTCAGTACC
SNP_4 798 ATATCCTACAAAAAGACAGGAAACGAGACCTTGAAAAAAGACTCAGTACC
SNP_5 638 ATATCCTACAAAAAGACAGGAAACGAGACCTTGAAAAAAGACTCAGTACC
RTPAP1_mrnaAA 800
SNP_1AA 800
SNP_2AA 800
SNP_3AA 800
SNP_4AA 798
SNP_5AA 638

801 811 821 831 841

RTPAP1_mrna 850 AGAAGGCATCCACTTATTGATTGCTTTTATACTTGCAACATGAAGGAAGC
SNP_1 850 AGAAGGCATCCACTTATTGATTGCTTTTATACTTGCAACATGAAGGAAGC
SNP_2 850 AGAAGGCATCCACTTATTGATTGCTTTTATACTTGCAACATGAAGGAAGC
SNP_3 850 AGAAGGCATCCACTTATTGATTGCTTTTATACTTGCAACATGAAGGAAGC
SNP_4 848 AGAAGGCATCCACTTATTGATTGCTTTTATACTTGCAACATGAAGGAAGC
SNP_5 688 AGAAGGCATCCACTTATTGATTGCTTTTATACTTGCAACATGAAGGAAGC
RTPAP1_mrnaAA 850
SNP_1AA 850
SNP_2AA 850
SNP_3AA 850
SNP_4AA 848
SNP_5AA 688

851 861 871 881 891

RTPAP1_mrna 900 ACGCTTTCTCACCAAAAAAAAAA
SNP_1 900 ACGCTTTCTCACCAAAAAAAAAA
SNP_2 900 ACGCTTTCTCACCAAAAAAAAAA
SNP_3 900 ACGCTTTCTCACCAAAAAAAAAA
SNP_4 898 ACGCTTTCTCACCAAAAAAAAAA
SNP_5 738 ACGCTTTCTCACCAAAAAAAAAA
RTPAP1_mrnaAA 900
SNP_1AA 900
SNP_2AA 900
SNP_3AA 900
SNP_4AA 898
SNP_5AA 738

901 911 921

FIG. 11 (cont'd)

a

forward →

...GTACCGTTGCAATGGTTATGGTCAGAAATCAGCAATCATGTGGAAGCCAGCAGCCGCAAGAAAGTTTGGGA

TACCAGAACTACCGACAACTCTCAGAGAACGATGAAGCGTGGCTGAATTGTATAATGAATGGAGATAGAGAGAAC

AGTGCAGTGCCAGACGTGGAAACGGGAGCACAAATGAACCTGCAGAAATTAATTGGGAATCGGAGGCTTGGAGGA

AAATAGAGATGGGGCAGTGTCTCTGGAAAGGAGTTCTAGGATGGGATGACTTGGCTTTGGGCCACTATATAGTGCTC

ATATATGGTAGTGAATAGTTGCCATTATAAGTTTTCGAACCTTAAATGCTCTGAAATTCCTCATGCAAGTA...

reverse ←

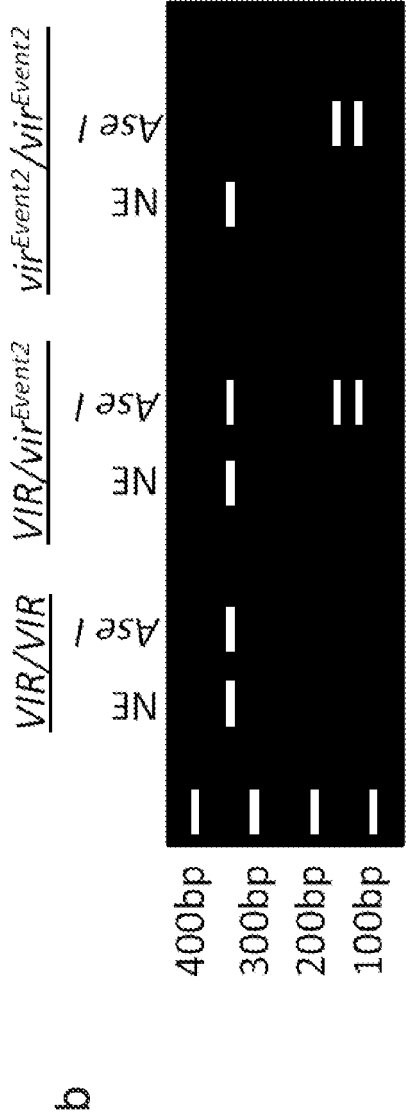


FIG. 12

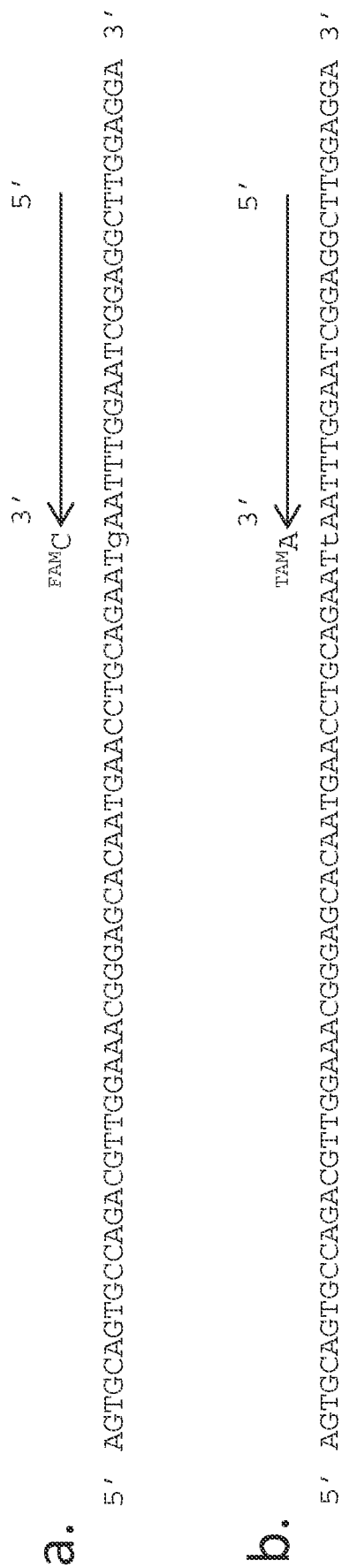


FIG. 13

a.

forward

...AAGTAATTAGCCACGGCCATGGAAAGTACCGTTGCAATGGTTATGGTCAGAAATCAGCAATCATGTGGA

AGCCAGCAGCCGCAAGAAAGTTGGGATACCAGAACTACCGACAATCTCAGAGAACGATGAAGCG**AGC**GAAT

Alu I

TGTATAA TGAATGGAGATAGAGAGAACAGTGCAGTGCCAGACGTTGGAAACGGGAGCAATGAACCTGCAGAA

TGAATTTGGAAATCGGAGGCTTGGAGGAAATAGAGATGGGGCAGTGTTTCTGGAAAGGAGTTCTAGGATGGGATG

reverse

ACTTGCTTTGGGCCACTATATAGTGCTCATATATGGTAGTGCAATAGTTGCCATTATAAGTTGTTTCGAACTTTAAT

GCTCCTGAAATT...

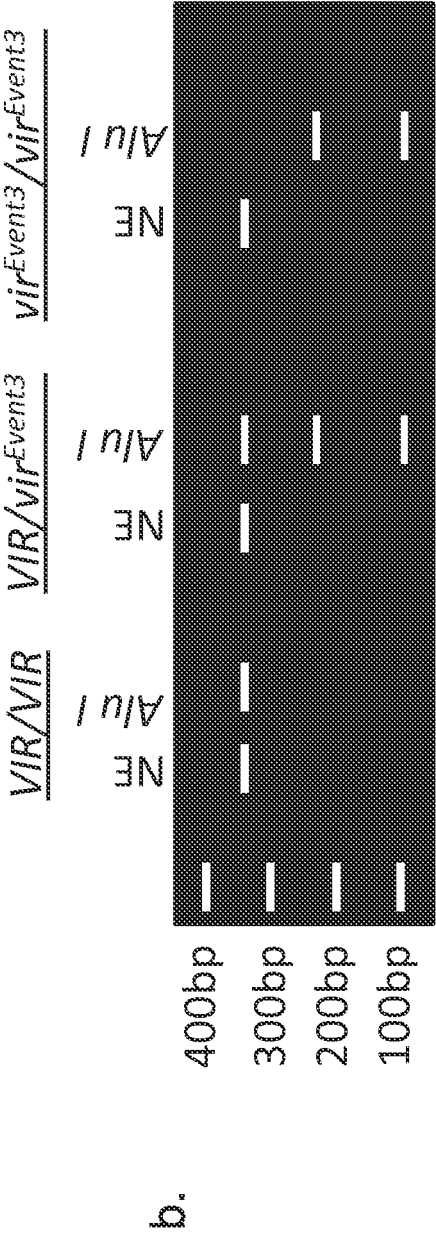


FIG. 14

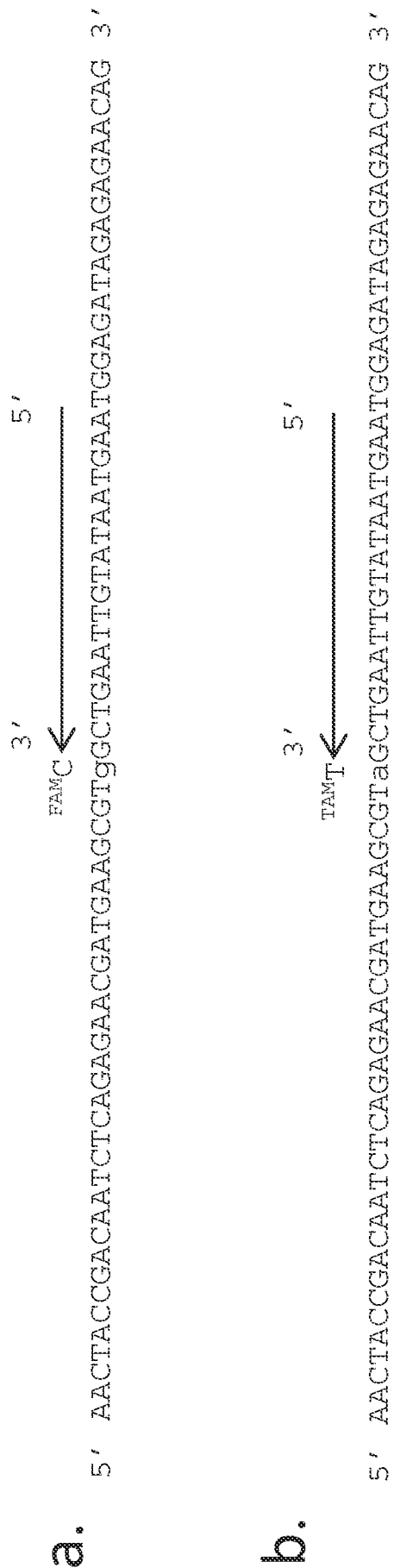


FIG. 15

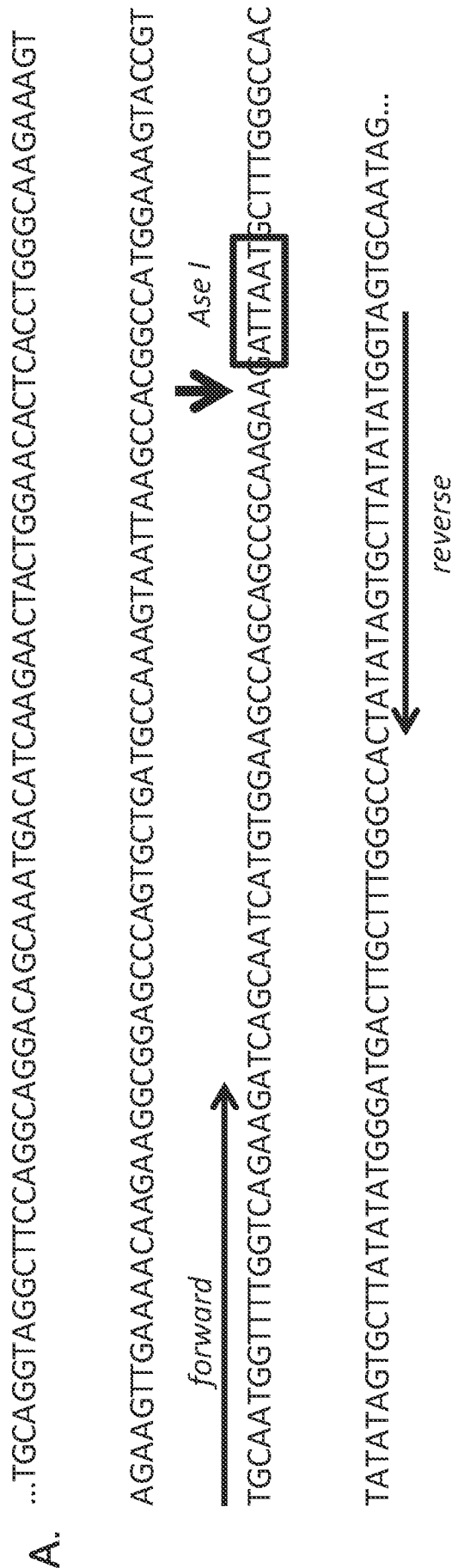
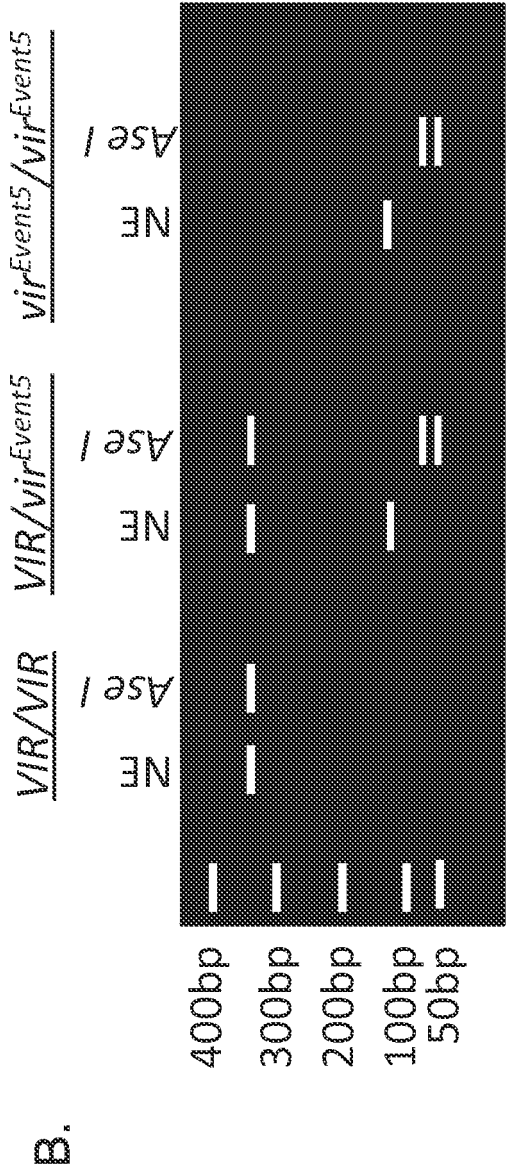


FIG. 16

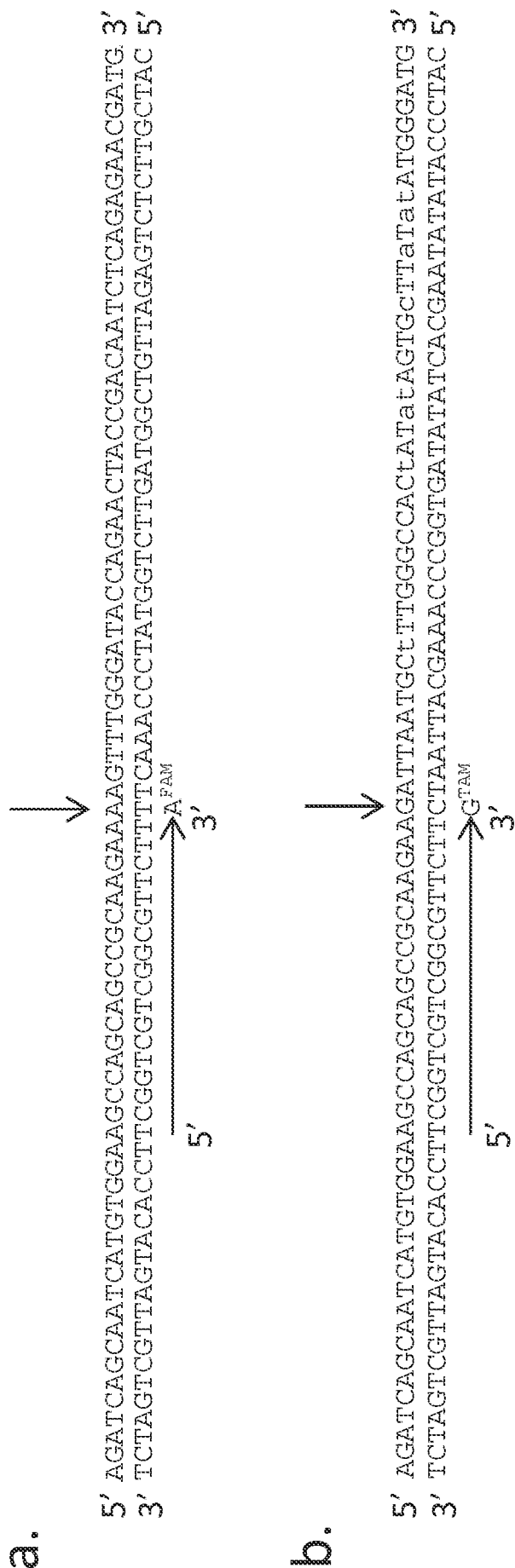


FIG. 17

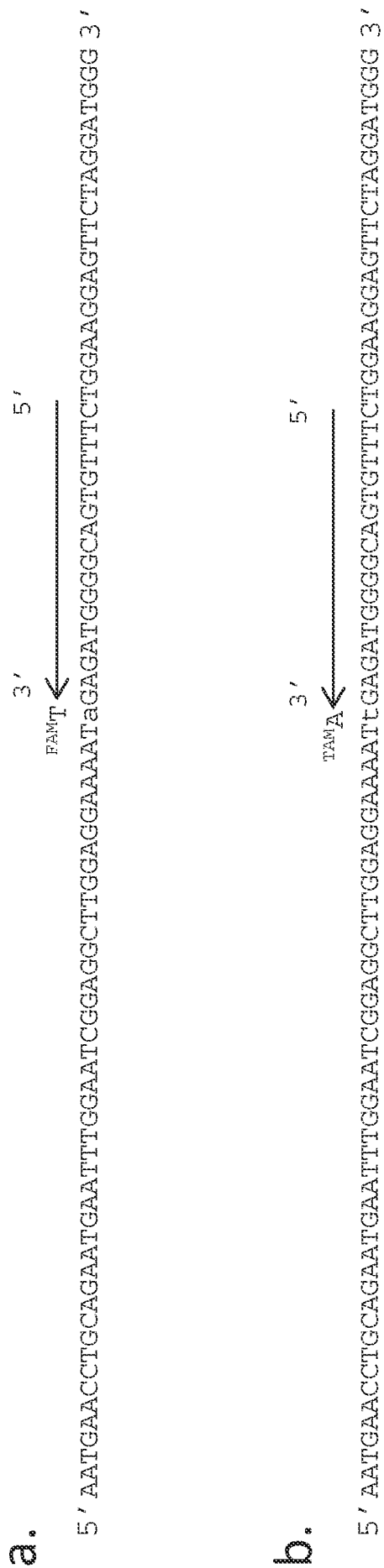


FIG. 18

a.

5' CCAGAACTACCGACAATCTCAGAGAACGATGAAGCGTGGCTGAAATTGTTAAATGAATGGAGATAGAGAGAACAGTGCAGTGC3'
 3' GGTCTTGATGGCTGTTAGAGTCTCTTGCTACTTTCGACCGACTTAAACAATTTACTTACCTCTATCTCTTGTACCGTCACG5'



b.

5' CCAGAACTACCGACAATCTCAGAGAACGATGAAGCGTGGCTGAAATTGTAATGAATGGAGATAGAGAGAACAGTGCAGTGC3'
 3' GGTCTTGATGGCTGTTAGAGTCTCTTGCTACTTTCGACCGACTTAAACAATTTACTTACCTCTATCTCTTGTACCGTCACG5'



FIG. 19