

NO 9019\_ST25  
SEQUENCE LISTING

<110> Nestec S.A.  
McCarthy, James G.  
Lepelley, Maud

<120> Modulation of Galactomannan Content in Coffee

<130> NO 9019

<150> INSERT APPLICATION NUMBER HERE

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<170> PatentIn version 3.5

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Ala Ile Gly Ile Asn Val Pro Arg Ser Arg Phe Leu Pro Val Lys Ala  
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Ser Ile Glu Lys Glu Val Phe Pro Lys Ile Ala Ala Glu Lys Met Leu  
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Asp Tyr Ile Thr Gly Leu Arg Leu Tyr Leu Asp Ser Leu Arg Lys Lys  
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Asp Ala Ser Lys Leu Ala Ser Gly Thr His Ile Val Gly Asn Val Leu  
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Val Ala Ile Gly Pro Gly Cys Val Val Glu Ala Gly Val Arg Leu Ser  
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Arg Cys Thr Val Met Arg Gly Val Arg Ile Lys Lys His Ala Cys Ile  
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Val Glu Asn Met Thr Ile Leu Gly Glu Asp Val His Val Cys Asp Glu  
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Cys Leu Arg Tyr Val Asp Glu Phe Pro Glu Ile His Phe Phe Gly Asp  
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Lys Thr Tyr Lys Gly Gly Asn Asp Ser Glu Ile Tyr Glu Ser Glu Arg  
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 Lys Asn Lys Phe Asn Ala Val Ile His Phe Ala Gly Leu Lys Ala Val  
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 Pro Cys Val Glu Asp Phe Asp Leu Lys Ala Met Asn Pro Tyr Gly Arg  
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 Pro Glu Trp Lys Ile Ile Leu Leu Arg Tyr Phe Asn Pro Val Gly Ala  
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130 135 140

Glu Glu Phe Pro Leu Cys Ala Val Asn Pro Tyr Gly Arg Thr Lys Leu  
145 150 155 160

Phe Ile Glu Glu Ile Cys Arg Asp Val Tyr Gly Ser Asp Ser Glu Trp  
165 170 175

Lys Ile Ile Leu Leu Arg Tyr Phe Asn Pro Val Gly Ala His Pro Ser  
Page 11

180

185

190

Gly Tyr Ile Gly Glu Asp Pro Arg Gly Ile Pro Asn Asn Leu Met Pro  
 195 200 205

Phe Val Gln Gln Val Ala Val Gly Arg Arg Pro Ala Leu Thr Val Phe  
 210 215 220

Gly Thr Asp Tyr Ser Thr Lys Asp Gly Thr Gly Val Arg Asp Tyr Ile  
 225 230 235 240

His Val Val Asp Leu Ala Asp Gly His Ile Ala Ala Val Asn Lys Leu  
 245 250 255

Ser Asp Pro Ser Ile Gly Cys Glu Val Tyr Asn Leu Gly Thr Gly Lys  
 260 265 270

Gly Thr Ser Val Leu Glu Met Val Glu Ala Phe Glu Lys Ala Ser Arg  
 275 280 285

Lys Lys Ile Pro Leu Val Lys Ala Gly Arg Arg Ala Gly Asp Ala Glu  
 290 295 300

Ile Val Tyr Gly Ser Thr Asp Lys Ala Glu His Glu Leu Asn Trp Lys  
 305 310 315 320

Ala Lys Tyr Gly Ile Glu Glu Met Cys Arg Asp Gln Trp Asn Trp Ala  
 325 330 335

Ser Lys Asn Pro Tyr Gly Tyr Gly Ser Pro Asp Ser Thr Asp  
 340 345 350

<210> 11  
 <211> 477  
 <212> PRT  
 <213> Solanum tuberosum

<400> 11

Met Ala Thr Ala Ala Thr Leu Ser Pro Ala Asp Ala Glu Lys Leu Asn  
 1 5 10 15

Asn Leu Lys Ser Ala Val Ala Gly Leu Asn Gln Ile Ser Asp Asn Glu  
 20 25 30

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

Gln His Ile Asp Trp Ser Lys Ile Gln Thr Pro Thr Asp Glu Val Val  
 50 55 60

Val Pro Tyr Asp Lys Leu Ala Pro Leu Ser Glu Asp Pro Ala Glu Thr  
 65 70 75 80

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Lys Asn Leu Leu Asp<sub>85</sub> Lys Leu Val Val<sub>90</sub> Leu Lys Leu Asn Gly<sub>95</sub> Gly Leu  
 Gly Thr Thr Met<sub>100</sub> Gly Cys Thr Gly Pro<sub>105</sub> Lys Ser Val Ile Glu<sub>110</sub> Val Arg  
 Asn Gly<sub>115</sub> Leu Thr Phe Leu Asp<sub>120</sub> Leu Ile Val Lys Gln Ile<sub>125</sub> Glu Ala Leu  
 Asn Ala<sub>130</sub> Lys Phe Gly Cys Ser<sub>135</sub> Val Pro Leu Leu<sub>140</sub> Met Asn Ser Phe  
 Asn Thr<sub>145</sub> His Asp Asp<sub>150</sub> Thr Leu Lys Ile Val<sub>155</sub> Glu Lys Tyr Ala Asn<sub>160</sub> Ser  
 Asn Ile Asp Ile<sub>165</sub> His Thr Phe Asn Gln Ser<sub>170</sub> Gln Tyr Pro Arg Leu<sub>175</sub> Val  
 Thr Glu Asp<sub>180</sub> Phe Ala Pro Leu Pro Cys<sub>185</sub> Lys Gly Asn Ser Gly<sub>190</sub> Lys Asp  
 Gly Trp Tyr<sub>195</sub> Pro Pro Gly His Gly<sub>200</sub> Asp Val Phe Pro Ser<sub>205</sub> Leu Met Asn  
 Ser Gly<sub>210</sub> Lys Leu Asp Ala<sub>215</sub> Leu Leu Ala Lys Gly<sub>220</sub> Lys Glu Tyr Val Phe  
 Val<sub>225</sub> Ala Asn Ser Asp Asn<sub>230</sub> Leu Gly Ala Ile Val<sub>235</sub> Asp Leu Lys Ile Leu<sub>240</sub>  
 Asn His Leu Ile<sub>245</sub> Leu Asn Lys Asn Glu Tyr<sub>250</sub> Cys Met Glu Val Thr<sub>255</sub> Pro  
 Lys Thr Leu Ala<sub>260</sub> Asp Val Lys Gly<sub>265</sub> Thr Leu Ile Ser Tyr<sub>270</sub> Glu Gly  
 Lys Val Gln<sub>275</sub> Leu Leu Glu Ile Ala<sub>280</sub> Gln Val Pro Asp Glu<sub>285</sub> His Val Asn  
 Glu Phe<sub>290</sub> Lys Ser Ile Glu Lys<sub>295</sub> Phe Lys Ile Phe Asn Thr Asn Asn Leu  
 Trp Val<sub>305</sub> Asn Leu Ser Ala<sub>310</sub> Ile Lys Arg Leu Val<sub>315</sub> Glu Ala Asp Ala Leu<sub>320</sub>  
 Lys Met Glu Ile<sub>325</sub> Ile Pro Asn Pro Lys Glu<sub>330</sub> Val Asp Gly Val Lys<sub>335</sub> Val  
 Leu Gln Leu Glu<sub>340</sub> Thr Ala Ala Gly Ala<sub>345</sub> Ala Ile Lys Phe Phe<sub>350</sub> Asp Arg

NO 9019\_ST25

Ala Ile Gly Ala Asn Val Pro Arg Ser Arg Phe Leu Pro Val Lys Ala  
355 360 365

Thr Ser Asp Leu Leu Leu Val Gln Ser Asp Leu Tyr Thr Leu Thr Asp  
370 375 380

Glu Gly Tyr Val Ile Arg Asn Pro Ala Arg Ser Asn Pro Ser Asn Pro  
385 390 395 400

Ser Ile Glu Leu Gly Pro Glu Phe Lys Lys Val Ala Asn Phe Leu Gly  
405 410 415

Arg Phe Lys Ser Ile Pro Ser Ile Ile Asp Leu Asp Ser Leu Lys Val  
420 425 430

Thr Gly Asp Val Trp Phe Gly Ser Gly Val Thr Leu Glu Gly Lys Val  
435 440 445

Thr Ile Ala Ala Lys Ser Gly Val Lys Leu Glu Ile Pro Asp Gly Ala  
450 455 460

Val Ile Ala Asn Lys Asp Ile Asn Gly Pro Glu Asp Ile  
465 470 475

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<211> 469  
<212> PRT  
<213> Oryza sativa

<400> 12

Met Ala Val Ala Ala Asp Val Lys Leu Glu Gly Leu Arg Ala Ala Thr  
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Asp Lys Leu Asp Gln Ile Ser Glu Asn Glu Lys Ser Gly Phe Ile Ser  
20 25 30

Leu Val Ser Arg Tyr Leu Ser Gly Glu Ala Glu Gln Ile Glu Trp Ser  
35 40 45

Lys Ile Gln Thr Pro Thr Asp Glu Val Val Val Pro Tyr Asp Thr Leu  
50 55 60

Ser Ala Ala Pro Glu Asp Leu Asn Glu Thr Lys Lys Leu Leu Asp Lys  
65 70 75 80

Leu Val Val Leu Lys Leu Asn Gly Gly Leu Gly Thr Thr Met Gly Cys  
85 90 95

Thr Gly Pro Lys Ser Val Ile Glu Val Arg Asn Gly Phe Thr Phe Leu  
100 105 110

Asp Leu Ile Val Ile Gln Ile Glu Ser Leu Asn Lys Lys Tyr Gly Cys  
115 120 125

NO 9019\_ST25

Asn Val Pro Leu Leu Leu Met Asn Ser Phe Asn Thr His Asp Asp Thr  
 130 135 140  
 Gln Lys Ile Val Glu Lys Tyr Ser Asn Ser Asn Ile Glu Ile His Thr  
 145 150 155 160  
 Phe Asn Gln Ser Gln Tyr Pro Arg Ile Val Thr Glu Asp Phe Leu Pro  
 165 170 175  
 Leu Pro Ser Lys Gly Lys Thr Gly Lys Asp Gly Trp Tyr Pro Pro Gly  
 180 185 190  
 His Gly Asp Val Phe Pro Ser Leu Asn Asn Ser Gly Lys Leu Asp Thr  
 195 200 205  
 Leu Leu Ala Gln Gly Lys Glu Tyr Val Phe Val Ala Asn Ser Asp Asn  
 210 215 220  
 Leu Gly Ala Ile Val Asp Ile Lys Ile Leu Asn His Leu Ile His Asn  
 225 230 235 240  
 Gln Asn Glu Tyr Cys Met Glu Val Thr Pro Lys Thr Leu Ala Asp Val  
 245 250 255  
 Lys Gly Gly Thr Leu Ile Ser Tyr Glu Gly Arg Val Gln Leu Leu Glu  
 260 265 270  
 Ile Ala Gln Val Pro Asp Glu His Val Asn Glu Phe Lys Ser Ile Glu  
 275 280 285  
 Lys Phe Lys Ile Phe Asn Thr Asn Asn Leu Trp Val Asn Leu Lys Ala  
 290 295 300  
 Ile Lys Arg Leu Val Glu Ala Glu Ala Leu Lys Met Glu Ile Ile Pro  
 305 310 315 320  
 Asn Pro Lys Glu Val Asp Gly Val Lys Val Leu Gln Leu Glu Thr Ala  
 325 330 335  
 Ala Gly Ala Ala Ile Arg Phe Phe Glu Lys Ala Ile Gly Ile Asn Val  
 340 345 350  
 Pro Arg Ser Arg Phe Leu Pro Val Lys Ala Thr Ser Asp Leu Leu Leu  
 355 360 365  
 Val Gln Ser Asp Leu Tyr Thr Leu Val Asp Gly Phe Val Ile Arg Asn  
 370 375 380  
 Pro Ala Arg Thr Asn Pro Ser Asn Pro Ser Ile Glu Leu Gly Pro Glu  
 385 390 395 400

NO 9019\_ST25

Phe Lys Lys Val Ala Asn Phe Leu Ala Arg Phe Lys Ser Ile Pro Ser  
405 410 415

Ile Val Glu Leu Asp Thr Leu Lys Val Ser Gly Asp Val Trp Phe Gly  
420 425 430

Ser Gly Val Thr Leu Lys Gly Lys Val Thr Ile Thr Ala Lys Ser Gly  
435 440 445

Lys Leu Glu Ile Pro Asp Gly Ala Val Leu Glu Asn Lys Asp Ile Asn  
450 455 460

Gly Pro Glu Asp Leu  
465

<210> 13  
<211> 476  
<212> PRT  
<213> Cucumis melo

<400> 13

Met Ala Ser Ala Ala Thr Leu Ser Pro Ala Asp Thr Glu Lys Leu Ser  
1 5 10 15

Lys Leu Lys Ala Ser Val Ser Gly Leu Thr Gln Ile Ser Glu Asn Glu  
20 25 30

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

Gln His Val Glu Trp Ser Lys Ile Gln Thr Pro Thr Asp Glu Val Val  
50 55 60

Val Pro Tyr Asp Ser Leu Ala Pro Val Pro Asn Asp Pro Ala Glu Thr  
65 70 75 80

Lys Lys Leu Leu Asp Lys Leu Val Val Leu Lys Leu Asn Gly Gly Leu  
85 90 95

Gly Thr Thr Met Gly Cys Thr Gly Pro Lys Ser Val Ile Glu Val Arg  
100 105 110

Asn Gly Leu Thr Phe Leu Asp Leu Ile Val Ile Gln Ile Glu Asn Leu  
115 120 125

Asn Ser Lys Tyr Gly Cys Asn Val Pro Leu Leu Leu Met Asn Ser Phe  
130 135 140

Asn Thr His Asp Asp Thr Gln Lys Ile Ile Glu Lys Tyr Lys Gly Ser  
145 150 155 160

Asn Val Asp Ile His Thr Phe Asn Gln Ser Gln Tyr Pro Arg Leu Val  
Page 16



Ala Glu Asp Tyr<sub>180</sub> Leu Pro Leu Pro Ser<sub>185</sub> Lys Gly Arg Thr Asp<sub>190</sub> Lys Asp

Gly Trp Tyr<sub>195</sub> Pro Pro Gly His Gly<sub>200</sub> Asp Val Phe Pro Ser<sub>205</sub> Leu Lys Asn

Ser Gly<sub>210</sub> Lys Leu Asp Ala Leu<sub>215</sub> Ile Ala Gln Gly<sub>220</sub> Lys Glu Tyr Val Phe

Val<sub>225</sub> Ala Asn Ser Asp Asn<sub>230</sub> Leu Gly Ala Val Val<sub>235</sub> Asp Leu Gln Ile Leu<sub>240</sub>

Asn His Leu Ile Gln<sub>245</sub> Asn Lys Asn Glu Tyr<sub>250</sub> Cys Met Glu Val Thr<sub>255</sub> Pro

Lys Thr Leu Ala<sub>260</sub> Asp Val Lys Gly Gly<sub>265</sub> Thr Leu Ile Ser Tyr<sub>270</sub> Glu Gly

Lys Val Gln<sub>275</sub> Leu Leu Glu Ile Ala<sub>280</sub> Gln Val Pro Asp Glu<sub>285</sub> His Val Asn

Glu Phe<sub>290</sub> Lys Ser Ile Gln Lys<sub>295</sub> Phe Lys Ile Phe Asn<sub>300</sub> Thr Asn Asn Leu

Trp Val<sub>305</sub> Asn Leu Lys Ala<sub>310</sub> Ile Lys Arg Leu Val<sub>315</sub> Glu Ala Asn Ala<sub>320</sub> Leu

Lys Met Glu Ile Ile<sub>325</sub> Pro Asn Pro Lys Glu<sub>330</sub> Val Asp Gly Ile Lys<sub>335</sub> Val

Leu Gln Leu Glu<sub>340</sub> Thr Ala Ala Gly Ala<sub>345</sub> Ala Ile Arg Phe Phe<sub>350</sub> Asp His

Ala Ile Gly<sub>355</sub> Ile Asn Val Pro Arg<sub>360</sub> Ser Arg Phe Leu Pro<sub>365</sub> Val Lys Ala

Thr Ser<sub>370</sub> Asp Leu Leu Leu Val<sub>375</sub> Gln Ser Asp Leu Tyr<sub>380</sub> Thr Leu Val Asp

Gly<sub>385</sub> Phe Val Leu Arg Asn<sub>390</sub> Lys Ala Arg Lys Asp<sub>395</sub> Pro Ser Asn Pro Ser<sub>400</sub>

Ile Glu Leu Gly Pro<sub>405</sub> Glu Phe Lys Lys Val<sub>410</sub> Gly Asn Phe Leu Ser<sub>415</sub> Arg

Phe Lys Ser Ile<sub>420</sub> Pro Ser Ile Ile Glu<sub>425</sub> Leu Asp Ser Leu Lys<sub>430</sub> Val Val

Gly Asp Val<sub>435</sub> Ser Phe Gly Ala Gly<sub>440</sub> Val Val Leu Lys Gly<sub>445</sub> Lys Val Thr

Ile Ser Ala Lys Pro Gly Thr Lys Leu Ala Val Pro Asp Asn Ala Val  
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Ile Ala Asn Lys Glu Ile Asn Gly Pro Glu Asp Phe  
 465 470 475

<210> 14  
 <211> 469  
 <212> PRT  
 <213> Arabidopsis thaliana

<400> 14

Met Ala Ala Thr Thr Glu Asn Leu Pro Gln Leu Lys Ser Ala Val Asp  
 1 5 10 15

Gly Leu Thr Glu Met Ser Glu Ser Glu Lys Ser Gly Phe Ile Ser Leu  
 20 25 30

Val Ser Arg Tyr Leu Ser Gly Glu Ala Gln His Ile Glu Trp Ser Lys  
 35 40 45

Ile Gln Thr Pro Thr Asp Glu Ile Val Val Pro Tyr Glu Lys Met Thr  
 50 55 60

Pro Val Ser Gln Asp Val Ala Glu Thr Lys Asn Leu Leu Asp Lys Leu  
 65 70 75 80

Val Val Leu Lys Leu Asn Gly Gly Leu Gly Thr Thr Met Gly Cys Thr  
 85 90 95

Gly Pro Lys Ser Val Ile Glu Val Arg Asp Gly Leu Thr Phe Leu Asp  
 100 105 110

Leu Ile Val Ile Gln Ile Glu Asn Leu Asn Asn Lys Tyr Gly Cys Lys  
 115 120 125

Val Pro Leu Val Leu Met Asn Ser Phe Asn Thr His Asp Asp Thr His  
 130 135 140

Lys Ile Val Glu Lys Tyr Thr Asn Ser Asn Val Asp Ile His Thr Phe  
 145 150 155 160

Asn Gln Ser Lys Tyr Pro Arg Val Val Ala Asp Glu Phe Val Pro Trp  
 165 170 175

Pro Ser Lys Gly Lys Thr Asp Lys Glu Gly Arg Tyr Pro Pro Gly His  
 180 185 190

Gly Asp Val Phe Pro Ala Leu Met Asn Ser Gly Lys Leu Asp Thr Phe  
 195 200 205

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Leu Ser Gln Gly Lys Glu Tyr Val Phe Val Ala Asn Ser Asp Asn Leu  
210 215 220

Gly Ala Ile Val Asp Leu Thr Ile Leu Lys His Leu Ile Gln Asn Lys  
225 230 235 240

Asn Glu Tyr Cys Met Glu Val Thr Pro Lys Thr Leu Ala Asp Val Lys  
245 250 255

Gly Gly Thr Leu Ile Ser Tyr Glu Gly Lys Val Gln Leu Leu Glu Ile  
260 265 270

Ala Gln Val Pro Asp Glu His Val Asn Glu Phe Lys Ser Ile Glu Lys  
275 280 285

Phe Lys Ile Phe Asn Thr Asn Asn Leu Trp Val Asn Leu Lys Ala Ile  
290 295 300

Lys Lys Leu Val Glu Ala Asp Ala Leu Lys Met Glu Ile Ile Pro Asn  
305 310 315 320

Pro Lys Glu Val Asp Gly Val Lys Val Leu Gln Leu Glu Thr Ala Ala  
325 330 335

Gly Ala Ala Ile Arg Phe Phe Asp Asn Ala Ile Gly Val Asn Val Pro  
340 345 350

Arg Ser Arg Phe Leu Pro Val Lys Ala Ser Ser Asp Leu Leu Leu Val  
355 360 365

Gln Ser Asp Leu Tyr Thr Leu Val Asp Gly Phe Val Thr Arg Asn Lys  
370 375 380

Ala Arg Thr Asn Pro Ser Asn Pro Ser Ile Glu Leu Gly Pro Glu Phe  
385 390 395 400

Lys Lys Val Ala Thr Phe Leu Ser Arg Phe Lys Ser Ile Pro Ser Ile  
405 410 415

Val Glu Leu Asp Ser Leu Lys Val Ser Gly Asp Val Trp Phe Gly Ser  
420 425 430

Ser Ile Val Leu Lys Gly Lys Val Thr Val Ala Ala Lys Ser Gly Val  
435 440 445

Lys Leu Glu Ile Pro Asp Arg Ala Val Val Glu Asn Lys Asn Ile Asn  
450 455 460

Gly Pro Glu Asp Leu  
465

<210> 15

<211> 361  
 <212> PRT  
 <213> Solanum tuberosum

<400> 15

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

Leu Thr Leu Ser Val Pro Lys Pro Leu Val Glu Phe Ala Asn Lys Pro  
 20 25 30

Met Ile Leu His Gln Ile Glu Ala Leu Lys Ala Val Gly Val Thr Glu  
 35 40 45

Val Val Leu Ala Ile Asn Tyr Gln Pro Glu Val Met Leu Asn Phe Leu  
 50 55 60

Lys Glu Phe Glu Ala Ser Leu Gly Ile Lys Ile Thr Cys Ser Gln Glu  
 65 70 75 80

Thr Glu Pro Leu Gly Thr Ala Gly Pro Leu Ala Leu Ala Arg Asp Lys  
 85 90 95

Leu Ile Asp Asp Ser Gly Glu Pro Phe Phe Val Leu Asn Ser Asp Val  
 100 105 110

Ile Ser Glu Tyr Pro Phe Lys Glu Met Ile Gln Phe His Lys Ser His  
 115 120 125

Gly Gly Glu Ala Ser Leu Met Val Thr Lys Val Asp Glu Pro Ser Lys  
 130 135 140

Tyr Gly Val Val Val Met Glu Glu Ser Thr Gly Gln Val Glu Arg Phe  
 145 150 155 160

Val Glu Lys Pro Lys Leu Phe Val Gly Asn Lys Ile Asn Ala Gly Phe  
 165 170 175

Tyr Leu Leu Asn Pro Ser Val Leu Asp Arg Ile Gln Leu Arg Pro Thr  
 180 185 190

Ser Ile Glu Lys Glu Val Phe Pro Lys Ile Ala Ala Glu Lys Lys Leu  
 195 200 205

Tyr Ala Met Val Leu Pro Gly Phe Trp Met Asp Ile Gly Gln Pro Arg  
 210 215 220

Asp Tyr Ile Thr Gly Leu Arg Leu Tyr Leu Asp Ser Leu Lys Lys His  
 225 230 235 240

Ser Ser Pro Lys Leu Ala Ser Gly Pro His Ile Val Gly Asn Val Ile  
 245 250 255

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Val Asp Glu Ser Ala Lys Ile Gly Glu Gly Cys Leu Ile Gly Pro Asp  
260 265 270

Val Ala Ile Gly Ser Gly Cys Val Ile Glu Ser Gly Val Arg Leu Ser  
275 280 285

Arg Cys Thr Val Met Arg Gly Val Arg Ile Lys Lys His Ala Cys Ile  
290 295 300

Ser Gly Ser Ile Ile Gly Trp His Ser Thr Val Gly Gln Trp Ala Arg  
305 310 315 320

Val Glu Asn Met Thr Ile Leu Gly Glu Asp Val His Val Cys Asp Glu  
325 330 335

Ile Tyr Ser Asn Gly Gly Val Val Leu Pro His Lys Glu Ile Lys Ser  
340 345 350

Ser Ile Leu Lys Pro Glu Ile Val Met  
355 360

<210> 16  
<211> 361  
<212> PRT  
<213> Solanum lycopersicum

<400> 16

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

Leu Thr Leu Ser Val Pro Lys Pro Leu Val Glu Phe Ala Asn Lys Pro  
20 25 30

Met Ile Leu His Gln Ile Glu Ala Leu Lys Ala Val Gly Val Thr Glu  
35 40 45

Val Val Leu Ala Ile Asn Tyr Gln Pro Glu Val Met Leu Asn Phe Leu  
50 55 60

Lys Glu Phe Glu Ala Ser Leu Gly Ile Lys Ile Thr Cys Ser Gln Glu  
65 70 75 80

Thr Glu Pro Leu Gly Thr Ala Gly Pro Leu Ala Leu Ala Arg Asp Lys  
85 90 95

Leu Ile Asp Asp Ser Gly Glu Pro Phe Phe Val Leu Asn Ser Asp Val  
100 105 110

Ile Ser Glu Tyr Pro Phe Lys Glu Met Ile Gln Phe His Lys Ser His  
115 120 125

Gly Gly Glu Ala Ser Leu Met Val Thr Lys Val Asp Glu Pro Ser Lys  
Page 21

130

135

Tyr Gly Val Val Val Met Glu Glu Ser Thr Gly Gln Val Glu Arg Phe  
145 150 155 160

Val Glu Lys Pro Lys Leu Phe Val Gly Asn Lys Ile Asn Ala Gly Phe  
165 170 175

Tyr Leu Leu Asn Pro Ser Val Leu Asp Arg Ile Gln Leu Arg Pro Thr  
180 185 190

Ser Ile Glu Lys Glu Val Phe Pro Lys Ile Ala Ala Glu Lys Lys Leu  
195 200 205

Tyr Ala Met Val Leu Pro Gly Phe Trp Met Asp Val Gly Gln Pro Arg  
210 215 220

Asp Tyr Ile Thr Gly Leu Arg Leu Tyr Leu Asp Ser Leu Lys Lys His  
225 230 235 240

Ser Ser Pro Lys Leu Ala Ser Gly Pro His Ile Val Gly Asn Val Ile  
245 250 255

Val Asp Glu Ser Ala Lys Ile Gly Glu Gly Cys Leu Ile Gly Pro Asp  
260 265 270

Val Ala Ile Gly Ser Gly Cys Val Ile Glu Ser Gly Val Arg Leu Ser  
275 280 285

Arg Cys Thr Val Met Arg Gly Val Arg Ile Lys Lys His Ala Cys Ile  
290 295 300

Ser Gly Ser Ile Ile Gly Trp His Ser Thr Val Gly Gln Trp Ala Arg  
305 310 315 320

Val Glu Asn Met Thr Ile Leu Gly Glu Asp Val His Val Cys Asp Glu  
325 330 335

Ile Tyr Ser Asn Gly Gly Val Val Leu Pro His Lys Glu Ile Lys Ser  
340 345 350

Ser Ile Leu Lys Pro Glu Ile Val Met  
355 360

<210> 17  
<211> 361  
<212> PRT  
<213> Medicago sativa

<400> 17

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

NO 9019\_ST25

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

NO 9019\_ST25

Arg Cys Thr Val Met Arg Gly Val Arg Ile Lys Lys His Ala Cys Ile  
290 295 300

Ser Ser Ser Ile Ile Gly Trp His Ser Thr Val Gly Gln Trp Ala Arg  
305 310 315 320

Val Glu Asn Met Thr Ile Leu Gly Glu Asp Val His Val Cys Asp Glu  
325 330 335

Ile Tyr Ser Asn Gly Gly Val Val Leu Pro His Lys Glu Ile Lys Thr  
340 345 350

Asn Ile Leu Lys Pro Glu Ile Val Met  
355 360

<210> 18  
<211> 361  
<212> PRT  
<213> Vitis vinifera  
<400> 18

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

Leu Thr Leu Ser Val Pro Lys Pro Leu Val Asp Phe Ala Asn Lys Pro  
20 25 30

Met Ile Leu His Gln Ile Glu Ala Leu Lys Ala Val Gly Val Ser Glu  
35 40 45

Val Val Leu Ala Ile Asn Tyr Gln Pro Glu Val Met Leu Asn Phe Leu  
50 55 60

Lys Glu Phe Glu Ala Lys Leu Gly Ile Thr Ile Thr Cys Ser Gln Glu  
65 70 75 80

Thr Glu Pro Leu Gly Thr Ala Gly Pro Leu Ala Leu Ala Arg Asp Lys  
85 90 95

Leu Ile Asp Asp Ser Gly Glu Pro Phe Phe Val Leu Asn Ser Asp Val  
100 105 110

Ile Ser Glu Tyr Pro Phe Lys Glu Met Ile Glu Phe His Lys Ala His  
115 120 125

Gly Gly Glu Ala Ser Ile Met Val Thr Lys Val Asp Glu Pro Ser Lys  
130 135 140

Tyr Gly Val Val Val Met Glu Glu Ser Ile Gly Arg Val Asp Arg Phe  
145 150 155 160

Val Glu Lys Pro Lys Leu Phe Val Gly Asn Lys Ile Asn Ala Gly Ile  
165 170 175



NO 9019\_ST25

Tyr Leu Leu Asn Pro Ser Val Leu Asp Arg Ile Glu Leu Arg Pro Thr  
 180 185 190  
 Ser Ile Glu Lys Glu Val Phe Pro Lys Ile Ala Ala Glu Lys Lys Leu  
 195 200 205  
 Tyr Ala Met Val Leu Pro Gly Phe Trp Met Asp Ile Gly Gln Pro Arg  
 210 215 220  
 Asp Tyr Ile Thr Gly Leu Arg Leu Tyr Leu Asp Ser Leu Arg Lys Lys  
 225 230 235 240  
 Ser Ser Ser Lys Leu Ala Ser Gly Ala His Ile Val Gly Asn Val Leu  
 245 250 255  
 Val Asp Glu Ser Ala Lys Ile Gly Glu Gly Cys Leu Ile Gly Pro Asp  
 260 265 270  
 Val Ala Ile Gly Pro Gly Cys Val Val Glu Ala Gly Val Arg Leu Ser  
 275 280 285  
 Arg Cys Thr Val Met Arg Gly Val Arg Ile Lys Lys His Ala Cys Ile  
 290 295 300  
 Ser Ser Ser Ile Ile Gly Trp His Ser Thr Val Gly Gln Trp Ala Arg  
 305 310 315 320  
 Val Glu Asn Met Thr Ile Leu Gly Glu Asp Val His Val Cys Asp Glu  
 325 330 335  
 Ile Tyr Ser Asn Gly Gly Val Val Leu Pro His Lys Glu Ile Lys Ser  
 340 345 350  
 Ser Ile Leu Lys Pro Glu Ile Val Met  
 355 360

<210> 19  
 <211> 247  
 <212> PRT  
 <213> Glycine max

<400> 19

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

NO 9019\_ST25

Asp Leu Ile Lys Ile Ser Glu Gln Leu Gly Ser Thr Val Thr Asn Asp  
50 55 60

Tyr Asp Tyr Val Phe Ser Glu Asn Gly Leu Val Ala His Lys Glu Gly  
65 70 75 80

Lys Leu Ile Gly Thr Gln Ser Leu Lys Ser Phe Leu Gly Glu Glu Lys  
85 90 95

Leu Lys Glu Phe Ile Asn Phe Thr Leu His Tyr Ile Ala Asp Leu Asp  
100 105 110

Ile Pro Ile Lys Arg Gly Thr Phe Ile Glu Phe Arg Ser Gly Met Leu  
115 120 125

Asn Val Ser Pro Ile Gly Arg Asn Cys Ser Gln Glu Glu Arg Asp Glu  
130 135 140

Phe Glu Lys Tyr Asp Lys Val His Asn Ile Arg Pro Lys Met Val Ser  
145 150 155 160

Val Leu Arg Glu Lys Phe Ala His Leu Asn Leu Thr Phe Ser Ile Gly  
165 170 175

Gly Gln Ile Ser Phe Asp Val Phe Pro Gln Gly Trp Asp Lys Thr Tyr  
180 185 190

Cys Leu Arg Tyr Leu Asp Gly Phe Asn Glu Ile His Phe Phe Gly Asp  
195 200 205

Lys Thr Tyr Lys Gly Gly Asn Asp His Glu Ile Tyr Glu Ser Glu Arg  
210 215 220

Thr Val Gly His Thr Val Thr Ser Pro Asp Thr Val Lys Gln Cys  
225 230 235 240

Lys Ser Leu Phe Leu Glu Asn  
245

<210> 20

<211> 249

<212> PRT

<213> Vitis vinifera

<400> 20

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

Thr Leu Thr Ala Pro Arg Lys Val Ala Thr Pro Gln Met Leu Glu Phe  
20 25 30

Met Arg Lys Leu Arg Lys Val Ile Thr Val Gly Val Val Gly Gly Ser  
35 40 45

NO 9019\_ST25

Asp Leu Val Lys Ile Ser Glu Gln Leu Gly Ser Ser Val Ile Asp Asp  
50 55 60

Tyr Asp Tyr Val Phe Ser Glu Asn Gly Leu Val Ala His Lys Asp Gly  
65 70 75 80

Lys Leu Ile Gly Thr Gln Ser Leu Lys Thr Phe Leu Gly Glu Glu Lys  
85 90 95

Leu Lys Glu Ile Ile Asn Phe Thr Leu His Tyr Ile Ala Asp Leu Asp  
100 105 110

Ile Pro Ile Lys Arg Gly Thr Phe Ile Glu Phe Arg Ser Gly Met Leu  
115 120 125

Asn Val Ser Pro Ile Gly Arg Asn Cys Ser Gln Glu Glu Arg Asp Glu  
130 135 140

Phe Glu Lys Tyr Asp Lys Ile His Asn Ile Arg Pro Lys Met Val Ser  
145 150 155 160

Val Leu Arg Glu Lys Phe Ala His Leu Asn Leu Thr Phe Ser Ile Gly  
165 170 175

Gly Gln Ile Ser Phe Asp Val Phe Pro Gln Gly Trp Asp Lys Thr Tyr  
180 185 190

Cys Leu Arg Tyr Leu Asp Asp Phe Pro Glu Ile His Phe Phe Gly Asp  
195 200 205

Lys Thr Tyr Glu Ala Gly Asn Asp His Glu Ile Tyr Glu Ser Glu Arg  
210 215 220

Thr Val Gly His Thr Val Thr Ser Pro Asp Asp Thr Val Glu Gln Cys  
225 230 235 240

Thr Ala Leu Phe Leu Ala Lys Ser Ser  
245

<210> 21  
<211> 246  
<212> PRT  
<213> Populus trichocarpa

<400> 21

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

Thr Leu Thr Ala Pro Arg Lys Glu Ala Thr Pro Ser Met Ile Glu Phe  
20 25 30

NO 9019\_ST25

Val Lys Glu Leu Arg Lys Val Val Thr Ile Gly Val Val Gly Gly Ser  
35 40 45

Asp Leu Ser Lys Ile Ser Glu Gln Leu Gly Lys Thr Val Ile Asn Asp  
50 55 60

Tyr Asp Tyr Val Phe Ser Glu Asn Gly Leu Val Ala His Lys Asp Gly  
65 70 75 80

Lys Leu Ile Gly Thr Gln Ser Leu Lys Ser Phe Leu Gly Asp Glu Lys  
85 90 95

Leu Lys Glu Phe Ile Asn Phe Thr Leu His Tyr Ile Ala Asp Leu Asp  
100 105 110

Ile Pro Ile Lys Arg Gly Thr Phe Ile Glu Phe Arg Ser Gly Met Leu  
115 120 125

Asn Val Ser Pro Ile Gly Arg Asn Cys Ser Gln Glu Glu Arg Asp Glu  
130 135 140

Phe Glu Lys Tyr Asp Lys Val Gln Asn Ile Arg Pro Lys Met Val Ser  
145 150 155 160

Val Leu Arg Glu Lys Phe Ala His Leu Asn Leu Thr Phe Ser Ile Gly  
165 170 175

Gly Gln Ile Ser Phe Asp Val Phe Pro Gln Gly Trp Asp Lys Thr Tyr  
180 185 190

Cys Leu Arg Tyr Leu Asp Glu Phe Ser Glu Ile His Phe Phe Gly Asp  
195 200 205

Lys Thr Tyr Lys Gly Gly Asn Asp His Glu Ile Tyr Glu Ser Glu Arg  
210 215 220

Thr Val Gly His Thr Val Thr Ser Pro Asp Asp Thr Val Glu Gln Cys  
225 230 235 240

Lys Ala Leu Phe Phe Ala  
245

<210> 22  
<211> 246  
<212> PRT  
<213> Arabidopsis thaliana

<400> 22

Met Ala Ala Lys Ile Pro Gly Val Ile Ala Leu Phe Asp Val Asp Gly  
1 5 10 15

Thr Leu Thr Ala Pro Arg Lys Glu Ala Thr Pro Glu Leu Leu Asp Phe  
20 25 30

NO 9019\_ST25

Ile Arg Glu<sub>35</sub> Leu Arg Lys Val<sub>40</sub> Val Thr Ile Gly Val<sub>45</sub> Val Gly Gly Ser  
 Asp Leu<sub>50</sub> Ser Lys Ile Ser Glu<sub>55</sub> Gln Leu Gly Lys<sub>60</sub> Thr Val Thr Asn Asp  
 Tyr Asp Tyr Cys Phe Ser<sub>70</sub> Glu Asn Gly Leu Val<sub>75</sub> Ala His Lys Asp Gly<sub>80</sub>  
 Lys Ser Ile Gly Ile<sub>85</sub> Gln Ser Leu Lys Leu<sub>90</sub> His Leu Gly Asp Asp<sub>95</sub> Lys  
 Leu Lys Glu Leu<sub>100</sub> Ile Asn Phe Thr Leu<sub>105</sub> His Tyr Ile Ala Asp<sub>110</sub> Leu Asp  
 Ile Pro Ile<sub>115</sub> Lys Arg Gly Thr Phe<sub>120</sub> Ile Glu Phe Arg Asn<sub>125</sub> Gly Met Leu  
 Asn Val<sub>130</sub> Ser Pro Ile Gly Arg<sub>135</sub> Asn Cys Ser Gln Glu<sub>140</sub> Glu Arg Asp Glu  
 Phe Glu Arg Tyr Asp Lys<sub>150</sub> Val Gln Asn Ile Arg<sub>155</sub> Pro Lys Met Val Ala<sub>160</sub>  
 Glu Leu Arg Glu Arg<sub>165</sub> Phe Ala His Leu Asn<sub>170</sub> Leu Thr Phe Ser Ile<sub>175</sub> Gly  
 Gly Gln Ile Ser<sub>180</sub> Phe Asp Val Phe Pro<sub>185</sub> Lys Gly Trp Asp Lys<sub>190</sub> Thr Tyr  
 Cys Leu Gln Tyr Leu Glu Asp Phe<sub>200</sub> Ser Glu Ile His Phe<sub>205</sub> Phe Gly Asp  
 Lys Thr Tyr Glu Gly Gly Asn<sub>215</sub> Asp Tyr Glu Ile Tyr<sub>220</sub> Glu Ser Pro Lys  
 Thr Ile Gly His Ser Val<sub>230</sub> Thr Ser Pro Asp Asp<sub>235</sub> Thr Val Ala Lys Cys<sub>240</sub>  
 Lys Ala Leu Phe Met<sub>245</sub> Ser

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 <211> 351  
 <212> PRT  
 <213> Arabidopsis thaliana  
 <400> 23

Met Gly Ser Ser Val Glu Gln Asn Ile Leu Val Thr Gly Gly Ala Gly  
 1 5 10 15

NO 9019\_ST25

Phe Ile Gly Thr His Thr Val Val Gln Leu Leu Lys Asp Gly Phe Lys  
20 25 30

Val Ser Ile Ile Asp Asn Phe Asp Asn Ser Val Ile Glu Ala Val Asp  
35 40 45

Arg Val Arg Glu Leu Val Gly Pro Asp Leu Ser Lys Lys Leu Asp Phe  
50 55 60

Asn Leu Gly Asp Leu Arg Asn Lys Gly Asp Ile Glu Lys Leu Phe Ser  
65 70 75 80

Lys Gln Arg Phe Asp Ala Val Ile His Phe Ala Gly Leu Lys Ala Val  
85 90 95

Gly Glu Ser Val Glu Asn Pro Arg Arg Tyr Phe Asp Asn Asn Leu Val  
100 105 110

Gly Thr Ile Asn Leu Tyr Glu Thr Met Ala Lys Tyr Asn Cys Lys Met  
115 120 125

Met Val Phe Ser Ser Ser Ala Thr Val Tyr Gly Gln Pro Glu Lys Ile  
130 135 140

Pro Cys Met Glu Asp Phe Glu Leu Lys Ala Met Asn Pro Tyr Gly Arg  
145 150 155 160

Thr Lys Leu Phe Leu Glu Glu Ile Ala Arg Asp Ile Gln Lys Ala Glu  
165 170 175

Pro Glu Trp Arg Ile Ile Leu Leu Arg Tyr Phe Asn Pro Val Gly Ala  
180 185 190

His Glu Ser Gly Ser Ile Gly Glu Asp Pro Lys Gly Ile Pro Asn Asn  
195 200 205

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

Asn Val Tyr Gly His Asp Tyr Pro Thr Glu Asp Gly Ser Ala Val Arg  
225 230 235 240

Asp Tyr Ile His Val Met Asp Leu Ala Asp Gly His Ile Ala Ala Leu  
245 250 255

Arg Lys Leu Phe Ala Asp Pro Lys Ile Gly Cys Thr Ala Tyr Asn Leu  
260 265 270

Gly Thr Gly Gln Gly Thr Ser Val Leu Glu Met Val Ala Ala Phe Glu  
275 280 285

Lys Ala Ser Gly Lys Lys Ile Pro Ile Lys Leu Cys Pro Arg Arg Ser

290

295

Gly Asp Ala Thr Ala Val Tyr Ala Ser Thr Glu Lys Ala Glu Lys Glu  
305 310 315 320

Leu Gly Trp Lys Ala Lys Tyr Gly Val Asp Glu Met Cys Arg Asp Gln  
325 330 335

Trp Lys Trp Ala Asn Asn Asn Pro Trp Gly Tyr Gln Asn Lys Leu  
340 345 350

<210> 24  
<211> 351  
<212> PRT  
<213> Arabidopsis thaliana  
<400> 24

Met Gly Ser Ser Val Glu Gln Asn Ile Leu Val Thr Gly Gly Ala Gly  
1 5 10 15

Phe Ile Gly Thr His Thr Val Val Gln Leu Leu Asn Gln Gly Phe Lys  
20 25 30

Val Thr Ile Ile Asp Asn Leu Asp Asn Ser Val Val Glu Ala Val His  
35 40 45

Arg Val Arg Glu Leu Val Gly Pro Asp Leu Ser Thr Lys Leu Glu Phe  
50 55 60

Asn Leu Gly Asp Leu Arg Asn Lys Gly Asp Ile Glu Lys Leu Phe Ser  
65 70 75 80

Asn Gln Arg Phe Asp Ala Val Ile His Phe Ala Gly Leu Lys Ala Val  
85 90 95

Gly Glu Ser Val Gly Asn Pro Arg Arg Tyr Phe Asp Asn Asn Leu Val  
100 105 110

Gly Thr Ile Asn Leu Tyr Glu Thr Met Ala Lys Tyr Asn Cys Lys Met  
115 120 125

Met Val Phe Ser Ser Ser Ala Thr Val Tyr Gly Gln Pro Glu Ile Val  
130 135 140

Pro Cys Val Glu Asp Phe Glu Leu Gln Ala Met Asn Pro Tyr Gly Arg  
145 150 155 160

Thr Lys Leu Phe Leu Glu Glu Ile Ala Arg Asp Ile His Ala Ala Glu  
165 170 175

Pro Glu Trp Lys Ile Ile Leu Leu Arg Tyr Phe Asn Pro Val Gly Ala  
180 185 190

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His Glu Ser Gly Arg Ile Gly Glu Asp Pro Lys Gly Ile Pro Asn Asn  
195 200 205

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

Asn Val Phe Gly His Asp Tyr Pro Thr Met Asp Gly Ser Ala Val Arg  
225 230 235 240

Asp Tyr Ile His Val Met Asp Leu Ala Asp Gly His Val Ala Ala Leu  
245 250 255

Asn Lys Leu Phe Ser Asp Ser Lys Ile Gly Cys Thr Ala Tyr Asn Leu  
260 265 270

Gly Thr Gly Gln Gly Thr Ser Val Leu Glu Met Val Ser Ser Phe Glu  
275 280 285

Lys Ala Ser Gly Lys Lys Ile Pro Ile Lys Leu Cys Pro Arg Arg Ala  
290 295 300

Gly Asp Ala Thr Ala Val Tyr Ala Ser Thr Gln Lys Ala Glu Lys Glu  
305 310 315 320

Leu Gly Trp Lys Ala Lys Tyr Gly Val Asp Glu Met Cys Arg Asp Gln  
325 330 335

Trp Asn Trp Ala Asn Lys Asn Pro Trp Gly Phe Gln Lys Lys Pro  
340 345 350

<210> 25  
<211> 351  
<212> PRT  
<213> Solanum tuberosum

<400> 25

Met Gly Val Gln Cys Gln Glu Asn Ile Leu Val Thr Gly Gly Ala Gly  
1 5 10 15

Phe Ile Gly Thr His Thr Val Val Gln Leu Leu Asn Glu Gly Phe Lys  
20 25 30

Val Thr Ile Ile Asp Asn Phe His Asn Ser Val Glu Glu Ala Val Asp  
35 40 45

Arg Val Arg Glu Leu Val Gly Pro Gln Leu Ser Gln Asn Leu Glu Phe  
50 55 60

His Leu Gly Asp Ile Arg Asn Lys Asp Asp Leu Glu Lys Leu Phe Ser  
65 70 75 80

Lys Lys Glu Phe Ala Ala Val Val His Phe Ala Gly Leu Lys Ala Val  
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Gly Glu Ser Val Val Gln Pro Phe Leu Tyr Phe Glu Asn Asn Leu Ile  
100 105 110

Gly Ser Ile Thr Leu Tyr Ser Val Met Ala Lys Tyr Asn Cys Lys Lys  
115 120 125

Leu Val Phe Ser Ser Ser Ala Thr Val Tyr Gly Gln Pro Glu Lys Val  
130 135 140

Pro Cys Val Glu Asp Phe Glu Leu Lys Ala Met Asn Pro Tyr Gly Arg  
145 150 155 160

Thr Lys Leu Phe Leu Glu Asp Ile Ala Arg Asp Ile Gln Lys Ala Asp  
165 170 175

Gln Glu Trp Asn Ile Ile Leu Leu Arg Tyr Phe Asn Pro Val Gly Ala  
180 185 190

His Glu Ser Gly Lys Leu Gly Glu Asp Pro Lys Gly Ile Pro Asn Asn  
195 200 205

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

Asn Val Tyr Gly Asn Asp Tyr Pro Thr Pro Asp Gly Thr Ala Ile Arg  
225 230 235 240

Asp Tyr Ile His Val Met Asp Leu Ala Asp Gly His Val Val Ala Leu  
245 250 255

Gln Arg Leu Leu Arg Gln Asn His Leu Gly Cys Val Ala Tyr Asn Leu  
260 265 270

Gly Thr Gly Lys Gly Lys Ser Val Leu Glu Met Val Ala Ala Phe Glu  
275 280 285

Arg Ala Ser Gly Lys Lys Ile Pro Leu Lys Met Cys Pro Arg Arg Pro  
290 295 300

Gly Asp Ala Thr Ala Val Tyr Ala Ser Thr Glu Lys Ala Glu Lys Glu  
305 310 315 320

Leu Gly Trp Lys Ala Lys Tyr Gly Ile Asn Glu Met Cys Arg Asp Gln  
325 330 335

Trp Lys Trp Ala Ser Gln Asn Pro Trp Gly Tyr Gln Ser Lys Pro  
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<213> *Arabidopsis thaliana*

&lt;400&gt; 26

Met Met Ala Arg Asn Val Leu Val Ser Gly Gly Ala Gly Tyr Ile Gly  
 1 5 10 15

Ser His Thr Val Leu Gln Leu Leu Leu Gly Gly Tyr Ser Val Val Val  
 20 25 30

Val Asp Asn Leu Asp Asn Ser Ser Ala Val Ser Leu Gln Arg Val Lys  
 35 40 45

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

Leu Arg Asp Arg Ser Ala Leu Glu Lys Ile Phe Ser Glu Thr Lys Phe  
 65 70 75 80

Asp Ala Val Ile His Phe Ala Gly Leu Lys Ala Val Gly Glu Ser Val  
 85 90 95

Glu Lys Pro Leu Leu Tyr Tyr Asn Asn Asn Leu Val Gly Thr Ile Thr  
 100 105 110

Leu Leu Glu Val Met Ala Gln His Gly Cys Lys Asn Leu Val Phe Ser  
 115 120 125

Ser Ser Ala Thr Val Tyr Gly Ser Pro Lys Glu Val Pro Cys Thr Glu  
 130 135 140

Glu Phe Pro Ile Ser Ala Leu Asn Pro Tyr Gly Arg Thr Lys Leu Phe  
 145 150 155 160

Ile Glu Glu Ile Cys Arg Asp Val Tyr Gly Ser Asp Pro Glu Trp Lys  
 165 170 175

Ile Ile Leu Leu Arg Tyr Phe Asn Pro Val Gly Ala His Pro Ser Gly  
 180 185 190

Asp Ile Gly Glu Asp Pro Arg Gly Ile Pro Asn Asn Leu Met Pro Phe  
 195 200 205

Val Gln Gln Val Ala Val Gly Arg Arg Pro His Leu Thr Val Phe Gly  
 210 215 220

Asn Asp Tyr Asn Thr Lys Asp Gly Thr Gly Val Arg Asp Tyr Ile His  
 225 230 235 240

Val Ile Asp Leu Ala Asp Gly His Ile Ala Ala Leu Arg Lys Leu Glu  
 245 250 255

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Asp Cys Lys Ile Gly Cys Glu Val Tyr Asn Leu Gly Thr Gly Asn Gly  
260 265 270

Thr Ser Val Leu Glu Met Val Asp Ala Phe Glu Lys Ala Ser Gly Lys  
275 280 285

Lys Ile Pro Leu Val Ile Ala Gly Arg Arg Pro Gly Asp Ala Glu Val  
290 295 300

Val Tyr Ala Ser Thr Glu Arg Ala Glu Ser Glu Leu Asn Trp Lys Ala  
305 310 315 320

Lys Tyr Gly Ile Glu Glu Met Cys Arg Asp Leu Trp Asn Trp Ala Ser  
325 330 335

Asn Asn Pro Tyr Gly Tyr Asp Ser Ser Ser Glu Asp Asn Ser His  
340 345 350

<210> 27

<211> 350

<212> PRT

<213> Arabidopsis thaliana

<400> 27

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

His Thr Val Leu Gln Leu Leu Glu Gly Gly Tyr Ser Ala Val Val Val  
20 25 30

Asp Asn Tyr Asp Asn Ser Ser Ala Ala Ser Leu Gln Arg Val Lys Lys  
35 40 45

Leu Ala Gly Glu Asn Gly Asn Arg Leu Ser Phe His Gln Val Asp Leu  
50 55 60

Arg Asp Arg Pro Ala Leu Glu Lys Ile Phe Ser Glu Thr Lys Phe Asp  
65 70 75 80

Ala Val Ile His Phe Ala Gly Leu Lys Ala Val Gly Glu Ser Val Glu  
85 90 95

Lys Pro Leu Leu Tyr Tyr Asn Asn Asn Ile Val Gly Thr Val Thr Leu  
100 105 110

Leu Glu Val Met Ala Gln Tyr Gly Cys Lys Asn Leu Val Phe Ser Ser  
115 120 125

Ser Ala Thr Val Tyr Gly Trp Pro Lys Glu Val Pro Cys Thr Glu Glu  
130 135 140

Ser Pro Ile Ser Ala Thr Asn Pro Tyr Gly Arg Thr Lys Leu Phe Ile  
145 150 155 160

NO 9019\_ST25

Glu Glu Ile Cys Arg Asp Val His Arg Ser Asp Ser Glu Trp Lys Ile  
165 170 175

Ile Leu Leu Arg Tyr Phe Asn Pro Val Gly Ala His Pro Ser Gly Tyr  
180 185 190

Ile Gly Glu Asp Pro Leu Gly Val Pro Asn Asn Leu Met Pro Tyr Val  
195 200 205

Gln Gln Val Ala Val Gly Arg Arg Pro His Leu Thr Val Phe Gly Thr  
210 215 220

Asp Tyr Lys Thr Lys Asp Gly Thr Gly Val Arg Asp Tyr Ile His Val  
225 230 235 240

Met Asp Leu Ala Asp Gly His Ile Ala Ala Leu Arg Lys Leu Asp Asp  
245 250 255

Leu Lys Ile Ser Cys Glu Val Tyr Asn Leu Gly Thr Gly Asn Gly Thr  
260 265 270

Ser Val Leu Glu Met Val Ala Ala Phe Glu Lys Ala Ser Gly Lys Lys  
275 280 285

Ile Pro Leu Val Met Ala Gly Arg Arg Pro Gly Asp Ala Glu Val Val  
290 295 300

Tyr Ala Ser Thr Glu Lys Ala Glu Arg Glu Leu Asn Trp Lys Ala Lys  
305 310 315 320

Asn Gly Ile Glu Glu Met Cys Arg Asp Leu Trp Asn Trp Ala Ser Asn  
325 330 335

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

<210> 28  
<211> 348  
<212> PRT  
<213> Arabidopsis thaliana

<400> 28

Met Val Gly Asn Ile Leu Val Thr Gly Gly Ala Gly Tyr Ile Gly Ser  
1 5 10 15

His Thr Val Leu Gln Leu Leu Leu Gly Gly Tyr Asn Thr Val Val Ile  
20 25 30

Asp Asn Leu Asp Asn Ser Ser Leu Val Ser Ile Gln Arg Val Lys Asp  
35 40 45

NO 9019\_ST25

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

Asn Pro Phe Gly Tyr Gly Ser Ser Pro Asn Ser Thr  
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<211> 348  
<212> PRT  
<213> Populus trichocarpa  
<400> 29

Met Ala Tyr Asn Ile Leu Val Thr Gly Gly Ala Gly Tyr Ile Gly Ser  
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His Thr Val Leu Gln Leu Leu Leu Gly Gly Tyr Asn Thr Val Val Val  
20 25 30

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

Leu Ala Gly Asp Phe Gly Lys Asn Leu Val Phe His Gln Val Asp Leu  
50 55 60

Arg Asp Lys Pro Ala Leu Glu Asn Val Phe Ala Glu Thr Lys Phe Asp  
65 70 75 80

Ala Val Ile His Phe Ala Gly Leu Lys Ala Val Gly Glu Ser Met Gln  
85 90 95

Lys Pro Leu Leu Tyr Phe Asn Asn Asn Leu Ile Gly Thr Ile Thr Leu  
100 105 110

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

Ser Ala Thr Val Tyr Gly Trp Pro Lys Glu Val Pro Cys Thr Glu Glu  
130 135 140

Phe Pro Leu Ser Ala Ala Asn Pro Tyr Gly Arg Thr Lys Leu Phe Ile  
145 150 155 160

Glu Glu Ile Cys Arg Asp Ile Tyr Ser Ser Asp Ser Glu Trp Lys Ile  
165 170 175

Thr Leu Leu Arg Tyr Phe Asn Pro Val Gly Ala His Pro Ser Gly Tyr  
180 185 190

Ile Gly Glu Asp Pro Arg Gly Ile Pro Asn Asn Leu Met Pro Tyr Val  
195 200 205

Gln Gln Val Ala Val Gly Arg Arg Pro His Leu Thr Val Phe Gly Thr  
210 215 220

NO 9019\_ST25

Asp Tyr Pro Thr Lys Asp Gly Thr Gly Val Arg Asp Tyr Ile His Val  
225 230 235 240

Val Asp Leu Ala Asp Gly His Ile Ala Ala Leu Arg Lys Leu Ser Glu  
245 250 255

Ala Asn Ile Gly Cys Glu Val Tyr Asn Leu Gly Thr Gly Lys Gly Thr  
260 265 270

Ser Val Leu Glu Met Val Ala Ala Phe Glu Lys Ala Ser Gly Lys Lys  
275 280 285

Ile Pro Leu Val Met Ala Asp Arg Arg Pro Gly Asp Ala Glu Thr Val  
290 295 300

Tyr Ala Ala Thr Glu Lys Ala Glu Arg Asp Leu Ser Trp Lys Ala Asn  
305 310 315 320

Tyr Gly Val Asp Glu Met Cys Arg Asp Gln Trp Asn Trp Ala Ser Lys  
325 330 335

Asn Pro Tyr Gly Tyr Gly Ser Pro Asp Gly Thr Asn  
340 345

<210> 30  
<211> 362  
<212> PRT  
<213> Solanum tuberosum

<220>  
<221> misc\_feature  
<222> (342)..(342)  
<223> Xaa can be any naturally occurring amino acid

<400> 30

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His Thr Val Leu Gln Leu Leu Leu Gly Gly Tyr Lys Thr Val Val Ile  
20 25 30

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

Ile Ala Gly Glu Tyr Gly Ser Asn Leu Ser Phe His Lys Val Asp Leu  
50 55 60

Arg Asp Lys Pro Ala Val Glu Glu Ile Phe Arg Ser Asn Lys Phe Asp  
65 70 75 80

Ala Val Ile His Phe Ala Gly Leu Lys Ala Val Gly Glu Ser Val Glu  
85 90 95

NO 9019\_ST25

Lys Pro Leu Met Tyr Tyr Asp Asn Asn Leu Ile Gly Thr Ile Thr Leu  
 100 105 110  
 Leu Glu Ile Met Ala Ala His Gly Cys Lys Arg Leu Val Phe Ser Ser  
 115 120 125  
 Ser Ala Thr Val Tyr Gly Trp Pro Lys Val Val Pro Cys Thr Glu Glu  
 130 135 140  
 Phe Pro Leu Ser Ala Ala Asn Pro Tyr Gly Arg Thr Lys Leu Phe Ile  
 145 150 155 160  
 Glu Glu Ile Cys Arg Asp Val Gln Asn Ala Asp Ser Glu Trp Lys Ile  
 165 170 175  
 Ile Leu Leu Arg Tyr Phe Asn Pro Val Gly Ala His Pro Ser Gly Arg  
 180 185 190  
 Ile Gly Glu Asp Pro Arg Gly Ile Pro Asn Asn Leu Met Pro Phe Val  
 195 200 205  
 Gln Gln Val Ala Val Gly Arg Arg Lys Glu Leu Thr Val Tyr Gly Thr  
 210 215 220  
 Asp Tyr Gly Thr Lys Asp Gly Thr Gly Val Arg Asp Tyr Ile His Val  
 225 230 235 240  
 Met Asp Leu Ala Asp Gly His Ile Ala Ala Leu Gln Lys Leu Ser Asp  
 245 250 255  
 Pro Ser Ile Gly Cys Glu Val Tyr Asn Leu Gly Thr Gly Lys Gly Thr  
 260 265 270  
 Ser Val Leu Glu Met Val Ala Ala Phe Glu Lys Ala Ser Gly Lys Lys  
 275 280 285  
 Ile Pro Met Val Met Ser Gly Arg Arg Pro Gly Asp Ala Glu Ile Val  
 290 295 300  
 Tyr Ala Ala Thr Glu Lys Ala Glu Arg Glu Leu Lys Trp Lys Ala Lys  
 305 310 315 320  
 Tyr Gly Ile Glu Glu Met Cys Arg Asp Gln Trp Asn Trp Ala Lys Lys  
 325 330 335  
 Asn Pro Tyr Gly Tyr Xaa Arg Asn Ser Gln Asn Leu Ile Thr Val Thr  
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 Asp Val Tyr Phe Asn Cys Ile Ile Ser Ser  
 355 360



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 <211> 348  
 <212> PRT  
 <213> Vitis vinifera

<400> 31

Met Ala Lys Thr Ile Leu Ile Thr Gly Gly Ala Gly Tyr Ile Gly Ser  
 1 5 10 15

His Thr Val Leu Gln Leu Leu Leu Gly Gly Phe Arg Ala Val Val Val  
 20 25 30

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

Leu Ala Ala Glu Phe Gly Asp Asn Leu Val Phe His Lys Leu Asp Leu  
 50 55 60

Arg Asp Lys Gln Ala Leu Glu Gln Leu Phe Ala Ser Thr Asn Phe Asp  
 65 70 75 80

Ala Val Ile His Phe Ala Gly Leu Lys Ala Val Gly Glu Ser Val Gln  
 85 90 95

Lys Pro Leu Leu Tyr Tyr Asp Asn Asn Leu Ile Gly Thr Ile Thr Leu  
 100 105 110

Leu Glu Val Met Ala Ala His Gly Cys Lys Lys Leu Val Phe Ser Ser  
 115 120 125

Ser Ala Thr Val Tyr Gly Trp Pro Lys Glu Val Pro Cys Thr Glu Glu  
 130 135 140

Phe Pro Leu Cys Ala Ala Asn Pro Tyr Gly Arg Thr Lys Leu Val Ile  
 145 150 155 160

Glu Asp Ile Cys Arg Asp Ile Tyr Gly Ser Asp Ser Glu Trp Lys Ile  
 165 170 175

Val Leu Leu Arg Tyr Phe Asn Pro Val Gly Ala His Ser Ser Gly His  
 180 185 190

Ile Gly Glu Asp Pro Arg Gly Ile Pro Asn Asn Leu Met Pro Phe Val  
 195 200 205

Gln Gln Val Ala Val Gly Arg Arg Pro Ala Leu Thr Val Phe Gly Ser  
 210 215 220

Asp Tyr Ser Thr Lys Asp Gly Thr Gly Val Arg Asp Tyr Ile His Val  
 225 230 235 240

Val Asp Leu Ala Asp Gly His Ile Ala Ala Leu Cys Lys Leu Phe Asn  
 245 250 255

Ser Glu Ile Gly Cys Glu Val Tyr Asn Leu Gly Thr Gly Lys Gly Thr  
                   260                  265                  270

Ser Val Leu Glu Met Val Ala Ala Phe Glu Lys Ala Ser Gly Lys Lys  
           275                  280                  285

Ile Pro Leu Val Met Ala Gly Arg Arg Pro Gly Asp Ala Glu Ile Val  
       290                  295                  300

Tyr Ala Ser Thr Ala Lys Ala Glu Lys Glu Leu Asn Trp Lys Ala Lys  
   305                  310                  315                  320

Tyr Gly Ile Ser Glu Met Cys Arg Asp Gln Trp Asn Trp Ala Ser Lys  
                   325                  330                  335

Asn Pro Tyr Gly Tyr Glu Ser Ser Pro Thr Gln Asp  
                   340                  345

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<220>  
 <223> synthetic sequence

<400> 32  
 gaacaggccc atcccttatt g

21

<210> 33  
 <211> 17  
 <212> DNA  
 <213> Artificial sequence

<220>  
 <223> synthetic sequence

<400> 33  
 cggcgcttgg cattgta

17

<210> 34  
 <211> 16  
 <212> DNA  
 <213> Artificial sequence

<220>  
 <223> synthetic sequence

<400> 34  
 atgcgcactg acaaca

16

<210> 35  
 <211> 24  
 <212> DNA  
 <213> Artificial sequence

<220>  
 <223> synthetic sequence

<400> 35  
gcaaaacctg gaaccaagtt agaa 24

<210> 36  
<211> 25  
<212> DNA  
<213> Artificial sequence

<220>  
<223> synthetic sequence

<400> 36  
gccatttata accttgtcag caatt 25

<210> 37  
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<212> DNA  
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<220>  
<223> synthetic sequence

<400> 37  
ttcccgcag agctg 15

<210> 38  
<211> 22  
<212> DNA  
<213> Artificial sequence

<220>  
<223> synthetic sequence

<400> 38  
gtgtggttga ggcaggtgtt ag 22

<210> 39  
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<212> DNA  
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<220>  
<223> synthetic sequence

<400> 39  
gatgcgaact ccacgcatt 19

<210> 40  
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<212> DNA  
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