

## SEQUENCE LISTING

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 XU, Meng  
 FLATT, James

<120> FUNCTIONAL MUNG BEAN-DERIVED COMPOSITIONS

<130> 116377.00018

<150> US 62/297,788

<151> 2016-02-19

<150> US 62/433,182

<151> 2016-12-12

<160> 15

<170> PatentIn version 3.5

<210> 1

<211> 453

<212> PRT

<213> Vigna radiata var. radiata

<400> 1

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Met | Ser | Ala | Arg | Val | Pro | Leu | Leu | Leu | Leu | Gly | Ile | Leu | Phe |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     | 15  |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Ala | Ser | Leu | Ser | Val | Ser | Phe | Gly | Ile | Val | His | Arg | Glu | Asn | His |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asp | Ala | Ala | Glu | Val | Ser | Val | Ser | Arg | Gly | Lys | Asn | Asn | Pro | Phe | Tyr |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |

Phe Asn Ser Asp Arg Trp Phe Arg Thr Leu Phe Arg Asn Glu Phe Gly  
 50 55 60

His Leu Arg Val Leu Gln Arg Phe Asp Gln Arg Ser Lys Gln Met Gln  
 65 70 75 80

Asn Leu Glu Asn Tyr Arg Val Val Glu Phe Gln Ser Lys Pro Asn Thr  
 85 90 95

Leu Leu Leu Pro His His Ala Asp Ala Asp Phe Leu Leu Val Val Leu  
 100 105 110

Asn Gly Arg Ala Val Leu Thr Leu Val Asn Pro Asp Gly Arg Asp Ser  
 115 120 125

His Ile Leu Glu Gln Gly His Ala Gln Lys Ile Pro Ala Gly Thr Ile  
 130 135 140

Phe Phe Leu Val Asn Pro Asp Asp Asn Glu Asn Leu Arg Ile Ile Lys  
 145 150 155 160

Leu Ala Val Pro Val Asn Asn Pro His Arg Phe Gln Asp Phe Phe Leu  
 165 170 175

Ser Ser Thr Glu Ala Gln Gln Ser Tyr Leu Gln Gly Phe Ser Lys Asn  
 180 185 190

Ile Leu Glu Ala Ser Phe Asp Ser Asp Ile Lys Glu Ile Asn Arg Val  
 195 200 205

Leu Phe Gly Glu Glu Gly Gln Gln Gln Gln Gln Gly Gln Glu Ser Gln  
 210 215 220

Gln Glu Gly Val Ile Val Glu Leu Lys Arg Glu Gln Ile Arg Glu Leu  
 225 230 235 240

3

Thr Lys His Ala Lys Ser Ser Ser Lys Lys Ser Leu Ser Ser Glu Asp  
245 250 255

Gln Pro Phe Asn Leu Arg Asn Gln Lys Pro Ile Tyr Ser Asn Lys Phe  
260 265 270

Gly Glu Phe Tyr Glu Ile Thr Pro Lys Lys Asn Pro Gln Leu Lys Asp  
275 280 285

Leu Asp Val Phe Ile Ser Ser Val Asp Met Lys Glu Gly Ser Leu Leu  
290 295 300

Leu Pro His Tyr Asn Ser Lys Ala Ile Val Ile Leu Val Ile Asn Glu  
305 310 315 320

Gly Glu Ala Asn Ile Glu Leu Val Gly Leu Arg Glu Glu Gln Gln Gln  
325 330 335

Gln Gln Gln Asp Glu Arg Leu Glu Val Gln Arg Tyr Arg Ala Glu Val  
340 345 350

Ser Glu Asp Asp Val Phe Val Ile Pro Ala Ala Tyr Pro Val Ala Ile  
355 360 365

Asn Ala Thr Ser Asn Leu Asn Phe Phe Ala Phe Gly Ile Asn Ala Glu  
370 375 380

Asn Asn Gln Arg Asn Phe Leu Ala Gly Glu Lys Asp Asn Val Ile Ser  
385 390 395 400

Glu Ile Pro Thr Glu Val Leu Asp Leu Ala Phe Pro Ala Pro Gly Glu  
405 410 415

Lys Val Glu Lys Leu Val Gln Lys Gln Ser Thr Ser His Phe Val Asp  
420 425 430

Ala Gln Pro Glu Glu Gln Gln Arg Glu Glu Gly Pro Lys Gly Arg Lys

435

440

445

Gly His Phe Val Tyr  
450

&lt;210&gt; 2

&lt;211&gt; 453

&lt;212&gt; PRT

&lt;213&gt; Vigna radiata

&lt;400&gt; 2

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

Ala Ser Leu Ser Val Ser Phe Gly Ile Val His Arg Glu Asn His Asp  
20 25 30

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

Asn Ser Asp Arg Trp Phe Arg Thr Leu Phe Arg Asn Glu Phe Gly His  
50 55 60

Leu Arg Val Leu Gln Arg Phe Asp Gln Arg Ser Lys Gln Met Gln Asn  
65 70 75 80

Leu Glu Asn Tyr Arg Val Val Glu Phe Gln Ser Lys Pro Asn Thr Leu  
85 90 95

Leu Leu Pro His His Ala Asp Ala Asp Phe Leu Leu Val Val Leu Asn  
100 105 110

Gly Arg Ala Val Leu Thr Leu Val Asn Pro Asp Gly Gly Arg Asp Ser  
115 120 125

His Ile Leu Glu Gln Gly His Ala Gln Lys Ile Pro Ala Gly Thr Ile  
130 135 140

Phe Phe Leu Val Asn Pro Asp Asp Asn Glu Asn Leu Arg Ile Ile Lys  
 145 150 155 160

Leu Ala Val Pro Val Asn Asn Pro His Arg Phe Gln Asp Phe Phe Leu  
 165 170 175

Ser Ser Thr Glu Ala Gln Gln Ser Tyr Leu Gln Gly Phe Ser Lys Asn  
 180 185 190

Ile Leu Glu Ala Ser Phe Asp Ser Asp Ile Lys Glu Ile Asn Arg Val  
 195 200 205

Leu Phe Gly Glu Glu Gly Gln Gln Gln Gln Gln Gly Gln Glu Ser Gln  
 210 215 220

Gln Glu Gly Val Ile Val Glu Leu Lys Arg Glu Gln Ile Arg Glu Leu  
 225 230 235 240

Thr Lys His Ala Lys Ser Ser Ser Lys Lys Ser Leu Ser Ser Glu Asp  
 245 250 255

Gln Pro Phe Asn Leu Arg Asn Gln Lys Pro Ile Tyr Ser Asn Lys Phe  
 260 265 270

Gly Glu Phe Tyr Glu Ile Thr Pro Lys Lys Asn Pro Gln Leu Lys Asp  
 275 280 285

Leu Asp Val Phe Ile Ser Ser Val Asp Met Lys Glu Gly Ser Leu Leu  
 290 295 300

Leu Pro His Tyr Asn Ser Lys Ala Ile Val Ile Leu Val Ile Asn Glu  
 305 310 315 320

Gly Glu Ala Asn Ile Glu Leu Val Gly Leu Arg Glu Glu Gln Gln Gln  
 325 330 335

6

Gln Gln Gln Asp Glu Arg Leu Glu Val Gln Arg Tyr Arg Ala Glu Val  
340 345 350

Ser Glu Asp Asp Val Phe Val Ile Pro Ala Ala Tyr Pro Val Ala Ile  
355 360 365

Asn Ala Thr Ser Asn Leu Asn Phe Phe Ala Phe Gly Ile Asn Ala Glu  
370 375 380

Asn Asn Gln Arg Asn Phe Leu Ala Gly Glu Lys Asp Asn Val Ile Ser  
385 390 395 400

Glu Ile Pro Thr Glu Val Leu Asp Leu Ala Phe Pro Ala Pro Gly Glu  
405 410 415

Lys Val Glu Lys Leu Val Gln Lys Gln Ser Thr Ser His Phe Val Asp  
420 425 430

Ala Gln Pro Glu Glu Gln Gln Arg Glu Glu Gly Pro Lys Gly Arg Lys  
435 440 445

Gly His Phe Val Tyr  
450

<210> 3

<211> 454

<212> PRT

<213> Vigna radiata var. radiata

<220>

<221> misc\_feature

<222> (56)..(57)

<223> Xaa can be any naturally occurring amino acid

<400> 3

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

Leu Ala Ser Leu Ser Val Ser Phe Gly Ile Val His Arg Glu Asn Ile  
 20 25 30

Asp Gly Ala Glu Val Ser Val Ser Arg Gly Lys Asn Asn Pro Phe Tyr  
 35 40 45

Phe Asn Ser Asp Arg Trp Phe Xaa Xaa Leu Phe Arg Asn Gln Phe Gly  
 50 55 60

His Leu Arg Val Leu Gln Arg Phe Asp Gln Arg Ser Lys Gln Met Gln  
 65 70 75 80

Asn Leu Glu Asn Tyr Arg Val Val Glu Phe Met Ser Lys Pro Asn Thr  
 85 90 95

Leu Leu Leu Pro His His Ala Asp Ala Asp Phe Leu Leu Val Val Leu  
 100 105 110

Asn Gly Arg Ala Val Leu Thr Leu Val Asn Pro Asp Gly Arg Asp Ser  
 115 120 125

Asn Ile Leu Glu Gln Gly His Ala Gln Lys Ile Pro Ala Gly Thr Thr  
 130 135 140

Phe Phe Leu Val Asn Pro Asp Asp Asn Glu Asn Leu Arg Ile Ile Lys  
 145 150 155 160

Leu Ala Val Pro Val Asn Asn Pro His Arg Phe Gln Asp Phe Phe Leu  
 165 170 175

Ser Ser Thr Glu Ala Gln Gln Ser Tyr Leu Gln Gly Phe Ser Lys Asn  
 180 185 190

Ile Leu Glu Ala Ser Phe Asp Ser Asp Ile Lys Glu Ile Ser Arg Val  
 195 200 205

Leu Phe Gly Glu Glu Gly Gln Gln Gln Gln Gln Gly Gln Glu Ser Gln

210

215

220

Gln Glu Gly Val Ile Val Glu Leu Lys Arg Glu Gln Ile Arg Glu Leu  
 225 230 235 240

Thr Lys His Ala Lys Ser Ser Ser Lys Lys Ser Leu Ser Ser Glu Asp  
 245 250 255

Gln Pro Phe Asn Leu Arg Asn Gln Lys Pro Ile Tyr Ser Asn Lys Phe  
 260 265 270

Gly Glu Phe Tyr Glu Ile Thr Pro Lys Lys Asn Pro Gln Leu Lys Asp  
 275 280 285

Leu Asp Val Phe Ile Ser Ser Val Asp Met Lys Glu Gly Ser Leu Leu  
 290 295 300

Leu Pro His Tyr Asn Ser Lys Ala Ile Val Ile Leu Val Ile Asn Glu  
 305 310 315 320

Gly Glu Ala Asn Ile Glu Leu Val Gly Leu Arg Glu Glu Gln Gln Gln  
 325 330 335

Gln Gln Gln Gln Asp Glu Arg Leu Glu Val Gln Arg Tyr Arg Ala Glu  
 340 345 350

Val Ser Glu Asp Asp Val Phe Val Ile Pro Ala Ala Tyr Pro Val Ala  
 355 360 365

Ile Asn Ala Thr Ser Asn Leu Asn Phe Phe Ala Phe Gly Ile Asn Ala  
 370 375 380

Glu Asn Asn Gln Arg Asn Phe Leu Ala Gly Glu Lys Asp Asn Val Ile  
 385 390 395 400

Ser Glu Ile Pro Thr Glu Val Leu Asp Leu Ala Phe Pro Ala Pro Gly  
 405 410 415

Glu Lys Val Glu Lys Leu Val Gln Lys Gln Ser Thr Ser His Phe Val  
 420 425 430

Asp Ala Gln Pro Glu Glu Gln Gln Arg Glu Glu Gly Pro Lys Gly Arg  
 435 440 445

Lys Gly His Phe Val Tyr  
 450

<210> 4  
 <211> 454  
 <212> PRT  
 <213> Vigna radiata

<400> 4

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

Leu Ala Ser Leu Ser Val Ser Phe Gly Ile Val His Arg Glu Asn Ile  
 20 25 30

Asp Gly Ala Glu Val Ser Val Ser Arg Gly Lys Asn Asn Pro Phe Tyr  
 35 40 45

Phe Asn Ser Asp Arg Trp Phe His Thr Leu Phe Arg Asn Gln Phe Gly  
 50 55 60

His Leu Arg Val Leu Gln Arg Phe Asp Gln Arg Ser Lys Gln Met Gln  
 65 70 75 80

Asn Leu Glu Asn Tyr Arg Val Val Glu Leu Met Ser Lys Pro Asn Thr  
 85 90 95

Leu Leu Leu Pro His His Ala Asp Ala Asp Phe Leu Leu Val Val Leu  
 100 105 110

Asn Gly Arg Ala Val Leu Thr Leu Val Asn Pro Asp Gly Arg Asp Ser  
115 120 125 10

Asn Ile Leu Glu Gln Gly His Ala Gln Lys Ile Pro Ala Gly Thr Thr  
130 135 140

Phe Phe Leu Val Asn Pro Asp Asp Asn Glu Asn Leu Arg Ile Ile Lys  
145 150 155 160

Leu Ala Val Pro Val Asn Asn Pro His Arg Phe Gln Asp Phe Phe Leu  
165 170 175

Ser Ser Thr Glu Ala Gln Gln Ser Tyr Leu Gln Gly Phe Ser Lys Asn  
180 185 190

Ile Leu Glu Ala Ser Phe Asp Ser Asp Ile Lys Glu Ile Ser Arg Val  
195 200 205

Leu Phe Gly Glu Glu Gly Gln Gln Gln Gln Gln Gly Gln Glu Ser Gln  
210 215 220

Gln Glu Gly Val Ile Val Glu Leu Lys Arg Glu Gln Ile Arg Glu Leu  
225 230 235 240

Thr Lys His Ala Lys Ser Ser Ser Lys Lys Ser Leu Ser Ser Glu Asp  
245 250 255

Gln Pro Phe Asn Leu Arg Asn Gln Lys Pro Ile Tyr Ser Asn Lys Leu  
260 265 270

Gly Arg Trp Phe Glu Ile Thr Pro Glu Lys Asn Pro Gln Leu Arg Asp  
275 280 285

Leu Asp Met Phe Ile Arg Ser Val Asp Met Lys Glu Gly Ser Leu Leu  
290 295 300

Leu Pro His Tyr Asn Ser Lys Ala Ile Val Ile Leu Val Ile Asn Glu

|     |  |  |  |  |     |  |  |  |  |     |  |  |     |
|-----|--|--|--|--|-----|--|--|--|--|-----|--|--|-----|
|     |  |  |  |  |     |  |  |  |  | 11  |  |  |     |
| 305 |  |  |  |  | 310 |  |  |  |  | 315 |  |  | 320 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Lys | Ala | Asn | Ile | Glu | Leu | Val | Gly | Gln | Arg | Glu | Gln | Gln | Lys | Gln |
|     |     |     |     | 325 |     |     |     |     | 330 |     |     |     |     | 335 |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gln | Glu | Glu | Gln | Glu | Glu | Ser | Trp | Glu | Val | Gln | Arg | Tyr | Arg | Ala | Glu |
|     |     |     | 340 |     |     |     |     | 345 |     |     |     |     | 350 |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Ser | Glu | Asp | Asp | Val | Phe | Ile | Ile | Pro | Ala | Thr | Tyr | Pro | Val | Ala |
|     |     | 355 |     |     |     |     | 360 |     |     |     |     | 365 |     |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ile | Asn | Ala | Thr | Ser | Asn | Leu | Asn | Phe | Phe | Ala | Phe | Gly | Ile | Asn | Ala |
|     | 370 |     |     |     |     | 375 |     |     |     |     | 380 |     |     |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Glu | Asn | Asn | Gln | Arg | Asn | Phe | Leu | Ala | Gly | Glu | Lys | Asp | Asn | Val | Ile |
| 385 |     |     |     |     | 390 |     |     |     |     | 395 |     |     |     |     | 400 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ser | Glu | Ile | Pro | Thr | Glu | Val | Leu | Asp | Val | Thr | Phe | Pro | Ala | Ser | Gly |
|     |     |     |     | 405 |     |     |     |     | 410 |     |     |     |     | 415 |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Glu | Lys | Val | Lys | Lys | Leu | Ile | Lys | Lys | Gln | Ser | Glu | Ser | Gln | Phe | Val |
|     |     |     | 420 |     |     |     |     | 425 |     |     |     |     | 430 |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asp | Ala | Gln | Pro | Glu | Gln | Gln | Glu | Arg | Glu | Glu | Ala | Arg | Lys | Gly | Gly |
|     |     | 435 |     |     |     |     | 440 |     |     |     |     | 445 |     |     |     |

|     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|
| Lys | Gly | Pro | Phe | Val | Tyr |
|     | 450 |     |     |     |     |

<210> 5  
 <211> 453  
 <212> PRT  
 <213> Vigna radiata

<400> 5

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Val | Arg | Ala | Arg | Val | Gln | Leu | Leu | Leu | Gly | Ile | Leu | Phe | Leu | Ala |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |

Ser Leu Ser Val Ser Phe Gly Ile Val His Arg Glu His Gln Glu Ser  
                   20                                  25                                  30

Gln Glu Glu Ser Asp Ser Arg Gly Gln Asn Asn Pro Phe Tyr Phe Asn  
           35                                  40                                  45

Ser Asp Arg Arg Phe His Thr Leu Phe Lys Asn Gln Tyr Gly His Leu  
       50                                  55                                  60

Arg Val Ile His Arg Phe Asp Gln Arg Ser Lys Gln Ile Gln Asn Leu  
   65                                  70                                  75                                  80

Glu Asn Tyr Arg Val Val Glu Phe Lys Ser Lys Pro Asn Thr Leu Leu  
                   85                                  90                                  95

Leu Pro His His Ala Asp Ala Asp Phe Leu Leu Val Val Leu Asn Gly  
                   100                                  105                                  110

Arg Ala Ile Leu Thr Leu Val Asn Pro Asp Gly Arg Asp Ser Tyr Ile  
           115                                  120                                  125

Leu Glu Gln Gly His Ala Gln Lys Ile Pro Ala Gly Thr Thr Phe Phe  
       130                                  135                                  140

Leu Val Asn Pro Asn Asp Asn Asp Asn Leu Arg Ile Ile Lys Leu Ala  
   145                                  150                                  155                                  160

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

Thr Glu Ala Gln Gln Ser Tyr Leu Arg Gly Phe Ser Lys Asn Ile Leu  
           180                                  185                                  190

Glu Ala Ser Phe Asp Ser Asp Phe Lys Glu Ile Asp Arg Val Leu Phe  
       195                                  200                                  205

13  
Gly Glu Glu Arg Gln Gln Gln His Gly Glu Glu Ser Gln Glu Glu Gly  
210 215 220

Val Ile Val Glu Leu Lys Arg Glu Gln Ile Arg Glu Leu Ile Lys His  
225 230 235 240

Ala Lys Ser Ser Ser Arg Lys Glu Leu Ser Ser Gln Asp Glu Pro Phe  
245 250 255

Asn Leu Arg Asn Ser Asn Pro Ile Tyr Ser Asn Lys Phe Gly Arg Trp  
260 265 270

Tyr Glu Ile Thr Pro Glu Lys Asn Pro Gln Leu Lys Asp Leu Asp Val  
275 280 285

Phe Ile Ser Ser Val Asp Met Lys Glu Gly Gly Leu Leu Leu Pro His  
290 295 300

Tyr Asn Ser Lys Ala Ile Val Ile Leu Val Ile Asn Glu Gly Glu Ala  
305 310 315 320

Lys Ile Glu Leu Val Gly Pro Ser Asp Gln Gln Gln Gln Asp Glu Ser  
325 330 335

Leu Glu Val Gln Arg Tyr Arg Ala Glu Leu Ser Glu Asp Asp Val Phe  
340 345 350

Val Ile Pro Ala Ala Tyr Pro Val Ala Ile Asn Ala Thr Ser Asn Leu  
355 360 365

Asn Phe Phe Ala Phe Gly Ile Asn Ala Glu Asn Asn Gln Arg Asn Phe  
370 375 380

Leu Ala Gly Glu Lys Asp Asn Val Met Ser Glu Ile Pro Thr Glu Val  
385 390 395 400

Leu Asp Val Ser Phe Pro Ala Ser Gly Asn Lys Val Glu Lys Leu Ile

14

405

410

415

Lys Lys Gln Ser Glu Ser His Phe Val Asp Ala Gln Pro Glu Gln Gln  
420 425 430

Gln Arg Glu Glu Gly His Lys Gly Arg Lys Gly Ser Leu Ser Ser Ile  
435 440 445

Leu Gly Ser Leu Tyr  
450

<210> 6  
<211> 379  
<212> PRT  
<213> Vigna radiata var. radiata

<220>  
<221> misc\_feature  
<222> (56)..(57)  
<223> Xaa can be any naturally occurring amino acid

<400> 6

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

Leu Ala Ser Leu Ser Val Ser Phe Gly Ile Val His Arg Glu Asn Ile  
20 25 30

Asp Gly Ala Glu Val Ser Val Ser Arg Gly Lys Asn Asn Pro Phe Tyr  
35 40 45

Phe Asn Ser Asp Arg Trp Phe Xaa Xaa Leu Phe Arg Asn Gln Phe Gly  
50 55 60

His Leu Arg Val Leu Gln Arg Phe Asp Gln Arg Ser Lys Gln Met Gln  
65 70 75 80

Asn Leu Glu Asn Tyr Arg Val Val Glu Phe Met Ser Lys Pro Asn Thr

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| 15  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
| 85  |     |     |     |     |     |     |     | 90  |     |     |     | 95  |     |     |     |  |
| Leu | Leu | Leu | Pro | His | His | Ala | Asp | Ala | Asp | Phe | Leu | Leu | Val | Val | Leu |  |
|     |     |     | 100 |     |     |     | 105 |     |     |     |     |     | 110 |     |     |  |
| Asn | Gly | Arg | Ala | Val | Leu | Thr | Leu | Val | Asn | Pro | Asp | Gly | Arg | Asp | Ser |  |
|     |     | 115 |     |     |     | 120 |     |     |     |     |     | 125 |     |     |     |  |
| Asn | Ile | Leu | Glu | Gln | Gly | His | Ala | Gln | Lys | Ile | Pro | Ala | Gly | Thr | Thr |  |
|     |     | 130 |     |     |     | 135 |     |     |     |     |     | 140 |     |     |     |  |
| Phe | Phe | Leu | Val | Asn | Pro | Asp | Asp | Asn | Glu | Asn | Leu | Arg | Ile | Ile | Lys |  |
| 145 |     |     |     |     | 150 |     |     |     |     |     | 155 |     |     | 160 |     |  |
| Leu | Ala | Val | Pro | Val | Asn | Asn | Pro | His | Arg | Phe | Gln | Asp | Phe | Phe | Leu |  |
|     |     |     | 165 |     |     |     |     |     | 170 |     |     | 175 |     |     |     |  |
| Ser | Ser | Thr | Glu | Ala | Gln | Gln | Ser | Tyr | Leu | Gln | Gly | Phe | Ser | Lys | Asn |  |
|     |     |     | 180 |     |     |     |     |     | 185 |     |     | 190 |     |     |     |  |
| Ile | Leu | Glu | Ala | Ser | Phe | Asp | Ser | Asp | Ile | Lys | Glu | Ile | Asn | Arg | Val |  |
|     |     | 195 |     |     |     |     |     | 200 |     |     | 205 |     |     |     |     |  |
| Leu | Phe | Gly | Glu | Asp | Ser | Val | Asp | Met | Lys | Glu | Gly | Ser | Leu | Leu | Leu |  |
|     |     | 210 |     |     | 215 |     |     |     |     |     | 220 |     |     |     |     |  |
| Pro | His | Tyr | Asn | Ser | Lys | Ala | Ile | Val | Ile | Leu | Val | Ile | Asn | Glu | Gly |  |
| 225 |     |     |     |     | 230 |     |     |     |     |     | 235 |     |     | 240 |     |  |
| Glu | Ala | Asn | Ile | Glu | Leu | Val | Gly | Leu | Arg | Glu | Glu | Gln | Gln | Gln | Gln |  |
|     |     |     | 245 |     |     |     |     |     | 250 |     |     | 255 |     |     |     |  |
| Gln | Gln | Gln | Asp | Glu | Arg | Leu | Glu | Val | Gln | Arg | Tyr | Arg | Ala | Glu | Val |  |
|     |     |     | 260 |     |     |     |     |     | 265 |     |     | 270 |     |     |     |  |
| Ser | Glu | Asp | Asp | Val | Phe | Val | Ile | Pro | Ala | Ala | Tyr | Pro | Val | Ala | Ile |  |
|     |     | 275 |     |     |     |     |     | 280 |     |     | 285 |     |     |     |     |  |

Asn Ala Thr Ser Asn Leu Asn Phe Phe Ala Phe Gly Ile Asn Ala Glu  
 290 295 300

Asn Asn Gln Arg Asn Phe Leu Ala Gly Glu Lys Asp Asn Val Ile Ser  
 305 310 315 320

Glu Ile Pro Thr Glu Val Leu Asp Leu Ala Phe Pro Ala Pro Gly Glu  
 325 330 335

Lys Val Glu Lys Leu Ile Glu Lys Gln Ser Thr Ser His Phe Val Asp  
 340 345 350

Ala Gln Pro Glu Glu Gln Gln Lys Glu Glu Asp Arg Asn Gly Lys Lys  
 355 360 365

Gly Pro Leu Ser Ser Ile Leu Asp Thr Leu Tyr  
 370 375

<210> 7  
 <211> 431  
 <212> PRT  
 <213> Vigna radiata var. radiata

<220>  
 <221> misc\_feature  
 <222> (56)..(57)  
 <223> Xaa can be any naturally occurring amino acid

<400> 7

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

Leu Ala Ser Leu Ser Val Ser Phe Gly Ile Val His Arg Glu Asn Ile  
 20 25 30

Asp Gly Ala Glu Val Ser Val Ser Arg Gly Lys Asn Asn Pro Phe Tyr  
 35 40 45

Phe Asn Ser Asp Arg Trp Phe Xaa Xaa Leu Phe Arg Asn Gln Phe Gly  
 50 55 60

His Leu Arg Val Leu Gln Arg Phe Asp Gln Arg Ser Lys Gln Met Gln  
 65 70 75 80

Asn Leu Glu Asn Tyr Arg Val Val Glu Phe Met Ser Lys Pro Asn Thr  
 85 90 95

Leu Leu Leu Pro His His Ala Asp Ala Asp Phe Leu Leu Val Val Leu  
 100 105 110

Asn Gly Arg Ala Val Leu Thr Leu Val Asn Pro Asp Gly Arg Asp Ser  
 115 120 125

Asn Ile Leu Glu Gln Gly His Ala Gln Lys Ile Pro Ala Gly Thr Thr  
 130 135 140

Phe Phe Leu Val Asn Pro Asp Asp Asn Glu Asn Leu Arg Ile Ile Lys  
 145 150 155 160

Leu Ala Val Pro Val Asn Asn Pro His Arg Phe Gln Asp Phe Phe Leu  
 165 170 175

Ser Ser Thr Glu Ala Gln Gln Ser Tyr Leu Gln Gly Phe Ser Lys Asn  
 180 185 190

Ile Leu Glu Ala Ser Phe Asp Ser Asp Ile Lys Glu Ile Ser Arg Ile  
 195 200 205

Leu Phe Gly Glu Glu Gly Gln Gln Gln Gln Gln Gly Gln Glu Ser Gln  
 210 215 220

Gln Glu Gly Val Ile Val Glu Leu Lys Arg Glu Gln Ile Arg Lys Leu  
 225 230 235 240

Thr Lys His Ala Lys Ser Ser Ser Lys Lys Ser Leu Ser Ser Glu Asp  
245 250 255

Glu Pro Phe Asn Leu Arg Asn Gln Lys Pro Ile Tyr Ser Asn Lys Leu  
260 265 270

Gly Arg Trp Phe Glu Ile Thr Pro Glu Arg Asn Pro Gln Leu Arg Asp  
275 280 285

Leu Asp Met Phe Ile Arg Ser Val Asp Ile Asn Glu Gly Ser Leu Leu  
290 295 300

Leu Pro His Tyr Asn Ser Arg Ala Thr Ala Ile Leu Val Ile Asn Glu  
305 310 315 320

Gly Asn Ala Asn Ile Glu Leu Val Gly Gln Arg Glu Gln Glu Glu Ser  
325 330 335

Leu Glu Val Gln Arg Tyr Ile Ala Glu Leu Ser Glu Gly Asp Val Phe  
340 345 350

Ile Ile Pro Ala Thr Tyr Pro Val Val Ile Asn Ala Thr Ser Asn Leu  
355 360 365

Asn Phe Phe Ala Phe Gly Ile Asn Ala Glu Asn Asn Gln Arg Asn Phe  
370 375 380

Leu Ala Gly Glu Lys Asp Asn Val Ile Ser Glu Ile Pro Thr Glu Val  
385 390 395 400

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

Lys Lys Gln Ser Glu Ser Gln Phe Val Asp Ala Gln Pro Glu Gln  
420 425 430

<210> 8  
 <211> 431  
 <212> PRT  
 <213> Vigna radiata var. radiata

<400> 8

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

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

Gln Ser Gln Glu Glu Ser Asp Ser Arg Gly Arg Asn Asn Pro Phe Tyr  
 35 40 45

Phe Asn Ser Asp Arg Phe His Thr Leu Tyr Thr Asn Glu Tyr Gly His  
 50 55 60

Leu Arg Val Leu Gln Arg Phe Asp Gln Arg Ser Lys Gln Ile Gln Asn  
 65 70 75 80

Leu Glu Asn Tyr Arg Leu Val Glu Phe Lys Ser Lys Pro Asn Thr Leu  
 85 90 95

Leu Leu Pro His His Ala Asp Ala Asp Phe Leu Leu Val Val Leu Asn  
 100 105 110

Gly Arg Ala Val Leu Thr Leu Val Asn Ala Asp Gly Arg Asp Ser Tyr  
 115 120 125

Ile Leu Glu Gln Gly His Ala Gln Arg Ile Pro Ala Gly Thr Ile Phe  
 130 135 140

Phe Val Val Asn Pro Asn Asp Asn Glu Asn Leu Arg Ile Ile Lys Met  
 145 150 155 160

Ala Val Pro Val Asn Asn Pro His Arg Phe Gln Asp Phe Phe Leu Ser  
 165 170 175

Ser Thr Glu Ala Gln Gln Ser Tyr Leu Gln Gly Phe Ser Lys Asn Val  
 180 185 190

Leu Glu Ala Ser Phe Asp Ser Glu Phe Lys Glu Ile Asn Arg Val Leu  
 195 200 205

Phe Gly Gly Glu Gly Gln Gln Gln Gly Gln Glu Ser Gln Gln Glu  
 210 215 220

Gly Val Ile Val Glu Leu Glu Arg Glu Gln Ile Arg Glu Leu Ile Lys  
 225 230 235 240

His Ala Lys Ser Ser Ser Arg Arg Ala Leu Ser Ser Gln Asp Glu Pro  
 245 250 255

Ile Asn Leu Arg Asn Arg Lys Pro Ile Tyr Ser Asn Lys Phe Gly Arg  
 260 265 270

Trp Tyr Glu Ile Thr Pro Glu Lys Asn Pro Gln Leu Arg Asp Met Asp  
 275 280 285

Met Phe Ile Ser Ser Val Asn Met Lys Glu Gly Gly Leu Leu Leu Pro  
 290 295 300

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

Ala Asn Leu Glu Leu Val Gly Gln Arg Glu Gln Glu Gln Glu Glu Ser  
 325 330 335

Trp Glu Val Gln Arg Tyr Arg Ala Glu Leu Ser Glu Asp Asp Val Phe  
 340 345 350

Ile Ile Pro Ala Thr Tyr Pro Val Ala Ile Asn Ala Thr Ser Asn Leu  
 355 360 365

Asn Phe Phe Ala Phe Gly Ile Asn Ala Glu Asn Asn Gln Arg Asn Phe  
 370 375 380

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

Leu Asp Val Thr Phe Pro Ala Ser Gly Glu Lys Val Val Lys Leu Val  
 405 410 415

Lys Lys Gln Ser Glu Ser Tyr Phe Val Asp Ala Gln Ser Glu Gln  
 420 425 430

<210> 9

<211> 338

<212> PRT

<213> Vigna radiata var. radiata

<400> 9

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

Ser Leu Ser Ile Ser Phe Gly Ile Leu His Trp Glu His Gln Glu Ser  
 20 25 30

Gln Glu Glu Ser Asp Ser Arg Gly Gln Asn Asn Pro Phe Tyr Phe Ser  
 35 40 45

Ser His Lys Arg Phe His Thr Leu Phe Lys Asn Gln Tyr Gly His Leu  
 50 55 60

Arg Val Leu His Arg Phe Asp Gln Arg Phe Gly Gln Ile Leu Asn Leu  
 65 70 75 80

Glu Asn Tyr Arg Val Val Gln Phe Lys Ser Lys Pro Asn Thr Leu Leu  
 85 90 95

Leu Pro His His Ala Asp Ala Asp Phe Leu Leu Val Val Leu Asn Gly

100

105

110

Arg Ala Ile Leu Thr Leu Val Asn Pro Asp Gly Arg Asp Ser Tyr Ile  
 115 120 125

Leu Glu Gln Gly His Ala Gln Lys Ile Pro Ala Gly Thr Thr Phe Phe  
 130 135 140

Leu Val Asn Pro Asn Asp Asn Asp Asn Leu Arg Ile Ile Lys Leu Ala  
 145 150 155 160

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

Thr Glu Ala Gln Gln Ser Tyr Leu Arg Gly Phe Ser Lys Asn Ile Leu  
 180 185 190

Glu Ala Ser Phe Asp Ser Asp Phe Lys Glu Ile Asp Arg Val Leu Phe  
 195 200 205

Gly Glu Glu Arg Gln Gln Gln His Gly Glu Glu Ser Gln Glu Glu Gly  
 210 215 220

Val Ile Val Glu Leu Lys Arg Glu Gln Ile Arg Glu Leu Ile Lys His  
 225 230 235 240

Ala Lys Ser Ser Ser Arg Lys Glu Leu Ser Ser Gln Asp Glu Pro Phe  
 245 250 255

Asn Leu Arg Asn Asn Asn Pro Ile Tyr Ser Asn Lys Phe Gly Arg Trp  
 260 265 270

Tyr Glu Ile Thr Pro Glu Arg Asn Pro Gln Leu Lys Asp Leu Asp Val  
 275 280 285

Phe Ile Ser Ser Val Asp Met Glu Glu Pro Glu Ile Phe His Phe Phe  
 290 295 300

Ser Ser Leu Met Leu Leu Pro Ser Val Leu Phe Pro Leu Thr Leu Ser  
 305 310 315 320

Asp Arg Ile Tyr Phe Cys Ala Gly Phe Leu Ala Leu Glu His Asp Phe  
 325 330 335

Cys Ala

<210> 10  
 <211> 246  
 <212> PRT  
 <213> Vigna radiata var. radiata  
 <400> 10

Phe Gly Glu Glu Gly Gln Gln Gln Gln Gln Gly Gln Glu Ser Gln Gln  
 1 5 10 15

Glu Gly Val Ile Val Glu Leu Lys Arg Glu Gln Ile Arg Glu Leu Ile  
 20 25 30

Arg His Ala Lys Ser Asn Ser Lys Thr Leu Ser Ser Gln Asn Glu Pro  
 35 40 45

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

Met His Glu Ile Thr Pro Glu Lys Asn Pro Gln Leu Arg Asp Leu Asp  
 65 70 75 80

Val Phe Leu Ser Tyr Val Asp Met Lys Glu Gly Gly Leu Leu Met Pro  
 85 90 95

Asn Tyr Asn Ser Lys Ala Ile Val Ile Leu Val Leu Asn Lys Gly Glu  
 100 105 110

Ala Asn Ile Glu Leu Val Gly Leu Lys Glu Pro Gln Gln Gln Gln  
115 120 125 24

Glu Glu Ser Trp Asp Val Gln Arg Tyr Ser Ala Glu Leu Thr Glu Asp  
130 135 140

Asp Val Phe Val Ile Pro Ala Ala Tyr Pro Val Ala Ile Asn Ala Thr  
145 150 155 160

Ser Asn Met Asn Phe Leu Ala Phe Gly Ile Asn Ala Glu Asn Asn Gln  
165 170 175

Arg Asn Phe Leu Ala Gly Glu Lys Asp Asn Val Ile Ser Glu Ile Pro  
180 185 190

Ser Gln Val Leu Glu Val Ala Phe Pro Gly Ser Gly Glu Lys Val Val  
195 200 205

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

Gln Gln Lys Glu Glu Gln Ser Lys Gly Arg Lys Gly Pro Leu Ser Ser  
225 230 235 240

Ile Leu Asp Thr Leu Tyr  
245

<210> 11  
<211> 613  
<212> PRT  
<213> Vigna radiata var. radiata

<400> 11

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

Ser Ala Arg Ser Cys Phe Gly Ser Ser Ser Ser Thr Asn Arg Phe Asn  
20 25 30

Arg Cys Gln Phe Asn Ser Leu Asn Ala Leu Lys Pro Asp His Arg Val  
 35 40 45

Glu Thr Asp Gly Gly Leu Val Glu Thr Trp Ser Ser Arg His Pro Glu  
 50 55 60

Leu Glu Cys Ala Gly Val Thr Ala Thr Arg Arg Thr Leu Tyr Arg Asn  
 65 70 75 80

Gly Leu Gln Met Pro Ser Tyr Ser Pro Tyr Ser Gln Met Ile Ile Val  
 85 90 95

Ile Gln Gly Lys Gly Ala Phe Gly Leu Ala Leu Ser Gly Cys Ala Glu  
 100 105 110

Thr Tyr Glu Glu Pro Ala Lys Glu Ser Ser Ser Ser Ser His Lys Pro  
 115 120 125

Ser Asp Ser His Gln Lys Ile His Gln Ser Gly Pro Gly His Val Ile  
 130 135 140

Leu Ile Pro Arg Gly Val Pro Phe Trp Ile Phe Asn Thr Gly Asp Glu  
 145 150 155 160

Pro Leu Ile Thr Val Thr Leu Leu Asp Thr Val Ser Glu Asp Asn Gln  
 165 170 175

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

Glu His Pro Glu Ala Met Lys Glu Lys Gln Gln Gln Gln Ala Glu Glu  
 195 200 205

Glu Gly Gly Asn Val Leu Ser Gly Phe Gly Lys Arg Phe Leu Ala Arg  
 210 215 220

Ala Leu Asn Ile Asp Gln Asp Ile Ala Asn Lys Leu Ile Ser Pro Asp  
 225 230 235 240

Asp Glu Met Lys Gln Ile Val Lys Leu Lys Glu Gly Leu Ser Val Ile  
 245 250 255

Ser Pro Lys Trp Gln Gly Gln Gln Glu Asp Glu Asp Glu Asp Asp Asp  
 260 265 270

Asp Glu Asp Glu Asp Glu Asp Glu Ser Val Ser Arg Pro Ser Arg Arg  
 275 280 285

Pro Ser His Gly Lys Arg Val Arg Lys Glu Glu Glu Lys Glu Val Glu  
 290 295 300

Pro Tyr Gly Lys His Val His Lys Glu Val Glu Lys Glu Val Glu Pro  
 305 310 315 320

Leu Pro Pro Arg Lys His Val His Lys Glu Glu Glu Lys Glu Ile Glu  
 325 330 335

Pro Leu Pro Pro Arg Arg Ser Arg His His His Asp Glu Asp Glu Asp  
 340 345 350

Glu Asp Glu Asp Glu Glu Glu Lys Pro Arg Arg Thr Arg Gly Pro Thr  
 355 360 365

Pro Ser Pro Lys Gly Glu Gly His Arg Gly Val Glu Val Glu Glu Asp  
 370 375 380

Glu Ser Asp Glu Ser Val Arg His Lys Thr Arg His Glu Lys Ser Trp  
 385 390 395 400

Lys Glu His Arg Pro Ala Gln Glu Asp Val Glu Arg Gly Glu Ala His  
 405 410 415

27

Glu Glu Trp Glu Thr Arg Pro Ser Lys Asp Lys Arg His Gly Ser Asn  
420 425 430

Gly Leu Glu Glu Thr Ile Cys Ser Ser Lys Leu Gln Phe Asn Ile Ala  
435 440 445

Arg Pro Lys Ser Ala Asp Phe Tyr Asn Pro Lys Ala Gly Arg Ile Lys  
450 455 460

Asn Leu Asn Ser Gln Ser Leu Pro Ala Leu Arg Asn Phe Gly Leu Ser  
465 470 475 480

Ala Gln Tyr Val Val Leu Tyr Lys Asn Gly Ile Tyr Ser Pro His Trp  
485 490 495

Asn Met Asp Ala Asn Ser Val Ile Tyr Val Ile Arg Gly Gln Gly Gln  
500 505 510

Val Arg Val Val Asn Asn Glu Gly Ile Met Val Phe Asp Asp Glu Leu  
515 520 525

Ser Lys Gly Gln Leu Leu Val Val Pro Gln Asn Phe Met Val Ala Glu  
530 535 540

Glu Ala Gly Asp Gln Gly Phe Glu Tyr Val Val Phe Lys Thr Asn Asp  
545 550 555 560

Asn Ala Val Thr Ser Tyr Leu Lys Glu Thr Phe Arg Ala Phe Pro Ala  
565 570 575

Glu Val Leu Ala Asn Ile Tyr Lys Leu Lys Gln Ser Gln Val Tyr Asp  
580 585 590

Leu Lys Tyr Asn Gly Asn Trp Gly Pro Leu Ala Asn Pro Val Gln Ser  
595 600 605

Gln Asp Gln Ser Ser

610

<210> 12  
 <211> 532  
 <212> PRT  
 <213> Vigna radiata var. radiata  
 <400> 12

Met Met Arg Ser Arg Phe Pro Leu Leu Leu Leu Gly Val Val Phe  
 1 5 10 15

Leu Ala Ser Val Ser Val Ser Phe Gly Ile Ala Tyr Trp Glu Lys Glu  
 20 25 30

Asn Leu Ser His Asn Lys Cys Leu Arg Ser Cys Ser Ser Glu Lys Ser  
 35 40 45

Thr Tyr Arg Ile Gln Ala Cys His Ala Arg Cys Asn Leu Leu Lys Glu  
 50 55 60

Asp Lys Glu His Gln Glu Gly Glu His Ser Leu Pro Thr His His Glu  
 65 70 75 80

Glu Glu Asp Glu Asp Glu Ser Arg Gln Pro Arg Pro Phe Pro Phe Pro  
 85 90 95

Phe Pro Ile Pro Leu Arg Pro Arg Glu Arg Gln Ser Glu Gly Ser Glu  
 100 105 110

Ser Ser Arg Lys Gln Asn Asn Pro Phe His Phe Ser Ser Asn Arg Phe  
 115 120 125

His Ser Leu Phe Lys Asn Pro Asn Gly His Ile Arg Leu Leu Gln Arg  
 130 135 140

Phe Asp Gln Gln Ser Lys Gln Leu Gln Asn Leu Gln Asp Tyr Arg Leu  
 145 150 155 160

Leu Glu Val Gln Leu Arg Pro Arg Thr Leu Leu Leu Pro His His Val  
                                   165                                  170                                  175

Asp Ala Asp Tyr Ile Ile Ile Ile Leu Ser Gly Arg Ala Ile Leu Thr  
                                   180                                  185                                  190

Leu Gln Asn Pro Asp Asp Arg Asp Ser Tyr Asn Leu Gln Asn Gly Asp  
                                   195                                  200                                  205

Val Gln Asn Ile Pro Ala Gly Thr Thr Leu Tyr Leu Ile Asn Pro Asp  
                                   210                                  215                                  220

Asn Glu Glu Thr Leu Lys Val Met Val Leu Ala Arg Pro Ile Asn Asn  
                                   225                                  230                                  235                                  240

Pro Gly Arg Leu Glu Ser Phe Phe Leu Ser Ser Thr Glu Ala Gln Gln  
                                   245                                  250                                  255

Ser Tyr Leu Gln Gly Phe Ser Lys Lys Thr Leu Glu Ala Ser Phe Asp  
                                   260                                  265                                  270

Thr Gln Phe Lys Glu Ile Asn Arg Val Leu Phe Gly Glu Glu Gly Gln  
                                   275                                  280                                  285

Gln Gln Asp Glu Glu Lys Gln Glu Gly Val Ile Val Lys Leu Ser Lys  
                                   290                                  295                                  300

Glu Gln Ile Arg Glu Leu Ser Lys His Ala Lys Ser Ser Ser Lys Lys  
                                   305                                  310                                  315                                  320

Thr Ile Ser Ser Lys Asp Lys Pro Phe Asn Leu Arg Ser Ser Ser Pro  
                                   325                                  330                                  335

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

Asn Pro Gln Leu Arg Asp Met Asp Val Phe Val Ser Phe Val Asn Met  
355 360 365 30

Lys Glu Gly Ala Leu Leu Leu Pro His Tyr Asn Ser Lys Ser Ile Val  
370 375 380

Ile Leu Val Val Asn Lys Gly Glu Ala Asn Ala Glu Leu Val Gly Glu  
385 390 395 400

Arg Glu Gln Gln Gln Glu Glu Ser Gly Glu Val Gln Arg Tyr Arg Ala  
405 410 415

Glu Leu Ser Glu Glu Asp Val Leu Val Ile Pro Ala Thr Tyr Pro Val  
420 425 430

Ala Ile Asn Ala Thr Ser Asn Leu Asn Phe Phe Ala Phe Gly Ile Asn  
435 440 445

Ala Glu Asn Asn Gln Arg Asn Phe Leu Ala Gly Glu Lys Asp Asn Val  
450 455 460

Met Ser Asp Ile Pro Arg Pro Val Leu Glu Val Ala Phe Pro Gly Ser  
465 470 475 480

Gly Glu Glu Thr Glu Lys Leu Ile Lys Lys Gln Thr Glu Ser Tyr Phe  
485 490 495

Val Asp Ala Gln Pro Gln Gln Lys Gln Ser Gln Glu Lys Glu Lys Glu  
500 505 510

Glu Lys Glu Glu Gly Ser Lys Gly Arg Asn Pro Leu Tyr Ser Ile Leu  
515 520 525

Asn Ala Phe Tyr  
530

<210> 13

<211> 155  
 <212> PRT  
 <213> Vigna radiata

<400> 13

Met Ala Val Phe Thr Phe Asp Asp Gln Ala Thr Ser Pro Val Ala Pro  
 1 5 10 15

Ala Thr Leu Tyr Asn Ala Leu Ala Lys Asp Ala Asp Asn Ile Ile Pro  
 20 25 30

Lys Ala Val Gly Ser Phe Gln Ser Val Glu Ile Val Glu Gly Asn Gly  
 35 40 45

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

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

Tyr Ser Tyr Ser Ile Val Gly Gly Val Ala Leu Pro Asp Thr Ala Glu  
 85 90 95

Lys Ile Thr Ile Asp Thr Lys Ile Ser Asp Gly Ala Asp Gly Gly Ser  
 100 105 110

Leu Ile Lys Leu Thr Ile Ser Tyr His Gly Lys Gly Asp Ala Pro Pro  
 115 120 125

Asn Glu Asp Glu Leu Lys Ala Gly Lys Ala Lys Ser Asp Ala Leu Phe  
 130 135 140

Lys Ala Val Glu Ala Tyr Leu Leu Ala Asn Pro  
 145 150 155

<210> 14  
 <211> 297  
 <212> PRT

<213> *Vigna radiata* var. *radiata*

<400> 14

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

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

Ser Leu Ser Phe Ser Phe Ser Arg Phe Gly Pro Asp His Lys Asp Leu  
35 40 45

Ile Phe Gln Gly Asp Ala Ile Ser Thr Asn Asn Val Leu Gln Leu Thr  
50 55 60

Lys Leu Asp Ser Ala Gly Asn Pro Leu Ser Gly Ser Val Gly Arg Val  
65 70 75 80

Leu Tyr Ser Ala Pro Leu His Leu Trp Glu Asn Ser Ala Val Val Ser  
85 90 95

Ser Phe Glu Thr Ser Phe Thr Phe Gln Ile Ser Thr Pro Tyr Thr Ser  
100 105 110

Pro Pro Ala Asp Gly Val Ala Phe Phe Leu Ala Pro Tyr Asp Thr Val  
115 120 125

Ile Pro Ser Asn Ser Gly Gly Ser Leu Leu Gly Leu Phe Ser Asn Leu  
130 135 140

Asn Ala Leu Arg Asn Ser Ser Thr Ser Gln Asn Gln Thr Ile Leu Asp  
145 150 155 160

Phe Lys Ala Val Ser Asn Lys Val Val Ala Val Glu Phe Asp Thr Tyr  
165 170 175

Pro Asn Glu Asn Ile Gly Asp Pro Ala Tyr Lys His Ile Gly Ile Asp

180

185

190

Val Asn Ser Ile Arg Ser Lys Thr Thr Ala Arg Trp Asn Trp Gln Asn  
 195 200 205

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

Leu Thr Val Ser Thr Phe Tyr Pro Gly Ser Asn Pro Val Thr Leu Ser  
 225 230 235 240

Tyr Asp Val Glu Leu His Thr Val Leu Ser Glu Trp Val Arg Val Gly  
 245 250 255

Phe Ser Ala Ser Ser Gly Glu Gln Lys Glu Arg Asn Thr Ile Leu Ser  
 260 265 270

Trp Ser Phe Thr Ser Ser Leu Lys Asn Asn Glu Val Lys Asp Glu Lys  
 275 280 285

Gln Asp Met Phe Ile Lys Thr Val Val  
 290 295

<210> 15

<211> 246

<212> PRT

<213> Vigna radiata var. radiata

<400> 15

Met Arg Ala Ser Thr Ser Ser Ile Pro Ile Pro Ser Ser Ser Ser Arg  
 1 5 10 15

Phe Ser Ile Phe Phe Phe Leu Leu Phe Ala Leu Leu Ala Leu Arg Ser  
 20 25 30

Ser Ser Ser Asp Cys Ser His Phe Gln His Arg Ala Pro Met Ala Thr  
 35 40 45

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

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

Ser Leu Leu Glu Phe Ala Arg Val Val Lys Ala Gln Glu Gln Val Val  
 85 90 95

Ala Gly Thr Leu His His Leu Thr Leu Glu Ala Ile Glu Ala Gly Glu  
 100 105 110

Lys Lys Leu Tyr Glu Ala Lys Val Trp Val Lys Pro Trp Leu Asn Ser  
 115 120 125

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

Ser Ala Asp Leu Gly Val Lys Lys Asp Gly His Lys Ser Gly Trp Gln  
 145 150 155 160

Ser Val Pro Thr His Asp Pro Gln Val Gln Asp Ala Ala Asn His Ala  
 165 170 175

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

His Glu Val Ala Asp Ala Lys Ala Glu Val Ile Asp Asp Phe Ala Lys  
 195 200 205

Phe Asn Leu Leu Leu Lys Val Lys Arg Gly Glu Lys Glu Glu Lys Phe  
 210 215 220

Lys Val Glu Val His Lys Asn Asn Glu Gly Ala Leu His Leu Asn Gln  
 225 230 235 240

Met Glu Gln Asp His Ser  
245