

SEQUENCE LISTING

<110> National Research Council of Canada

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<120> Insulin-Like Growth Factor 1 Receptor-Specific Antibodies and

Uses Thereof

<130> 12599-98

<150> 61/948,818

<151> 2014-03-06

<160> 38

<170> PatentIn version 3.5

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Ala Met Gly Trp Xaa Arg Gln Ala Pro Gly Lys Xaa Xaa Glu Xaa Val
35 40 45

Xaa His Ile Thr Trp Ser Arg Gly Thr Thr Arg Xaa Ala Ser Ser Val
50 55 60

Lys Xaa Arg Phe Thr Ile Ser Arg Asp Xaa Xaa Lys Asn Thr Xaa Tyr
65 70 75 80

Leu Gln Met Asn Ser Leu Xaa Xaa Glu Asp Thr Ala Val Tyr Tyr Cys
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Ala Ala Ser Thr Phe Leu Arg Ile Leu Pro Glu Glu Ser Ala Tyr Thr
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Tyr Trp Gly Gln Gly Thr Xaa Val Thr Val Ser Ser
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30

Ala Met Gly Trp Phe Arg Gln Ala Pro Gly Lys Glu Arg Glu Phe Val

35

40

45

Gly His Ile Thr Trp Ser Arg Gly Thr Thr Arg Val Ala Ser Ser Val

50

55

60

Lys Asp Arg Phe Thr Ile Ser Arg Asp Ser Ala Lys Asn Thr Val Tyr

65

70

75

80

Ala Met Gly Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
 35 40 45

Gly His Ile Thr Trp Ser Arg Gly Thr Thr Arg Tyr Ala Ser Ser Val
 50 55 60

Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Val Tyr
 65 70 75 80

Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys
 85 90 95

Ala Ala Ser Thr Phe Leu Arg Ile Leu Pro Glu Glu Ser Ala Tyr Thr
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Ala Met Gly Trp Phe Arg Gln Ala Pro Gly Lys Gly Leu Glu Phe Val

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Gly His Ile Thr Trp Ser Arg Gly Thr Thr Arg Tyr Ala Ser Ser Val

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Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Val Tyr

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Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys

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Ala Ala Ser Thr Phe Leu Arg Ile Leu Pro Glu Glu Ser Ala Tyr Thr
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Tyr Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser
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Ala Met Gly Trp Phe Arg Gln Ala Pro Gly Lys Gly Leu Glu Phe Val
 35 40 45

Gly His Ile Thr Trp Ser Arg Gly Thr Thr Arg Tyr Ala Ser Ser Val
 50 55 60

Lys Gly Arg Phe Thr Ile Ser Arg Asp Ser Ser Lys Asn Thr Val Tyr
 65 70 75 80

Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys
 85 90 95

Ala Ala Ser Thr Phe Leu Arg Ile Leu Pro Glu Glu Ser Ala Tyr Thr
 100 105 110

Tyr Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser
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Ser Leu Arg Leu Ser Cys Ala Val Ser Gly Gly Thr Val Ser Pro Thr
 20 25 30

Ala Met Gly Trp Phe Arg Gln Ala Pro Gly Lys Glu Arg Glu Phe Val
 35 40 45

Gly His Ile Thr Trp Ser Arg Gly Thr Thr Arg Tyr Ala Ser Ser Val
 50 55 60

Lys Gly Arg Phe Thr Ile Ser Arg Asp Ser Ser Lys Asn Thr Val Tyr
 65 70 75 80

Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys
 85 90 95

Ala Ala Ser Thr Phe Leu Arg Ile Leu Pro Glu Glu Ser Ala Tyr Thr
 100 105 110

Tyr Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser
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Ser Leu Arg Leu Ser Cys Xaa Xaa Ser Gly Gly Thr Val Ser Pro Thr

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30

Ala Met Gly Trp Xaa Arg Gln Ala Pro Gly Lys Xaa Xaa Glu Xaa Val

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45

Xaa His Ile Thr Trp Ser Arg Gly Thr Thr Arg Xaa Ala Ser Ser Val
 50 55 60

Lys Xaa Arg Phe Thr Ile Ser Arg Asp Xaa Xaa Lys Asn Thr Xaa Tyr
 65 70 75 80

Leu Gln Met Asn Ser Leu Xaa Xaa Glu Asp Thr Ala Val Tyr Tyr Cys
 85 90 95

Ala Ala Ser Thr Phe Leu Arg Ile Leu Pro Glu Glu Ser Ala Tyr Thr
 100 105 110

Tyr Trp Gly Gln Gly Thr Xaa Val Thr Val Ser Ser Met Thr Val Asp
 115 120 125

Lys Lys Leu Glu Pro Ser Gly Pro Ile Ser Thr Ile Asn Pro Cys Pro
 130 135 140

Pro Cys Lys Glu Cys His Lys Cys Pro Ala Pro Asn Leu Glu Gly Gly
 145 150 155 160

Pro Ser Val Phe Ile Phe Pro Pro Asn Ile Lys Asp Val Leu Met Ile
 165 170 175

Ser Leu Thr Pro Lys Val Thr Cys Val Val Val Asp Val Ser Glu Asp

180

185

190

Asp Pro Asp Val Gln Ile Ser Trp Phe Val Asn Asn Val Glu Val His

195

200

205

Thr Ala Gln Thr Gln Thr His Arg Glu Asp Tyr Asn Ser Thr Ile Arg

210

215

220

Val Val Ser Thr Leu Pro Ile Gln His Gln Asp Trp Met Ser Gly Lys

225

230

235

240

Glu Phe Lys Cys Lys Val Asn Asn Lys Asp Leu Pro Ser Pro Ile Glu

245

250

255

Arg Thr Ile Ser Lys Ile Lys Gly Leu Val Arg Ala Pro Gln Val Tyr

260

265

270

Ile Leu Pro Pro Pro Ala Glu Gln Leu Ser Arg Lys Asp Val Ser Leu

275

280

285

Thr Cys Leu Val Val Gly Phe Asn Pro Gly Asp Ile Ser Val Glu Trp
 290 295 300

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

Leu Asp Ser Asp Gly Ser Tyr Phe Ile Tyr Ser Lys Leu Asn Met Lys
 325 330 335

Thr Ser Lys Trp Glu Lys Thr Asp Ser Phe Ser Cys Asn Val Arg His
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Glu Gly Leu Lys Asn Tyr Tyr Leu Lys Lys Thr Ile Ser Arg Ser Pro
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Gly Lys
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Ser Leu Arg Leu Ser Cys Glu Val Ser Gly Gly Thr Val Ser Pro Thr
20 25 30

Ala Met Gly Trp Phe Arg Gln Ala Pro Gly Lys Glu Arg Glu Phe Val
35 40 45

Gly His Ile Thr Trp Ser Arg Gly Thr Thr Arg Val Ala Ser Ser Val
50 55 60

Lys Asp Arg Phe Thr Ile Ser Arg Asp Ser Ala Lys Asn Thr Val Tyr
65 70 75 80

Leu Gln Met Asn Ser Leu Lys Ser Glu Asp Thr Ala Val Tyr Tyr Cys
85 90 95

Ala Ala Ser Thr Phe Leu Arg Ile Leu Pro Glu Glu Ser Ala Tyr Thr
100 105 110

Tyr Trp Gly Gln Gly Thr Gln Val Thr Val Ser Ser Met Thr Val Asp

115

120

125

Lys Lys Leu Glu Pro Ser Gly Pro Ile Ser Thr Ile Asn Pro Cys Pro

130

135

140

Pro Cys Lys Glu Cys His Lys Cys Pro Ala Pro Asn Leu Glu Gly Gly

145

150

155

160

Pro Ser Val Phe Ile Phe Pro Pro Asn Ile Lys Asp Val Leu Met Ile

165

170

175

Ser Leu Thr Pro Lys Val Thr Cys Val Val Val Asp Val Ser Glu Asp

180

185

190

Asp Pro Asp Val Gln Ile Ser Trp Phe Val Asn Asn Val Glu Val His

195

200

205

Thr Ala Gln Thr Gln Thr His Arg Glu Asp Tyr Asn Ser Thr Ile Arg

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215

220

Val Val Ser Thr Leu Pro Ile Gln His Gln Asp Trp Met Ser Gly Lys
 225 230 235 240

Glu Phe Lys Cys Lys Val Asn Asn Lys Asp Leu Pro Ser Pro Ile Glu
 245 250 255

Arg Thr Ile Ser Lys Ile Lys Gly Leu Val Arg Ala Pro Gln Val Tyr
 260 265 270

Ile Leu Pro Pro Pro Ala Glu Gln Leu Ser Arg Lys Asp Val Ser Leu
 275 280 285

Thr Cys Leu Val Val Gly Phe Asn Pro Gly Asp Ile Ser Val Glu Trp
 290 295 300

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

Leu Asp Ser Asp Gly Ser Tyr Phe Ile Tyr Ser Lys Leu Asn Met Lys
 325 330 335

Thr Ser Lys Trp Glu Lys Thr Asp Ser Phe Ser Cys Asn Val Arg His
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Glu Gly Leu Lys Asn Tyr Tyr Leu Lys Lys Thr Ile Ser Arg Ser Pro

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Gly Lys

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Leu Phe Leu Ser Ala Ala Leu Ser Leu Trp Pro Thr Ser Gly Glu Ile

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25

30

Cys Gly Pro Gly Ile Asp Ile Arg Asn Asp Tyr Gln Gln Leu Lys Arg

35

40

45

Leu Glu Asn Cys Thr Val Ile Glu Gly Tyr Leu His Ile Leu Leu Ile

50

55

60

Ser Lys Ala Glu Asp Tyr Arg Ser Tyr Arg Phe Pro Lys Leu Thr Val

65

70

75

80

Ile Thr Glu Tyr Leu Leu Leu Phe Arg Val Ala Gly Leu Glu Ser Leu

85

90

95

Gly Asp Leu Phe Pro Asn Leu Thr Val Ile Arg Gly Trp Lys Leu Phe

100

105

110

Tyr Asn Tyr Ala Leu Val Ile Phe Glu Met Thr Asn Leu Lys Asp Ile

115

120

125

Gly Leu Tyr Asn Leu Arg Asn Ile Thr Arg Gly Ala Ile Arg Ile Glu

130

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140

Lys Asn Ala Asp Leu Cys Tyr Leu Ser Thr Val Asp Trp Ser Leu Ile

145

150

155

160

Leu Asp Ala Val Ser Asn Asn Tyr Ile Val Gly Asn Lys Pro Pro Lys
 165 170 175

Glu Cys Gly Asp Leu Cys Pro Gly Thr Met Glu Glu Lys Pro Met Cys
 180 185 190

Glu Lys Thr Thr Ile Asn Asn Glu Tyr Asn Tyr Arg Cys Trp Thr Thr
 195 200 205

Asn Arg Cys Gln Lys Met Cys Pro Ser Thr Cys Gly Lys Arg Ala Cys
 210 215 220

Thr Glu Asn Asn Glu Cys Cys His Pro Glu Cys Leu Gly Ser Cys Ser
 225 230 235 240

Ala Pro Asp Asn Asp Thr Ala Cys Val Ala Cys Arg His Tyr Tyr Tyr
 245 250 255

Ala Gly Val Cys Val Pro Ala Cys Pro Pro Asn Thr Tyr Arg Phe Glu
 260 265 270

Gly Trp Arg Cys Val Asp Arg Asp Phe Cys Ala Asn Ile Leu Ser Ala
 275 280 285

Glu Ser Ser Asp Ser Glu Gly Phe Val Ile His Asp Gly Glu Cys Met

290

295

300

Gln Glu Cys Pro Ser Gly Phe Ile Arg Asn Gly Ser Gln Ser Met Tyr

305

310

315

320

Cys Ile Pro Cys Glu Gly Pro Cys Pro Lys Val Cys Glu Glu Glu Lys

325

330

335

Lys Thr Lys Thr Ile Asp Ser Val Thr Ser Ala Gln Met Leu Gln Gly

340

345

350

Cys Thr Ile Phe Lys Gly Asn Leu Leu Ile Asn Ile Arg Arg Gly Asn

355

360

365

Asn Ile Ala Ser Glu Leu Glu Asn Phe Met Gly Leu Ile Glu Val Val

370

375

380

Thr Gly Tyr Val Lys Ile Arg His Ser His Ala Leu Val Ser Leu Ser

385

390

395

400

Phe Leu Lys Asn Leu Arg Leu Ile Leu Gly Glu Glu Gln Leu Glu Gly
 405 410 415

Asn Tyr Ser Phe Tyr Val Leu Asp Asn Gln Asn Leu Gln Gln Leu Trp
 420 425 430

Asp Trp Asp His Arg Asn Leu Thr Ile Lys Ala Gly Lys Met Tyr Phe
 435 440 445

Ala Phe Asn Pro Lys Leu Cys Val Ser Glu Ile Tyr Arg Met Glu Glu
 450 455 460

Val Thr Gly Thr Lys Gly Arg Gln Ser Lys Gly Asp Ile Asn Thr Arg
 465 470 475 480

Asn Asn Gly Glu Arg Ala Ser Cys Glu Ser Asp Val Leu His Phe Thr
 485 490 495

Ser Thr Thr Thr Ser Lys Asn Arg Ile Ile Ile Thr Trp His Arg Tyr
 500 505 510

Arg Pro Pro Asp Tyr Arg Asp Leu Ile Ser Phe Thr Val Tyr Tyr Lys
 515 520 525

Glu Ala Pro Phe Lys Asn Val Thr Glu Tyr Asp Gly Gln Asp Ala Cys

530

535

540

Gly Ser Asn Ser Trp Asn Met Val Asp Val Asp Leu Pro Pro Asn Lys

545

550

555

560

Asp Val Glu Pro Gly Ile Leu Leu His Gly Leu Lys Pro Trp Thr Gln

565

570

575

Tyr Ala Val Tyr Val Lys Ala Val Thr Leu Thr Met Val Glu Asn Asp

580

585

590

His Ile Arg Gly Ala Lys Ser Glu Ile Leu Tyr Ile Arg Thr Asn Ala

595

600

605

Ser Val Pro Ser Ile Pro Leu Asp Val Leu Ser Ala Ser Asn Ser Ser

610

615

620

Ser Gln Leu Ile Val Lys Trp Asn Pro Pro Ser Leu Pro Asn Gly Asn

625

630

635

640

Leu Ser Tyr Tyr Ile Val Arg Trp Gln Arg Gln Pro Gln Asp Gly Tyr
645 650 655

Leu Tyr Arg His Asn Tyr Cys Ser Lys Asp Lys Ile Pro Ile Arg Lys
660 665 670

Tyr Ala Asp Gly Thr Ile Asp Ile Glu Glu Val Thr Glu Asn Pro Lys
675 680 685

Thr Glu Val Cys Gly Gly Glu Lys Gly Pro Cys Cys Ala Cys Pro Lys
690 695 700

Thr Glu Ala Glu Lys Gln Ala Glu Lys Glu Glu Ala Glu Tyr Arg Lys
705 710 715 720

Val Phe Glu Asn Phe Leu His Asn Ser Ile Phe Val Pro Arg Pro Glu
725 730 735

Arg Lys Arg Arg Asp Val Met Gln Val Ala Asn Thr Thr Met Ser Ser
740 745 750

Arg Ser Arg Asn Thr Thr Ala Ala Asp Thr Tyr Asn Ile Thr Asp Pro
755 760 765

Glu Glu Leu Glu Thr Glu Tyr Pro Phe Phe Glu Ser Arg Val Asp Asn

770

775

780

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

785

790

795

800

Ile Asp Ile His Ser Cys Asn His Glu Ala Glu Lys Leu Gly Cys Ser

805

810

815

Ala Ser Asn Phe Val Phe Ala Arg Thr Met Pro Ala Glu Gly Ala Asp

820

825

830

Asp Ile Pro Gly Pro Val Thr Trp Glu Pro Arg Pro Glu Asn Ser Ile

835

840

845

Phe Leu Lys Trp Pro Glu Pro Glu Asn Pro Asn Gly Leu Ile Leu Met

850

855

860

Tyr Glu Ile Lys Tyr Gly Ser Gln Val Glu Asp Gln Arg Glu Cys Val

865

870

875

880

Ser Arg Gln Glu Tyr Arg Lys Tyr Gly Gly Ala Lys Leu Asn Arg Leu
885 890 895

Asn Pro Gly Asn Tyr Thr Ala Arg Ile Gln Ala Thr Ser Leu Ser Gly
900 905 910

Asn Gly Ser Trp Thr Asp Pro Val Phe Phe Tyr Val Gln Ala Lys Thr
915 920 925

Gly Tyr Glu Asn Phe Ile His Leu Ile Ile Ala Leu Pro Val Ala Val
930 935 940

Leu Leu Ile Val Gly Gly Leu Val Ile Met Leu Tyr Val Phe His Arg
945 950 955 960

Lys Arg Asn Asn Ser Arg Leu Gly Asn Gly Val Leu Tyr Ala Ser Val
965 970 975

Asn Pro Glu Tyr Phe Ser Ala Ala Asp Val Tyr Val Pro Asp Glu Trp
980 985 990

Glu Val Ala Arg Glu Lys Ile Thr Met Ser Arg Glu Leu Gly Gln Gly
995 1000 1005

Ser Phe Gly Met Val Tyr Glu Gly Val Ala Lys Gly Val Val Lys

1010

1015

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Asp Glu Pro Glu Thr Arg Val Ala Ile Lys Thr Val Asn Glu Ala

1025

1030

1035

Ala Ser Met Arg Glu Arg Ile Glu Phe Leu Asn Glu Ala Ser Val

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1045

1050

Met Lys Glu Phe Asn Cys His His Val Val Arg Leu Leu Gly Val

1055

1060

1065

Val Ser Gln Gly Gln Pro Thr Leu Val Ile Met Glu Leu Met Thr

1070

1075

1080

Arg Gly Asp Leu Lys Ser Tyr Leu Arg Ser Leu Arg Pro Glu Met

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1090

1095

Glu Asn Asn Pro Val Leu Ala Pro Pro Ser Leu Ser Lys Met Ile

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1105

1110

Gln Met Ala Gly Glu Ile Ala Asp Gly Met Ala Tyr Leu Asn Ala
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Asn Lys Phe Val His Arg Asp Leu Ala Ala Arg Asn Cys Met Val
 1130 1135 1140

Ala Glu Asp Phe Thr Val Lys Ile Gly Asp Phe Gly Met Thr Arg
 1145 1150 1155

Asp Ile Tyr Glu Thr Asp Tyr Tyr Arg Lys Gly Gly Lys Gly Leu
 1160 1165 1170

Leu Pro Val Arg Trp Met Ser Pro Glu Ser Leu Lys Asp Gly Val
 1175 1180 1185

Phe Thr Thr Tyr Ser Asp Val Trp Ser Phe Gly Val Val Leu Trp
 1190 1195 1200

Glu Ile Ala Thr Leu Ala Glu Gln Pro Tyr Gln Gly Leu Ser Asn
 1205 1210 1215

Glu Gln Val Leu Arg Phe Val Met Glu Gly Gly Leu Leu Asp Lys
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Pro Asp Asn Cys Pro Asp Met Leu Phe Glu Leu Met Arg Met Cys

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1245

Trp Gln Tyr Asn Pro Lys Met Arg Pro Ser Phe Leu Glu Ile Ile

1250

1255

1260

Ser Ser Ile Lys Glu Glu Met Glu Pro Gly Phe Arg Glu Val Ser

1265

1270

1275

Phe Tyr Tyr Ser Glu Glu Asn Lys Leu Pro Glu Pro Glu Glu Leu

1280

1285

1290

Asp Leu Glu Pro Glu Asn Met Glu Ser Val Pro Leu Asp Pro Ser

1295

1300

1305

Ala Ser Ser Ser Ser Leu Pro Leu Pro Asp Arg His Ser Gly His

1310

1315

1320

Lys Ala Glu Asn Gly Pro Gly Pro Gly Val Leu Val Leu Arg Ala

1325

1330

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Ser Phe Asp Glu Arg Gln Pro Tyr Ala His Met Asn Gly Gly Arg
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Lys Asn Glu Arg Ala Leu Pro Leu Pro Gln Ser Ser Thr Cys
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tatgaagaca ccaggcccag gtaaagctgg aggagtct

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<211> 30

<212> DNA

<213> Artificial

<220>

<223> Reverse primer

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30

<210> 25

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<212> PRT

<213> Artificial

<220>

<223> IGF1R-4 peptide

<400> 25

Glu Phe Val Gly His Ile Thr Trp Ser Arg

1

5

10

<210> 26

<211> 19

<212> PRT

<213> Artificial

<220>

<223> IGF1R-4 peptide

<400> 26

Leu Ser Cys Glu Val Ser Gly Gly Thr Val Ser Pro Thr Ala Met Gly

1

5

10

15

Trp Phe Arg

<210> 27

<211> 15

<212> PRT

<213> Artificial

<220>

<223> FC5 and FC5-ILIS peptide

<400> 27

Ile Thr Trp Gly Gly Asp Asn Thr Phe Tyr Ser Asn Ser Val Lys

1	5	10	15
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<210> 28

<211> 9

<212> PRT

<213> Artificial

<220>

<223> A20.1 peptide

<400> 28

Thr Thr Tyr Tyr Ala Asp Ser Val Lys

1 5

<210> 29

<211> 11

<212> PRT

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<400> 29

Glu Phe Val Ala Ala Gly Ser Ser Thr Gly Arg

1 5 10

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<212> PRT

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<223> A20.1 peptide

<400> 30

Thr Phe Ser Met Asp Pro Met Ala Trp Phe Arg

1 5 10

<210> 31

<211> 26

<212> PRT

<213> Artificial

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<223> A20.1 peptide

<400> 31

Asp Glu Tyr Ala Tyr Trp Gly Gln Gly Thr Gln Val Thr Val Ser Ser

1

5

10

15

Gly Gln Ala Gly Gln Gly Ser Glu Gln Lys

20

25

<210> 32

<211> 11

<212> PRT

<213> Artificial

<220>

<223> EG2 peptide

<400> 32

Asp Phe Ser Asp Tyr Val Met Gly Trp Phe Arg
1 5 10

<210> 33

<211> 16

<212> PRT

<213> Artificial

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<223> EG2 peptide

<400> 33

Leu Glu Glu Ser Gly Gly Gly Leu Val Gln Ala Gly Asp Ser Leu Arg

1 5 10 15

<210> 34

<211> 32

<212> PRT

<213> Artificial

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<223> EG2 peptide

<400> 34

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

Val Tyr Tyr Cys Ala Val Asn Ser Ala Gly Thr Tyr Val Ser Pro Arg

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25

30

<210> 35

<211> 14

<212> PRT

<213> Artificial

<220>

<223> Albumin peptide

<400> 35

Ala Pro Gln Val Ser Thr Pro Thr Leu Val Glu Ala Ala Arg

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5

10

<210> 36

<211> 29

<212> PRT

<213> Artificial

<220>

<223> Galanin-cysteamide

<400> 36

Gly Trp Thr Leu Asn Ser Ala Gly Tyr Leu Leu Gly Pro His Ala Ile
1 5 10 15

Asp Asn His Arg Ser Phe Ser Asp Lys His Gly Leu Thr
20 25

<210> 37

<211> 19

<212> PRT

<213> Artificial

<220>

<223> Signal peptide

<400> 37

Met Glu Phe Gly Leu Ser Trp Val Phe Leu Val Ala Ile Leu Lys Gly
1 5 10 15

Val Gln Cys

<210> 38

<211> 371

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Glu Pro Ser Gly Pro Ile Ser Thr Ile Asn Pro Cys Pro Pro Cys Lys

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5

10

15

Glu Cys His Lys Cys Pro Ala Pro Asn Leu Glu Gly Gly Pro Ser Val

20

25

30

Phe Ile Phe Pro Pro Asn Ile Lys Asp Val Leu Met Ile Ser Leu Thr

35

40

45

Pro Lys Val Thr Cys Val Val Val Asp Val Ser Glu Asp Asp Pro Asp

50

55

60

Val Gln Ile Ser Trp Phe Val Asn Asn Val Glu Val His Thr Ala Gln

65

70

75

80

Thr Gln Thr His Arg Glu Asp Tyr Asn Ser Thr Ile Arg Val Val Ser

85

90

95

Thr Leu Pro Ile Gln His Gln Asp Trp Met Ser Gly Lys Glu Phe Lys

100

105

110

Cys Lys Val Asn Asn Lys Asp Leu Pro Ser Pro Ile Glu Arg Thr Ile

115

120

125

Ser Lys Ile Lys Gly Leu Val Arg Ala Pro Gln Val Tyr Ile Leu Pro

130

135

140

Pro Pro Ala Glu Gln Leu Ser Arg Lys Asp Val Ser Leu Thr Cys Leu

145

150

155

160

Val Val Gly Phe Asn Pro Gly Asp Ile Ser Val Glu Trp Thr Ser Asn

165

170

175

Gly His Thr Glu Glu Asn Tyr Lys Asp Thr Ala Pro Val Leu Asp Ser

180

185

190

Asp Gly Ser Tyr Phe Ile Tyr Ser Lys Leu Asn Met Lys Thr Ser Lys
 195 200 205

Trp Glu Lys Thr Asp Ser Phe Ser Cys Asn Val Arg His Glu Gly Leu
 210 215 220

Lys Asn Tyr Tyr Leu Lys Lys Thr Ile Ser Arg Ser Pro Gly Gly Gly
 225 230 235 240

Gly Ser Gly Gly Gly Gly Ser Xaa Val Xaa Leu Xaa Glu Ser Gly Gly
 245 250 255

Gly Leu Val Gln Xaa Gly Gly Ser Leu Arg Leu Ser Cys Xaa Xaa Ser
 260 265 270

Gly Gly Thr Val Ser Pro Thr Ala Met Gly Trp Xaa Arg Gln Ala Pro
 275 280 285

Gly Lys Xaa Xaa Glu Xaa Val Xaa His Ile Thr Trp Ser Arg Gly Thr
 290 295 300

Thr Arg Xaa Ala Ser Ser Val Lys Xaa Arg Phe Thr Ile Ser Arg Asp
 305 310 315 320

Xaa Xaa Lys Asn Thr Xaa Tyr Leu Gln Met Asn Ser Leu Xaa Xaa Glu

325

330

335

Asp Thr Ala Val Tyr Tyr Cys Ala Ala Ser Thr Phe Leu Arg Ile Leu

340

345

350

Pro Glu Glu Ser Ala Tyr Thr Tyr Trp Gly Gln Gly Thr Xaa Val Thr

355

360

365

Val Ser Ser

370