

NIAG006PCT.ST25
SEQUENCE LISTING

<110> NOVARTIS A.G.
University of Zurich

<120> Improved NOGO-A binding molecules and pharmaceutical use thereof

<130> NIAG-006-PCT

<150> 61/001,741
<151> 2007-11-02

<150> EP07119847.7
<151> 2007-11-02

<160> 33

<170> PatentIn version 3.3

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245

250

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Phe Asn Glu Lys Arg Val Ala Val Glu Ala Pro Met Arg Glu Glu Tyr
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Ala Asp Phe Lys Pro Phe Glu Arg Val Trp Glu Val Lys Asp Ser Lys
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Lys Thr Ser Asn Pro Phe Leu Val Ala Ala Gln Asp Ser Glu Thr Asp
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 Lys Glu Lys Leu Ser Ala Leu Pro Pro Glu Gly Gly Lys Pro Tyr Leu
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Val Asn Cys Thr Ile Lys Glu Leu Arg Arg Leu Phe Leu Val Asp
1100 1105 1110

Asp Leu Val Asp Ser Leu Lys Phe Ala Val Leu Met Trp Val Phe
1115 1120 1125

Thr Tyr Val Gly Ala Leu Phe Asn Gly Leu Thr Leu Leu Ile Leu
1130 1135 1140

Ala Leu Ile Ser Leu Phe Ser Val Pro Val Ile Tyr Glu Arg His
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Gln Ala Gln Ile Asp His Tyr Leu Gly Leu Ala Asn Lys Asn Val
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Arg Lys Ala Glu
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35 40 45

Ser Leu Pro Ser Leu Ser Pro Leu Ser Ala Ala Ser Phe Lys Glu His
50 55 60

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

Gln Glu Asn Val Ser₈₅ Glu Ala Ser Lys₉₀ Glu Val Ser Glu Lys Ala₉₅ Lys

Thr Leu Leu Ile₁₀₀ Asp Arg Asp Leu Thr₁₀₅ Glu Phe Ser Glu Leu₁₁₀ Glu Tyr

Ser Glu Met₁₁₅ Gly Ser Ser Phe Ser₁₂₀ Val Ser Pro Lys Ala₁₂₅ Glu Ser Ala

Val Ile₁₃₀ Val Ala Asn Pro Arg₁₃₅ Glu Glu Ile Ile Val₁₄₀ Lys Asn Lys Asp

Glu₁₄₅ Glu Glu Lys Leu Val₁₅₀ Ser Asn Asn Ile Leu₁₅₅ His Asn Gln Gln Glu₁₆₀

Leu Pro Thr Ala Leu₁₆₅ Thr Lys Leu Val Lys₁₇₀ Glu Asp Glu Val Val₁₇₅ Ser

Ser Glu Lys Ala₁₈₀ Lys Asp Ser Phe Asn₁₈₅ Glu Lys Arg Val Ala₁₉₀ Val Glu

Ala Pro Met₁₉₅ Arg Glu Glu Tyr Ala₂₀₀ Asp Phe Lys Pro Phe₂₀₅ Glu Arg Val

Trp Glu₂₁₀ Val Lys Asp Ser Lys₂₁₅ Glu Asp Ser Asp Met₂₂₀ Leu Ala Ala Gly

Gly₂₂₅ Lys Ile Glu Ser Asn₂₃₀ Leu Glu Ser Lys Val₂₃₅ Asp Lys Lys Cys Phe₂₄₀

Ala Asp Ser Leu Glu₂₄₅ Gln Thr Asn His Glu₂₅₀ Lys Asp Ser Glu Ser₂₅₅ Ser

Asn Asp Asp Thr₂₆₀ Ser Phe Pro Ser Thr₂₆₅ Pro Glu Gly Ile Lys₂₇₀ Asp Arg

Ser Gly Ala₂₇₅ Tyr Ile Thr Cys Ala₂₈₀ Pro Phe Asn Pro Ala₂₈₅ Ala Thr Glu

Ser Ile₂₉₀ Ala Thr Asn Ile Phe₂₉₅ Pro Leu Leu Gly Asp₃₀₀ Pro Thr Ser Glu

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Thr Glu Lys Asn Thr₃₂₅ Ser Thr Lys Thr Ser₃₃₀ Asn Pro Phe Leu Val₃₃₅ Ala

Ala Gln Asp Ser₃₄₀ Glu Thr Asp Tyr Val₃₄₅ Thr Thr Asp Asn Leu Thr Lys

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355

360

365

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Lys Ile Ala Tyr Glu Thr Lys Met Asp Leu Val Gln Thr Ser Glu Val
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405 410 415

Glu Ser Glu Ala Thr Pro Ser Pro Val Leu Pro Asp Ile Val Met Glu
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Pro Ser Ser Ser Pro Leu Glu Ala Ser Ser Val Asn Tyr Glu Ser Ile
450 455 460

Lys His Glu Pro Glu Asn Pro Pro Pro Tyr Glu Glu Ala Met Ser Val
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Ser Leu Lys Lys Val Ser Gly Ile Lys Glu Glu Ile Lys Glu Pro Glu
485 490 495

Asn Ile Asn Ala Ala Leu Gln Glu Thr Glu Ala Pro Tyr Ile Ser Ile
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Ala Cys Asp Leu Ile Lys Glu Thr Lys Leu Ser Ala Glu Pro Ala Pro
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Asp Leu Phe Ser Asp Asp Ser Ile Pro Asp Val Pro Gln Lys Gln Asp
565 570 575

Glu Thr Val Met Leu Val Lys Glu Ser Leu Thr Glu Thr Ser Phe Glu
580 585 590

Ser Met Ile Glu Tyr Glu Asn Lys Glu Lys Leu Ser Ala Leu Pro Pro
595 600 605

Glu Gly Gly Lys Pro Tyr Leu Glu Ser Phe Lys Leu Ser Leu Asp Asn
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Thr Lys Asp Thr Leu Leu Pro Asp Glu Val Ser Thr Leu Ser Lys Lys
625 630 635 640

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Glu Lys Ile Pro Leu₆₄₅ Gln Met Glu Glu Leu₆₅₀ Ser Thr Ala Val Tyr Ser
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 Thr Phe Ser₆₇₅ Asp Ser Ser Pro Ile₆₈₀ Glu Ile Ile Asp Glu₆₈₅ Phe Pro Thr
 Leu Ile₆₉₀ Ser Ser Lys Thr Asp₆₉₅ Ser Phe Ser Lys Leu₇₀₀ Ala Arg Glu Tyr
 Thr Asp Leu Glu Val Ser₇₁₀ His Lys Ser Glu Ile₇₁₅ Ala Asn Ala Pro Asp₇₂₀
 Gly Ala Gly Ser Leu₇₂₅ Pro Cys Thr Glu Leu₇₃₀ Pro His Asp Leu₇₃₅ Ser Leu
 Lys Asn Ile Gln₇₄₀ Pro Lys Val Glu Glu₇₄₅ Lys Ile Ser Phe Ser₇₅₀ Asp Asp
 Phe Ser Lys₇₅₅ Asn Gly Ser Ala Thr₇₆₀ Ser Lys Val Leu₇₆₅ Leu Leu Pro Pro
 Asp Val₇₇₀ Ser Ala Leu Ala Thr₇₇₅ Gln Ala Glu Ile Glu₇₈₀ Ser Ile Val Lys
 Pro Lys Val Leu Val Lys₇₉₀ Glu Ala Glu Lys Lys₇₉₅ Leu Pro Ser Asp Thr₈₀₀
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 Lys Thr Ser

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 Pro Gly Gly₃₅ Ser Leu Arg Leu Ser₄₀ Cys Ala Ala Ser Gly₄₅ Phe Thr Phe

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Ser Asn Tyr Trp Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu
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Glu Trp Val Ala Thr Ile Lys Gln Asp Gly Ser Gln Lys Asn Tyr Val
65 70 75 80

Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ala Lys Asn
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Ser Leu Tyr Leu Arg Leu Asn Ser Leu Arg Ala Glu Asp Thr Ala Val
100 105 110

Tyr Tyr Cys Ala Thr Glu Leu Phe Asp Leu Trp Gly Arg Gly Ser Leu
115 120 125

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

Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys
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Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser
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Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser
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Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser
195 200 205

Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn
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Thr Cys Pro Pro Cys Pro
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Ala Ser Gln Ser Val Ser Ser Tyr Leu Ala Trp Tyr Gln Gln Lys Pro
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Cys Asp Arg Leu Gly Gln Ala Pro Arg Leu Leu Ile Tyr Asp Ala Ser
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Asn Arg Ala Thr Gly Ile Pro Ala Arg Phe Ser Gly Ser Gly Ser Gly
85 90 95

Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Glu Pro Cys Asp Arg Leu
100 105 110

Glu Asp Phe Ala Val Tyr Tyr Cys Gln Gln Arg Ser Asn Trp Pro Ile
115 120 125

Thr Phe Gly Gln Gly Thr Arg Leu Glu Ile Lys Arg Thr Val Ala Ala
130 135 140

Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu Gln Leu Lys Ser Gly
145 150 155 160

Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe Tyr Pro Arg Glu Ala
165 170 175

Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln Ser Gly Asn Ser Gln
180 185 190

Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser Thr Tyr Ser Leu Ser
195 200 205

Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu Lys His Lys Val Tyr
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gactctgtga agggccgatt caccatctcc agagacaacg ccaagaactc actgtatctg 300

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ctgagcaaag cagactacga gaaacacaaa gtctacgcct gcgaagtcac ccatcagggc 660
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Gly

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21

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35 40 45

Ser Asn Tyr Trp Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu
50 55 60

Glu Trp Val Ala Thr Ile Lys Gln Asp Gly Ser Gln Lys Asn Tyr Val
65 70 75 80

Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ala Lys Asn
85 90 95

Ser Leu Tyr Leu Arg Leu Asn Ser Leu Arg Ala Glu Asp Thr Ala Val
100 105 110

Tyr Tyr Cys Ala Thr Glu Leu Phe Asp Leu Trp Gly Arg Gly Ser Leu
115 120 125

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

Ala Pro Cys Ser Arg Ser Thr Ser Glu Ser Thr Ala Ala Leu Gly Cys
145 150 155 160

Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser
165 170 175

Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser
180 185 190

Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser
195 200 205

Leu Gly Thr Lys Thr Tyr Thr Cys Asn Val Asp His Lys Pro Ser Asn
210 215 220

Thr Lys Val Asp Lys Arg Val Glu Ser Lys Tyr Gly Pro Pro Cys Pro
225 230 235 240

Ser Cys Pro Ala Pro Glu Phe Leu Gly Gly Pro Ser Val Phe Leu Phe
245 250 255

Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val
260 265 270

Thr Cys Val Val Val Asp Val Ser Gln Glu Asp Pro Glu Val Gln Phe
275 280 285

Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro
290 295 300

Arg Glu Glu Gln Phe Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr
305 310 315 320

Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val
325 330 335

Ser Asn Lys Gly Leu Pro Ser Ser Ile Glu Lys Thr Ile Ser Lys Ala
340 345 350

Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Gln
355 360 365

Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly
370 375 380

Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro
385 390 395 400

Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser
405 410 415

Phe Phe Leu Tyr Ser Arg Leu Thr Val Asp Lys Ser Arg Trp Gln Glu
420 425 430

Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn His
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Leu Ser Pro Gly Glu Arg Ala Thr Leu Ser Cys Arg Ala Ser Gln Ser
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Val Ser Ser Tyr Leu Ala Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro
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Arg Leu Leu Ile Tyr Asp Ala Ser Asn Arg Ala Thr Gly Ile Pro Ala
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Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser
 85          90          95

Ser Leu Glu Pro Glu Asp Phe Ala Val Tyr Tyr Cys Gln Gln Arg Ser
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Asn Trp Pro Ile Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys Arg
115          120          125

Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu Gln
130          135          140

Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe Tyr
145          150          155          160

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

Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser Thr
180          185          190

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

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Tyr Asp Ala Ser Asn Arg Ala Thr Gly Ile Pro Ala Arg Phe Ser Gly
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agt ggg tct ggg aca gac ttc act ctc acc atc agc agc cta gag cct 240
Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Glu Pro
65 70 75 80

gaa gat ttt gca gtt tat tac tgt cag cag cgt agc aac tgg ccg atc 288
Glu Asp Phe Ala Val Tyr Tyr Cys Gln Gln Arg Ser Asn Trp Pro Ile
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<211> 107

<212> PRT

<213> Mus musculus

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Leu Ala Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Arg Leu Leu Ile
35 40 45

Tyr Asp Ala Ser Asn Arg Ala Thr Gly Ile Pro Ala Arg Phe Ser Gly
50 55 60

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Glu Pro
65 70 75 80

Glu Asp Phe Ala Val Tyr Tyr Cys Gln Gln Arg Ser Asn Trp Pro Ile
85 90 95

Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys
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 Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Asn Tyr
 20 25 30
 tgg atg agc tgg gtc cgc cag gct ccg ggg aaa ggg ctg gag tgg gtg 144
 Trp Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
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 gcc acc ata aag caa gat gga agt cag aaa aac tat gtg gac tct gtg 192
 Ala Thr Ile Lys Gln Asp Gly Ser Gln Lys Asn Tyr Val Asp Ser Val
 50 55 60
 aag ggc cga ttc acc atc tcc aga gac aac gcc aag aac tca ctg tat 240
 Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ala Lys Asn Ser Leu Tyr
 65 70 75 80
 ctg cga ttg aac agc ctg aga gcc gag gac acg gct gtg tat tac tgt 288
 Leu Arg Leu Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys
 85 90 95
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 Ser Ser

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 35 40 45
 Ala Thr Ile Lys Gln Asp Gly Ser Gln Lys Asn Tyr Val Asp Ser Val
 50 55 60

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Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ala Lys Asn Ser Leu Tyr
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Ser Ser

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