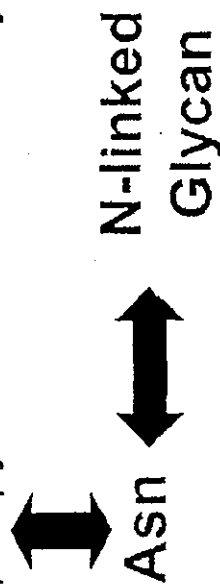


1/10

GH-N (pituitary)

fpti plsrldnam lrahrhqla fdtyqefeea yipkeqkysf lqnpqtslcf sesiptpsnr
eetqqksnle lrisllliq swlepvaqlr svfanslvvg asdsnvdydl kdleegiql mgrledgspr
tgqifkqtys kfdtnshndd allknygily cfrkmdkve tflrivqcrs vegscgf



GH-V (placenta)

fpti plsrldnam lrarrlyqla ydtyqefeea yilkeqkysf lqnpqtslcf sesiptpsnr
vktqqksnle lrisllliq swlepvaqlr svfanslvvg asdsnvyrhl kdleegiql mvrledgspr
tgqifnqsyys kfdtkshndd allknygily cfrkmdkve tflrivqcrs vegscgf



Fig. 1

2/10

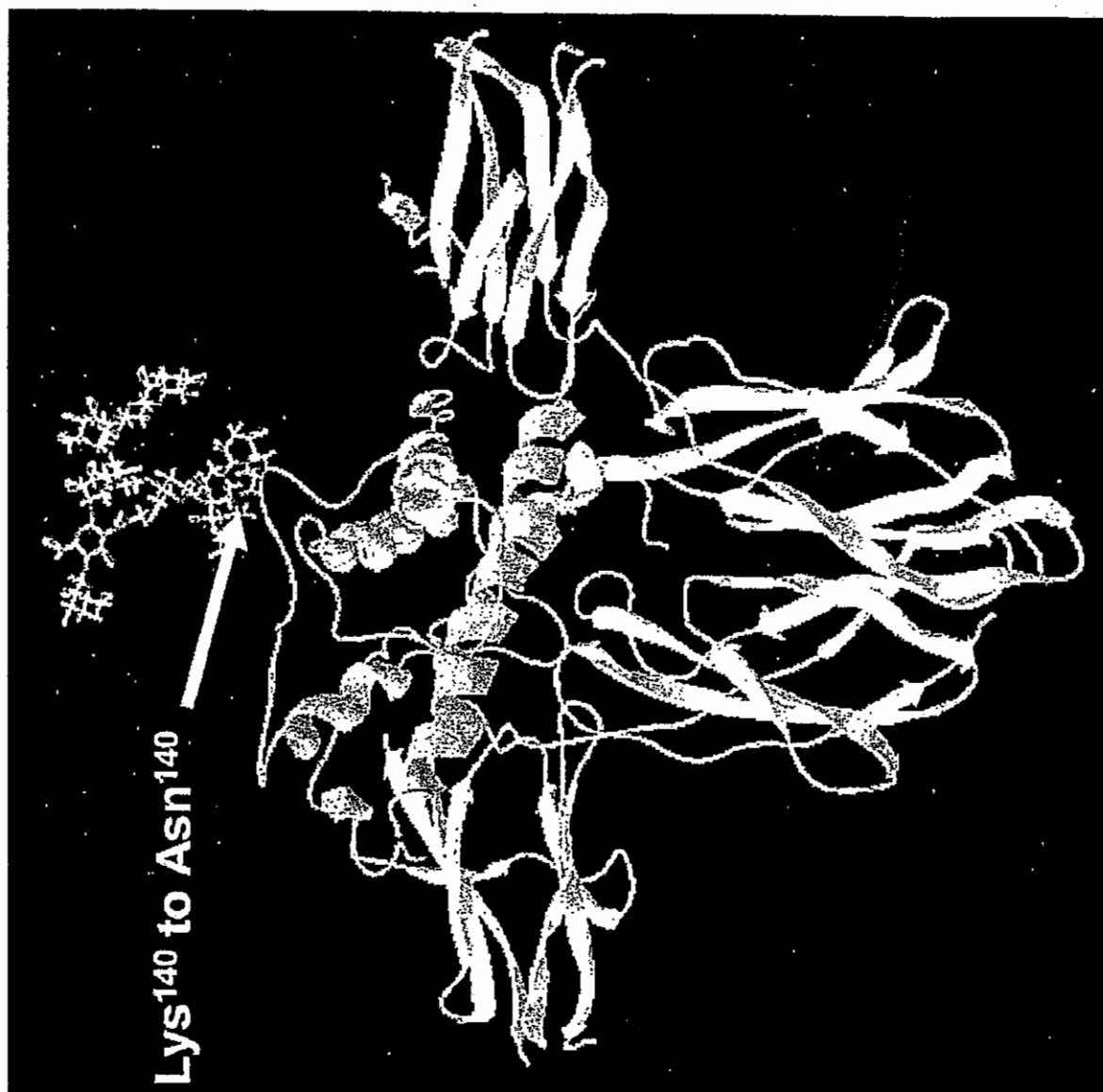


Fig. 2

3/10

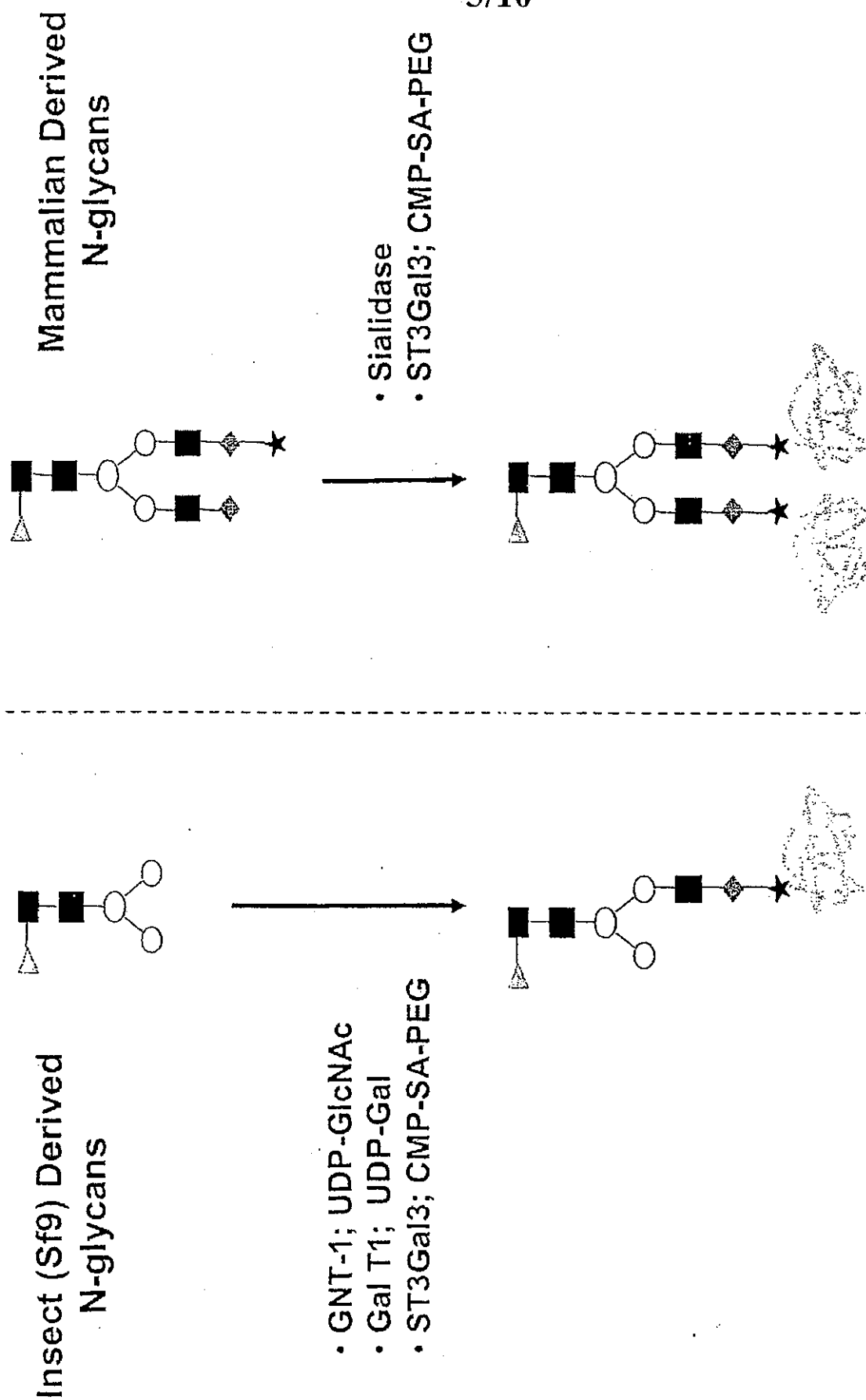


Fig. 3

4/10

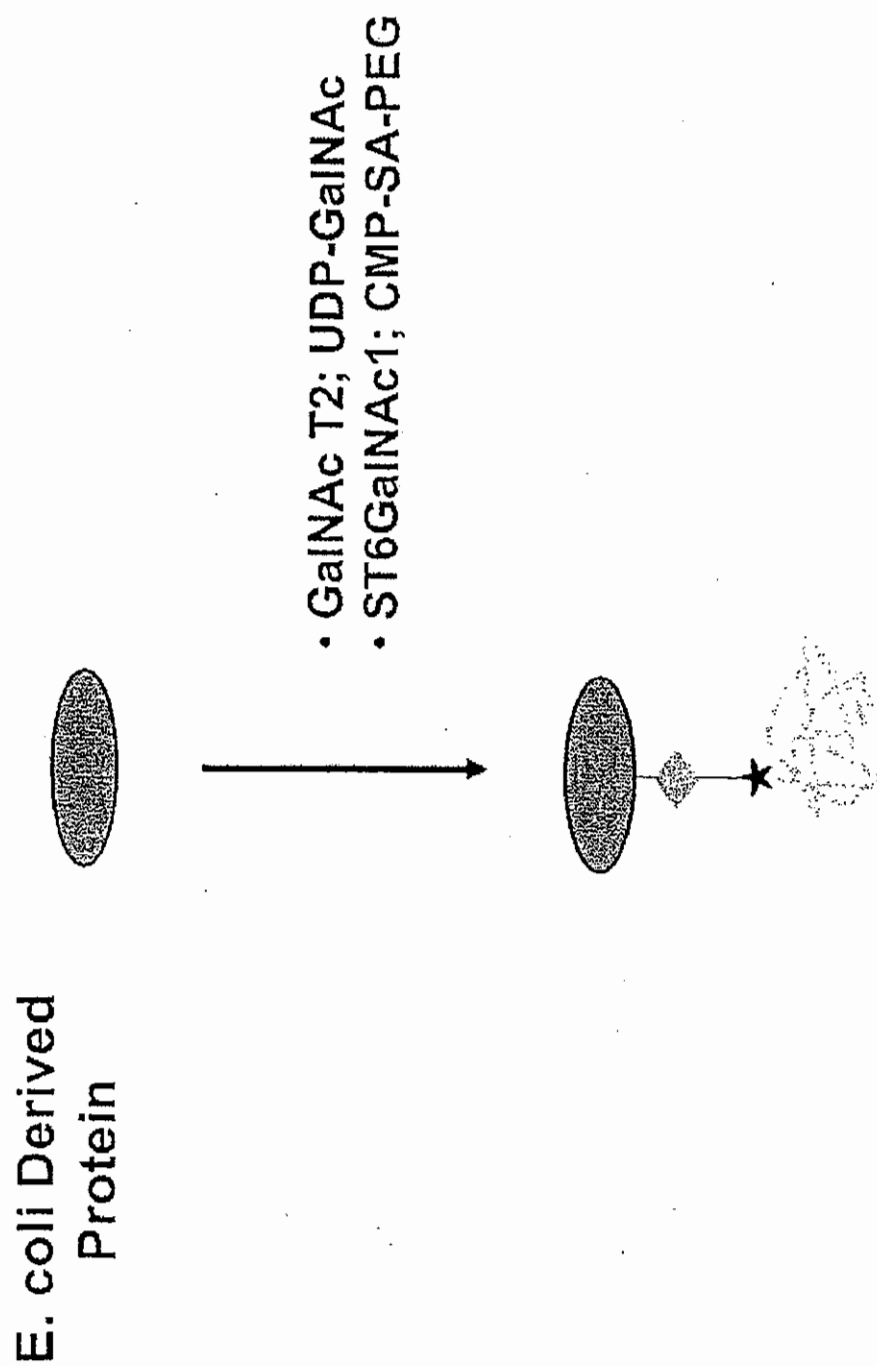


Fig. 4

5/10

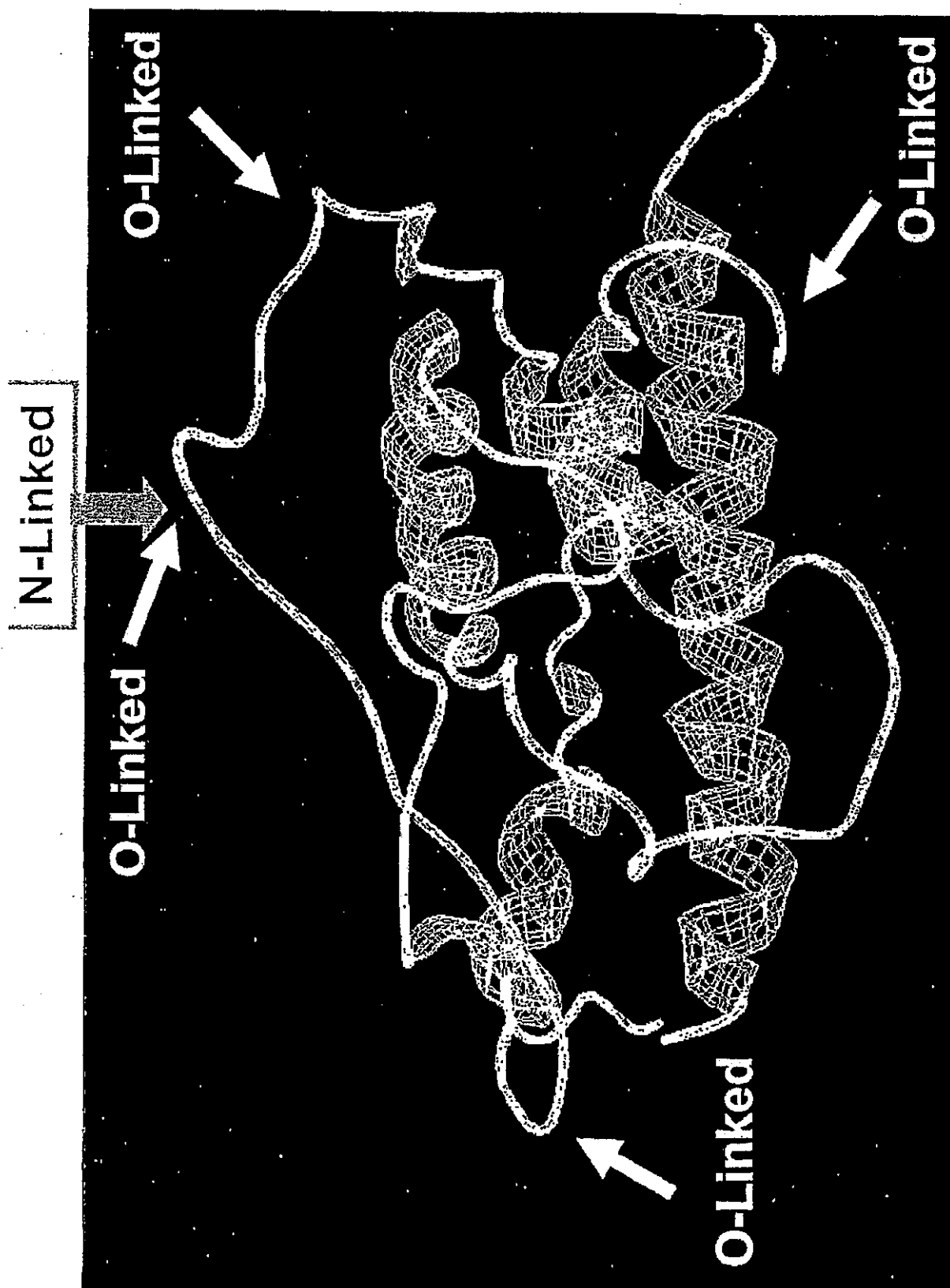


Fig. 5

GH-N (O-Glycosylation)

ptt f ptt p lsrldnam lrahrhqla fdtyqefeea yipkeqkysf lqn ptt ptt lcf sesi ptp ttt

eeetqqksnle llrisllliq swlepvaqlr svfanslvvg asdsnvdydll kdleegiql mgrledgs

pttt qifk ttts kfdtnshnodd allknygllly cfrkdmkve tflrivqrs vegscgf

6/10

GH-N (pituitary)

fpti plsrldnam lrahrllhqla fdtyqefeea yipkeqkysf lqnpqtslcf sesiptpsnr
eetqqksnle llrisllliq swlepvpqlr svfanslvvg asdsnvvdll kdleegiati mgrledgspr
tqgirkqtys kfdtnshnndd allknygllly cfrkmdkve tflrivqcrs vegscgf

eetqqksnle llrisllliq swlepvaqlr svfanslvvg asdsnvvdll kdleegiati mgrledgspr
tqgirkatys kfdtnshnodd allknygllly cfrkmdkve tflrivqcrs vegscgf

tgqifkatys kfdtshndd allknygll cfrkmdkve tflrivqcrs vegscgf

7/10

hGH O-linked 134	(1)	---FPTIPLSR ⁵⁰ LDNAMLRAHRLHQLAFD ⁵⁰ TYQEFEEAYIPKEQKYSFLQN	50
hGH O-linked 5'	(1)	PTT ⁵⁰ FPTIPLSR ⁵⁰ LDNAMLRAHRLHQLAFD ⁵⁰ TYQEFEEAYIPKEQKYSFLQN	50
hGH-N1 mature	(1)	---FPTIPLSR ⁵⁰ LDNAMLRAHRLHQLAFD ⁵⁰ TYQEFEEAYIPKEQKYSFLQN	50
Consensus	(1)	FPTIPLSR ⁵⁰ LDNAMLRAHRLHQLAFD ⁵⁰ TYQEFEEAYIPKEQKYSFLQN	50
		51	100
hGH O-linked 134	(48)	PQTS ⁵¹ LCFSESIP ⁵¹ TPSNREETOQKSNLELLRISLLLIQSWLEPVQFLRSVF	51
hGH O-linked 5'	(51)	PQTS ⁵¹ LCFSESIP ⁵¹ TPSNREETOQKSNLELLRISLLLIQSWLEPVQFLRSVF	51
hGH-N1 mature	(48)	PQTS ⁵¹ LCFSESIP ⁵¹ TPSNREETOQKSNLELLRISLLLIQSWLEPVQFLRSVF	51
Consensus	(51)	PQTS ⁵¹ LCFSESIP ⁵¹ TPSNREETOQKSNLELLRISLLLIQSWLEPVQFLRSVF	51
		101	150
hGH O-linked 134	(98)	ANSLVYGASDSNVYDLLKDL ¹⁰¹ EEGIQ ¹⁰¹ TLMGRL ¹⁰¹ EDGSP ¹⁰¹ TTT ¹⁰¹ QIFKQ ¹⁰¹ YSKFD	101
hGH O-linked 5'	(101)	ANSLVYGASDSNVYDLLKDL ¹⁰¹ EEGIQ ¹⁰¹ TLMGRL ¹⁰¹ EDGSP ¹⁰¹ RTGQIFKQ ¹⁰¹ YSKFD	101
hGH-N1 mature	(98)	ANSLVYGASDSNVYDLLKDL ¹⁰¹ EEGIQ ¹⁰¹ TLMGRL ¹⁰¹ EDGSP ¹⁰¹ RTGQIFKQ ¹⁰¹ YSKFD	101
Consensus	(101)	ANSLVYGASDSNVYDLLKDL ¹⁰¹ EEGIQ ¹⁰¹ TLMGRL ¹⁰¹ EDGSP ¹⁰¹ RTGQIFKQ ¹⁰¹ YSKFD	101
		151	194
hGH O-linked 134	(148)	TNSHND ¹⁵¹ DALLKNYGLLYC ¹⁵¹ FRKMD ¹⁵¹ KVETFLRIVQCRSVEGSCGF	151
hGH O-linked 5'	(151)	TNSHND ¹⁵¹ DALLKNYGLLYC ¹⁵¹ FRKMD ¹⁵¹ KVETFLRIVQCRSVEGSCGF	151
hGH-N1 mature	(148)	TNSHND ¹⁵¹ DALLKNYGLLYC ¹⁵¹ FRKMD ¹⁵¹ KVETFLRIVQCRSVEGSCGF	151
Consensus	(151)	TNSHND ¹⁵¹ DALLKNYGLLYC ¹⁵¹ FRKMD ¹⁵¹ KVETFLRIVQCRSVEGSCGF	151

Fig. 7

8/10

hGH O-linked 134 (1) ---FPTIPLSRFDNAMLRAHRLHQLAFDTYQEFEAEAYIPKEQKYSFLQN 50
 hGH O-linked 5' (1) -MVTPTIPLSRFDNAMLRAHRLHQLAFDTYQEFEAEAYIPKEQKYSFLQN
 hGH-N1 mature (1) ---FPTIPLSRFDNAMLRAHRLHQLAFDTYQEFEAEAYIPKEQKYSFLQN
 Consensus (1) FPTIPLSRFDNAMLRAHRLHQLAFDTYQEFEAEAYIPKEQKYSFLQN
 51. 100
 hGH O-linked 134 (48) PQTSLCFSESIPTPSNREETQQKSNNLELLRISLLLIQSWLEPVQFLRSVF
 hGH O-linked 5' (51) PQTSLCFSESIPTPSNREETQQKSNNLELLRISLLLIQSWLEPVQFLRSVF
 hGH-N1 mature (48) PQTSLCFSESIPTPSNREETQQKSNNLELLRISLLLIQSWLEPVQFLRSVF
 Consensus (51) PQTSLCFSESIPTPSNREETQQKSNNLELLRISLLLIQSWLEPVQFLRSVF
 101 150
 hGH O-linked 134 (98) ANSLVYGASDSNVYDLLKDLFEGIQTLMGRLDGSPTTGQIFKQYTSKFD
 hGH O-linked 5' (101) ANSLVYGASDSNVYDLLKDLFEGIQTLMGRLDGSPTTGQIFKQYTSKFD
 hGH-N1 mature (98) ANSLVYGASDSNVYDLLKDLFEGIQTLMGRLDGSPTTGQIFKQYTSKFD
 Consensus (101) ANSLVYGASDSNVYDLLKDLFEGIQTLMGRLDGSPTTGQIFKQYTSKFD
 151 194
 hGH O-linked 134 (148) TNSHNDALLKNYGLLYCFRKDMDKVETFLRIVQCRSVEGSCGF
 hGH O-linked 5' (151) TNSHNDALLKNYGLLYCFRKDMDKVETFLRIVQCRSVEGSCGF
 hGH-N1 mature (148) TNSHNDALLKNYGLLYCFRKDMDKVETFLRIVQCRSVEGSCGF
 Consensus (151) TNSHNDALLKNYGLLYCFRKDMDKVETFLRIVQCRSVEGSCGF

Fig. 8

9/10

FPTIPLSRLFDNAMLRAHRLHQLAFDITYQEFEEAYIPKEQKYSFLQNPQTSLCFSE
SIPTPSNREETQQKSNLELLRISLLLIQSWLEPVQFLRSVFANSLVYGASDSNVYDL
LKDLEEGIQTLMGRLEDGSPRTGQIFKQTYSKFDTNSHNDDALLKNYGLLYCFRK
DMDKVETFLRIVQCRSVEGSCGF

FIG. 9A

FPTIPLSRLFDNAMLRARRLYQLAYDITYQEFEEAYILKEQKYSFLQNPQTSLCFSE
SIPTPSNRVKTQQKSNLELLRISLLLIQSWLEPVQLLRSVFANSLVYGASDSNVYR
HLKDLEEGIQTLMWRLLEDGSPRTGQIFNQSYSKFDTKSHNDDALLKNYGLLYCF
RKDMDKVETFLRIVQCRSVEGSCGF

FIG. 9B

FPTIPLSRLFDNAMLRAHRLHQLAFDITYQEFEEAYIPKEQKYSFLQNPQTSLCFSE
SIPTPSNREETQQKSNLELLRISLLLIQSWLEPVQFLRSVFANSLVYGASDSNVYDL
LKDLEEGIQTLMGRLEDGSPRTTQIFKQTYSKFDTNSHNDDALLKNYGLLYCFRK
DMDKVETFLRIVQCRSVEGSCGF

FIG. 9C

PTTFPTIPLSRLFDNAMLRAHRLHQLAFDITYQEFEEAYIPKEQKYSFLQNPQTSLC
FSESIPTPSNREETQQKSNLELLRISLLLIQSWLEPVQFLRSVFANSLVYGASDSNV
YDLLKDLEEGIQTLMGRLEDGSPRTGQIFKQTYSKFDTNSHNDDALLKNYGLLY
CFRKDMDKVETFLRIVQCRSVEGSCGF

FIG. 9D

FPTIPLSRLFDNAMLRAHRLHQLAFDITYQEFEEAYIPKEQKYSFLQNPQTSLCFSE
SIPTPSNREETQQKSNLELLRISLLLIQSWLEPVQFLRSVFANSLVYGASDSNVYDL
LKDLEEGIQTLMGRLEDGSPRTTGQIFKQTYSKFDTNSHNDDALLKNYGLLYCFRK
DMDKVETFLRIVQCRSVEGSCGF

FIG. 9E

10/10

MVTPTIPLSRLFDNAMLRAHRLHQLAFDITYQEFEEAYIPKEQKYSFLQNPQTSLCF
SESIPTPSNREETQQKSNLELLRISLLLIQSWLEPVQFLRSVFANSLVYGASDSNVY
DLLKDLEEGIQTLMGRLEDGSPRTGQIFKQTYSKFDTNSHNDDALLKNYGLLYCF
RKDMDKVETFLRIVQCRSVEGSCGF

FIG. 9F

MVTPTIPLSRLFDNAMLRAHRLHQLAFDITYQEFEEAYIPKEQKYSFLQNPQTSLCF
SESIPTPSNREETQQKSNLELLRISLLLIQSWLEPVQFLRSVFANSLVYGASDSNVY
DLLKDLEEGIQTLMGRLEDGSPRTGQIFKQTYSKFDTNSHNDDALLKNYGLLYCF
RKDMDKVETFLRIVQCRSVEGSCGF

FIG. 9G

MFPTIPLSRLFDNAMLRAHRLHQLAFDITYQEFEEAYIPKEQKYSFLQNPQTSLCFS
ESIPTPSNREETQQKSNLELLRISLLLIQSWLEPVQFLRSVFANSLVYGASDSNVYD
LLKDLEEGIQTLMGRLEDGSPTVGQIFKQTYSKFDTNSHNDDALLKNYGLLYCFR
KDMDKVETFLRIVQCRSVEGSCGF

FIG. 9H

MFPTIPLSRLFDNAMLRAHRLHQLAFDITYQEFEEAYIPKEQKYSFLQNPQTSLCFS
ESIPTPSNREETQQKSNLELLRISLLLIQSWLEPVQFLRSVFANSLVYGASDSNVYD
LLKDLEEGIQTLMGRLEDGSPTTTQIFKQTYSKFDTNSHNDDALLKNYGLLYCFR
KDMDKVETFLRIVQCRSVEGSCGF

FIG. 9I

SEQUENCE LISTING

<110> Neose Technologies, Inc.
DeFrees, Shawn

<120> COMPOSITIONS AND METHODS FOR THE PREPARATION OF HUMAN GROWTH
HORMONE GLYCOSYLATION MUTANTS

<130> 040853-01-5101WO

<150> US 60/469,114

<151> 2003-05-09

<150> US 60/494,751

<151> 2003-08-13

<150> US 60/495,076

<151> 2003-08-14

<150> US 60/535,290

<151> 2004-01-08

<160> 79

<170> PatentIn version 3.2

<210> 1

<211> 191

<212> PRT

<213> Homo sapiens

<220>

<221> MISC_FEATURE

<223> mature human growth hormone (GH-N)

<400> 1

Phe Pro Thr Ile Pro Leu Ser Arg Leu Phe Asp Asn Ala Met Leu Arg
1 5 10 15

Ala His Arg Leu His Gln Leu Ala Phe Asp Thr Tyr Gln Glu Phe Glu
20 25 30

Glu Ala Tyr Ile Pro Lys Glu Gln Lys Tyr Ser Phe Leu Gln Asn Pro
35 40 45

Gln Thr Ser Leu Cys Phe Ser Glu Ser Ile Pro Thr Pro Ser Asn Arg
50 55 60

Glu Glu Thr Gln Gln Lys Ser Asn Leu Glu Leu Leu Arg Ile Ser Leu
65 70 75 80

Leu Leu Ile Gln Ser Trp Leu Glu Pro Val Gln Phe Leu Arg Ser Val
85 90 95

Phe Ala Asn Ser Leu Val Tyr Gly Ala Ser Asp Ser Asn Val Tyr Asp
100 105 110

Leu Leu Lys Asp Leu Glu Glu Gly Ile Gln Thr Leu Met Gly Arg Leu

115	120	125
Glu Asp Gly Ser Pro Arg Thr Gly Gln Ile Phe Lys Gln Thr Tyr Ser		
130	135	140
Lys Phe Asp Thr Asn Ser His Asn Asp Asp Ala Leu Leu Lys Asn Tyr		
145	150	155
Gly Leu Leu Tyr Cys Phe Arg Lys Asp Met Asp Lys Val Glu Thr Phe		
165	170	175
Leu Arg Ile Val Gln Cys Arg Ser Val Glu Gly Ser Cys Gly Phe		
180	185	190

<210> 2
 <211> 191
 <212> PRT
 <213> Homo sapiens
 <220>
 <221> MISC_FEATURE
 <223> mature human growth hormone (GH-V)
 <400> 2

Phe Pro Thr Ile Pro Leu Ser Arg Leu Phe Asp Asn Ala Met Leu Arg		
1	5	10
Ala Arg Arg Leu Tyr Gln Leu Ala Tyr Asp Thr Tyr Gln Glu Phe Glu		
20	25	30
Glu Ala Tyr Ile Leu Lys Glu Gln Lys Tyr Ser Phe Leu Gln Asn Pro		
35	40	45
Gln Thr Ser Leu Cys Phe Ser Glu Ser Ile Pro Thr Pro Ser Asn Arg		
50	55	60
Val Lys Thr Gln Gln Lys Ser Asn Leu Glu Leu Leu Arg Ile Ser Leu		
65	70	75
Leu Leu Ile Gln Ser Trp Leu Glu Pro Val Gln Leu Leu Arg Ser Val		
85	90	95
Phe Ala Asn Ser Leu Val Tyr Gly Ala Ser Asp Ser Asn Val Tyr Arg		
100	105	110
His Leu Lys Asp Leu Glu Glu Gly Ile Gln Thr Leu Met Trp Arg Leu		
115	120	125
Glu Asp Gly Ser Pro Arg Thr Gly Gln Ile Phe Asn Gln Ser Tyr Ser		
130	135	140
Lys Phe Asp Thr Lys Ser His Asn Asp Asp Ala Leu Leu Lys Asn Tyr		
145	150	155
Gly Leu Leu Tyr Cys Phe Arg Lys Asp Met Asp Lys Val Glu Thr Phe		
165	170	175
Leu Arg Ile Val Gln Cys Arg Ser Val Glu Gly Ser Cys Gly Phe		

180 185 190

<210> 3
 <211> 191
 <212> PRT
 <213> Homo sapiens
 <220>
 <221> MISC_FEATURE
 <223> human growth hormone mutant 1
 <400> 3

Phe Pro Thr Ile Pro Leu Ser Arg Leu Phe Asp Asn Ala Met Leu Arg
 1 5 10 15

Ala His Arg Leu His Gln Leu Ala Phe Asp Thr Tyr Gln Glu Phe Glu
 20 25 30

Glu Ala Tyr Ile Pro Lys Glu Gln Lys Tyr Ser Phe Leu Gln Asn Pro
 35 40 45

Gln Thr Ser Leu Cys Phe Ser Glu Ser Ile Pro Thr Pro Ser Asn Arg
 50 55 60

Glu Glu Thr Gln Gln Lys Ser Asn Leu Glu Leu Leu Arg Ile Ser Leu
 65 70 75 80

Leu Leu Ile Gln Ser Trp Leu Glu Pro Val Gln Phe Leu Arg Ser Val
 85 90 95

Phe Ala Asn Ser Leu Val Tyr Gly Ala Ser Asp Ser Asn Val Tyr Asp
 100 105 110

Leu Leu Lys Asp Leu Glu Glu Gly Ile Gln Thr Leu Met Gly Arg Leu
 115 120 125

Glu Asp Gly Ser Pro Thr Thr Thr Gln Ile Phe Lys Gln Thr Tyr Ser
 130 135 140

Lys Phe Asp Thr Asn Ser His Asn Asp Asp Ala Leu Leu Lys Asn Tyr
 145 150 155 160

Gly Leu Leu Tyr Cys Phe Arg Lys Asp Met Asp Lys Val Glu Thr Phe
 165 170 ; 175

Leu Arg Ile Val Gln Cys Arg Ser Val Glu Gly Ser Cys Gly Phe
 180 185 190

<210> 4
 <211> 194
 <212> PRT
 <213> Homo sapiens
 <220>
 <221> MISC_FEATURE
 <223> human growth hormone mutant 2 (O-linked N-terminus)
 <400> 4

Pro Thr Thr Phe Pro Thr Ile Pro Leu Ser Arg Leu Phe Asp Asn Ala

1 5 10 15
 Met Leu Arg Ala His Arg Leu His Gln Leu Ala Phe Asp Thr Tyr Gln
 20 25 30
 Glu Phe Glu Glu Ala Tyr Ile Pro Lys Glu Gln Lys Tyr Ser Phe Leu
 35 40 45
 Gln Asn Pro Gln Thr Ser Leu Cys Phe Ser Glu Ser Ile Pro Thr Pro
 50 55 60
 Ser Asn Arg Glu Glu Thr Gln Gln Lys Ser Asn Leu Glu Leu Leu Arg
 65 70 75 80
 Ile Ser Leu Leu Leu Ile Gln Ser Trp Leu Glu Pro Val Gln Phe Leu
 85 90 95
 Arg Ser Val Phe Ala Asn Ser Leu Val Tyr Gly Ala Ser Asp Ser Asn
 100 105 110
 Val Tyr Asp Leu Leu Lys Asp Leu Glu Glu Gly Ile Gln Thr Leu Met
 115 120 125
 Gly Arg Leu Glu Asp Gly Ser Pro Arg Thr Gly Gln Ile Phe Lys Gln
 130 135 140
 Thr Tyr Ser Lys Phe Asp Thr Asn Ser His Asn Asp Asp Ala Leu Leu
 145 150 155 160
 Lys Asn Tyr Gly Leu Leu Tyr Cys Phe Arg Lys Asp Met Asp Lys Val
 165 170 175
 Glu Thr Phe Leu Arg Ile Val Gln Cys Arg Ser Val Glu Gly Ser Cys
 180 185 190

Gly Phe

<210> 5
 <211> 191
 <212> PRT
 <213> Homo sapiens
 <220>
 <221> MISC_FEATURE
 <223> human growth hormone mutant 3
 <400> 5

Phe Pro Thr Ile Pro Leu Ser Arg Leu Phe Asp Asn Ala Met Leu Arg
 1 5 10 15
 Ala His Arg Leu His Gln Leu Ala Phe Asp Thr Tyr Gln Glu Phe Glu
 20 25 30
 Glu Ala Tyr Ile Pro Lys Glu Gln Lys Tyr Ser Phe Leu Gln Asn Pro
 35 40 45
 Gln Thr Ser Leu Cys Phe Ser Glu Ser Ile Pro Thr Pro Ser Asn Arg

50 55 60
 Glu Glu Thr Gln Gln Lys Ser Asn Leu Glu Leu Leu Arg Ile Ser Leu
 65 70 75 80
 Leu Leu Ile Gln Ser Trp Leu Glu Pro Val Gln Phe Leu Arg Ser Val
 85 90 95
 Phe Ala Asn Ser Leu Val Tyr Gly Ala Ser Asp Ser Asn Val Tyr Asp
 100 105 110
 Leu Leu Lys Asp Leu Glu Glu Gly Ile Gln Thr Leu Met Gly Arg Leu
 115 120 125
 Glu Asp Gly Ser Pro Thr Thr Gly Gln Ile Phe Lys Gln Thr Tyr Ser
 130 135 140
 Lys Phe Asp Thr Asn Ser His Asn Asp Asp Ala Leu Leu Lys Asn Tyr
 145 150 155 160
 Gly Leu Leu Tyr Cys Phe Arg Lys Asp Met Asp Lys Val Glu Thr Phe
 165 170 175
 Leu Arg Ile Val Gln Cys Arg Ser Val Glu Gly Ser Cys Gly Phe
 180 185 190

<210> 6
 <211> 193
 <212> PRT
 <213> Homo sapiens
 <220>
 <221> MISC_FEATURE
 <223> human growth hormone mutant 4 (O-linked N-terminus)
 <400> 6

Met Val Thr Pro Thr Ile Pro Leu Ser Arg Leu Phe Asp Asn Ala Met
 1 5 10 15
 Leu Arg Ala His Arg Leu His Gln Leu Ala Phe Asp Thr Tyr Gln Glu
 20 25 30
 Phe Glu Glu Ala Tyr Ile Pro Lys Glu Gln Lys Tyr Ser Phe Leu Gln
 35 40 45
 Asn Pro Gln Thr Ser Leu Cys Phe Ser Glu Ser Ile Pro Thr Pro Ser
 50 55 60
 Asn Arg Glu Glu Thr Gln Gln Lys Ser Asn Leu Glu Leu Leu Arg Ile
 65 70 75 80
 Ser Leu Leu Leu Ile Gln Ser Trp Leu Glu Pro Val Gln Phe Leu Arg
 85 90 95
 Ser Val Phe Ala Asn Ser Leu Val Tyr Gly Ala Ser Asp Ser Asn Val
 100 105 110
 Tyr Asp Leu Leu Lys Asp Leu Glu Glu Gly Ile Gln Thr Leu Met Gly

115	120	125															
Arg	Leu	Glu	Asp	Gly	Ser	Pro	Arg	Thr	Gly	Gln	Ile	Phe	Lys	Gln	Thr		
130						135					140						
Tyr	Ser	Lys	Phe	Asp	Thr	Asn	Ser	His	Asn	Asp	Asp	Ala	Leu	Leu	Lys		
145					150					155					160		
Asn	Tyr	Gly	Leu	Leu	Tyr	Cys	Phe	Arg	Lys	Asp	Met	Asp	Lys	Val	Glu		
				165					170					175			
Thr	Phe	Leu	Arg	Ile	Val	Gln	Cys	Arg	Ser	Val	Glu	Gly	Ser	Cys	Gly		
			180					185					190				

Phe

<210> 7
 <211> 193
 <212> PRT
 <213> Homo sapiens
 <220>
 <221> MISC_FEATURE
 <223> human growth hormone mutant 5
 <400> 7

Met	Val	Thr	Pro	Thr	Ile	Pro	Leu	Ser	Arg	Leu	Phe	Asp	Asn	Ala	Met		
1				5					10					15			
Leu	Arg	Ala	His	Arg	Leu	His	Gln	Leu	Ala	Phe	Asp	Thr	Tyr	Gln	Glu		
			20					25					30				
Phe	Glu	Glu	Ala	Tyr	Ile	Pro	Lys	Glu	Gln	Lys	Tyr	Ser	Phe	Leu	Gln		
			35				40					45					
Asn	Pro	Gln	Thr	Ser	Leu	Cys	Phe	Ser	Glu	Ser	Ile	Pro	Thr	Pro	Ser		
			50			55					60						
Asn	Arg	Glu	Glu	Thr	Gln	Gln	Lys	Ser	Asn	Leu	Glu	Leu	Leu	Arg	Ile		
65					70					75					80		
Ser	Leu	Leu	Leu	Ile	Gln	Ser	Trp	Leu	Glu	Pro	Val	Gln	Phe	Leu	Arg		
				85					90					95			
Ser	Val	Phe	Ala	Asn	Ser	Leu	Val	Tyr	Gly	Ala	Ser	Asp	Ser	Asn	Val		
			100					105					110				
Tyr	Asp	Leu	Leu	Lys	Asp	Leu	Glu	Glu	Gly	Ile	Gln	Thr	Leu	Met	Gly		
			115				120					125					
Arg	Leu	Glu	Asp	Gly	Ser	Pro	Arg	Thr	Gly	Gln	Ile	Phe	Lys	Gln	Thr		
			130			135						140					
Tyr	Ser	Lys	Phe	Asp	Thr	Asn	Ser	His	Asn	Asp	Asp	Ala	Leu	Leu	Lys		
145					150					155					160		
Asn	Tyr	Gly	Leu	Leu	Tyr	Cys	Phe	Arg	Lys	Asp	Met	Asp	Lys	Val	Glu		

165

170

175

Thr Phe Leu Arg Ile Val Gln Cys Arg Ser Val Glu Gly Ser Cys Gly
 180 185 190

Phe

<210> 8
 <211> 192
 <212> PRT
 <213> Homo sapiens
 <220>
 <221> MISC_FEATURE
 <223> human growth hormone mutant 6
 <400> 8

Met Phe Pro Thr Ile Pro Leu Ser Arg Leu Phe Asp Asn Ala Met Leu
 1 5 10 15

Arg Ala His Arg Leu His Gln Leu Ala Phe Asp Thr Tyr Gln Glu Phe
 20 25 30

Glu Glu Ala Tyr Ile Pro Lys Glu Gln Lys Tyr Ser Phe Leu Gln Asn
 35 40 45

Pro Gln Thr Ser Leu Cys Phe Ser Glu Ser Ile Pro Thr Pro Ser Asn
 50 55 60

Arg Glu Glu Thr Gln Gln Lys Ser Asn Leu Glu Leu Leu Arg Ile Ser
 65 70 75 80

Leu Leu Leu Ile Gln Ser Trp Leu Glu Pro Val Gln Phe Leu Arg Ser
 85 90 95

Val Phe Ala Asn Ser Leu Val Tyr Gly Ala Ser Asp Ser Asn Val Tyr
 100 105 110

Asp Leu Leu Lys Asp Leu Glu Glu Gly Ile Gln Thr Leu Met Gly Arg
 115 120 125

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

Ser Lys Phe Asp Thr Asn Ser His Asn Asp Asp Ala Leu Leu Lys Asn
 145 150 155 160

Tyr Gly Leu Leu Tyr Cys Phe Arg Lys Asp Met Asp Lys Val Glu Thr
 165 170 175

Phe Leu Arg Ile Val Gln Cys Arg Ser Val Glu Gly Ser Cys Gly Phe
 180 185 190

<210> 9
 <211> 192
 <212> PRT
 <213> Homo sapiens

<220>

<221> MISC_FEATURE

<223> human growth hormone mutant 7

<400> 9

Met Phe Pro Thr Ile Pro Leu Ser Arg Leu Phe Asp Asn Ala Met Leu
1 5 10 15

Arg Ala His Arg Leu His Gln Leu Ala Phe Asp Thr Tyr Gln Glu Phe
20 25 30

Glu Glu Ala Tyr Ile Pro Lys Glu Gln Lys Tyr Ser Phe Leu Gln Asn
35 40 45

Pro Gln Thr Ser Leu Cys Phe Ser Glu Ser Ile Pro Thr Pro Ser Asn
50 55 60

Arg Glu Glu Thr Gln Gln Lys Ser Asn Leu Glu Leu Leu Arg Ile Ser
65 70 75 80

Leu Leu Leu Ile Gln Ser Trp Leu Glu Pro Val Gln Phe Leu Arg Ser
85 90 95

Val Phe Ala Asn Ser Leu Val Tyr Gly Ala Ser Asp Ser Asn Val Tyr
100 105 110

Asp Leu Leu Lys Asp Leu Glu Glu Gly Ile Gln Thr Leu Met Gly Arg
115 120 125

Leu Glu Asp Gly Ser Pro Thr Thr Thr Gln Ile Phe Lys Gln Thr Tyr
130 135 140

Ser Lys Phe Asp Thr Asn Ser His Asn Asp Asp Ala Leu Leu Lys Asn
145 150 155 160

Tyr Gly Leu Leu Tyr Cys Phe Arg Lys Asp Met Asp Lys Val Glu Thr
165 170 175

Phe Leu Arg Ile Val Gln Cys Arg Ser Val Glu Gly Ser Cys Gly Phe
180 185 190

<210> 10

<211> 6

<212> PRT

<213> Homo sapiens

<400> 10

Phe Pro Thr Ile Pro Leu
1 5

<210> 11

<211> 5

<212> PRT

<213> Homo sapiens

<400> 11

Pro Gln Thr Ser Leu

1 5

<210> 12
<211> 6
<212> PRT
<213> Homo sapiens
<400> 12

Pro Thr Pro Ser Asn Arg
1 5

<210> 13
<211> 7
<212> PRT
<213> Homo sapiens
<400> 13

Pro Arg Thr Gly Gln Ile Phe
1 5

<210> 14
<211> 13
<212> PRT
<213> Homo sapiens
<400> 14

Pro Arg Thr Gly Gln Ile Phe Lys Gln Thr Tyr Ser Lys
1 5 10

<210> 15
<211> 4
<212> PRT
<213> Homo sapiens
<400> 15

Phe Lys Gln Thr
1

<210> 16
<211> 7
<212> PRT
<213> Homo sapiens
<400> 16

Phe Pro Thr Ile Pro Leu Ser
1 5

<210> 17
<211> 9
<212> PRT
<213> Artificial sequence
<220>
<223> N-terminal mutants
<400> 17

Met Val Thr Pro Thr Ile Pro Leu Ser
1 5

<210> 18
<211> 9
<212> PRT
<213> Artificial sequence
<220>
<223> N-terminal mutants
<400> 18

Met Gln Thr Pro Thr Ile Pro Leu Ser
1 5

<210> 19
<211> 12
<212> PRT
<213> Artificial sequence
<220>
<223> N-terminal mutants
<400> 19

Met Ala Pro Thr Ser Ser Pro Thr Ile Pro Leu Ser
1 5 10

<210> 20
<211> 13
<212> PRT
<213> Artificial sequence
<220>
<223> N-terminal mutants
<400> 20

Met Ala Pro Thr Ser Ser Ser Pro Thr Ile Pro Leu Ser
1 5 10

<210> 21
<211> 11
<212> PRT
<213> Artificial sequence
<220>
<223> N-terminal mutants
<400> 21

Met Pro Thr Thr Phe Pro Thr Ile Pro Leu Ser
1 5 10

<210> 22
<211> 11
<212> PRT
<213> Artificial sequence
<220>
<223> N-terminal mutants
<400> 22

Met Pro Thr Ser Ser Pro Thr Ile Pro Leu Ser
1 5 10

<210> 23

<211> 12
<212> PRT
<213> Artificial sequence
<220>
<223> N-terminal mutants
<400> 23

Met Pro Thr Ser Ser Ser Pro Thr Ile Pro Leu Ser
1 5 10

<210> 24
<211> 7
<212> PRT
<213> Homo sapiens
<400> 24

Phe Pro Thr Ile Pro Leu Ser
1 5

<210> 25
<211> 9
<212> PRT
<213> Artificial sequence
<220>
<223> mutants
<400> 25

Met Phe Pro Thr Gln Ile Pro Leu Ser
1 5

<210> 26
<211> 9
<212> PRT
<213> Artificial sequence
<220>
<223> mutants
<400> 26

Met Phe Pro Thr Ser Ile Pro Leu Ser
1 5

<210> 27
<211> 9
<212> PRT
<213> Artificial sequence
<220>
<223> mutants
<400> 27

Met Phe Pro Thr Ser Ser Pro Leu Ser
1 5

<210> 28
<211> 9
<212> PRT
<213> Artificial sequence
<220>
<223> mutants

<400> 28

Met Thr Pro Thr Gln Ile Pro Leu Ser
1 5

<210> 29

<211> 9

<212> PRT

<213> Artificial sequence

<220>

<223> mutants

<400> 29

Met Phe Pro Thr Thr Thr Pro Leu Ser
1 5

<210> 30

<211> 9

<212> PRT

<213> Homo sapiens

<400> 30

Ala Tyr Ile Pro Lys Glu Gln Lys Tyr
1 5

<210> 31

<211> 9

<212> PRT

<213> Artificial sequence

<220>

<223> mutants

<400> 31

Ala Tyr Ile Pro Thr Gln Gly Ala Tyr
1 5

<210> 32

<211> 9

<212> PRT

<213> Artificial sequence

<220>

<223> mutants

<400> 32

Ala Tyr Ile Pro Thr Ser Ser Ser Tyr
1 5

<210> 33

<211> 10

<212> PRT

<213> Artificial sequence

<220>

<223> mutants

<400> 33

Ala Gln Ile Thr Pro Thr Glu Gln Lys Tyr
1 5 10

<210> 34
<211> 9
<212> PRT
<213> Artificial sequence
<220>
<223> mutants
<400> 34

Ala Tyr Ile Pro Thr Glu Gln Ser Tyr
1 5

<210> 35
<211> 9
<212> PRT
<213> Homo sapiens
<400> 35

Leu Gln Asn Pro Gln Thr Ser Leu Cys
1 5

<210> 36
<211> 9
<212> PRT
<213> Artificial sequence
<220>
<223> mutants
<400> 36

Leu Gln Thr Pro Gln Thr Ser Leu Cys
1 5

<210> 37
<211> 9
<212> PRT
<213> Artificial sequence
<220>
<223> mutants
<400> 37

Leu Gln Asn Pro Thr Thr Ser Leu Cys
1 5

<210> 38
<211> 12
<212> PRT
<213> Homo sapiens
<400> 38

Ser Glu Ser Ile Pro Thr Pro Asn Arg Glu Glu Thr
1 5 10

<210> 39
<211> 12
<212> PRT
<213> Artificial sequence
<220>

<223> mutants
<400> 39

Ser Glu Ser Thr Pro Thr Pro Asn Arg Glu Glu Thr
1 5 10

<210> 40
<211> 12
<212> PRT
<213> Artificial sequence
<220>
<223> mutants
<400> 40

Ser Ser Ser Thr Pro Thr Pro Asn Arg Glu Glu Thr
1 5 10

<210> 41
<211> 12
<212> PRT
<213> Artificial sequence
<220>
<223> mutants
<400> 41

Ser Glu Ser Ile Pro Thr Pro Asn Thr Glu Glu Thr
1 5 10

<210> 42
<211> 12
<212> PRT
<213> Artificial sequence
<220>
<223> mutants
<400> 42

Ser Glu Ser Ile Pro Thr Pro Asn Thr Gln Glu Thr
1 5 10

<210> 43
<211> 12
<212> PRT
<213> Artificial sequence
<220>
<223> mutants
<400> 43

Ser Glu Ser Ile Pro Thr Pro Thr Gln Gly Ala Thr
1 5 10

<210> 44
<211> 12
<212> PRT
<213> Artificial sequence
<220>
<223> mutants
<400> 44

Ser Glu Ser Ile Pro Thr Pro Thr Glu Ser Ser Thr
1 5 10

<210> 45
<211> 12
<212> PRT
<213> Artificial sequence
<220>
<223> mutants
<400> 45

Ser Gln Ser Thr Pro Thr Pro Asn Arg Glu Glu Thr
1 5 10

<210> 46
<211> 12
<212> PRT
<213> Artificial sequence
<220>
<223> mutants
<400> 46

Ser Gln Ser Thr Pro Thr Pro Asn Gln Glu Glu Thr
1 5 10

<210> 47
<211> 12
<212> PRT
<213> Artificial sequence
<220>
<223> mutants
<400> 47

Ser Glu Ser Thr Pro Thr Pro Thr Ser Ser Ser Thr
1 5 10

<210> 48
<211> 11
<212> PRT
<213> Homo sapiens
<400> 48

Ser Trp Leu Glu Pro Val Gln Phe Leu Arg Ser
1 5 10

<210> 49
<211> 11
<212> PRT
<213> Artificial sequence
<220>
<223> mutants
<400> 49

Ser Trp Leu Glu Pro Thr Gln Gly Leu Arg Ser
1 5 10

<210> 50
<211> 11
<212> PRT
<213> Artificial sequence
<220>
<223> mutants
<400> 50

Ser Trp Leu Glu Pro Thr Gln Gly Ala Thr Ser
1 5 10

<210> 51
<211> 11
<212> PRT
<213> Artificial sequence
<220>
<223> mutants
<400> 51

Ser Ser Gln Thr Pro Val Gln Phe Leu Arg Ser
1 5 10

<210> 52
<211> 11
<212> PRT
<213> Artificial sequence
<220>
<223> mutants
<400> 52

Ser Trp Leu Glu Pro Thr Ser Ser Leu Ser Ser
1 5 10

<210> 53
<211> 11
<212> PRT
<213> Artificial sequence
<220>
<223> mutants
<400> 53

Ser Met Val Thr Pro Val Gln Phe Leu Arg Ser
1 5 10

<210> 54
<211> 11
<212> PRT
<213> Homo sapiens
<400> 54

Glu Asp Gly Ser Pro Arg Thr Gly Gln Ile Phe
1 5 10

<210> 55
<211> 11
<212> PRT
<213> Artificial sequence

<220>
<223> mutants
<400> 55

Glu Asp Gly Ser Pro Thr Thr Gly Gln Ile Phe
1 5 10

<210> 56
<211> 11
<212> PRT
<213> Artificial sequence
<220>
<223> mutants
<400> 56

Glu Asp Gly Ser Pro Asn Thr Gly Gln Ile Phe
1 5 10

<210> 57
<211> 11
<212> PRT
<213> Artificial sequence
<220>
<223> mutants
<400> 57

Glu Asp Gly Ser Pro Thr Gln Gly Gln Ile Phe
1 5 10

<210> 58
<211> 11
<212> PRT
<213> Artificial sequence
<220>
<223> mutants
<400> 58

Glu Asp Gly Ser Pro Thr Val Gly Gln Ile Phe
1 5 10

<210> 59
<211> 11
<212> PRT
<213> Artificial sequence
<220>
<223> mutants
<400> 59

Glu Asp Gly Ser Pro Thr Thr Thr Gln Ile Phe
1 5 10

<210> 60
<211> 11
<212> PRT
<213> Artificial sequence
<220>
<223> mutants

<400> 60

Glu Asp Gly Ser Pro Thr Ser Ser Gln Ile Phe
1 5 10

<210> 61

<211> 11

<212> PRT

<213> Artificial sequence

<220>

<223> mutants

<400> 61

Glu Asp Gly Ser Pro Thr Thr Gln Gly Ile Phe
1 5 10

<210> 62

<211> 11

<212> PRT

<213> Artificial sequence

<220>

<223> mutants

<400> 62

Glu Asp Gly Ser Pro Gln Thr Gly Gln Ile Phe
1 5 10

<210> 63

<211> 11

<212> PRT

<213> Artificial sequence

<220>

<223> mutants

<400> 63

Glu Asp Gly Thr Pro Asn Thr Gly Gln Ile Phe
1 5 10

<210> 64

<211> 11

<212> PRT

<213> Artificial sequence

<220>

<223> mutants

<400> 64

Glu Asp Gln Thr Pro Asn Thr Gly Gln Ile Phe
1 5 10

<210> 65

<211> 9

<212> PRT

<213> Homo sapiens

<400> 65

Gly Gln Ile Phe Lys Gln Thr Tyr Ser
1 5

<210> 66
<211> 9
<212> PRT
<213> Artificial sequence
<220>
<223> mutants
<400> 66

Gly Gln Ile Phe Asn Gln Thr Tyr Ser
1 5

<210> 67
<211> 9
<212> PRT
<213> Artificial sequence
<220>
<223> mutants
<400> 67

Gly Gln Ile Phe Asn Ile Thr Tyr Ser
1 5

<210> 68
<211> 9
<212> PRT
<213> Artificial sequence
<220>
<223> mutants
<400> 68

Gly Gln Ile Phe Pro Gln Thr Ser Ser
1 5

<210> 69
<211> 9
<212> PRT
<213> Artificial sequence
<220>
<223> mutants
<400> 69

Gly Gln Ile Phe Pro Thr Thr Thr Ser
1 5

<210> 70
<211> 9
<212> PRT
<213> Artificial sequence
<220>
<223> mutants
<400> 70

Gly Gln Ile Thr Pro Gln Thr Tyr Ser
1 5

<210> 71

<211> 9
<212> PRT
<213> Artificial sequence
<220>
<223> mutants
<400> 71

Gly Gln Ile Phe Thr Gln Thr Tyr Ser
1 5

<210> 72
<211> 9
<212> PRT
<213> Artificial sequence
<220>
<223> mutants
<400> 72

Gly Gln Ile Ser Thr Gln Thr Tyr Ser
1 5

<210> 73
<211> 9
<212> PRT
<213> Artificial sequence
<220>
<223> mutants
<400> 73

Gly Gln Ile Pro Thr Thr Thr Tyr Ser
1 5

<210> 74
<211> 7
<212> PRT
<213> Homo sapiens
<400> 74

Val Glu Gly Ser Cys Gly Phe
1 5

<210> 75
<211> 11
<212> PRT
<213> Artificial sequence
<220>
<223> mutants
<400> 75

Val Glu Gly Ser Cys Gly Pro Thr Thr Thr Pro
1 5 10

<210> 76
<211> 11
<212> PRT
<213> Artificial sequence
<220>

<223> mutants
<400> 76

Val Glu Gly Ser Cys Gly Pro Thr Ser Ser Pro
1 5 10

<210> 77
<211> 13
<212> PRT
<213> Artificial sequence
<220>
<223> mutants
<400> 77

Val Glu Gly Ser Cys Gly Pro Thr Gln Gly Ala Met Pro
1 5 10

<210> 78
<211> 11
<212> PRT
<213> Artificial sequence
<220>
<223> mutants
<400> 78

Val Glu Gly Ser Cys Gly Pro Thr Thr Ile Pro
1 5 10

<210> 79
<211> 11
<212> PRT
<213> Artificial sequence
<220>
<223> mutants
<400> 79

Val Glu Gly Ser Cys Gly Pro Met Val Thr Pro
1 5 10