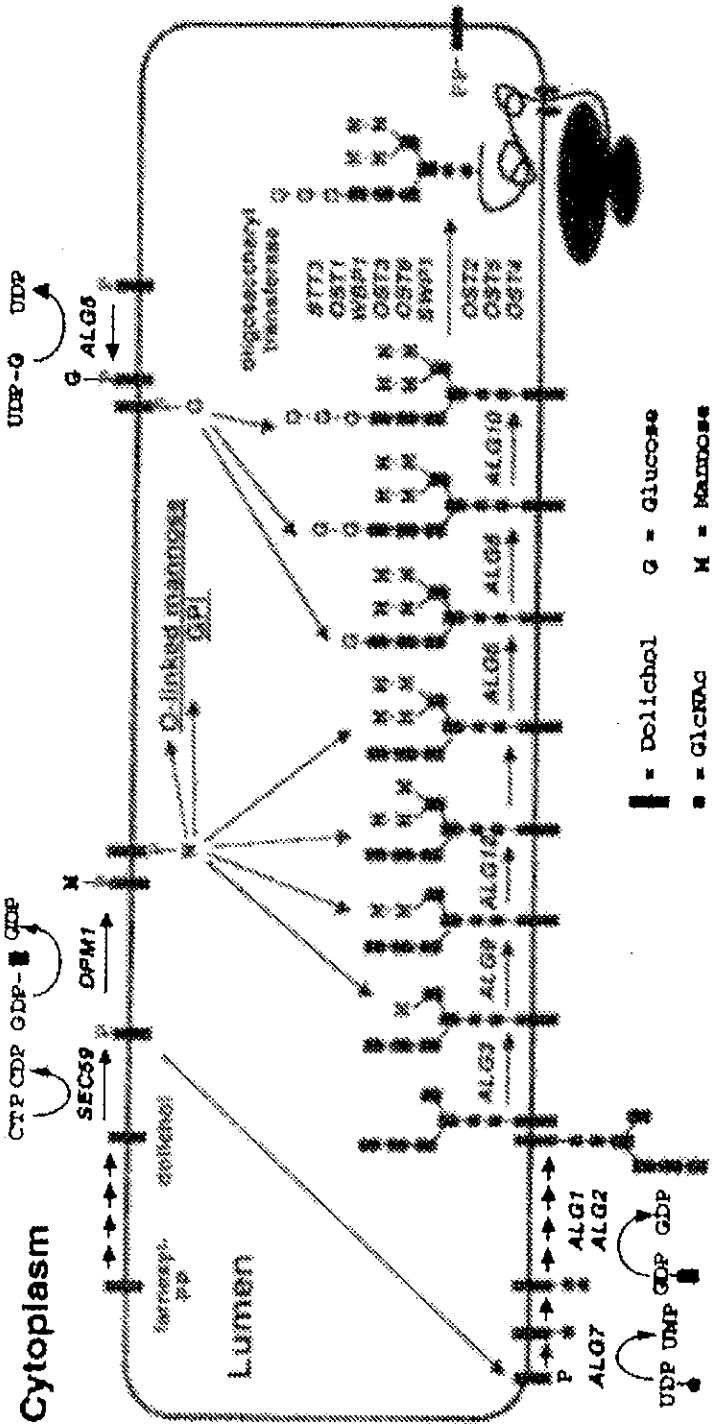

Cytoplasm
Lumen
UDP-G
UDP
G
ALG5
CTP CDP
GDP-M
GDP
SEC59
DPM1
M
P
ALG3
ALG9
ALG12
ALG6
ALG8
ALG10
ALG1
ALG2
ALG7
GDP
GDP
UDP
UMP
oligosaccharyl transferase
STT3
OST1
WBP1
OST3
OST6
SWP1
OST2
OST5
OST4
O-linked mannose
PMT
= Dolichol
G = Glucose
= GlcNAc
M = Mannose

FIG. 1

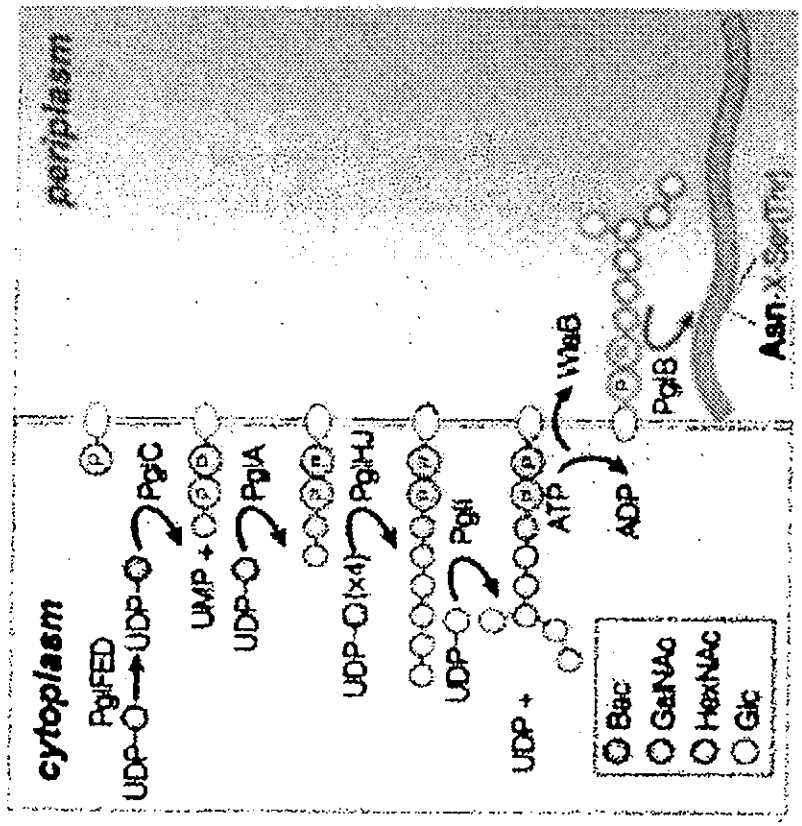

periplasm
cytoplasm
PglFED
UDP-O
UDP-O
PglC
UMP +
UDP-O
PglA
UDP-O(x4)
PglHIJ
UDP-O
PglI
UDP +
ATP
ADP
WaaB
PglB
Asn
Bac
GalNAc
HexNAc
Glc

FIG. 2

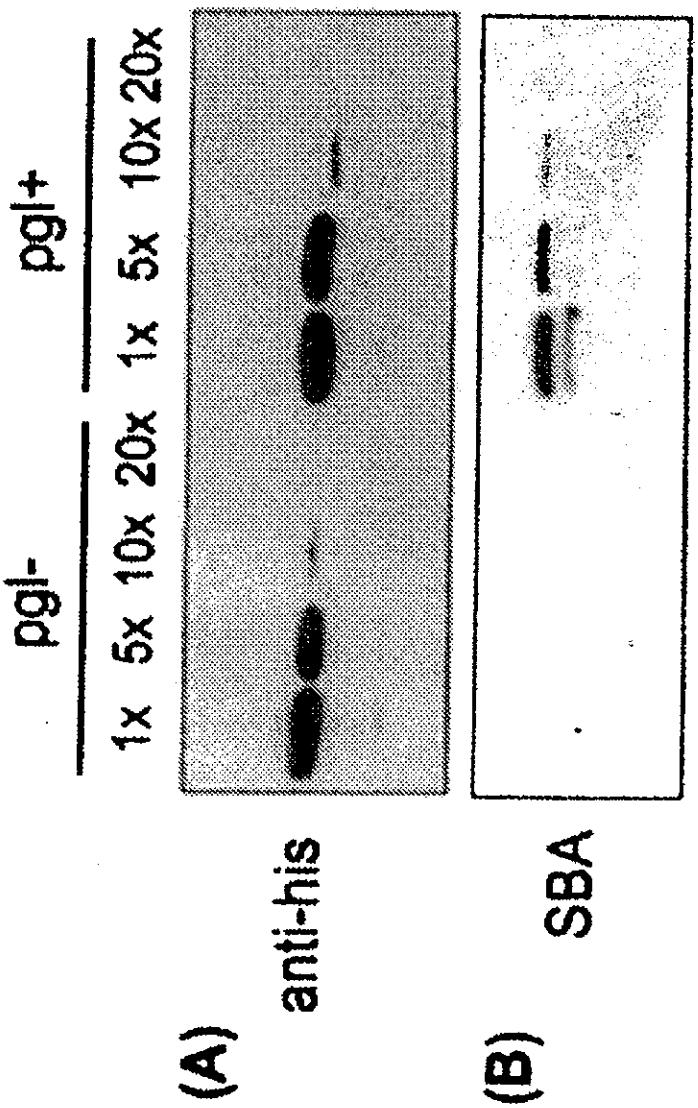


FIG. 3

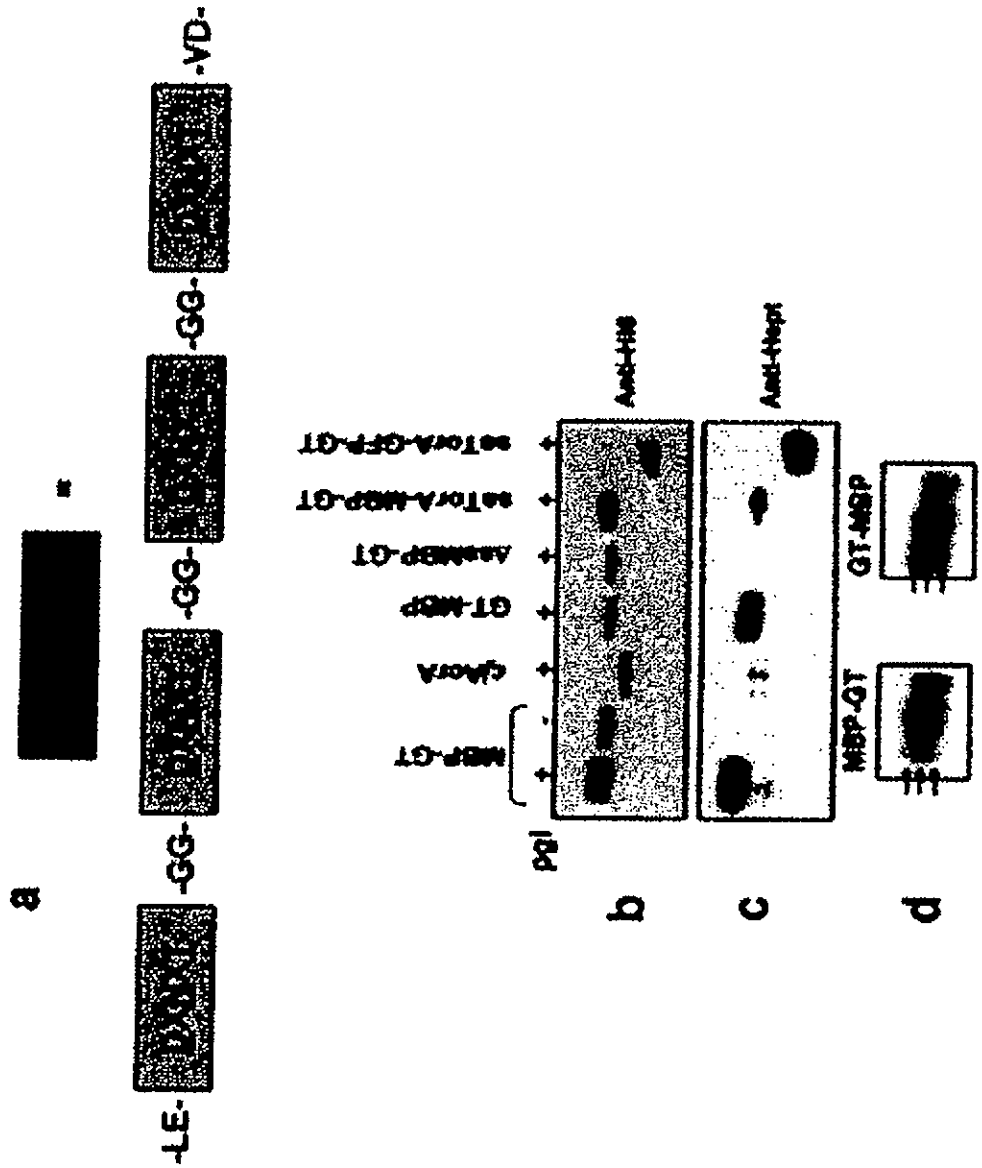

a
-LE-
-GG-
-GG-
-GG-
-VD-
b
c
d
Anti-His
Anti-Hsp1
MBP-GT
cjAcrA
GT-MBP
AAMBP-GT
saTcrA-MBP-GT
saTcrA-GFP-GT
GT-MBP
MBP-GT

FIG. 4

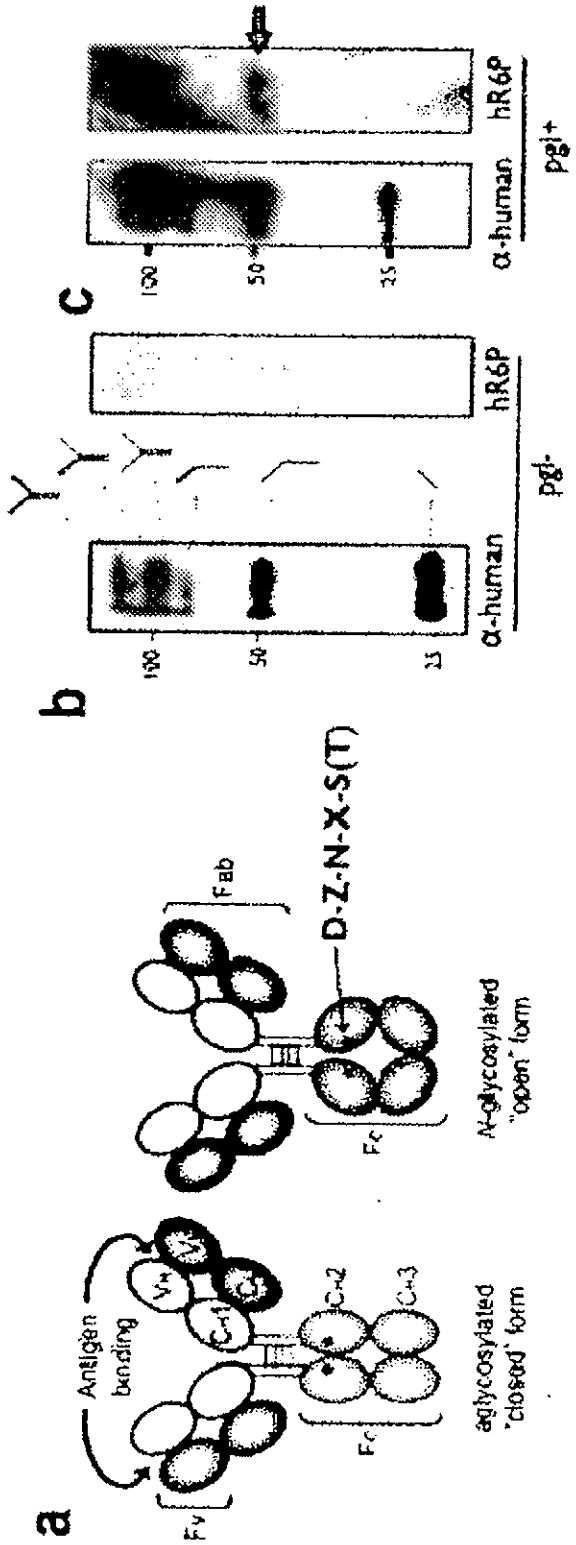
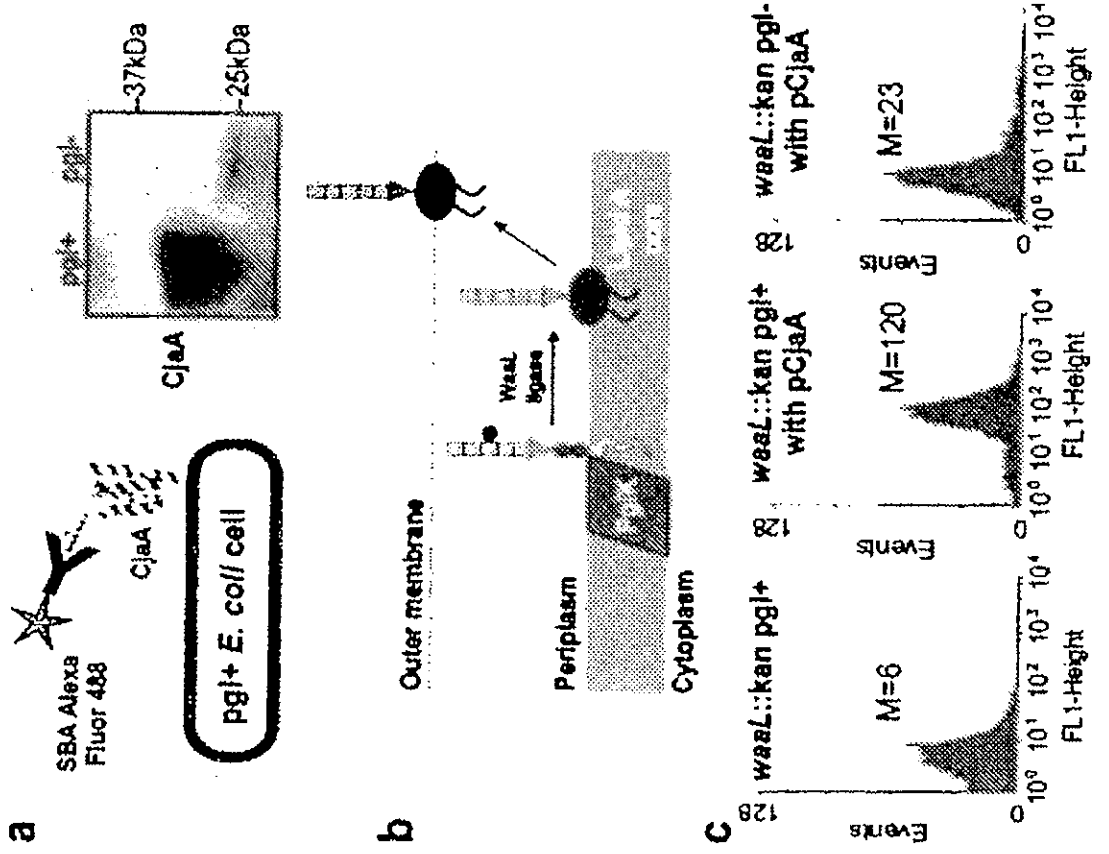

a
Antigen binding
Fv
Fab
D-Z-N-X-S(T)
Fc
N-glycosylated "open" form
aglycosylated "closed" form
b
α-human
hR6P
pgl-
c
150
50
35
α-human
hR6P
pgl+

FIG. 5

FIG. 6


a
SBA Alexa Fluor 488
CjaA
Pgl+ E. coli cell
pgl+
pgl-
37kDa
25kDa
CjaA
b
Outer membrane
WaaL ligase
Periplasm
Cytoplasm
c
waaL::kan pgl+
M=6
waaL::kan pgl+ with pCjaA
M=120
waaL::kan pgl- with pCjaA
M=23
Events
FL1-Height

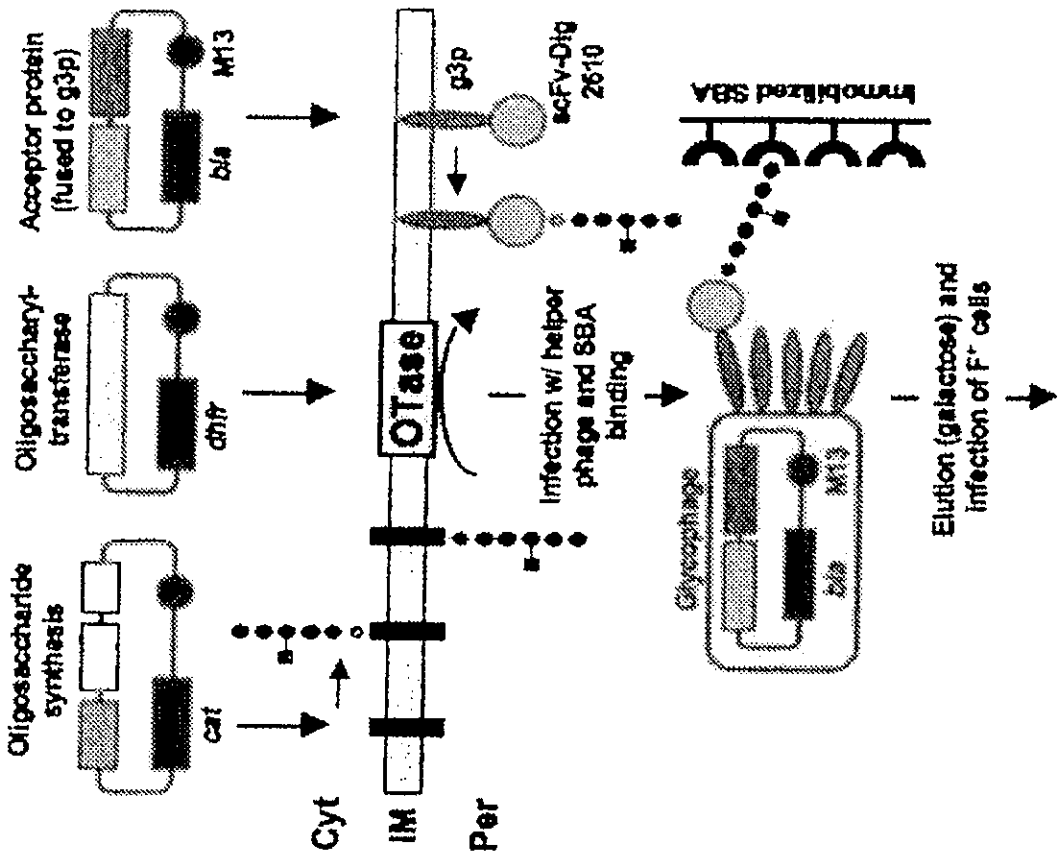

Acceptor protein (fused to g3p)
M13
bla
Oligosaccharyl-transferase
dhfr
Oligosaccharide synthesis
cat
Cyt
IM
Per
OTase
g3p
scFv-Dig 2610
Infection w/ helper phage and SBA binding
Immobilized SBA
Glycophage
M13
bla
Elution (galactose) and infection of F+ cells

FIG. 7

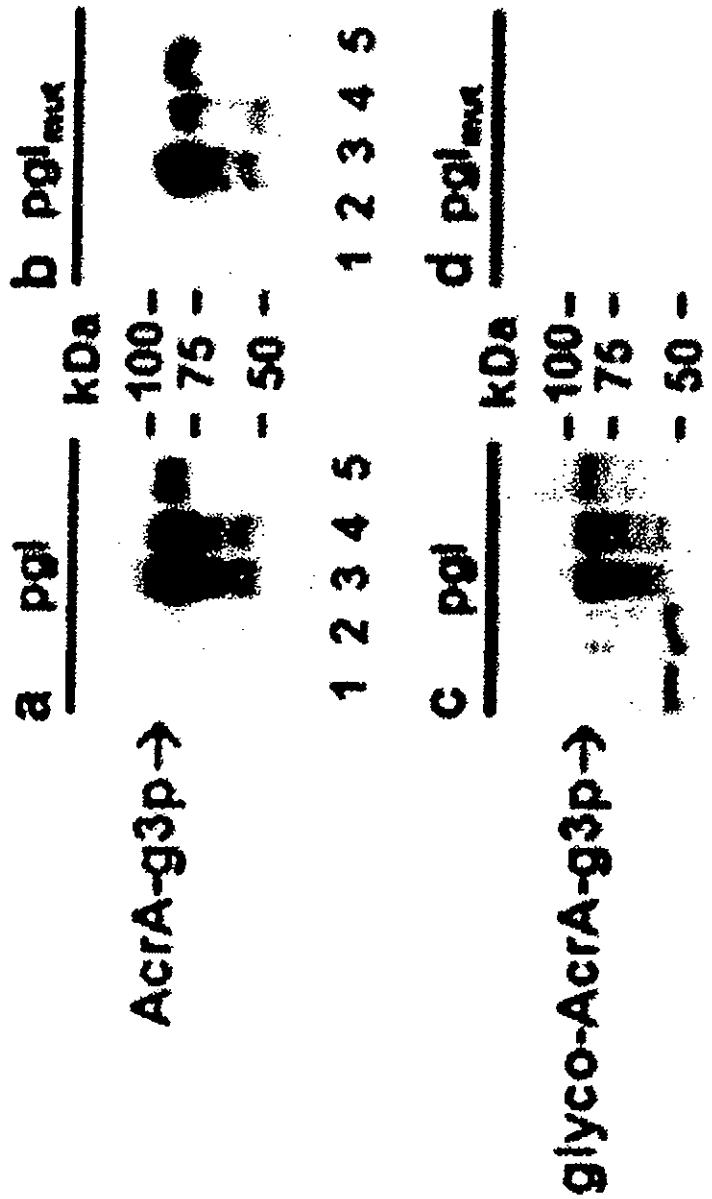

a pgl
b pgl mut
kDa
100
75
50
AcrA-g3p→
1 2 3 4 5
1 2 3 4 5
c pgl
d pgl mut
kDa
100
75
50
glyco-AcrA-g3p→

FIG. 8

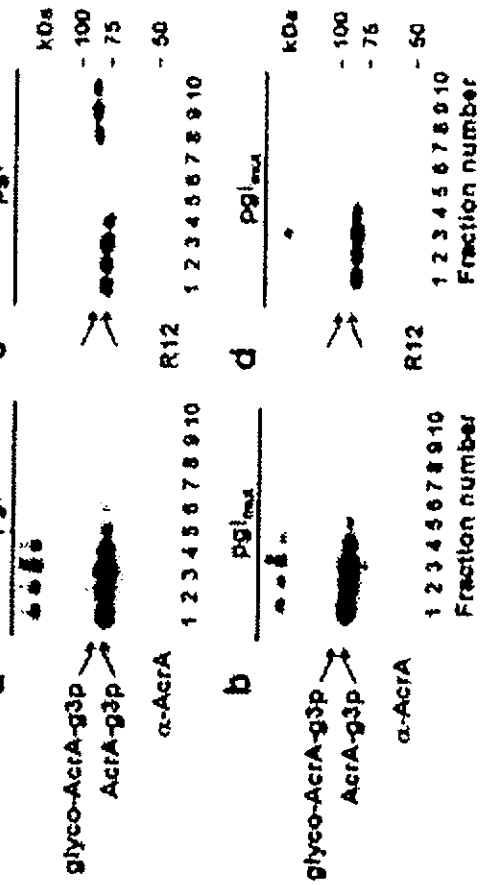

a
pgl
glyco-AcrA-g3p
AcrA-g3p
α-AcrA
1 2 3 4 5 6 7 8 9 10
Fraction number
b
pgl$_{mut}$
glyco-AcrA-g3p
AcrA-g3p
α-AcrA
1 2 3 4 5 6 7 8 9 10
Fraction number
c
pgl
kDa
100
75
50
R12
1 2 3 4 5 6 7 8 9 10
Fraction number
d
pgl$_{mut}$
kDa
100
75
50
R12
1 2 3 4 5 6 7 8 9 10
Fraction number

FIG. 9B

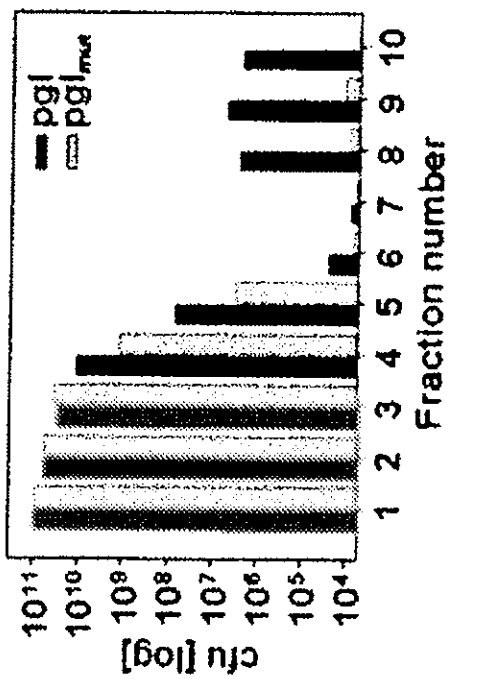
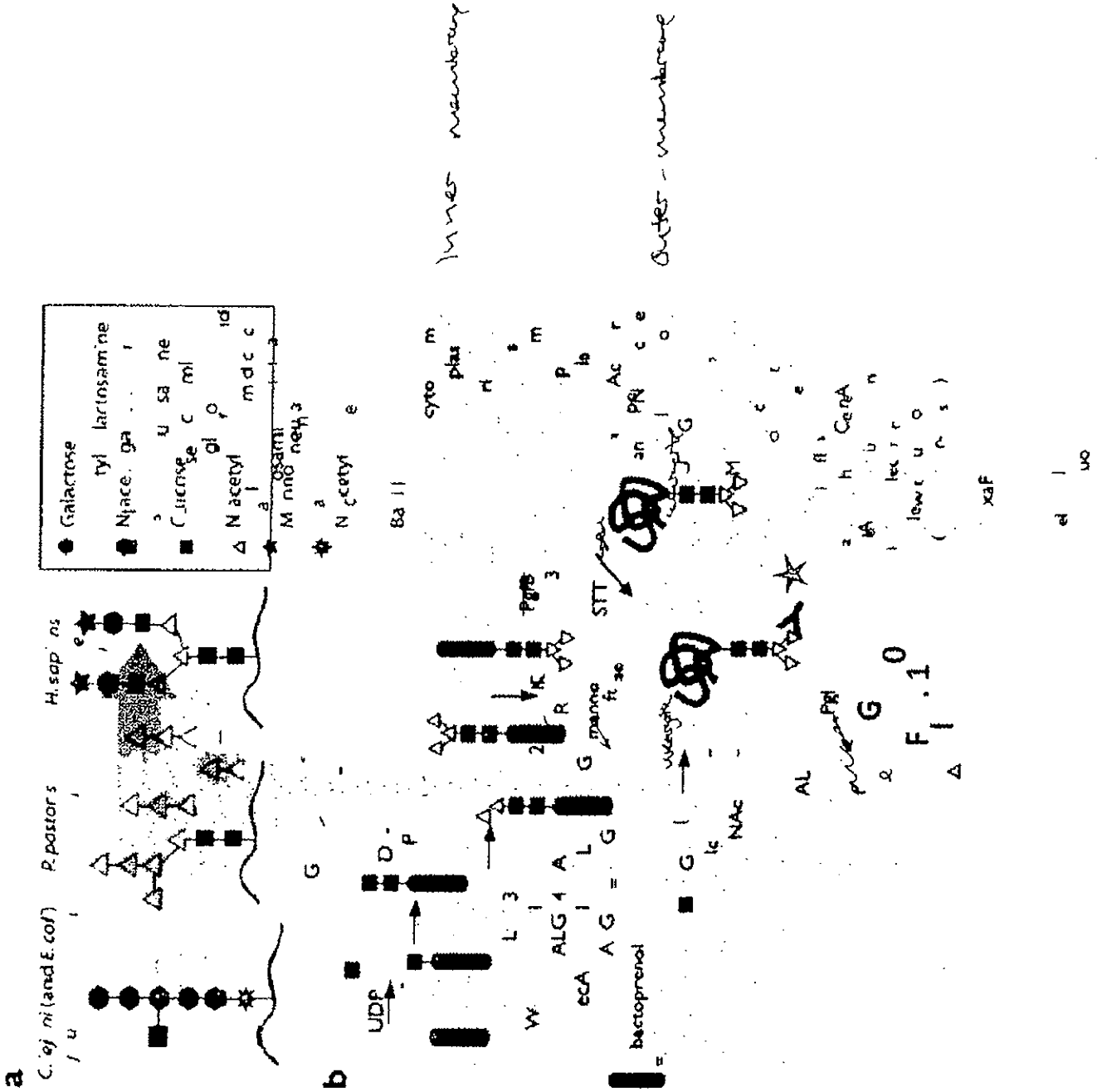

pgl
pgl$_{mut}$
cfu [log]
10^{11}
10^{10}
10^{9}
10^{8}
10^{7}
10^{6}
10^{5}
10^{4}
1 2 3 4 5 6 7 8 9 10
Fraction number

FIG. 9A


a
b
Galactose
N-acetyl
Glucose
Bactoprenol
UDP
Inner membrane
Outer membrane
STT
cytoplasm
periplasm
Acceptor
Pgl
ALG
ECA
WecA
WecG
WbaP
WzxE
WzyE
WzzE
WaaL
CpsA
CpsB
CpsC
CpsD
CpsE
CpsF
CpsG
CpsH
CpsI
CpsJ
CpsK
CpsL
CpsM
CpsN
CpsO
CpsP
CpsQ
CpsR
CpsS
CpsT
XafF

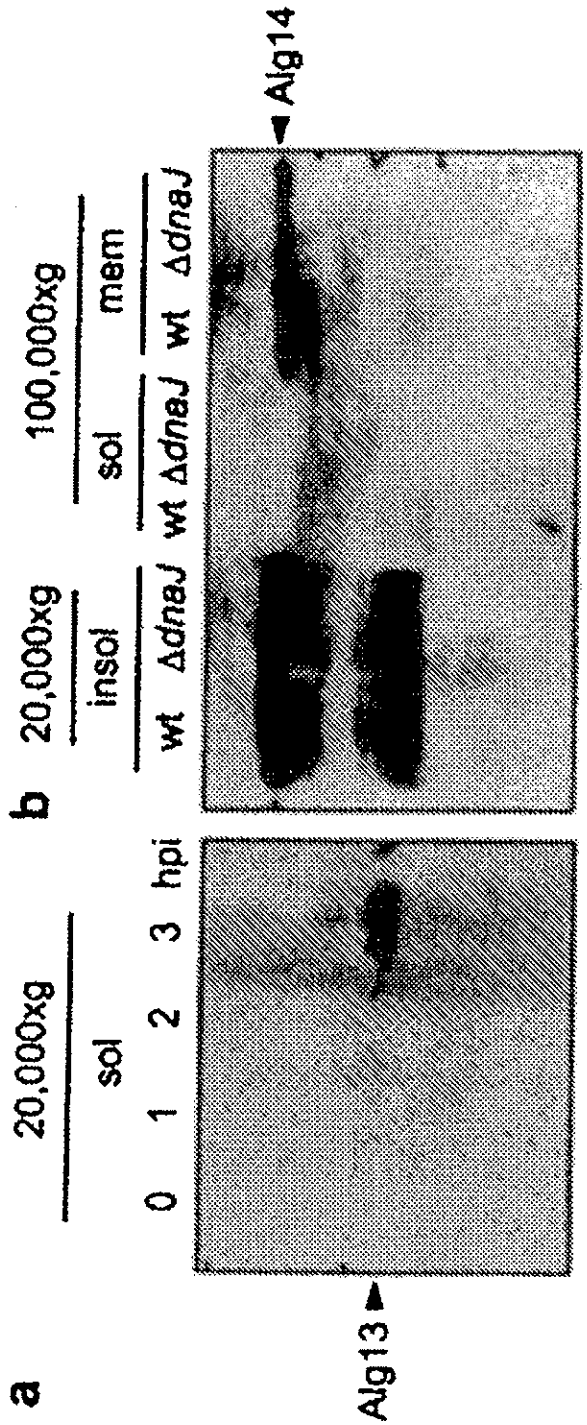

a
20,000xg
sol
0 1 2 3 hpi
Alg13
b
20,000xg
insol
wt ΔdnaJ
100,000xg
sol
wt ΔdnaJ
mem
wt ΔdnaJ
Alg14

FIG. 11

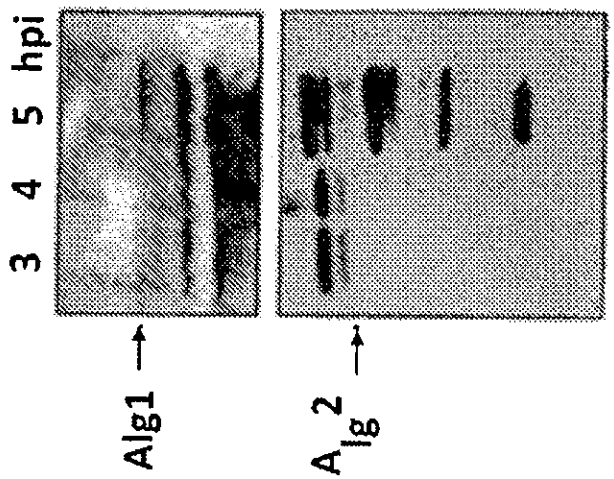


FIG. 12

ALIGNMENT

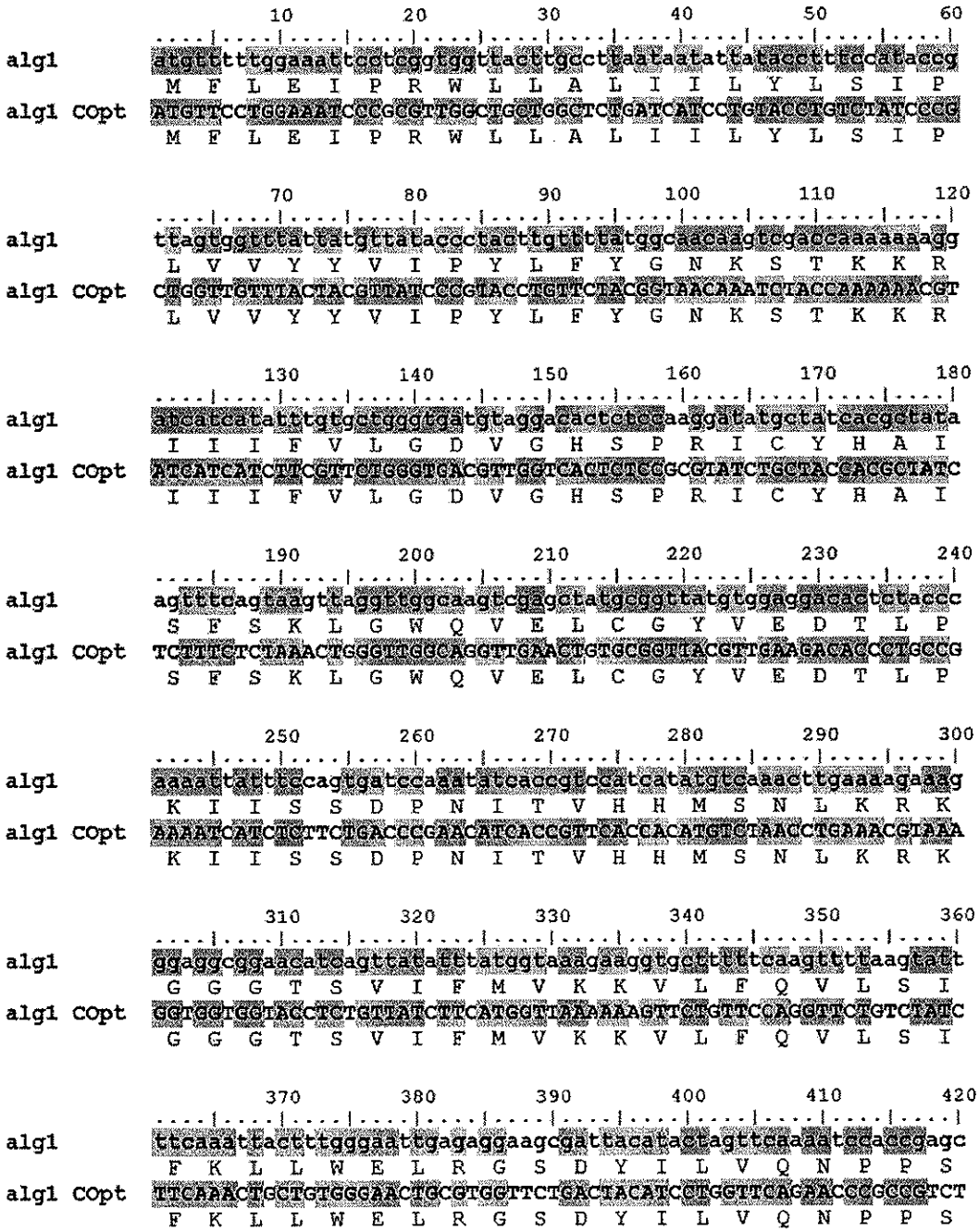


Figure 13

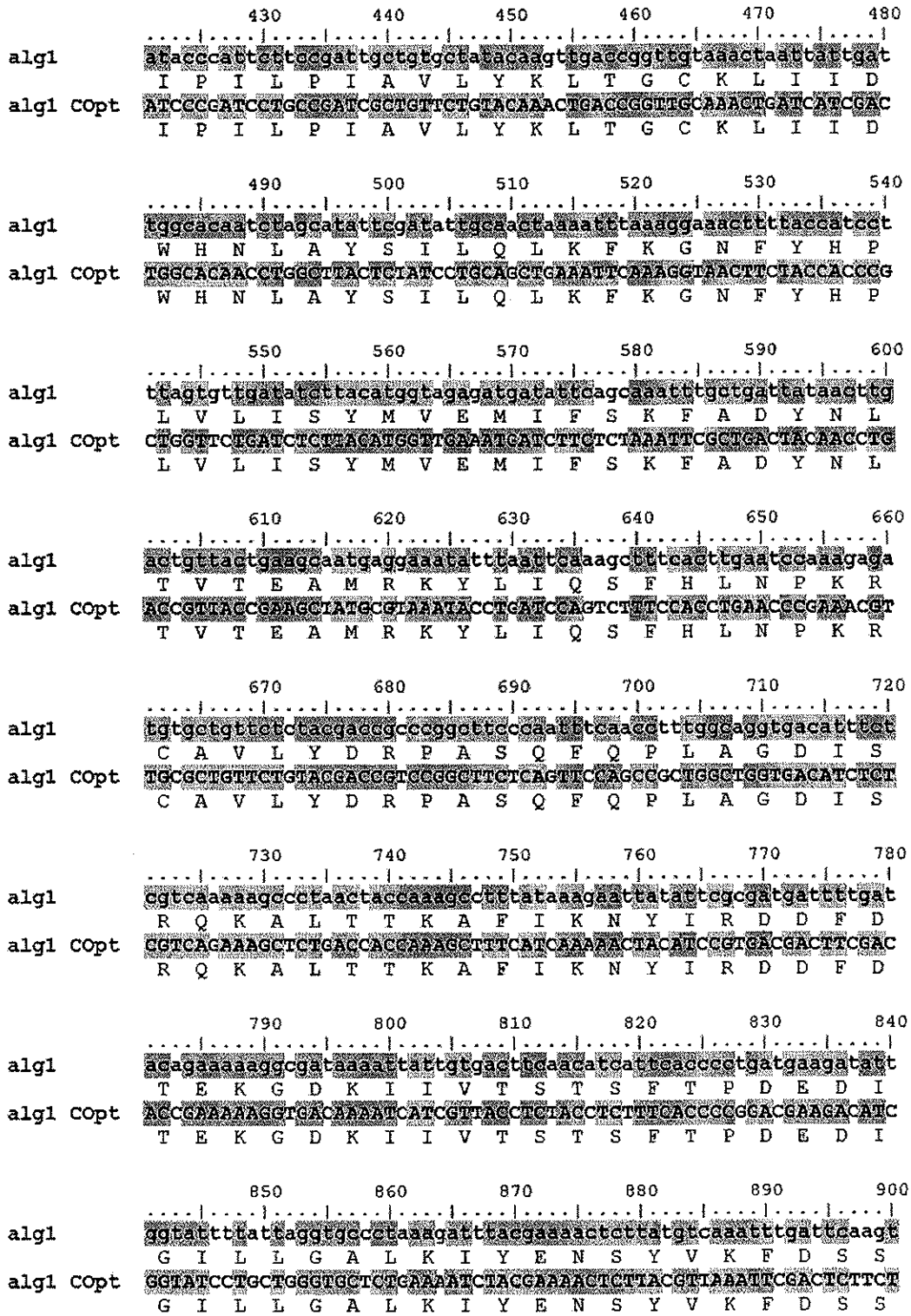


Figure 13 (continued)

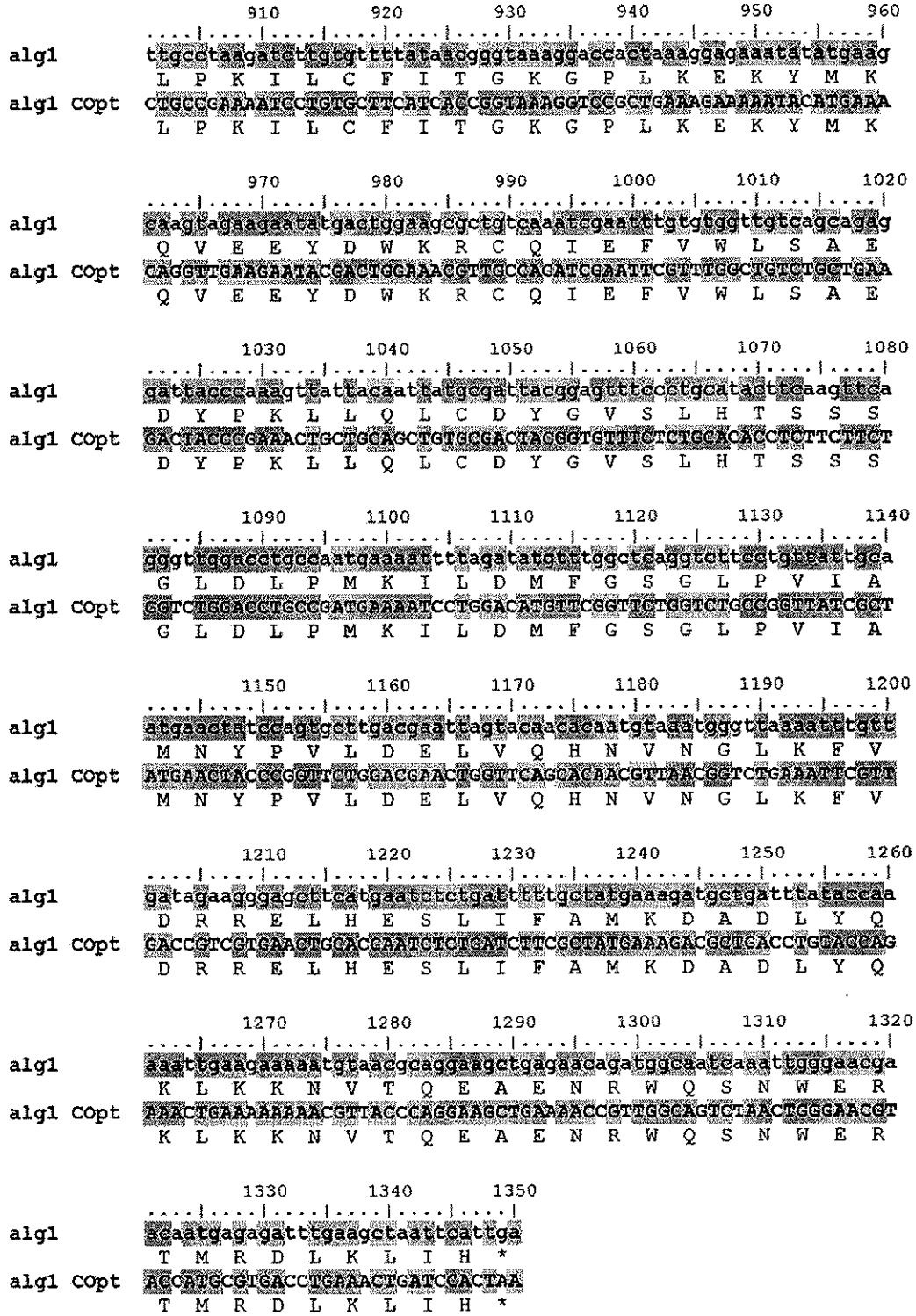


Figure 13 (continued)

ALIGNMENT

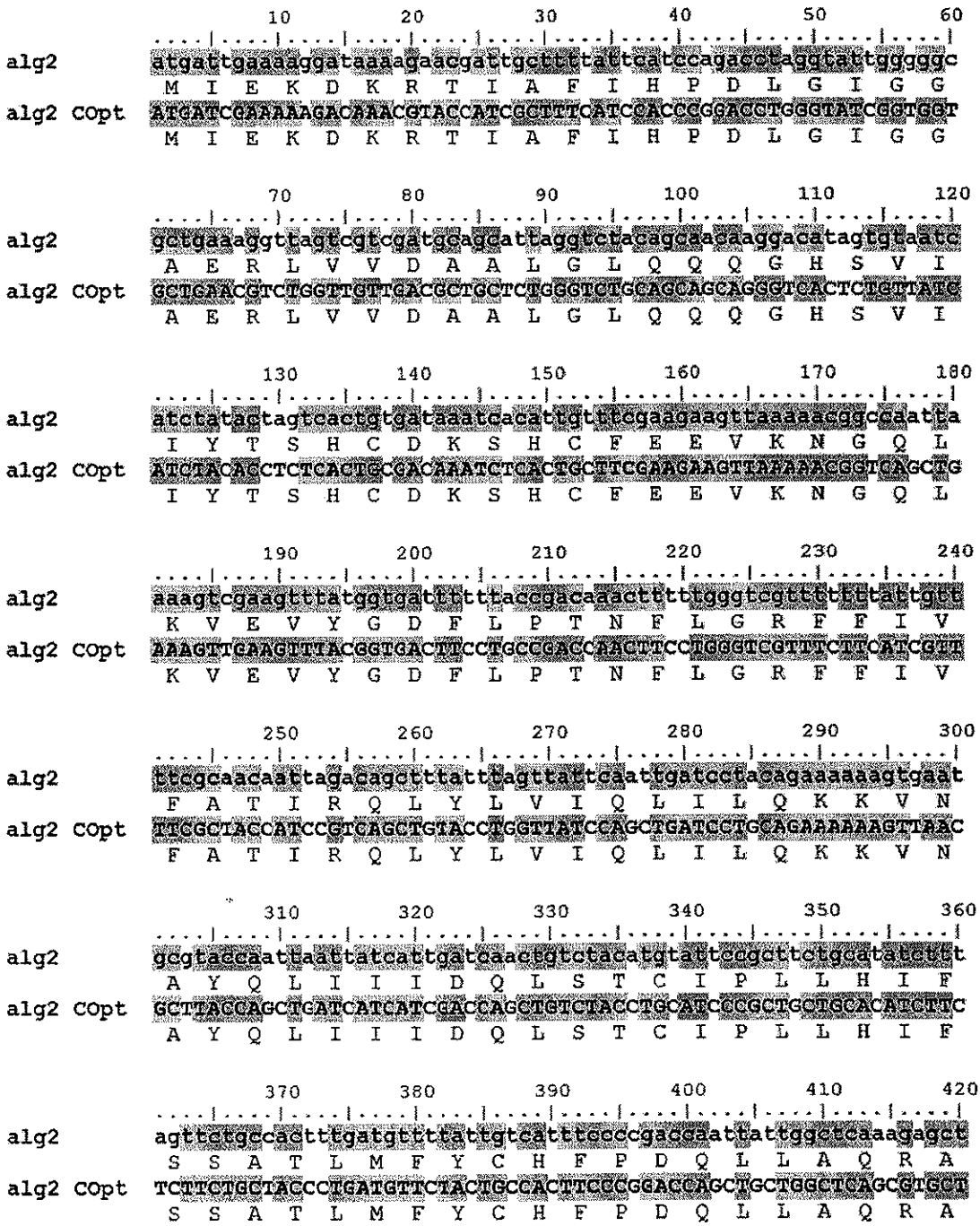


Figure 14

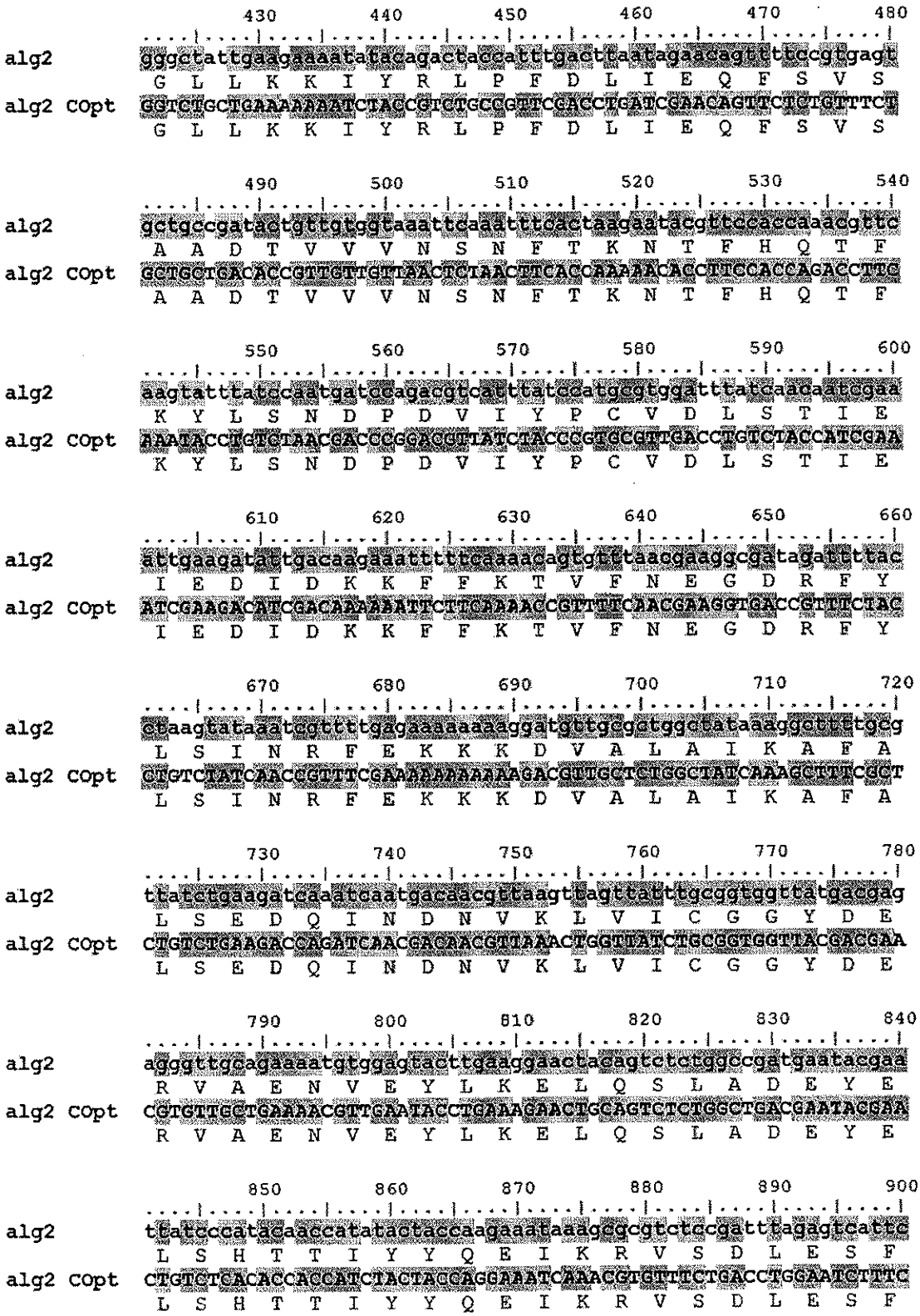


Figure 14 (continued)

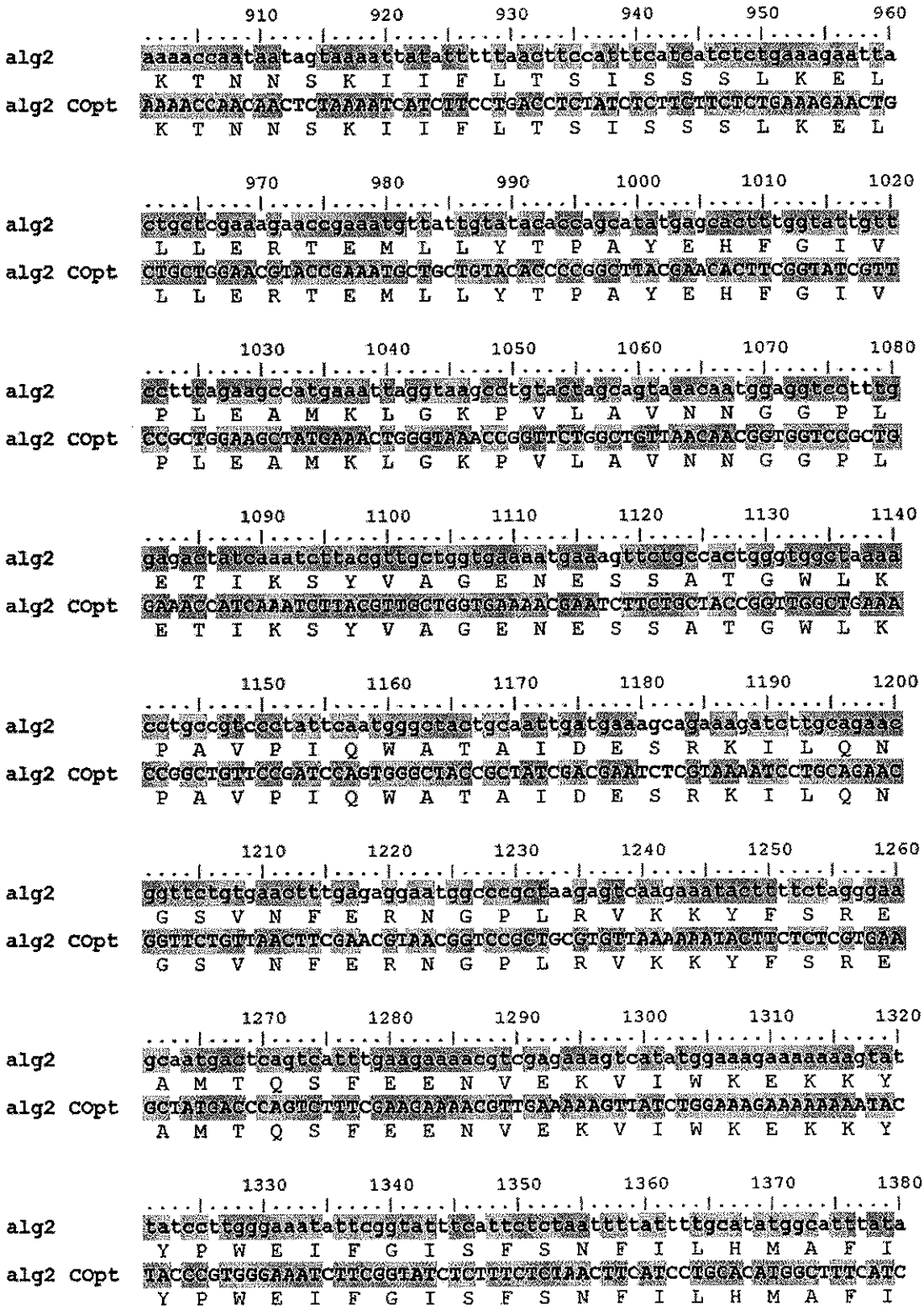


Figure 14 (continued)

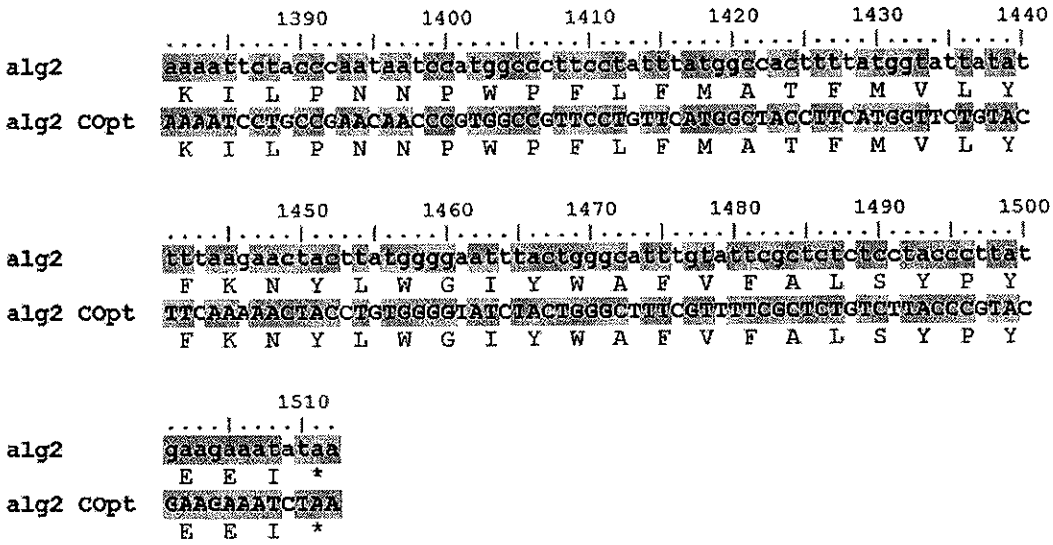


Figure 14 (continued)

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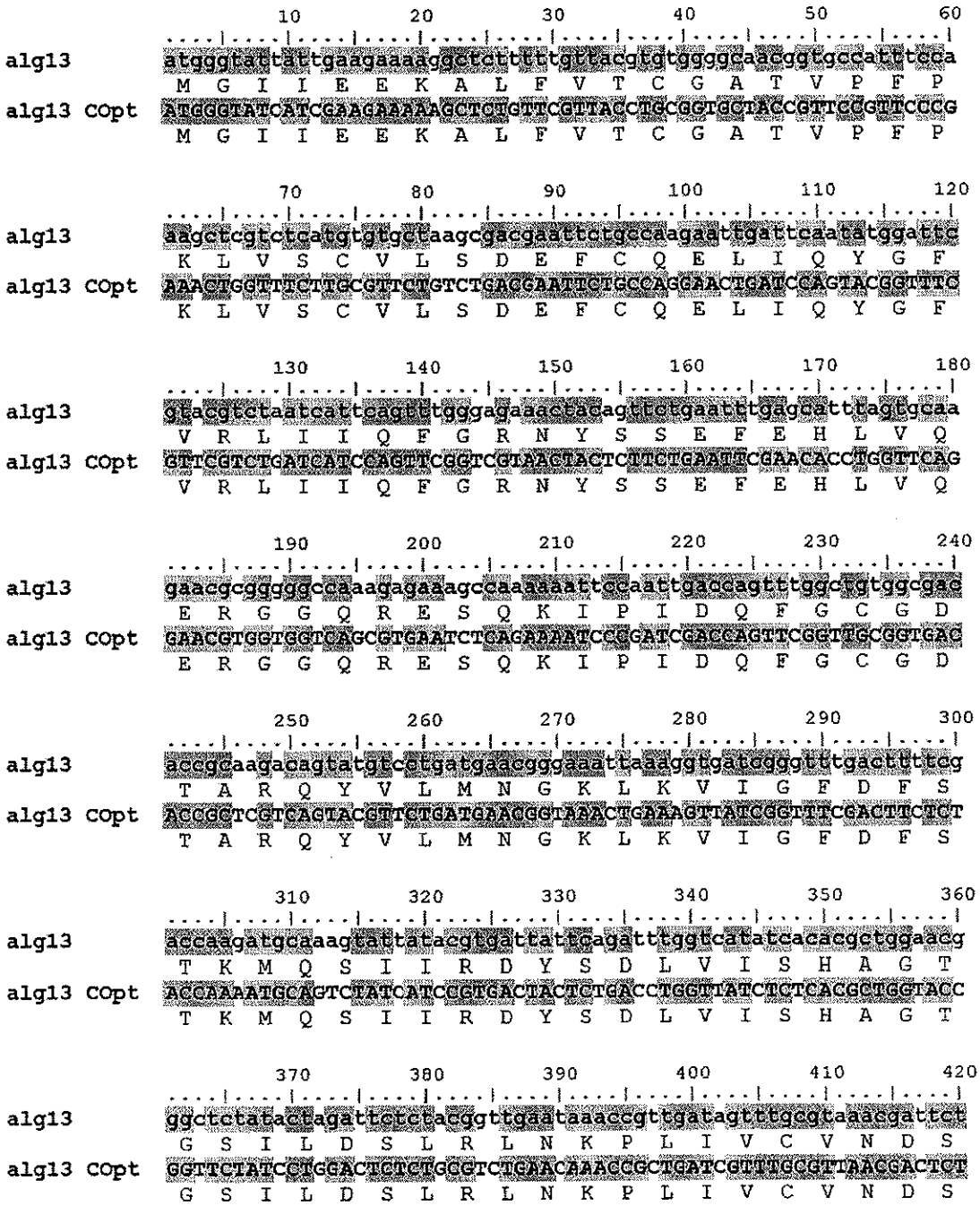


Figure 15

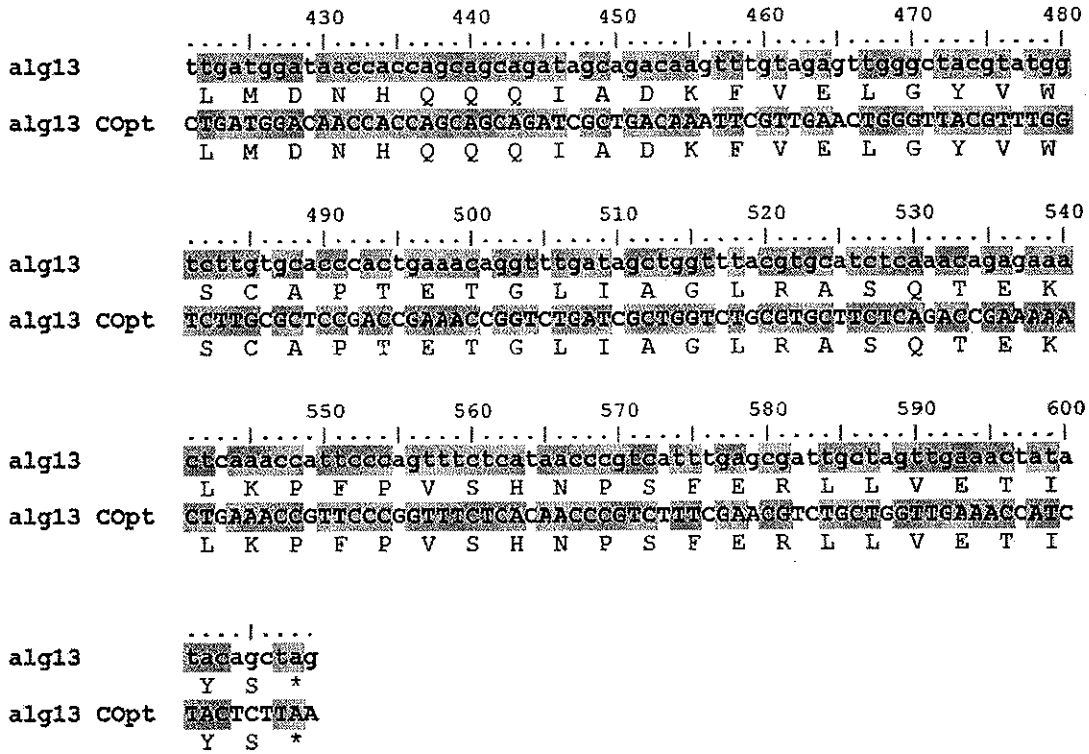


Figure 15 (continued)

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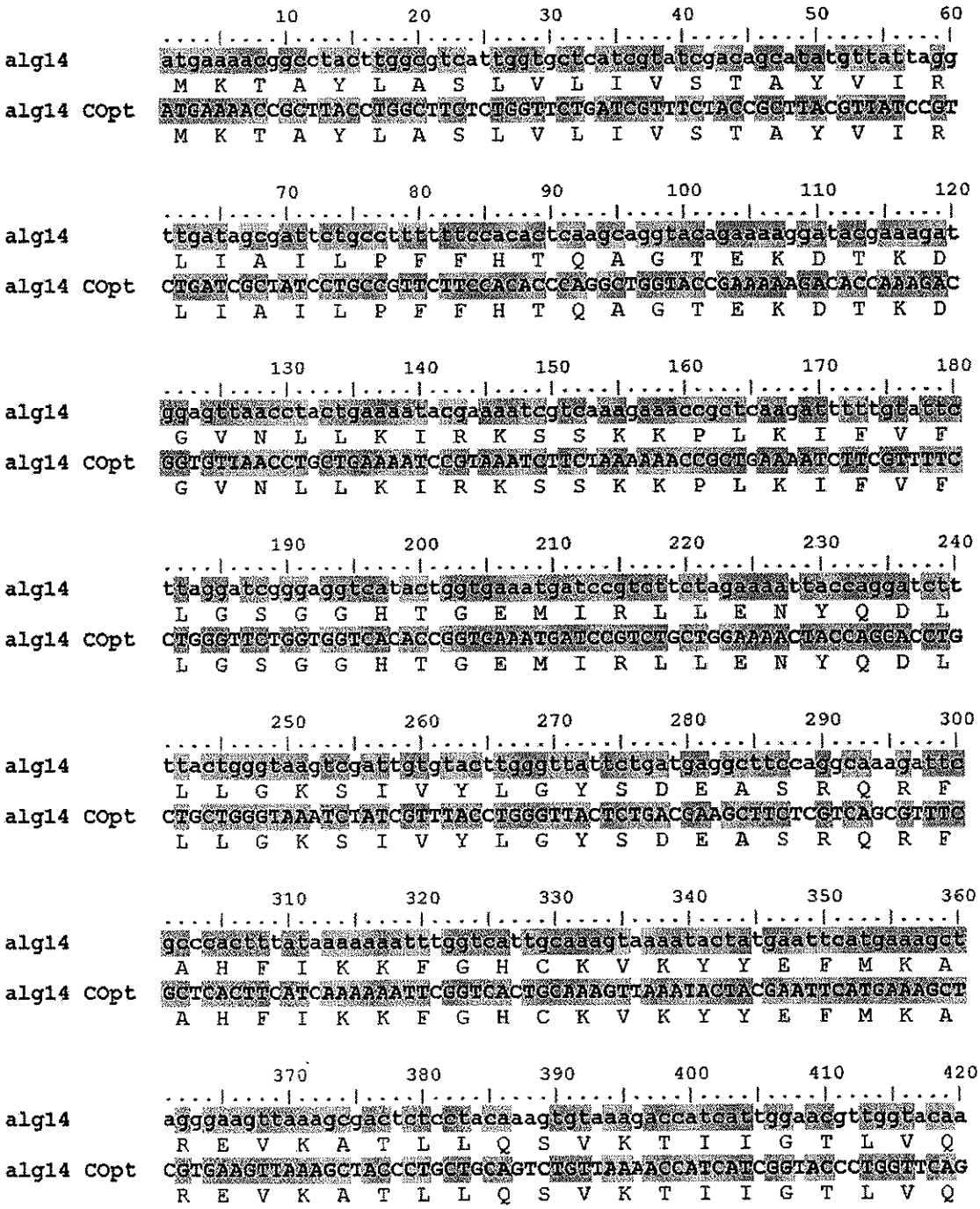


Figure 16

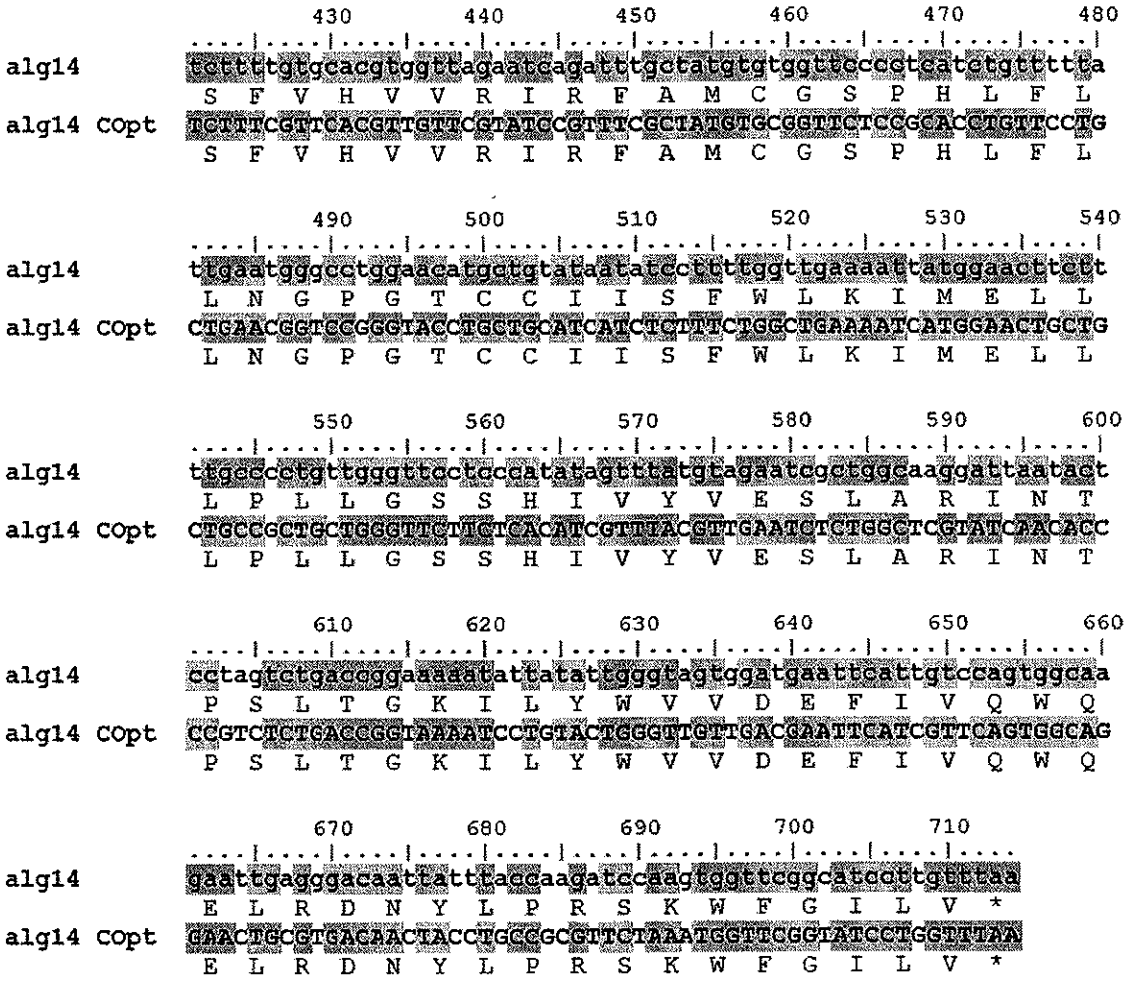


Figure 16 (continued)

ALIGNMENT

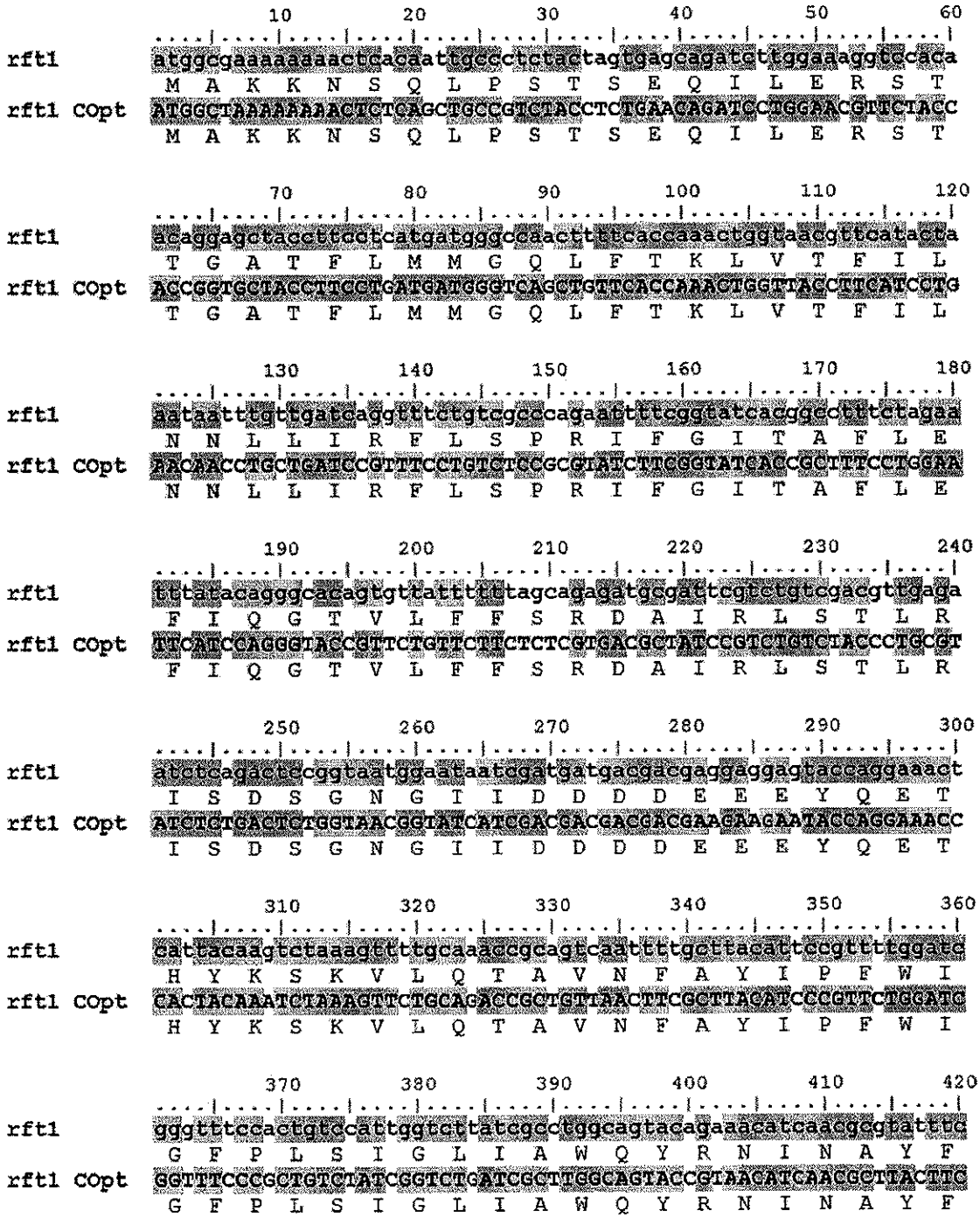


Figure 17

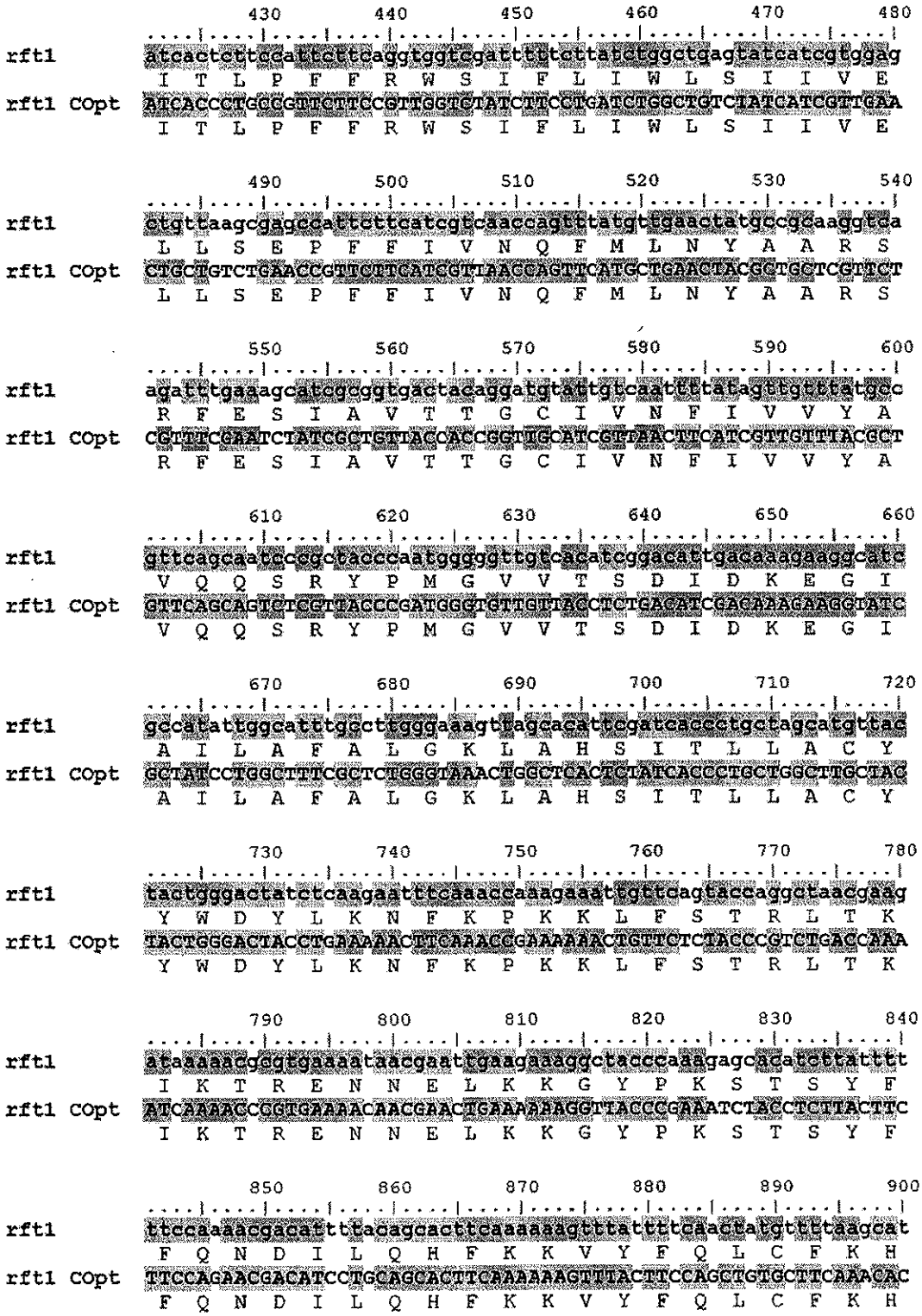


Figure 17 (continued)

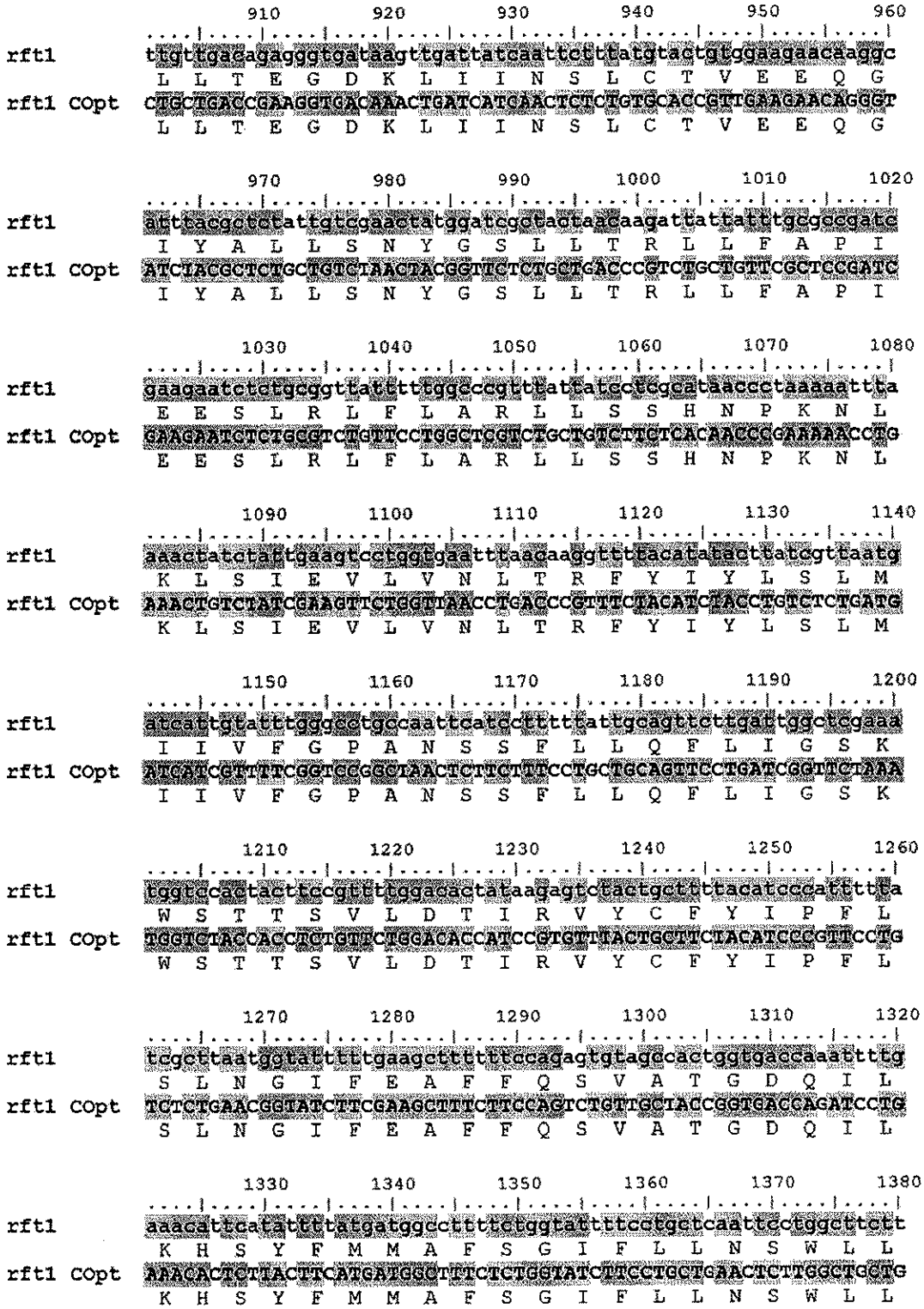


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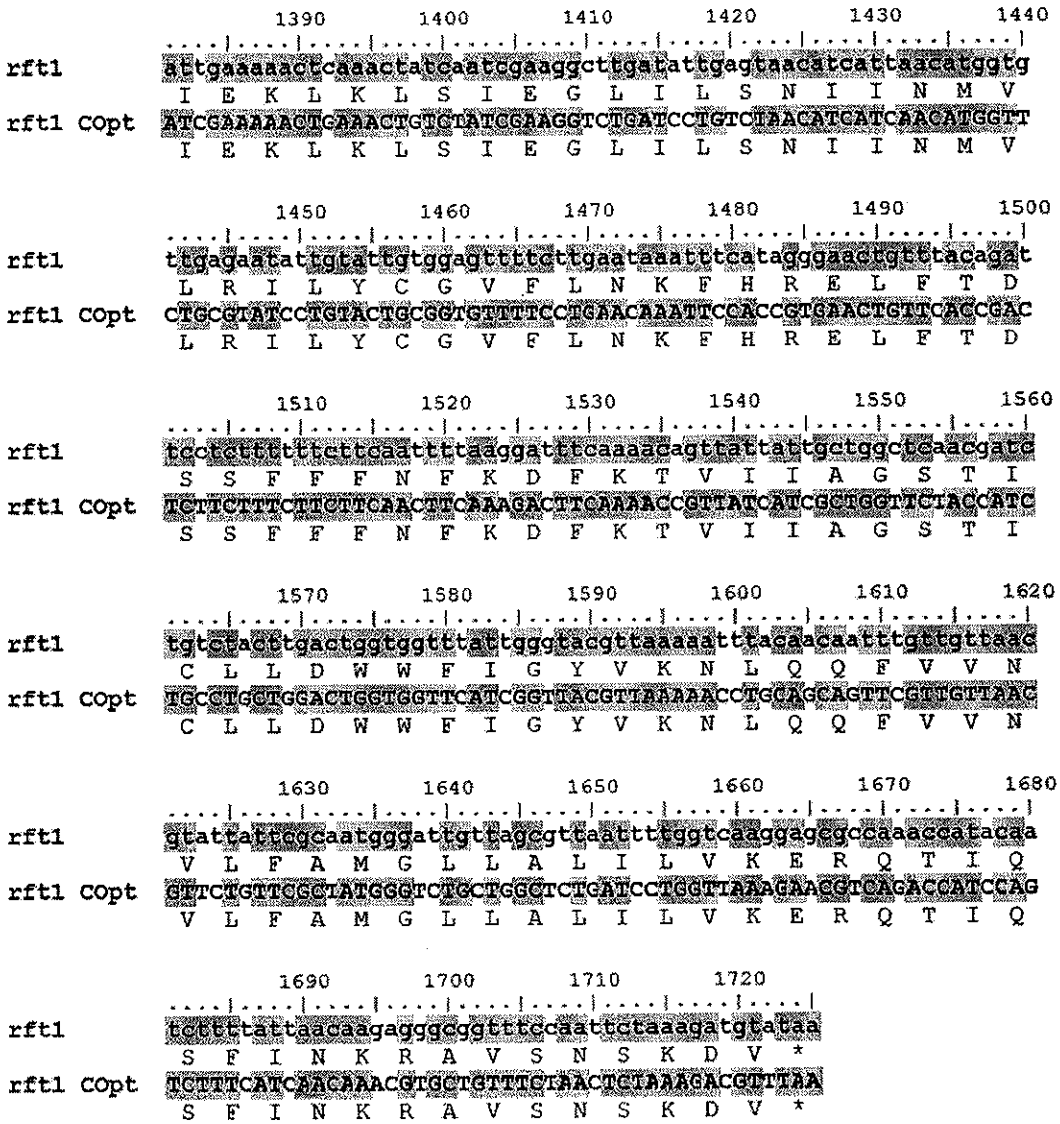


Figure 17 (continued)

ALIGNMENT

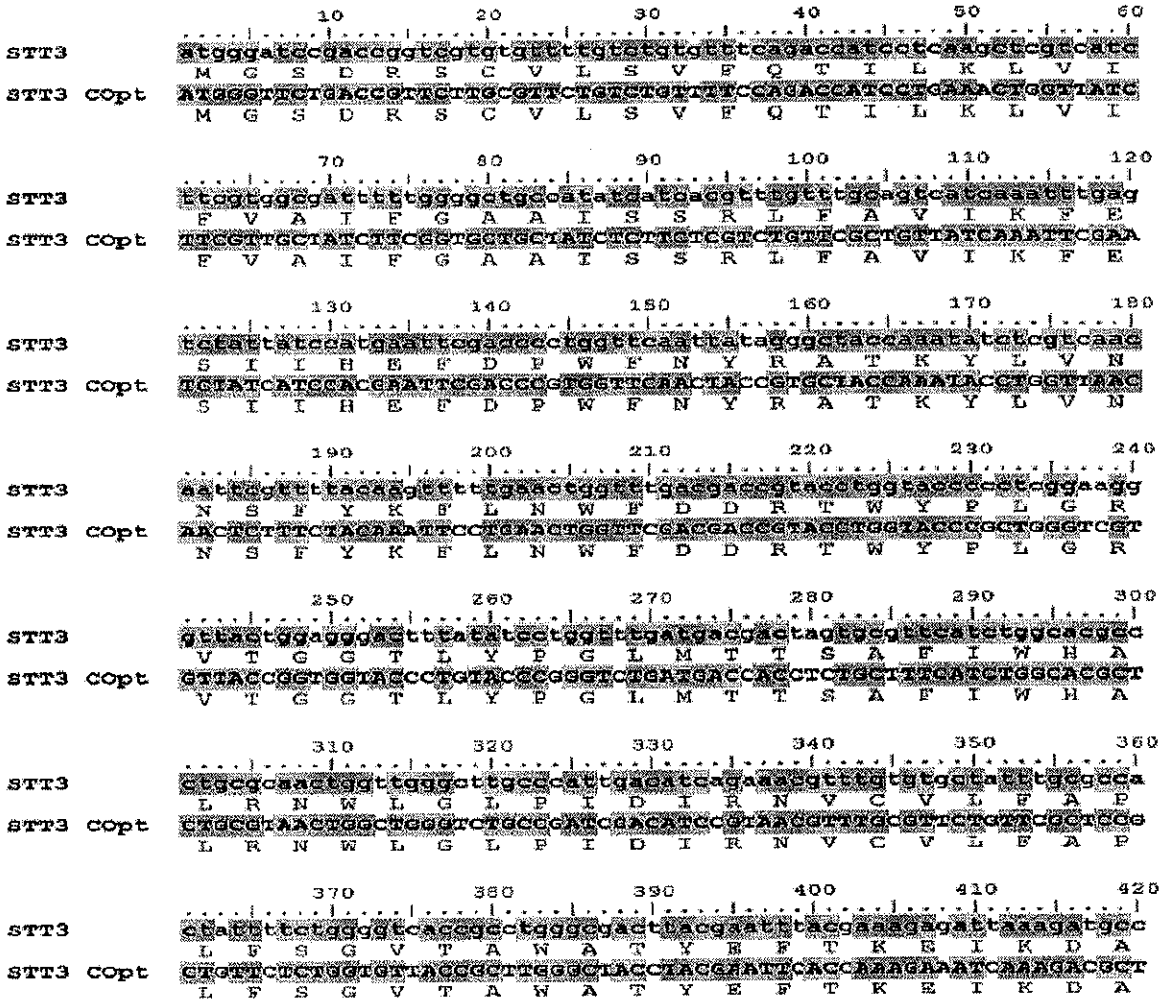


Figure 18

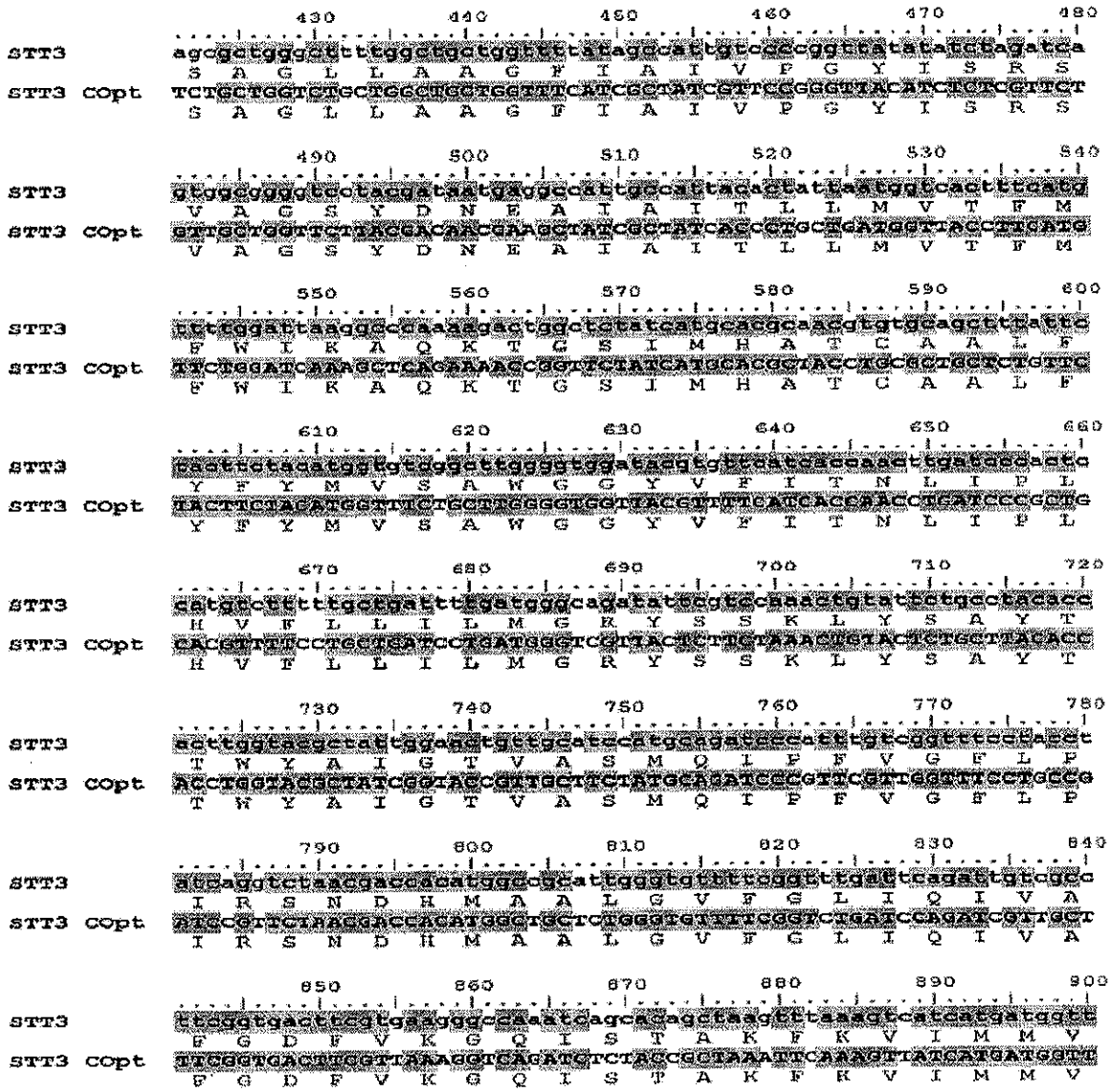


Figure 18 (continued)

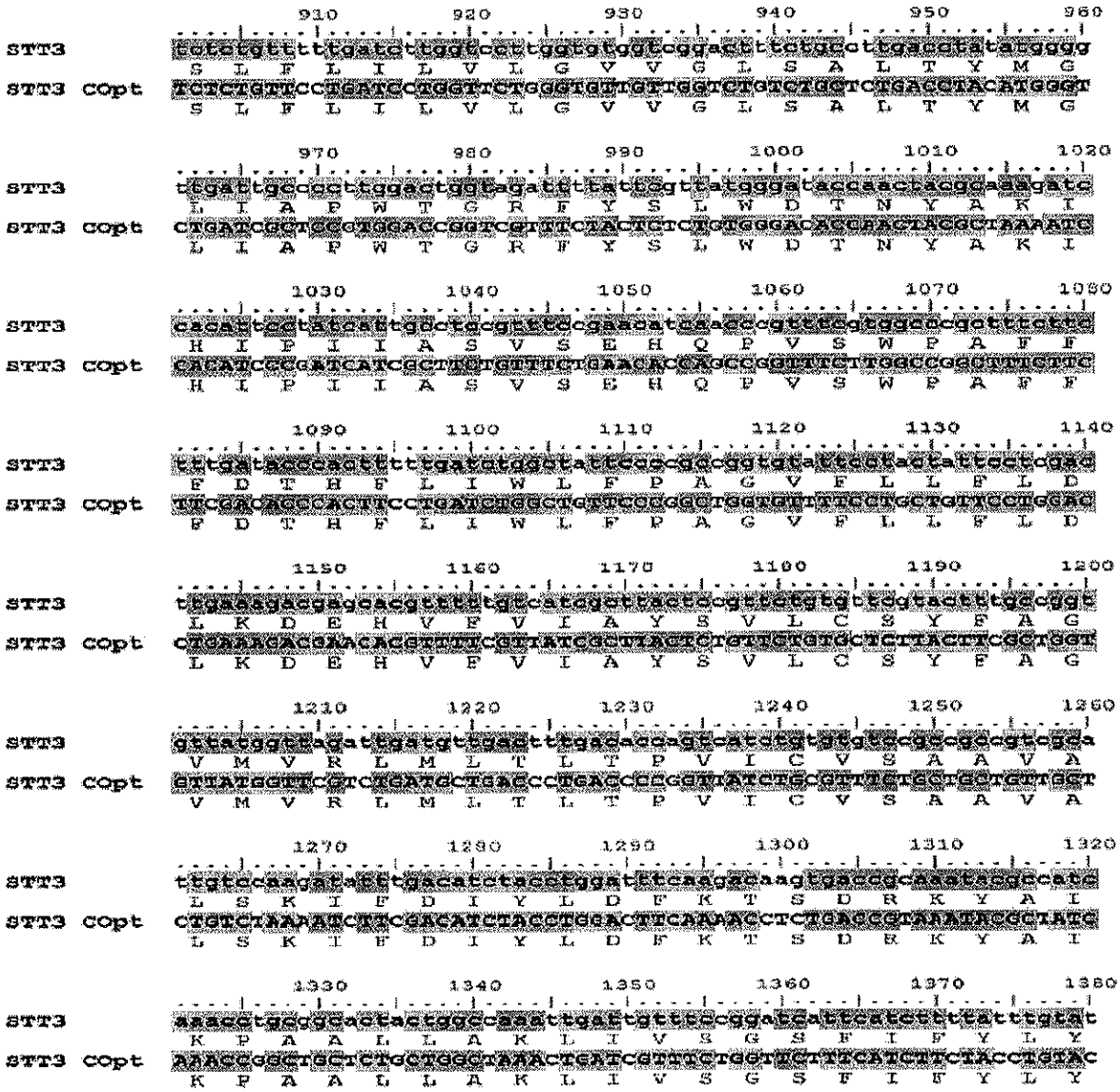


Figure 18 (continued)

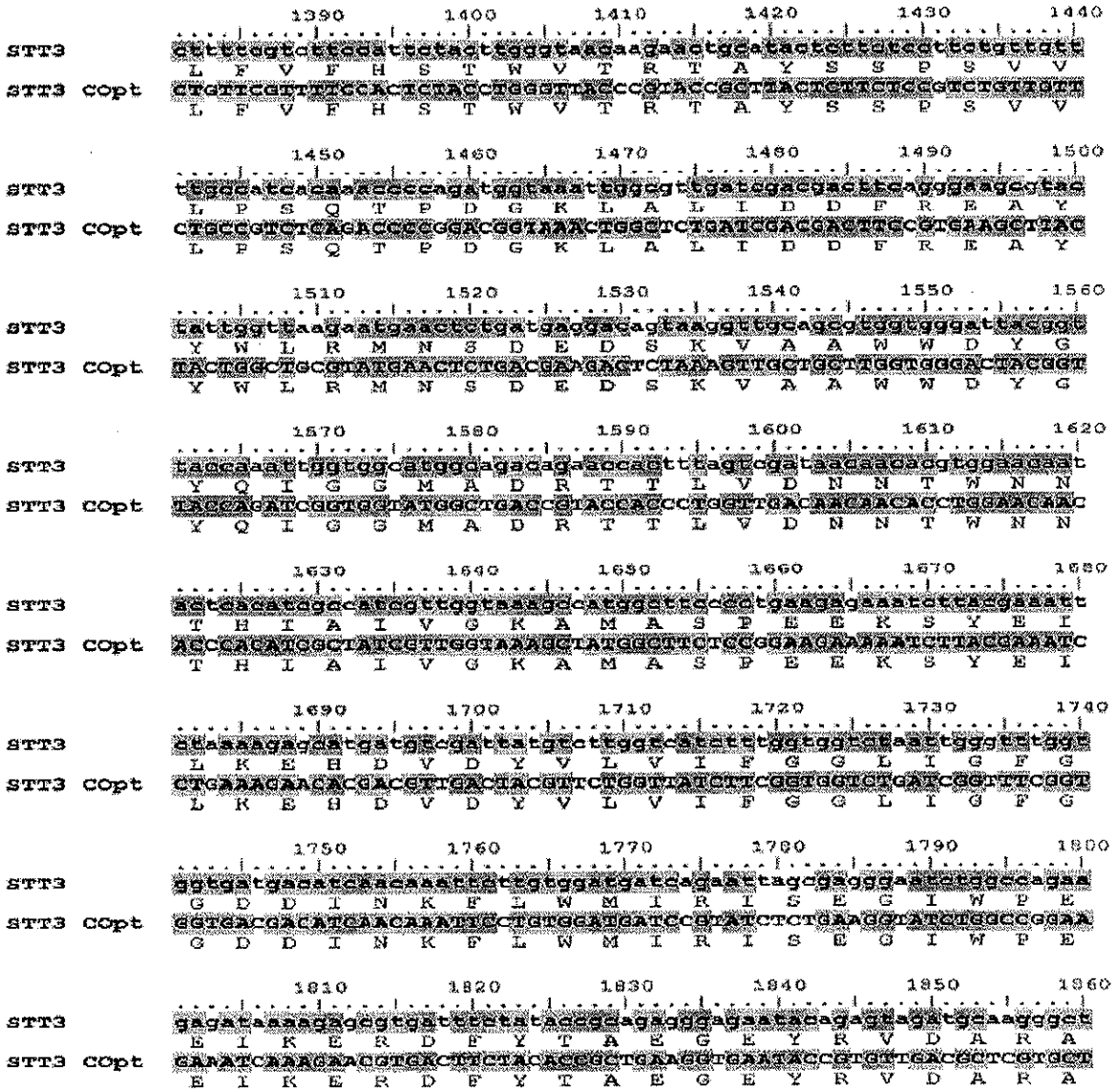


Figure 18 (continued)

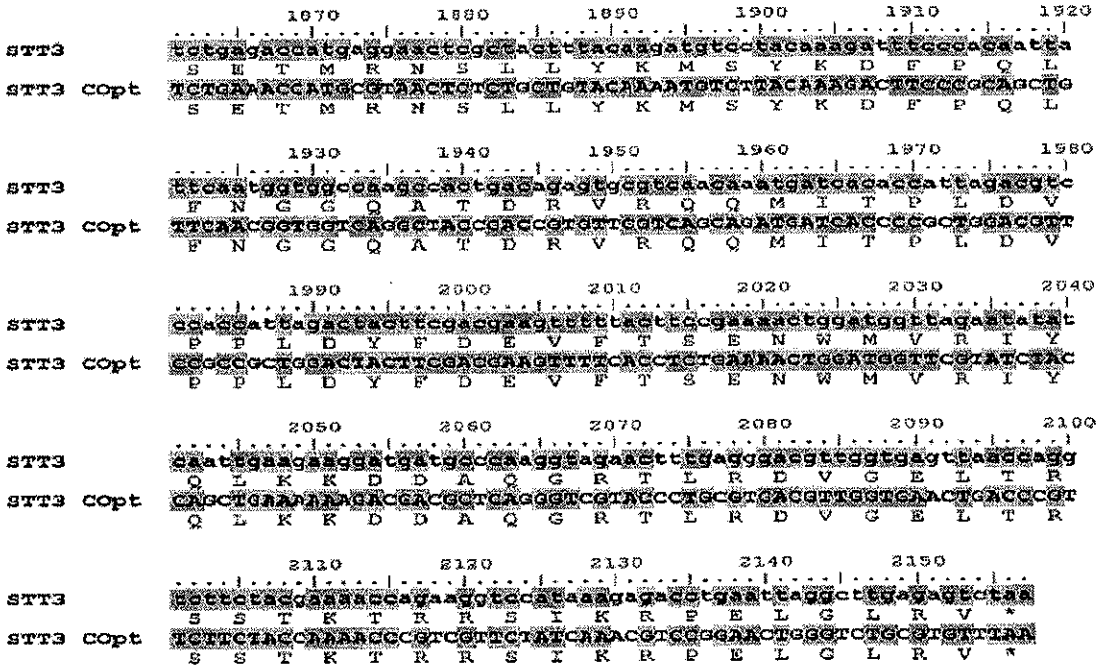


Figure 18 (continued)