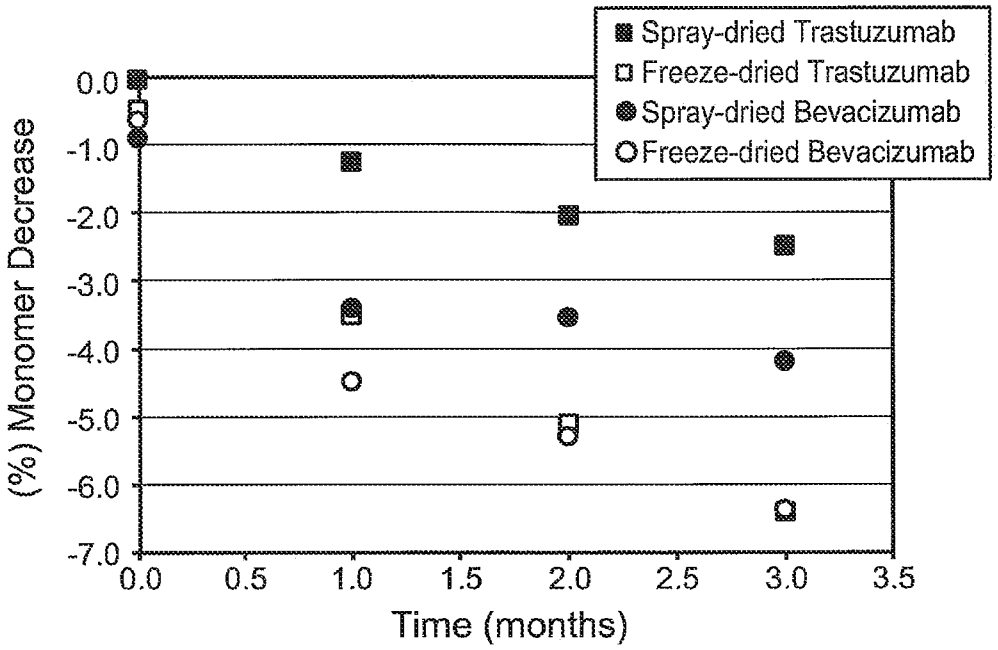

Spray-dried Trastuzumab
Freeze-dried Trastuzumab
Spray-dried Bevacizumab
Freeze-dried Bevacizumab
(%) Monomer Decrease
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
-6.0
-7.0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
Time (months)

FIG. 1

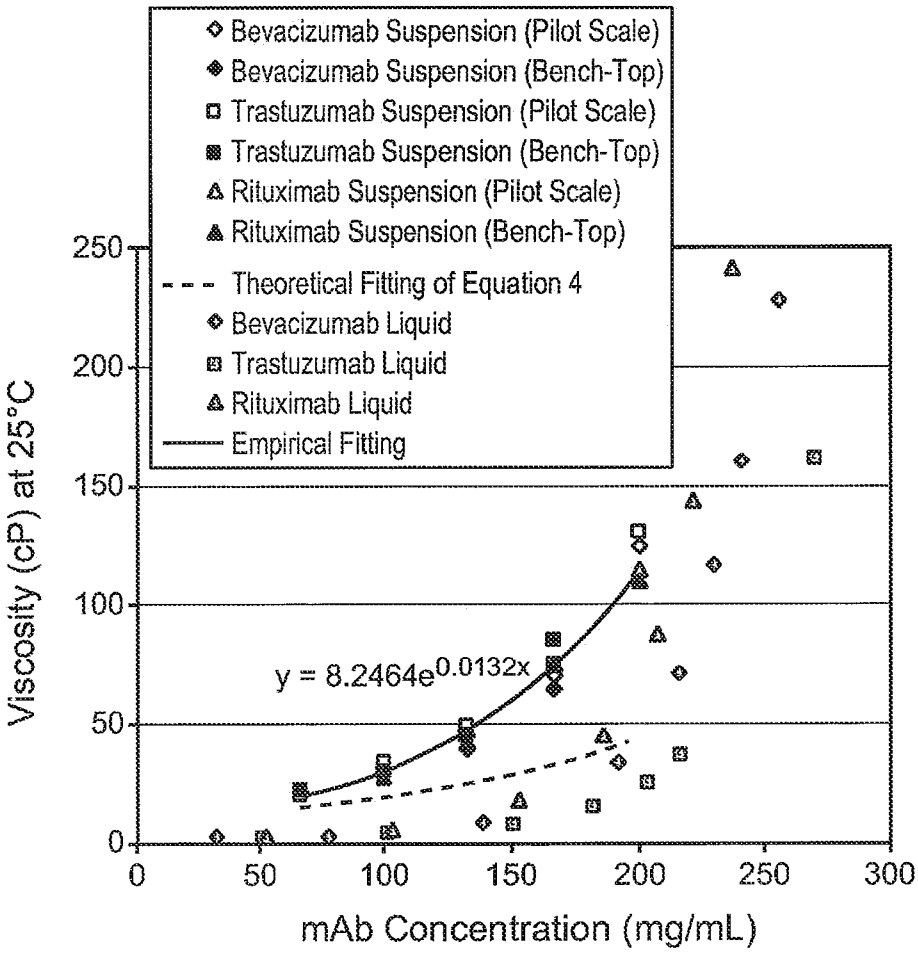

Bevacizumab Suspension (Pilot Scale)
Bevacizumab Suspension (Bench-Top)
Trastuzumab Suspension (Pilot Scale)
Trastuzumab Suspension (Bench-Top)
Rituximab Suspension (Pilot Scale)
Rituximab Suspension (Bench-Top)
Theoretical Fitting of Equation 4
Bevacizumab Liquid
Trastuzumab Liquid
Rituximab Liquid
Empirical Fitting
y = 8.2464e0.0132x
Viscosity (cP) at 25°C
250
200
150
100
50
0
0
50
100
150
200
250
300
mAb Concentration (mg/mL)

FIG. 2

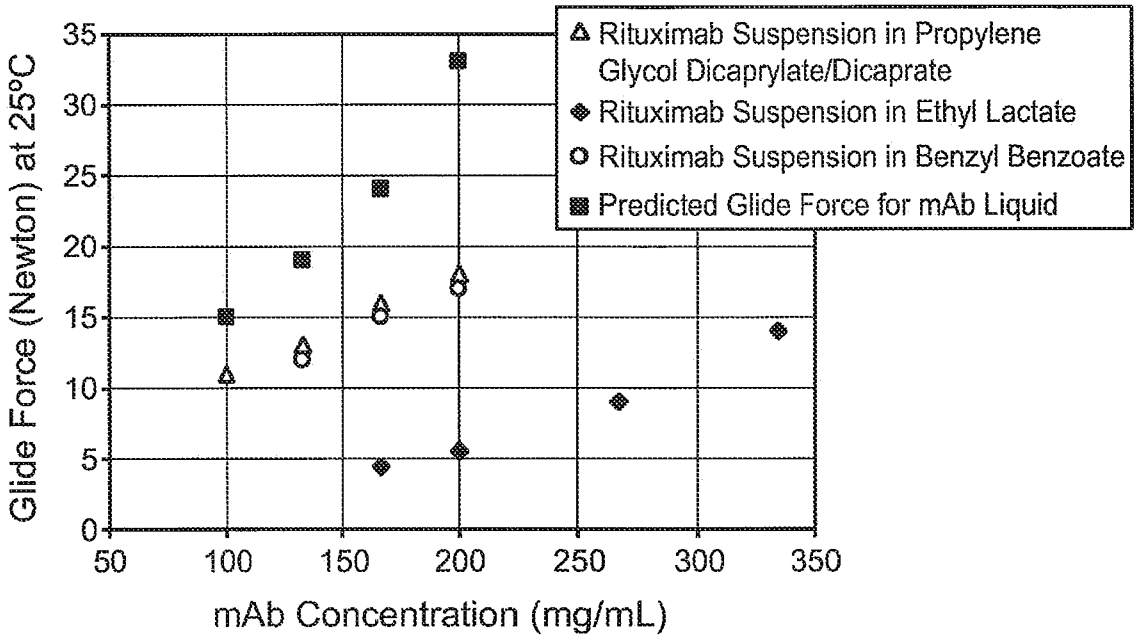

Rituximab Suspension in Propylene Glycol Dicaprylate/Dicaprate
Rituximab Suspension in Ethyl Lactate
Rituximab Suspension in Benzyl Benzoate
Predicted Glide Force for mAb Liquid
Glide Force (Newton) at 25°C
0
5
10
15
20
25
30
35
50
100
150
200
250
300
350
mAb Concentration (mg/mL)

FIG. 3

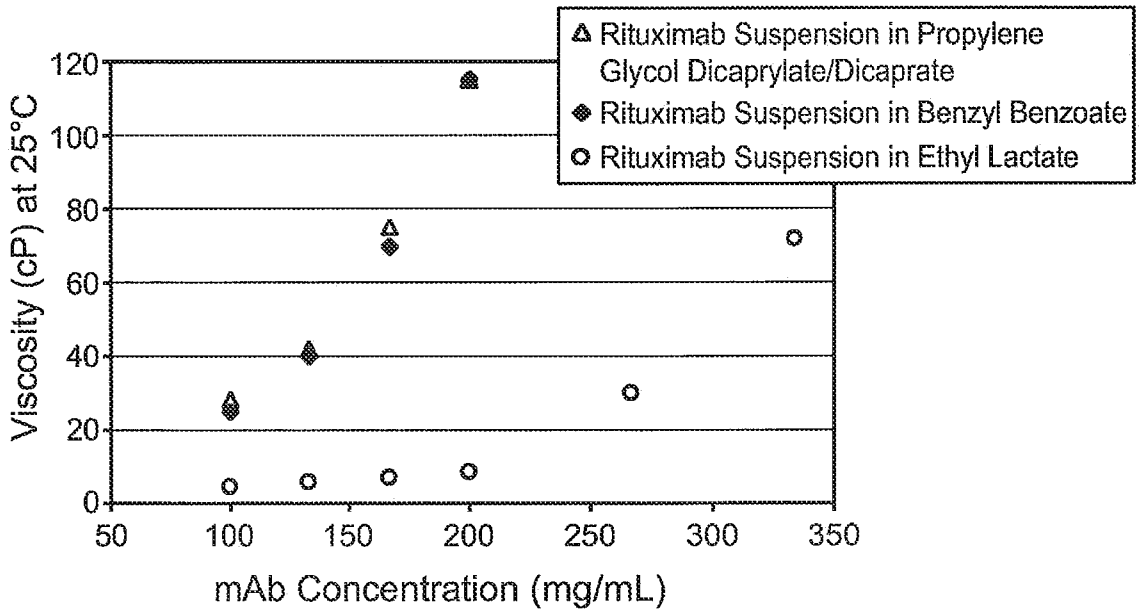

Rituximab Suspension in Propylene Glycol Dicaprylate/Dicaprate
Rituximab Suspension in Benzyl Benzoate
Rituximab Suspension in Ethyl Lactate
Viscosity (cP) at 25°C
0
20
40
60
80
100
120
50
100
150
200
250
300
350
mAb Concentration (mg/mL)

FIG. 4

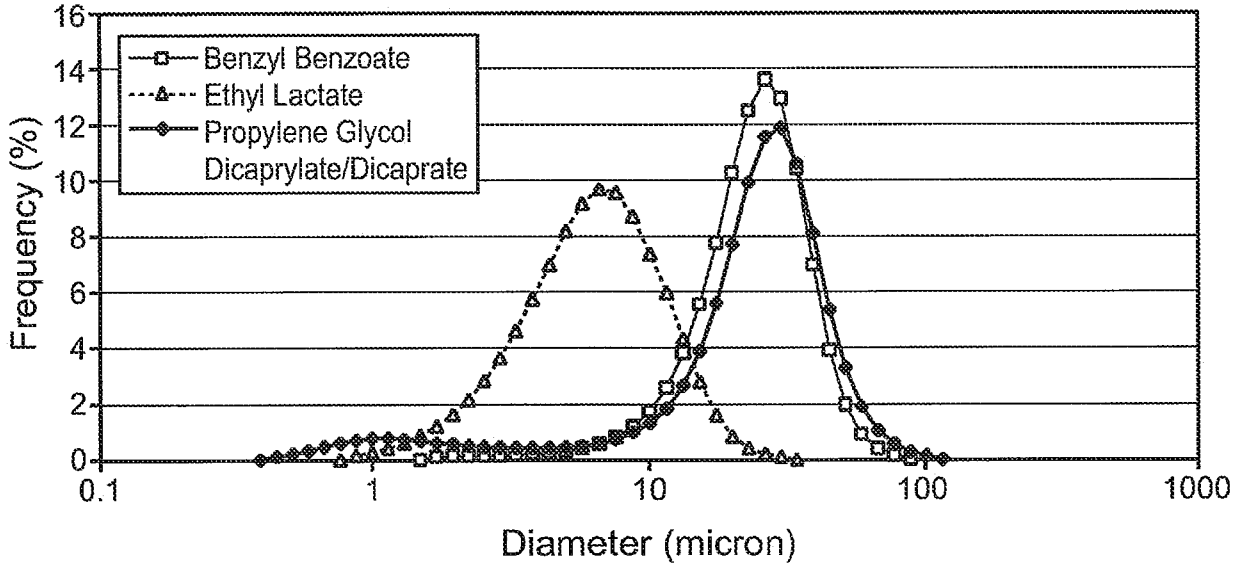


FIG. 5

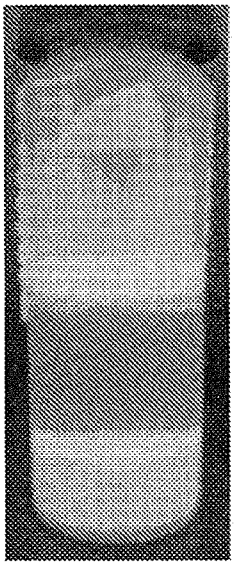


FIG. 6A

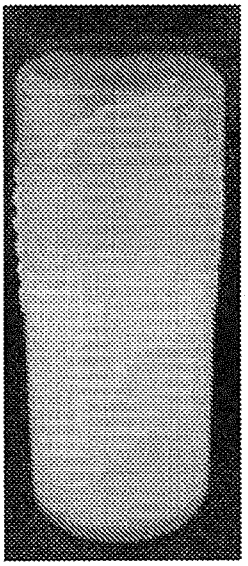


FIG. 6B

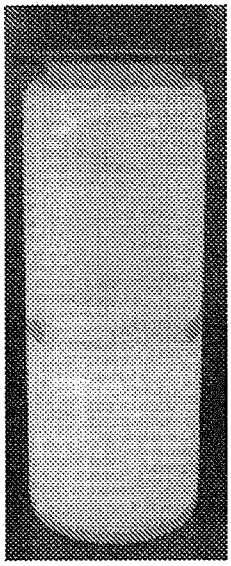


FIG. 6C

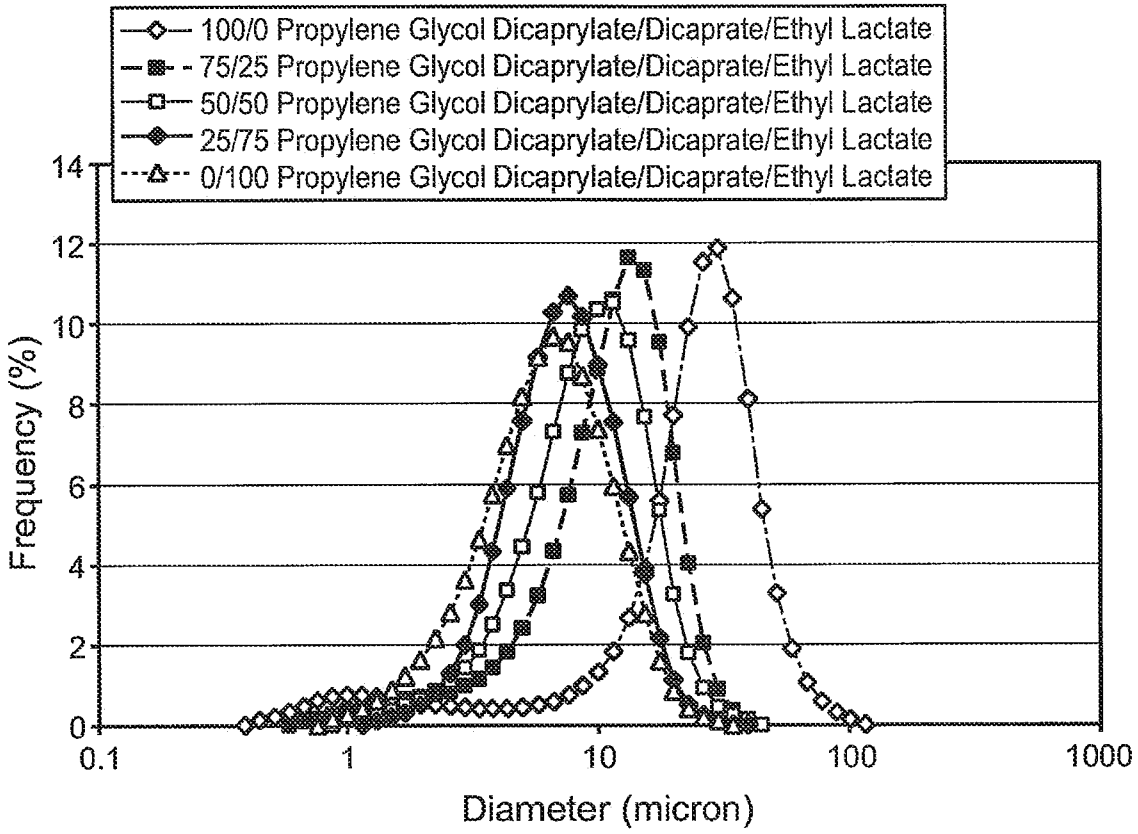

100/0 Propylene Glycol Dicaprylate/Dicaprate/Ethyl Lactate
75/25 Propylene Glycol Dicaprylate/Dicaprate/Ethyl Lactate
50/50 Propylene Glycol Dicaprylate/Dicaprate/Ethyl Lactate
25/75 Propylene Glycol Dicaprylate/Dicaprate/Ethyl Lactate
0/100 Propylene Glycol Dicaprylate/Dicaprate/Ethyl Lactate
Frequency (%)
0
2
4
6
8
10
12
14
0.1
1
10
100
1000
Diameter (micron)

FIG. 7A



FIG. 7B

FIG. 8A-1

FIG. 8A-2

FIG. 8A

FIG. 8A-1

Rituximab Heavy Chain

```
          | +1       FR1                                  10                  15
          |Gln Val Gln Leu Gln Gln Pro Gly Ala Glu Leu Val Lys Pro Gly Ala Ser
           20                  25                  30 |31   CDR1        35 | 36
Val Lys Met Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr|Ser Tyr Asn Met His|Trp
              40  FR2              45                 49| 50       52 52A  53  54
Val Lys Gln Thr Pro Gly Arg Gly Leu Glu Trp Ile Gly|Ala Ile Tyr Pro Gly Asn
55          CDR2     60                  65 |66  FR3          70
Gly Asp Thr Ser Tyr Asn Gln Lys Phe Lys Gly|Lys Ala Thr Leu Thr Ala Asp Lys
    75                  80      82  82A 82B 82C 83      85
Ser Ser Ser Thr Ala Tyr Met Gln Leu Ser Ser Leu Thr Ser Glu Asp Ser Ala Val
90                94|95      CDR3         100 100A100B100C100D 101 102|103
Tyr Tyr Cys Ala Arg|Ser Thr Tyr Tyr Gly Gly Asp Trp Tyr Phe Asn Val|Trp Gly
105 FR4             110         113|114                   120
Ala Gly Thr Thr Val Thr Val Ser Ala|Ala Ser Thr Lys Gly Pro Ser Val Phe Pro
                          Human Gamma 1 Constant
130 133                       140
Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu Val
                    150             154 156 157 162
Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser
169 171                             180 182
Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser
190                                 200 203 205                 210
Val Val Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn
```

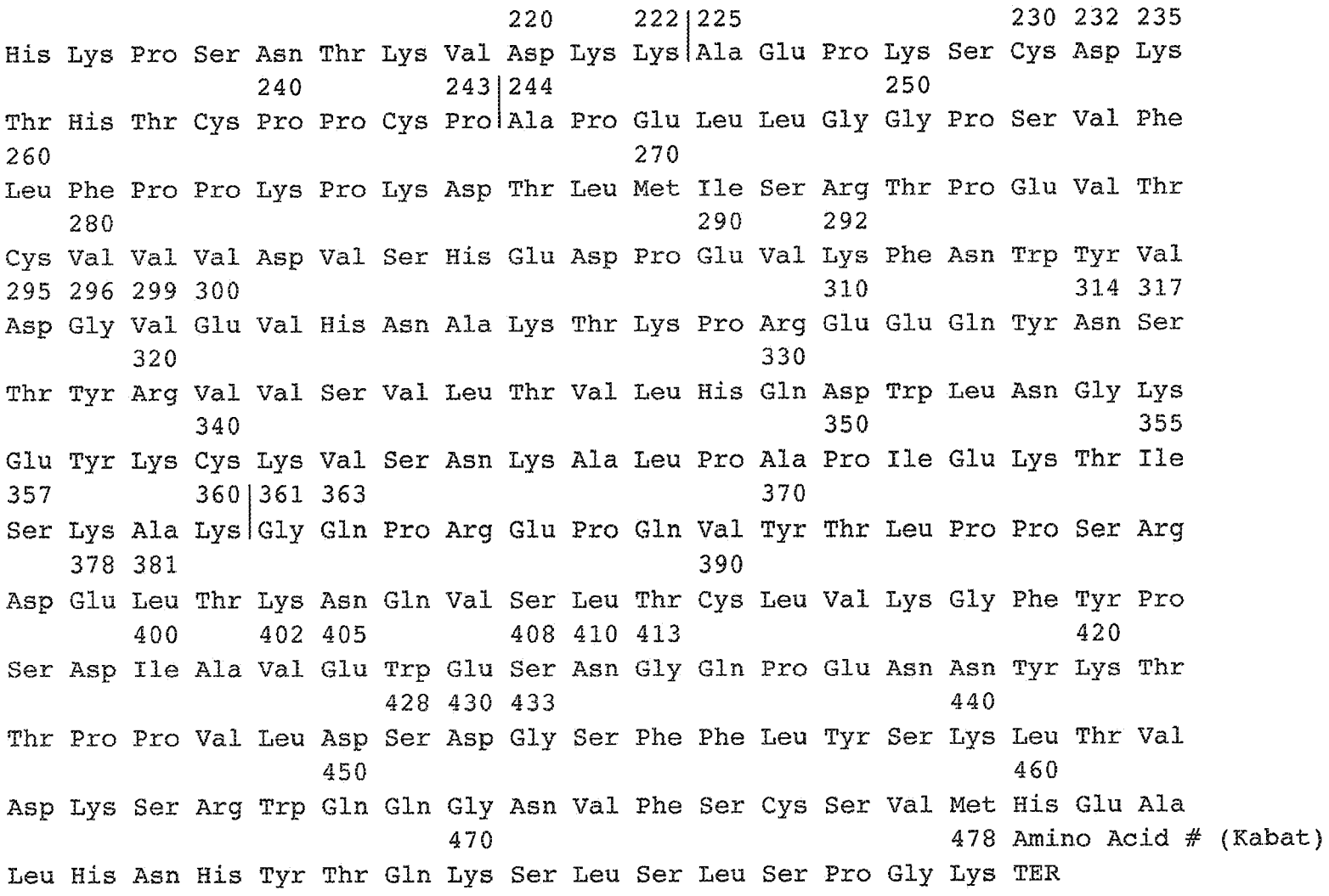

220 222 225 230 232 235
His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Ala Glu Pro Lys Ser Cys Asp Lys
240 243 244 250
Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
260 270
Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr
280 290 292
Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val
295 296 299 300 310 314 317
Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
320 330
Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys
340 350 355
Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile
357 360 361 363 370
Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg
378 381 390
Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro
400 402 405 408 410 413 420
Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr
428 430 433 440
Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val
450 460
Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala
470 478 Amino Acid # (Kabat)
Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys TER

FIG. 8A-2

Rituximab Light Chain

```
                        | +1      FR1                                  10
                        |Gln Ile Val Leu Ser Gln Ser Pro Ala Ile Leu Ser Ala Ser
                          20          23 | 24      CDR1     27/ 29  30          34 |
Pro Gly Glu Lys Val Thr Met Thr Cys|Arg Ala Ser Ser Ser Val Ser Tyr Ile His|
 35      FR2             40                      45              49 |50      CDR2
Trp Phe Gln Gln Lys Pro Gly Ser Ser Pro Lys Pro Trp Ile Tyr|Ala Thr Ser Asn
    55   56| 57          60        FR3           65                  70
Leu Ala Ser|Gly Val Pro Val Arg Phe Ser Gly Ser Gly Ser Gly Thr Ser Tyr Ser
         75                      80                      85           88|89  90
Leu Thr Ile Ser Arg Val Glu Ala Glu Asp Ala Ala Thr Tyr Tyr Cys|Gln Gln Trp
      CDR3  95        97 |98       100 FR4                 105       107|108       110
Thr Ser Asn Pro Pro Thr|Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys|Arg Thr Val
                                 120
Ala Ala Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu Gln Leu Lys Ser Gly Thr
                              Human Kappa Constant
130                                     140
Ala Ser Val Val Cys Leu Leu Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp
    150                                 160
Lys Val Asp Asn Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp
         170                                 180
Ser Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr
              190                                 200
Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser Pro Val
                  210             214                Amino Acid # (kabat)
Thr Lys Ser Phe Asn Arg Gly Glu Cys TER
```

FIG. 8B

Bevacizumab Heavy Chain

EVQLVESGGGLVQPGGSLRLSCAASGYTFTNYGMNWVRQAPGKGLEWVGWINTYTGE
PTYAADFKRRFTFSLDTSKSTAYLQMNSLRAEDTAVYYCAKYPHYYGSSHWYFDVWG
QGTLVTVSS||ASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALT
SGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCD
KTHTCPPCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWY
VDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKT
ISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYK
TTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK

FIG. 9A

Bevacizumab Light Chain

DIQMTQSPSSLSASVGDRVTITCSASQDISNYLNWYQQKPGKAPKVLIYFTSSLHSG
VPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYSTVPWTFGQGTKVEIKR||TVAAP
SVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKD
STYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

FIG. 9B

TRASTUZUMAB Heavy Chain

```
1                               15                              30                              45
E V Q L V E S G G G L V Q P G G S L R L S C A A S G F N I K D T Y I H W V R Q A P G K G L
                                                                CDR H1
46                              60                              75                              90
E W V A R I Y P T N G Y T R Y A D S V K G R F T I S A D T S K N T A Y L Q M N S L R A E D
                CDR H2
91                              105                             120                             135
T A V Y Y C S R W G G D G F Y A M D Y W G Q G T L V T V S S || A S T K G P S V F P L A P S S
                CDR H3
136                             150                             165                             180
K S T S G G T A A L G C L V K D Y F P E P V T V S W N S G A L T S G V H T F P A V L Q S S

181                             195                             210                             225
G L Y S L S S V V T V P S S S L G T Q T Y I C N V N H K P S N T K V D K K V E P K S C D K

226                             240                             255                             270
T H T C P P C P A P E L L G G P S V F L F P P K P K D T L M I S R T P E V T C V V V D V S

271                             285                             300                             315
H E D P E V K F N W Y V D G V E V H N A K T K P R E E Q Y N S T Y R V V S V L T V L H Q D

316                             330                             345                             360
W L N G K E Y K C K V S N K A L P A P I E K T I S K A K G Q P R E P Q V Y T L P P S R E E

361                             375                             390                             405
M T K N Q V S L T C L V K G F Y P S D I A V E W E S N G Q P E N N Y K T T P P V L D S D G

406                             420                             435                             449
S F F L Y S K L T V D K S R W Q Q G N V F S C S V M H E A L H N H Y T Q K S L S L S P G
```

FIG. 10A

TRASTUZUMAB Light Chain

```
1                                 15                                30                                45
D I Q M T Q S P S S L S A S V G D R V T I T C [R A S Q D V N T A V A] W Y Q Q K P G K A P K
                                                    CDR L1

46                                60                                75                                90
L L I Y [S A S F L Y S] G V P S R F S G S R S G T D F T L T I S S L Q P E D F A T Y Y C [Q Q]
          CDR L2

91                                105                               120                               135
[H Y T T P P T] F G Q G T K V E I K R‖T V A A P S V F I F P P S D E Q L K S G T A S V V C L
 CDR L3

136                               150                               165                               180
L N N F Y P R E A K V Q W K V D N A L Q S G N S Q E S V T E Q D S K D S T Y S L S S T L T

181                               195                               210     214
L S K A D Y E K H K V Y A C E V T H Q G L S S P V T K S F N R G E C
```

FIG. 10B