Fig. 1

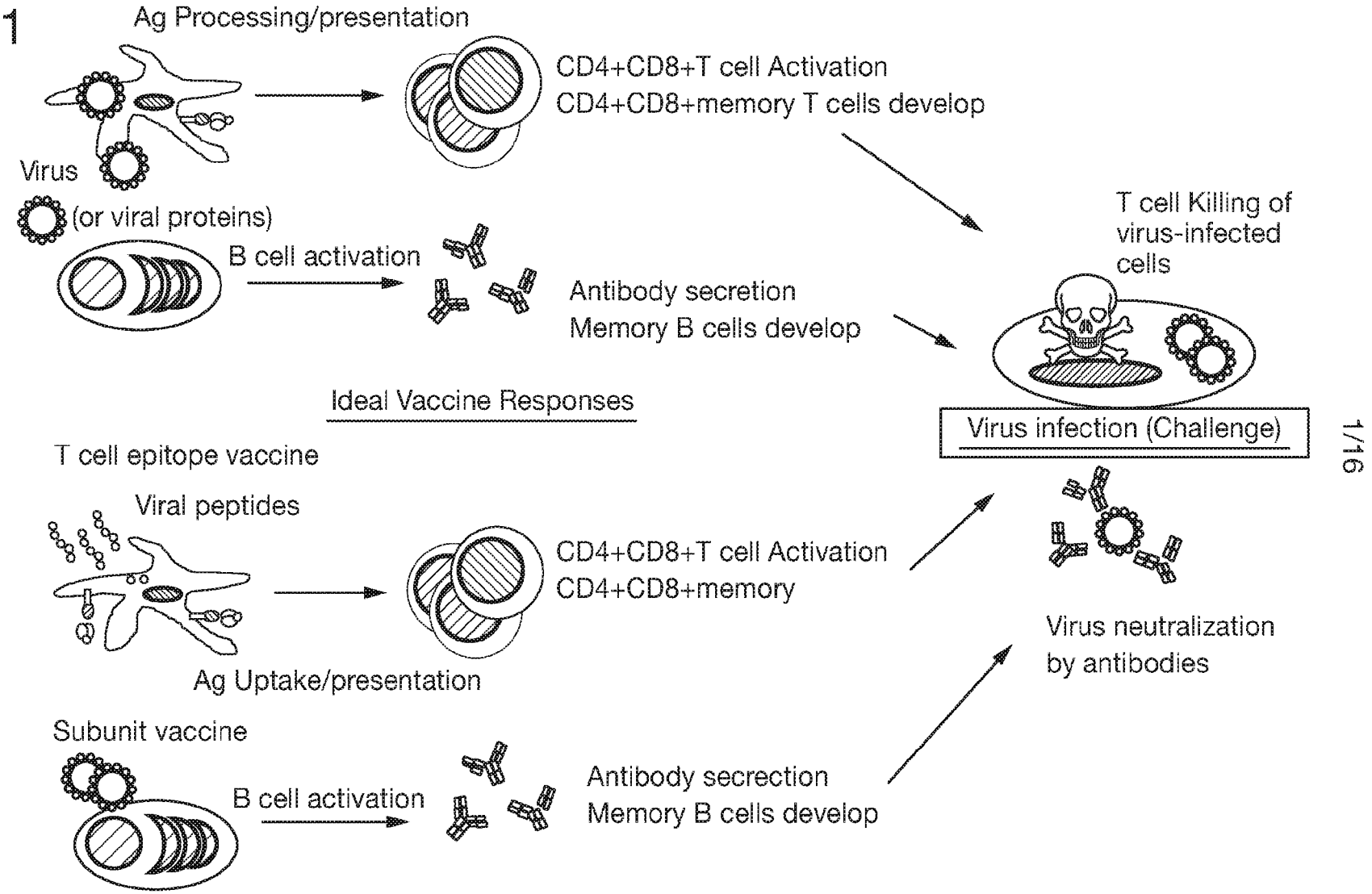
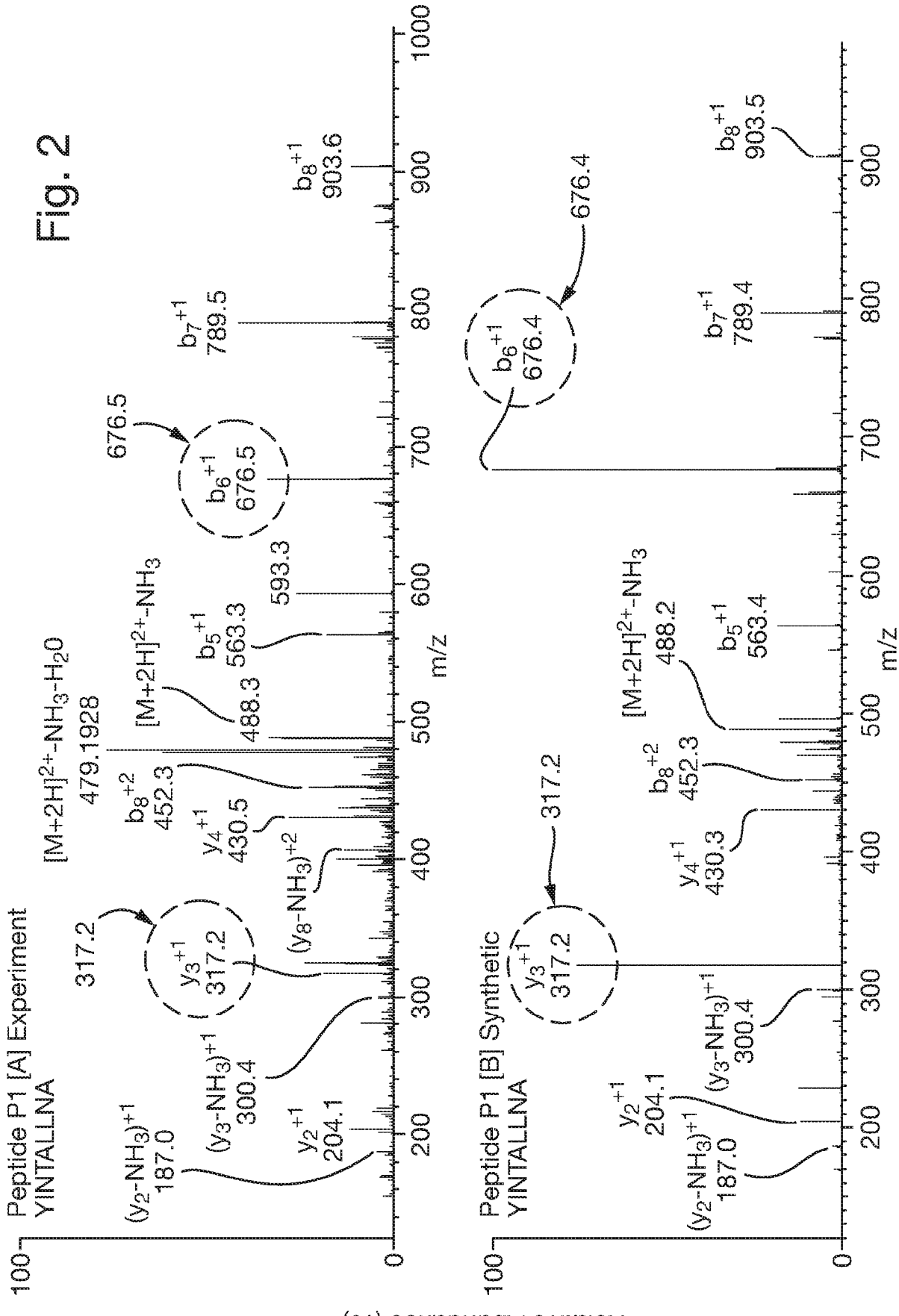

Ag Processing/presentation
CD4+CD8+T cell Activation
CD4+CD8+memory T cells develop
Virus
(or viral proteins)
B cell activation
Antibody secretion
Memory B cells develop
T cell Killing of virus-infected cells
Ideal Vaccine Responses
Virus infection (Challenge)
T cell epitope vaccine
Viral peptides
CD4+CD8+T cell Activation
CD4+CD8+memory
Ag Uptake/presentation
Virus neutralization by antibodies
Subunit vaccine
B cell activation
Antibody secretion
Memory B cells develop

Fig. 2


Peptide P1 [A] Experiment
YINTALLNA
Peptide P1 [B] Synthetic
YINTALLNA
Relative Abundance (%)
m/z
100
0
200
300
400
500
600
700
800
900
1000
$(y_2\text{-}NH_3)^{+1}$ 187.0
y_2^{+1} 204.1
$(y_3\text{-}NH_3)^{+1}$ 300.4
317.2
y_3^{+1} 317.2
$(y_8\text{-}NH_3)^{+2}$
y_4^{+1} 430.5
b_8^{+2} 452.3
$[M+2H]^{2+}\text{-}NH_3\text{-}H_2O$ 479.1928
$[M+2H]^{2+}\text{-}NH_3$
b_5^{+1} 563.3
488.3
593.3
676.5
b_6^{+1} 676.5
b_7^{+1} 789.5
b_8^{+1} 903.6
y_4^{+1} 430.3
b_8^{+2} 452.3
488.2
b_5^{+1} 563.4
676.4
b_6^{+1} 676.4
b_7^{+1} 789.4
b_8^{+1} 903.5

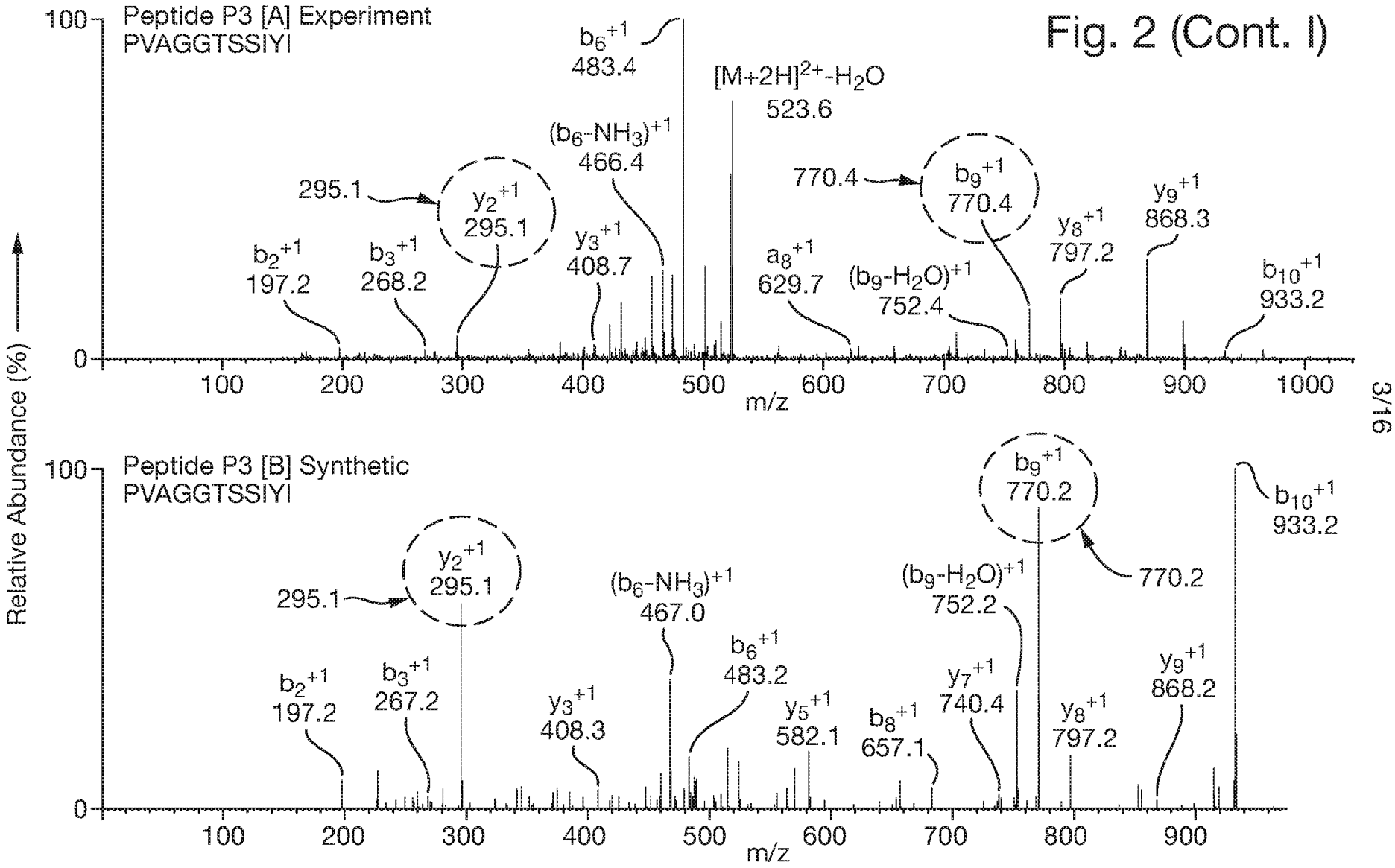
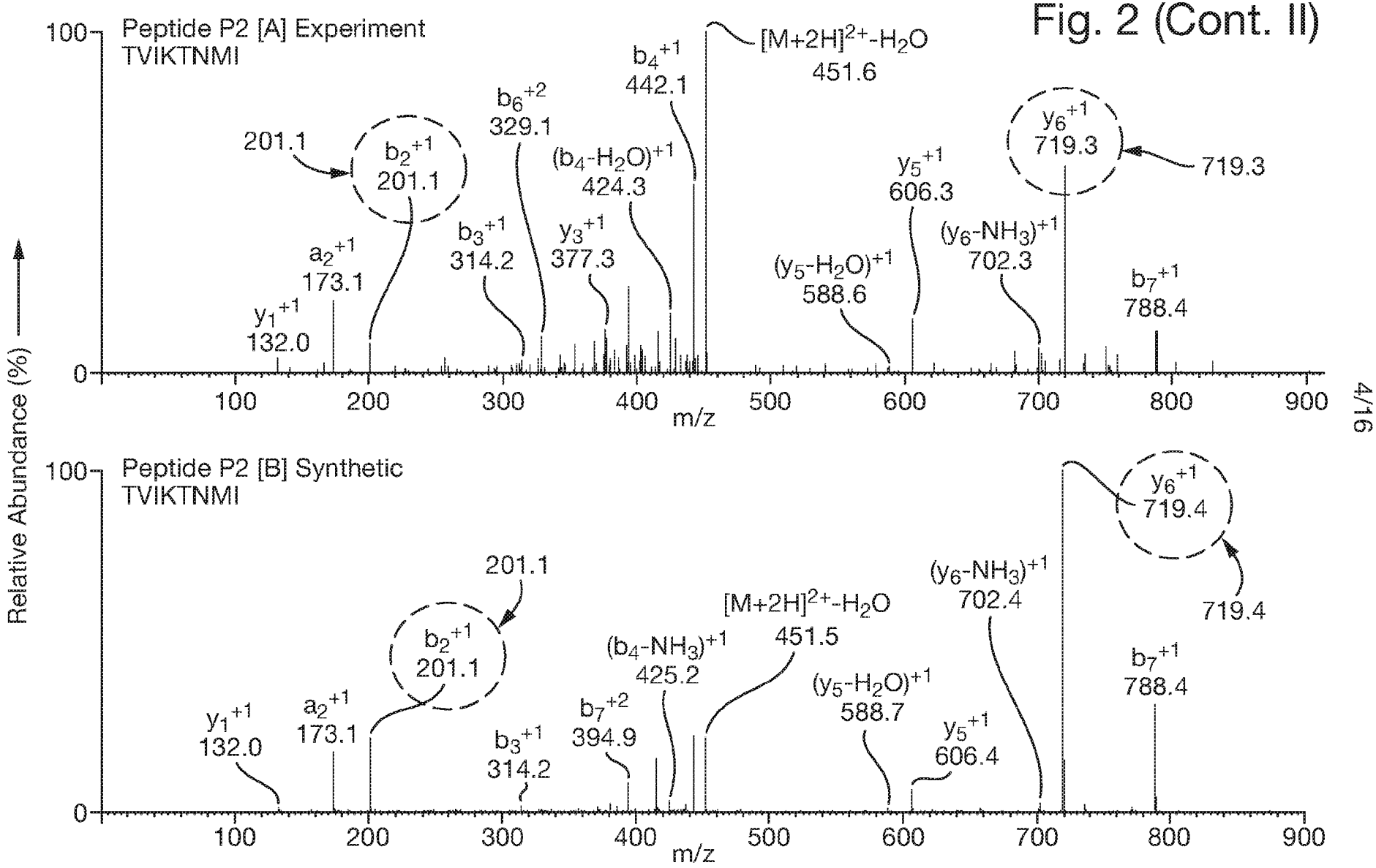

Peptide P3 [A] Experiment
PVAGGTSSIYI
100
0
Relative Abundance (%)
b_6^{+1} 483.4
$[M+2H]^{2+}-H_2O$ 523.6
$(b_6-NH_3)^{+1}$ 466.4
295.1
y_2^{+1} 295.1
770.4
b_9^{+1} 770.4
y_9^{+1} 868.3
y_8^{+1} 797.2
b_2^{+1} 197.2
b_3^{+1} 268.2
y_3^{+1} 408.7
a_8^{+1} 629.7
$(b_9-H_2O)^{+1}$ 752.4
b_{10}^{+1} 933.2
100 200 300 400 500 600 700 800 900 1000
m/z
Peptide P3 [B] Synthetic
PVAGGTSSIYI
100
0
b_9^{+1} 770.2
b_{10}^{+1} 933.2
y_2^{+1} 295.1
295.1
$(b_6-NH_3)^{+1}$ 467.0
$(b_9-H_2O)^{+1}$ 752.2
770.2
b_6^{+1} 483.2
y_7^{+1} 740.4
y_9^{+1} 868.2
b_2^{+1} 197.2
b_3^{+1} 267.2
y_3^{+1} 408.3
y_5^{+1} 582.1
b_8^{+1} 657.1
y_8^{+1} 797.2
100 200 300 400 500 600 700 800 900
m/z

Fig. 2 (Cont. I)

Fig. 2 (Cont. II)


Peptide P2 [A] Experiment
TVIKTNMI
100
0
Relative Abundance (%)
201.1
b_2^{+1} 201.1
b_6^{+2} 329.1
b_4^{+1} 442.1
$[M+2H]^{2+}-H_2O$ 451.6
$(b_4-H_2O)^{+1}$ 424.3
y_6^{+1} 719.3
719.3
y_5^{+1} 606.3
$(y_6-NH_3)^{+1}$ 702.3
b_3^{+1} 314.2
y_3^{+1} 377.3
a_2^{+1} 173.1
$(y_5-H_2O)^{+1}$ 588.6
b_7^{+1} 788.4
y_1^{+1} 132.0
100 200 300 400 500 600 700 800 900
m/z
Peptide P2 [B] Synthetic
TVIKTNMI
100
0
201.1
b_2^{+1} 201.1
y_6^{+1} 719.4
719.4
$(y_6-NH_3)^{+1}$ 702.4
$[M+2H]^{2+}-H_2O$ 451.5
$(b_4-NH_3)^{+1}$ 425.2
b_7^{+1} 788.4
$(y_5-H_2O)^{+1}$ 588.7
y_5^{+1} 606.4
b_7^{+2} 394.9
b_3^{+1} 314.2
a_2^{+1} 173.1
y_1^{+1} 132.0
100 200 300 400 500 600 700 800 900
m/z

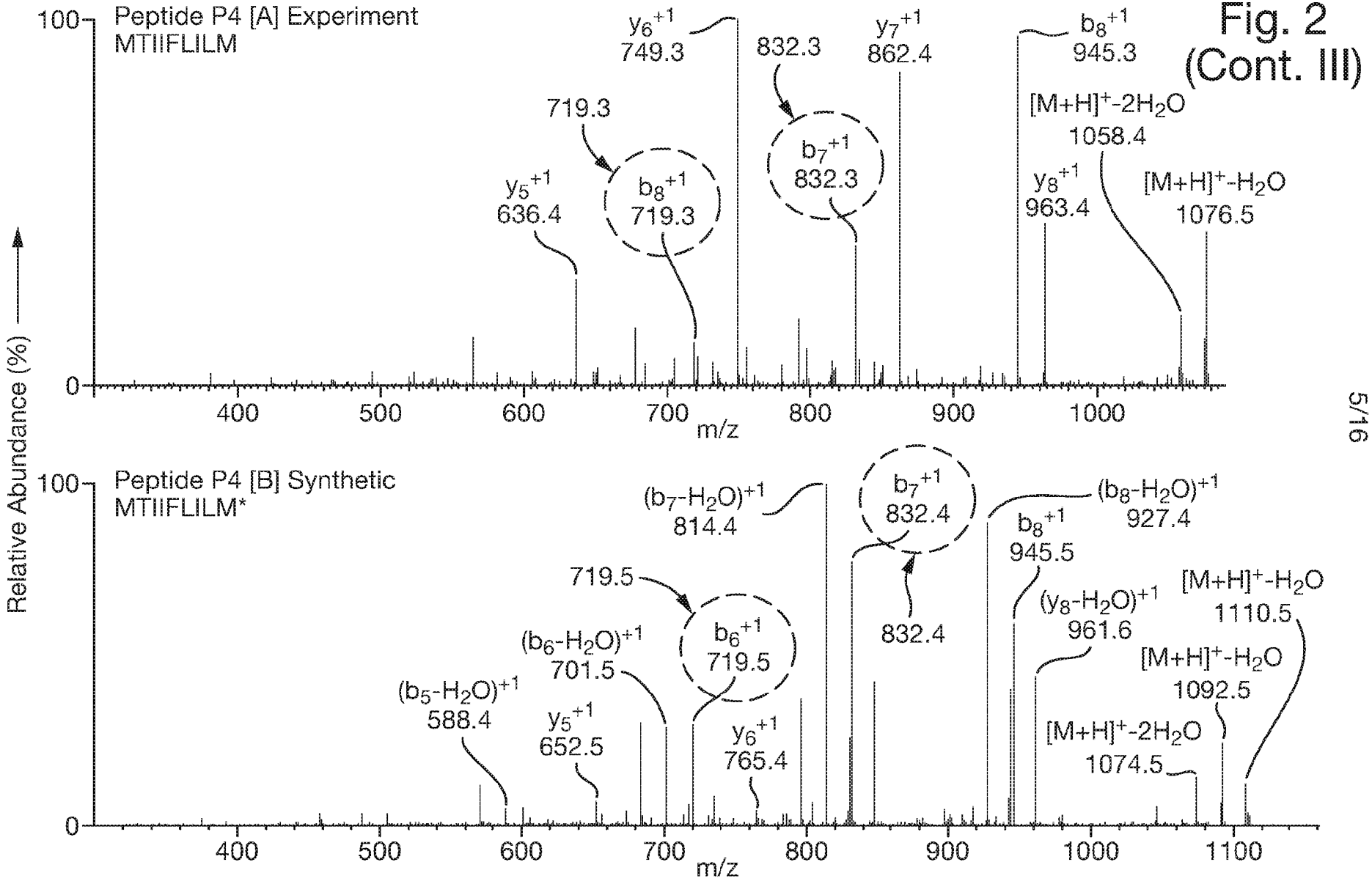


Fig. 2 (Cont. III)

Fig. 2 (Cont. IV)

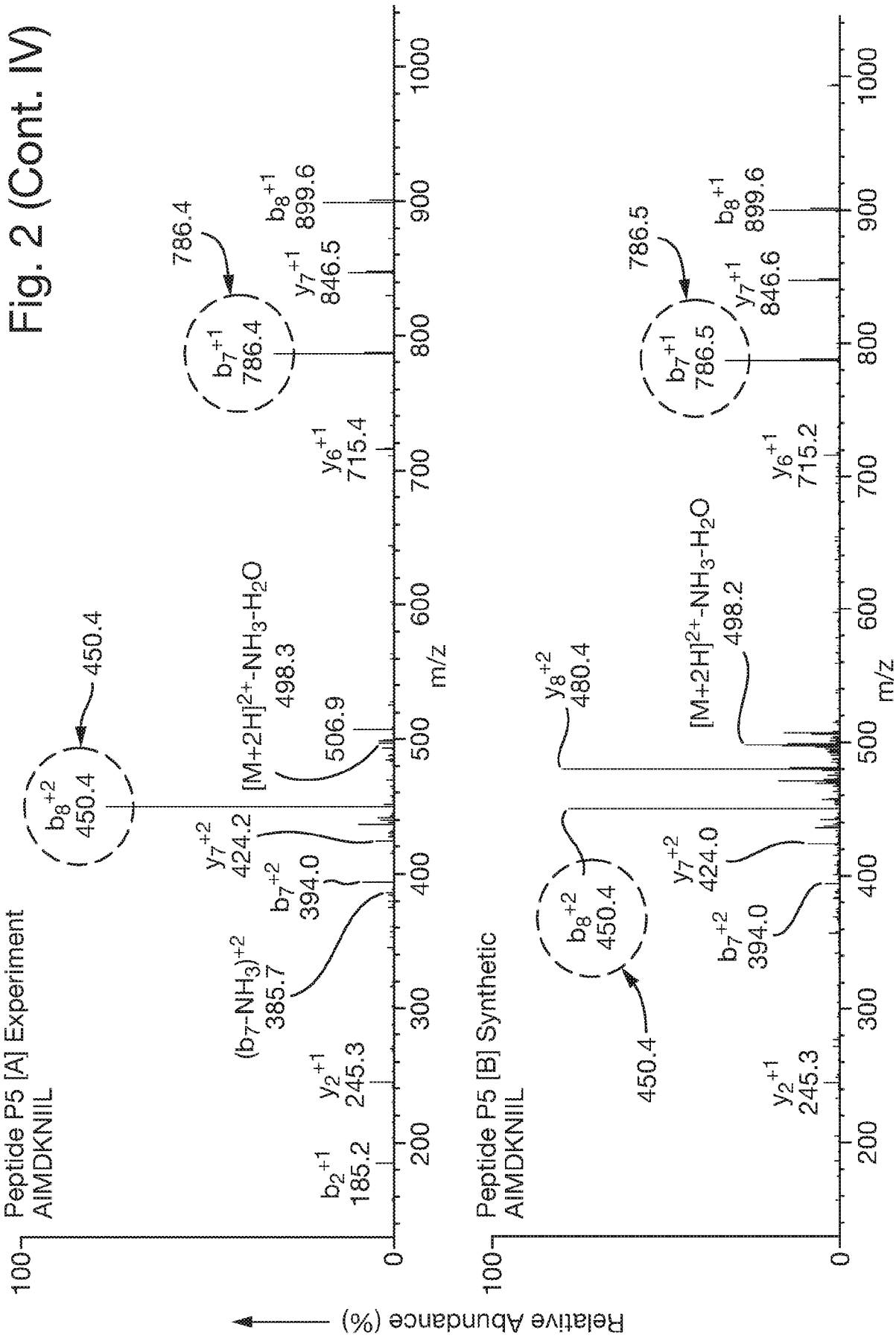

Peptide P5 [A] Experiment
AIMDKNIIL
Peptide P5 [B] Synthetic
AIMDKNIIL
Relative Abundance (%)
m/z
100
0
200
300
400
500
600
700
800
900
1000
b_8^{+2} 450.4
450.4
786.4
b_7^{+1} 786.4
y_7^{+1} 846.5
b_8^{+1} 899.6
y_6^{+1} 715.4
$[M+2H]^{2+}$-NH_3-H_2O 498.3
506.9
y_7^{+2} 424.2
b_7^{+2} 394.0
$(b_7$-$NH_3)^{+2}$ 385.7
y_2^{+1} 245.3
b_2^{+1} 185.2
786.5
b_7^{+1} 786.5
y_7^{+1} 846.6
b_8^{+1} 899.6
y_6^{+1} 715.2
y_8^{+2} 480.4
$[M+2H]^{2+}$-NH_3-H_2O 498.2
y_7^{+2} 424.0
b_7^{+2} 394.0
y_2^{+1} 245.3
450.4

Fig. 3A

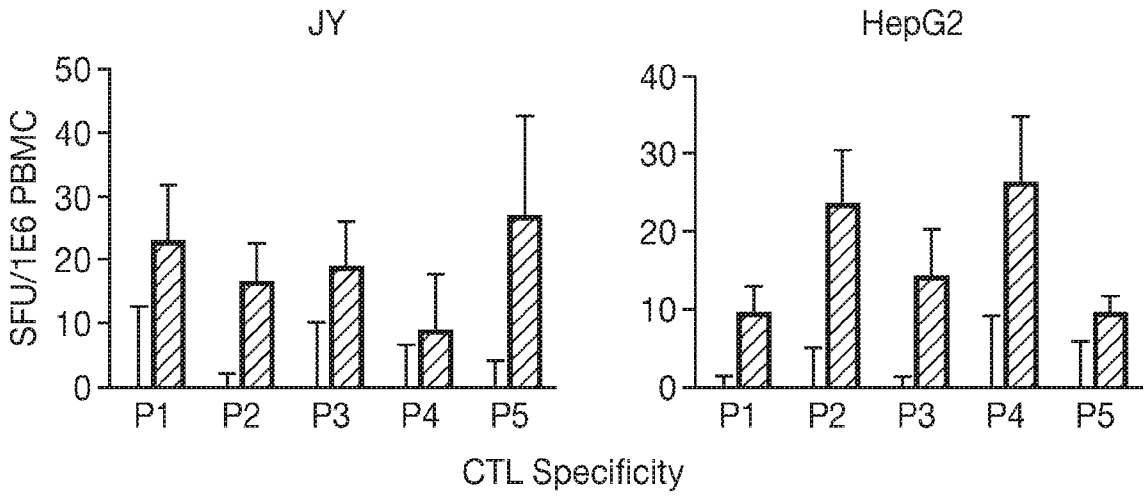

JY
HepG2
SFU/1E6 PBMC
50
40
30
20
10
0
40
30
20
10
0
P1
P2
P3
P4
P5
CTL Specificity

Fig. 3B

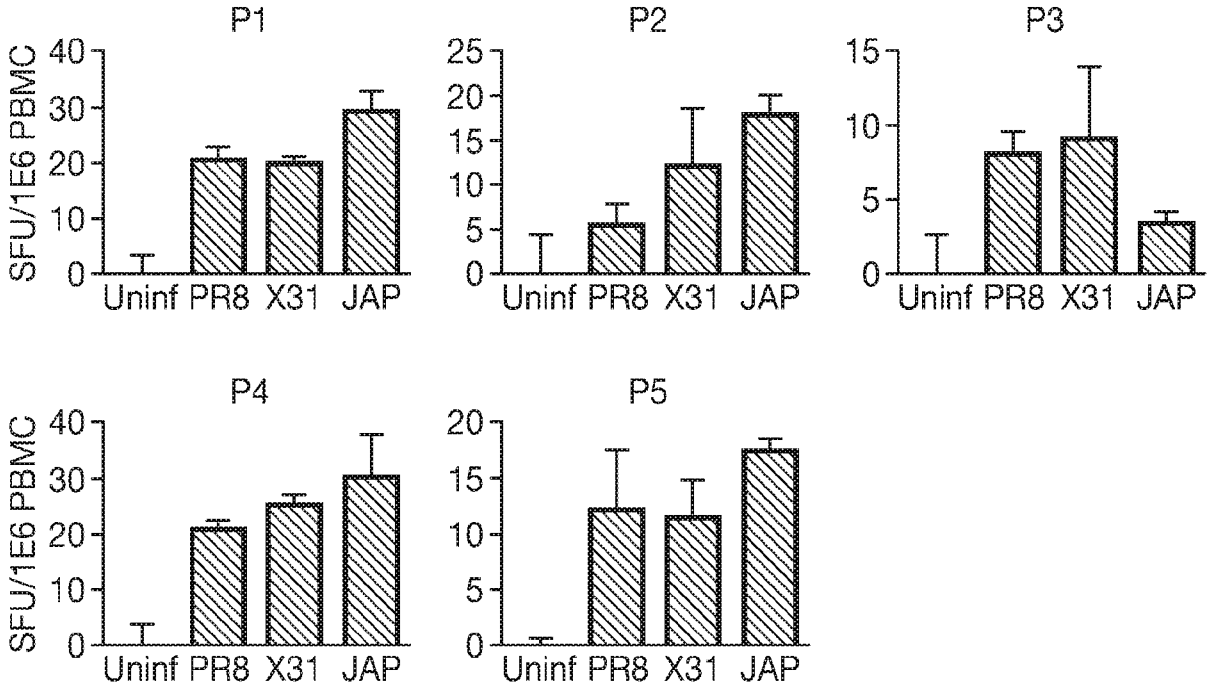

P1
P2
P3
P4
P5
SFU/1E6 PBMC
40
30
20
10
0
25
20
15
10
5
0
15
10
5
0
Uninf
PR8
X31
JAP

Fig. 4A

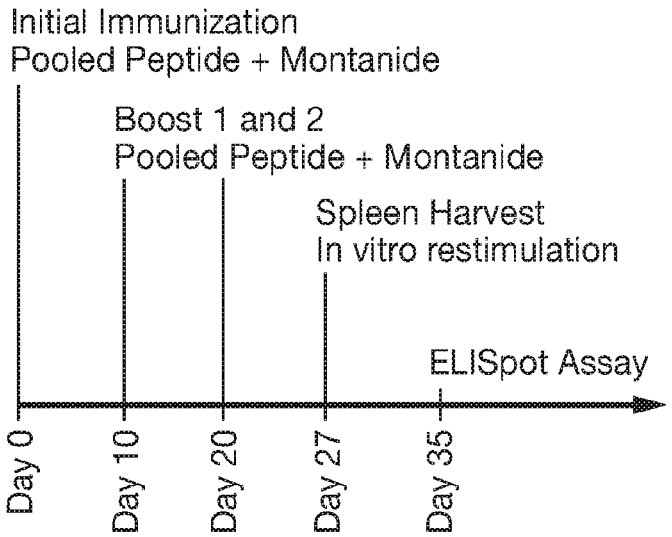


Fig. 4B

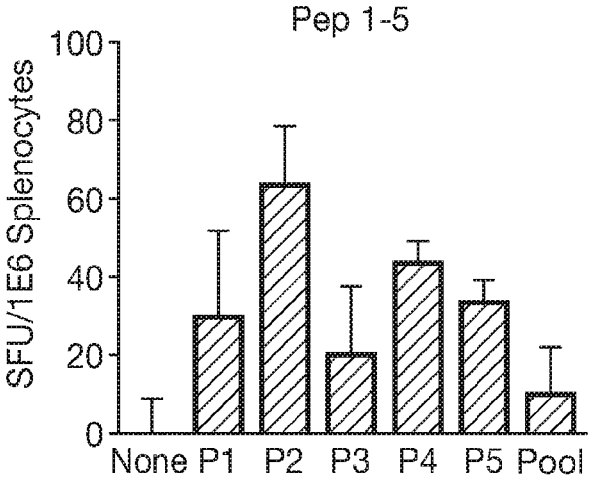


Fig. 4C

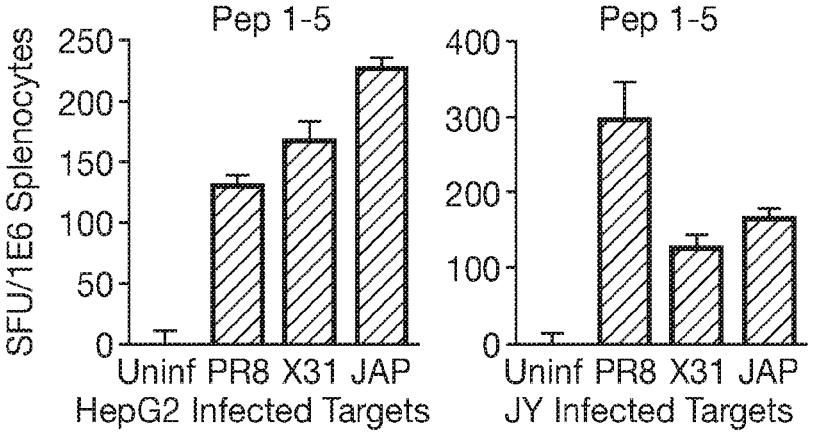


Fig. 4D

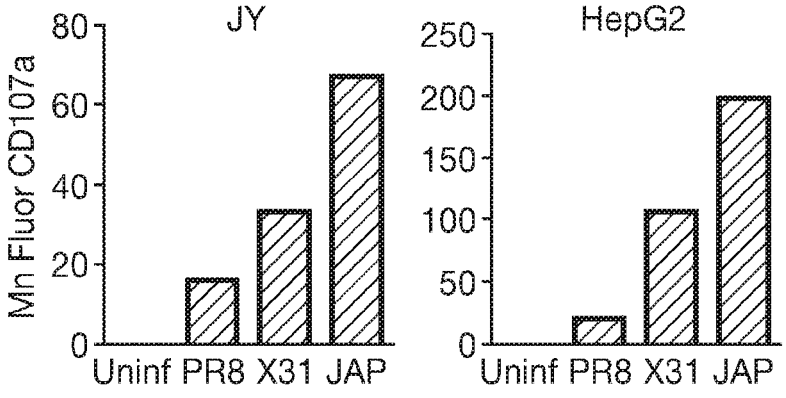


Fig. 5A

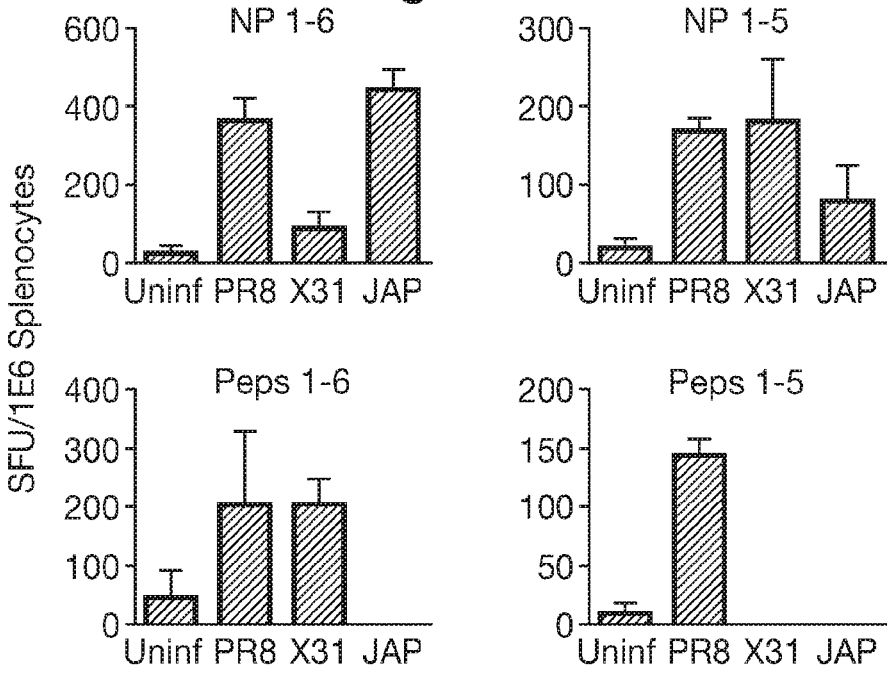


Fig. 5B

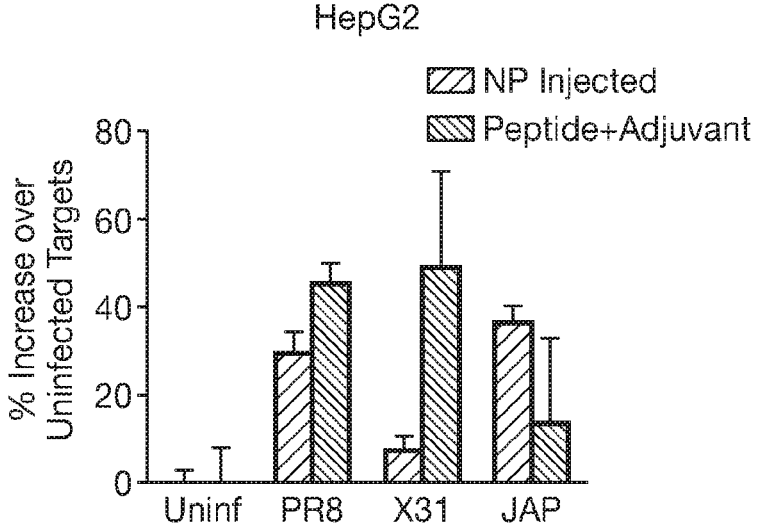


Fig. 5C

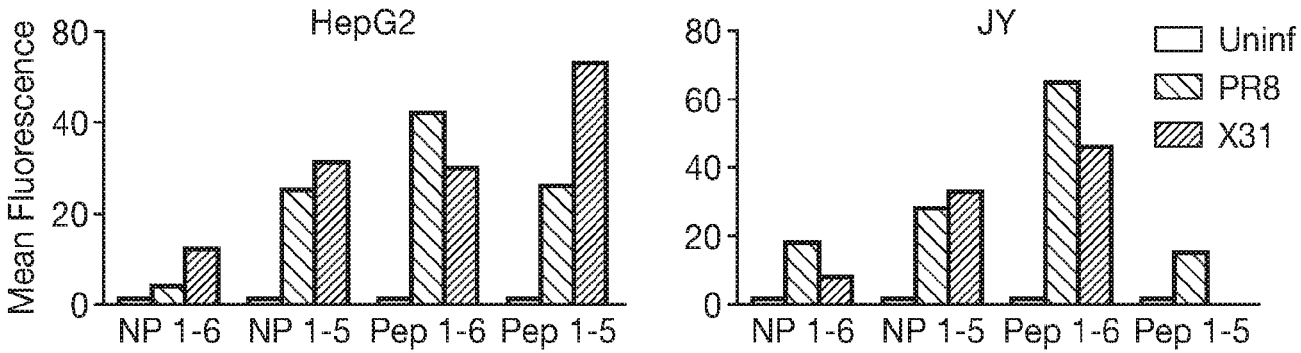


Fig. 6

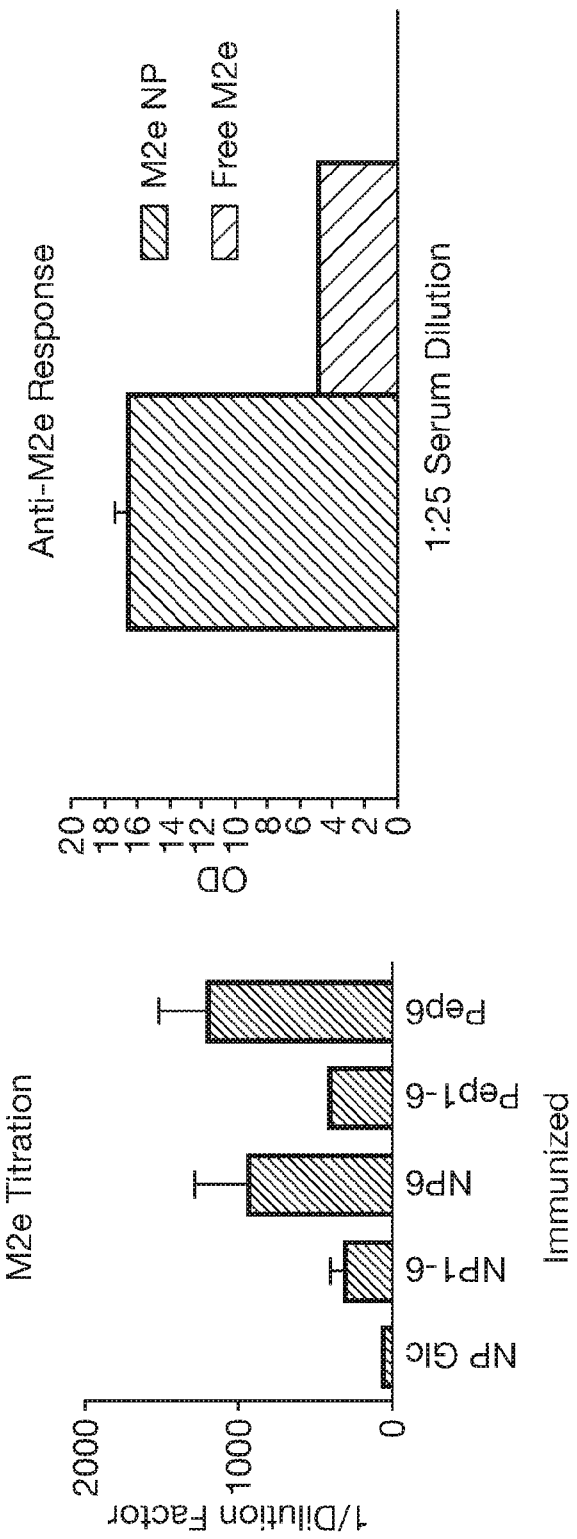

Anti-M2e Response
M2e NP
Free M2e
OD
20
18
16
14
12
10
8
6
4
2
0
1:25 Serum Dilution
M2e Titration
1/Dilution Factor
2000
1000
0
NP Glc
NP1-6
NP6
Pep1-6
Pep6
Immunized

Fig. 7

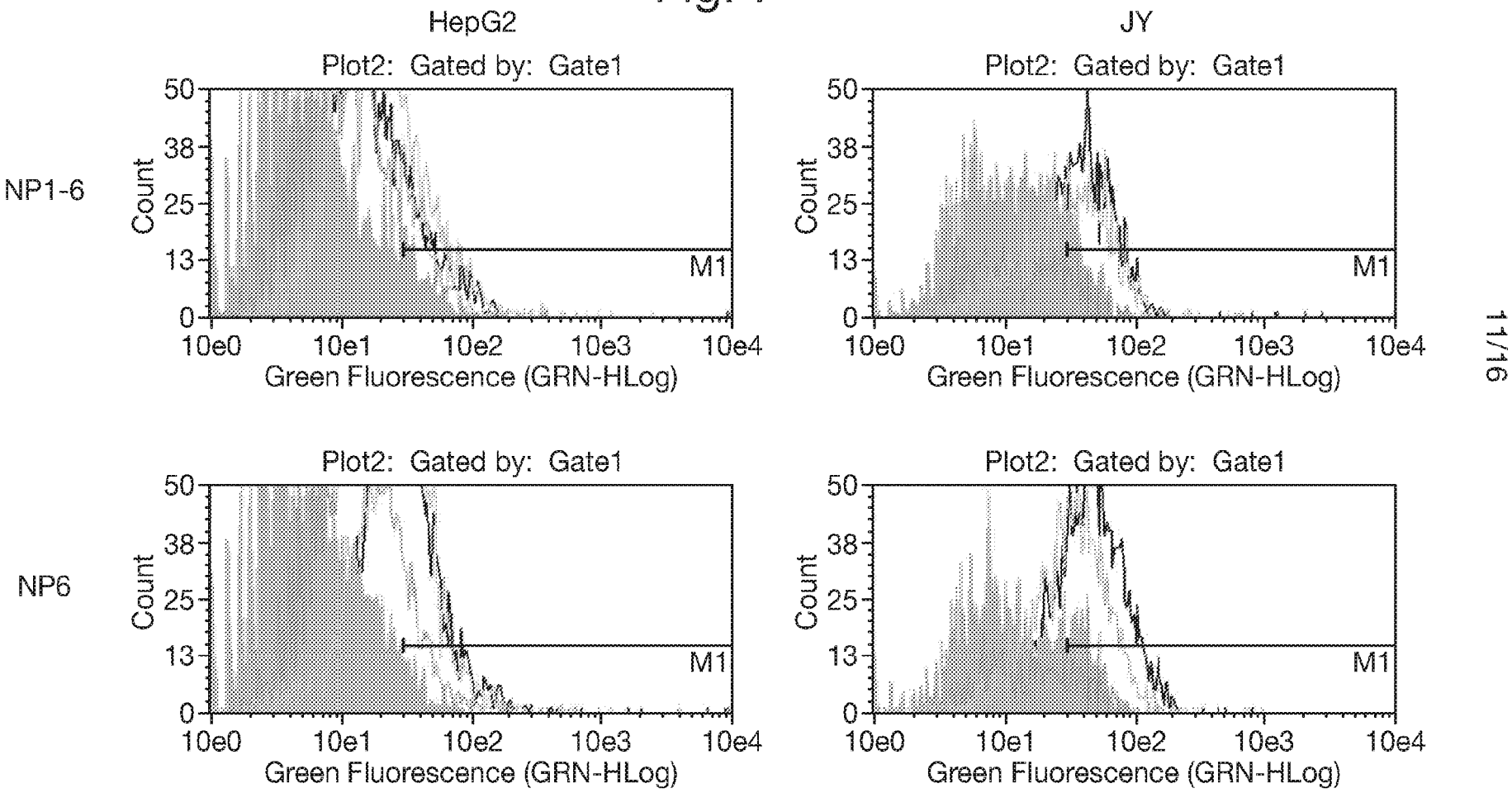

HepG2
JY
NP1-6
NP6
Plot2: Gated by: Gate1
Count
50
38
25
13
0
M1
10e0
10e1
10e2
10e3
10e4
Green Fluorescence (GRN-HLog)

Fig. 7 (Cont.)

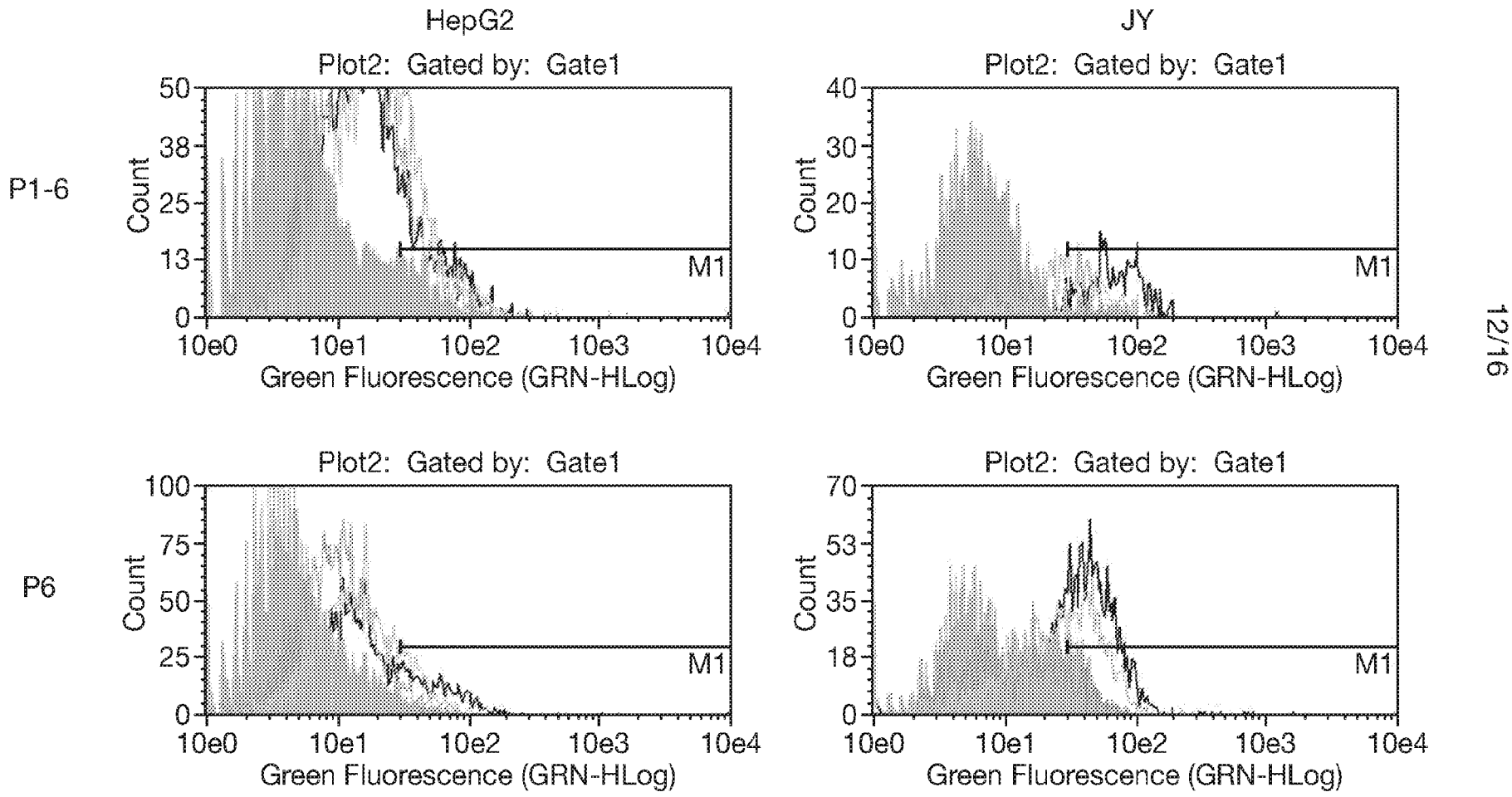

HepG2
JY
P1-6
P6
Plot2: Gated by: Gate1
Count
Green Fluorescence (GRN-HLog)
M1
10e0
10e1
10e2
10e3
10e4

Fig. 8

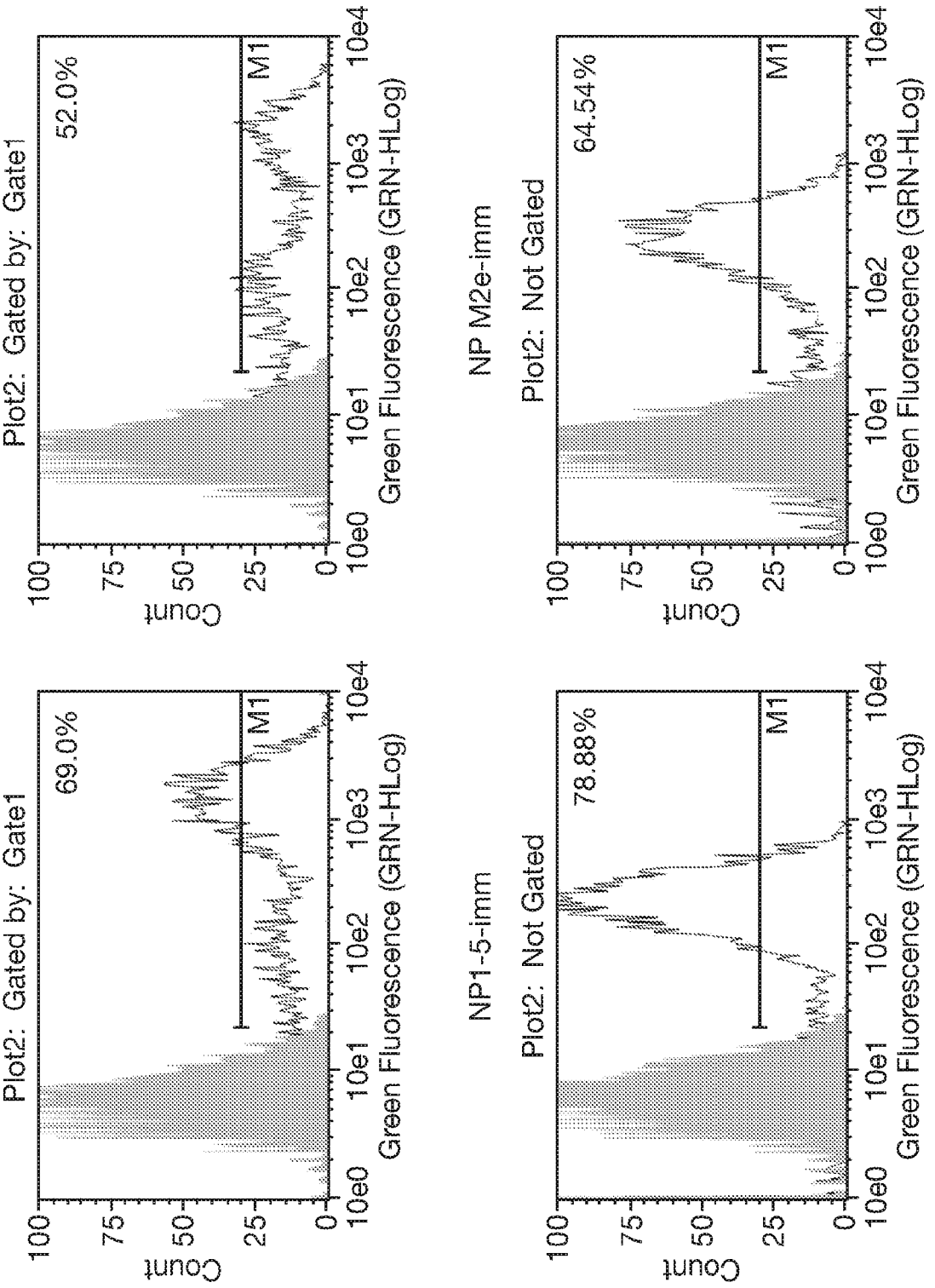

P1-5-imm
Plot2: Gated by: Gate1
69.0%
M1
Count
Green Fluorescence (GRN-HLog)
pM2e-imm
Plot2: Gated by: Gate1
52.0%
M1
Count
Green Fluorescence (GRN-HLog)
NP1-5-imm
Plot2: Not Gated
78.88%
M1
Count
Green Fluorescence (GRN-HLog)
NP M2e-imm
Plot2: Not Gated
64.54%
M1
Count
Green Fluorescence (GRN-HLog)

Fig. 9

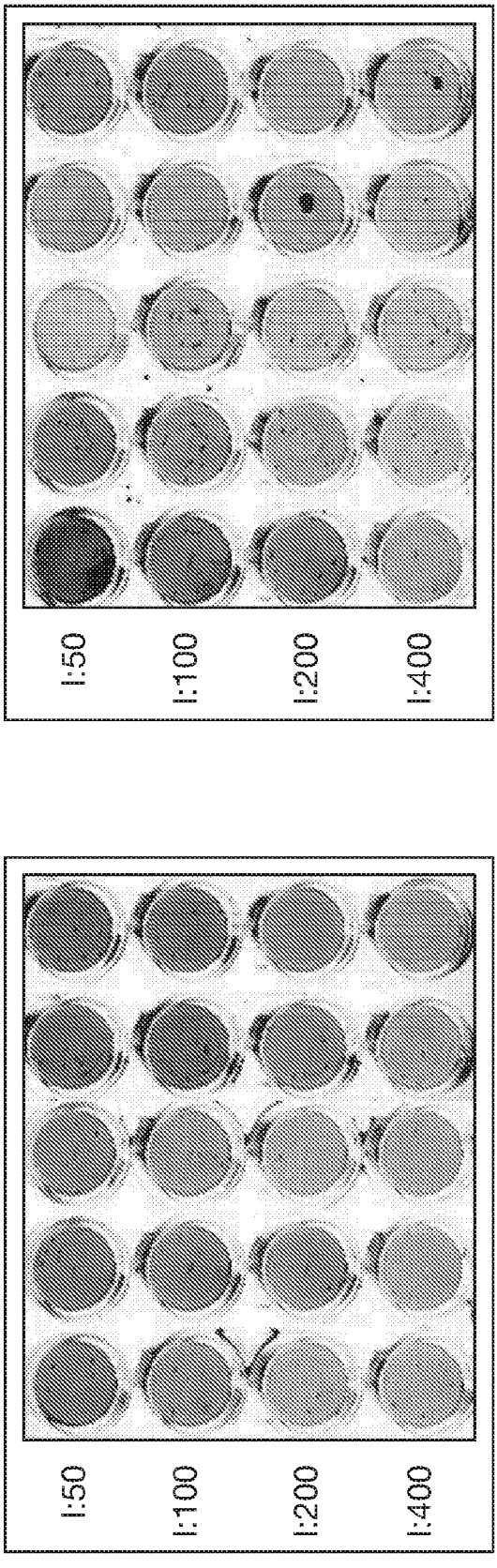


Fig. 10

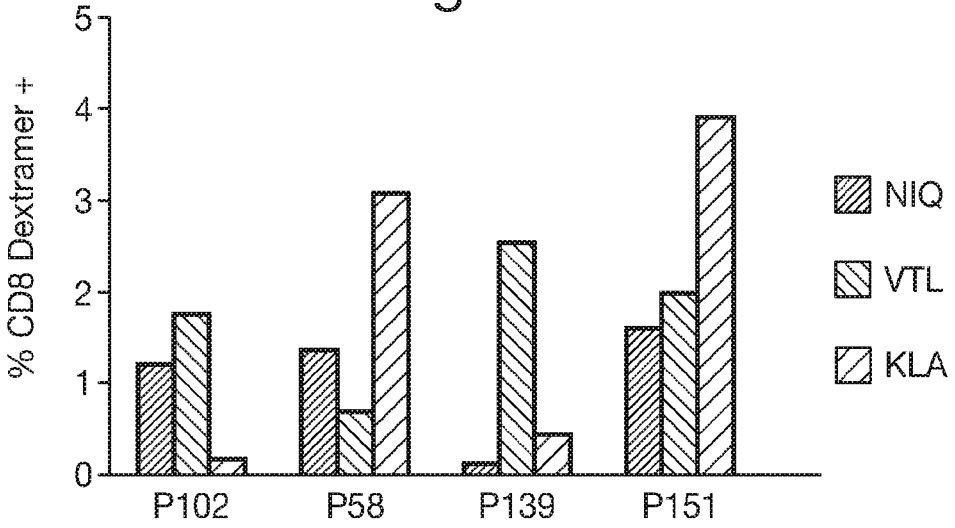

% CD8 Dextramer +
5
4
3
2
1
0
P102
P58
P139
P151
NIQ
VTL
KLA

Fig. 11

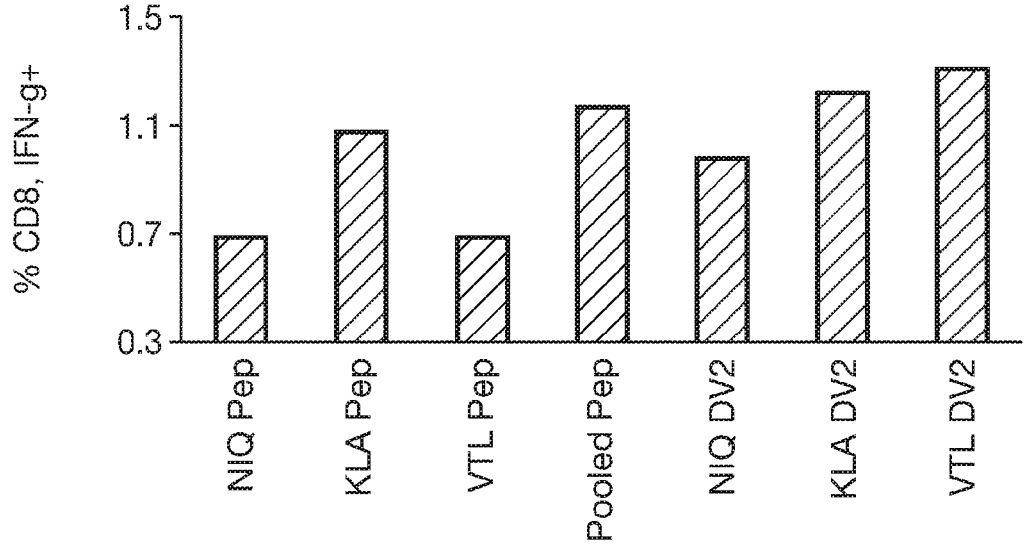
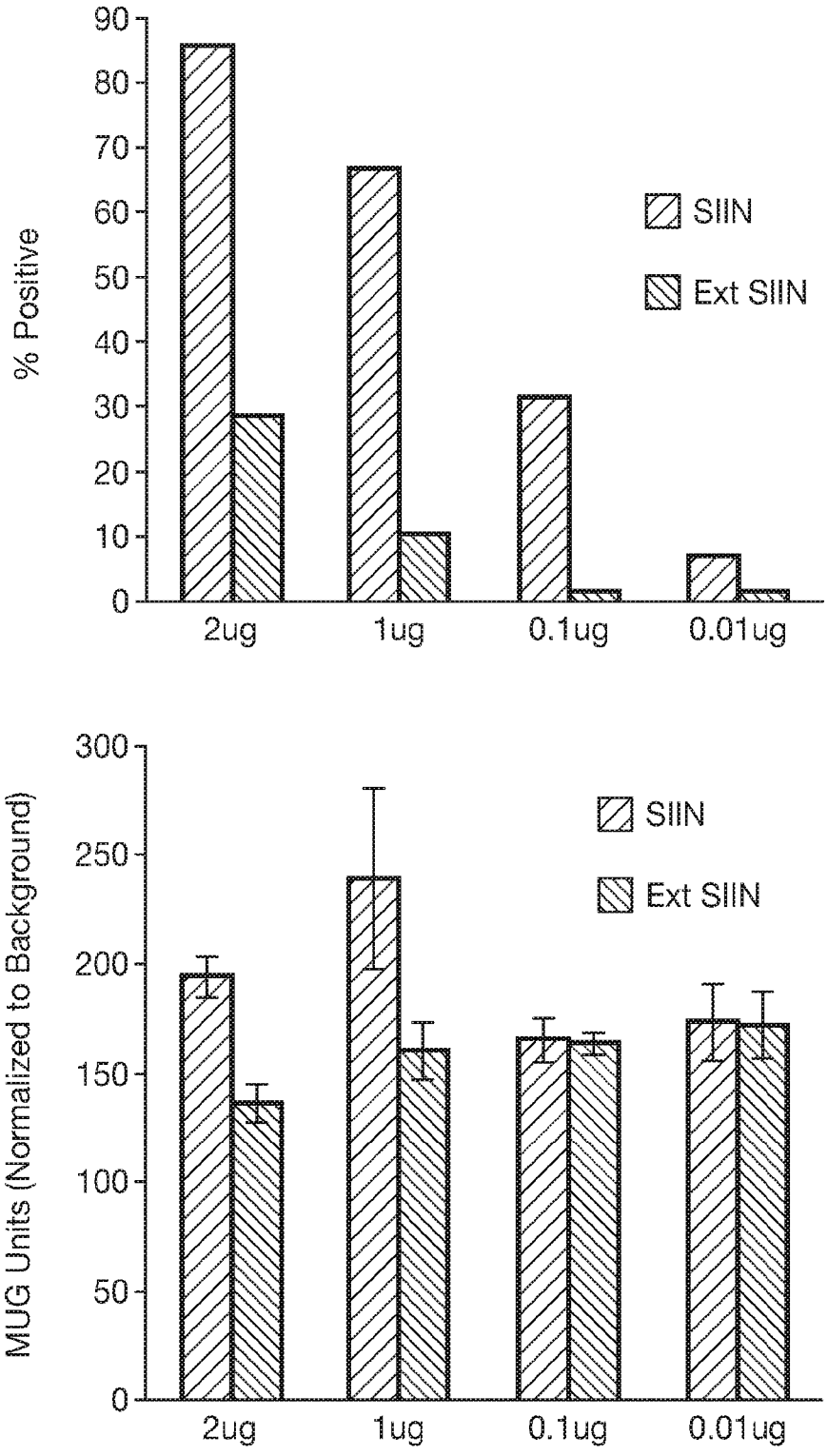

% CD8, IFN-g+
1.5
1.1
0.7
0.3
NIQ Pep
KLA Pep
VTL Pep
Pooled Pep
NIQ DV2
KLA DV2
VTL DV2

Fig. 12


% Positive
90
80
70
60
50
40
30
20
10
0
2ug
1ug
0.1ug
0.01ug
SIIN
Ext SIIN
MUG Units (Normalized to Background)
300
250
200
150
100
50
0
2ug
1ug
0.1ug
0.01ug
SIIN
Ext SIIN