Figure 1

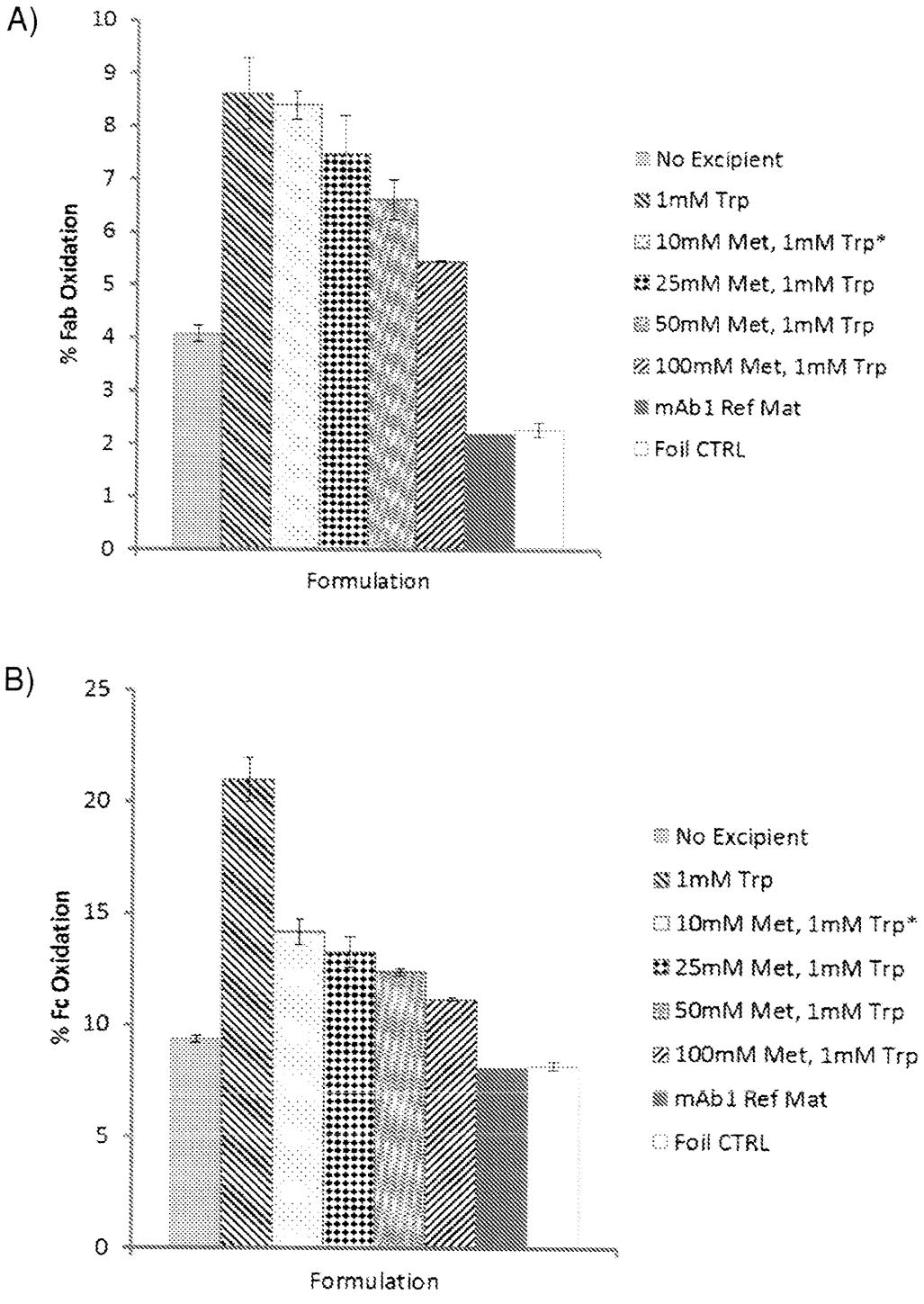

A)
% Fab Oxidation
10
9
8
7
6
5
4
3
2
1
0
Formulation
No Excipient
1mM Trp
10mM Met, 1mM Trp*
25mM Met, 1mM Trp
50mM Met, 1mM Trp
100mM Met, 1mM Trp
mAb1 Ref Mat
Foil CTRL
B)
% Fc Oxidation
25
20
15
10
5
0
Formulation
No Excipient
1mM Trp
10mM Met, 1mM Trp*
25mM Met, 1mM Trp
50mM Met, 1mM Trp
100mM Met, 1mM Trp
mAb1 Ref Mat
Foil CTRL

Figure 2

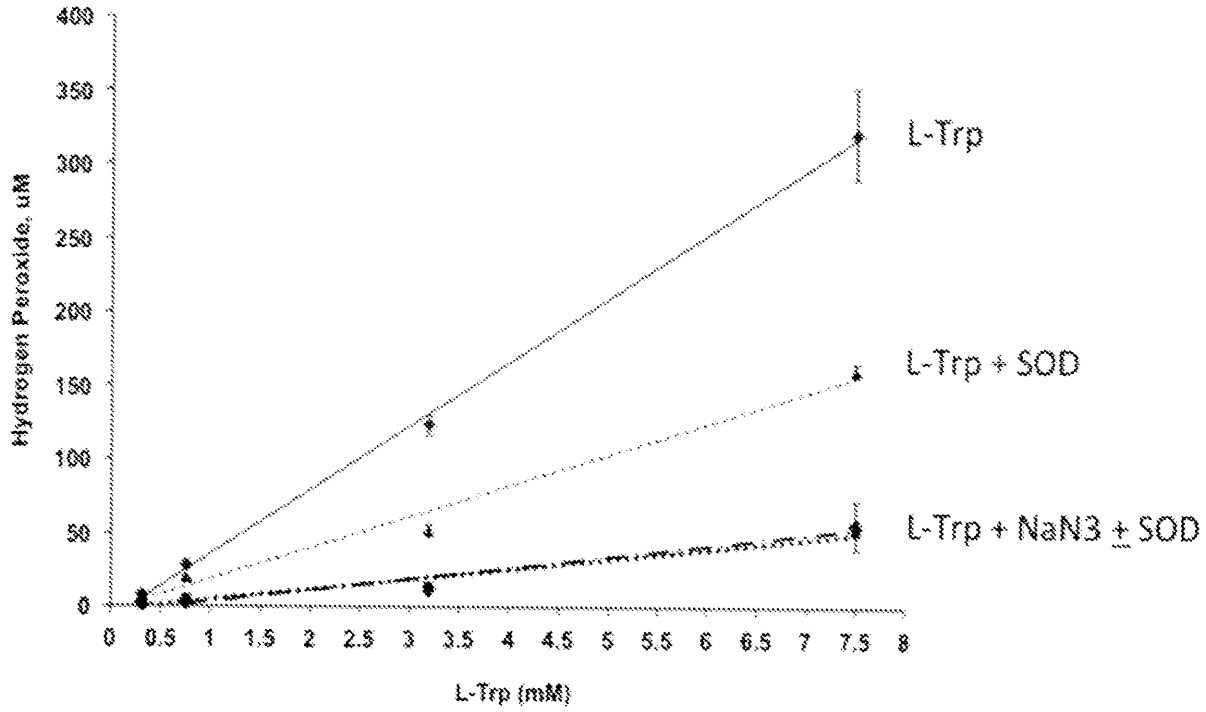

Hydrogen Peroxide, uM
400
350
300
250
200
150
100
50
0
0 0.5 1 1.5 2 2.5 3 3.5 4 4.5 5 5.5 6 6.5 7 7.5 8
L-Trp (mM)
L-Trp
L-Trp + SOD
L-Trp + NaN3 ± SOD

Figure 3

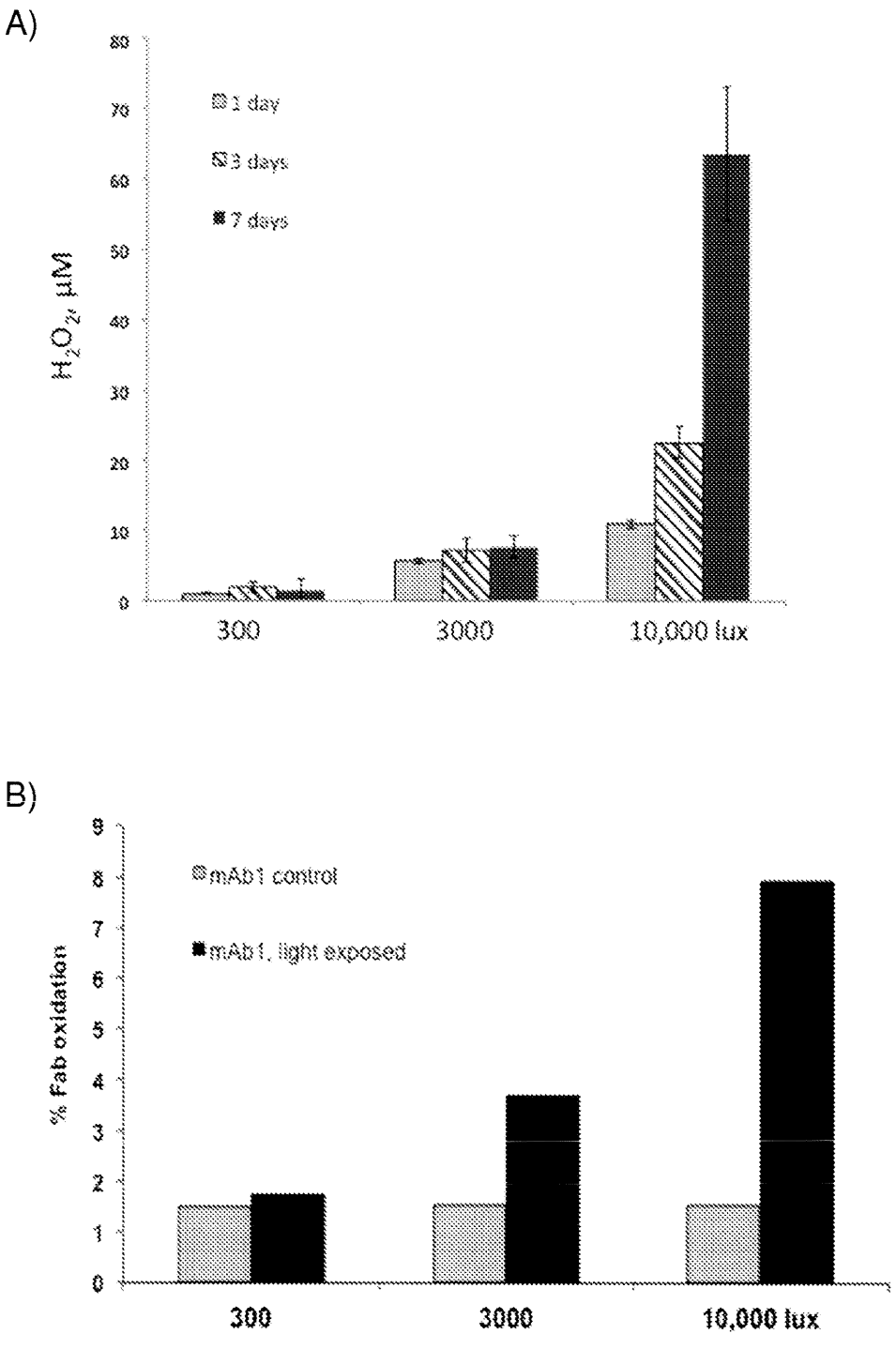
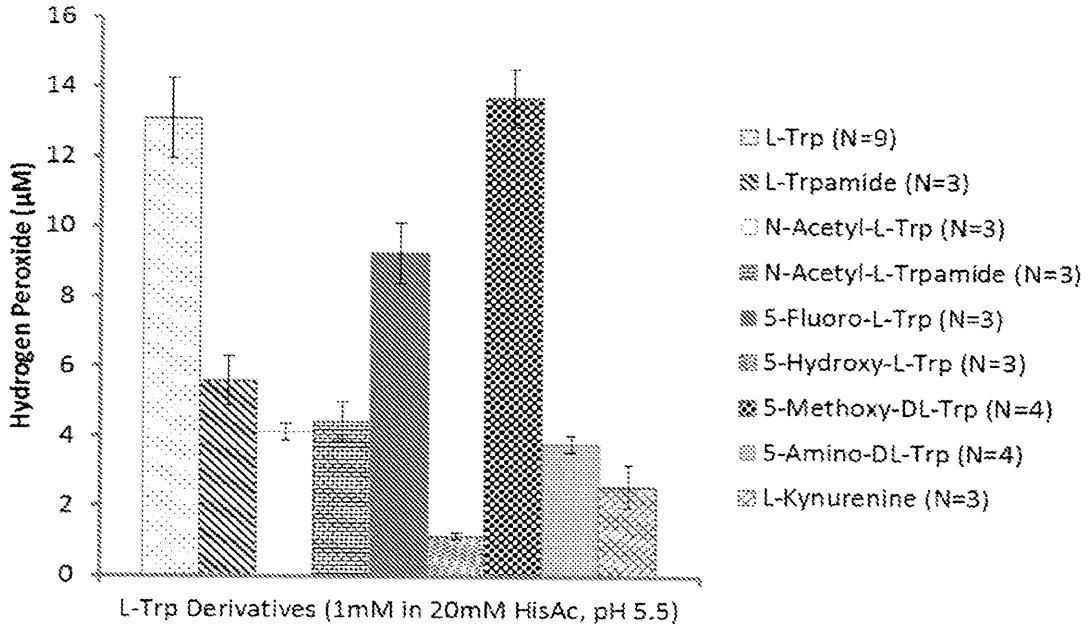

A)
1 day
3 days
7 days
H_2O_2, µM
0
10
20
30
40
50
60
70
80
300
3000
10,000 lux
B)
mAb1 control
mAb1, light exposed
% Fab oxidation
0
1
2
3
4
5
6
7
8
9
300
3000
10,000 lux

Figure 4

A)


Hydrogen Peroxide (µM)
16
14
12
10
8
6
4
2
0
L-Trp Derivatives (1mM in 20mM HisAc, pH 5.5)
L-Trp (N=9)
L-Trpamide (N=3)
N-Acetyl-L-Trp (N=3)
N-Acetyl-L-Trpamide (N=3)
5-Fluoro-L-Trp (N=3)
5-Hydroxy-L-Trp (N=3)
5-Methoxy-DL-Trp (N=4)
5-Amino-DL-Trp (N=4)
L-Kynurenine (N=3)

B)

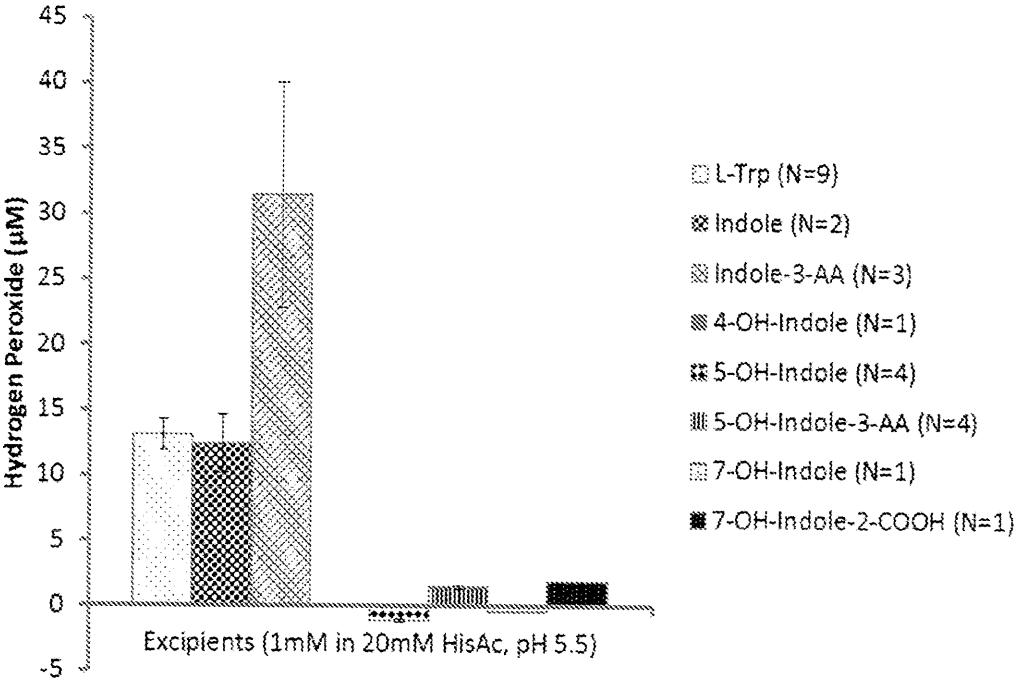

Hydrogen Peroxide (µM)
45
40
35
30
25
20
15
10
5
0
-5
Excipients (1mM in 20mM HisAc, pH 5.5)
L-Trp (N=9)
Indole (N=2)
Indole-3-AA (N=3)
4-OH-Indole (N=1)
5-OH-Indole (N=4)
5-OH-Indole-3-AA (N=4)
7-OH-Indole (N=1)
7-OH-Indole-2-COOH (N=1)

Figure 5

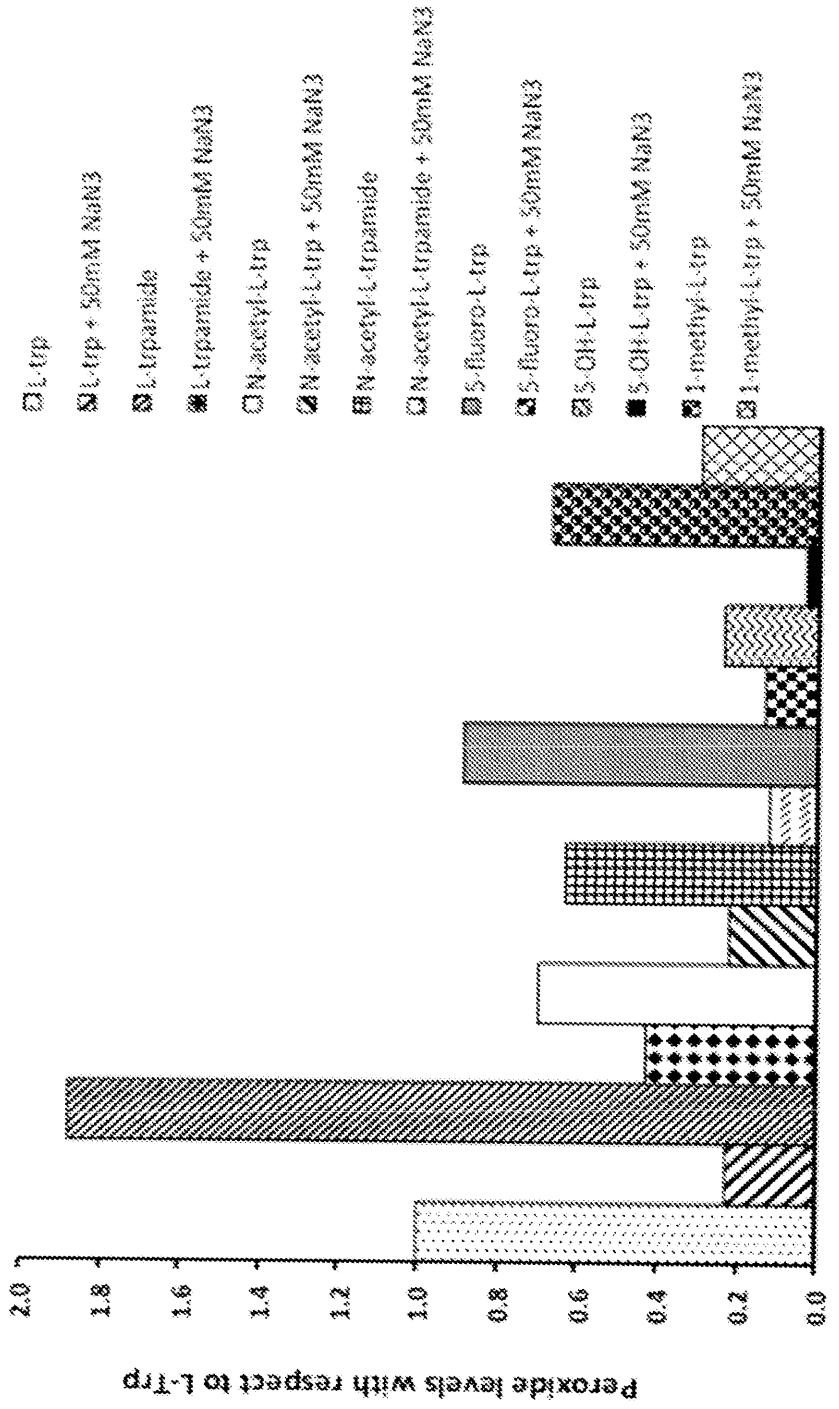

L-trp
L-trp + 50mM NaN3
L-trpamide
L-trpamide + 50mM NaN3
N-acetyl-L-trp
N-acetyl-L-trp + 50mM NaN3
N-acetyl-L-trpamide
N-acetyl-L-trpamide + 50mM NaN3
5-fluoro-L-trp
5-fluoro-L-trp + 50mM NaN3
5-OH-L-trp
5-OH-L-trp + 50mM NaN3
1-methyl-L-trp
1-methyl-L-trp + 50mM NaN3
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
Peroxide levels with respect to L-Trp

Figure 6

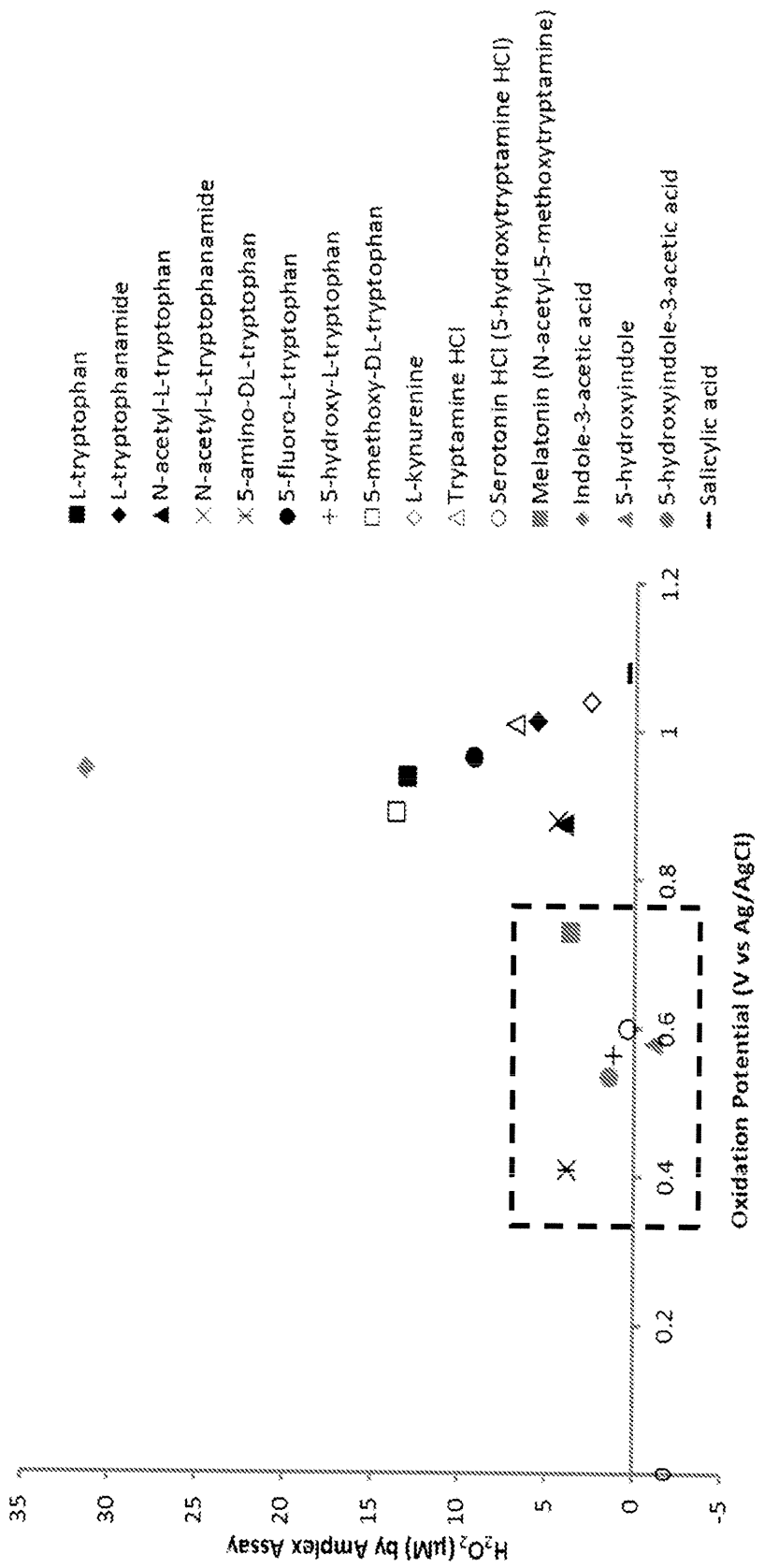
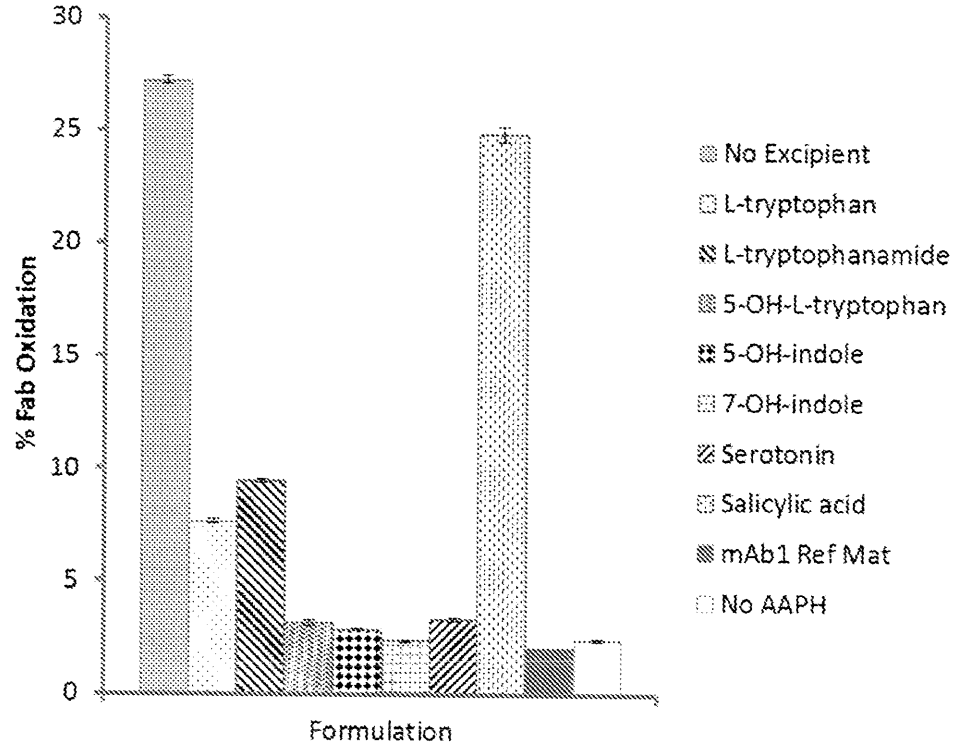

L-tryptophan
L-tryptophanamide
N-acetyl-L-tryptophan
N-acetyl-L-tryptophanamide
5-amino-DL-tryptophan
5-fluoro-L-tryptophan
5-hydroxy-L-tryptophan
5-methoxy-DL-tryptophan
L-kynurenine
Tryptamine HCl
Serotonin HCl (5-hydroxytryptamine HCl)
Melatonin (N-acetyl-5-methoxytryptamine)
Indole-3-acetic acid
5-hydroxyindole
5-hydroxyindole-3-acetic acid
Salicylic acid
H2O2 (µM) by Amplex Assay
Oxidation Potential (V vs Ag/AgCl)
35
30
25
20
15
10
5
0
-5
0
0.2
0.4
0.6
0.8
1
1.2

Figure 7

A)


30
25
20
15
10
5
0
% Fab Oxidation
Formulation
No Excipient
L-tryptophan
L-tryptophanamide
5-OH-L-tryptophan
5-OH-indole
7-OH-indole
Serotonin
Salicylic acid
mAb1 Ref Mat
No AAPH

B)

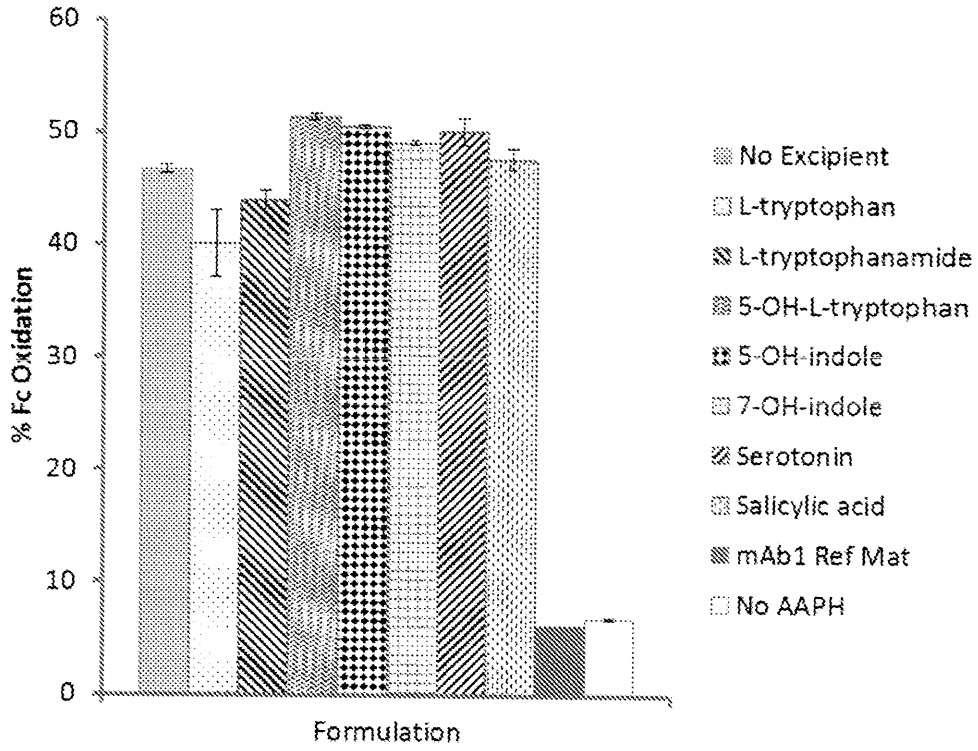

60
50
40
30
20
10
0
% Fc Oxidation
Formulation
No Excipient
L-tryptophan
L-tryptophanamide
5-OH-L-tryptophan
5-OH-indole
7-OH-indole
Serotonin
Salicylic acid
mAb1 Ref Mat
No AAPH

Figure 8

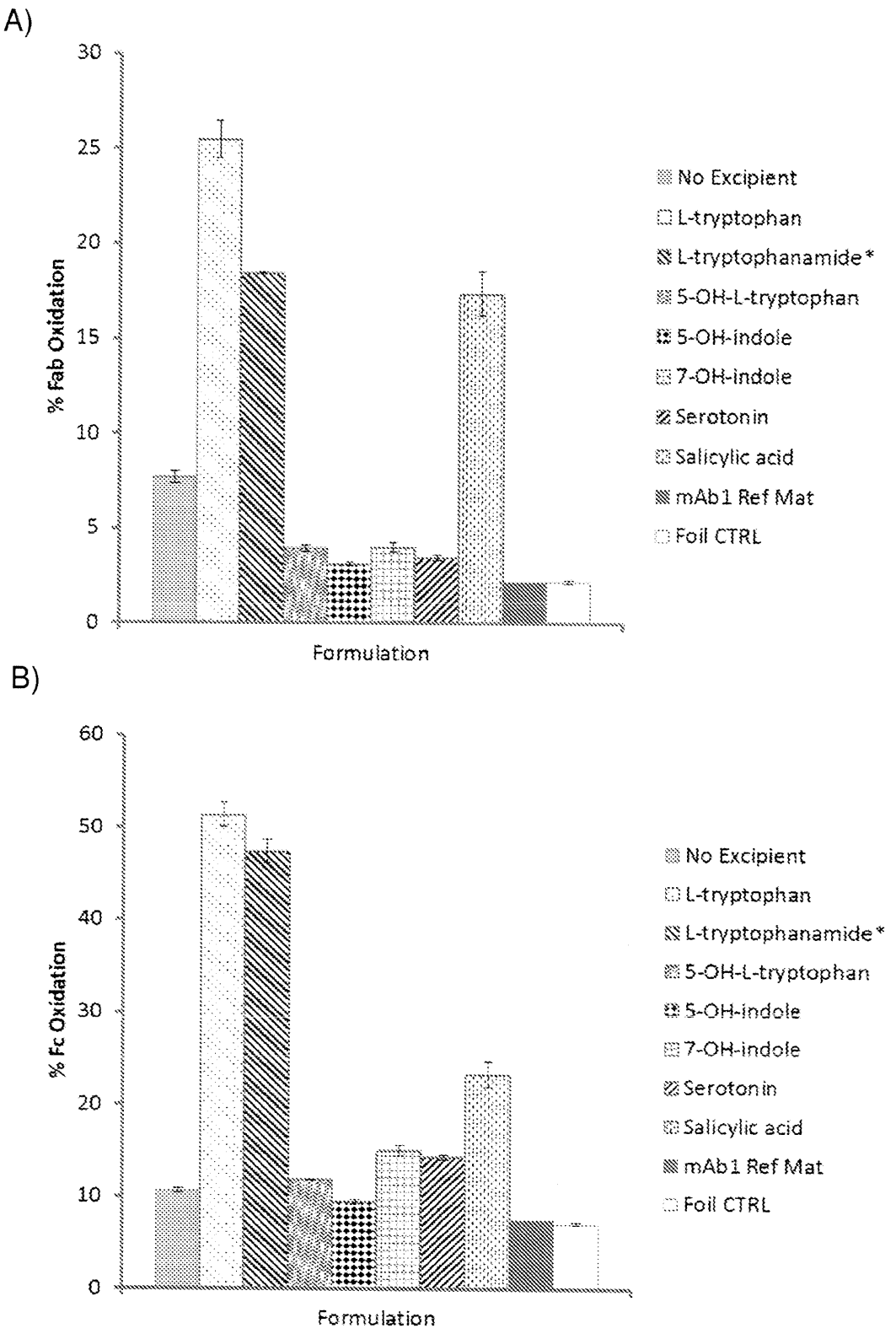
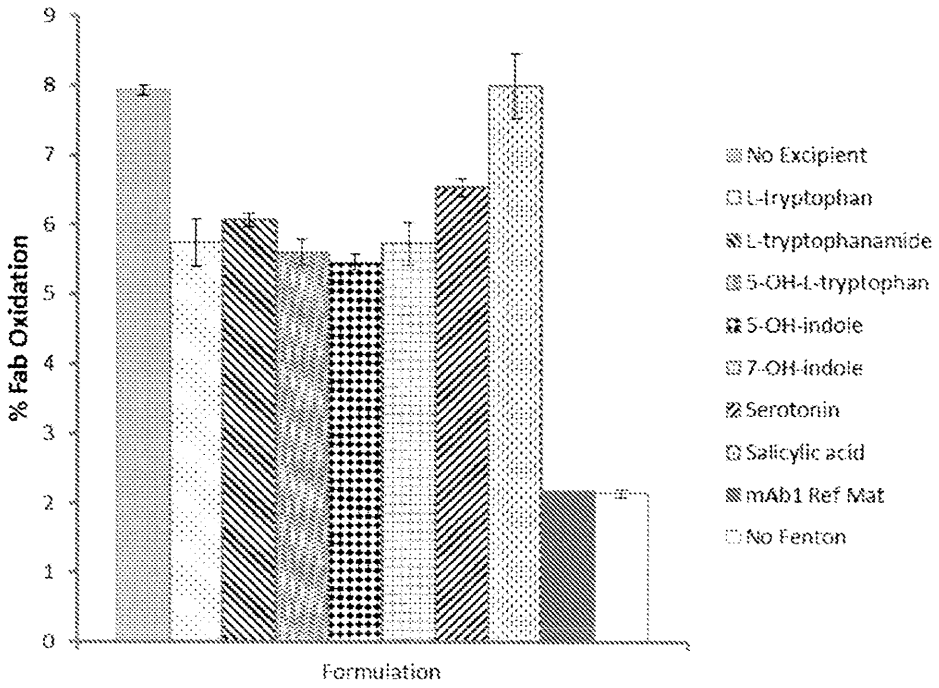

A)
30
25
20
15
10
5
0
% Fab Oxidation
Formulation
No Excipient
L-tryptophan
L-tryptophanamide*
5-OH-L-tryptophan
5-OH-indole
7-OH-indole
Serotonin
Salicylic acid
mAb1 Ref Mat
Foil CTRL
B)
60
50
40
30
20
10
0
% Fc Oxidation
Formulation
No Excipient
L-tryptophan
L-tryptophanamide*
5-OH-L-tryptophan
5-OH-indole
7-OH-indole
Serotonin
Salicylic acid
mAb1 Ref Mat
Foil CTRL

Figure 9

A)


% Fab Oxidation
0
1
2
3
4
5
6
7
8
9
Formulation
No Excipient
L-tryptophan
L-tryptophanamide
5-OH-L-tryptophan
5-OH-indole
7-OH-indole
Serotonin
Salicylic acid
mAb1 Ref Mat
No Fenton

B)

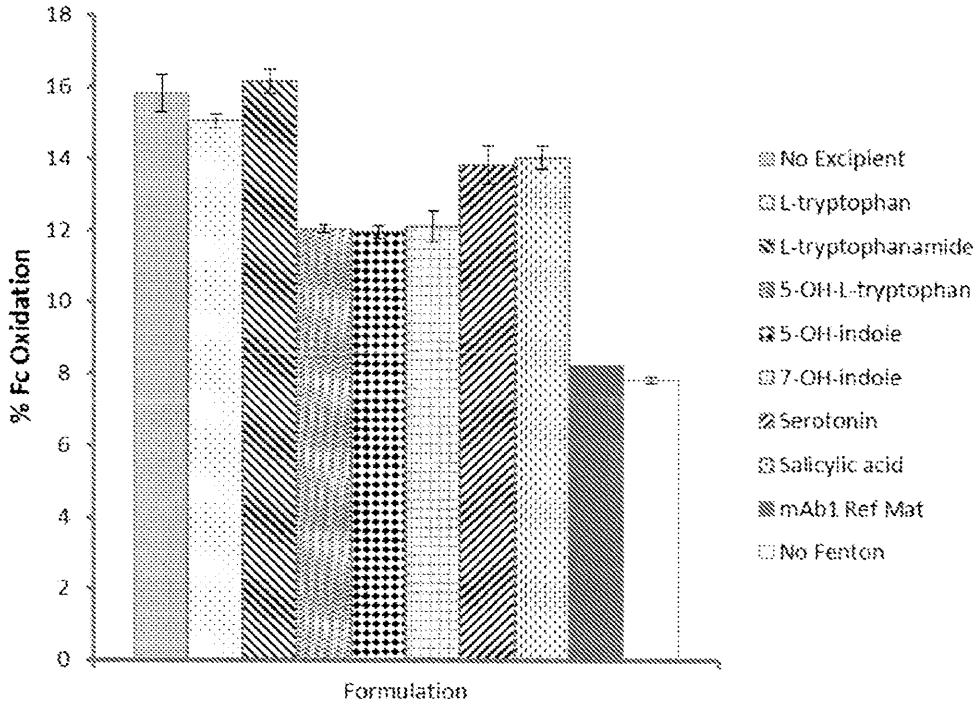
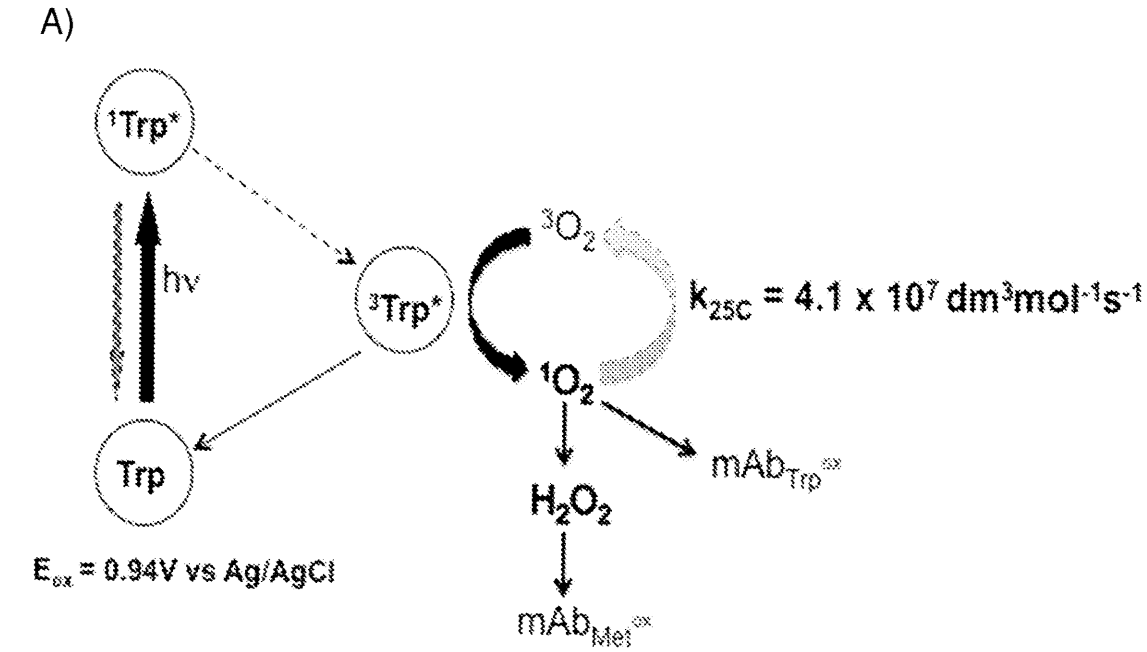
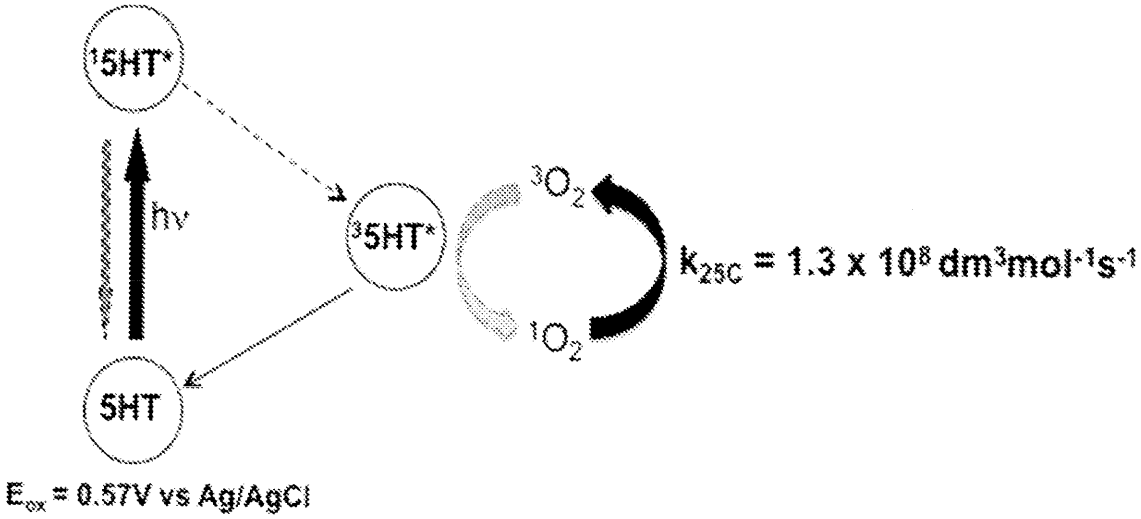

% Fc Oxidation
0
2
4
6
8
10
12
14
16
18
Formulation
No Excipient
L-tryptophan
L-tryptophanamide
5-OH-L-tryptophan
5-OH-indole
7-OH-indole
Serotonin
Salicylic acid
mAb1 Ref Mat
No Fenton

Figure 10


A)
^{1}Trp*
hν
^{3}Trp*
Trp
E_{ox} = 0.94V vs Ag/AgCl
$^3O_2$
$^1O_2$
k_{25C} = 4.1 x 10^7 $dm^3mol^{-1}s^{-1}$
mAb_{Trp}^{ox}
H_2O_2
mAb_{Met}^{ox}


B)
^{1}5HT*
hν
^{3}5HT*
5HT
E_{ox} = 0.57V vs Ag/AgCl
$^3O_2$
$^1O_2$
k_{25C} = 1.3 x 10^8 $dm^3mol^{-1}s^{-1}$