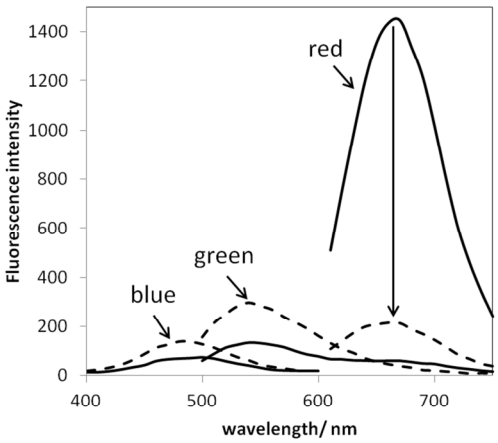
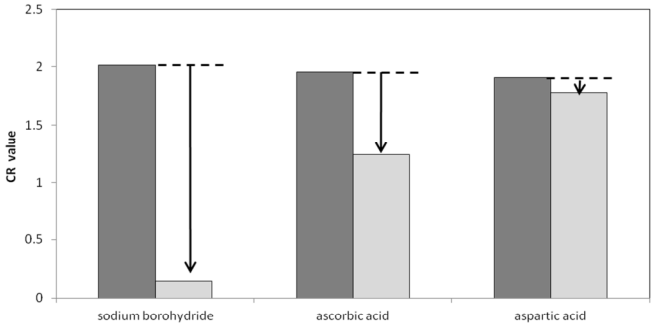
FIG. 1a and 1b





$NaBH_4$		Ascorbic acid		Aspartic acid	
cyan	red	cyan	Yellow-green	cyan	green

FIG. 2a and 2b

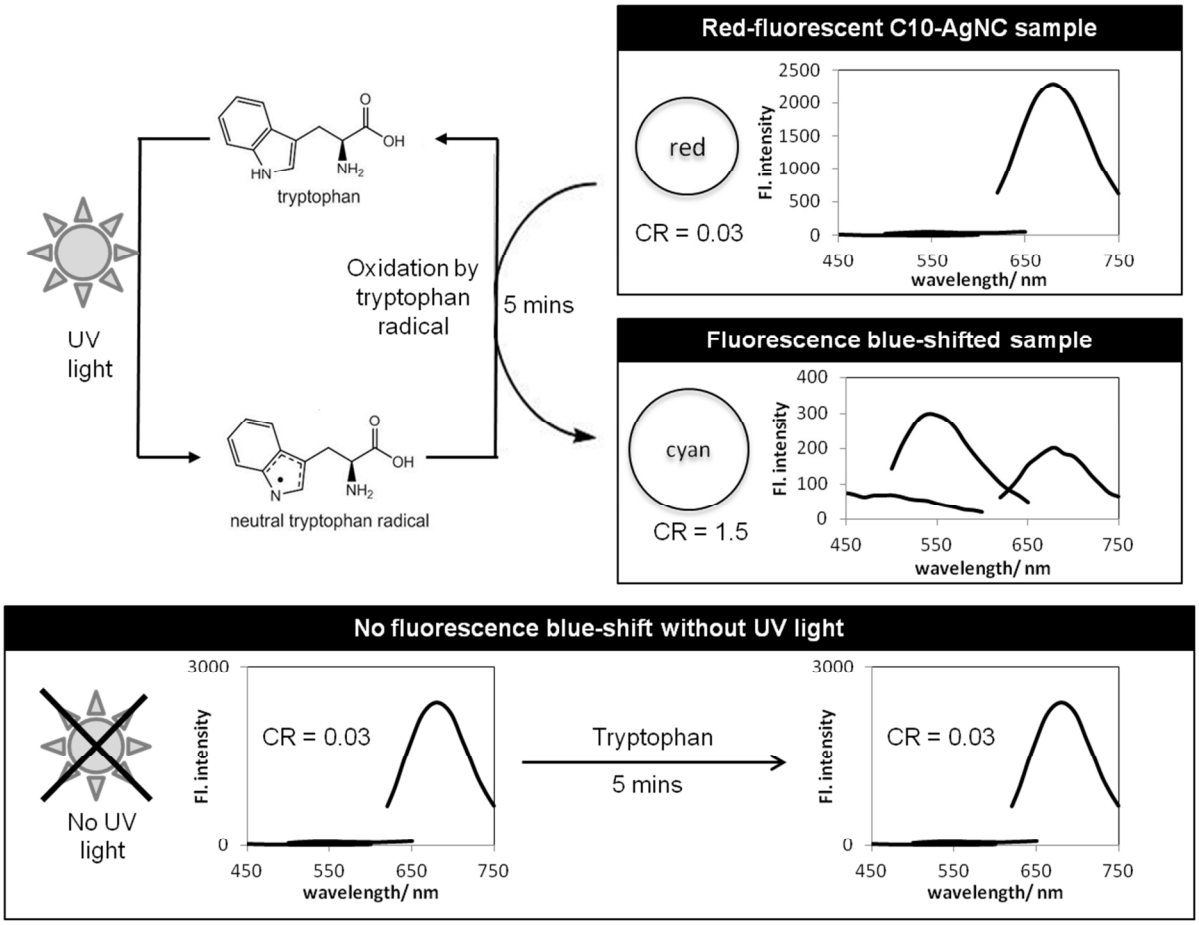

Red-fluorescent C10-AgNC sample
red
CR = 0.03
Fl. intensity
wavelength/ nm
tryptophan
Oxidation by tryptophan radical
5 mins
UV light
neutral tryptophan radical
Fluorescence blue-shifted sample
cyan
CR = 1.5
Fl. intensity
wavelength/ nm
No fluorescence blue-shift without UV light
No UV light
CR = 0.03
Fl. intensity
wavelength/ nm
Tryptophan
5 mins
CR = 0.03
Fl. intensity
wavelength/ nm

FIG. 3

C20: C10-AgNC ratio (by volume)	Fluorescence colour of mixture	Oxidation (hydroxyl radicals)	Reduction (Vitamin C)
10:0	Cyan (CR = 2.0)	Cyan (CR = 14.1)	Green (CR = 1.2)
8:2	Cyan (CR = 1.5)	Cyan (CR = 7.7)	Yellow-green (CR = 0.9)
6:4	Green (CR = 1.0)	Cyan (CR = 3.2)	Yellow (CR = 0.6)
4:6	Yellow (CR = 0.6)	Green (CR = 1.5)	Orange (CR = 0.4)
2:8	Orange (CR = 0.29)	Dark yellow (CR = 0.8	Orange-red (CR = 0.26)
0:10	Red (CR = 0.1)	Orange (CR = 0.4)	Red (CR = 0.1)

FIG. 4 (a),(b),(c)

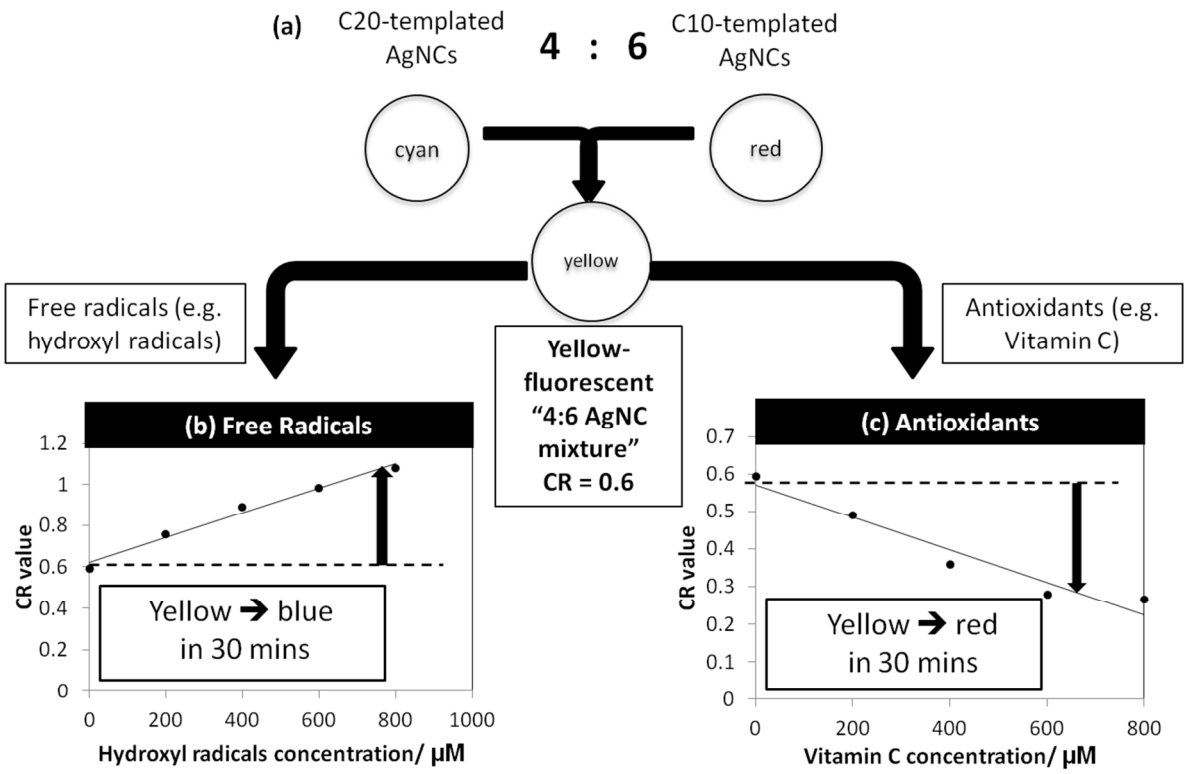

(a)
C20-templated AgNCs
4 : 6
C10-templated AgNCs
cyan
red
yellow
Free radicals (e.g. hydroxyl radicals)
Yellow-fluorescent "4:6 AgNC mixture" CR = 0.6
Antioxidants (e.g. Vitamin C)
(b) Free Radicals
CR value
Yellow → blue in 30 mins
Hydroxyl radicals concentration/ μM
(c) Antioxidants
CR value
Yellow → red in 30 mins
Vitamin C concentration/ μM

FIG. 5a and 5b

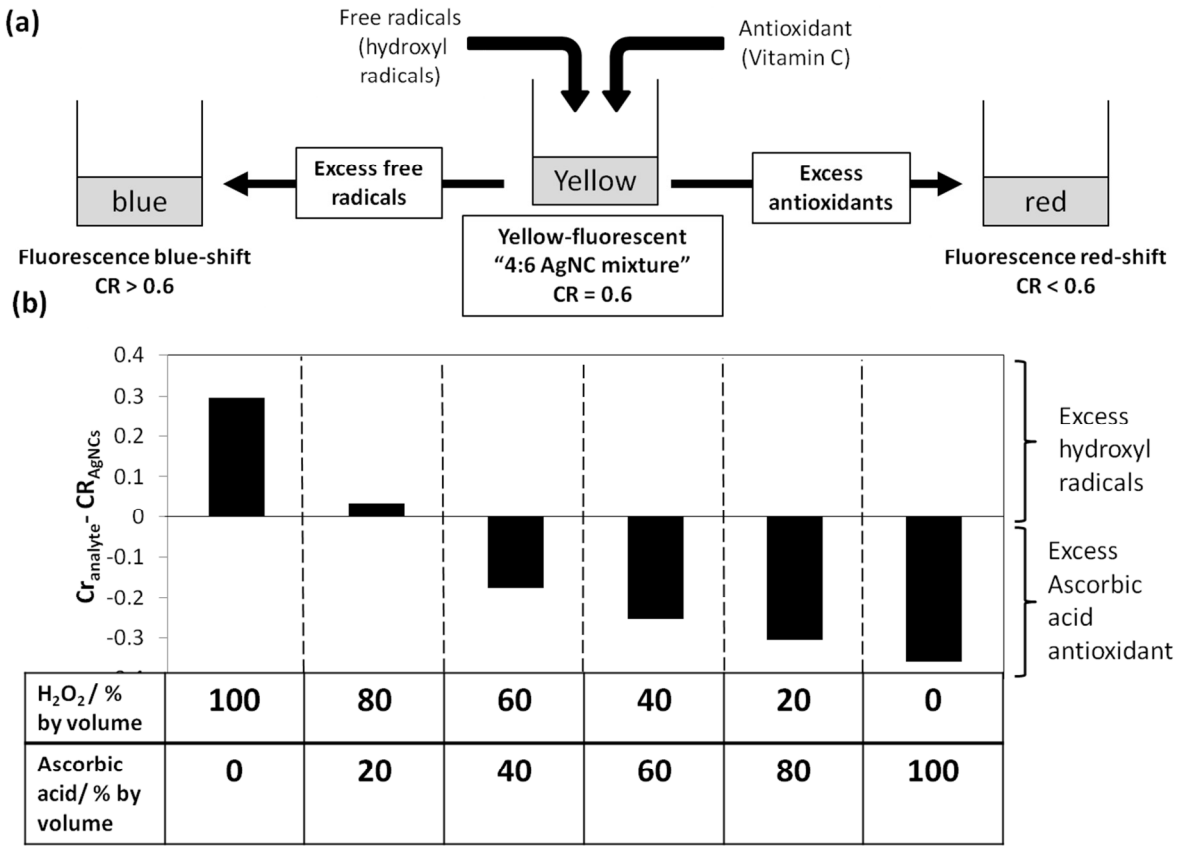
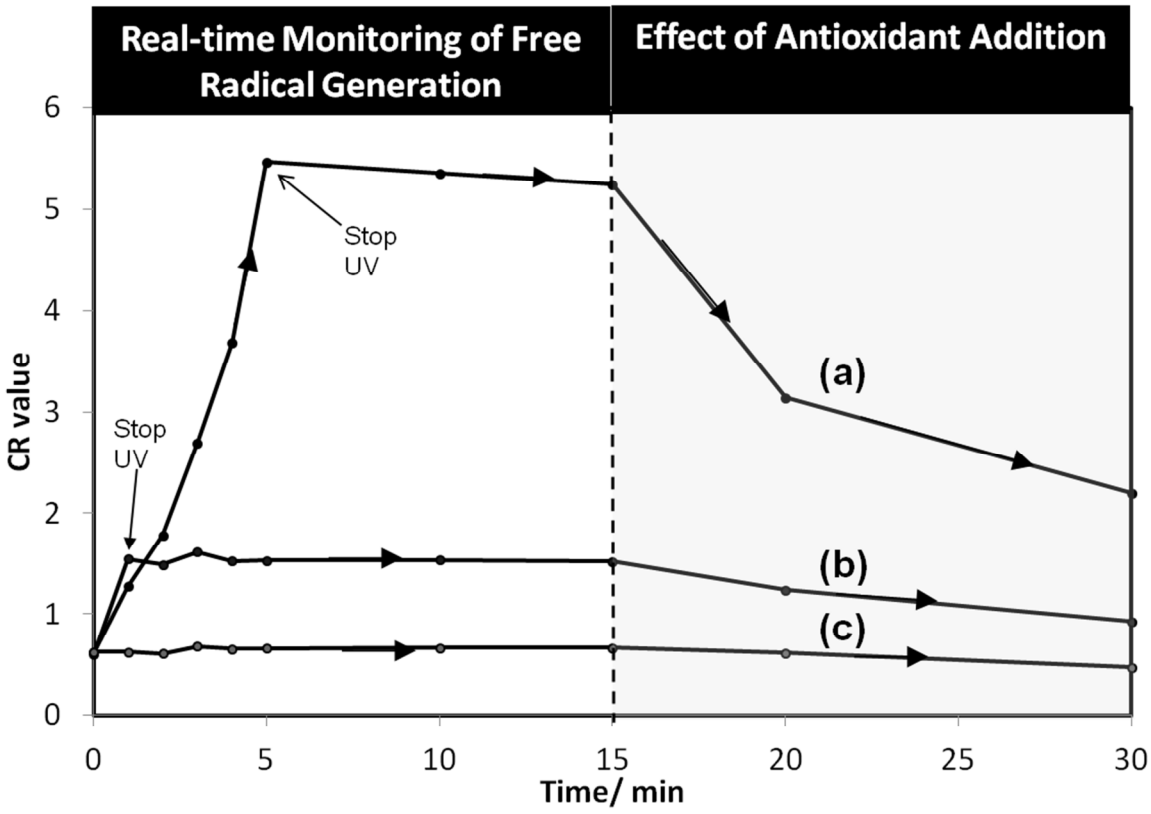

(a)
Free radicals (hydroxyl radicals)
Antioxidant (Vitamin C)
blue
Excess free radicals
Yellow
Excess antioxidants
red
Fluorescence blue-shift
CR > 0.6
Yellow-fluorescent
"4:6 AgNC mixture"
CR = 0.6
Fluorescence red-shift
CR < 0.6
(b)
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
Cr analyte - CR AgNCs
Excess hydroxyl radicals
Excess Ascorbic acid antioxidant
H2O2 / % by volume
100
80
60
40
20
0
Ascorbic acid/ % by volume
0
20
40
60
80
100

FIG. 6


Real-time Monitoring of Free Radical Generation
Effect of Antioxidant Addition
CR value
Time/ min
Stop UV
Stop UV
(a)
(b)
(c)
0
1
2
3
4
5
6
0
5
10
15
20
25
30