

## Supporting Information

# Colorimetric Sensor Array for Detection and Discrimination of Antioxidants Based on the AgNanoshell Depositionon Gold Nanoparticle Surfaces

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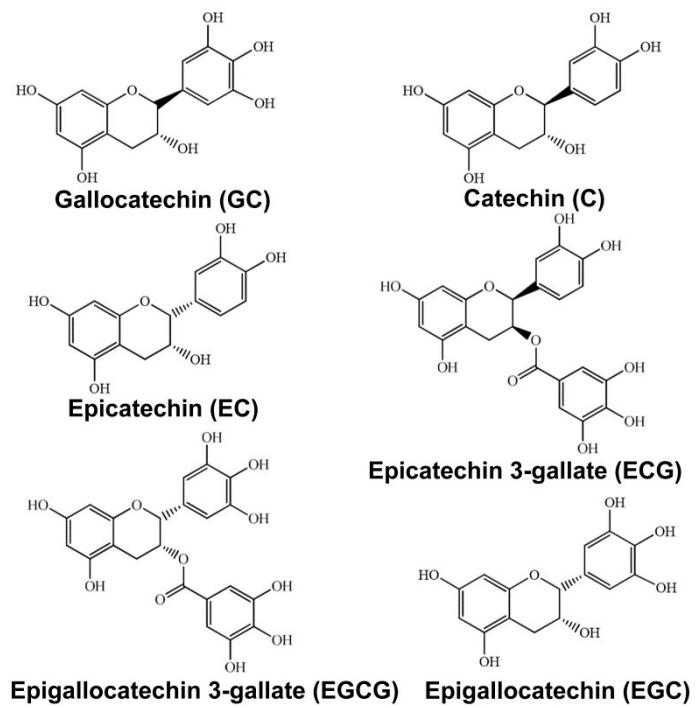
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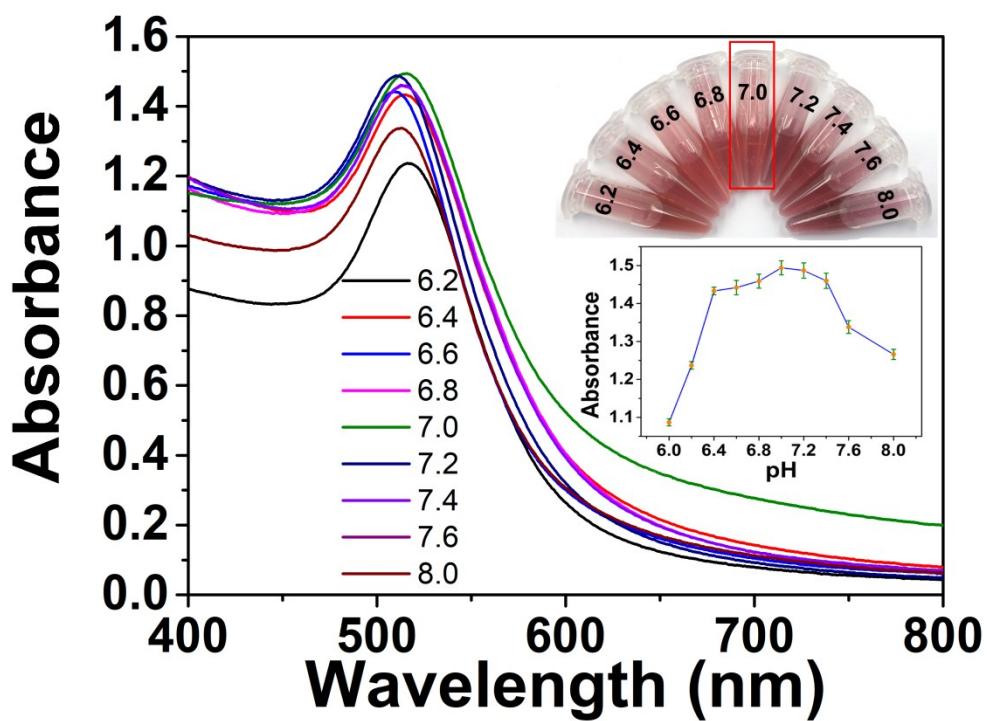
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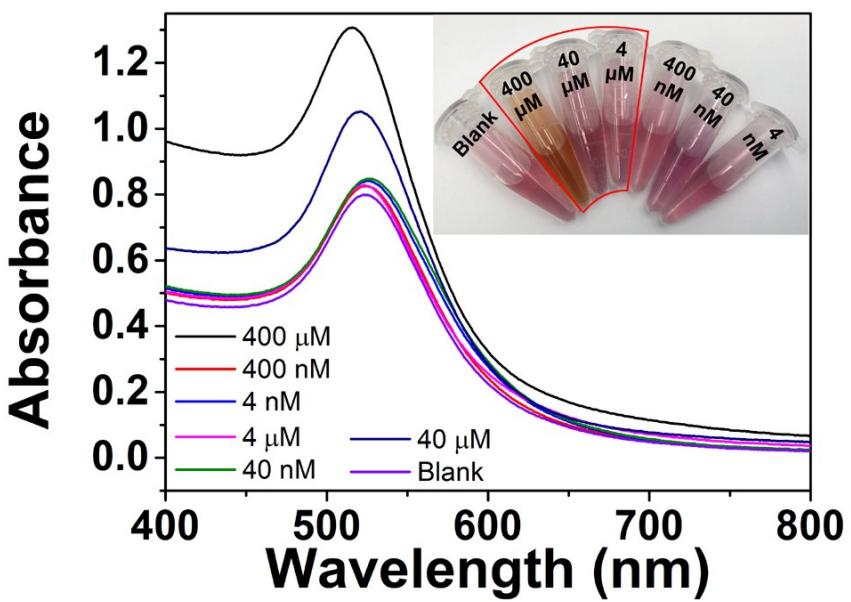
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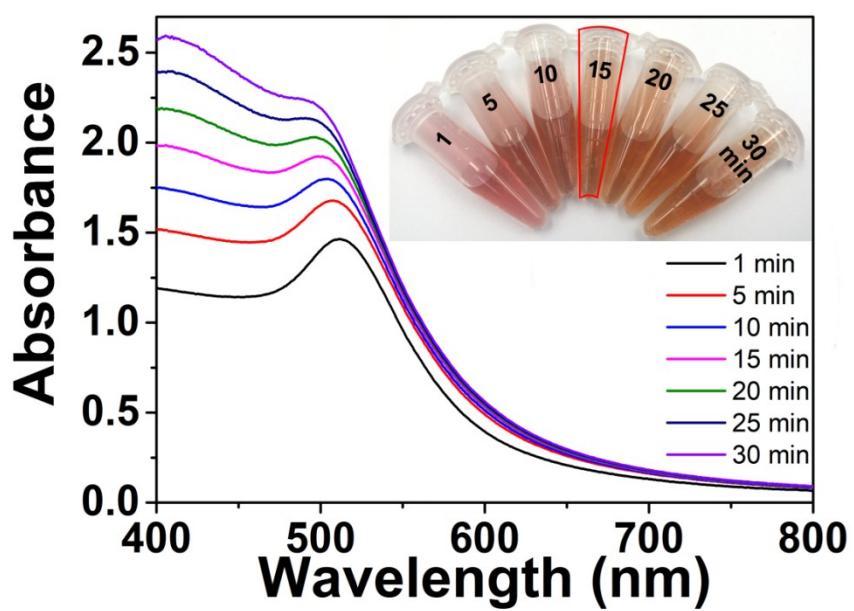
**Figure S1**The structures of six catechins



**Figure S2**UV-Vis absorption spectra of AuNP solutions in different pH values of PBS. Inset: the photographic images corresponding to the UV-Vis absorption spectra. Effect of different pH values of PBS on the absorbance of AuNP solutions at 520 nm. Error bars represent the standard deviation of triplicates.



**Figure S3** UV-Vis absorption spectra of the solution after reaction in the presence of different concentrations of AgNO<sub>3</sub>. Inset: photographic images corresponding to the UV-Vis absorption spectra.



**Figure S4**UV-Vis absorption spectra of the AuNP solution after different reaction time. Inset: photographic images corresponding to the UV-Vis absorption spectra.

**Table S1** The training matrix of the colorimetric response patterns against 6 analytes using this sensor assay at the concentration of 200  $\mu\text{M}$ .

antioxidants	$\Delta\text{RGB-AgNO}_3(400\ \mu\text{M})$	$\Delta\text{RGB-AgNO}_3(40\ \mu\text{M})$	$\Delta\text{RGB-AgNO}_3(4\ \mu\text{M})$
C	93.1933474	84.74078121	96.55568342
C	94.71536306	84.74078121	102.2448043
C	98.39715443	84.29116205	93.46657156
C	87.82368701	84.43340571	95.86448769
C	94.3716059	85.07643622	95.25229656
EC	104.3695358	130.418557	82.96384755
EC	102.2007828	130.418557	82.96384755
EC	104.6279121	133.7273345	81.63945125
EC	106.8316433	133.7273345	81.1418511
EC	106.3014581	132.5481045	81.25269226
GC	94.07443861	124.4065915	50.85272854
GC	93.32202312	124.4065915	48.64154603
GC	88.26097665	120.9504031	51.56549234
GC	96.13532129	122.0696522	45.09988914
GC	95.75489544	119.2224811	43.30127019
EGC	121.6593605	49.52776999	22.04540769
EGC	120.9710709	49.52776999	29.08607914
EGC	117.3243368	42	25.8069758
EGC	120.245582	48.64154603	19.84943324
EGC	123.3328829	49.34571917	27.5317998
EGCG	108.6324077	67.6609193	106.3437821
EGCG	104.1201229	67.6609193	117.4308307
EGCG	106.8176015	67.05967492	114.952164
EGCG	110.6842356	61.29437168	108.9219904
EGCG	103.116439	64.28841264	110.0999546
ECG	87.0689382	77.39509028	39.42080669
ECG	88.24964589	77.39509028	36.40054945
ECG	80.61017306	71.59608928	34.53983208
ECG	88.97752525	55.11805512	28.37252192
ECG	85.48099204	77.12976079	25.01999201

**Table S2** The training matrix of the colorimetric response patterns against 6 analytes using this sensor assay at the concentration of 20  $\mu\text{M}$ .

antioxidants	$\Delta\text{RGB-AgNO}_3(400\ \mu\text{M})$	$\Delta\text{RGB-AgNO}_3(40\ \mu\text{M})$	$\Delta\text{RGB-AgNO}_3(4\ \mu\text{M})$
C	18.78829423	74.71278338	78.77816956
C	19.72308292	74.71278338	94.64142856
C	20.54263858	83.86894539	88.77499648
C	28.08914381	79.4858478	93.30058949
C	35.58089375	81.84741902	77.69813383
EC	37.85498646	75.74958746	100.8464179
EC	33.3166625	75.74958746	121.893396
EC	32.75667871	80.31811751	114.2278425
EC	41.15823125	79.15175298	114.3940558
EC	43.56604182	76.11175993	103.2521186
GC	21.9544984	46.84015371	7.141428429
GC	20.14944168	46.84015371	14.59451952
GC	17.49285568	54.92722458	22.56102835
GC	21.56385865	57.218878	27.74887385
GC	30.82207001	53.1130869	7.280109889
EGC	65.38348415	107.856386	130.9198228
EGC	66.46803743	107.856386	146.7821515
EGC	69.07966416	116.1636776	143.8540927
EGC	87.25823743	119.235062	155.4027027
EGC	82.77680835	114.6123903	151.211772
EGCG	54.64430437	64.96922348	88.93818078
EGCG	46.27094121	64.96922348	112.2408125
EGCG	44.56455991	68.04410334	104.297651
EGCG	61.65225057	53.1130869	110.5667219
EGCG	64.76109943	54.87257967	106.8316433
ECG	39.63584237	90.8735385	150.7779825
ECG	37.98683983	90.8735385	164.8332491
ECG	33.76388603	89.93886813	162.708328
ECG	51.53639491	100.7025322	170.1087887
ECG	54.8634669	102.034308	162.3637891

**Table S3** The training matrix of the colorimetric response patterns against 6 analytes using this sensor assay at the concentration of 2  $\mu\text{M}$ .

antioxidants	$\Delta\text{RGB-AgNO}_3$ (400 $\mu\text{M}$ )	$\Delta\text{RGB-AgNO}_3$ (40 $\mu\text{M}$ )	$\Delta\text{RGB-AgNO}_3$ (4 $\mu\text{M}$ )
C	20.85665361	73.83088785	142.551745
C	22.56102835	73.83088785	133.4953183
C	27.44084547	77.57576941	138.6434275
C	24.12467616	88.04544281	135.9264507
C	24.75883681	79.12648103	135.753453
EC	11.70469991	106.6677083	115.5378726
EC	13.15294644	106.6677083	109.0596167
EC	11.5758369	112.5833025	104.6374694
EC	14.96662955	110.9594521	100.4838295
EC	15.39480432	116.6619047	106.6489569
GC	19.41648784	130.8357749	217.8302091
GC	10.95445115	130.8357749	199.8824655
GC	12.32882801	142.846071	206.7099417
GC	8.366600265	142.0176045	202.7658748
GC	13.15294644	137.4845446	205.5358849
EGC	38.13135193	136.4001466	161.2978611
EGC	40.91454509	136.4001466	160.4306704
EGC	37.60319135	144.1180072	157.4198209
EGC	35.11409973	144.4333756	156.4768353
EGC	38.37968212	146.2326913	157.8258534
EGCG	18.60107524	31.2409987	91.26883367
EGCG	20.80865205	31.2409987	93.34880824
EGCG	21	34.42382896	89.18520057
EGCG	16.40121947	43.23193264	84.22588676
EGCG	22.15851981	47.96873982	93.1557835
ECG	28.16025568	124.4588285	196.4942747
ECG	22.47220505	124.4588285	182.8824759
ECG	28.80972058	128.351081	193.7756435
ECG	26.26785107	133.8954816	190.8402473
ECG	32.09361307	137.6263056	194.3038857

**Table S4** The training matrix of the colorimetric response patterns against 6 analytes using this sensor assay at the concentration of 0.2  $\mu\text{M}$ .

antioxidants	$\Delta\text{RGB-AgNO}_3$ (400 $\mu\text{M}$ )	$\Delta\text{RGB-AgNO}_3$ (40 $\mu\text{M}$ )	$\Delta\text{RGB-AgNO}_3$ (4 $\mu\text{M}$ )
C	11.5758369	93.62691921	83.36066219
C	15.16575089	93.62691921	79.93122043
C	10.77032961	98.23441352	86.79285685
C	5.196152423	102.3181313	81.64557551
C	4.123105626	102.3181313	91.79324594
EC	27.09243437	113.2519316	130.8778056
EC	29.03446228	113.2519316	134.3167897
EC	20.0748599	122.0368797	136.0367597
EC	25.03996805	118.14398	136.7077174
EC	21.63330765	119.8707637	138.426876
GC	31.78049716	115.1824639	139.9499911
GC	38.60051813	115.1824639	141.665098
GC	28.39013913	126.1824076	139.9499911
GC	29.84962311	118.8402289	138.2353066
GC	29.84962311	122.2906374	148.5294584
EGC	47.16990566	77.99358948	54.88169094
EGC	52.32590181	77.99358948	50.76416059
EGC	47.16990566	86.07554821	59.01694672
EGC	48.88762625	77.05193054	49.2138192
EGC	42.72001873	80.50465825	51.8748494
EGCG	39.37003937	99.54898292	86.44073114
EGCG	39.37003937	99.54898292	93.29523032
EGCG	35.86084215	111.1035553	91.9782583
EGCG	35.86084215	100.3244736	92.62289134
EGCG	34.10278581	107.2240645	100.0099995
ECG	14.73091986	108.0601684	73.60706488
ECG	19.54482029	108.0601684	78.5684415
ECG	16.673332	112.9291813	78.74642849
ECG	15.39480432	105.6314347	76.5049018
ECG	11.70469991	115.8533556	80.28698525

**Table S5** The training matrix of the colorimetric response patterns against 6 analytes using this sensor assay at the concentration of 0.02  $\mu\text{M}$ .

antioxidants	$\Delta\text{RGB-AgNO}_3$ (400 $\mu\text{M}$ )	$\Delta\text{RGB-AgNO}_3$ (40 $\mu\text{M}$ )	$\Delta\text{RGB-AgNO}_3$ (4 $\mu\text{M}$ )
C	28.17800561	29.58039892	101.7496929
C	31.591138	29.58039892	98.22932352
C	28.17800561	37.80211634	106.061303
C	36.5650106	31.52776554	110.154437
C	27.31300057	33.51119216	104.1393297
EC	44.09081537	46.69047012	168.2468425
EC	50.91168825	46.69047012	169.7939928
EC	48.76474136	50.17967716	176.5729311
EC	48.76474136	43.35896678	175.6189056
EC	40.54626987	50.47771786	169.7939928
GC	54.64430437	47.93745926	112.7342007
GC	59.80802622	47.93745926	111.9017426
GC	58.08614293	57.43692192	113.6177803
GC	61.53048025	58.01723882	126.313103
GC	53.93514624	57.24508713	119.1091936
EGC	24.37211521	62.87288764	111.3642672
EGC	25.0998008	62.87288764	100.1299156
EGC	27.67670501	71.28113355	108.7244223
EGC	32.69556545	62.2655603	119.2476415
EGC	26.19160171	64.79197481	108.5218872
EGCG	28.58321186	24.06241883	135.3292282
EGCG	27.12931993	24.06241883	130.1537552
EGCG	34.33656943	26.70205985	137.0437886
EGCG	31.28897569	20.22374842	135.5359731
EGCG	25.67099531	23.74868417	136.5650028
ECG	33.12099032	33.83784863	130.6942998
ECG	36.61966685	33.83784863	132.0302996
ECG	39.12799509	30.88689042	136.1212695
ECG	42.55584566	32.34192326	134.3949404
ECG	35.67912555	34.59768778	131.4572174

**Table S6** The training matrix of the colorimetric response patterns against 6 analytes using this sensor assay at the concentration of 0.01 $\mu$ M.

antioxidants	$\Delta$ RGB-AgNO <sub>3</sub> (400 $\mu$ M)	$\Delta$ RGB-AgNO <sub>3</sub> (40 $\mu$ M)	$\Delta$ RGB-AgNO <sub>3</sub> (4 $\mu$ M)
C	35.86084215	40.21193853	3.741657387
C	32.71085447	40.21193853	3.741657387
C	33.18132005	20.78460969	12.88409873
C	34.36568055	30.7408523	17.97220076
C	32.04684072	32.38826948	11.18033989
EC	39.69886648	60.58052492	78.09609465
EC	40.16217126	60.58052492	69.45502142
EC	39.10242959	41.59326869	76.69419796
EC	37.20215048	51.28352562	77.23341246
EC	36.81032464	41.64132563	71.53320907
GC	33.76388603	64.69157596	83.71379815
GC	30.6757233	64.69157596	64.76109943
GC	38.8458492	53.16013544	82.23138087
GC	40.64480287	53.16013544	77.69813383
GC	37.69615365	55.01817881	78.94935085
EGC	28.08914381	36.02776707	125.7378225
EGC	24.73863375	36.02776707	120.5860688
EGC	23.08679276	34.13209633	128.9689885
EGC	31.25699922	25.76819745	132.4613151
EGC	26.19160171	34.0881211	127.9687462
EGCG	36.7151195	59.87486952	59.41380311
EGCG	38.44476557	59.87486952	55.14526272
EGCG	34.11744422	52.64028875	58.83026432
EGCG	39.87480407	64.28841264	73.17103252
EGCG	33.91164992	60.11655346	64.41273166
ECG	3.16227766	83.43860018	75.2861209
ECG	10.39230485	83.43860018	73.25298629
ECG	6.403124237	49.81967483	83.89278872
ECG	8.774964387	55.57877293	82.92767934
ECG	8.774964387	57.84461946	77.3369252

**Table S7** The training matrix of the colorimetric response patterns against catechin with different concentrations (0.01-200 μM) using this sensor assay.

antioxidants	ΔRGB-AgNO <sub>3</sub> (400 μM)	ΔRGB-AgNO <sub>3</sub> (40 μM)	ΔRGB-AgNO <sub>3</sub> (4 μM)
200μM	73.27346041	29.69848481	47.29693436
200μM	81.25884567	29.69848481	40.37325848
200μM	82.72242743	29.69848481	41.32795664
200μM	71.07038764	26.43860813	39.63584237
200μM	74.73285757	29.30870178	44.72135955
100μM	68.5273668	32.32645975	32.07802986
100μM	75.06663706	32.32645975	18.05547009
100μM	76.75936425	29.79932885	25.15949125
100μM	68.5273668	34.2636834	23.70653918
100μM	69.92853495	30.23243292	22.69361144
20μM	63.33245613	17.60681686	41.88078318
20μM	59.49789912	17.60681686	31.25699922
20μM	66.36264009	18.81488772	35.52463934
20μM	61.13100686	18	29.59729717
20μM	63.82005954	24.39262184	31.84336666
10μM	54.41507144	21.47091055	25.88435821
10μM	52.35456045	21.47091055	14.17744688
10μM	62.3217458	10.39230485	28.65309756
10μM	62.31372241	22.04540769	18.81488772
10μM	63.182276	18.05547009	23.70653918
2μM	37.49666652	47.04253395	45.04442252
2μM	35.24202037	47.04253395	36.52396474
2μM	42.07136794	42.53234064	39.20459157
2μM	34.0881211	45.97825573	31.33687923
2μM	32.83291032	46.27094121	40.02499219
0.02μM	27.31300057	36.72873534	34.82814953
0.02μM	25.0998008	36.72873534	26.41968963
0.02μM	31.84336666	32.26453161	29
0.02μM	23.9582971	35.86084215	22.13594362
0.02μM	22.6715681	36.06937759	29.89983278
0.01μM	18.38477631	19.41648784	15.84297952
0.01μM	7.348469228	19.41648784	25.49509757
0.01μM	18.62793601	16.03121954	22.56102835
0.01μM	17.57839583	21.9317122	22.5166605
0.01μM	19.5192213	25.3179778	17.3781472

**Table S8** The training matrix of the colorimetric response patterns against epicatechin with different concentrations (0.01-200 μM) using this sensor assay.

antioxidants	ΔRGB-AgNO <sub>3</sub> (400 μM)	ΔRGB-AgNO <sub>3</sub> (40 μM)	ΔRGB-AgNO <sub>3</sub> (4 μM)
200μM	116.1981067	80.09993758	95.1209756
200μM	114.4945414	80.09993758	75.49834435
200μM	112.0803283	87.96021828	89.54328562
200μM	111.1890282	82.66196223	84.12490713
200μM	111.0900536	80.09993758	110.1725919
100μM	90.47651629	101.0544408	129.7304899
100μM	85.51608036	101.0544408	113.7980668
100μM	93.39700209	102.0637056	123.0690863
100μM	88.75246475	91.83136719	120.6896847
100μM	92.13576938	91.32360045	152.6237203
20μM	68.19824045	75.70336849	128.9767421
20μM	63.2455532	75.70336849	111.6825859
20μM	70.71067812	80.72793816	123.2112008
20μM	63.00793601	80.56674252	124.040316
20μM	63.2455532	76.4852927	148.4419078
10μM	61.32699243	58.48931526	114.4814395
10μM	56.5154846	58.48931526	108.692226
10μM	61	60.77005842	114.5600279
10μM	55.61474625	56.30275304	111.7362967
10μM	59.8414572	55.47071299	134.3354011
2μM	48.61069841	56.0178543	161.5518493
2μM	47.07440918	56.0178543	83.13843876
2μM	52.23983155	59.14389233	92.40129869
2μM	44.39594576	52.48809389	88.41379983
2μM	50.15974482	51.42956348	119.0294081
0.02μM	33.61547263	37.41657387	69.89277502
0.02μM	30.01666204	37.41657387	62.95236294
0.02μM	28.58321186	46.28174586	61.40032573
0.02μM	25.01999201	37.58989226	62.00806399
0.02μM	30.01666204	35.91656999	85.34635317
0.01μM	24.59674775	9.433981132	69.99285678
0.01μM	19.23538406	9.433981132	55.30822724
0.01μM	23.85372088	8.062257748	67.09694479
0.01μM	20.49390153	3.741657387	63.15061362
0.01μM	13.56465997	7.280109889	91.46584062

**Table S9** The training matrix of the colorimetric response patterns against epicatechin 3-gallate with different concentrations (0.01-200 μM) using this sensor assay.

antioxidants	ΔRGB-AgNO <sub>3</sub> (400 μM)	ΔRGB-AgNO <sub>3</sub> (40 μM)	ΔRGB-AgNO <sub>3</sub> (4 μM)
200μM	111.5750868	140.4919927	187.1069213
200μM	109.2886087	140.4919927	181.6067179
200μM	103.9278596	128.7361643	184.8485867
200μM	117.2774488	147.2888319	192.0650931
200μM	115.2258652	144.2671134	186.4966488
100μM	93.1557835	162.7667042	175.4907405
100μM	96.84523736	162.7667042	174.2125139
100μM	88.14760348	140.1998573	172.9913293
100μM	99.12113801	157.0127383	179.7804216
100μM	94.94208761	152.8953891	168.0714134
20μM	85.00588215	155.9294712	141.8344105
20μM	86.13361713	155.9294712	146.8434541
20μM	89.17959408	146.0342426	146.9761885
20μM	92.20086767	151.4628667	146.5469208
20μM	86.86195945	150.6685103	139.992857
10μM	102.3230179	79.12016178	90.69178574
10μM	105.3043209	79.12016178	82.3893197
10μM	96.87104831	69.69935437	87.8749111
10μM	108.4573649	58.45511098	82.33468285
10μM	102.8542658	74.22937424	57.99137867
2μM	63.03967005	111.6691542	121.1073904
2μM	58.92367945	111.6691542	120.3079382
2μM	58.66856058	109.658561	122.5275479
2μM	66.06057826	115.1043005	120.7849328
2μM	52.09606511	108.6692229	127.8671185
0.02μM	40.36087214	69.61321714	133.9925371
0.02μM	41.97618372	69.61321714	136.8612436
0.02μM	42.29657197	58.22370651	137.6263056
0.02μM	50.60632372	68.41783393	136.8612436
0.02μM	44.83302354	63.82789359	131.1258937
0.01μM	12.68857754	90.03332716	107.5453393
0.01μM	19.26136028	90.03332716	102.5962962
0.01μM	13.74772708	89.49860334	116.9829047
0.01μM	14.45683229	93.8562731	109.3892134
0.01μM	15.26433752	90.04443348	108.9495296

**Table S10** The training matrix of the colorimetric response patterns against epigallocatechin with different concentrations (0.01-200 μM) using this sensor assay.

antioxidants	ΔRGB-AgNO <sub>3</sub> (400 μM)	ΔRGB-AgNO <sub>3</sub> (40 μM)	ΔRGB-AgNO <sub>3</sub> (4 μM)
200μM	126.2418314	46.96807426	15.90597372
200μM	130.3303495	46.96807426	17.94435844
200μM	126.2893503	45.49725266	17.1464282
200μM	126.83848	48.83646179	8.831760866
200μM	132.9812017	44.57577818	18.05547009
100μM	110.6752005	57.44562647	17.60681686
100μM	115.8274579	57.44562647	18.16590212
100μM	113.3754824	51.73973328	20.22374842
100μM	114.9391143	53.52569476	20.02498439
100μM	121.1073904	47.02127178	19.67231557
20μM	138.8560406	70.80254233	36.08323711
20μM	137.1495534	70.80254233	35.84689666
20μM	133.7235955	75.6174583	32.44996148
20μM	140.4848746	71.35124386	32.54228019
20μM	140.5631531	72.36711961	28.61817604
10μM	87.50999943	108.7474138	40.01249805
10μM	98.59513173	108.7474138	37.58989226
10μM	90.33825325	114.074537	41.73727351
10μM	93.26306879	114.2278425	32.04684072
10μM	92.65527508	111.0045044	37.58989226
2μM	54.08326913	137.8695035	43.30127019
2μM	54.64430437	137.8695035	37.53664876
2μM	58.1893461	139.5528574	42.94182111
2μM	53.48831648	137.3389966	41.56921938
2μM	54.41507144	128.5729365	38.18376618
0.02μM	46.41120554	134.8851363	94.46163242
0.02μM	50.48762225	134.8851363	88.22698
0.02μM	50.99019514	138.267856	89.28605714
0.02μM	54.68089246	134.2758355	91.67333309
0.02μM	55.80322571	136.4331338	90.60905032
0.01μM	86.84468896	163.65207	122.4744871
0.01μM	88.48163651	163.65207	112.7696768
0.01μM	89.67162316	166.7033293	112.7696768
0.01μM	94.34511116	163.3738045	121.2765435
0.01μM	94.28149341	160.5521722	112.2051692

**Table S11** The training matrix of the colorimetric response patterns against epigallocatechin 3-gallate with different concentrations (0.01-200μM) using this sensor assay.

antioxidants	ΔRGB-AgNO <sub>3</sub> (400 μM)	ΔRGB-AgNO <sub>3</sub> (40 μM)	ΔRGB-AgNO <sub>3</sub> (4 μM)
200μM	108.6324077	67.6609193	106.3437821
200μM	104.1201229	67.6609193	117.4308307
200μM	106.8176015	67.05967492	114.952164
200μM	110.6842356	61.29437168	108.9219904
200μM	103.116439	64.28841264	110.0999546
100μM	91.65696918	75.1598297	125.0319959
100μM	89.81091248	75.1598297	131.91285
100μM	86.5909926	73.19152956	126.0912368
100μM	99.76973489	79.59899497	124.3704145
100μM	91.65696918	85.1704174	126.0039682
20μM	78.59389289	135.900699	60.73713856
20μM	79.55501241	135.900699	68.79680225
20μM	70.63285355	130.617763	62.41794614
20μM	73.73601562	128.4406478	60.62177826
20μM	78.59389289	127.1573828	65.39877675
10μM	64.76109943	70.67531394	81.45550933
10μM	63.56099433	70.67531394	79.2527602
10μM	57.98275606	69.18814927	72.2564876
10μM	60.94259594	66.64082833	79.72452571
10μM	58.70264049	73.76313442	69.8641539
2μM	64.60650122	63.15061362	36.45545227
2μM	63.11893535	63.15061362	35.44009029
2μM	63.75735252	62.28964601	33.2565783
2μM	64.04685785	51.07837116	29.08607914
2μM	66.46803743	53.30103188	27
0.02μM	17.02938637	60.76183012	87.21238444
0.02μM	12.08304597	60.76183012	89.0056178
0.02μM	17.74823935	53.31978995	91.79324594
0.02μM	17.4642492	53.71219601	98.98484733
0.02μM	14.28285686	55.26300752	95.69743988
0.01μM	23.15167381	20.1246118	23.72762104
0.01μM	23.85372088	20.1246118	36.24913792
0.01μM	17.49285568	21.30727575	25.29822128
0.01μM	25.3179778	24.75883681	31.1608729
0.01μM	19.10497317	37.65634077	29.563491

**Table S12** The training matrix of the colorimetric response patterns against gallic acid with different concentrations (0.01-200 μM) using this sensor assay.

antioxidants	ΔRGB-AgNO <sub>3</sub> (400 μM)	ΔRGB-AgNO <sub>3</sub> (40 μM)	ΔRGB-AgNO <sub>3</sub> (4 μM)
200μM	91.21951546	79.98749902	19.6468827
200μM	90.36038955	79.98749902	21.47091055
200μM	95.65040512	73.52550578	33.82306905
200μM	92.28217596	77.58221446	26.38181192
200μM	91.58602513	63.31666447	11.18033989
100μM	87.869221	76.74633542	45.32107677
100μM	89.69949833	76.74633542	47.21228654
100μM	94.94208761	70.32780389	58.15496539
100μM	83.10234654	40.21193853	19.72308292
100μM	90.43782395	65.21502894	40.16217126
20μM	67.45368782	60.24948133	53.19774431
20μM	71.42828571	60.24948133	61.20457499
20μM	70.61161378	50.3189825	73.73601562
20μM	68.65857558	42.62628297	58.5918083
20μM	70.61161378	43.11612227	53.42284156
10μM	61.32699243	83.3126641	79.78721702
10μM	65.98484675	83.3126641	92.37965144
10μM	66.21933252	74.97332859	102.3181313
10μM	60.67948583	76.15773106	91.87491497
10μM	62.63385666	73.10950691	86.82165628
2μM	39.73663297	48.20788317	43.78355856
2μM	47.33920151	48.20788317	52.81098371
2μM	47.01063709	42.86023798	55.01817881
2μM	42.36744033	46.17358552	51.66236541
2μM	43.11612227	33.76388603	41.78516483
0.02μM	23.62202362	22.11334439	33.54101966
0.02μM	23.51595203	22.11334439	39.05124838
0.02μM	25.47547841	24.61706725	39.11521443
0.02μM	19.4422221	24	37.17526059
0.02μM	20.61552813	14.03566885	23.76972865
0.01μM	13.92838828	4.472135955	92.74696761
0.01μM	10.81665383	4.472135955	97.28309206
0.01μM	10.19803903	15.26433752	98.16312953
0.01μM	13.49073756	12.68857754	93
0.01μM	14.45683229	7.348469228	82.23138087

**Table S13**The training matrix of the colorimetric response patterns against 6 analytes with different concentrations using this sensor assay.

antioxidants	$\Delta\text{RGB-AgNO}_3$ (400 $\mu\text{M}$ )	$\Delta\text{RGB-AgNO}_3$ (40 $\mu\text{M}$ )	$\Delta\text{RGB-AgNO}_3$ (4 $\mu\text{M}$ )
EC(200 $\mu\text{M}$ )	116.2	80.1	95.12
EC(200 $\mu\text{M}$ )	114.49	80.1	75.5
EC(200 $\mu\text{M}$ )	112.08	87.96	89.54
EC(200 $\mu\text{M}$ )	111.19	82.66	84.12
EC(200 $\mu\text{M}$ )	111.09	80.1	110.17
EC(100 $\mu\text{M}$ )	90.48	101.05	129.73
EC(100 $\mu\text{M}$ )	85.52	101.05	113.8
EC(100 $\mu\text{M}$ )	93.4	102.06	123.07
EC(100 $\mu\text{M}$ )	88.75	91.83	120.69
EC(100 $\mu\text{M}$ )	92.14	91.32	152.62
EC(0.2 $\mu\text{M}$ )	33.62	37.42	69.89
EC(0.2 $\mu\text{M}$ )	30.02	37.42	62.95
EC(0.2 $\mu\text{M}$ )	28.58	46.28	61.4
EC(0.2 $\mu\text{M}$ )	25.02	37.59	62.01
EC(0.2 $\mu\text{M}$ )	30.02	35.92	85.35
C(10 $\mu\text{M}$ )	63.33	17.61	41.88
C(10 $\mu\text{M}$ )	59.5	17.61	31.26
C(10 $\mu\text{M}$ )	66.36	18.81	35.52
C(10 $\mu\text{M}$ )	61.13	18	29.6
C(10 $\mu\text{M}$ )	63.82	24.39	31.84
C(0.01 $\mu\text{M}$ )	18.38	19.42	15.84
C(0.01 $\mu\text{M}$ )	7.35	19.42	25.5
C(0.01 $\mu\text{M}$ )	18.63	16.03	22.56
C(0.01 $\mu\text{M}$ )	17.58	21.93	22.52
C(0.01 $\mu\text{M}$ )	19.52	25.32	17.38
ECG(200 $\mu\text{M}$ )	111.58	140.49	187.11
ECG(200 $\mu\text{M}$ )	109.29	140.49	181.61
ECG(200 $\mu\text{M}$ )	103.93	128.74	184.85
ECG(200 $\mu\text{M}$ )	117.28	147.29	192.07
ECG(200 $\mu\text{M}$ )	115.23	144.27	186.5
ECG(0.2 $\mu\text{M}$ )	40.36	69.61	133.99
ECG(0.2 $\mu\text{M}$ )	41.98	69.61	136.86
ECG(0.2 $\mu\text{M}$ )	42.3	58.22	137.63
ECG(0.2 $\mu\text{M}$ )	50.61	68.42	136.86
ECG(0.2 $\mu\text{M}$ )	44.83	63.83	131.13
ECG(0.01 $\mu\text{M}$ )	12.69	90.03	107.55
ECG(0.01 $\mu\text{M}$ )	19.26	90.03	102.6
ECG(0.01 $\mu\text{M}$ )	13.75	89.5	116.98
ECG(0.01 $\mu\text{M}$ )	14.46	93.86	109.39

ECG(0.01 μM)	15.26	90.04	108.95
EGCG(0.2 μM)	17.03	60.76	87.21
EGCG(0.2 μM)	12.08	60.76	89.01
EGCG(0.2 μM)	17.75	53.32	91.79
EGCG(0.2 μM)	17.46	53.71	98.98
EGCG(0.2 μM)	14.28	55.26	95.7
GC(200 μM)	91.22	79.99	19.65
GC(200 μM)	90.36	79.99	21.47
GC(200 μM)	95.65	73.53	33.82
GC(200 μM)	92.28	77.58	26.38
GC(200 μM)	91.59	63.32	11.18
GC(20 μM)	67.45	60.25	53.2
GC(20 μM)	71.43	60.25	61.2
GC(20 μM)	70.61	50.32	73.74
GC(20 μM)	68.66	42.63	58.59
GC(20 μM)	70.61	43.12	53.42
GC(10 μM)	61.33	83.31	79.79
GC(10 μM)	65.98	83.31	92.38
GC(10 μM)	66.22	74.97	102.32
GC(10 μM)	60.68	76.16	91.87
GC(10 μM)	62.63	73.11	86.82
GC(2 μM)	39.74	48.21	43.78
GC(2 μM)	47.34	48.21	52.81
GC(2 μM)	47.01	42.86	55.02
GC(2 μM)	42.37	46.17	51.66
GC(2 μM)	43.12	33.76	41.79
GC(0.01 μM)	13.93	4.47	92.75
GC(0.01 μM)	10.82	4.47	97.28
GC(0.01 μM)	10.2	15.26	98.16
GC(0.01 μM)	13.49	12.69	93
GC(0.01 μM)	14.46	7.35	82.23
EGC(100 μM)	110.68	57.45	17.61
EGC(100 μM)	115.83	57.45	18.17
EGC(100 μM)	113.38	51.74	20.22
EGC(100 μM)	114.94	53.53	20.02
EGC(100 μM)	121.11	47.02	19.67
EGC(20 μM)	138.86	70.8	36.08
EGC(20 μM)	137.15	70.8	35.85
EGC(20 μM)	133.72	75.62	32.45
EGC(20 μM)	140.48	71.35	32.54
EGC(20 μM)	140.56	72.37	28.62
EGC(2 μM)	54.08	137.87	43.3
EGC(2 μM)	54.64	137.87	37.54
EGC(2 μM)	58.19	139.55	42.94

EGC(2 $\mu$ M)	53.49	137.34	41.57
EGC(2 $\mu$ M)	54.42	128.57	38.18
EGC(0.2 $\mu$ M)	46.41	134.89	94.46
EGC(0.2 $\mu$ M)	50.49	134.89	88.23
EGC(0.2 $\mu$ M)	50.99	138.27	89.29
EGC(0.2 $\mu$ M)	54.68	134.28	91.67
EGC(0.2 $\mu$ M)	55.8	136.43	90.61

**Table S14.** The training matrix of the colorimetric response patterns against the mixture of GC and EGC at 20  $\mu\text{M}$  and 0.2  $\mu\text{M}$  using this sensor assay.

antioxidants	$\Delta\text{RGB-AgNO}_3$ (400 $\mu\text{M}$ )	$\Delta\text{RGB-AgNO}_3$ (40 $\mu\text{M}$ )	$\Delta\text{RGB-AgNO}_3$ (4 $\mu\text{M}$ )	
20 $\mu\text{M}$	GC/EGC=1:9	62.46551048	107.4598995	140.0374236
	GC/EGC=1:9	63.08002854	107.4598995	138.4725244
	GC/EGC=1:9	66.33226967	114.916709	137.217528
	GC/EGC=1:9	69.8307955	115.3015178	142.2319233
	GC/EGC=1:9	65.11843057	112.6819418	143.8778301
	GC/EGC=2:8	56.17437138	96.76734987	122.4169923
	GC/EGC=2:8	56.28818704	96.76734987	119.8180287
	GC/EGC=2:8	59.07182069	103.3489236	120.2339386
	GC/EGC=2:8	60.73713856	106.4543094	124.6588946
	GC/EGC=2:8	58.2360713	100.4832324	124.2582794
	GC/EGC=3:7	46.5602835	86.08060176	104.7965648
	GC/EGC=3:7	46.13686162	86.08060176	102.4800468
	GC/EGC=3:7	45.46911039	91.80114378	103.2504237
	GC/EGC=3:7	49.8117456	94.91322353	107.2001866
	GC/EGC=3:7	47.2687	89.17337046	103.6659057
	GC/EGC=4:6	47.06208665	85.68243694	97.53194349
	GC/EGC=4:6	46.22812996	85.68243694	92.85709451
	GC/EGC=4:6	48.06162711	90.57814306	96.62090871
	GC/EGC=4:6	49.76183276	93.68393672	98.72426247
	GC/EGC=4:6	47.98708159	86.36851278	95.36708027
0.2 $\mu\text{M}$	GC	21.56385865	52.47856705	23.15167381
	GC	18.78829423	52.47856705	12.20655562
	GC	18.02775638	52.84884105	26.01922366
	GC	16.15549442	55.50675635	13.92838828
	GC	20.24845673	44.24929378	9.110433579
	EGC	65.38348415	107.856386	147.3091986
	EGC	66.46803743	107.856386	146.7821515
	EGC	70.1997151	114.5905755	143.8540927
	EGC	79.33473388	119.235062	155.4027027
	EGC	68.62215386	114.6123903	153.1535178
	GC/EGC=6:4	26.20992179	89.16523986	145.4786582
	GC/EGC=6:4	26.58571045	89.16523986	145.3753762
	GC/EGC=6:4	28.21276307	94.44363398	144.1037127
	GC/EGC=6:4	30.03065101	91.48770409	142.059565
	GC/EGC=6:4	26.272419	88.15917422	139.4179328
	GC/EGC=7:3	21.16341182	90.66090668	150.7138348
	GC/EGC=7:3	21.06893448	90.66090668	154.0271405
	GC/EGC=7:3	21.88812463	91.94563611	150.217742

GC/EGC=7:3	24.27035228	92.81734752	147.5958333
GC/EGC=7:3	18.41195264	90.66476714	148.3441944
GC/EGC=9:1	20.63976744	101.5293061	171.5470198
GC/EGC=9:1	22.89759813	101.5293061	174.9839993
GC/EGC=9:1	21.35907301	105.7270542	169.7796513
GC/EGC=9:1	23.38482414	103.7636738	168.8880398
GC/EGC=9:1	21.76465024	100.7032274	168.5973309
GC	19.74841766	105.2663289	180.047216
GC	21.47091055	105.2663289	184.6808057
GC	19.41648784	110.5531546	177.8623063
GC	22.22611077	108.78419	177.8623063
GC	20.97617696	104.885652	177.3865835
EGC	36.06937759	67.91906949	95.1052049
EGC	36.06937759	67.91906949	93.90953093
EGC	39.11521443	70.29224708	97.12878049
EGC	41.79712909	66.96267617	89.25245095
EGC	34.38022688	63.09516622	81.64557551



**Table S15.** The training matrix of the colorimetric response patterns against the mixture of GC, EGC and ECG at 200  $\mu$ M and 2  $\mu$ M using this sensor assay.

antioxidants	$\Delta\text{RGB-AgNO}_3$ (400 $\mu$ M)	$\Delta\text{RGB-AgNO}_3$ (40 $\mu$ M)	$\Delta\text{RGB-AgNO}_3$ (4 $\mu$ M)
200 $\mu$ M	GC/EGC/ECG=4:3:3	34.2773978	32.74278546
	GC/EGC/ECG=4:3:3	34.79166567	32.74278546
	GC/EGC/ECG=4:3:3	33.46923961	37.839926
	GC/EGC/ECG=4:3:3	35.50112674	31.88792875
	GC/EGC/ECG=4:3:3	34.78850385	33.70489579
	GC/EGC/ECG=3:4:3	36.84901627	27.93760906
	GC/EGC/ECG=3:4:3	37.34876169	27.93760906
	GC/EGC/ECG=3:4:3	40.21193853	31.84729188
	GC/EGC/ECG=3:4:3	39.571328	25.292489
	GC/EGC/ECG=3:4:3	37.40668389	29.24534151
	GC	29.73213749	67.42403132
	GC	29.73213749	67.42403132
	GC	27.47726333	73.74279626
	GC	33.54101966	70.9506871
	GC	30.95157508	65.06919394
	EGC	55.03635162	37.22902094
	EGC	55.03635162	37.22902094
	EGC	55.53377351	36.29049462
	EGC	55.78530272	37.69615365
	EGC	56.70978752	35.14256678
	ECG	22.20360331	25.63201124
	ECG	23.17326045	25.63201124
	ECG	21.61018278	30.47950131
	ECG	25.88435821	9.433981132
	ECG	20	28.65309756
	GC/EGC/ECG=2:4:4	31.9077044	26.88262636
	GC/EGC/ECG=2:4:4	32.44198514	26.88262636
	GC/EGC/ECG=2:4:4	31.33342624	29.17498929
	GC/EGC/ECG=2:4:4	34.78731953	23.20954976
	GC/EGC/ECG=2:4:4	32.33910327	28.13824444
	GC/EGC/ECG=4:4:2	27.4149886	23.59736426
2 $\mu$ M	GC/EGC/ECG=4:4:2	27.88910899	23.59736426
	GC/EGC/ECG=4:4:2	27.04114643	28.12177804
	GC/EGC/ECG=4:4:2	30.23040853	20.10381058
	GC/EGC/ECG=4:4:2	27.92020057	24.72166661
	GC/EGC=9:1	20.63976744	101.5293061
	GC/EGC=9:1	22.89759813	101.5293061
	GC/EGC=9:1	21.35907301	105.7270542
			169.7796513

GC/EGC=9:1	23.38482414	103.7636738	168.8880398
GC/EGC=9:1	21.76465024	100.7032274	168.5973309
GC	12.88409873	77.95511529	169.8705389
GC	0	77.95511529	162.6437825
GC	7.549834435	94.20721841	166.0271062
GC	4.472135955	84.90583019	166.0271062
GC	4.898979486	77.95511529	159.5650338
EGC	32.87856445	82.83718972	113.4680572
EGC	30.69201851	82.83718972	123.1503147
EGC	31.70173497	94.78396489	116.7775663
EGC	33.74907406	86.49277426	119.7747887
EGC	30.88689042	86.49277426	112.1918001
ECG	28.39013913	70.85901495	148.492424
ECG	27.80287755	70.85901495	145.6639969
ECG	28.3019434	78.84161338	153.1176019
ECG	23.62202362	75.81556568	154.0746572
ECG	34.88552709	77.89736838	148.3441944

**Table S16.** The training matrix of the colorimetric response patterns against the 6 analytes at 2  $\mu\text{M}$  with tannic acid(TA) and gallic acid(GA) at 200 $\mu\text{M}$  as potential interferences using this sensor assay.

antioxidants	$\Delta\text{RGB-AgNO}_3$ (400 $\mu\text{M}$ )	$\Delta\text{RGB-AgNO}_3$ (40 $\mu\text{M}$ )	$\Delta\text{RGB-AgNO}_3$ (4 $\mu\text{M}$ )
2 $\mu\text{M}$	C	11.5758369	93.62691921
	C	15.16575089	93.62691921
	C	10.77032961	98.23441352
	C	5.196152423	102.3181313
	C	4.123105626	102.3181313
	EC	27.09243437	113.2519316
	EC	29.03446228	113.2519316
	EC	20.0748599	122.0368797
	EC	25.03996805	118.14398
	EC	21.63330765	119.8707637
	GC	31.78049716	115.1824639
	GC	38.60051813	115.1824639
	GC	28.39013913	126.1824076
	GC	29.84962311	118.8402289
	GC	29.84962311	122.2906374
	EGC	47.16990566	77.99358948
	EGC	52.32590181	77.99358948
	EGC	47.16990566	86.07554821
	EGC	48.88762625	77.05193054
200 $\mu\text{M}$	EGC	42.72001873	80.50465825
	EGCG	39.37003937	99.54898292
	EGCG	39.37003937	99.54898292
	EGCG	35.86084215	111.1035553
	EGCG	35.86084215	100.3244736
	EGCG	34.10278581	107.2240645
	ECG	14.73091986	108.0601684
	ECG	19.54482029	108.0601684
	ECG	16.673332	112.9291813
	ECG	15.39480432	105.6314347
	ECG	11.70469991	115.8533556
	GA	55.31726674	111.4271062
	GA	59.53990259	111.4271062
	GA	52.03844733	123.1340733
200 $\mu\text{M}$	GA	55.15432893	106.2873464
	GA	53.82378656	125.1678873
	TA	42.62628297	102.1665307
	TA	44.04543109	102.1665307

TA	42.42640687	105.3612832	99.57409302
TA	42.08325083	106.7005155	91.92388155
TA	43.15089802	104.7425415	105.3850084

**Table S17.**The training matrix of the colorimetric response patterns against the 6 analytes at 0.02 μM in serum samples using this sensor assay.

antioxidants	ΔRGB-AgNO <sub>3</sub> (400 μM)	ΔRGB-AgNO <sub>3</sub> (40 μM)	ΔRGB-AgNO <sub>3</sub> (4 μM)
C	30.08321791	30.03331484	100.9455299
C	32.07802986	30.03331484	98.31073187
C	30.90307428	37.20215048	105.5461984
C	37.20215048	32.80243893	109.6403211
C	31.25699922	31.52776554	109.6540013
EC	46.38965402	47.16990566	167.9136683
EC	50.40833264	47.16990566	168.7424072
EC	49.93996396	49.58830507	175.3567792
EC	49.28488612	45.39823785	175.068558
EC	43.46262762	48.83646179	174.292857
GC	55.25395913	48.36320916	111.8570516
GC	60.28266749	48.36320916	111.5123312
GC	59.9082632	57.02630972	113.6177803
GC	61.53048025	58.01723882	127.667537
GC	56.29387178	55.31726674	123.6567831
EGC	26.0959767	63.38769597	111.8793994
EGC	24.37211521	63.38769597	99.70456359
EGC	28.70540019	71.19691005	107.5685828
EGC	32.69556545	61.97580173	120.4574614
EGC	26.77685568	63.60817558	112.0223192
EGCG	28.0713377	24.06241883	133.4203882
EGCG	26.2488095	24.06241883	129.2826361
EGCG	30.49590136	27.76688675	135.3292282
EGCG	30.43024811	19.26136028	134.8517705
EGCG	27.12931993	21.30727575	140.6591625
ECG	34.4818793	36.02776707	129.3406355
ECG	36.02776707	36.02776707	132.1135875
ECG	39.8246155	30.47950131	134.2907294
ECG	43.05810028	31.27299154	133.8394561
ECG	38.52272057	33.86738844	135.9816164
control	22.3159136	33.30165161	15.26433752
control	28.14249456	33.30165161	11.78982612
control	32.58834147	21.9544984	22.75961335
control	28.14249456	19.31320792	12.36931688
control	19.5192213	34.78505426	14.35270009