Supporting Information

New insights into chitosan-Ag nanocomposites synthesis: physicochemical aspects of formation, structure-bioactivity relationship and mechanism of antioxidant activity

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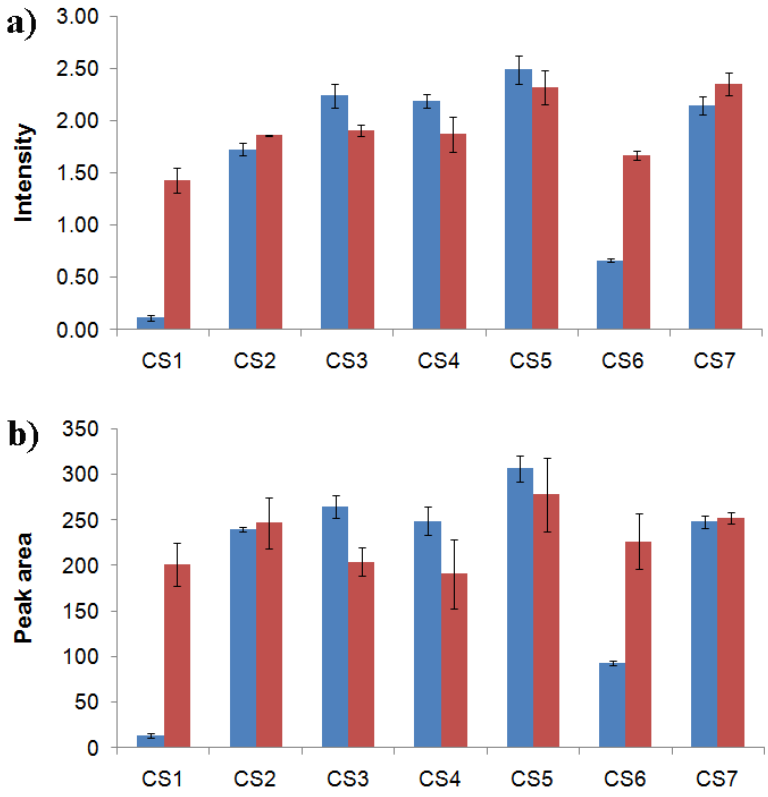

Fig. S1. Intensity (a) and area (b) of the SPR band of chitosan-Ag NCs, normalized to a silver concentration of 0.031 mg/mL, before (blue bars) and after (red bars) treatment with $NaBH_4$.

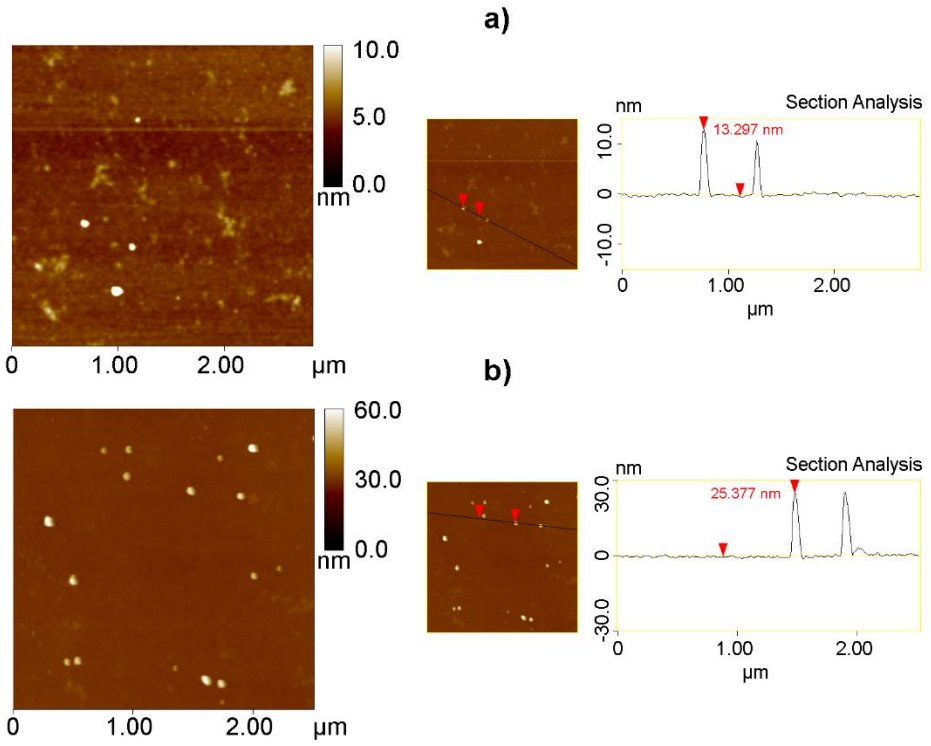

Fig. S2. AFM images and section analysis of CS5 (a) and CS7 (b) NCs.

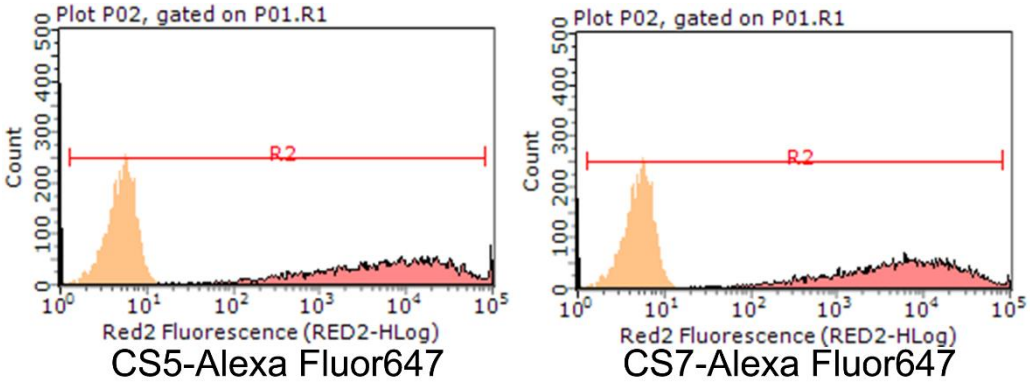

Fig. S3. Flow cytometry histograms of SCC7 cells treated with Alexa Fluor 647-labeled CS5 or CS7 for 3 h (red) compared to untreated cells (orange).

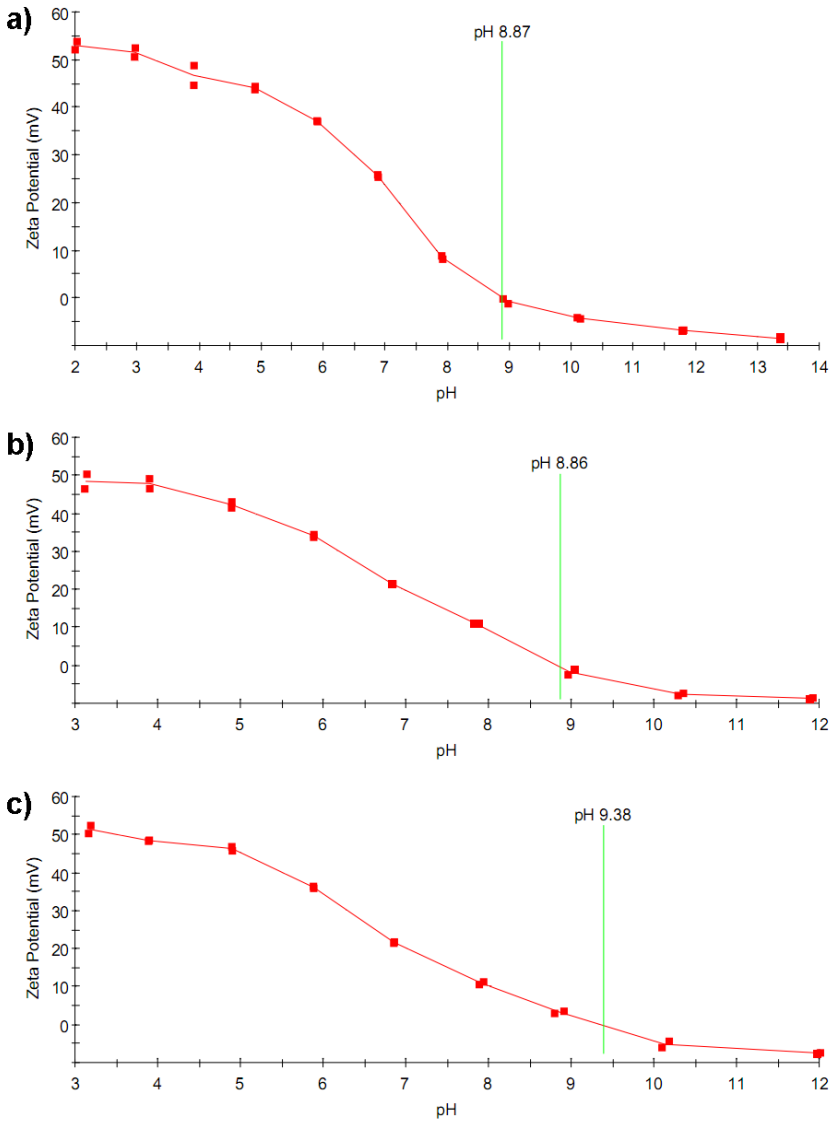

Fig. S4. Zeta potential curves as a function of pH for the original chitosan (a), CS5 (b), and CS7 (c) NCs.

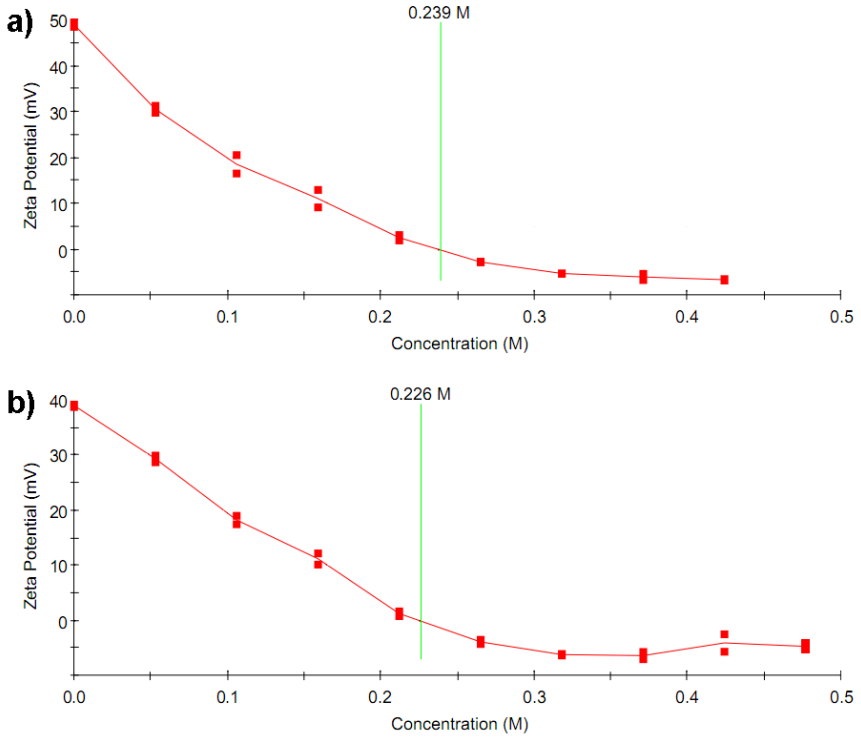

Fig. S5. Effect of BSA concentration on zeta potential for CS5 (a) and CS7 (b) NCs.

Table S1. Characteristics of the photoelectron spectra: binding energies (E), Gaussian widths (FWHM), area (S), and atomic percent (A) of photoelectron peaks belonging to different chemical groups in the C1s, N1s, and O1s spectra of the CS5 sample.

Name	E, eV	FWHM, eV	S, CPS.eV	A, %	SF
Ag3d5 Scan A	367.71	1.09	845.67	0.13	13.068
C1s Scan A	284.81	1.15	14285.46	27.01	1
C1s Scan B	286.36	1.28	15882.37	30.06	1
C1s Scan C	287.98	1.12	3860.72	7.31	1
C1s Scan D	288.91	1.13	569.4	1.08	1
N1s Scan A	399.19	1.35	4086.64	4.98	1.676
N1s Scan B	400.35	1.67	678.38	0.83	1.676
N1s Scan C	401.98	1.71	328.17	0.4	1.676
O1s Scan A	532.68	1.53	28563.95	22.36	2.881
O1s Scan B	531.15	1.82	6860.04	5.36	2.881
O1s Scan C	534.48	1.27	613.23	0.48	2.881

Table S2. Characteristics of the photoelectron spectra: binding energies (E), Gaussian widths (FWHM), area (S), and atomic percent (A) of photoelectron peaks belonging to different chemical groups in the C1s, N1s, and O1s spectra of the CS7 sample.

Name	E, eV	FWHM, eV	S, CPS.eV	A, %	SF
Ag3d5 Scan A	367.98	1.28	1348.38	0.2	13.068
Ag3d5 Scan B	369.15	1.28	341.07	0.05	13.068
C1s Scan A	284.77	1.3	9424.43	17.66	1
C1s Scan B	286.33	1.27	18301.48	34.32	1
C1s Scan C	287.91	1.12	4255.31	7.99	1
C1s Scan D	288.91	1.13	569.4	1.07	1
N1s Scan A	399.26	1.45	4869.08	5.88	1.676
N1s Scan B	400.39	1.67	698.49	0.84	1.676
N1s Scan C	401.9	1.71	449.53	0.54	1.676
O1s Scan A	532.7	1.53	35113.98	27.23	2.881
O1s Scan B	531.15	1.82	4829.79	3.74	2.881
O1s Scan C	534.48	1.27	613.23	0.48	2.881

Table S3. The atomic percent of various nitrogen species based on XPS data.

Nitrogen type	Sample	
	CS5	CS7
N1(399.19-399.26 eV) amine	80.2	80.9
N2(400.35-400.39 eV) amide	13.3	11.6
N3(401.90-401.98 eV) protonated amine	6.4	7.5

The atomic percent of various N/C/O species was determined through curve fitting to the N1s peak in the XPS spectra.