

Supporting Information

Bio-inspired Synthesis of Chiral Silver Nanoparticles in Mucin Glycoprotein – The Natural Choice

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1. Materials and methods

All Chemicals were purchased from Sigma-Aldrich. Water was supplied from Barnstead water purification system. UV-Visible Absorption spectra were recorded on a Cary 5000, Varian. All UV-Visible spectra were recorded in 200-800 nm (1.0 nm steps) spectral range with baseline correction. Circular Dichroism spectra were recorded on Chirascan™ Circular Dichroism Spectrometer, Applied Photophysics. Spectra of the samples were recorded at 20°C in 250-750 nm (1 nm steps) spectral range, where each spectrum was corrected according to an appropriate blank. Transmission Electron Microscopy images were recorded on Philips Tecnai F20 TEM. Samples with nanoparticles and protein were prepared for TEM by immersing a 2000 mesh Cu grid (SPi) in the sample solution and dried overnight at room temperature (RT). Samples with nanoparticles (without protein) were prepared for TEM by immersing a 300 mesh SiO_x plated Cu grid (SPi) in the sample solution and dried overnight at RT.

(1a) Synthesis of Ag nanoparticles inside Bovine Submaxillary Mucin (BSM) Protein (complex 1). AgNO₃ (1 mg/ml) was added to aqueous solution of BSM (10 mg/ml). The mixture was stirred at 700 rpm for 24 hours at RT. Then, 1 ml of 50 mM borate buffer (pH 10) was added to the mixture and stirred for additional 3 days.

(1b) Ag nanoparticles reduction control. AgNO₃ (1 mg) was dissolved in 1 ml of di-ionized water and stirred for 1 hour at 700 rpm in RT. Then, 1 ml of 50 mM borate buffer (pH 10) was added to the mixtures and stirred for 3 days.

(1c) Synthesis of Ag citrate nanoparticles into BSM (complex 2). Ag nanoparticles were synthesized using a previously described procedure.¹ Then, 1 ml of BSM (10 mg/ml) solution in 50 mM borate buffer was mixed with the Ag citrate nanoparticles. The mixture was stirred at 700 rpm at RT for 24 hrs. All mixtures were filtered through 0.45 µm filter and loaded on a Sephadex G-25 gel-permeation column (Pharmacia Biotech). Ag nanoparticles were eluted with pure water and elution was monitored by UV-vis spectroscopy.

2. TEM Images

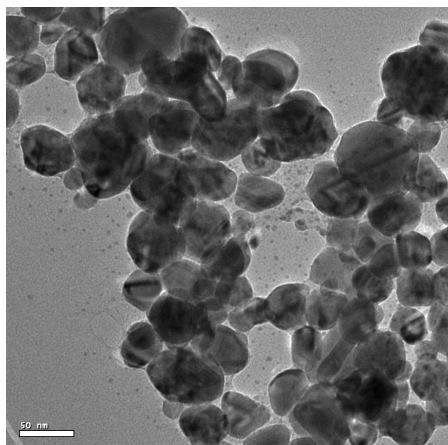


Figure S1. TEM image of Ag NPs (without BSM). Scale bar: 50nm.

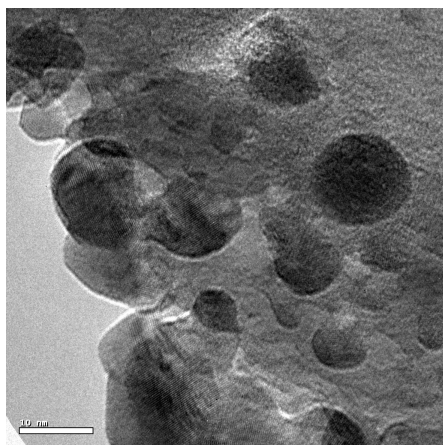


Figure S2. TEM image of complex **2**. Scale bar: 10nm.

3. Reference

- (1) Lee, P.C; Meisel, D. J. Phys. Chem. **1982**, 86, 3391.