Supporting Information

Controlled Release of Biologically Active Silver from Nanosilver Surfaces

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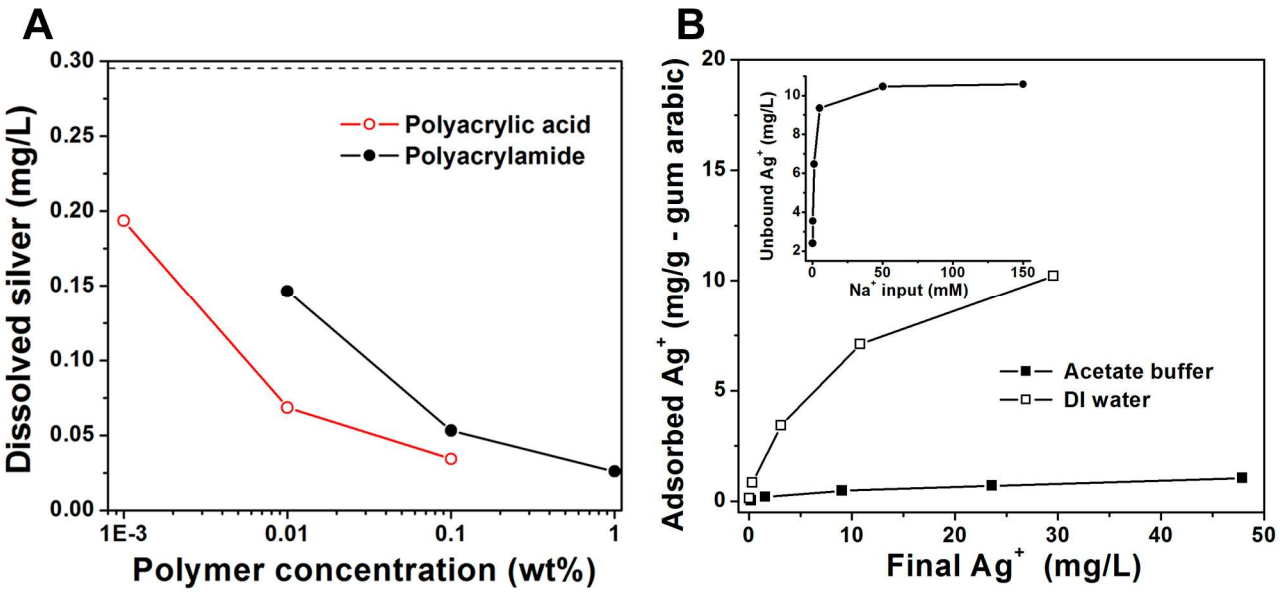

Figure S1. Interaction of polymers with silver cation, relevant to the effect of polymer surface coatings on ion release. (A) 1-day release of Ag^+ from nAg-4.8 nm particles in the presence of O-, N-containing polymers (polyacrylic acid with M_v=3,000,000 and polyacrylamide with M_w=10,000). Experiments in air-saturated acetate buffer (pH 5.6) at room temperature in the dark (initial nAg 2 mg/L). Dashed line represents typical 1-day silver ion release in acetate buffer (0.28 mg/L) without polymer. (B) Adsorption isotherm of Ag^+ binding to gum Arabic in DI water and acetate buffer (pH5.6, 5mM), showing reduced adsorption in the buffer. $AgClO_4$ was added to gum Arabic solution (0.2 wt %) with silver concentrations of 0.3, 2, 10, 25 and 50 mg/L, then incubated at room temperature in the dark for 1 day, followed by quantification of free Ag^+ concentration by GFAAs after removing gum Arabic phase by

centrifugal ultrafiltration. Insert shows Ag^+ desorption from gum Arabic as a function of Na^+ concentration, indicating that Na^+ acts as a competing cation that drives desorption of bound Ag^+ from the polymer. $AgClO_4$ (10 mg/L) was incubated in gum Arabic solution (0.2 wt % in DI water) at room temperature in dark for 1 day, followed by addition of $NaNO_3$ at 0.1, 1, 5, 50, and 150 mM. Free Ag^+ was isolated by centrifugal ultrafiltration after 5 min and quantified by GFAAs.

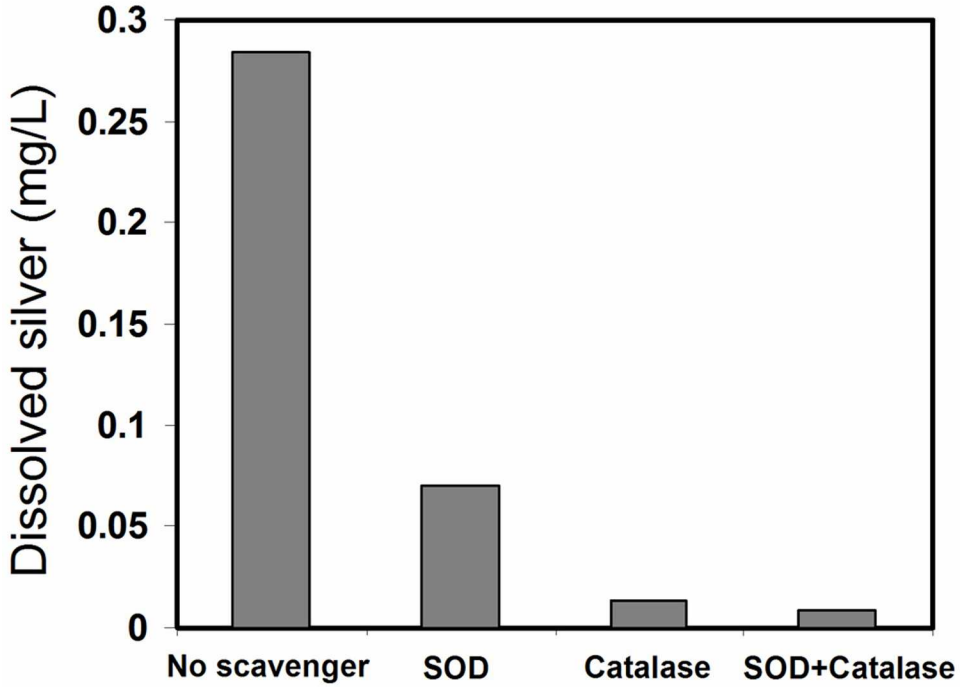

Figure S2. Effect of antioxidant enzymes on silver ion release. Incubation of nAg-4.8 nm for one day in air-saturated pH 5.6 acetate buffer containing no scavenger, 200 UI/mL superoxide dismutase (SOD) from bovine liver, 200 UI/mL catalase from bovine liver, or 200 UI/mL SOD plus 200 UI/mL catalase, followed by measuring dissolved silver concentration through centrifugal ultrafiltration and GFAAs analysis. Experiment was conducted in the dark at room temperature (initial nAg 2 mg/L).