Electronic Supplementary Material (ESI) for Journal of Materials Chemistry B. This journal is © The Royal Society of Chemistry 2015

## **Supplementary Information for**

## **Biofunctionalized Surface-Modified Silver Nanoparticles**

## for Gene Delivery

Kishor Sarkar<sup>a</sup>, Sovan Lal Banerjee<sup>b</sup>, P. P. Kundu<sup>b</sup>, Giridhar Madras<sup>a</sup>, Kaushik Chatterjee<sup>c\*</sup>

<sup>a</sup>Department of Chemical Engineering and <sup>c</sup>Department of Material Engineering,

Indian Institute of Science, Bangalore 560012, India

<sup>b</sup>Department of Polymer Science and Technology, 92 A. P. C. Road, University of Calcutta, Kolkata 700009, India



**Figure S1:** DLS particle size profile of CTS-g-PAAm@Ag NPs and PEG/CTS-g-PAAm@AgNPs at 0 day (a, c) and 30 days (b, d), respectively. TEM images of CTS-g-PAAm@AgNPs and PEG/CTS-g-PAAm@AgNPs at 0 day (e, g) and 30 days (f, h), respectively.



**Figure S2:** Agarose gel electrophoresis of CTS-*g*-PAAm@Ag/pDNA complex (a) and PEG/CTS-*g*-PAAm@Ag/pDNA complex (b) at different AgNP/DNA weight ratios (1:1, 2:, 4:1, 6:1, 8:1 and 10:1). EtBr displacement assay of AgNPs with different weight ratios of AgNP/pDNA (c).



**Figure S3:** Representative fluorescence images of HeLa cells transfected by CTS-*g*-PAAm@Ag/pDNA complexes at AgNP/DNA weight ratios 4:1, 6:1, 8:1 and 10:1 (a1-a4), PEG/CTS-*g*-PAAm@Ag/pDNA complexes at AgNP/DNA weight ratios 4:1, 6:1, 8:1 and 10:1 (b1-b4), RGDS peptide decorated PEG/CTS-*g*-PAAm@Ag/pDNA complex at AgNP/ DNA weight of 10:1 with different RGDS content 1, 3, 6, and 10% (c1-c4), only pDNA (d1) and PEI/pDNA complex at N/P ratio 10 (d2). The scale bar is 0.1 mm.



**Figure S4:** Representative fluorescence images of A549 cells transfected by CTS-*g*-PAAm@Ag/pDNA complexes at AgNP/ DNA weight ratios 4:1, 6:1, 8:1 and 10:1 (a1-a4), PEG/CTS-*g*-PAAm@Ag/pDNA complexes at AgNP/ DNA weight ratios 4:1, 6:1, 8:1 and 10:1 (b1-b4), RGDS peptide decorated PEG/CTS-*g*-PAAm@Ag/pDNA complex at AgNP/DNA weight of 10:1 with different RGDS content 1, 3, 6, and 10% (c1-c4), only pDNA (d1) and PEI/pDNA complex at N/P ratio 10 (d2). The scale bar is 0.1 mm.



**Figure S5:** Relative transfection efficiency of (a) PEG/CTS-*g*-PAAm@Ag/pDNA and (b) 10% RGDS peptide decorated PEG/CTS-*g*-PAAm@Ag/pDNA complexes at weight ratio of 10:1 in HeLa and A549 cells. Both cells were pretreated with various endocytosis inhibitors for 30 min before transfection with vector/pDNA complexes containing 1 µg of pDNA for 6 h. After further 42 h of incubation, the transfection efficiency was quantified by FACS analysis.



**Figure S6:** CLSM images of cellular uptake by HeLa cells after 6 h of transfection with only Cy3-labeled pDNA (a1-a3), PEG/CTS-*g*-PAAm@Ag/pDNA/Cy3-labeled pDNA complex (b1-b3), 10% RGDS decorated PEG/CTS-*g*-PAAm@Ag/pDNA/Cy3-labeled pDNA complex (c1-c3) at weight ratio of 10:1 and PEI/ Cy3-labeled pDNA complex at N/P ratio of 10 (d1-d3). For each panel, images from left to right show Cy3 labeled pDNA (red), cell nuclei stained by DAPI (blue), and overlay of the two images. Scale bar is 25 µm.