Supporting Information

Multifunctional Inorganic Nanoparticles for Imaging, Targeting, and Drug Delivery

Monty Liong,[1] Jie Lu,[2] Michael Kovochich,[3] Tian Xia,[3] Stefan G. Ruehm,[4] Andre E. Nel,[3,*] Fuyuhiko Tamanoi,[2,*] and Jeffrey I. Zink[1,*]

[1]Department of Chemistry and Biochemistry
[2]Department of Microbiology, Immunology, and Molecular Genetics
[3]Department of Medicine
[4]Department of Radiological Sciences

University of California, Los Angeles, California, 90095

*Email: zink@chem.ucla.edu (J.I.Z), fuyut@microbio.ucla.edu (F.T.), anel@mednet.ucla.edu (A.E.N.)

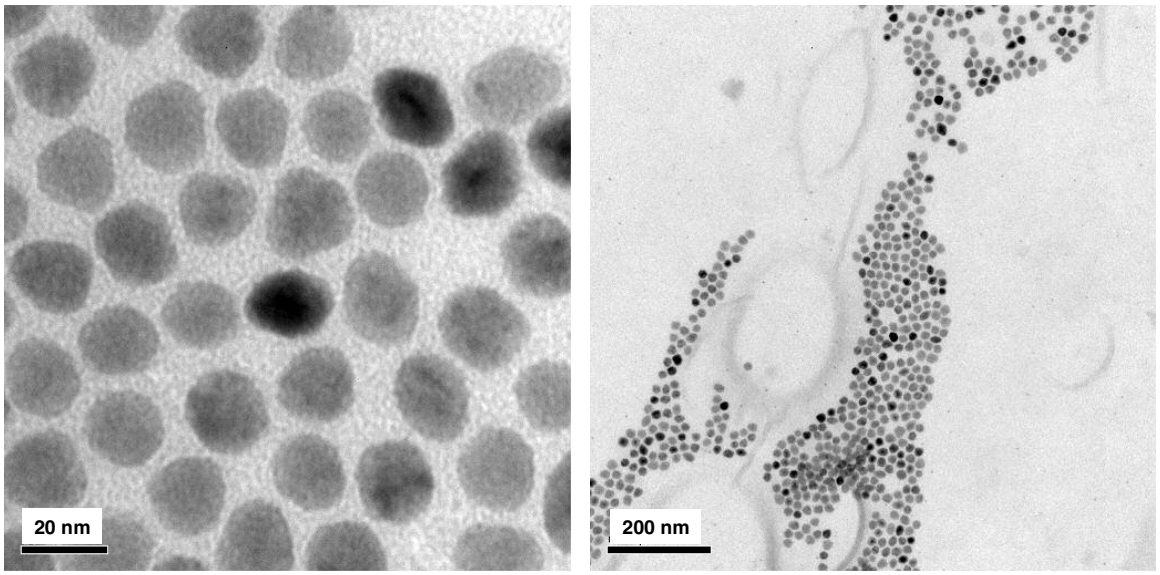

Figure S-1. Transmission electron microscope (TEM) images of the iron oxide nanocrystals (NCs).

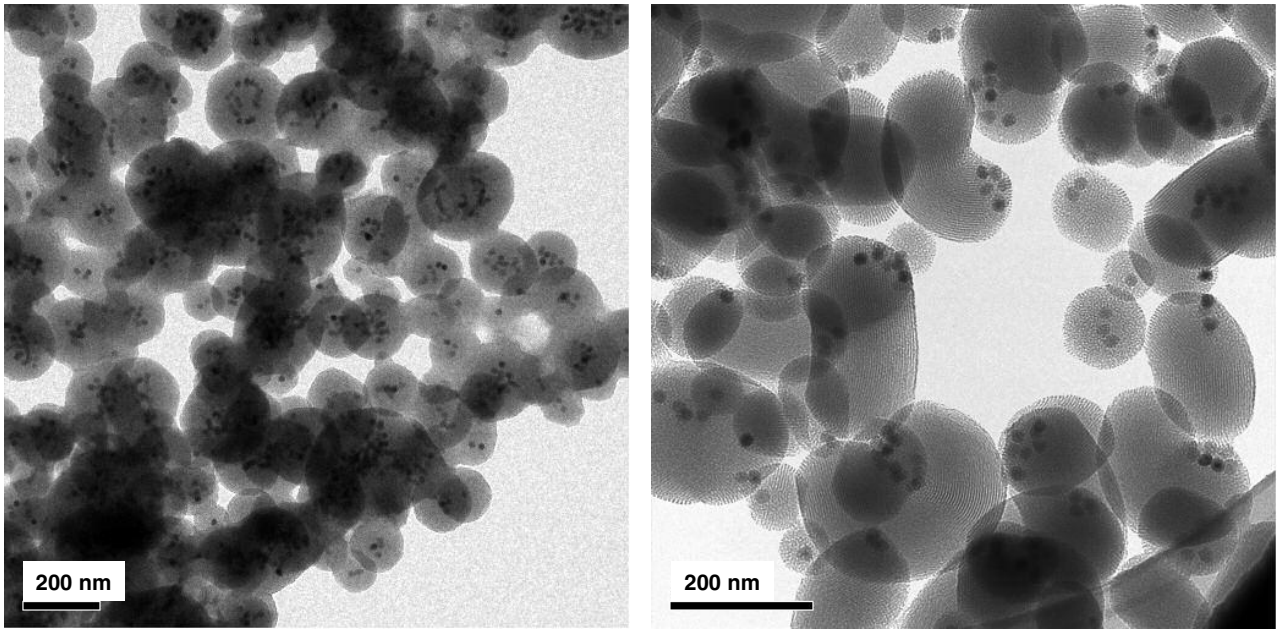

Figure S-2. The mesoporous silica formed large clumps of materials when the reaction temperature was set at over 80^{o}C (left). Low temperature (below 65^{o}C) resulted in materials which consisted of mostly structured mesoporous silica particles with the iron oxide clusters situated on the edges of the silica particles (right).

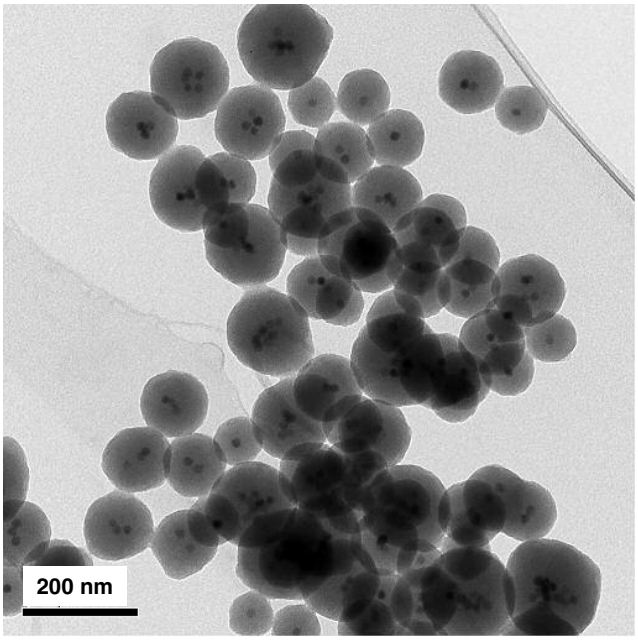

Figure S-3. TEM image of the iron oxide-mesoporous silica NPs at lower magnification.

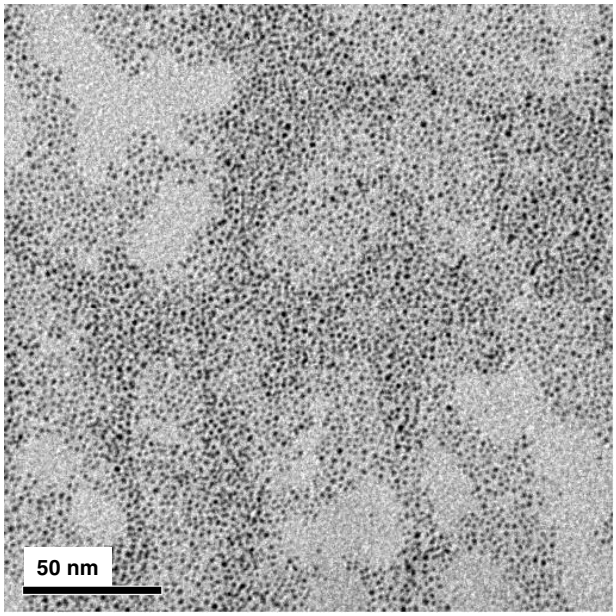

Figure S-4. TEM image of the as-synthesized dodecanethiol-capped gold NCs.

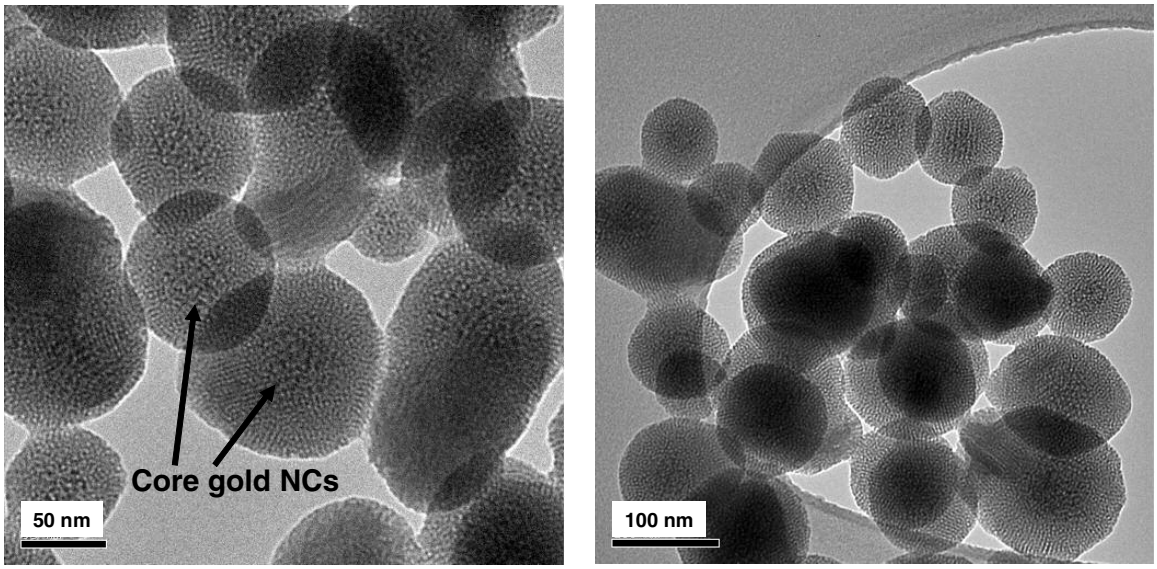

Figure S-5. TEM images of the gold-mesoporous silica NPs. The dark gold NCs were incorporated at the center of the NPs.

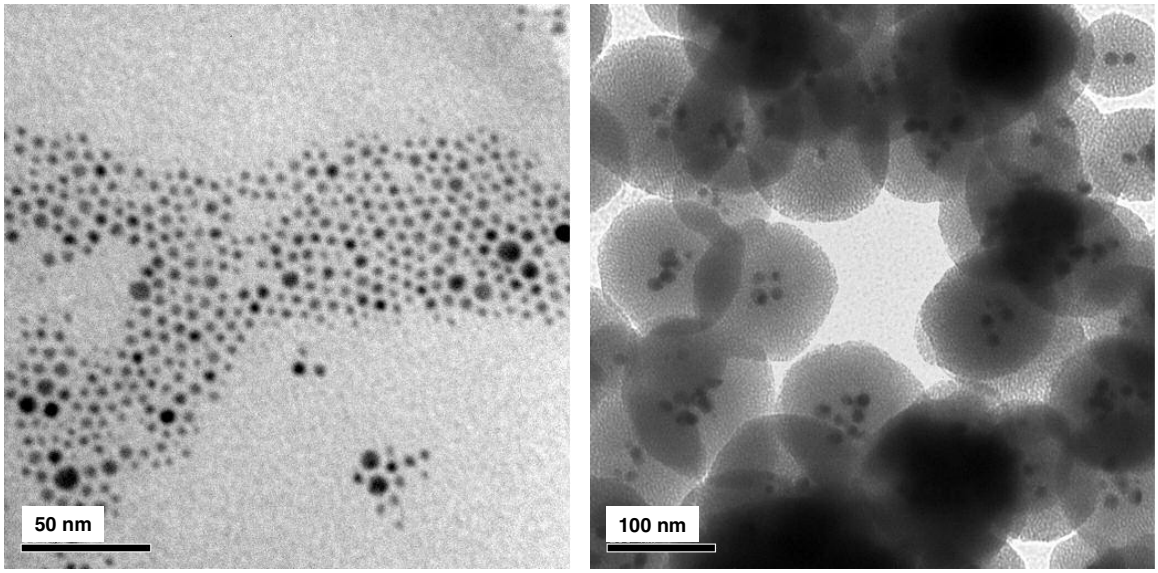

Figure S-6. TEM images of the as-synthesized oleylamine-capped silver NCs (left) and silver-mesoporous silica NPs.

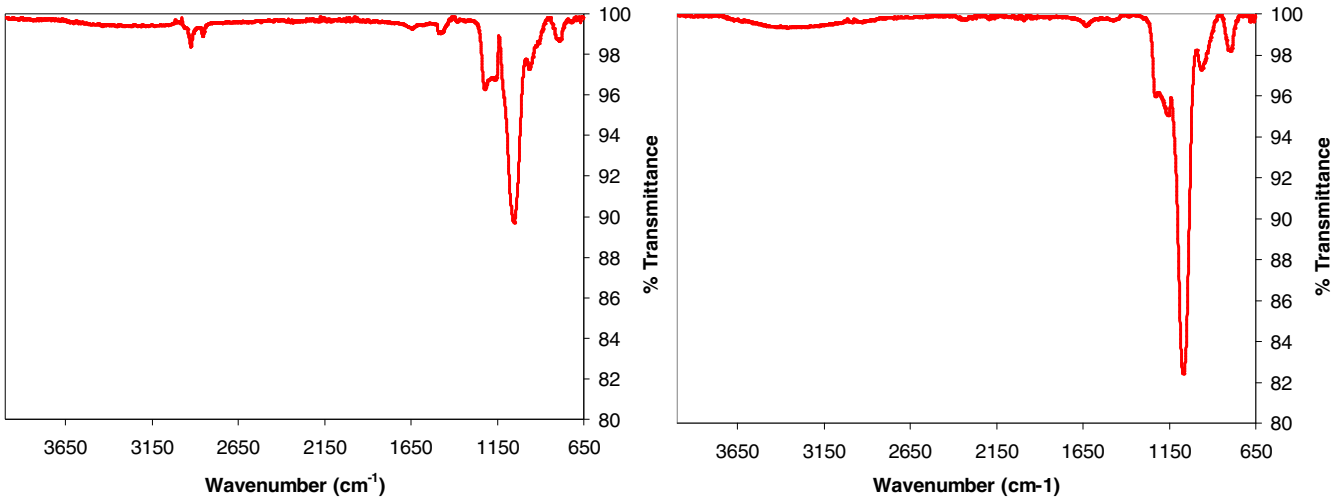

Figure S-7. FTIR spectra of the as-synthesized NPs (left) and after the surfactant removal process (right). The C-H stretch (2850–3000 cm^{-1}) peaks from the CTAB surfactants disappeared after the ion-exchange procedure.

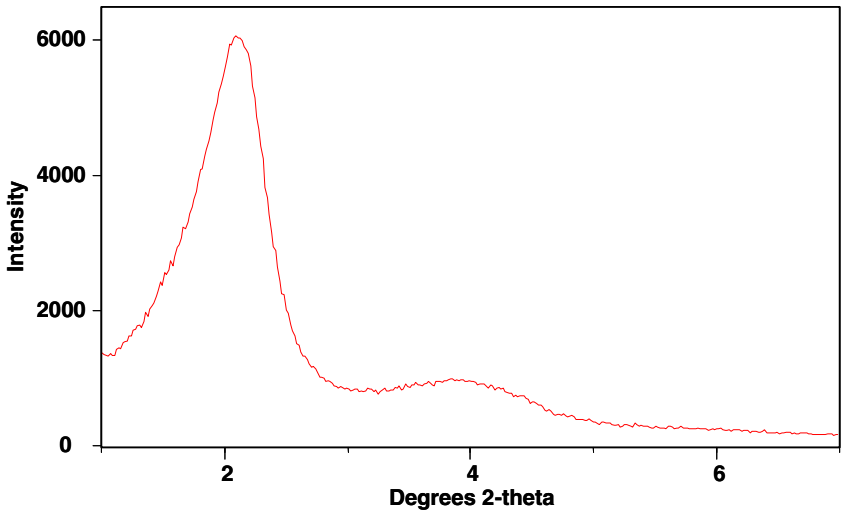

Figure S-8. X-ray diffraction pattern of the iron oxide-mesoporous silica NPs. An interplanar spacing of $d(100)$ = 4.1 nm was calculated from the XRD pattern

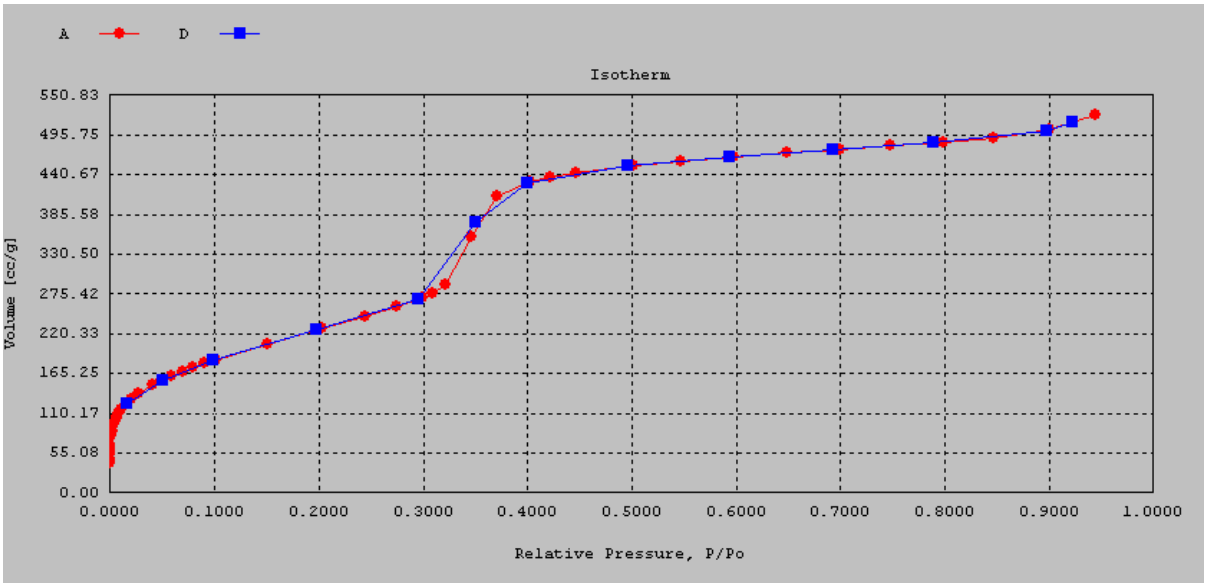

Figure S-9. Nitrogen adsorption-desorption isotherm of the NPs after the surfactant removal process showing the type IV isotherm that is typically observed for structured mesoporous materials.

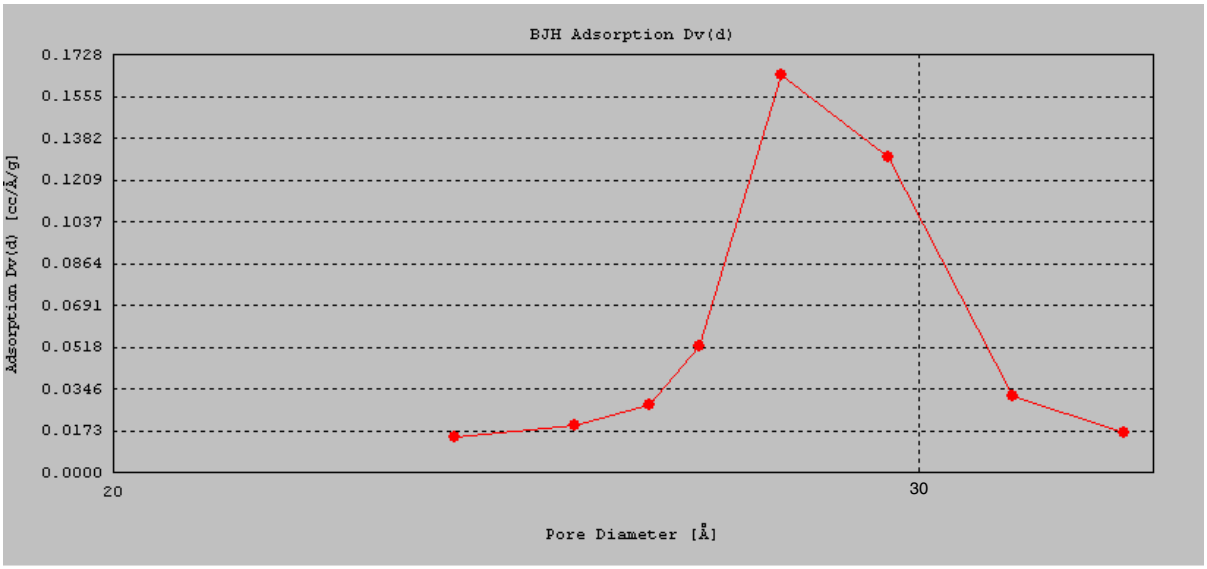

Figure S-10. Pore size distribution calculated by the Barret-Joyner-Halenda (BJH) method shows that the pore diameter of the NPs is approximately 2.8 nm.