Supplementary Material (ESI) for Chemical Communications

Experimental Section:

Preparation of Gold Quantum Dots (GQDs) Capped with 11-Mecaptodecanonic Acid (MUDA) via Ligand Exchange. All chemicals were purchased from Aldrich. To synthesize gold quantum dots (GQDs) in sub-nm diameter, the gold ions (10 wt % in aqua, 1.5 μmol) were added 5 mL of water (18 MΩ cm^{-1}) containing hydroxyl-terminated polyamidoamine (PAMAM, 10 wt % in methanol, 0.25 μmol). The solution was stirred in cold room (4^{o}C) for 24 h until color transformation from pale yellow to blue and then shaken at 37 ^{o}C for 3 days. Ligand exchange of GQDs proceeded by adding MUDA (20 mM in ethanol, 20 μL) to GQD aqua and stirring in the dark for 2 days. PAMAM were excluded from GQD aqua by anion exchange resin prior to dialysis, which further removed excess MUDA. The MUDA-GQDs were lyophilized to store in the dark.

Cellular Uptake. HeLa cells were cultured in a humidified atmosphere with 5% CO_2. The cell culture medium was Minimum Essential Medium (MEM; Gibco) supplemented with 10% fetal bovine serum (FBS; Hyclone). For the imaging by confocal microscopy, cells were plated 24 hrs before the experiment. After incubation with GQD or GQD-SV40 for 1.5 hrs, cells were stained with membrane-specific dye, wheat germ agglutinin (WGA) 594. Cell image was captured by a Leica TCS confocal spectral microscope using 63 x oil immersion objective.