## **Supplementary Information**

## Facile preparation of water-soluble fluorescent gold nanoclusters for cellular imaging applications

Li Shang,<sup>1</sup> René M. Dörlich,<sup>1</sup> Stefan Brandholt<sup>1</sup>, Reinhard Schneider,<sup>2</sup> Vanessa Trouillet,<sup>3</sup> Michael Bruns, <sup>3</sup> Dagmar Gerthsen<sup>2</sup> and G. Ulrich Nienhaus<sup>1,4,\*</sup>

<sup>1</sup> Institute of Applied Physics and Center for Functional Nanostructures (CFN), Karlsruhe Institute of Technology (KIT), Wolfgang-Gaede-Strasse 1, 76131 Karlsruhe, Germany.

<sup>2</sup> Laboratory of Electron Microscopy (LEM), Karlsruhe Institute of Technology (KIT), Wolfgang-Gaede-Strasse 1, 76131 Karlsruhe, Germany.

<sup>3</sup> Institute of Materials Research III, Karlsruhe Institute of Technology (KIT), Hermann-von-Helmholtz-Platz 1, 76344 Karlsruhe, Germany.

<sup>4</sup> Department of Physics, University of Illinois at Urbana-Champaign, Urbana, Illinois 61801, USA.



**Figure S1** Fluorescence intensity of the reaction solution (37 °C, pH 10.0) versus time for different molar ratios of DPA/Au. The emission was recorded at 610 nm with excitation at 400 nm.



**Figure S2** Fluorescence intensity of the reaction solution (5 mM DPA, 37  $^{\circ}$ C), recorded at 610 nm versus time for different pH values, taken with excitation at 400 nm.



**Figure S3** Fluorescence emission spectra of aqueous solutions of DPA-AuNCs upon excitation at 400 (black), 450 (red), and 500 (blue) nm.

Supplementary Material (ESI) for Nanoscale This journal is © The Royal Society of Chemistry 2011



**Figure S4** Fluorescence emission spectra of DPA-AuNCs in 0.01 M PBS at pH 5, 6, 7, 8, 9 and 10, taken with excitation at 400 nm.



Figure S5 Size distribution of an aqueous solution of DPA-AuNCs determined by DLS.



**Figure S6** Fluorescence emission (A) and absorption (B) spectra of DPA-AuNCs in buffer solution immediately after synthesis (black) and after storage at 4 °C for 1 month (red) and 3 months (blue).



**Figure S7** 3D image reconstruction of a HeLa cell (plasma membrane stained in red) exposed to DPA-AuNCs (green). The voxel size is  $110 \text{ nm} \times 110 \text{ nm} \times 184 \text{ nm}$ .