## **Supplementary Information**

## Nanodiamonds as Raman probes for specifically targeted bioimaging: Visualization and mechanism study of the interaction between nanodiamonds-EGF and EGFR

Dandan Li,<sup>ab</sup> Xin Chen,<sup>abc</sup> Hong Wang,<sup>c</sup> Yuan Yu,<sup>a</sup> Jie Liu,<sup>a</sup> Yu Wang,<sup>d</sup> Jinghua Zhang,<sup>d</sup> Meiling Zheng,<sup>a</sup> and Jinfang Zhi<sup>a\*</sup>

<sup>a</sup> Laboratory of Photochemical Conversion and Optoelectronic Materials, Technical Institute of

Physics and Chemistry, Chinese Academy of Science, Beijing 100190, PR China.

- <sup>b</sup> University of Chinese Academy of Sciences, Beijing 100049, PR China.
- <sup>c</sup> Department of Pharmaceutical Analysis, School of Pharmaceutical Sciences, Peking
- University, Beijing 100191, PR China.
- <sup>d</sup> Beijing Center for Physical and Chemical Analysis, Beijing 100089, PR China
- \* Corresponding author: e-mail: zhi-mail@mail.ipc.ac.cn, Fax: +86 825 435 37.



Figure S1. Size and zeta potential of NDs and NDs-EGF. (A) The increased particle size showed the successful attachment of EGF to cNDs and (B) the modification did not have significant influence on NDs surface negative charge.



Figure S2. Infrared spectra of (A) NDs-EGF, (B) EGF and (C) NDs. The O-H bending near 1630 cm<sup>-1</sup> and C=O stretching at 1765cm<sup>-1</sup> are characteristic for the carboxylic group connected on the nanodiamond surfaces. Characteristic protein amide peaks were observed at 1640cm<sup>-1</sup> (C=O stretching, amide I) and 1540cm<sup>-1</sup> (N-H bending, amide II). When the EGF molecule was

conjugated with NDs covalently, the O-H disappeared and replaced with amide peaks from EGF. The IR measurement also ensured the covalent bond between NDs and EGF.



Figure S3. Cytotoxicity of NDs and NDs-EGF to Hela cells, incubated at the concentration of 25  $\mu$ g/mL for 4h, and following another 48 h recovery. The not obvious difference in cell viability indicated the biocompatibility of NDs and NDs-EGF under our experiment condition. The values represent mean± SD.