Electronic Supplementary Material (ESI) for Nanoscale. This journal is © The Royal Society of Chemistry 2018

## **Supporting Information**

## CuO-functionalized NMOF probe with tunable excitation wavelength for selective detection and imaging of H<sub>2</sub>S in living cells

Yu Ma, Caiyun Zhang, Peng Yang, Xiangyuan Li, Lili Tong, Fang Huang, Jieyu Yue and Bo Tang\*

College of Chemistry, Chemical Engineering and Materials Science, Collaborative Innovation Center of Functionalized Probes for Chemical Imaging in Universities of Shandong, Key Laboratory of Molecular and Nano Probes, Ministry of Education, Institute of Molecular and Nano Science, Shandong Normal University, Jinan 250014, P. R. China.

Corresponding. author e-mail: tangb@sdnu.edu.cn.



**Fig. S1** PXRD patterns for: JCPDS card of CuO, synthesized CuO nanoparticles; simulated from the single-crystal data of UiO-66, as-synthesized UiO-66 sample, TO, TO@UiO-66 and CuO@TO@UiO-66.



Fig. S2 EDS spectra of a) TO@UiO-66 and b) CuO@TO@UiO-66



Fig. S3 UV-vis absorption spectra of supernatant at different time after culturing this nanoprobe in Tris-HCl buffer.



Fig. S4 TEM image of the probe after being treated with NaHS. Scale bar = 50 nm.



Fig. S5 UV-vis absorption spectra of UiO-66 and TO@UiO-66.



**Fig. S6** UV-vis absorption spectra of thiazole orange aqueous solution with different concentrations.



**Fig. S7** Linear correlation between absorption intensity and the corresponding concentration of thiazole orange (2  $\mu$ M, 3  $\mu$ M, 4  $\mu$ M, 5  $\mu$ M, 6  $\mu$ M, 7  $\mu$ M, 8  $\mu$ M and 9  $\mu$ M).

To calculate the amount of thiazole orange incorporated in the UiO-66 framework, standard curve for determining dye concentration were recorded (Fig. S7). Specifically, the absorption spectra of the thiazole orange dye with different concentrations were measured firstly (Fig. S6). Then, a good linear relationship between the TO concentrations and the enhanced UV-vis absorption at 510 nm was obtained (Fig. S7). Its linear equation is A = 0.3696 + 0.05489[TO]µM and the correlation coefficient is  $R^2 = 0.9978$ . Then, the amount of thiazole orange incorporated in the UiO-66 framework was able to be calculated according to the absorption at 510 nm.



Fig. S8 Characterization of the FRET.



**Fig. S9** Fluorescence spectra for aqueous solutions of TO@UiO-66, physical mixture of TO@UiO-66 and CuO nanoparticles, and CuO-modified TO@UiO-66.



Fig. S10 Quenching effects on the fluorescence emission of TO@UiO-66 with different amounts of CuO nanoparticle (0-200  $\mu$ M).



**Fig. S11** MTT assay of HepG2 cells in the presence of different concentrations of CuO@TO@UiO-66.