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A novel near-infrared fluorescent probe for highly selective detection of cysteine and its application in living cells

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Abstract: A novel red-emitting fluorescent probe (**DDNA**) for cysteine has been rationally designed and synthesized, which exhibited a low limit of detection to Cys (0.26 μM) as well as a favorable large Stokes shift ($\lambda_{\text{Em}}-\lambda_{\text{Ex}}=128$ nm). This novel fluorophore (**HDM**), which features a large π -conjugation system and typical intramolecular charge transfer (ICT) process, has a long emission wavelength at 631 nm. Besides that, as a turn-on fluorescent probe, it shows high selectivity and sensitivity for Cys over other metal ions and amino acids including the similar structured homocysteine (Hcy) and glutathione (GSH). Finally, the probe **DDNA** was successfully applied to bioimage intracellular Cys in HeLa cells with low cytotoxicity.

Graphical abstract

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