

Accepted Manuscript

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PII: S0003-2670(18)30801-8

DOI: [10.1016/j.aca.2018.06.036](https://doi.org/10.1016/j.aca.2018.06.036)

Reference: ACA 236051

To appear in: *Analytica Chimica Acta*

Received Date: 8 December 2017

Revised Date: 25 May 2018

Accepted Date: 12 June 2018

Please cite this article as: Y. Ma, Y. Zhao, L. Xia, J. Huang, Y. Gu, P. Wang, A novel one- and two-photon fluorescent probe induced by light for selective imaging of Cys in living cells and tissues, *Analytica Chimica Acta* (2018), doi: 10.1016/j.aca.2018.06.036.

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A novel one- and two-photon fluorescent probe induced by light for selective imaging of Cys in living cells and tissues

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Abstract

A novel one- and two-photon fluorescent probe based on a photoreaction was developed for the detection of cysteine (Cys). After it was reacted with Cys and illuminated by light, a strong turn-on fluorescence was observed at the excitation of 390 nm. The probe IC-2 was well tolerated at physiological pH conditions and exhibited a fast response rate to Cys within 10 min. Moreover, the probe IC-2 displayed high selectivity towards Cys among other amino acids and metal ions. Fluorescence response studies suggested that the limit of detection of IC-2 was calculated as 2.6×10^{-8} M. An MTT assay demonstrated that IC-2 had good cell permeability and low cytotoxicity to HepG2 cells. Notably, IC-2 was successfully applied in one- and two-photon fluorescence imaging for Cys in living cells and tissues.

Keywords: Fluorescent probe; Two-photon; Cysteine; Fluorescence imaging; Photoreaction

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