

Author's Accepted Manuscript

A highly sensitive fluorescent probe for fast recognition of DTT and its application in one- and two-photon imaging

Tong Sun, Lili Xia, Jinxin Huang, Yueqing Gu, Peng Wang



PII: S0039-9140(18)30539-3
DOI: <https://doi.org/10.1016/j.talanta.2018.05.046>
Reference: TAL18687

To appear in: *Talanta*

Received date: 18 February 2018
Revised date: 7 May 2018
Accepted date: 11 May 2018

Cite this article as: Tong Sun, Lili Xia, Jinxin Huang, Yueqing Gu and Peng Wang, A highly sensitive fluorescent probe for fast recognition of DTT and its application in one- and two-photon imaging, *Talanta*, <https://doi.org/10.1016/j.talanta.2018.05.046>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

A highly sensitive fluorescent probe for fast recognition of DTT and its application in one- and two-photon imaging

Tong Sun^{a1}, Lili Xia^{b1}, Jinxin Huang^b, Yueqing Gu^b, Peng Wang^{b,*}

^aShandong Institute for Food and Drug Control, Jinan 250101, China

^bDepartment of Biomedical Engineering, School of Engineering, China
Pharmaceutical University, Nanjing 210009, China

*Corresponding email address: wangpeng159seu@hotmail.com

Abstract

As a widely used reducing agent, 1, 4-dithiothreitol (DTT) plays important roles in the fields of biology, biochemistry, and biomedicine. The development of facile and fast methods for DTT detection is urgent and necessary. In this article, we rationally constructed a novel two-photon fluorescent probe 6-(methylsulfinyl)-2-phenyl-1*H*-benzo[de]isoquinoline-1,3(2*H*)-dione (**NC-DTT**) for detecting DTT, which employed the 1,8-naphthalimide and sulfoxide as the fluorophore and receptor unit respectively. The sulfoxide group in probe **NC-DTT** can be reduced by DTT to compound 6-(methylthio)-2-phenyl-1*H*-benzo[de]isoquinoline-1,3(2*H*)-dione (**NC**), which could emit strong fluorescence with large Stokes shift presumably due to the enhanced intramolecular charge transfer (ICT). This probe responded to DTT quickly (within 1000 s) and showed satisfactory selectivity. A good linearity between fluorescence intensity and the concentration of DTT in the range of 0 -700 μ M was observed, and the detection limit towards DTT was 1.4×10^{-7} M. Furthermore, the probe was successfully employed in one- and two-photon imaging of DTT in HepG2 cells with low cytotoxicity.

Graphical abstract

¹ T. Sun and L. Xia contributed equally.

Download English Version:

<https://daneshyari.com/en/article/7676021>

Download Persian Version:

<https://daneshyari.com/article/7676021>

[Daneshyari.com](https://daneshyari.com)