

Accepted Manuscript

Title: A highly sensitive near-infrared ratiometric fluorescent probe for detecting nitroreductase and cellular imaging

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PII: S0925-4005(15)30271-9

DOI: <http://dx.doi.org/doi:10.1016/j.snb.2015.08.093>

Reference: SNB 18948

To appear in: *Sensors and Actuators B*

Received date: 5-5-2015

Revised date: 4-8-2015

Accepted date: 21-8-2015



Please cite this article as: D. Zhu, L. Xue, G. Li, H. Jiang, A highly sensitive near-infrared ratiometric fluorescent probe for detecting nitroreductase and cellular imaging, *Sensors and Actuators B: Chemical* (2015), <http://dx.doi.org/10.1016/j.snb.2015.08.093>

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A highly sensitive near-infrared ratiometric fluorescent probe for detecting nitroreductase and cellular imaging

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Abstract

Based on the selective reduction of nitro group to hydroxylamine or amino group by nitroreductase in the presence of NADPH as an electron donor, a near-infrared ratiometric fluorescent probe CyNNO₂ was designed and synthesized. CyNNO₂ containing a *p*-nitrobenzyl moiety as a reactive group can selectively respond to nitroreductase with a ratiometric fluorescence signal output. The limit of detection for nitroreductase is 0.0058 ng/mL. Moreover, the probe can be used to image the endogenous nitroreductase in A549 cells under hypoxic condition.

Keywords: Fluorescent probe, Near-infrared, Ratiometric, Nitroreductase, Cellular imaging

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