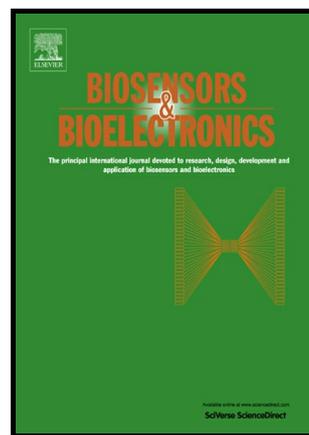


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Peng Wang, Qianqian Wang, Jinxin Huang, Nan Li, Yueqing Gu



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A dual-site fluorescent probe for direct and highly selective detection of cysteine and its application in living cells

Peng Wang*, Qianqian Wang, Jinxin Huang, Nan Li, Yueqing Gu*

Department of biomedical engineering, school of engineering, China pharmaceutical university, Nanjing, 210009, P. R. China

*Corresponding author. wangpeng159seu@hotmail.com

Abstract

Monitoring the concentration of cysteine (Cys) in living creature is of significance in disease diagnosis because abnormal concentration of cysteine are involved in a variety of diseases. Herein a novel fluorescent probe **HC** with high- and low-sensitivity sites for the detection of cysteine was designed and synthesized. The acrylate group was employed as the high sensitivity site, which can be selectively and fast removed by Cys. And the α,β -unsaturated ketone can react with Cys as the low sensitivity site. Our probe **HC** can remarkably exhibit a turn-on signal to the low concentration range of Cys and a ratiometric response to the high concentration range of Cys. Furthermore, kinetic studies showed that the probe possesses a rapid response to Cys and highly selective property to differentiate Cys from glutathione (GSH) and homocysteine (Hcy). Moreover, it has been successfully applied for detection of cysteine in living cells in terms of its excellent cell permeability and low cytotoxicity. Accordingly, these desirable characteristics may suggest that probe **HC** could be applied for discriminative sensing of intracellular Cys, giving it potential for biological applications.

Keywords: dual-site; Cys; fluorescent probe; imaging

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