A novel isophorone-based red-emitting fluorescent probe for selective detection of sulfide anion in water for invivo imaging

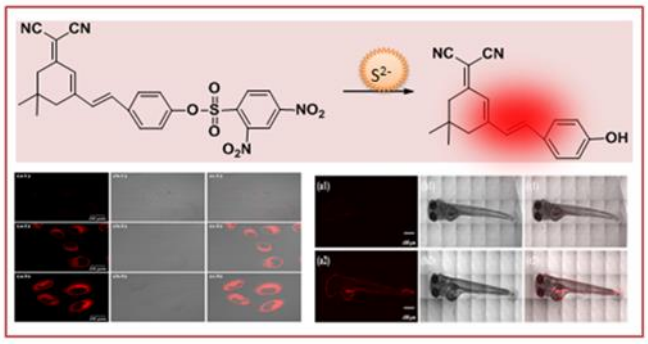
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Abstract (300 word limit)

To design and synthesize selective and sensitive sensing systems to detect various chemically and biologically pertinent species has attained a significant interest. Among these species, sulfide anion is a very important member. sulfide is a toxic anion, generated not only as a byproduct in industrial processes but also in biosystems due to microbial reduction of sulfate by anaerobic bacteria and sulfide generation from the sulfur-containing amino acids in meat proteins In addition, sulfide is employed in the production of sulfur and sulfuric acid, dyes and cosmetic manufacturing, production of wood pulp, etc. It is significant in industrial processes, biology and environmental science. And its toxicity increase considerably when protonated. Hence, robust fluorescent sensors for sulfide which are water soluble and biocompatible are highly desirable. Here, we developed a novel red-emitting fluorescent probe (**SP1)** for sulfide anion based on cleaving the dinitrobenzenesulfonate ester to restore the fluorescence, accompanied with a long wavelength emission at 644 nm. The detection process took place in 100% PBS buffer, which suggesting it

had an excellent water solubility. Most importantly, the ability of the **SP1** to detect sulfide anion in living cells (MCF-7 cells) and zebrafish had also been proved.

image



Recent Publications (minimum 5)

1. Pan J. Xu JC, Zhang YL, Wang L, Qin CQ, Zeng lT, Zhang y (2016) A novel fluorescent probe for rapid and sensitive detection of hydrogen sulfide in living cells. Spectrochim. Acta A 168: 132–138.

2. F.Y. Zheng, M. Wen, F. Zeng, S.Z. Wu (2013) A water-soluble, low-cytotoxic and sensitive fluorescent probe basedon poly(ethylene glycol) for detecting sulfide anion in aqueous media and imaging inside live cells. Polymer 54: 5691-5697.

3.D.P. Li, J.F. Zhang, J. Cui, X.F. Ma, J.T. Liu, J.Y. Miao, B.X. Zhao (2016) A ratiometric fluorescent probe for fast detection of hydrogen sulfide and recognition of biological thiols. Sens. Actuators B 234:231–238.

4. L. Zhang, S. Li, M. Hong, Y.Q. Xu, S.S. Wang, Y. Liu, Y. Qian, J. Zhao (2014) A colorimetric and ratiometric fluorescent probe for the imaging of endogenous hydrogen sulphide in living cells and sulphide determination in mouse hippocampus. Org. Biomol. Chem. 12: 5115–5125.

5. F.J. Huo, Y.Q. Zhang, P. Ning, X.M. Meng, C.X. Yin, A novel isophorone-based red-emitting fluorescent probe for selective detection of sulfide anion in water for invivo imaging**.** Journal of Materials Chemistry B, 2017, DOI: 10.1039/C7TB00299H.

Biography (150 word limit)



Caixia Yin was born in Shanxi, China, in 1978. She received her PhD in 2005 from Shanxi University of Molecular Science Institute of Prof. Pin Yang. Subsequently she joined the group of Shie Ming Peng Taiwan University as a postdoctoral fellow (2006–2007). In 2009, she became a professor in Institute of Molecular Science of Shanxi University, China. Her recent research focuses on molecular recognition.



Fangjun Huo: He obtained his Doctor Degree in chemistry for Shanxi University in 2007. Now he is an Assoiate Professor in Research Institute of Applied Chemistry at Shanxi University major in organic chemistry. His current research interests are sensors, supramolecular chemistry.



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Notes/Comments