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Synthesis of amphiphilic fluorescent probe and follow-up imaging of Hg²⁺ in living cells

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Transition metal ions have played a crucial role in the field of environment and biology, the traditional detection methods have some limitations, low detection limit, narrow linear range and single detection. A fluorescent probe has used on the biological and environmental analysis owing to extremely broad response range, high selectivity, real-time monitoring capability, anti-interference and low detection limit and so on. And design and synthesis of receptor molecules with selective recognition have attracted much attention in recent years. In this paper, rhodamine and phenyl isothiocyanate were used to design and synthesize fluorescent probes that can efficiently detect mercury ions. It was found that the probe (ACHL) was also able to selectively recognize Hg²⁺ in DMSO/water(v/v,7:3), and detection of Hg²⁺ does not disturb by the addition of other ions and show high selectivity. The probe possesses identification stability of Hg²⁺ about 3 min and displays very fast real-time detection performance. The linear range of the probe is 1-20 μ M, and the detection limit of ACHL was 0.31 μ M. Simultaneously, the probe was also applied to biological cell experiments for detection of imaging of Hg²⁺. The probe shows good solubility in MDSO/water, lower detection limit, and well cell permeability. The cytotoxicity of the probe was measured, found that the probes have less cytotoxic in the concentration of probe was less than 100 μ M. Therefore, the probes were able to trace intracellular Hg²⁺ by fluorescence imaging in living cells.

Biography

Wei Gang is a PhD candidate in the state key laboratory for modification of chemical fibers and polymer materials, college of materials science and engineering, Donghua University, Shanghai, China. My main research is about preparing amphipathic target fluorescent recognition molecules, and applied to specifically identify tumor cells and can track cell morphology from time to time. On the other hand, there are achievements in the field of fluorescent probes, a series of rhodamine and fluorescein fluorescent probes were prepared and synthesized, and the cations, anions and amino acids could be specifically identified.

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