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Highly selective and sensitive detection of Zn(II) and Cu(II) ions using a novel peptide fluorescent probe by two different mechanisms and its application in live cell imaging

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Abstract

Metalloproteins are often a useful template for the design and development of peptide fluorescent probes. Herein, we report a novel and simple fluorescent probe **L** comprised of tetrapeptide and dansyl groups by the solid phase peptide synthesis (SPPS). As a multifunctional analytical probe, **L** exhibited a highly selective “turn-on” fluorescent response to zinc ions, and a selective “turn-off” fluorescent response to copper ions at an excitation wavelength of 330 nm. The high sensitivity of **L** was made possible photo-induced electron transfer (PET), and **L** exhibited very low detection limits for Zn²⁺ and Cu²⁺ of 4.9 nM and 15 nM in 100% aqueous solutions, respectively. Furthermore, **L** displayed very low biotoxicity and

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