

A Novel Class of Zinc-Chelating Ratiometric Fluorescent Probes

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Technology description

Abstract

Northwestern scientists have synthesized a new class of zinc-chelating probes that are useful as ratiometric probes for zinc (Zn(II)). These reagents incorporate 2-(2'-hydroxyphenyl) benzooxazole (HBO) as a fluorophore with an aminomethyl pyridine moiety, to bind heavy metal ions selectively. Probes of this family are effective for measuring zinc concentration in physiological solutions, as the absorption spectra of these indicators shift upon zinc binding. These probes may be utilized in investigating zinc functions in a variety of biological processes, like gene transcription and translation that depend heavily on zinc-binding proteins. Such tools will help reveal the catalytic, structural, and regulatory functions of zinc in these proteins and in turn elucidate zinc's impact on metabolism, gene expression, and signal transduction. Histochemical studies of mammalian tissues including the prostate, pancreas and brain have revealed patterns of zinc accumulation that are disrupted in some types of prostatic cancer, diabetes and neurodegenerative disorders. Therefore, this novel reagent has the potential to increase understanding of the role of zinc in normal and disease-associated cellular processes.

Application area

Zinc studies in biological systems

Histochemical studies of mammalian tissues

Advantages

Selective binding to heavy metal ions

Effective at measuring zinc concentration in physiological solutions

Institution

[Northwestern University](#)

Inventors

[Thomas O'Halloran](#)

Professor

[Masayasu Taki](#)

联系我们



叶先生

电话 : 021-65679356

手机 : 13414935137

邮箱 : yeyingsheng@zf-ym.com