



Review

Fluorescent nanoprobes for sensing and imaging of metal ions: Recent advances and future perspectives



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ARTICLE INFO

Article history:

Received 20 January 2016

Received in revised form 20 April 2016

Accepted 22 May 2016

Available online 11 June 2016

Keywords:

Fluorescent nanoprobes

Metal ions

Noble metal

Upconversion nanoparticles

Quantum dots

Carbon nanomaterials

ABSTRACT

Recent advances in nanoscale science and engineering have generated nanomaterials with unique optical properties. Over the past decade, numerous fluorescent nanoprobes have been developed for highly sensitive and selective sensing and imaging of metal ions, both *in vitro* and *in vivo*. In this review, we provide an overview of the recent development of the design and optical properties of the different classes of fluorescent nanoprobes based on noble metal nanomaterials, upconversion nanoparticles, semiconductor quantum dots, and carbon-based nanomaterials. We further detail their application in the detection and quantification of metal ions for environmental monitoring, food safety, medical diagnostics, as well as their use in biomedical imaging in living cells and animals.

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