

Designing Luminescent Lanthanide Probes for Targeted Theranostic, Bioimaging and Sensing Agents

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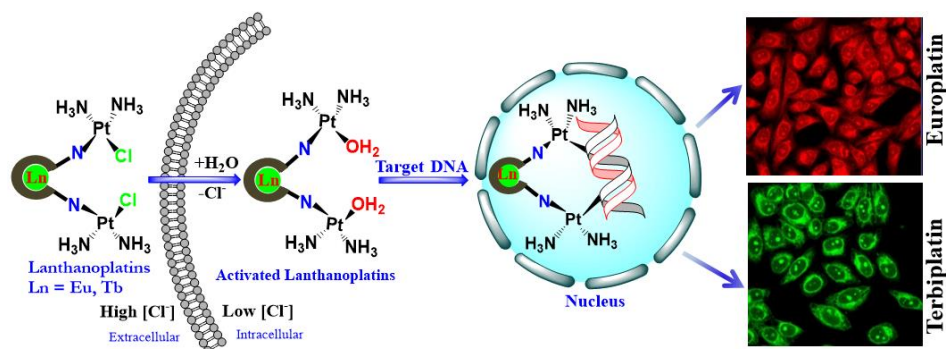
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Abstract:

Lanthanide complexes with long luminescence lifetime are ideally suitable for interference-free bioimaging or important analyte sensing through time-gated fluorescence microscopy/spectroscopy avoiding limitations of scattering and short-lived autofluorescence.^{1,2} Development of low MW photostable cellular stains remains vital in understanding complex intracellular structures and biochemical pathways. We have thoughtfully designed various Ln(III) probes conjugated to the chelated antenna and studied their structures, photophysics with modulation of sensitization pathways for desired applications. In this seminar, I will discuss various chemical design strategies for selective bioimaging or luminescent sensing, coordination chemistry, antenna design, drug delivery, cellular pH-sensing, and the detection of biothreat agents.³⁻⁸ The presentation will underscore the opportunities available for diverse uses of unrivaled optical characteristics of luminescent lanthanide probes in interdisciplinary research areas using a rational synthetic inorganic chemistry approach.



References:

1. C. Hefferin, L. M. Matosziuk, T. J. Meade, *Chem. Rev.* **2014**, *114*, 4496-4539.
2. Bünzli, J.-C. G. *Chem. Rev.* **2010**, *110*, 2729-2755.
3. Singh, K.; Singh, S.; Sivakumar, S.; Patra, A. K. et al. *Chem. Commun.* **2017**, *53*, 6144-6147.
4. Gupta, K.; Patra, A. K. *Eur. J. Inorg. Chem.* **2018**, 1882-1890.
5. Abbas, Z.; Patra, A. K. et al. *New J. Chem.* **2019**, *43*, 15139-15152.
6. Gupta, K.; Patra, A. K. *ACS Sensors* **2020**, *5*, 1268-1272.
7. Abbas, Z.; Patra, A. K. et al. *J. Mater. Chem. C* **2021**, *9*, 10037-10051.
8. Yadav, U.; Patra, A. K. et al. *Sens. Actuators B Chem.* **2022**, 132938.

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