Eu^{II}-based Contrast Agents for Imaging Hypoxia in a Wide Range of Diseases

Description

This learning object (LO) focuses on a recent *JACS* paper (*J. Am. Chem. Soc*. 2022, 144, 23053 - 23060), which explores the chemistry of Eu^{II}-based contrast agents. Chemists at Wayne State University (Detroit, MI) and researchers at Baylor College of Medicine (Houston, TX) have collaborated to investigate the first divalent lanthanide complex that persists in oxygenated environments for magnetic imaging resonance (MRI) applications.

Learning Goals

There are various goals for this activity, which reinforces fundamental inorganic chemistry concepts.

- The student will read and critically evaluate the chemical literature.
- The student will improve science communication skills.
- The student will apply fundamental topics of inorganic chemistry to innovative research impacting society:
    - Point Groups and Symmetry
    - Electron Configuration and Oxidation States
    - Charges on ligands and metal centers

Implementation Notes

This literature assignment has not been implemented yet in the classroom. However, a student handout with several questions is provided for use in the classroom. The students should be provided the assignment at least one week before the classroom activity to provide sufficient time to answer the questions. During class time, the students should be placed in teams (2-4) to prepare a creative poster for a gallery walk based on their responses to questions. **Materials Needed:** Post-It poster paper, colorful markers, pencils, rulers

Time Required

One class period (with assignment provided a week prior)

Web Resources

Systemic Delivery of Divalent Europium from Ligand Screening with Implications to Direct Imaging of Hypoxia
https://pubs.acs.org/doi/full/10.1021/jacs.2c10373

Evaluation

Allow the students to develop a rubric for evaluating the posters for a competition.

Related VIPEr LOs

f-Element Lecture Material
https://www.ionicviper.org/class-activity/f-elements-lecture-material