**Incorporating hard-soft acid-base theory to create transition-metal and oxidation-state specific biological probes**

**Peer-Review Assignment and Guiding Questions**

Peer review of manuscripts is a vital part of the academic research enterprise. The research article you work hard to write will be judged for significance, scientific rigor, and clarity by your scientific peers prior to publication. You will also find yourself reviewing manuscripts as you progress through your graduate studies, thus it is important to understand the process. ACS offers a free course at the following link: <https://institute.acs.org/courses/acs-reviewer-lab.html>

Completion of ACS Reviewer Lab is not required for this assignment, it is only included here for your information.

In this assignment, you will work together in your assigned groups and provide a peer review for one to two manuscripts. The peer review should be about ½-1 page in length for each manuscript, but the limits are not strict. You will present your review to the class for discussion. Each group will turn in their peer review documents; each review should be on separate pages.

The peer review should include the following:

1. A short summary of the work performed in the article and any interesting scientific advances. In this summary, you can also include your overall view of the article. You can note any strengths and weaknesses. The last sentence should be your recommendation to the editor (ie. publish as is, publish with minor revisions, or reject).
2. A point-by-point critique of specific issues that the authors should address. This may include feedback on experimental rigor, figure clarity, and/or the overall flow of the manuscript.
3. A rating of either Low, Medium, High, or Very High in the categories of **Significance**, **Novelty**, **Broad Interest**, and **Scholarly Presentation**.
4. A Yes or No answer for the following questions: **Are the conclusions adequately supported by the data? Are the literature references appropriate and correct?**

**Guiding Questions:**

1. Using your knowledge of hard-soft acid-base theory, what aspect of the sensor in your assigned manuscript enables it to be metal selective and oxidation-state specific?
2. Describe the Irving-Williams series.
3. Identify and describe one negative control experiment.
4. Identify and describe one synthetic molecule that is used as a negative control. If one was not described in the assigned manuscript, what type of molecule do you envision being able to synthesize to act as a negative control?
5. Describe the sensor uncaging mechanism employed in the assigned manuscript. (ie. photoinduced electron transfer, relaxivity switching, etc.)
6. Identify and describe one spectroscopic/experimental method used in the manuscript that you were previously unfamiliar with. What did the authors use this instrument/method to probe?
7. What experiments are performed to measure metal binding and affinity?