**Literature Discussion Learning Object:**

**Paper: Mechanisms Controlling the Cellular Metal Economy**

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1. Explain what is meant by the term “biological trace elements.” Which metals do you think would be considered as such?

2. Describe the function and give an example of metalloregulatory proteins, metalloenzymes, and metallochaperones.

3. If you could look at all of the species inside a live bacterial cell, how much Zn2+(aq) would you find? Explain. Calculate the total number of Zn2+(aq) ions in a cell with a volume of 42 femtoliters.

4. Rearrange the equation in Scheme 1 to get an expression for the binding affinity in terms of Kd. Provide two assumptions implicit in this simple model.

5. The paper states “all of the structurally characterized Fur proteins were isolated bound to zinc, not iron.” Explain how the chemical properties of these metals might make them interchangeable. Explain how imperfect metal binding specificity complicates the study of these proteins.

6. After reading the article, have your views about transition metals in biology changed compared to what they were before?