**Journal Club Assignment #4**

**Porphyrin—Polyyne [3]- and [5]Rotaxanes**

***Org. Lett.* 2017**, 19, 348-351

\*\*A .pdf of this article is available on the class website which is in color and may help answer some of these questions.

1. Quickly read the abstract and the first page or so. Using your textbook or any other resource define the following terms. Also provide a structure to serve as an example for each one. (*20 points*)

a.) Porphyrin

b.) Rotaxane

c.) Catenane

d.) Polyyne

2. Consult Figure 1. At the heart of this gigantic molecule is a molecule called a porphyrin. This molecule (and others similar to it) have huge biological significance. Perform an internet search for the following for the following substances. You do not have to draw the structure for each substance but which metal cation does each bind to? (*15 points*)

a.) Heme

b.) Hemocyanin

c.) Chlorophyll

3. For each of the substances listed in Question 2 tell the color of each. At least one should be common sense. (*5 points*)

4. Consult Scheme 1. At the very bottom of the scheme the structures of compounds **Zn-P3Ra** and **Zn-P5Rb** are shown. What is different between the two structures?

(*10 points*)

5. For this question you will have to use the electronic copy of the document. Again referring to Scheme 1, the hexahexyne structures shown in blue are attached to the molecule. How are these portions attached? If it is not a chemical bond then what prevents them from detaching from the molecule?

(*15 points*)

6. Using both the text and Scheme 1 describe, in your own words, how this synthesis was accomplished. No reaction conditions or mechanisms are required just describe how the molecule was put together. (*35 points*)