

Goals: This is a survey course that covers a broad range of frontier research topics at the interface of inorganic chemistry and biology. A basic knowledge of biochemistry and inorganic chemistry is assumed (e.g. nature and structures of amino acids and proteins, fundamentals of transition metal coordination chemistry). Students are expected to establish the structure-property-reactivity relationship for metals (particularly transition metals) in biological and biomimetic systems, and gain the capabilities of thinking, analyzing and solving challenges in bioinorganic chemistry research.

When/Where: Monday 10:30am-12pm and Wednesday 3:30-5pm, in Chem 204

Instructor: Dong Wang, Chem 217, x4290, dong1.wang@umontana.edu

Office Hours: By appointment

Text: No textbook is required. The following books are highly recommended.
Lippard, S. J. and Berg, J. M., *Principles of Bioinorganic Chemistry*, University Science Books.
Lawrence Que, Jr. Edited, *Physical Methods in Bioinorganic Chemistry: Spectroscopy and Magnetism*, University Science Books.

Course website: [Moodle](#)

Evaluation:

a) 25 one-minute paper by email – 250 points	25% of grade
b) Two 1-hour in-class exams – 100 points each	20% of grade
c) Final take-home exam – 300 points	30% of grade
d) Final presentation – 250 points	25% of grade

Course Content and Exam Date Overview:

Topic (tentative)

Spectroscopic techniques (EPR, Mossbauer, XAS...)
Electron transfer proteins (cytochromes, FeS clusters...)
O₂ binding proteins (hemoglobin, myoglobin, hemerythrin...)
Heme enzymes (cytochrome P450, peroxidase...)
Nonheme monoiron enzymes (α -KG dependent enzymes...)
Nonheme diiron enzymes (MMO, RNR...)
Multicopper enzymes (MMO, tyrosinase...)
Monocopper enzymes (superoxide dismutase, galactose oxidase...)
Manganese enzymes (PSII, catalase...)
Heterometal cluster enzymes (cytochrome c oxidase, nitrogenase)
Molybdenum enzymes (molybdoproteins and oxo transfer)

Exam 1 (Tuesday, Oct. 16)

Exam 2 (Thursday, Nov. 27)

Final Exam (Take-home Dec. 11-15)

Final Presentation (Monday, Dec. 15)

Course Notes:

- Each one-minute paper is due by email to dong1.wang@umontana.edu within 24 hours of each class, except for the two exam classes. Use 2-3 sentences to summarize the contents covered in class and ask any question you might have.
- The final exam is comprehensive and take-home. The exam will be handed out at the end of the last class on Dec. 11 and the answers will be collected at the beginning of the final presentation on Dec. 15. You are required to work independently on the final exam.
- If you have a legitimate conflict with an exam date, you must inform the instructor **at least 1 week before the exam** to make alternate arrangements. Missed exams will receive a grade of zero.
- The \pm grading system will be employed.
 - See the [Catalog for Academic Policies and Procedures](#) which includes grading policies
- See the [Student Conduct Code](#) for the definition and potential consequences of academic misconduct and plagiarism.
- Information on disability accommodations is available on the [University of Montana Accessibility Website](#).

Tentative Schedule

Month	Day	Topic
September	6	Introduction
	11, 13	Survey of spectroscopic techniques
	18, 20	Electron transfer proteins
	25, 27	O ₂ carrier proteins
October	2, 4	Heme enzymes
	9, 11	Nonheme monoiron enzymes
	16	Exam 1
	18	Nonheme diiron enzymes
	23, 25	
	30	Multicopper enzymes
November	1	
	6, 8	Monocopper enzymes
	13, 15	Manganese enzymes
	20	Molybdenum enzymes
	22	Thanksgiving Break, no class
	27	Exam 2
December	29	
	4, 6	Heterometal cluster enzymes
	11	
	15	Final Presentation