



**Biochemistry 917 Seminar in Gene Regulation
crosslisted as Micro 917**

Credits: 1

Canvas Course URL: N/A

Course Designations and Attributes: Graduate

Meeting Time and Location: Tuesday, 12 noon, 5503 Microbial Sciences Building

Instructional Mode: Face-to-Face instruction

Specify how Credit Hours are met by the Course: Traditional Carnegie Definition – One hour (i.e. 50 minutes) of classroom or direct faculty/instructor instruction and two hours of out of class student work each week over approximately 15 weeks.

INSTRUCTORS AND TEACHING ASSISTANTS

Instructor Title and Name: Professor Robert Landick

Instructor Availability: by appointment

Instructor Email/Preferred Contact: rlandick@wisc.edu

OFFICIAL COURSE DESCRIPTION

Course Description

As approved through governance, presented in [the Guide](#).

Participants will discuss recent literature in topics related to prokaryotic and eukaryotic gene regulation. These topics include but are not limited to regulation of transcription, translation, and genome organization. Each week, one student participant will lead a critical discussion on a recent publication in the field of gene regulation. The discussion leader will explain the background materials, methodology, experimental results, and broader implications of the publication. All participants will be expected to take an active role in the discussion.

Requisites

Advanced coursework in molecular biology and permission of instructor.

LEARNING OUTCOMES

Course Learning Outcomes:

Students will become familiar with state-of-the-art research in the area of gene expression and regulation, students will gain communication skills by preparing a presentation, and students will gain experience in critically evaluating experimental results.

Texts: The texts of this course will be primary research literature selected by the professors and students. The literature is available from UW campus libraries.

Representative List of Readings: See below. Student choice papers are selected by the enrolled students.

GRADING

Attendance: 20% Participation: 20% Presentation: 60%

DISCUSSION SESSIONS

Date	Topic/Paper
09/19	Antibacterial nucleoside-analog inhibitor of bacterial RNA polymerase. Maffioli S. I., et al. <i>Cell</i> . 169, 1240–1248.e23 (2017).
09/26	Deep-sea vent phage DNA polymerase specifically initiates DNA synthesis in the absence of primers. Zhu, B., et al. <i>Proc. Natl. Acad. Sci. U. S. A.</i> 114, E2310–E2318 (2017).
10/04	Multisubunit RNA polymerase cleavage factors modulate the kinetics and energetics of nucleotide incorporation: an RNA polymerase I case study. Appling, F. D. et al. <i>Biochemistry</i> . 56, 5654–5662 (2017).
10/10	The transcription fidelity factor GreA impedes DNA break repair. Sivaramakrishnan, P., et al. <i>Nature</i> . 550, 214–218 (2017).
10/17	Disassembly of the <i>Staphylococcus aureus</i> hibernating 100S ribosome by an evolutionarily conserved GTPase. Basu, A., et al. <i>Proc. Natl. Acad. Sci. U. S. A.</i> 114, E8165–E8173 (2017)
10/24	Mfd translocase is necessary and sufficient for transcription-coupled repair in <i>Escherichia coli</i>. Adebali, O., et al. <i>J. Biol. Chem.</i> 292, 18386–18391 (2017).
10/31	6S RNA mimics B-form DNA to regulate <i>Escherichia coli</i> RNA polymerase. Chen, J., et al. <i>Mol. Cell</i> . 68, 388–397.e6 (2017).
11/7	Mutagenic cost of ribonucleotides in bacterial DNA. Schroeder, J. W., et al. <i>Proc. Natl. Acad. Sci. U. S. A.</i> 114, 11733–11738 (2017).
11/21	Interplay between sigma region 3.2 and secondary channel factors during promoter escape by bacterial RNA polymerase. Petushkov, I., et al. <i>Biochem. J.</i> 474, 4053–4064 (2017).
11/28	Mechanism of transcription anti-termination in human mitochondria. Hillen, H. S., et al. <i>Cell</i> . 171, 1082–1093.e13 (2017).

12/5	<i>In situ</i> capture of chromatin interactions by biotinylated dCas9. Liu, X., et al. <i>Cell</i> . 170, 1028–1043.e19 (2017).
12/12	Structural basis of bacterial transcription activation. Liu, B., et al. <i>Science</i> . 358, 947–951 (2017).

RULES, RIGHTS & RESPONSIBILITIES

- See the Guide's to [Rules, Rights and Responsibilities](#)

ACADEMIC INTEGRITY

By enrolling in this course, each student assumes the responsibilities of an active participant in UW-Madison's community of scholars in which everyone's academic work and behavior are held to the highest academic integrity standards. Academic misconduct compromises the integrity of the university. Cheating, fabrication, plagiarism, unauthorized collaboration, and helping others commit these acts are examples of academic misconduct, which can result in disciplinary action. This includes but is not limited to failure on the assignment/course, disciplinary probation, or suspension. Substantial or repeated cases of misconduct will be forwarded to the Office of Student Conduct & Community Standards for additional review. For more information, refer to studentconduct.wiscweb.wisc.edu/academic-integrity/.

ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES

McBurney Disability Resource Center syllabus statement: "The University of Wisconsin-Madison supports the right of all enrolled students to a full and equal educational opportunity. The Americans with Disabilities Act (ADA), Wisconsin State Statute (36.12), and UW-Madison policy (Faculty Document 1071) require that students with disabilities be reasonably accommodated in instruction and campus life. Reasonable accommodations for students with disabilities is a shared faculty and student responsibility. Students are expected to inform faculty [me] of their need for instructional accommodations by the end of the third week of the semester, or as soon as possible after a disability has been incurred or recognized. Faculty [I], will work either directly with the student [you] or in coordination with the McBurney Center to identify and provide reasonable instructional accommodations. Disability information, including instructional accommodations as part of a student's educational record, is confidential and protected under FERPA." <http://mcburney.wisc.edu/facstaffother/faculty/syllabus.php>

DIVERSITY & INCLUSION

Institutional statement on diversity: "Diversity is a source of strength, creativity, and innovation for UW-Madison. We value the contributions of each person and respect the profound ways their identity, culture, background, experience, status, abilities, and opinion enrich the university community. We commit ourselves to the pursuit of excellence in teaching, research, outreach, and diversity as inextricably linked goals.

The University of Wisconsin-Madison fulfills its public mission by creating a welcoming and inclusive community for people from every background – people who as students, faculty, and staff serve Wisconsin and the world." <https://diversity.wisc.edu/>