



## **Eukaryotic Molecular Biology**

Biochemistry/Genetics/Medical Genetics 620

**Credits:** 3

### **Canvas Course URL**

The course web site at <https://canvas.wisc.edu/courses/140997> contains the syllabus, PowerPoint lecture notes, Discussion assignments, and sample exams from past years

### **Course Designations and Attributes**

**Level:** Intermediate

**L&S Credit Type:** Counts as LAS credit (L&S)

**Course Options:** 50% Graduate Coursework Requirement

### **Meeting Time and Location**

MWF 11:00-11:50, Biochemical Sciences Building (BSB), Room 1211

### **Instructional Mode**

All face-to-face

### **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 a minimum of two hours of out of class student work each week over approximately 15 weeks, or an equivalent amount of engagement over a different number of weeks.

## **INSTRUCTORS AND TEACHING ASSISTANTS**

Dr. David Wassarman, Department of Medical Genetics,  
4262 Genetics/Biotech, [dawassarman@wisc.edu](mailto:dawassarman@wisc.edu)

Teaching Assistant: Justin McKetney, IPIB graduate student,  
4400 Genetics/Biotech, [mcketney@wisc.edu](mailto:mcketney@wisc.edu)

### **Instructor Availability**

Contact Professor Wassarman by e-mail to set up a one-on-one meeting.

## **OFFICIAL COURSE DESCRIPTION**

### **Course Description**

This course focuses on the basic molecular mechanisms that regulate DNA, RNA, and protein metabolism in eukaryotic organisms. This course is intended for advanced undergraduates and first year graduate students with a firm knowledge of basic biochemistry.

### Requisites

BIOCHEM 501 or 508 or graduate standing

## LEARNING OUTCOMES

### Course Learning Outcomes

Students will develop advanced problem solving and communication skills in the field of eukaryotic molecular biology.

## GRADING

Grades will be assigned based on total points earned, with a maximum of 380. Each exam is 100 points. Each Discussion assignment is 10 points.

	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>
A	88-100	89-100	89-100	88-100	89-100
AB	83-87	85-88	84-88	83-87	83-88
B	74-82	76-84	76-83	73-82	74-82
BC	70-73	72-75	71-75	70-72	70-73
C	66-69	68-71	66-70	66-69	64-69
D	61-65	61-67	61-65	61-65	61-63
F	<61	<61	<61	<61	<61

## CLASS FORMAT

The class meets for three 50-minute periods each week over the spring semester and carries the expectation that students will work on course learning activities (Discussion assignments and exam preparation) for about 2 hours out of the classroom for every class period. The syllabus includes additional information about meeting times and expectations for student work. Information will be presented in two formats: in 31 sessions, Prof. Wassarman will present lectures on topics central to eukaryotic molecular biology and in 8 sessions (listed as "Discussion" in the syllabus) Prof. Wassarman will lead a class discussion aimed at developing problem solving skills. The final 3 sessions will be exams.

## REQUIRED TEXTBOOK, SOFTWARE & OTHER COURSE MATERIALS

No textbook is required for the course, but textbooks are a great resource for basic information. Primary research articles, review articles, and the internet can provide more specific and current information.

## EXAMS, QUIZZES, PAPERS & OTHER MAJOR GRADED WORK

### Discussion assignments

Students should turn in the Discussion assignments at the beginning of the class prior to the Discussion class. Answers should be less than one 8.5 x 11 inch page (one side). To facilitate discussion, graded assignments will be returned to students at the beginning of the Discussion class.

### Exams

Exams will follow completion of the major sections of the course: exam 1-transcription, exam 2-post-transcriptional events, exam 3-translation and DNA replication, damage, repair, and mutation (see syllabus). During the exams, students can use notes on one 8.5 x 11 inch page (both sides). The format of the exams will be the same as the Discussion assignments. A review session led by the TA will be held a few days prior to each exam.

### Schedule

Date	#	Topic	Assignments
(W) Jan 23	1	Orientation	
(F) Jan 25	2	RNA pol I transcription	
(M) Jan 28	3	RNA pol I	
(W) Jan 30	4	RNA pol II transcription	
(F) Feb 1	5	RNA pol II transcription	<b>Discussion 1</b>
(M) Feb 4	6	Discussion 1	
(W) Feb 6	7	RNA pol II transcription	
(F) Feb 8	8	RNA pol II transcription	
(M) Feb 11	9	RNA pol III transcription	<b>Discussion 2</b>
(W) Feb 13	10	Discussion 2	
(F) Feb 15	11	Chromatin	
(M) Feb 18	12	Chromatin	
(W) Feb 20	13	Chromatin	<b>Discussion 3</b>
(F) Feb 22	14	Discussion 3	
(M) Feb 25	15	Chromatin	
(W) Feb 27	16	<b>Exam 1</b>	
(F) March 1	17	Pre-mRNA splicing	
(M) March 4	18	Pre-mRNA splicing	
(W) March 6	19	Pre-mRNA splicing	<b>Discussion 4</b>
(F) March 8	20	Discussion 4	
(M) March 11	21	Capping and polyadenylation	
(W) March 13	22	Polyadenylation	
(F) March 15	23	RNA decay	
(M) March 18		Spring break	
(W) March 20		Spring break	
(F) March 22		Spring break	
(M) March 25	24	RNA decay	
(W) March 27	25	siRNAs	<b>Discussion 5</b>
(F) March 29	26	Discussion 5	
(M) April 1	27	miRNAs	
(W) April 3	28	CRISPR	<b>Discussion 6</b>
(F) April 5	29	Discussion 6	
(M) April 8	30	Other RNA-related events	
(W) April 10	31	<b>Exam 2</b>	
(F) April 12	32	Translation	
(M) April 15	33	Translation	
(W) April 17	34	Translation	<b>Discussion 7</b>
(F) April 19	35	Discussion 7	
(M) April 22	36	DNA replication	
(W) April 24	37	DNA replication	
(F) April 26	38	DNA replication	

(M) April 29	39	DNA damage, repair and mutation	<b>Discussion 8</b>
(W) May 1	40	Discussion 8	
(F) May 3	41	DNA damage, repair and mutation	
(M) May 6	42	<b>Exam 3</b>	2:45-4:45, room pending

## RULES, RIGHTS & RESPONSIBILITIES

- See the Guide's [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/](http://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/>