

## Eukaryotic Molecular Biology, Biochemistry/Genetics 620

**Time and place:** MWF 11:00-11:50, Biochemical Sciences Building (BSB), Room 1211

**Instructors:**

Dr. David Wassarman, Department of Medical Genetics, 4262 Genetics/Biotech, dawassarman@wisc.edu  
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**Course description:** This course focuses on solving problems related to the basic molecular mechanisms that regulate DNA, RNA, and protein metabolism in eukaryotic organisms. The course is intended for advanced undergraduates and first years graduate students with a firm knowledge of basic biochemistry.

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

(W) April 25	37	DNA replication		Ansari
(F) April 27	38	DNA replication	<b>Research proposal-part 2</b>	Ansari
(M) April 30	39	DNA damage and repair	<b>Discussion 8</b>	Ansari
(W) May 2	40	Discussion 8		Ansari
(F) May 4	41	DNA repair		Ansari
(Sun) May 6	42	<b>Exam 3</b>	10:05-12:05, room pending	Ansari

**Learning objective:** The primary goal of the class is for students to develop the problem solving skills necessary to make research discoveries in the field of eukaryotic molecular biology.

**Class format:** The class meets MWF for 50 minutes. Information will be presented in two formats. In 31 sessions, faculty will present lectures on topics central to the discipline of eukaryotic molecular biology. In 8 sessions (listed as "Discussion" in the syllabus), students and faculty will discuss assignments aimed at developing problem solving skills in eukaryotic molecular biology. The final 3 sessions will be exams.

**Discussion assignments:** Students should turn in the Discussion assignments at the beginning of the class prior to the Discussion. Answers should be less than 1 page (one side).

**Research proposal assignment:** The assignment is to choose one eukaryotic gene of unknown function and write a 4-page paper that proposes molecular biology approaches to determine the function of the gene (*i.e.*, the RNA or encoded protein). Details will be provided in the third class session.

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

**Grades:** Grades will be assigned based on total points earned, with a maximum of 480. Each exam is 100 points. The research proposal is 100 points. Each Discussion assignment is 10 points.

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

**Web site:** The course web site at Learn@UW contains the syllabus, instructions for the research proposal, PowerPoint lecture notes, Discussion assignments, sample exams from last year, and sample research proposals from past students.

**Resources for additional information:** Textbooks are a great resource for basic information. Primary research articles, review articles, and the internet can provide more specific and current information.

*In this class, diversity is a source of knowledge, creativity, and innovation. We value the contributions of each person, and we respect the profound ways their identities, cultures, backgrounds, experiences, abilities, and opinions enrich the class and the university community.*

*We are deeply committed to providing an accessible learning environment for all students. If you have formal disability accommodations through the McBurney Center or you need informal accommodations, please let us know at the beginning of the semester.*