

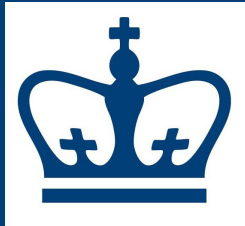
Molecular Biology

BIOL UN4512

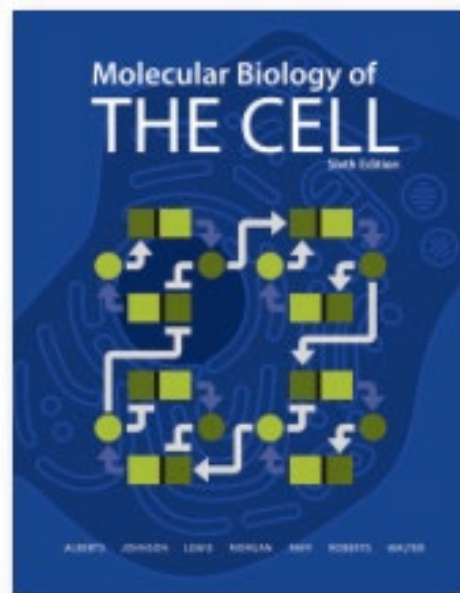
MW2:40-3:55pm

Spring 2023

Jim Manley & Alice Hecklen



Molecular Biology of the Cell 6th edition Alberts et al. Garland Science 2014
ISBN: 9780815344322



Come discover how large proteins /RNA machines build our cells, including how DNA is organized in the nucleus, replicated, repaired, recombined and transcribed, and how RNA is spliced & translated

Point Distribution

Exam 1:	100 Hecklen
Exam 2:	100 Hecklen
Articles	75 (25pts each x 3)
Case Study	25
Exam 3	100 Manley
Final Exam:	<u>100</u> Manley
	500
H 300Pts = 50% & M 200Pts = 50%	

Instructors:

Alice Hecklen	ah2289
Office Hour:	W 4:30-5:30pm
Jim Manley	jlm2
Office Hour:	F 10-12pm by appointment

TAs:

Daniel Vaz	drv2118
Pedro Bak-Gordon	pgb2122
Vincenzo DiNatale	vpd2108

Prerequisite: BIOL UN2005/2006 or a comparable year of molecular based intro biology

Canvas: PowerPoints are posted just before the lecture under "Files" in sequentially numbered lecture folders. Ask the TAs if you have trouble locating an article, which are intentionally not posted to be sure you know how to access articles.

Academic Integrity, as outlined below, is required:

<http://www.college.columbia.edu/academics/academicintegrity>

Regrade Policy. Regrades are permitted up to 1 weeks after exams are returned in class.

Make-up exams. In case of serious illness or personal crisis, rescheduling of the exam will require support documentation (doctor's note or general advisor confirmation). Please contact Dr. H ASAP to schedule a make-up.

Late Assignment Policy. As this pertains primarily to the individual research article assignments, which prepare you for the article discussion, no late assignments (i.e. after class has begun) will be accepted.

TA Sessions: TAs hold office hours, article reviews or exam reviews.

Instructor Reviews: Dr H has a review before exam 1 & 2

Course Schedule

Date	MBOC e6	Topic
1. January 16	MLK Holiday	
2. January 18	Ch4	Nuclear organization & DNA Macro structure
3. January 23		Chromatin & TADs
4. January 25		Gene Families and Phase Separation GP
5. January 30	Case Study	Color Vision
6. February 1	Ch 12: 658-662 & Ch14: 755-8 & 800-9	Mitochondrial DNA GP
7. February 6	Article 1 - Smell	Lomvardas et al. <i>Cell</i> 2006 <i>Cell</i> 126 : 403-413
8. February 8	Exam 1	
9. February 13	Ch 5	DNA Replication
10. February 15		Ori Spreading
11. February 20		DNA Repair GP
12. February 22		DNA Repair
13. February 27	Article 2 - CRISPR	Ma et al. 2017 <i>Nature</i> 548 : 413-9
14. March 1		Cancer GP
15. March 6	Article 3 -DNA Repair	Lyu et al. 2021 <i>EMBO J.</i> 40(2) : 1-20
16. March 8	Exam 2	
17. March 13	Spring Break	
18. March 15	Spring Break	
19. March 20	Ch 6 & 7	RNA, Prokaryotic transcription
20. March 22		Eukaryotic transcription (General features)
21. March 27		Eukaryotic mRNA processing (capping, splicing)
22. March 29		Eukaryotic mRNA processing (polyadenylation, coupling to transcription, termination, transport). rRNA, tRNA processing
23. April 3		Translation
24. April 5		Regulation - Intro, DNA binding transcription factors
25. April 10	Exam 3	
26. April 12		Mechanisms of transcriptional regulation I
27. April 17		Mechanisms of transcriptional regulation II
28. April 19		Mechanisms of regulation. Elongation, RNA processing
29. April 24		Mechanisms of regulation. Transport, translation, miRNAs and other non-coding RNAs
30. April 26		Mechanisms of regulation. Transport, translation, miRNAs and other non-coding RNAs
31. May 1	Paper Discussion	
Wed 5/10 1:10-4pm	FINAL - Tentative	

Some methods or content will be taken from chapter 8, 12, 17 & 20

Readings & topics may not perfectly correspond to the day stated as lectures vary from year to year