

# Epigenetics and Human Disease

ZOO 4926 6927

3 credits

**Prerequisites:** A grade of "C" or better in Integrated Principles of Biology I and II (BSC 2010, 2010L, 2011, 2011L)

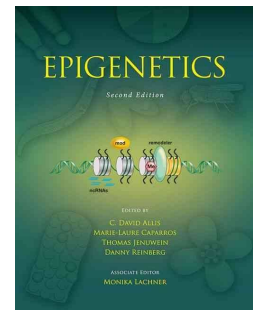
**Instructor:** Hua Yan  
Office: 511 Carr Hall  
Email: [hua.yan@ufl.edu](mailto:hua.yan@ufl.edu)

**Class Schedule:** Monday, Wednesday, Friday, Period 2 (8:30 AM - 9:20 AM)

**Format:** Remote, Synchronous via Zoom

**Textbook:** EPIGENETICS 2<sup>nd</sup> Edition

By C. David Allis, Marie-Laure Caparros, Thomas Jenuwein, Danny Reinberg  
2015 by Cold Spring Harbor Laboratory Press (Publisher)



You may find the book in the UF Bookstore:

<https://www.bkstr.com/floridastore/product/epigenetics-603780-1>

or in the Cold Spring Harbor Laboratory Press:

<https://www.cshlpress.com/default.tpl?action=full&cart=1597252342182565782&--eqskudatarq=987&typ=ps&newtitle=Epigenetics%2C%20Second%20Edition>

or other sources.

**Course website:** <https://elearning.ufl.edu/>

(Select Log in to E-Learning) Class material including the syllabus, supplemental readings, and other information related to the course will be posted on the course website on e-Learning.

**Office hours:** Wednesday and Friday Period 7 (1:55 AM–2:45 PM) or by appointment

**Email:** All email correspondence must be from your @ufl.edu account, have your full name in the body of the email, and contain the course number in the subject line. Emails not meeting these requirements may not be answered quickly.

**Course Objectives:** This course is an introduction to the epigenetic processes and epigenetic basis of human disease. The course will take a mechanistic view of the epigenetic modifications, including transcription factors, DNA methylation, histone modifications, non-coding RNAs as well as how they regulate chromatin status and gene transcription. This course provides a strong foundation for Biology students, pre-med, and pre-health students. This course will include lectures and in-class group activities. Topics will include, but are not limited to: chromatin dynamics and remodeling, epigenetic modifications, topologically associating domains, dosage compensation, genomic imprinting, epigenetic reprogramming, and how our knowledge of these processes is leading to our

understanding and treatment of human disease. Grades will be assigned based on performance on multiple types of assessments including: exams, in-class activities (supplemental readings and presentations), and final writing of a mini-review. Exams will emphasize material covered in lecture, assigned reading in the textbook, and assigned supplemental information.

**Class Attendance**

Students are expected to attend all classes and are responsible for all material covered during the lecture. Students are required to read the assigned chapters before coming to class.

**Exams**

There will be 3 Exams during the semester. Exams are not cumulative. Exams will cover the material presented in lecture as well as any assigned supplemental reading or web-based material. The tests will contain multiple-choice questions, and written short answer questions. Honorlock will be used to proctor the online exam. Check the UF website before your start to take exams:

<https://elearning.ufl.edu/keep-teaching/online-proctoring-using-honorlock/>

Exam scores are released within a week after the exams, and are available for review for a week after its release. You may not review previous exams after the semester has ended.

**Make-up Exams**

**No make-up exams will be given without prior permission or documentation of illness.**

In case of illness, a note from your physician is required. A personal matter requires a note from the Dean of Students (<http://www.dso.ufl.edu/>, 202 Peabody Hall).

**Grading**

Course grades will be determined by the scores of the 3 exams plus the activities and mini-review as follows: Each exam will be 20% of the total course grade (3 exams = 60%). The in-class activities will count as 20% of the course grade, and final mini-review will count for 20% of the course grade. 60% exam scores + 20% activity scores + 20% mini-review scores = 100% course grade.

A curve for each exam will be calculated as follows: The top three scores on each exam will be averaged, and the difference between that value and the maximum possible value of 100 points will be determined. This curve point value will be added to each exam. At the end of the semester, letter grades will be assigned based upon the percentage of the curved exam grades that you have earned during the semester (plus activities and mini-review), using the cut-offs in the adjacent table. These cut-offs may be lowered at the discretion of the instructor, but they will not be increased.

Point Range (%)	Letter Grade
≥ 93.0	A
≥ 90.0	A-
≥ 87.0	B+
≥ 83.0	B
≥ 80.0	B-
≥ 77.0	C+
≥ 73.0	C
≥ 70.0	C-
≥ 67.0	D+
≥ 63.0	D
≥ 60.0	D-
< 60.0	E

- In-class group activities** We will separate students into several groups. For the first supplemental reading, all groups present. For the rest of supplemental readings, only one group present the assigned paper and other groups write a one-page summary.
- Final mini-review** Each student is required to write a final mini-review on your interested topic in epigenetics: 2-3 pages for undergraduate students and 3-5 pages for graduate students, single spaced, including references. See Lecture Schedule for the timeline.
- Conduct in Class** Please be courteous and mute your microphone, except when you ask questions or talk during class discussions or activities, as the background noise can be distracting to the professor and other students.
- Academic Honesty** All students registered at the University of Florida have agreed to comply with the following statement:
- “I understand that the University of Florida expects its students to be honest in all their academic work. I agree to adhere to this commitment to academic honesty and understand that my failure to comply with this commitment may result in disciplinary action up to and including expulsion from the University.”*
- In addition, on all work submitted for credit the following pledge is either required or implied:
- “On my honor I have neither given nor received unauthorized aid in doing this assignment.”*
- If you witness any instances of academic dishonesty in this class, please notify the instructor, or file an incident report at: [Link to incident report forms](#)
- For additional information on Academic Honesty, please refer to the University of Florida Student Honor Code at: [Link to Student Honor Code](#)
- Accommodations for Students with Disabilities** Students with disabilities who require accommodations should first seek assistance at the Dean of Students Office of Disability Resources, in Peabody 202 (phone: 352-392-1261). The Dean of Students Office of Disability Resources will work with the instructor to accommodate the student. Please see the University of Florida [Disability Resources website](#) for more information.
- Personal Wellness** Your well-being is important to the University of Florida. [The U Matter, We Care](#) initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact [umatter@ufl.edu](mailto:umatter@ufl.edu) so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the [Counseling and Wellness Center](#). Many students experience test anxiety and other stress related problems. [“A Self Help Guide for Students”](#) is available through the Counseling and Wellness Center (3190 Radio Road, 352-392-1575).

**Lecture Schedule**

Lecture topics for this course are listed below. This is a flexible, tentative schedule; the dates and amount of coverage of specific topics may vary somewhat from the list below.

Date		Topic	Chapter
		<b>Course Introduction</b>	
Mon 8/31	1	Introduction to the course	
		<b>Overview and Concepts</b>	
Wed 9/2	2	Review of background knowledge	
Fri 9/4	3	Introduction to epigenetics 1	3
Mon 9/7		Holiday — no classes	
Wed 9/9	4	Introduction to epigenetics 2	3
Fri 9/11	5	Student presentation	Supplemental reading
		<b>Epigenetic Modifications</b>	
Mon 9/14	6	Position-effect variegation	12
Wed 9/16	7	DNA methylation in mammals	15
Fri 9/18	8	lncRNA and eRNA	2 (lncRNAs, enhancer RNAs)
Mon 9/21	9	Student presentation	Supplemental reading
Wed 9/23	10	<b>EXAM 1</b>	
Fri 9/25	11	Polycomb-group proteins 1	17
Mon 9/28	12	Polycomb-group proteins 2	17
Wed 9/30	13	Student presentation	Supplemental reading
Fri 10/2	14	Trithorax-group proteins and nucleosome remodeling 1	18, 21
Mon 10/5	15	Trithorax-group proteins and nucleosome remodeling 2	18, 21
Wed 10/7	16	Student presentation	Supplemental reading
Fri 10/9	17	Long-range chromatin interactions 1 Student presentation	19, Supplemental reading
Mon 10/12	18	Long-range chromatin interactions 2	19
Wed 10/14	19	Student presentation	Supplemental reading
Fri 10/16	20	<b>EXAM 2</b>	
		<b>Epigenetic Regulations</b>	
Mon 10/19	21	Dosage compensation 1	24
Wed 10/21	22	Dosage compensation 2	25
Fri 10/23	23	Student presentation	Supplemental reading
Mon 10/26	24	Genomic imprinting 1	26
Wed 10/28	25	Genomic imprinting 2	26

Fri 10/30	26	Student presentation	Supplemental reading
Mon 11/2	27	Stem cells	27
Wed 11/4	28	Epigenetic reprogramming	28
Fri 11/6	29	Student presentation	Supplemental reading
Mon 11/9	30	<b>EXAM 3</b>	
Wed 11/11		Holiday — no classes	
		<b>Epigenetics and Human Disease</b>	
Fri 11/13	31	Metabolic signaling to chromatin	30
Mon 11/16	32	Neuronal development and function	32
Wed 11/18	33	Student presentation	Supplemental reading
Fri 11/20	34	Epigenetics and human disease	33
Mon 11/23	35	Student presentation	Supplemental reading
Wed 11/25		Holiday — no classes	
Fri 11/27		Holiday — no classes	
Mon 11/30	36	Epigenetics in cancer 1	34
Wed 12/2	37	Epigenetics in cancer 2	35
Fri 12/4	38	Student presentation	Supplemental reading
Mon 12/7	39	A view in perspective	36
Wed 12/9	40	Summary and Q&A on mini-review	
Fri 12/11		<b>Deadline for mini-review</b>	