

# Epigenetics and Human Disease

ZOO 4926, ZOO 6927, ANT 4930, CHM 4930 Special Topics 3 credits

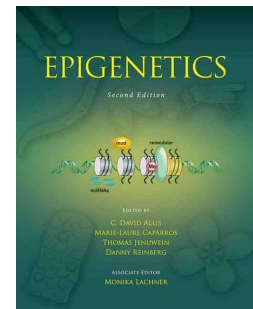
**Prerequisites:** A grade of "C" or better in Integrated Principles of Biology I and II (BSC 2010, 2010L, 2011, 2011L).

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

**Class Schedule:** Monday, Wednesday, Friday, Period 5 (11:45 AM - 12:35 PM)

**Class Location:** Turlington Hall – L007

**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 via Zoom:** 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 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, pluripotent stem cells, epigenetic reprogramming, as well as 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, presentations and summaries), and final writing of a mini-review. Exams will emphasize material covered in lecture and assigned supplemental information.

#### Face-to-face Policies

We have face-to-face instructional sessions to accomplish the student learning objectives of this course. In response to COVID-19, the following policies and requirements are in place to maintain your learning environment and to enhance the safety of our in-classroom interactions.

- You are required to wear approved face coverings at all times during class and within buildings. Following and enforcing these policies and requirements are all of our responsibility. Failure to do so will lead to a report to the Office of Student Conduct and Conflict Resolution.
- This course has been assigned a physical classroom with enough capacity to maintain physical distancing (6 feet between individuals) requirements. Please utilize designated seats and maintain appropriate spacing between students. Please do not move desks or stations.
- Sanitizing supplies are available in the classroom if you wish to wipe down your desks prior to sitting down and at the end of the class.
- Follow your instructor's guidance on how to enter and exit the classroom. Practice physical distancing to the extent possible when entering and exiting the classroom.
- If you are experiencing COVID-19 symptoms ([Click here for guidance from the CDC on symptoms of coronavirus](#)), please use the UF Health screening system and follow the instructions on whether you are able to attend class. [Click here for UF Health guidance on what to do if you have been exposed to or are experiencing Covid-19 symptoms](#).
  - Course materials will be provided to you with an excused absence, and you will be given a reasonable amount of time to make up work. [Find more information in the university attendance policies](#).

#### Exams

There will be 3 Exams during the semester. Exams are not cumulative. Exams will cover the material presented in lecture as well as assigned supplemental reading. The tests will contain multiple-choice questions, and written short answer questions. Exams will be online, and Honorlock will be used to proctor the 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.

#### Attendance and make-ups

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

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 may require a note from the Dean of Students (<http://www.dso.ufl.edu/>, 202 Peabody Hall).

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found in the online catalog at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

If you are experiencing COVID-19 symptoms, see the requirements above in “Face-to-face Policies”. Again, course materials will be provided to you with an excused absence, and you will be given a reasonable amount of time to make up work. Refer to the above link for more information on the university’s attendance policy.

**Accommodations**

Students who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting <https://disability.ufl.edu/students/get-started/>. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

**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 one-page summaries.

**Final mini-review**

Each student is required to write a final mini-review on your interested topic in epigenetics: 3 pages or more for undergraduate students and 5 pages or more for graduate students, single spaced, including figure(s) and references. This is NOT a group assignment. See Lecture Schedule for the timeline.

**Grading**

Course grades will be determined by the scores of the 3 exams plus in-class activities and mini-review as follows: Each exam will be 20% of the total course grade (3 exams = 60%). In-class activities will count as 26% of the course grade, and final mini-review will count for 14% of the course grade. 60% exam scores + 26% activity scores + 14% 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 in-class 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

## Resources Available to Students

### Health and Wellness

- *U Matter, We Care*: [umatter@ufl.edu](mailto:umatter@ufl.edu); 392-1575
- *Counseling and Wellness Center*: <http://www.counseling.ufl.edu/cwc/Default.aspx>; 392-1575
- *Sexual Assault Recovery Services (SARS)*: Student Health Care Center; 392-1161
- *University Police Department*: <http://www.police.ufl.edu/>; 392-1111 (911 for emergencies)

### Academic Resources

- *E-learning technical support*: [Learningsupport@ufl.edu](mailto:Learningsupport@ufl.edu); <https://lss.at.ufl.edu/help.shtml>; 352-392-4357 (opt. 2)
- *Career Resource Center*: Reitz Union; <http://www.crc.ufl.edu/>; 392-1601
- *Library Support*: <http://cms.uflib.ufl.edu/ask>
- *Teaching Center*: Broward Hall; 392-2010 or 392-6420
- *Writing Studio*: 302 Tigert Hall; <http://writing.ufl.edu/writing-studio/>; 846-1138

**Procedure for Conflict Resolution** Any classroom issues, disagreements or grade disputes should be discussed first between the instructor and the student. If the problem cannot be resolved, please contact the Undergraduate or Graduate Coordinator or the Department Chair. Be prepared to provide documentation of the problem, as well as all graded materials for the semester. Issues that cannot be resolved departmentally will be referred to the University Ombuds Office (<http://www.ombuds.ufl.edu>; 392-1308) or the Dean of Students Office (<http://www.dso.ufl.edu>; 392-1261). For further information refer to [https://www.dso.ufl.edu/documents/UF\\_Complaints\\_policy.pdf](https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf) (for residential classes) or <http://www.distance.ufl.edu/student-complaintprocess> (for online classes).

### Conduct in Class

Please be courteous and **do not talk during lecture** (except during class discussions or activities), as this can be distracting to the professor and the other students. Also, cell phones should be silenced during lecture.

### 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](#)

Please see the University of Florida [Disability Resources website](#) for more information.

**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 1/11	1	Introduction to the course	
		<b>Overview and Concepts</b>	
Wed 1/13	2	Introduction to epigenetics 1	
Fri 1/15	3	Introduction to epigenetics 2	3
Mon 1/18		Holiday — no class	
Wed 1/20	4	Introduction to epigenetics 3	3
Fri 1/22	5	Student presentation	Supplemental reading
Mon 1/25	6	Student presentation	Supplemental reading
		<b>Epigenetic Modifications</b>	
Wed 1/27	7	Position-effect variegation	12
Fri 1/29	8	DNA methylation in mammals	15
Mon 2/1	9	lncRNA and eRNA	2 (lncRNAs, enhancer RNAs)
Wed 2/3	10	Student presentation	Supplemental reading
Fri 2/5	11	<b>EXAM 1</b>	
Mon 2/8	12	Polycomb-group proteins 1	17
Wed 2/10	13	Polycomb-group proteins 2	17
Fri 2/12	14	Student presentation	Supplemental reading
Mon 2/15	15	Trithorax-group proteins and nucleosome remodeling 1	18, 21
Wed 2/17	16	Trithorax-group proteins and nucleosome remodeling 2	18, 21
Fri 2/19	17	Student presentation	Supplemental reading
Mon 2/22	18	Long-range chromatin interactions 1 Student presentation	19, Supplemental reading
Wed 2/24	19	Long-range chromatin interactions 2	19
Fri 2/26	20	Student presentation	Supplemental reading
Mon 3/1	21	<b>EXAM 2</b>	
		<b>Epigenetic Regulations</b>	
Wed 3/3	22	Dosage compensation 1	24
Fri 3/5	23	Dosage compensation 2	25
Mon 3/8	24	Student presentation	Supplemental reading
Wed 3/10	25	Genomic imprinting 1	26

Fri 3/12	26	Genomic imprinting 2	26
Mon 3/15	27	Student presentation	Supplemental reading
Wed 3/17	28	Stem cells	27
Fri 3/19	29	Epigenetic reprogramming	28
Mon 3/22	30	Student presentation	Supplemental reading
Wed 3/24		Recharge day — no class	
Fri 3/26	31	<b>EXAM 3</b>	
		<b>Epigenetics and Human Disease</b>	
Mon 3/29	32	Metabolic signaling to chromatin	30
Wed 3/31	33	Neuronal development and function	32
Fri 4/2	34	Student presentation	Supplemental reading
Mon 4/5	35	Epigenetics and human disease	33
Wed 4/7	36	Student presentation	Supplemental reading
Fri 4/9	37	Epigenetics in cancer 1	34
Mon 4/12	38	Epigenetics in cancer 2	35
Wed 4/14	39	Student presentation	Supplemental reading
Fri 4/16	40	A view in perspective	31, 36
Mon 4/19	41	Student presentation	Supplemental reading
Wed 4/21	42	Q&A on mini-review	
Fri 4/23		<b>Deadline for mini-review</b>	