

Epigenetics and Human Disease

PCB4562

3 credits

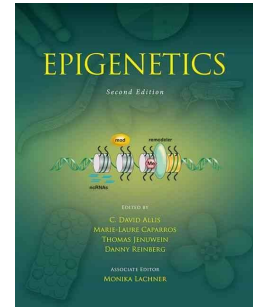
Prerequisites: A grade of "C" or better in Integrated Principles of Biology I and II (BSC2010 and BSC2011). A grade of "C" or better in Genetics (PCB3063).

Instructor: Hua Yan
Office: 511 Carr Hall
Email: hua.yan@ufl.edu

Class Schedule: Monday, Wednesday, Friday, Period 6 (12:50 PM - 1:40 PM)

Class Location: BAR 0211

Textbook: EPIGENETICS 2nd 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, course slides, assigned papers, and other information related to the course will be posted on the course website on e-Learning.

Office hours via Zoom: Monday Period 7 (1:55 PM–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 (required readings, presentations and summaries), and final writing of a mini-review. Exams will emphasize material covered in lecture and assigned information.

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 reading. The tests will contain multiple-choice questions, and written short answer questions.

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>

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 required reading, all groups present. For the rest of required 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, 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.

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

A curve for each exam will be calculated as follows: The top two 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.

Evaluation

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/>.

Resources Available to Students

Health and Wellness

- *U Matter, We Care*: 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; <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
- *Student Complaints On-Campus*: <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>
- *On-Line Students Complaints*: <http://distance.ufl.edu/student-complaint-process/>

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 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 (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

UF students are bound by The Honor Pledge which states: “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code.”

On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.”

The Honor Code (<http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

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
		Course Introduction	
Wed 8/23	1	Introduction to the course	
		Overview and Concepts	
Fri 8/25	2	Introduction to epigenetics 1	3
Mon 8/28	3	Introduction to epigenetics 2	3
Wed 8/30	4	Introduction to epigenetics 3	3
		Epigenetic Modifications	
Fri 9/1	5	Position-effect variegation	12
Mon 9/4		Holiday — no class	
Wed 9/6	6	Student presentation	Assigned paper
Fri 9/8	7	DNA methylation in mammals	15
Mon 9/11	8	lncRNA and eRNA	2 (lncRNAs, enhancer RNAs)
Wed 9/13	9	Student presentation	Assigned paper
Fri 9/15	10	Polycomb-group proteins 1	17
Mon 9/18	11	EXAM 1	
Wed 9/20	12	Polycomb-group proteins 2	17
Fri 9/22	13	Student presentation	Assigned paper
Mon 9/25	14	Trithorax-group proteins and nucleosome remodeling 1	18, 21
Wed 9/27	15	Trithorax-group proteins and nucleosome remodeling 2	18, 21
Fri 9/29	16	Student presentation	Assigned paper

Mon 10/2	17	Long-range chromatin interactions 1 Student presentation	19, Assigned paper
Wed 10/4	18	Long-range chromatin interactions 2	19
Fri 10/6		Holiday — no class	
Mon 10/9	19	Student presentation	Assigned paper
Wed 10/11	20	EXAM 2	
		Epigenetic Regulations	
Fri 10/13	21	Dosage compensation 1	24
Mon 10/16	22	Dosage compensation 2	25
Wed 10/18	23	Student presentation	Assigned paper
Fri 10/20	24	Genomic imprinting 1	26
Mon 10/23	25	Genomic imprinting 2	26
Wed 10/25	26	Student presentation	Assigned paper
Fri 10/27	27	Stem cells	27
Mon 10/30	28	Epigenetic reprogramming	28
Wed 11/1	29	Student presentation	Assigned paper
Fri 11/3	30	EXAM 3	
		Epigenetics and Human Disease	
Mon 11/6	31	Metabolic signaling to chromatin	30
Wed 11/8	32	Neuronal development and function	32
Fri 11/10		Holiday — no class	
Mon 11/13	33	Student presentation	Assigned paper
Wed 11/15	34	Epigenetics and human disease	33
Fri 11/17	35	Student presentation	Assigned paper
Mon 11/20	36	Epigenetics in cancer 1	34
Wed 11/22		Holiday — no class	
Fri 11/24		Holiday — no class	
Mon 11/27	37	Epigenetics in cancer 2	35
Wed 11/29	38	Student presentation	Assigned paper
Fri 12/1	39	A view in perspective	31, 36
Mon 12/4	40	Student presentation	Assigned paper
Wed 12/6	41	Q&A on mini-review	
Fri 12/8		Deadline for mini-review	