
ANMLSCI 697J

Genes, Cells and Development

COURSE DESCRIPTION

Understanding how a fetus develops from a single fertilized cell is a question that has perplexed biologists for over 100 years. While the field originally used only a few organisms and experimental techniques to tease out these questions, the last 15 years has seen fundamental shifts in the science of developmental biology. Advances in genetics, molecular biology, imaging and powerful new model organisms have brought the field closer to its goal. In this course experts in the field of mouse and frog development will lecture on basic topics in developmental biology including fertilization, axis specification, germ layer induction, organogenesis, cancer, postembryonic development and epigenetics. Within each topic there will be a focus on both classic and modern day literature that will constitute the required reading for the course. It is anticipated that students will not only master the topics covered but also gain the ability to evaluate the literature and design experiments in the field.

CONTACT INFORMATION

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Materials

Book (optional) “Developmental Biology” by Scott Gilbert, 9th or 10th edition

Milestones

EXAM 1

EXAM 2

EVALUATION

Participation 33%:

Participation will be a major portion of this course. All students are required to be prepared for each lecture by reading the provided papers and formulating questions. There will be ample opportunity to ask questions, respond to questions and have discussions in class.

Exams 66%:

There will be 2 exams. A midterm and a final exam, each of which will constitute 1/3 of the grade. Each exam will be take-home and will be based around the topics reviewed in class as well as literature/experimental techniques.

PROGRAM

DATE	INSTRUCTOR	TOPIC
January 19 th January 21 st	ALFANDARI ALFANDARI	Lecture 1-4 will deal with descriptive embryogenesis and classical experiments that led to the discovery of mesoderm induction and axis formation.
January 26 th January 28 th	ALFANDARI ALFANDARI	
February 2 nd February 4 th	ALFANDARI ALFANDARI	Lectures 5 to 8 will look at signaling pathways that regulates axis formation and induction. Primary articles will be used to tease out facts from models and hypotheses
February 9 ^h February 11 th	ALFANDARI ALFANDARI	
February 16 th February 18 th	MONDAY SCHEDULE-NO CLASS COUSIN	NO CLASS Development of the Nervous System
February 23 rd February 25 th	COUSIN ALBERTSON	The Neural Crest and craniofacial development Evo-Devo
March 1 st March 3 rd	ALBERTSON TREMBLAY	Evo-Devo Early mouse development and experimental techniques
March 8 th March 10 th	TREMBLAY TREMBLAY	Building an embryo: A/P patterning and nodal signaling Endoderm formation
March 15 th March 17 th	SPRING BREAK-NO CLASS SPRING BREAK- NO CLASS	NO CLASS NO CLASS
March 22 nd March 24 th	TREMBLAY SCHNEYER	Induction of liver and pancreas Development of islets cells in pancreas
March 29 th March 31 st	SCHNEYER MAGER	Potential therapies Epigenetic reprogramming
April 5 th April 7 th	NO CLASS MAGER	NO CLASS Induced pluripotency
April 12 th April 14 th	MAGER JERRY	Stem cell Breast cancer pathogenesis & barriers to oncogenesis
April 19 th April 21 st	JERRY JERRY	Cancer genetics Cancer stem cells
April 26 th	JERRY	Cancer epigenetic

THE UNIVERSITY OF MASSACHUSETTS ACADEMIC HONESTY POLICY:

Since the integrity of the academic enterprise of any institution of higher education requires honesty in scholarship and research, academic honesty is required of all students at the University of Massachusetts Amherst.

Academic dishonesty is prohibited in all programs of the University. Academic dishonesty includes but is not limited to: cheating, fabrication, plagiarism, and facilitating dishonesty. [See [Appendix B](#) for detailed examples of behavior that constitutes academic dishonesty.] Appropriate sanctions may be imposed on any student who has committed an act of academic dishonesty. Instructors should take reasonable steps to address academic misconduct. [See [Appendix C](#) for some suggested ways to deal with issues of academic integrity.] Any person who has reason to believe that a student has committed academic dishonesty should bring such information to the attention of the appropriate course instructor as soon as possible. Instances of academic dishonesty not related to a specific course should be brought to the attention of the appropriate department Head or Chair. The procedures outlined below are intended to provide an efficient and orderly process by which action may be taken if it appears that academic dishonesty has occurred and by which students may appeal such actions.

Since students are expected to be familiar with this policy and the commonly accepted standards of academic integrity, ignorance of such standards is not normally sufficient evidence of lack of intent.

Please see: http://www.umass.edu/dean_students/codeofconduct/acadhonesty/index.php for the remainder of the academic honesty policy.