CAMB 5110: Principles of Development **Fall/Winter 2025**

Date	Topic	Lecturer
Wed. 8/27	Organizational Meeting	*Steve DiNardo & Nancy Speck*
Mon. 9/1	**NO CLASS | LABOR DAY**	
Wed. 9/3	Cell lineage and fate maps; Introduction to genetics	*Bushra Raj*
Fri. 9/5	Single cell analyses and cell fate	*Bushra Raj*
Mon. 9/8	Induction of primary germ layers	*Dan Kessler*
Wed. 9/10	Body plan formation: Gastrulation, germ layer formation and morphogenesis	*Peter Klein*
Mon. 9/15	Embryonic gene activation	*Matt Good*
Wed. 9/17	Left-right patterning	*Dan Kessler*
Mon. 9/22	Morphogens in patterning	*Mary Mullins*
Wed. 9/24	Journal club discussion-1	
Mon. 9/29	Mouse molecular genetic models and approaches	*Patrick Seale*
Wed. 10/1	X chromosome inactivation in development	*Montserrat Anguera*
Mon. 10/6	Single Molecule Imaging, Nuclear Organization and Transcription	*Mustafa Mir*
Wed. 10/8	Journal club discussion-2	
Mon. 10/13	Stem cells in tissue maintenance & regeneration	*Chris Lengner*
Wed. 10/15	Modeling human development and disease using iPS cells	*Wenli Yang*
Mon. 10/20	Stem cell niches	*Steve DiNardo*
Wed. 10/22	**NO CLASS | IRM SYMPOSIUM**	
Fri. 10/24	Skeletal development and mechanical cues	*Joel Boerckel*
Mon. 10/27	Journal club discussion-3	
Wed. 10/29	Cytoskeleton, cell shape and embryogenesis	*Nicolas Plachta*

Mon. 11/3	(Tubulogenesis – tentative title)	*Meera Sundaram*
Wed. 11/5	Journal club discussion-3	
Mon. 11/10	Metabolic regulation of development	*Patrick Seale*
Wed. 11/12	Biological rhythms and development	*Juan Alvarez*
Mon. 11/17	Journal club discussion-5	
Wed. 11/19	***Take home problem set will be sent out*** Retrotransposon reactivation in development and disease	*Andrew Modzelewski*
Mon. 11/24	Hematopoietic stem cell formation and renewal	*Nancy Speck*
Wed. 11/26	**NO CLASS**	
Mon. 12/1	Journal club discussion-6	
Wed. 12/3	***Take home problem set due*** Regeneration	*Faye Mourkioti*
Mon. 12/8	Evolutionary - Development	*Steve DiNardo*
Wed. 12/10	Journal club discussion -7	
Mon. 12/15	Review of problem set	

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Class Schedule:
BRB 1201
3:30PM – 5PM on Mondays and Wednesdays (unless otherwise noted)

Students will have access to the canvas site. Please check on Canvas for changes/updates.

Course Website:
The class site on Canvas (canvas.upenn.edu) includes the course schedule, syllabus, faculty contact information, discussion papers for download (Files > Discussion papers), and a "Discussions" tab to submit your answers to questions (see below).

Journal Club Discussions:
Students should pair up, and choose one of the research papers for discussion. The papers are listed under Files > Discussion papers on the course website, and the syllabus indicates the class date for discussion. We will post a sign-up sheet for these Discussions.

The task you and your partner have is to lead a journal club-style discussion of the paper. You are responsible for providing background/context, presenting the key figures (not every figure, and not every panel), answering questions from your peers, encouraging their participation, and moderating a discussion of the work.

All students must read the paper carefully and submit answers to the following questions before class under the "Discussions" tab on the Canvas course site:

1. What conceptual issue lies at the heart of the work?
2. What experiment produces the authors' most convincing data? Why?
3. What experiment is least convincing to you? Why?
4. What hypothesis derived from this paper would you set out to test next? Can you propose a way you might test that hypothesis?

Take home problem set:
Will be sent out on 11/19, and due on 12/03. Students should work in pairs to complete the questions.

Grading:
1. Journal club presentation (35%)
2. Class participation (35%)
− Attendance
− Engagement in class: asking questions, contributing to discussions,
− Submitted comments/questions
3. Take home problem set (30%)