CAMB 511: PRINCIPLES OF DEVELOPMENT **Winter/Spring 2022**

Date	Topic	Lecturer
1/14	Organizational Meeting	*Patrick Seale*
1/18	IRM Symposium (No Class)	
1/20	Cell lineage and fate maps; Introduction to genetics	*Bushra Raj*
1/21	Body plan formation: Gastrulation, germ layer formation and morphogenesis	*Peter Klein*
1/25	Morphogens in patterning	*Joe Zinski*
1/27	Induction of the primary germ layers	*Dan Kessler*
1/28	Discussion-1	
2/1	Establishment of the AP and DV axes in Drosophila	*Shawn Little*
2/3	Creating periodic patterns	*Shawn Little*
2/4	Discussion-2	
2/8	Establishing neuronal identity: Cilia and Shh signaling	*Doug Epstein*
2/10	Left-right patterning	*Dan Kessler*
2/11	Discussion-3	
2/15	Notch signaling/lateral inhibition	*Meera Sundaram*
2/17	Tubulogenesis: insights from C. elegans	*Meera Sundaram*
2/18	Discussion-4	
2/22	Scaling in development	*Matt Good*
2/24	Single Molecule Imaging, Nuclear Organization and Transcription	*Mustafa Mir*
2/25	Discussion-5 **(Send out Midterm exam)**	
3/1	Single cell tracking and cell specification events	*John Murray*
3/3	Vascular development and angiogenesis	*Arndt Siekmann*
3/4	No Discussion **(Midterm due)**	
3/7 - 3/11	*Spring Break*	

Date	Topic	Lecturer
3/15	Principles of stem cells in development	*Chris Lengner*
3/17	Stem cell niches in development	*Steve DiNardo*
3/18	Discussion-6	
3/22	Lung development and branching	*Jarod Zepp*
3/24	Lineage reprogramming in development	*Ken Zaret*
3/25	Discussion-7	
3/29	Circadian regulation of tissue homeostasis and maturation	*Juan Alvarez*
3/31	Cytoskeleton, cell shape and embryogenesis	*Nicolas Plachta*
4/1	Discussion-8	
4/5	Adipose tissue development	*Patrick Seale*
4/7	Hematopoietic stem cell formation and renewal	*Nancy Speck*
4/8	Discussion-9 **(N&V articles due)**	
4/12	TBD	
4/14	Imaging stem cell dynamics	*Pantelis Rompolas*
4/15	Discussion-10	
4/19	Skeletal development and mechanical cues	*Joel Boerckel*
4/21	Mechanosensing in cell fate and differentiation	*Alex Hughes*
4/22	Discussion-11 **(Send out Final exam)**	
4/26	X chromosome inactivation in development and disease	*Monserrat Anguera*
4/28	Metabolic regulation of development	*Patrick Seale*
4/29	Discussion-12	
5/3	Evo-Devo	*Steve DiNardo*
5/5	Regeneration	*Faye Mourkioti*
5/6	Discussion-13 **(Final Exam due)**	

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Class Schedule:
Lectures-1:45-3:15 on Tuesday and Thursday
Discussions-Friday 1:45-2:45

Discussions:
Each week one research article will be assigned for mandatory reading. One student will present the article to the rest of the class and lead the discussion.

News & Views Paper:
Students **not** doing a presentation will write a **"News & Views"** article for one of the selected discussion papers. The "News & Views" should put the paper in the context of its field, highlighting the research advance, and should not simply be a summary of the paper. It is a viewpoint, so personal opinions can be included, including your views regarding significance and weaknesses/caveats.

Discussion Boards:
A discussion board will be available on Canvas for each assigned paper (active for one-week Fri-Fri). Non-presenting students should post at least one comment per paper. You can choose a figure from the paper to explain in your own words, comment on the significance of a particular result, raise questions about a method, etc.

Grading:
1. Discussion presentation or N&V article (30)
2. Participation and attendance (30)
    - Discussion boards in Canvas
    - Participation during lectures and discussions (engagement in class, asking questions, contributing to discussions)
3. Midterm and Final take home exams (20 each, total 40)

Course Website:
Our class site on Canvas (canvas.upenn.edu) includes the course schedule, syllabus, faculty contact information, discussion papers for download, discussion board.