MCB231 Spring 2014

Lecture: Tu Th 11-12:30 2011 VLSB; Discussion: F, 12-1 101Wheeler

Instructors: Nipam Patel and David Weisblat with guest lecturers Gian Garriga, John Gerhart, Iswar Hariharan, Richard Harland, Lin He, Dirk Hockemeyer, Dan Rokhsar and Fred Wilt

Overview: With advanced courses in any topic, it becomes impossible to cover field in breadth, and the subject matter to be covered is dictated largley by the interests and expertise of the instructors. This is particularly the case for 'derivative' fields such as developmental biology. As developmental biologists, we are concerned 1) with the ways in which the canonical processes elucidated by cell biologists, molecular biologists and geneticists are tweaked and orchestrated to give rise to representatives of any given species and 2) with understanding how developmental mechanisms are further modified during evolution to generate a diverse range of body plans across species.

In MCB231, principles of animal development will be set forth from the classical and recent experimental analyses of induction, localization, patterning mutants, axis formation, regional gene expression, and cell interactions. Early development of selected vertebrates and invertebrates will be examined, and emerging topics in microRNA and stem cell biology will be highlighted. A weekly discussion section with readings from the research literature is required.

There is no required text. Recommended for review or background:
Slack, Essential Developmental Biology (3rd edition)
Gilbert, Developmental Biology (current edition is 9th; 6th edition is available online at www.ncbi.nlm.nih.gov/books)

Lectures: (schedule is included below)

Discussions: Each discussion section will consist of 2-3 students presenting 1-2 assigned research articles relevant to the concurrent lectures. At our first meeting, we will choose presentation dates and briefly discuss how to give an effective presentation. The discussion papers will be assigned as the course progresses and will typically be assigned at least one week prior to discussion.

Discussion Guidelines: You should present a critical evaluation of the paper, as in a 290 seminar (which most of you haven't taken yet!). Although the entire class is esxpected to have read the paper prior to discussion, you should treat your presentation as though we have not. As you prepare your presentation, it will probably become clear that you need to read additional papers (for background knowledge or to clarify previous work that the paper is based on) – you are expected to do this additional reading.

Your presentation should be organized as follows:

1. Background: put the paper in context.
2. Statement of the main points and claims of the paper.

3. Detailed consideration of the methods and data: usually this takes the form of going through the figures, discussing each not in general terms but pointing out salient features ("if you compare lane A and G of the figure you see that....")
4. Discussion of whether the work is convincing, how well presented it was, how clear, whether the conclusions are justified, what more you would have liked to see, how this fits with present day notions. Was the work important or overblown?

The whole presentation, including discussion, should take about 30-45 minutes so that the whole section should take an hour, depending upon the number of papers presented. **Members of the class are expected to participate in the discussion.** Powerpoint presentations are standard to present background and data, but you are encouraged to make use of the blackboard during the discussion.

Grading: Grades will be assigned on the basis of your **presentation**(s) **and participation** in Discussion.

MCB231 Spring 2014 Schedule

1	Tu	Jan	21	DW	Introduction: thinking about development
2	Th	Jan	23	NP	Introduction: thinking about development
	F	Jan	24		*Discussion:*
3	Tu	Jan	28	NP	Genetic approaches
4	Th	Jan	30	NP	Drosophila pattern formation
	F	Jan	31		*Discussion:*
5	Tu	Feb	4	NP	Drosophila pattern formation
6	Th	Feb	6	NP	Hox genes
	F	Feb	7		*Discussion:*
7	Tu	Feb	11	RH	Amphibian development
8	Th	Feb	13	RH	Symmetry breaking & mesoderm induction
	F	Feb	14		*Discussion:*
9	Tu	Feb	18	DW	Evolutionary relationships
10	Th	Feb	20	DW	Evolutionary relationships
	F	Feb	21		*Discussion:*
11	Tu	Feb	25	DW	Spiralian development
12	Th	Feb	27	DW	Spiralian development
	F	Feb	28		*Discussion:*
13	Tu	Mar	4	NP	Hox gene evolution
14	Th	Mar	6	NP	Hox gene evolution
	F	Mar	7		*Discussion:*
15	Tu	Mar	11	GG	Asymmetric cell division
16	Th	Mar	13	GG	Asymmetric cell division
	F	Mar	14		*Discussion:*
17	Tu	Mar	18	DW	Spiralian development
18	Th	Mar	20	DW	Spiralian development
	W	Mar	21		*Discussion:*
					Spring break Mar 24-28

19	Tu	Apr	1	DW	Neural tube patterning
20	Th	Apr	3	IH	Regeneration
	F	Apr	4		*Discussion:*
21	Tu	Apr	8	JG	Hemichordates and deuterostome evolution
22	Th	Apr	10	FW	Urchin development
	F	Apr	11		*Discussion:*
23	Tu	Apr	15	NP	Wing Development in Insects
24	Th	Apr	17	NP	WingLimb Development in Vertebrates
	F	Apr	18		*Discussion:*
25	Tu	Apr	22	DR	Population genetics and evolution
26	Th	Apr	24	CM	Stem Cells Sticklebacks: Dev Gen of Vert Evol
	F	Apr	25		*Discussion:*
27	Tu	Apr	29	LH	Early Mouse and Stem Cells
28	Th	May	1	DH	Stem Cells
	F	May	2		*Discussion:*