

BI 117: DEVELOPMENTAL BIOLOGY

CLASS WEBSITE: <http://www.its.caltech.edu/~bi117/>

Professor: Professor C. Chace Tydell, e-mail, chacetyd@caltech.edu

Class Hours: 1:00 – 2:20 p.m., Broad 100 (Rock Auditorium) Tuesdays and Thursdays

Dr. Tydell's Office Hours: By appointment

Recitation Sections: Mondays or Tuesdays 7-8pm, Broad 100.

Note: Recitation sections cover important materials including much that will be tested. They also provide information about exams and assignments. Attendance is strongly advised and the intelligent course of action.

Teaching Assistants:

Celia Shiau (ceshiau@caltech.edu)

Cory Tobin (ctobin@caltech.edu)

Jane Khudyakov (janek@caltech.edu)

Iliia Shadrin (ishadrin@caltech.edu)

TA's will hold office hours the weeks they are in charge of the weekly assignment.

Grading: 30% Weekly Papers/Problem Sets. 30% Midterm. 40% Final.

Required Text: Scott Gilbert "Developmental Biology", 8th edition

Recommended Text: Alberts' Molecular Biology of the Cell

Also a good reference: Wolpert's "Principles of Development"

SCHEDULE OF TOPICS

Lecture 1 – Tuesday Jan 8, 2008

OVERVIEW OF EVENTS IN DEVELOPMENT AND FERTILIZATION

Hand out: Paper #1, Guide to Writing Papers, Syllabus

Reading: Gilbert, Chapter 1,2,7

Lecture 2 – Thursday Jan 10, 2008

RELATIONSHIP BETWEEN DEVELOPMENT AND EVOLUTION – TATJANA SAUKA-SPENGLER, PHD

Reading: Gilbert, Chapter 22

Lecture 3 – Tuesday Jan 15, 2008

FERTILIZATION AND CLEAVAGE

Hand out: Problem set #1

Reading: Selections from Gilbert, Chapter 7, 8 – 11
(selected parts concerning cleavage)

Due: Paper #1

Lecture 4 – Thursday Jan 17, 2008

SEA URCHIN GASTRULATION

Reading: Selections from Gilbert, Chapter 8 – 11
(check in "Contents")

Lecture 5 – Tuesday Jan 22, 2008

VERTEBRATE GASTRULATION

Hand out: Problem set #2

Reading: Gilbert, Chapter 6, 10

Due: Problem set #1

Lecture 6 – Thursday Jan 24, 2008

NEURULATION AND NERVOUS SYSTEM FORMATION

Reading: Gilbert, Chapter 10-12

Lecture 7 – Tuesday Jan 29, 2008

CELL SIGNALING AND TRANSCRIPTIONAL REGULATION

Reading: Gilbert, Chapters 5, 6

Due: Problem set #2

Lecture 8 – Thursday Jan 31, 2008

EARLY DROSOPHILA DEVELOPMENT

Reading: Gilbert, Chapter 8,9

Alberts, Molecular Biology of the Cell: 1067-1076

Lecture 9 – Tuesday, Feb 5, 2008

HOX GENES IN FLIES AND MAMMALS

Reading: Gilbert, Chapter 11

Lecture 10 – Thursday Feb 7, 2008- **In-Class Midterm**

Lecture 11 – Tuesday Feb 12, 2008

LINEAGE DETERMINATION AND INDUCTIVE INTERACTIONS IN THE NEMATODE

Reading: Gilbert, Chapter 8

Alberts, Molecular Biology of the Cell: 1067-1076

Handout: Paper #2

Lecture 12 – Thursday Feb 14, 2008

NEURAL CREST - MARIANNE BRONNER-FRASER, PHD

Reading: Gilbert, Chapter 13

Lecture 13 – Tuesday Feb 19, 2008

EYE DEVELOPMENT - PETER LWIGALE, PHD

Reading: Gilbert, Chapter 12

Hand out: Paper #3

Due: Paper #2

Lecture 14 – Thursday Feb 21, 2008

LIMB PATTERNING

Reading: Chapters 14, 16, 18

Lecture 15 – Tuesday Feb 26, 2008

BONE AND CARTILAGE DEVELOPMENT

Handout: Problem set #3

Reading: Chapters 14, 16, 18

Due: Paper #3

Lecture 16 – Thursday Feb 28, 2008

HEART DEVELOPMENT – TATIANA HOCHGREB, PHD

Reading: Gilbert, Chapter 15

Lecture 17 – Tuesday March 4, 2008

STEM CELLS

Handout: Paper #4

Reading: Gilbert, Chapter 21

Due: Problem set #3

Lecture 18 – Thursday March 6, 2008

HEMATOPOIESIS

Reading: TBA

Lecture 19 – Tuesday March 11, 2008

DEVELOPMENT OF IMMUNE SYSTEM

Reading: TBA

Due: Paper #4

Take Home **FINAL EXAM**

Pick up March 11 after 3pm, Due by 11 am March 13

Weekly REQUIREMENT – Papers or Problem Sets

Due on most Tuesdays. See schedule above.

1 Page Paper on Scientific Article Pertinent to Lectures of that Week

--Papers assigned by TAs

--Give Synopsis and Critique

--Limit one page (typed)

General format of paper reviews (see paper review guidelines handout for details).

- I. Background and rationale of experiments.
- II. Interpretation of results.
- III. Propose the next logical experiment(s) you would do if working in this area.

COLLABORATION POLICY – Study groups prior to exams are acceptable.

Absolutely **NO** collaboration on papers, problem sets, midterm or final.

Concepts presented in papers and problem sets can be *discussed* but paper reviews and problem set answers must be derived autonomously and also written independently.

Violation of this policy is a violation of the HONOR CODE.

Extension Policy:

PROBLEM SETS/PAPERS: ONLY for medical reasons with physician's note.

Each day late drops grade 10%. 1 week maximum extension.

MIDTERM/FINAL: ONLY for medical reasons with physician's note.