BI 117: DEVELOPMENTAL BIOLOGY

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

Professor: Professors Marianne Bronner (mbronner@caltech.edu), Magdalena Zernicka-Goetz (mz205@cam.ac.uk) and Staff,
Class Hours: 1:00 – 2:20 p.m., Tuesdays and Thursdays
Recitation Sections: Mondays 7-8pm
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:

Fayth Tan (fhtan@caltech.edu) Hugo Urrutia (hurrutia@caltech.edu)
Hannah Ryon (hryon@caltech.edu) Zoe Beatty (zbeatty@caltech.edu)

TA's will hold office hours the weeks they are in charge of the weekly assignment. Time: Monday 8-9pm.

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

Required Text: Scott Gilbert "Developmental Biology", 11th edition

Recitations: Mondays, 7pm

SCHEDULE OF TOPICS

Lecture 1—Tuesday Jan 5, 2021
OVERVIEW OF EVENTS IN DEVELOPMENT &
HOW TO REVIEW PAPERS & TECHNIQUES IN DEVELOPMENTAL BIOLOGY
Reading: Gilbert, Chapter 1
Distribute: Paper #1, Syllabus

Lecture 2— Thursday Jan 7, 2021
BRONNER--FERTILIZATION AND CLEAVAGE
Reading: Gilbert, Chapter 4&5

Lecture 3—Tuesday Jan 12, 2021
ZERNICKA-GOETZ--TRANSITION FROM TOTIPOTENCY TO DIFFERENTIATION
Distribute: Paper #2
Due: Paper #1

Lecture 4— Thursday Jan 14, 2021
BRONNER--GASTRULATION
Reading: Gilbert, Chapter 7&8

Lecture 5—Tuesday Jan 19, 2021
ZERNICKA-GOETZ—MODELS AND VIEWS OF DEVELOPMENT
Reading: Gilbert, Chapter 6
Distribute: Problem Set #1
Due: Paper #2

Lecture 6—Thursday Jan 21, 2021
BRONNER--MESODERM INDUCTION

Reading: Gilbert, Chapter 5

Lecture 7—Tuesday Jan 26, 2021
ZERNICKA-GOETZ—DEVELOPMENTAL PLASTICITY AND SYMMETRY BREAKING
Reading: Gilbert,
Distribute: Problem Set #2
Due: Problem Set #1

Lecture 8— Thursday Jan 28, 2021
BRONNER--NEURAL INDUCTION
Reading: Gilbert, Chapter 9

Lecture 9—Tuesday, Feb 2, 2021
BRONNER--NEURULATION AND NERVOUS SYSTEM FORMATION
Reading: Gilbert, Chapter 9
Due: Problem Set #2

Lecture 10—Thursday Feb 4, 2021
ZERNICKA-GOETZ—HUMAN EMBRYO DEVELOPMENT
Reading: Gilbert,

Lecture 11—Tuesday Feb 9, 2021---– **Midterm (usually in class but have this as review ?)**

Lecture 12—Thursday Feb 11, 2021
BRONNER--NEURAL CREST
Reading: Gilbert, Chapter 10
Distribute: Paper #3

Lecture 13—Tuesday Feb 16, 2021
ZERNICKA-GOETZ—EMBRYONIC STEM CELLS AND SYNTHETIC EMBRYOS
Reading: Gilbert,
Distribute: Problem Set #3

Lecture 14—Thursday Feb 18, 2021
BRONNER--MESODERM FORMATION AND DIFFERENTIATION
Reading: Gilbert, Chapter 11
Due: Paper #3

Lecture 15—Tuesday Feb 23, 2021
ZERNICKA-GOETZ--TRANSGENERATIONAL INHERITANCE
Reading: Gilbert,
Distribute: Paper #4
Due: Problem Set #3

Lecture 16—Thursday Feb 25, 2021
BRONNER--LIMB PATTERNING
Reading: Chapter 13

Lecture 17—Tuesday March 2, 2021
BRONNER--HOX GENES IN FLIES AND MAMMALS
Reading: Gilbert, parts of Chapter 6&8

Distribute: Problem Set #4
Due: Paper #4

Lecture 18—Thursday March 4, 2021
ZERNICKA-GOETZ—ADULT STEM CELLS & REGENERATION
Reading: Gilbert, Chapter 15&17

Lecture 19—Tuesday March 10, 2021
BRONNER--DEVELOPMENT AND EVOLUTION
Reading: Gilbert, Chapter 19
Due: Problem Set #4

Take Home **FINAL EXAM**
Pick up March 11 after 3p.m., Due by 11am March 18th

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.

Extra Credit:
ATTEND A DEVELOPMENTAL BIOLOGY SEMINAR IN THE DIVISION OF BIOLOGY AND WRITE A ONE PAGE SYNOPSIS. EQUIVLANENT TO ONE PAPER REVIEW.