INSC/CAMB 597 - Developmental Neurobiology 2011

Wednesday and Friday 2:00 – 3:30; Room 1105, BRB II/III

Mandatory Organizational Meeting: January 19th, 2:00PM in 1105 BRB II/III

Course Director: Greg Bashaw (gbashaw@mail.med.upenn.edu)

General Description: The goal of this course is to examine the principles underlying nervous system development. This is not a survey course in Developmental Neurobiology. Rather, the course will focus on selected topics, for which we will discuss the genetic, molecular and cellular strategies employed to study these problems in different model organisms.

Spring 2011 Topics: Generation of Neuronal Diversity; Cell Migration in the Cortex; Specification of Spinal Cord Neurons; Axon Guidance at the Midline; Tiling and Branching; Synapse Formation; Wiring the Olfactory System.

Textbooks: No specific textbooks are required. The following texts are useful resources. Developmental Biology by Scott Gilbert; Development of the Nervous System by Sanes, Reh, and Harris; and Molecular and Cellular Approaches to Neural Development edited by Cowan, Jessell, and Zipursky.

Format: Each class is 1.5 hours in length. During the first hour, an assigned paper will be discussed in detail. During the last 20-30 minutes, faculty will introduce methods, concepts, and background information pertinent to the paper that will be discussed at the following meeting.

While faculty will provide guidance during the discussion, students will be primarily responsible for presenting and discussing the papers. So that every participant can contribute thoughtfully to the discussion, you should come prepared to answer these questions:
1) What was the main finding of the paper (3-4 sentences)?
2) What experiment produces the authors’ most convincing data?
3) What experiment is the least convincing or weakest? Why?
4) What hypothesis derived from this paper would you set out to test next, and how (3-4 sentences)?
You will submit written answers to these questions at the beginning of each class- so do not try to read the paper just before class.

**Grading:** A) Participation in paper presentation and discussion: 50%. During the semester, you will receive feedback on your participation by e-mail. B) Two 2-page research type proposals, 25% each. Each proposal will be on a topic of your choice that has already been discussed in the course. Guidelines on the proposal as well as an example will be posted on the Blackboard.

**Course Web page:** This course will use Penn’s “Electronic Blackboard” web software at: [https://courseweb.upenn.edu/](https://courseweb.upenn.edu/). All materials and updates will be posted here. This is a secure site requiring your PennKey. A guide on how to get up and running with the Blackboard can be found at [http://www.library.upenn.edu/courseware/usingbb_students.html](http://www.library.upenn.edu/courseware/usingbb_students.html). If you have trouble with access, please contact the support staff at bb-support@pobox.upenn.edu
# Syllabus: Developmental Neurobiology (Spring 2011)

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<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Faculty</th>
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| Wed 1/19 2:00PM | ORGANIZATIONAL MEETING  
Introduction to first paper | Greg Bashaw  
gbashaw@mail.med.upenn.edu |
| Fri 1/21 | SPECIFICATION OF NEURAL CELL TYPES I  
Generation of Neuronal Diversity | Greg Bashaw |
| Wed 1/26 | SPECIFICATION OF NEURAL CELL TYPES I  
Generation of Neuronal Diversity | Greg Bashaw |
| Fri 1/28 | SPECIFICATION OF NEURAL CELL TYPES I  
Generation of Neuronal Diversity | Greg Bashaw |
| Wed 2/2 | CELL MIGRATION I  
Cell Migration in the Cortex | Jeffrey Golden  
goldenj@mail.med.upenn.edu |
| Fri 2/4 | SPECIFICATION OF NEURAL CELL TYPES II  
Specification Of Spinal Cord Neurons and Motor Connectivity | Michael Granato  
granatom@mail.med.upenn.edu |
| Wed 2/9 | SPECIFICATION OF NEURAL CELL TYPES II  
Specification Of Spinal Cord Neurons and Motor Connectivity | Michael Granato  
granatom@mail.med.upenn.edu |
| Fri 2/11 | SPECIFICATION OF NEURAL CELL TYPES II  
Specification Of Spinal Cord Neurons and Motor Connectivity | Michael Granato  
granatom@mail.med.upenn.edu |
| Wed 2/16 | SPECIFICATION OF NEURAL CELL TYPES II  
Specification Of Spinal Cord Neurons and Motor Connectivity | Michael Granato  
granatom@mail.med.upenn.edu |
| Fri 2/18 | SPECIFICATION OF NEURAL CELL TYPES II  
Specification Of Spinal Cord Neurons and Motor Connectivity | Michael Granato  
granatom@mail.med.upenn.edu |
| Wed 2/23 | SPECIFICATION OF NEURAL CELL TYPES II  
Specification Of Spinal Cord Neurons and Motor Connectivity | Michael Granato  
granatom@mail.med.upenn.edu |
| Fri 2/25 | SPECIFICATION OF NEURAL CELL TYPES II  
Specification Of Spinal Cord Neurons and Motor Connectivity | Michael Granato  
granatom@mail.med.upenn.edu |
| Wed 3/2 | CELL MIGRATION II: Axon Guidance At The CNS Midline | Greg Bashaw |
| Fri 3/4 | CELL MIGRATION II: Axon Guidance At The CNS Midline | Greg Bashaw |
| Wed 3/9 | CELL MIGRATION II: Axon Guidance At The CNS Midline | Greg Bashaw |
| Fri 3/11 | CELL MIGRATION II: Axon Guidance At The CNS Midline | Greg Bashaw |
| Wed 3/16 | PATTERNING NEURONAL CONNECTIONS: Tiling and Branching | Michael Granato |
| Fri 3/18 | PATTERNING NEURONAL CONNECTIONS: Tiling and Branching | Michael Granato |
| Wed 3/23 | PATTERNING NEURONAL CONNECTIONS: Tiling and Branching | Michael Granato |
| SPRING BREAK | | |
| Wed 4/6 | SYNAPSE FORMATION | Matthew Dalva  
dalva@mail.med.upenn.edu |
| Fri 4/8 | SYNAPSE FORMATION | Matthew Dalva  
dalva@mail.med.upenn.edu |
| Wed 4/13 | SYNAPSE FORMATION | Matthew Dalva  
dalva@mail.med.upenn.edu |
| Fri 4/15 | SYNAPSE FORMATION | Matthew Dalva  
dalva@mail.med.upenn.edu |
| Wed 4/20 | WIRING THE OLFATORY SYSTEM | Jonathan Raper  
raperj@mail.med.upenn.edu |
| Fri 4/22 | WIRING THE OLFATORY SYSTEM | Jonathan Raper  
raperj@mail.med.upenn.edu |
| Wed 4/27 | WIRING THE OLFATORY SYSTEM | Jonathan Raper  
raperj@mail.med.upenn.edu |
| Fri 4/29 | WIRING THE OLFATORY SYSTEM | Jonathan Raper  
raperj@mail.med.upenn.edu |
| Wed 5/4 | WRAP-UP  
Student Feedback | Greg Bashaw |

1st written proposal due March 7th

2nd written proposal due May 9th