Principles of Neuroscience I – Organization and Development of the Nervous System (GMS6021 – 2 Credits)
Spring 2013

Directors:
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Dr. Sue Semple-Rowland (rowland@mbi.ufl.edu) (office: 352-392-3598)

Course Description
This five-week course will cover the basic principles underlying the development and organization of the nervous system. This course is the first in a series of three core course modules that are required for all IDP Neuroscience students. The objective of the course is to provide students with an overview of the fundamental processes underlying brain development. Questions that will be discussed include: How and where does the nervous system originate? How are the cell types that constitute the nervous system generated? How do progenitors know which cell type to become? How do progenitors find and reach their appropriate location in the brain? How do maturing neurons form synaptic connections? What are the limits of plasticity in the brain?

The primary teaching format will be lectures followed at the end of the week by student-led discussions of material related to the topics covered that week. By understanding how the nervous system develops, students will be prepared for the 2nd, 3rd, and 4th modules of this course that will focus on signaling in the nervous system, neuropharmacology, and neural integration and control of behavior, respectively.

Textbook (Strongly Recommended)

Student Evaluation
Participation in weekly discussions/problem sets: 30%, midterm exam: 30%, final exam: 40%
LECTURE SCHEDULE:
T, Th (9-11:00am) F (9-10am) Location: MBI Building, Rm L1-101

LECTURE TOPICS

WEEK 1
Jan 8th    Neural Development: Historical framework – Overview of course and research problem exercises
           *(Drs. Matt Sarkisian and Sue Semple-Rowland)*
Jan 10th   Neural Induction *(Dr. Pedro Fernandez-Funez)* – chapter 1
Jan 11th   Neural Patterning *(Dr. Christy Larkins)* – chapter 2

WEEK 2
Jan 15th   Hindbrain/Spinal Cord Development *(Dr. Paul Reier)* – chapters 2, 4
Jan 17th   Regulation of Neural Survival and Death -1hr *(Dr. Marieta Heaton)* – chapter 7
Jan 18th   Student led discussion of research problem – neural induction/patterning/cell survival *(Drs. Sarkisian and Semple-Rowland)*

WEEK 3
Jan 22th   Neurogenesi and Neuronal Migration *(Dr. Matt Sarkisian)* – chapter 3
Jan 24th   Neural Differentiation and Regionalization of the Brain *(Dr. Matt Sarkisian)* – chapter 2, 4
Jan 25th   **MIDTERM** exam (material thru Jan 22) and take-home research problem – neurogenesis, migration, differentiation *(Drs. Sarkisian and Rowland)*

WEEK 4
Jan 29th   Axon Growth and Pathfinding *(Dr. Michael Lane)* – chapters 5, 6
Jan 31st   Synaptogenesis *(Dr. Lucia Notterpek)* – chapter 8
Feb 1st    Student led discussion of research problem – axon growth and pathfinding/synaptogenesis *(Drs. Sarkisian and Semple-Rowland)*

WEEK 5
Feb 5th    Neural Plasticity 1 – Cellular Plasticity *(Dr. Jason Coleman)* – chapter 9
Feb 7th    Neural Plasticity 2 – Systems Plasticity *(Dr. Sue Semple-Rowland)* – chapters 9, 10
Feb 8th    **FINAL** exam + problem (material Jan 24th- Feb 7th)
           TAKE HOME FINAL PROBLEM (due Feb 11th by 5pm)
About the Lecturers:

**Dr. Matt Sarkisian** is Assistant Professor in the Dept of Neuroscience (Email: msarkisian@ufl.edu) Phone: 392-6850

**Dr. Sue Semple-Rowland** is Professor in the Dept of Neuroscience (Email: rowland@mbi.ufl.edu) Phone: 294-0036

**Dr. Pedro Fernandez-Funez** is Assistant Professor in the Dept of Neurology (Email: pedro.fernandez@neurology.ufl.edu) Phone: 273-5550

**Dr. Christy Larkins** is a postdoctoral fellow in the lab or Dr. Marty Cohn in the Dept of Molecular Genetics & Microbiology (Email: christinelarkins@ufl.edu) Phone: 273-8101

**Dr. Paul Reier** is Professor in the Dept of Neuroscience (Email: reier@ufl.edu) Phone: 392-8696

**Dr. Marieta Heaton** is Professor in the Dept of Neuroscience, and is co-director of the course (Email: heaton@mbi.ufl.edu) Phone: 392-1185

**Dr. Michael Lane** is Assistant Professor in the Dept of Neuroscience (Email: malane@ufl.edu) Phone: 359-3429

**Dr. Lucia Notterpek** is Professor and Chair of the Dept of Neuroscience (Email: notterpek@mbi.ufl.edu) Phone: 294-5373

**Dr. Jason Coleman** is Assistant Professor in the Dept of Pediatrics (Email: jcoleman@ufl.edu) Phone: 294-5674