CAMB713: Neuroepigenetics

TIME: 2 hours / week Thursdays 1-3pm

LOCATION: Small – medium seminar room in CRB or SCTR (up to 20 attendants)

COURSE DIRECTORS:
Zhaolan (Joe) Zhou 215.746.5025 zhaolan@pennmedicine.upenn.edu
Elizabeth Heller 215.573.7038 eheller@pennmedicine.upenn.edu
Hao Wu 215.573.9360 haowu2@pennmedicine.upenn.edu

GOALS: This is a course intended to bring students up to date concerning our understanding of Neural Epigenetics. It is based on assigned topics and readings covering a variety of experimental systems and concepts in the field of Neuroepigenetics, formal presentations by individual students, critical evaluation of primary data, and in-depth discussion of potential issues and future directions, with goals to:

1) Review basic concepts of epigenetics in the context of neuroscience
2) Learn to critically evaluate a topic (not a single paper) and set the premise
3) Improve experimental design and enhance rigor and reproducibility
4) Catch up with the most recent development in neuroepigenetics
5) Develop professional presentation skills - be a story teller

FORMAT: Each week will focus on a specific topic of Neuroepigenetics via a “seminar” style presentation by a class member with the following expectations:

Consultation with preceptor prior to presentation
Introduction (~20 min):
   Context of topic in the field
   Historic perspectives of the topic
   Current understandings

Primary data (~40 min):
   Questions of interest
   Design of experiments
   Interpretation of data

Discussion (~20 min):
   Issues/challenges
   Proposed future experiments
   Future directions in a big picture

Engage class for discussion and participation, and manage the presentation in 2 hours

One or more course directors and a guest preceptor will be present each week to facilitate discussions

EVALUATION:
1) Read assigned paper and relevant background/developments broadly
2) Consultation with faculty preceptor
3) Peer evaluation and faculty evaluation
4) Enforcement – grading policy: 50% class participation
   50% presentation

COURSE UNIT VALUE: 1 unit
ENROLLMENT LIMITS: 15 (maximum)
PREREQUISITES: BIOM555 or permission by course directors
List of Topics of Interest

The molecular basis of epigenetics (An overview by course directors)
Cutting-edge technologies in studying neuroepigenetics
Neurogenesis and adult neurogenesis
Neuronal differentiation and cellular diversity
Synaptogenesis and synaptic plasticity
Neuronal activity-dependent gene regulation
Epigenetic mechanisms in learning and memory
Epigenetic mechanisms in the context of neurodevelopmental disorders
Epigenetic mechanisms in the context of neuropsychiatric disorders
Epigenetic mechanisms in the context of aging and neurodegeneration
Imprinting in the central nervous system
Transgenerational inheritance in the context of stress
Transgenerational inheritance in the context of addiction

List of Faculty Preceptors (*course directors)

Marisa Bartolomei      Cell and Dev. Biology 215.898.9063 bartolom@pennmedicine.upenn.edu
                      9-123 Smilow
Shelley Berger        Cell and Dev. Biology 215.746.3106 bergers@pennmedicine.upenn.edu
                      9-125 Smilow
Nancy Bonini           Biology 204G Lynch 215.573.9267 nbonini@sas.upenn.edu
Erica Korb            Genetics 9-133 Smilow 215.573.5705 ekorb@pennmedicine.upenn.edu
*Liz Heller           Pharmacology 10-115 Smilow 215.573.7038 eheller@pennmedicine.upenn.edu
Jennifer Phillips-     Bioengineering 215.898.4121 jcremins@seas.upenn.edu
Cremins
Chris Pierce          Psychiatry 2223 TRL 215.573.7605 rcpierce@upenn.edu
Hongjun Song          Neuroscience 105 CRB 215.573.2449 shongjun@pennmedicine.upenn.edu
*Hao Wu               Genetics 547A CRB 215.573.9360 haowu2@pennmedicine.upenn.edu
*Zhaolan (Joe) Zhou   Genetics 452A CRB 215.746.5025 zhaolan@pennmedicine.upenn.edu