CAMB713: Neuroepigenetics

TIME: Thursdays 1:45-3:45
9/2 - 12/9

LOCATION: Stellar Chance 204

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 neuroepigenetics. It is based on assigned topics and readings covering a variety of experimental systems and concepts in the field, formal presentations by individual students, critical evaluation of primary data, and in-depth discussion of potential issues and future directions.

The goals of each seminar-style session are:

1) Review basic concepts of epigenetics in the context of neuroscience
2) Learn to critically evaluate a topic (not a single paper) and rigor of prior research
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 storyteller

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

Oral Presentation with Slides

Introduction (~10 min):	Context of topic in the field
	Historic perspectives of the topic
	Current understandings
Primary data (~30 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) Knowledge of assigned paper and broadly relevant background/developments
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 director

Date	Directors (Min. 2)	Preceptor	Topic
9/2	Joe, Liz, Hao	Course Directors - Joe/Hao/Liz	Organizational Meeting
9/9	Joe, Liz, Hao	Course Directors - Joe	The essence of neuroepigenetics: DNA modification and related methods
9/16	Joe, Hao	Course Directors - Hao	3D genome/long non-coding RNA/Phase separation and related methods
9/23	Liz, Hao	Jennifer Cremins	3D genome and heterochromatin misfolding in fragile X
9/30	Liz, Joe	Erica Korb	Histone variants in neurodevelopmental disorders
10/7	Hao, Joe	Marisa Bartolomei	Imprinting in the brain and imprinting disorders
10/14	Liz, Joe	Colin Conine	Epigenetic inheritance and miRNAs
10/21	Joe, Hao	Richard Phillips	Epigenetic mechanisms driving central nervous system tumors
10/28	Liz, Joe	Joe Zhou	Epigenetic mechanisms underlying stress-related major depressive disorder
11/4	Liz, Joe	Naiara Akizu	Epigenetic mechanisms of neural development and diseases
11/11	Joe, Hao, Liz	Hongjun Song	Epitranscriptomics
11/18	Joe, Hao, Liz	Shelley Berger	TBD
11/25	Thanksgiving	No class	
12/2	Joe, Hao, Liz	Liz	Chromatin regulation of alternative splicing
12/9	Joe, Hao	Hao	Single-cell Genomics (transcriptome/epigenome) in Neuroscience

Additional information on class Google sheet:
https://docs.google.com/spreadsheets/d/1JkEbBcq-ASZS_9sh1j4dZ8rbKaS2Ff3SHsIoMp3H-fU/edit?usp=sharing