CAMB713: Neuroepigenetics

TIME: Thursdays 1-3pm 9/3 – 12/10 (organizational meeting 9/3, no class on 11/26)

LOCATION: Zoom (virtual)
https://pennmedicine.zoom.us/j/97654240270
Passcode: 039745

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 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 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 9-123 Smilow	215.898.9063	bartolom@pennmedicine.upenn.edu
Naiara Aquizu Lopez	5052 Colket Translational Research Building	215.590.2232	aquizun@email.chop.edu
Felice Elephant	Drexel	215.895.0220	fe22@drexel.edu
Peter Hamilton	VCU	804.628.3003	peter.hamilton@vcuhealth.org
*Liz Heller	Pharmacology 10-115 Smilow	215.573.7038	eheller@pennmedicine.upenn.edu
Erica Korb	Genetics 9-133 Smilow	215.573.5705	ekorb@pennmedicine.upenn.edu
Ian Maze	Mount Sinai	212.824.8979	ian.maze@mssm.edu
Hongjun Song	Neuroscience 105 CRB	215.573.2449	shongjun@pennmedicine.upenn.edu
*Hao Wu	Genetics 527 CRB	215.573.9360	haowu2@pennmedicine.upenn.edu
*Zhaolan (Joe) Zhou	Genetics 452A CRB	215.746.5025	zhaolan@pennmedicine.upenn.edu

List of Faculty Preceptors (*course directors**)**

Date	Presenter/Student	Preceptor	Topic
9/3	Organization meeting	Course Directors (Joe/Hao/Liz)	
9/10	Lecture 1	Course Directors (Joe)	The essence of neuroepigenetics: DNA modification
9/17	Lecture 2	Course Directors (Liz)	The essence of neuroepigenetics: Histone modification
9/24	Ryan Schwark	Course Directors (Hao)	MECP2 & neurodevelopmental disease
10/1	Kate Titus	Erica Korb	Histone variants in the brain
10/8	Marissa Maroni	Felice Elephant	Neuroepigenetics of AD in drosophila
10/15	Adrienne Jo	Naiara Aquizu Lopez	Neurodevelopmental disorders of histone lysine methylases
10/22	Katie Copley	Course Directors (Liz)	Epigenetics of addiction
10/29	Amanda Weiss	Ian Maze	Monoaminylation in brain
11/5	Elizabeth Mercado Ayon	Course Directors (Joe)	Epigenetic mechanisms underlying the effect of stress
11/12	Sarah Gagnon	Hongjun Song	Epi-transcriptomics in neural development
11/19	Rae Herman	Peter Hamilton	Transcriptional regulation in Brain
12/3	Vanessa Sanchez	Marisa Bartolomei	Genomic imprinting in brain
12/10	Sophia Villiere	Course Directors (Hao)	Single-cell multi-omics in mammalian motor cortex