CAMB/NGG713: Neuroepigenetics

TIME: Thursdays 1-3pm  9/7/23 – 12/07/23 (no class on 11/16 & 11/23)

LOCATION: CRB 302

COURSE DIRECTORS:
- Zhaolan (Joe) Zhou  215.746.5025  zhaolan@pennmedicine.upenn.edu
- Erica Korb  215.605.9759  ekorb@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 1) lectures on basic concepts of epigenetics and related methods by course directors, and 2) assigned literature 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 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 (~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 ~1.5 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 directors
List of Faculty Preceptors (*course directors)

<table>
<thead>
<tr>
<th>Date</th>
<th>Preceptor</th>
<th>Topic</th>
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<tr>
<td>9/7</td>
<td>Course Directors (Joe/Er Erica/Hao)</td>
<td>Organization meeting &amp; Lecture 1: 3D chromatin organization and neurogenomics methods</td>
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<tr>
<td>9/14</td>
<td>Course Directors (Erica)</td>
<td>Lecture 2: Histone modification</td>
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<td>9/21</td>
<td>Course Directors (Joe)</td>
<td>Lecture 3: DNA modification</td>
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<tr>
<td>9/28</td>
<td>Kahlilia Blanco</td>
<td>A signaling pathway for transcriptional regulation of sleep amount in mice</td>
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<td>10/5</td>
<td>Liz Heller</td>
<td>Chromatin mediated alternative splicing in brain</td>
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<td>10/12</td>
<td>Erica Korb</td>
<td>Histone variants, histone PTMs</td>
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<td>10/19</td>
<td>Yijing Su</td>
<td>Immediate and deferred epigenomic signatures of in vivo neuronal activation in mouse hippocampus</td>
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<td>10/26</td>
<td>Hao Wu</td>
<td>Single-cell Epigenomics</td>
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<td>11/2</td>
<td>Marisa Bartolomei</td>
<td>Genomic Imprinting in Brain</td>
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<td>11/9</td>
<td>Hongjue Song</td>
<td>Epitranscriptomic regulation of neurogenesis</td>
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<td>11/30</td>
<td>Shelley Berger</td>
<td>Metabolic-Epigenetic axis in learning and memory</td>
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<tr>
<td>12/07</td>
<td>Naiara Aquizu</td>
<td>Histone bivalency regulates the timing of cerebellar granule cell development</td>
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