Principles in Genetics & Epigenetics
Syllabus - Spring 2021
Online meeting, Tuesday/Thursday, 10:30 am - noon.

<table>
<thead>
<tr>
<th>Date, Day</th>
<th>Lecture Topic</th>
<th>Lecturer</th>
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</thead>
<tbody>
<tr>
<td>January 12, T</td>
<td>The structure of the genome</td>
<td>Sen</td>
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<tr>
<td>January 14, Th</td>
<td>Chromosomes and aneuploidy</td>
<td>Cole</td>
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<tr>
<td>January 19, T</td>
<td>Genetic screens</td>
<td>Mattox</td>
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<tr>
<td>January 21, Th</td>
<td>RNA interference</td>
<td>Arur</td>
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<tr>
<td>January 26, T</td>
<td>Transgenic animals</td>
<td>Behringer</td>
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<tr>
<td>January 28, Th</td>
<td>Conditional genetic manipulations</td>
<td>Wang</td>
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<tr>
<td>February 2, T</td>
<td>Molecular basis of disease phenotype-genotype</td>
<td>Hixson</td>
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<tr>
<td>February 4, Th</td>
<td>Next generation DNA sequencing</td>
<td>Fornage/Krahe</td>
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<tr>
<td>February 9, T</td>
<td>Current human genetic approaches to gene discovery for multifactorial disorders</td>
<td>Fornage</td>
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<tr>
<td>February 11, Th</td>
<td>Applications of genetic information to health outcomes in multifactorial disorders</td>
<td>Fornage</td>
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<tr>
<td>February 16, T</td>
<td>Medical genetics services &amp; clinical risk assessment</td>
<td>Singletary</td>
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<tr>
<td>February 18, Th</td>
<td>Genetic basis of cancer</td>
<td>Huff/Krahe</td>
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<tr>
<td>February 23, T</td>
<td>Case study: Cancer genetics</td>
<td>Huff/Krahe</td>
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<tr>
<td>February 25, Th</td>
<td>Functional validation of Variants in Disease Candidate Genes</td>
<td>Karras</td>
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<tr>
<td>March 2, T</td>
<td>RNA-Seq Workshop</td>
<td>Liu</td>
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<tr>
<td>March 4, Th</td>
<td>RNA-Seq Workshop</td>
<td>Liu</td>
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<tr>
<td>March 9, T</td>
<td>RNA-Seq Workshop</td>
<td>Liu</td>
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<tr>
<td>March 11, Th</td>
<td>RNA-Seq Workshop</td>
<td>Liu</td>
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<td>March 15-19</td>
<td>Spring Break – No class</td>
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<tr>
<td>March 23, T</td>
<td>Gene precision therapies and stem cell therapeutics</td>
<td>McDonnell</td>
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<td>March 25, Th</td>
<td>The microbiome in human disease</td>
<td>Hanis</td>
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<tr>
<td>March 30, T</td>
<td>Epigenetics &amp; expression of the genome</td>
<td>Cheng</td>
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<tr>
<td>April 1, Th</td>
<td>Epigenetics techniques: bench skills</td>
<td>Jain</td>
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<tr>
<td>April 6, T</td>
<td>Histone code (writers &amp; erasers)</td>
<td>Lee</td>
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<td>April 8, Th</td>
<td>Histone code (readers)</td>
<td>Bedford</td>
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<tr>
<td>April 13, T</td>
<td>DNA methylation</td>
<td>Huang</td>
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<td>April 15, Th</td>
<td>Imprinting &amp; X inactivation</td>
<td>Chen</td>
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<td>April 20, T</td>
<td>Histone variants</td>
<td>Bartholomew</td>
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<td>April 22, Th</td>
<td>ATP-dependent chromatin remodelers</td>
<td>Bartholomew</td>
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<td>April 27, T</td>
<td>Non-coding RNAs</td>
<td>Calin</td>
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<tr>
<td>April 29, Th</td>
<td>Epigenetics and cancer therapeutics</td>
<td>Santos</td>
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<tr>
<td>May 3-7</td>
<td>Final Exams</td>
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Course Description

The course is organized into three general sections: 1. Experimental Genetics, 2. Human Genetics, and 3. Epigenetics. There will also be a hands-on bioinformatics workshop to learn how to process and analyze RNA-seq data.

This course fulfills a requirement of the Genetics and Epigenetics Graduate Program.

RNA-Seq Workshop

This hands-on workshop will teach you how to process and analyze sequence data to assess and compare transcriptomes. You can use your own sequence data, use datasets in public repositories, or we will provide sequence datasets.
Course Directors

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