

## BIOM555 - REGULATION OF THE GENOME: SPRING 2019

### Lectures:

Austrian Auditorium, CRB: Tuesdays/Thursdays: 9:00 am – 10:30 am

**Small Group Discussions:** January 24 through April 26

**A: Thursdays 11am - 12pm** (Session 1: BRB 701 by Natoya; Session 2: BRB 801 by McKensie)

**B: Thursdays 3:30pm - 4:30pm** (Session 3: Stellar Chance 204 by Aoi; Session 4: Stellar Chance 104 (except for Apr. 19, in Stellar Chance 301 by Megan)

**C: Fridays 11am - 12pm** (Session 5: BRB 1413 BRB (except for Feb. 2 and 23, in Blockley 1311 by Blake; Session 6: Stellar Chance 204 (except for Feb.23 and Mar.16, in Stellar Chance 1001 by (TA))

### Course Director:

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### Teaching Assistants:

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### BGS Administrator:

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### **Section 1 – Genome Maintenance**

**January 17:** Course Introduction – Relevance to BGS students (Klaus Kaestner)

**January 22:** Regulation of DNA Replication (Paul Lieberman)

**January 24:** DNA Repair and Cell Cycle Checkpoints I (Roger Greenberg) ([Discussion problem set 1](#))

**January 29:** DNA Repair and Cell Cycle Checkpoints II (Roger Greenberg)

**January 31:** Telomere Function (Brad Johnson) ([Discussion of problem sets 2](#))

### **Section 2 – Transcription and Epigenomic Methods**

**February 5:** Design and interpretation of ChIP-Seq and ATAC-seq (Klaus Kaestner)

**February 7:** Design and interpretation of RNAseq, GROseq, and scRNAseq (Golnaz Vahedi)([Discussion 3](#))

**February 12:** Eukaryotic Gene Transcription 1 (Ken Zaret)

**February 14:** Eukaryotic Gene Transcription 2 (Ken Zaret) ([Discussion 4](#))

**February 19:** **EXAM 1, IN CLASS**

### **Section 3 – Chromatin Modifications**

**February 21:** Covalent DNA Modifications (Zhaolan (Joe) Zhou) ([Discussion 5](#))

**February 26:** Nucleosome Structure (Ben Black)

**February 28:** Genome Editing (Jorge Henao-Mejia) ([Discussion 6](#))

**March 5:** **Spring Break**

**March 7:** **Spring Break**

**March 12:** Histone and Chromatin I (Shelley Berger)

**March 14:** Histone and Chromatin II (Shelley Berger) ([Discussion 7](#))

## Section 4 – Chromatin Regulation

- March 19:** Chromatin regulation in the context of nuclear architecture (Maya Capelson)  
**March 21:** Chromatin regulation by the Polycomb pathway (Roberto Bonasio) ([Discussion 8](#))  
**March 26:** Chromatin-chromatin interactions (Gerd Blobel)  
**March 28:** Analysis of higher chromatin structure:3C, 4C, HiC (Robert Faryabi)  
**April 2:** Chromatin regulation in the context of Imprinting (Marisa Bartolomei)  
**April 4:** REVIEW SESSION FOR EXAM (TAs)

## Section 5 – Post-transcriptional Regulation

- April 9:** **Exam 2, IN CLASS**  
**April 11:** miRNAs/siRNAs (Zissimos Mourelatos) ([Discussion 9](#))  
**April 16:** Long non-coding RNAs (Montserrat Anguera)  
**April 18:** RNA editing (Tom Jongens) ([Discussion 10](#))  
**April 23:** RNA processing I (Kristen Lynch)  
**April 25:** RNA processing II (Kristen Lynch) ([Discussion 11](#))  
**April 30:** Translational Control and RNA Localization I (Peter Klein)  
**May 2:** Translational Control and RNA Localization II (Peter Klein) ([Discussion 12](#))  
**May 7:** REVIEW SESSION FOR EXAM (TAs)  
**May 9:** **EXAM 3, IN CLASS**

## General References for Review (Library/Web)

Molecular Biology of the Cell (Alberts et al.)

<http://www.ncbi.nlm.nih.gov/books/bv.fcgi?call=bv.View..ShowTOC&rid=mboc4.TOC&depth=10>

Molecular Cell Biology Lodish et al. (older editions are by Darnell et al.)

<http://www.ncbi.nlm.nih.gov/80/books/bv.fcgi?call=bv.View..ShowTOC&rid=mcb.TOC>

Genes VIII Benjamin Lewin

## **Lecturers: (Area code is 215 for all phone numbers)**

- Montserrat Anguera (898-0567: [anguera@vet.upenn.edu](mailto:anguera@vet.upenn.edu))  
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Ken Zaret (573-5813: [zaret@upenn.edu](mailto:zaret@upenn.edu))  
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**GRADES**

**3 EXAMS: 25% each**

**DISCUSSION SESSION (STUDENTS MUST CHOOSE ONE DISCUSSION SESSION AND ATTEND THAT SESSION EACH WEEK. ATTENDANCE AND PARTICIPATION REQUIRED): 25 %**