BIOM555 - REGULATION OF THE GENOME: SPRING 2020

Lectures: Austin Auditorium, CRB: Tuesdays and Thursdays: 9:00 am – 10:30 am; Thursday, January 16 through Thursday, May 7

Small Group Discussions: January 30 through April 30. Students choose one discussion session and attend that session each week. Attendance and participation are required.

A: Session 1: Thursday 11am ~ 12pm ~ Room 104 Stellar Chance (McKensie)
B: Session 2: Thursday 11am ~ 12pm ~ Room 204 Stellar Chance (Isabel)
C: Session 3: Thursday 3:30pm ~ 4:30pm ~ Room 104 Stellar Chance (Sylvia)
D: Session 4: Thursday 3:30pm ~ 4:30pm ~ Room 204 Stellar Chance (Yaoyu)
E: Session 5: Fridays 11am - 12pm ~ Room 104 Stellar Chance (Ioana)
F: Session 6: Friday 11am – 12pm ~ Room 204 Stellar Chance (Rebecca)
G: Session 7: Friday 11am – 12pm ~ 301 Stellar Chance (Adam)

Exams: 3 Exams, equal weight (25% each exam) Start at 8:30 am, end at 10:20 am. No regrading by teaching assistants. For issues with exam grades, please make an appointment with the course director.

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Section 1 – Genome Maintenance
Thursday, January 16: Course Introduction – Definition of Common Terms and Techniques (Klaus Kaestner)
Tuesday, January 21: Design and interpretation of ChIP-Seq and ATAC-seq (Klaus Kaestner)
Thursday, January 23: Design and Interpretation of RNAseq, GROseq, and scRNAseq (Golnaz Vahedi)

Tuesday, January 28: Regulation of DNA Replication (Paul Lieberman)
Thursday, January 30: DNA Repair and Cell Cycle Checkpoints (Roger Greenberg)
(Discussion of problem set 1: Design and Interpretation of RNAseq, GROseq, scRNAseq, ChIP-Seq and ATAC-Seq)

Section 2 – Transcription and Epigenomic Methods
Tuesday, February 4: Eukaryotic Gene Transcription 1 (Ken Zaret)
Thursday, February 6: Eukaryotic Gene Transcription 2 (Ken Zaret)
(Discussion 2: Regulation of DNA replication and DNA repair and cell cycle checkpoints)
Tuesday, February 11:  Telomere Function (Brad Johnson)

Thursday, February 13:  REVIEW SESSION FOR EXAM (TAs)  
(Discussion 3: Eukaryotic Transcription) 
Tuesday, February 18:  EXAM 1, IN CLASS (Material up to February 4)

Section 3 – Chromatin Modifications
Thursday, February 20:  Covalent DNA Modifications (Zhaolan (Joe) Zhou)  
(Discussion 4: Telomere Function) 
Tuesday, February 25:  Nucleosome Structure (Ben Black)  
Thursday, February 27:  Genome Editing (Jorge Henao-Mejia)  
(Discussion 5: Covalent DNA Modifications)

Tuesday, March 3:  Histone and Chromatin I (Shelley Berger)  
Thursday, March 5:  Histone and Chromatin II (Shelley Berger)  
(Discussion 6: Nucleosome Structure and Genome Editing)

Tuesday, March 10:  Spring Break ~ No Class  
Thursday, March 12:  Spring Break ~ No Class

Section 4 – Chromatin Regulation
Tuesday, March 17:  Chromatin Regulation in the Polycomb Pathway (Roberto Bonasio)  
Thursday, March 19:  Trithorax and Chromatin Remodeling (Roberto Bonasio)  
(Discussion 7: Histone and Chromatin)

Tuesday, March 24:  Chromatin-Chromatin Interactions (Gerd Blobel)  
Thursday, March 26:  Analysis of Higher Chromatin Atructure:3C, 4C, HiC (Robert Faryabi)  
(Discussion 8: Chromatin: Nuclear Architecture and Polycomb Pathway)

Tuesday, March 31:  Chromatin Regulation in the Context of Imprinting (Marisa Bartolomei)  
Thursday, March 31:  REVIEW SESSION FOR EXAM (TAs)  
(Discussion 9: Analysis of Higher Order Chromatin Structure)

Section 5 – Post-transcriptional Regulation
Tuesday, April 7:  EXAM 2, IN CLASS (Material up to March 26) 
Thursday, April 9:  miRNAs/siRNAs (Zissimos Mourelatos)  
(Discussion 10: Chromatin in the Context of Imprinting)

Tuesday, April 14:  Long Non-Coding RNAs (Montserrat Anguera)  
Thursday, April 16:  RNA Editing (Tom Jongens)  
(Discussion 11: miRNA/siRNA)

Tuesday, April 21:  RNA Processing I (Kristen Lynch)  
Thursday, April 23:  RNA Processing II (Kristen Lynch)  
(Discussion 12: Long Non-Coding RNAs, RNA Editing and Translational Control)

Tuesday, April 28:  Translational Control and RNA Localization I (Peter Klein)  
Thursday, April 30:  Translational Control and RNA Localization II (Peter Klein)  
(Discussion 13: RNA Processing and Translational Control)

Tuesday, May 5:  REVIEW SESSION FOR EXAM (TAs)  
Thursday, May 7:  EXAM 3, IN CLASS

General References for Review (Library/Web)  
Molecular Biology of the Cell (Alberts et al.)  
Molecular Cell Biology Lodish et al. (older editions are by Darnell et al.)  
Lecturers: *(Area code is 215 for all phone numbers)*

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