BIOM555 - REGULATION OF THE GENOME: SPRING 2022

COURSE INFORMATION

Lectures: Austrian Auditorium, CRB: Tuesdays and Thursdays: 8:30 am – 10:00 am; Tuesday, January 18 through Thursday, April 28

Small group discussions: January 27 through April 22. Students choose one discussion session and attend that session each week. Attendance and participation are required. Sign up using this link.

Session 1: Thursdays 10–11 am – 204 Stellar Chance (Andy)
Session 2: Thursdays 10–11 am – 104 Stellar Chance (Jesse)
Session 3: Thursdays 10–11 am – 301 Stellar Chance (Brittany)
Session 4: Thursdays 3:30–4:30 pm – 204 Stellar Chance (Karen)
Session 5: Thursdays 3:30–4:30 pm – 104 Stellar Chance (Brittney)
Session 6: Fridays 11am–12 pm – 204 Stellar Chance (Sean)
Session 7: Fridays 11am–12 pm – 104 Stellar Chance (Yee Hoon)

Exams: There will be three exams, which will be taken in the Smilow Auditorium (on February 22 and March 29) and in CRB Austrian (on April 28), in presence of the TA's, using Canvas. The exams will start at 8:00 am and end at 10:00 am.

Final grade: The final grade for the course is a composite of the three exam, each counting for 25%, and a grade given by the TA's for class participation during the small group discussions, which counts for the remaining 25%. Final scores ≥ 90 will be given an "A", between 80 and 89.9 a "B", and scores below 80 a B- or a C. In prior years, the mean final score was ~ 87 and the median ~88. Should this year's mean and median be significantly lower, the course directors will consider adjustments to the grading scheme in favor of the class.

Office hours: There are no formal office hours. The course directors and TA's will answer questions and concerns about the course after the lectures or during the small group discussions.

Course Directors:
Roberto Bonasio: roberto@bonasiolab.org
Klaus Kaestner: kaestner@pennmedicine.upenn.edu

Teaching Assistants:
Brittney Allyn: brittney.allyn@pennmedicine.upenn.edu
Yee Hoon Foong: yfoong@pennmedicine.upenn.edu
Andrew Katznelson: akatznel@pennmedicine.upenn.edu
Sean Louzon: Sean.Louzon@pennmedicine.upenn.edu
Brittany Mactaggart: britmact@pennmedicine.upenn.edu
Jesse Weber: jesseweb@pennmedicine.upenn.edu
Karen Wong: karewong@pennmedicine.upenn.edu

BGS Course Coordinator:
Colleen Dunn: dunncoll@pennmedicine.upenn.edu; 898-2792; 160 BRB II/III

<div align="center">**LECTURE SCHEDULE**</div>

Section 1 – Genome maintenance

Tuesday, January 18:   Course outline & introduction to next generation sequencing (Roberto Bonasio)

Thursday, January 20: DNA replication (Paul Lieberman)

Tuesday, January 25:   Telomeres (Roger Greenberg)

Thursday, January 27: DNA repair and cell cycle checkpoints (Roger Greenberg)

Thursday/Friday (Discussion of problem set 1: DNA replication and telomeres)

Tuesday, February 1:   Genome Editing (Jorge Henao-Mejia)

Section 2 – Transcription

Thursday, February 3:   Nucleosome structure (Ben Black)

Thursday/Friday (Discussion of problem set 2: DNA repair and Genome editing)

Tuesday, February 8:   RNAseq, GROseq, and scRNAseq (Klaus Kaestner)

Thursday, February 10: Eukaryotic transcription I – (Ken Zaret)

Thursday/Friday (Discussion of problem set 3: Nuecleosome structure & RNA-seq)

Tuesday, February 15: Eukaryotic transcription II – (Ken Zaret)

Thursday, February 17: REVIEW SESSION (TAs)

Thursday/Friday (Discussion of problem set 4: Regulation of transcription)

Section 3 – Chromatin Modifications

Tuesday, February 22: EXAM 1; Smilow Auditorium

Thursday, February 24: Epigenomic methods: BS-seq, ChIP-seq, ATAC-seq (Klaus Kaestner)

Tuesday, March 1:   Histone marks (Roberto Bonasio)

Thursday, March 3:   Polycomb (Roberto Bonasio)

Thursday/Friday (Discussion of problem set 4: Epigenomics and histone modifications)

Tuesday, March 8:   Trithorax and chromatin remodeling (Roberto Bonasio)

Section 4 – DNA modifications and 3D organization

Thursday, March 10:   Spatial genomics methods: sequencing and imaging (Melike Lakadamyali)

Thursday/Friday (Discussion of problem set 5: Polycomb, and trithorax)

Tuesday, March 15:   Chromatin topology and nuclear organization (Melike Lakadamyali)

Thursday, March 17:   DNA modifications (Marisa Bartolomei)

Thursday/Friday (Discussion of problem set 6: Spatial genomics and chromatin organization)

Tuesday, March 22:   Genomic imprinting and dosage compensation (Marisa Bartolomei)

Thursday, March 24:   REVIEW SESSION FOR EXAM (TAs)

Thursday/Friday (Discussion of problem set 7: DNA modifications and imprinting)

Section 5 – Coding and noncoding RNA regulation

Tuesday, March 29:   EXAM 2; Smilow Auditorium

Thursday, March 31:   Small RNAs and RNA interference (Colin Conine)

Tuesday, April 5:   Long non-coding RNAs (Colin Conine)

Thursday, April 7:   RNA processing (Kristen Lynch)

Tuesday, April 12:   RNA modifications (Kristen Lynch)
Thursday, April 14:   RNA localization (Peter Klein)

Tuesday, April 19:   Translational control (Peter Klein)
Thursday, April 21:   Transgenerational epigenetics & course conclusion (Roberto Bonasio)

Tuesday, April 26:   REVIEW SESSION FOR EXAM (TAs)
Thursday, April 28:   **EXAM 3**; Class of 62 and Reunion Audiorium

General references for review (library/web)
Lewin's Genes XII (Krebs, Goldstein, Kilpatrick)
Epigenetics, 2nd edition (Allis, Jenuwein, Reinberg)

Email addresses for lecturers
Marisa Bartolomei:	bartolom@pennmedicine.upenn.edu
Ben Black:	blackbe@ pennmedicine.upenn.edu
Roberto Bonasio:	roberto@bonasiolab.org
Colin Conine:	conine@upenn.edu
Roger Greenberg:	rogergr@pennmedicine.upenn.edu
Jorge Henao-Mejia:	jhena@pennmedicine.upenn.edu
Klaus Kaestner:	kaestner@pennmedicine.upenn.edu
Peter Klein:	pklein@pennmedicine.upenn.edu
Melike Lakadamyali:	melikel@pennmedicine.upenn.edu
Paul Lieberman:	lieberman@wistar.org
Kristen Lynch:	klync@pennmedicine.upenn.edu
Ken Zaret:	zaret@upenn.edu

Good research practices: BGS requires its doctoral students to be trained in i) Responsible Conduct of Research (RCR), and ii) Scientific Rigor and Reproducibility (SRR) (https://www.med.upenn.edu/bgs-rcr-exdes/). Course content is designed to complement RCR and SRR efforts.