

BMB 509: Structural and Mechanistic Biochemistry

Spring 2019

Course Director: Greg Van Duyne, vanduyne@penmedicine.upenn.edu; 809 SCL
Classes: Tuesday and Thursday 2:30-4:00, 253 BRB II/III
Required textbook: None
Prerequisites: BMB 508 and BIOM 600 or equivalent background
Homework: Read ~2 papers per week relating to lecture topics; complete paper-based assignments
Grading: 1/3 assignments, 1/3 exam I, 1/3 exam II

Synopsis: This course builds on BMB 508 and includes three overlapping areas: I) experimental approaches used in mechanistic biochemical research, II) topics in modern biochemical research drawn from our faculty's expertise, with an emphasis on molecular mechanism, and III) topics in metabolism and bioenergetics that provide a foundation for many of the research programs at Penn. Paper-based assignments are designed to reinforce experimental aspects of the lecture material and strengthen paper reading and writing skills. The course emphasizes elements of experimental design and experimental rigor and reproducibility.

Course Topics and Schedule:

Date	Topic	Lecturer
Jan 17	Biochemical methods I	Greg Van Duyne
Jan 22	Biochemical methods II	Greg Van Duyne
Jan 24	Biochemical methods III (Tour/Demo, 810 SCL)	Kushol Gupta
Jan 29	Screening methodologies	Sara Cherry
Jan 31	MS methods in biochemical research	Ben Garcia
Feb 5	Chemical biology of DNA	Rahul Kohli
Feb 7	Composition and properties of membranes	Paul Axelsen
Feb 12	DNA Packaging: nucleosomes and chromatin	Ben Black
Feb 14	DNA repair mechanisms	Eric Brown
Feb 19	RNA biochemistry	Kathy Liu
Feb 21	RNA editing	Jeremy Wilusz
Feb 26	Transcription mechanisms	Kenji Murakami
Feb 28	Transcriptional regulation	Ale Gardini
Mar 5	Spring Break	
Mar 7	Spring Break	
Mar 12	Review	Greg Van Duyne
Mar 14	Exam I (in class)	
Mar 19	Site-specific recombinases	Greg Van Duyne
Mar 21	Glycoproteins	Yair Argon
Mar 26	AAA+ protein function and mechanism	Jim Shorter
Mar 28	Myosin biochemistry and biophysics	Mike Ostap
Apr 2	Protein acetylation and methylation	Ronen Marmorstein
Apr 4	Metals in Biology	Donita Brady
Apr 9	Modeling cellular regulatory circuits	Mark Goulian
Apr 11	Metabolism and chromatin regulation	Katy Wellen
Apr 16	Energy production and dormancy in TB	Harvey Rubin
Apr 18	IDH and the TCA cycle	Kim Sharp
Apr 23	Insulin signaling	Paul Titchenell
Apr 25	Review	Greg Van Duyne
Apr 30	Exam II (in class)	