BBCB 509: Structural and Mechanistic Biochemistry Spring 2026

Course Director: Greg Van Duyne
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Class time/location: Tuesday and Thursday 1:45-3:15
BRB 251 (class meets in 810 Stellar-Chance on Jan 22)

Course materials: Lecture notes, assignments, and grades will be available on canvas.

Prerequisites: BBCB 508 and BIOM 600 or equivalent background; lecturers will assume that you understand the basic biochemistry, biophysics, and cell biology taught in those courses.

Assignments: An assignment will be posted on Canvas by Thursday of each week and will be due the following Thursday at the end of class. Some assignments will involve reading and analyzing a paper related to the week's lecture topics. Other assignments will contain problems to solve and/or questions to answer relating to the lectures.

Grading: Based on assignments (75%) and attendance (25%). There will be no exams. Assignment grades are reduced by 1/2 letter grade every day (or partial day) past the due date/time regardless of the reason.

Synopsis: This course builds on BBCB 508 and covers three overlapping areas: I) experimental approaches used in structural and mechanistic biochemical research, II) core topics in biochemistry, and III) modern biochemical research drawn from faculty research areas. The assignments are designed to expand on and reinforce aspects of the lecture material.

Date	Topic	Lecturer
Experimental approaches in biochemistry		
Jan 15	Biochemical/biophysical methods I	Greg Van Duyne
Jan 20	Biochemical/biophysical methods II	Greg Van Duyne
Jan 22	Biochemical/biophysical methods III	Kushol Gupta (810 SCL)
Jan 27	MS-based proteomics and microfludics	Aaron Timperman
Jan 29	High throughput screening methodologies	Sara Cherry
Feb 3	Gene regulation and development tools	Mustafa Mir
Nucleic Acid biochemistry		
Feb 5	RNA biochemistry I	Kathy Liu
Feb 10	Chemical biology of Nucleic Acids	Lijun Zhou
Feb 12	RNA biochemistry II	Bin Tian
Feb 17	DNA Packaging: nucleosomes and chromatin	Ben Black

Feb 19	DNA repair mechanisms	Roger Greenberg
Feb 24	Epigenetic regulation of transcription	Alessandro Gardini
Feb 26	Transcription mechanisms	Kenji Murakami

Membranes and glycobiology

Mar 3	Membranes and membrane proteins	Vera Moiseenkova-Bell
Mar 5	Glycobiology	Greg Van Duyne

Mar 10	University Spring Break - No Class	
Mar 12	University Spring Break - No Class	

Protein structure and function

Mar 17	AAA+ protein function and mechanism	Jim Shorter
Mar 19	Biochemistry of immunology	Nik Sgourakis
Mar 24	Myosin biochemistry and biophysics	Mike Ostap
Mar 26	Protein dynamics	Greg Bowman

Chemical biology

Mar 31	Modulation of the Ubiquitin Proteasome System	George Burslem
Apr 2	Chemical biology of imaging	Mark Sellmyer
Apr 7	Metals in biology	Donita Brady
Apr 9	Biochemistry of Cell Death	Cornelius Taabazuing

Metabolism

Apr 14	Insulin signaling	Greg Van Duyne
Apr 16	Metabolism and chromatin regulation	Katy Wellen
Apr 21	Exercise metabolism	Mitch Lewis
Apr 23	NAD metabolism and aging	Joe Baur
Apr 28	Metabolism and health	Mitch Lewis