

Chemical Biology Course, Fall 2026

The spirit of this course is to explore the complexities of modern biology using the tools of chemistry. The lectures cover amino acid chemistry, nucleic acid chemistry, posttranslational modifications of proteins, discovery and use of chemical probes to examine cellular mechanisms, membrane chemistry, chemical tools for imaging, and natural product biosynthesis. The method of evaluation is class attendance, active participation in the discussions and proposal presentation.

***Tuesdays 1:30pm – 3:30pm**

**** Thursdays 2:00pm – 4:00pm**

October 1 (Thu) HAC **North** Conference Room, **Tarun Kapoor** Discovering Chemical Probes and Drugs

October 6 (Tue) HAC South Conference Room, **Tarun Kapoor** Using Chemical Probes to Examine Biological Mechanisms

October 13 (Tue) HAC South Conference Room, **Tarun Kapoor** Identifying the Physiological Targets of Chemical Inhibitors

October 20 (Tue) HAC South Conference Room, **Katya Vinogradova** Posttranslational modifications

October 27 (Tue) HAC South Conference Room, **Jiankun Lyu** Computational methods for chemical biology: structure-centric approaches

October 29 (Thu) HAC South Conference Room, **Katya Vinogradova** Bioorthogonal Chemistry

November 3 (Tue) HAC South Conference Room, **Jiankun Lyu** Computational methods for chemical biology: ligand-centric approaches

November 10 (Tue) HAC **North** Conference Room, **Sean Brady** Natural Product 1 – Polyketides

November 17 (Tue) HAC South Conference Room, **Sean Brady** Natural Product 2 – Nonribosomal peptides

November 24 **No lecture** [*week of Thanksgiving*]

December 1 (Tue) HAC South Conference Room, **Sean Brady** Natural Product 3 – Additional natural products and practice problems

December 8 (Tue) HAC South Conference Room, **Katya Vinogradova** Functional Proteomics and Activity-Based Protein Profiling

December 15 (Tue) HAC South Conference Room, **Jiankun Lyu** Ligand discovery for membrane proteins

December 18 (Fri) HAC South Conference Room, Proposal Presentations or a written exam [lunch 12-2]

Attendance is required. If you have to miss a class please email Dr. Lyu (jlyu@rockefeller.edu), Dr. Vinogradova (vinograd@rockefeller.edu) and Dr Kapoor (kapoor@rockefeller.edu) in advance to discuss your absence.

Class notes will be distributed as pdf files.

Recommended background materials (not required):

Posttranslational Modification of Proteins: Expanding Nature's Inventory, Christopher Walsh

The Organic Chemistry of Biological Pathways, McMurry and Begley

Chemical Biology From Small Molecules to Systems Biology and Drug Design, Volumes 1-3, Schreiber, Kapoor, and Wess

Structure and Mechanism in Protein Science, Alan Fersht

The Molecules of Life Physical and Chemical Principles, Kuriyan, Konforti, Wemmer