Biochemistry 694:412
Proteomics and Functional Genomics
Spring 2025

Nelson Biology Laboratories, A237
2:00 – 3:20 PM Tuesday/Thursday

Draft Syllabus of Lectures

Date	Topic	Lecturer
Tue. Jan. 21	Course introduction and overview of genomics & proteomics	JF/SA
Thur. Jan. 23	New strategies and technologies for DNA sequencing	SA
Tue. Jan. 28	DNA sequencing – current technologies & applications	SA
Thur. Jan. 30	Applications of new DNA sequencing technologies (con'd)	SA
Tue. Feb. 04	Introduction to Chromatin and genome I	JF
Thur. Feb. 06	Introduction to Chromatin and genome II	JF
Tue. Feb. 11	~~Analytical and preparative protein chemistry?~~	SA
Thur. Feb. 13	~~Preparative protein chemistry (cont'd)?~~	SA
Tue. Feb. 18	Protein Mass Spectrometry and Proteomics I	SA
Thur. Feb. 20	Protein Mass Spectrometry and Proteomics II	SA
TBD	Exam I posted	
Tue. Feb. 25	Protein folding *in vitro*	SA
Thur. Feb. 27	Protein folding *in vivo*	SA
Tue. Mar. 04	Protein-protein interactions I	SA
TBD	Exam 1 due	
Thur. Mar. 06	Protein-protein interactions II	SA
Tue. Mar. 11	Macromolecule interactions: liquid-liquid phase separation I	JF
Thur. Mar. 13	Macromolecule interactions: liquid-liquid phase separation II	JF
Tue. Mar. 18	Spring Break	
Thur. Mar. 20	Spring Break	
Tue. Mar. 25	Manipulating protein levels, from RNA interference to Knockout I	JF
Thur. Mar. 27	CRISPR genome editing	JF

Tue. Apr. 01	CRISPR genome editing and Next-generation sequencing	JF
Thur. Apr. 03	***A neurodegenerative disease of children: From gene discovery to treatment*** xxx	
TBD	Exam 2 posted	
Tue. Apr. 08	Next Generation sequencing methods – ChIP-seq data analysis	JF
Thur. Apr. 10	NGS sequencing techniques and data analysis – RNA-seq data analysis	JF
TBD	Exam 2 due*	
Tue. Apr. 15	NGS sequencing techniques and data analysis – Troubleshooting	JF
Thur. Apr. 17	*Students' presentations*	
Tue. Apr. 22	*Students' presentations*	
TBD	(*Exam 2 due – *extended date for early presenters*)	
Thur. Apr. 24	*Students' presentations*	
Tue. Apr. 29	*Students' presentations*	
Thur. May. 01	*Students' presentations* *Exam 3 posted*	
Tue. May. 06	No class	
Thur. May. 08	Exam 3 due Pizza Party! (time and location TBD)	

**Students presenting on April 13th or April 18th have until Wed., April 19, to hand in their Exam 2 answers.*

Grading Breakdown:

- **Take-home Exam I: 30%**
- **Take-home Exam II: 30%**
- **Student Presentation: 20%**
- **Take-home Exam III: 15%**
- **Presentation Peer Reviews: 5%**

Exams:

Take-home exams will assess your understanding of course materials. These exams are significant components of your grade.

Student Presentation (20% of Grade):

Each student will select a disease from a provided list for presentation.

Focus Areas:

- **Molecular pathology or mechanism of the disease.**
- **Impact on regular physiology.**
- **Current research and overview, including potential cures.**
- **Clinical trial statuses, outcomes, and your perspective as a hypothetical physician or scientist.**

Aim to critically analyze the disease and its treatment, conveying both scientific understanding and personal insight.

Presentation Peer Review (5% of Grade):

Two students will be randomly selected to review each presentation.

Write a one-page summary focusing on:

- **Summary of the presentation's content.**
- **Personal opinions on the disease and its treatment.**
- **Constructive criticism for the presenter, including any missed but important aspects.**

Note:

- **There will be no final exam.**
- **Active participation, especially during presentations, is encouraged and contributes to your final grade.**

Lectures and assigned readings are posted at canvas.rutgers.edu.

Links to download example files of NGS analysis are posted at canvas.rutgers.edu.

Prof. Anderson's email address: anderson@cabm.rutgers.edu
Prof. Fei's email address: jia.fei@rutgers.edu

Information for Student-Wellness Services:

- Student Success Essentials: https://success.rutgers.edu
- Student Support Services: https://www.rutgers.edu/academics/student-support
- The Learning Centers: https://rlc.rutgers.edu/
- Rutgers Libraries: https://www.libraries.rutgers.edu/
- Bias Incident Reporting: https://studentaffairs.rutgers.edu/bias-incident-reporting
- Dean of Students – Student Support Office: https://success.rutgers.edu/resource/dean-students-student-support-office
- Office of Veteran and Military Programs and Services: https://veterans.rutgers.edu
- Student Health Services: http://health.rutgers.edu/

- Counseling, Alcohol and Other Drug Assistance Program & Psychiatric Services (CAPS): http://health.rutgers.edu/medical-counseling-services/counseling/
- UWill: free immediate access to teletherapy; you can choose a therapist based on your preferences including issue, gender, language, ethnicity. http://health.rutgers.edu/uwill/
- Office for Violence Prevention and Victim Assistance: https://vpva.rutgers.edu/
- Office of Disability Services: https://ods.rutgers.edu/
- Basic Needs Assistance (food, housing, and other essentials): https://ruoffcampus.rutgers.edu/basic-needs
- Rutgers Student Food Pantry: https://ruoffcampus.rutgers.edu/food-pantry