Syllabus for Mol Biol 254A Biochemistry –Eisenberg and Guo section

Course Title: Concepts in Molecular Biosciences
Section Title: Structure, Function and Dynamics of Macromolecular Assemblies

Fall 2020

Faculty contact information
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Virtual Office Hour: Friday 12:00-12:30

Learning objectives:

1. **Change learning mindset: from remembering information to selecting important research questions and critically analyzing research articles**
2. **Increase your comfort in talking about science**
3. **Understand macromolecular structures properly**
4. **Understand the importance of controls**
5. **Gain in-depth knowledge about the techniques used in the papers**
6. **Distinguish authors' conclusion from what they actually have found**
7. **Analyze data using proper statistical methods and present the results in informative graphs**
8. **Improve your oral communication and presentation skills**
9. **Practice scientific writing**
10. **Learn to give and take constructive feedback**
11. **Design your own experiments**

General schedule of the lectures and meetings:

Basecamp and structural biology tutorial on Monday-Thursday (Sep. 24-Oct. 2). Details in a separate instruction. To sign up for a 2-h tutorial session, go to
http://people.mbi.ucla.edu/cascio/LECTURES/M254/
Login (username m254, password: macromol) and follow instructions for tutorial registration.

Student meeting	Monday	10am-noon
Faculty-Student class	Tuesday	10am-noon
Student meeting	Thursday	10am-noon
Faculty-Student class	Friday	10am-noon

Main course web site: https://ccle.ucla.edu/course/view/20F-MOLBIO254A-2 and sign in using your UCLA Logon ID. All papers and questions may be downloaded from there.

Class/meeting schedule and papers

1. **Oct. 5.** **(10am-noon) Organization meeting with faculty** followed by student meeting on **CryoEM reveals how the small molecule EGCG binds to Alzheimer's brain-derived tau fibrils and initiates fibril disaggregation. Seidler et al. BioRxiv (2020) https://www.biorxiv.org/content/10.1101/2020.05.29.124537v1.full.pdf**.

   Oct. 6. **Faculty-Student class on** Seidler *et al.*

   Oct. 7. **First draft of Research Abstract** (see below for details) **due by noon**.

2. **Oct. 8.** **Faculty-student class. (9-11am—note earlier time for this class)**

   Workshop: How to Write a Research Abstract.

   Reading, writing and thinking are all coupled to each other. In preparation for this workshop, students will be given reading materials on the standard format of a scientific paper and on how to write it at the beginning of the quarter. You will be asked to write an abstract regarding your current rotation projects, or previous research projects. You can assume everything works and imagine any reasonable results. The first draft should be emailed to both instructors and all other students by **noon on Oct 7**. At the faculty-student class on Oct 8, we will discuss important issues in writing and go over your drafts one by one. Students will help each other revise their abstracts at the student-only meeting on Oct 9. The second drafts should be emailed to both instructors and all other students by **Oct 9**. We will go through another round of feedback and revision on Oct 12-13. The final abstracts are due at **5pm on Oct 13**. The writing exercise will be graded and the score will contribute 20% to the final score of the course.

   Specific instructions: The submitted abstract should have a title and student author's name. The body of the abstract should be no more than 250 words. The abstract should be double-spaced with fonts sufficiently large (at least 11 points). The submitted file name should start with the student's full name, followed by version # (e.g. v1, v2, or v3).

   The student leader for the workshop is responsible for loading all the submitted abstracts on a computer for display at the faculty-student class. Please do not use any version revised after the submission.

   The first two rounds of critiques will be given orally at the Faculty-Student classes. There are usually many comments described in a short period of time. Help each other by working in groups of 3 students. Take written and mental notes, and share them after the class and during the student-only meetings. Group members are also expected to exchange comments on each other's abstracts at the student-only meetings.

   Note: For the two writing workshops, the student-only meeting and the faculty-student class dates are swapped and that the Oct 8 meeting is 1 hour earlier than our regular class time.

   Oct. 9. Student meeting on writing workshop I.

   Oct. 9. **Second draft of Research Abstract due by noon.**

3. **Oct. 12. Faculty-student class on** Writing workshop II

   Oct. 13. Student meeting on writing workshop II
   Oct. 13. Final Research Abstract due by 5pm.

4. **Oct. 15.** Student meeting on **A Broad-Spectrum Inhibitor of CRISPR-Cas9**. Harrington *et al.* Cell 170, 1224-1233 (2017).

   Oct. 16. Faculty-Student class on Harrington *et al.* (2017).

5. **Oct. 19.** Student meeting on **A Dynamic Search Process Underlies MicroRNA Targeting.** Chandradoss *et al.* Cell 162, 96-107 (2015).

   Oct. 20. Faculty-Student class on Chandradoss *et al.* (2015).

6. **Oct. 22.** Student meeting on **Structure-based inhibitors halt prion-like seeding by Alzheimer's disease–and tauopathy–derived brain tissue samples.** Seidler *et al.* Journal of Biological Chemistry, 294: 16451–16464 (2019).

   Oct. 23. Faculty-Student class on Seidler *et al.* (2019).

7. **Oct. 26.** Student meeting on **Atomic structures of low-complexity protein segments reveal kinked β sheets that assemble networks**. Hughes *et al.* Science 359, 698-701 (2018).

   Oct. 27. Student-Faculty class on Hughes *et al*. (2018).

8. **Oct 29.** Student meeting on **A multicolor riboswitch-based platform for imaging of RNA in live mammalian cells**. Braselmann *et al.* Nature Chemical Biology 14, 964-971 (2018).

   Oct. 30. Student-Faculty class on Braselmann *et al.*

9. **Nov. 2.** Student meeting on **New author guidelines for displaying data and reporting data analysis and statistical methods in experimental biology.** Michel *et al.* Molecular Pharmacology 97, 49–60 (2020).

   Nov. 3. Student-Faculty class on Michel *et al.* (2020).

10. **Nov. 5. 10-11am Questions and Answers**

    Nov 6. 10-11:30am Final Exam

Grading of the course: The final letter grades depend on final scores, 55% of which are from the final exam, 20% from the writing exercise and 25% from participation in class discussion.

Feedback: In the third week, we will provide you with concrete feedback to your participation with the goal of enhancing your learning experience. Feedback will be delivered in an individual meeting with one of us, and you are expected to summarize afterwards and submit your action items for leaning in to us.

Useful links:
PubMed: http://www.ncbi.nlm.nih.gov/pubmed
Routing through the UCLA library system offers increased accessibility to e-publications:
http://www.ncbi.nlm.nih.gov/sites/entrez?tool=cdl&holding=uclalib&otool=cdlotool
If you are using an off campus computer you will need to set up the BOL (Bruin On-Line) proxy server - follow instructions on the BOL site.