BIOL 485: Biological Aspects of Drug Discovery for Infectious Diseases
http://faculty.washington.edu/crowther/Teaching/BIOL485A/

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Mondays & Wednesdays, 9:40-10:40 AM
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OVERVIEW

The process of creating new therapeutics is rife with biology-related challenges, from identifying appropriate molecular targets to optimizing a compound's pharmacokinetic properties. In this seminar course we will explore several of these challenges through extensive reading and discussion of primary research literature. Whenever possible we will draw examples from the field of malaria research, as this disease continues to inflict enormous morbidity and mortality upon humans and remains an area of considerable research activity worldwide. The course will meet twice per week; most class time will be devoted to discussions of research papers from the primary literature.

GOALS & ASSESSMENT

I hope that all students in this course will attain the goals listed below, shown next to their corresponding assessments:

Goal	Assessment
(1) Gain willingness and confidence in reading and discussing primary research literature.	(1) Pre- and post-course surveys (not graded)
(2) Get better at reading, understanding, and discussing primary research literature. How? a. sheer practice b. guided inquiry (instructor prompts, worksheets) c. teamwork (students work in groups) d. meta-cognition (figuring out what works for you and why)	(2)-(3) Homework/worksheets (20% of grade) Classroom participation (20% of grade) Short quizzes (20% of grade) Leadership of 1 class session (20% of grade) Independent projects (20% of grade)
(3) Gain an improved understanding of how research leads to the creation of new drugs for infectious diseases.	

COURSE COMPONENTS

Your activities and grade in this course will include the components shown in the table above and discussed below.

Worksheets. Students will turn in a worksheet on the assigned reading at the start of each class session. The format of the worksheets is adapted from the "Figure Facts" worksheet (J.E. Round & A.M. Campbell 2013, *CBE-Life Sciences Education* 12: 39-46, 2013). Worksheets will be graded mostly for completeness. I want to see that you have made an honest effort to grapple with the assigned reading,

even if you don't understand it all (which is fine and, indeed, expected). All worksheet assignments will be posted online. They are due at the start of each class session. If you want to ensure that your worksheet gets to me on time, you can email it to me. If you want to refer to your worksheet during class discussions, which I recommend, hand in one copy (or email it to me) and keep a copy for yourself. Students are encouraged to discuss reading assignments with each other, but each student must complete his/her worksheet independently. Also note that some worksheet questions will ask for information not contained in the assigned article; in these cases you are expected to find an appropriate source (Wikipedia will often suffice).

Classroom participation. Like the worksheets, class participation will be graded mostly for active intellectual involvement rather than mastery of the material per se. An incomplete understanding of the material is expected, and should not prevent you from speaking.

Short quizzes. Quizzes will be given as indicated in the schedule below. In general, they will not focus on the details of the research articles. (That's what the in-class discussions are for!) Instead, quizzes will focus on the more general aspects of drug development illustrated by each paper.

Leadership of 1 class session. Teams of 3 students will lead one class during the second half of the course. (Each student will do this once.) These teams should not simply present lecture-style summaries of the papers, but should cover them in a way that encourages active participation by all students, as modeled by me in earlier sessions. Each student team will meet with me as part of their preparation and will prepare a homework assignment for the class to complete prior to their session.

Independent projects. Each student will write a "News & Views"-style report on one primary research paper not covered in class. This paper should relate to malaria drug development in some way, should be different from those chosen by other students), and should not be the focus of an already-published "News & Views"-style article. As with the worksheets, students may discuss papers with each other (and with me!) but should write up their work independently. The choice of paper should be made by July 17 and a draft is due for peer review on July 31. (You may also solicit feedback on your draft from me, but your questions should be more directed than "What do you think of this?") The final paper is due on the last day of class. The paper should summarize the study and its context in approximately 800 words, along with an illustrative figure or table.

LATE ASSIGNMENTS & MAKE-UPS

A penalty of 20% per day will be assessed for any work turned in late. Quizzes taken late will also be assessed a 20% penalty (not per day) unless a compelling excuse (illness, family emergency, etc.) is presented.

COOPERATION & RESPECT

Throughout this course we will work together closely as we tackle challenging material. Such teamwork necessitates respect and trust among all of us. In both small-group and whole-class discussions, we will honor everyone's right to speak and be heard, a corollary being that no individual should completely dominate a discussion. At the same time, we will acknowledge that differences of opinion are inevitable

and that some answers to questions will be better than others. If you have any concerns or suggestions about this as the quarter progresses, please talk to me.

Students are also welcome to work together outside of class. However, assignments to be turned in must be written independently. Students should put text into their own words whenever possible; direct quotes should be indicated with quotation marks and page numbers. Plagiarism, either of another student or of an outside source, is considered academic misconduct and will be handled accordingly. If you have any questions about what I do and do not consider plagiarism, please ask!

SCHEDULE

Date	*Topic/Paper*
June 24	pre-course survey; course introduction; evidence-based teaching
June 26	a brief history of drug development (PubMed ID **10720314**)
July 1	the need for new drugs: the challenge of a malaria vaccine (PubMed ID **23136909**); sign-up for student-led discussions
July 3	the challenge of a malaria vaccine, continued; QUIZ #1
July 8	the need for new drugs: resistance to existing drugs (PubMed ID **11090624**)
July 10	overview of the drug discovery process (**ISOA/ARF Drug Development Tutorial**)
July 15	phenotypic screening (PubMed ID **17116676**)
July 17	phenotypic screening, continued; QUIZ #2; independent project paper selections due
July 22	molecular target selection and validation (PubMed ID **20436472**)
July 24	target-based screening (PubMed ID **15795226**)
July 29	target-based screening (PubMed ID **22612231**)
July 31	hit-to-lead progress (PubMed ID **15556768**); QUIZ #3
Aug. 2	independent project drafts due at 12 noon
Aug. 5	peer feedback on independent project drafts
Aug. 7	hit-to-lead progress (PubMed ID **18522386**)
Aug. 12	animal models of malaria (PubMed ID **21696174**)
Aug. 14	human studies (PubMed ID **17336652**)
Aug. 19	human studies (PubMed ID **19451638**); QUIZ #4
Aug. 21	the future of malaria drug development (PubMed ID **21311580**); independent projects due; post-course survey

Shaded dates denote student-led discussions. Full citations of each paper may be obtained by going to http://pubmed.gov and typing in the PubMed ID. Access to some papers may require going through the E-Journals section of the UW Libraries website.

COURSE WEBSITE, CONTACT INFORMATION, OFFICE HOURS

To get to the course website, go to faculty.washington.edu/crowther/, click on Teaching from the left-hand navigation menu, and then click on Biology 485. Or just go straight to faculty.washington.edu/crowther/Teaching/BIOL485A/.

The best way to reach me is often by email: crowther@uw.edu. My office number is 206-685-2857. My office is in room E691A of South Lake Union Building E in the UW Medicine complex. You are welcome to visit me there ; appointments are recommended. I will also hold no-appointment-necessary "office hours" from 12pm to 1:30pm at the By George cafe on the following days: June 24, 26, 27, 28; July 1, 3, 8, 10, 11, 15, 17, 18, 22, 24, 25, 29, 31. Office hours at By George will be from 10:50am to 12:30pm on August 7, 12, 14, 19, and 21.