

## PBIO 525 Discussion Topics in Physiology and Biophysics

**Course meets:** Mondays from 1:00 to 2:00 PM in room T-478

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**Course web page:** <http://courses.washington.edu/pbio525/>

### Schedule:

Date	Instructor	Topic
October 2	Asbury	Molecular motors / Mitosis
October 9	Santana	Excitation-contraction coupling
October 16	Asbury	Molecular motors / Mitosis
October 23	Santana	Excitation-contraction coupling
October 30	Asbury	Molecular motors / Mitosis
November 6	Santana	Excitation-contraction coupling
November 13	Asbury	Molecular motors / Mitosis
November 20	Santana	Excitation-contraction coupling
November 27	Asbury	Molecular motors / Mitosis
December 4	Santana	Excitation-contraction coupling

**Goals of this course:** Our primary goal is to hone our skills in critical thinking and group scientific discussion. Our secondary goal is to learn about new developments in two specific areas of molecular biophysics (topics this year are excitation-contraction coupling and molecular motors / mitosis ).

**Evaluation:** Final grades will be given on the basis of student participation (quantity and quality of questions, comments, and/or suggestions) in weekly discussions and their presentations.

**General instructions for paper discussion:** One or two students will be chosen to lead each session. Session leaders will select a paper for discussion and obtain instructor approval for this selection at least one week prior to the actual discussion. The selected paper will then be distributed by posting on the course website. All participants are expected to read the paper beforehand and to come prepared for discussion and critical evaluation of the work (see below, "How critical should participants be...?"). Session leaders will prepare a powerpoint presentation (1) summarizing the major conclusion of their chosen paper, (2) briefly explaining why it is significant, and (3) displaying the primary evidence that supposedly supports the conclusion (see tips below). During class, the session leaders will lead an informal group discussion of the paper. The primary goal of this discussion is to facilitate evaluation of the work, with particular emphasis on whether the data support the claims made by the authors. Presenters are expected to choose papers that, in their opinion, represent solid scientific work. However, it is quite possible that other discussants will not come to the same conclusion. It is more important to have a critical discussion than to come to a consensus.

Below we provide more specific suggestions for journal club presenters and participants. First, an excerpt is printed from Dr. Bertil Hille's public speaking suggestions. Second, we print some additional suggestions of our own.

**Bertil's suggestions for preparing slides and giving public talks:**

***Title on slide:*** Use a declarative/informative brief title at top of EACH slide. Not "Effects of A" but "A Blocks B" or "A is Inactive" or "A activates B." This will help those who doze or looked down or jotted a note when you first said what the slide was.

***Other words on slide:*** Use as few words as possible. Avoid long lists of anything. People can't retain them.

***Size of lettering:*** 20 to 40 point! Everyone makes them too small. The larger size is for titles. A convenient rule of thumb is that the lowercase letters of any label need to be 1/40 of the size of the picture at least--you can measure this during practice projection. Don't be embarrassed to use large letters. Look at any billboard. No figure labeled for publication has letters big enough for projection. To make a test, project something in G-417 and go to the very BACK of the room and ask if it is clear.

***Margins around figures:*** Don't have any space around the figure. Magnify the figure until it comes right up to the edge. We see a lot of postage stamp graphs and micrographs surrounded by beautiful fields of color in new slides--but we can't see what is in the figure. Delete the empty space by magnifying, not by adding more stuff.

***Colors:*** Colors are great but try also to have contrasting brightness. Objects differing in color but not brightness are hard to see. Contrast is paramount. Dark reds are brilliant on the computer screen but don't project as very red. They disappear if put on a black background. They are fine against white.

***Pointers:*** Move pointer slowly to guide movement of the eyes to exactly what you are now talking about. Don't wave it rapidly or in circles to call attention to an area. The observer gets dizzy and can't see through all the visual interference you are creating. I just close my eyes when that happens.

**Additional tips for journal club participants:**

***What is the purpose of a journal club?***

A journal club is a forum for discussing primary scientific literature in depth, with a group of interested people. The advantage is that collectively, a group can evaluate strong points and uncover flaws in a paper much more quickly, thoroughly, and efficiently than one person reading on their own. New papers are published at a dizzying rate these days. To keep up, we have to quickly distill important findings down to their essence. Journal clubs are the best way to do this.

***How do I choose a paper to present in a journal club?***

Above all, choose a paper that offers what you think is a significant advance in an area of interest to you and the other participants. Use your best judgment and solicit opinions from other participants if you are unsure. Avoid the all-too-common mistake of choosing a paper simply because its topic (title) mentions a molecule, organism, or phenomenon that you are studying. You want a paper that is worthy of an in depth discussion. After discussion, it may turn out that your opinion of the paper changes. If so, great! The journal club has served its purpose.

***How critical should participants be in evaluating a paper?***

Criticism is the name of the game here. If you suspect a flaw in the paper you should point it out to the group. If you are unsure whether it is a true flaw or just a misunderstanding on your part, bring it up anyway. Through group discussion you may learn quickly that the flaw is real, or else your misunderstanding might be cleared up. Either outcome is great. At times, journal club discussions may seem overly critical. Ignore this feeling. The authors of the paper are not going to get offended (presumably they are not in attendance). In fact, they should be flattered their paper was deemed important enough to warrant discussion. Critical evaluation is a cornerstone of scientific progress. Embrace your critical side!

***As the presenter, am I expected to defend the paper?***

Yes. You should be prepared to put yourself in the authors' shoes at times during the discussion. When a flaw is found in the paper, try to understand and then articulate the challenges the authors/experimenters may have faced that would make it difficult to avoid. Actually, everyone involved in the discussion should attempt to do this. However, as presenter you bear more of the burden, since you presumably chose the paper and read it most thoroughly.

***How much background material should I present?***

This depends on your audience. You need enough background so that everyone can understand the main point of the paper, why it is a potentially significant advance, and no more. Do not go overboard trying to cover an entire textbook's worth of background material. On the other hand, don't just jump in and start presenting the data without introduction. Think carefully about the essential pieces of information needed by your audience. Composing a concise and effective set of background slides is among the most challenging aspects of any presentation. It takes time to do a good job. Journal clubs are an excellent forum to practice this art.

I often use a trick when I give presentations to help keep me and my audience focused through the background section. Before launching into the background, I begin by stating the main point of the talk briefly, in one or two sentences. (In the case of a journal club, I state the main finding of the paper.) Then I segue into the background by stating that before I explain the details I need to cover a few pieces of background info. This way it is clear that I will skip any background not directly related to the topic at hand. Sometimes I find it tough to summarize an entire paper or talk in one or two sentences. However, if I cannot do it, it usually means the point is not clear enough in my own mind. Therefore I almost always force myself to complete this exercise.

***Should I present every figure and table in the paper?***

I usually present all the figures and tables that appear in print, but sometimes I omit extra online figures or tables. In a good paper, each piece of data supports a specific point related to the overall conclusion. As presenter, your job is to decide what these specific points are and to present enough data to support each one. If the paper is long and each point is supported by multiple pieces of data, it is okay to skip some in favor of those that are most compelling.

The most important thing is to connect each piece of data to a specific point. Ask yourself what each graph, chart, or image means. What specific points does it support? Try to convey this to your audience. A common mistake is to spend too much time describing experimental techniques without ever explaining what the result means.

***Specific advice for creating power point slides in journal club setting:***

1. Every slide displaying a figure from the paper should have a title that concisely states the conclusion that is meant to be drawn from the figure. In fact, all slides should have a title that concisely states the main point of the slide. No exceptions! (apart from the first title slide, a conclusion slide, and acknowledgement slide)
2. When the original figure has multiple panels, traces, or whatever, help your audience remember which is which by adding labels
3. Listen to Bertil – no lists of words, no long paragraphs of words!