

BISP194: Membrane Trafficking Winter 2012**Dr. Amy Kiger Tues. 11:00 am – 12:20 pm, York Hall 3010****COURSE INFORMATION****BISP 194. *Membrane Trafficking in Tissue Homeostasis and Human Disease***

This course will focus on fundamental concepts and conserved cellular mechanisms of membrane

trafficking that maintains tissue homeostasis and, when disrupted, underlies many diseases. With active

student participation, we will discuss primary literature that addresses the regulation and machinery

involved in (primarily endocytic) membrane trafficking, and how aberrations in this cellular process results

in a range of human diseases such as immune deficiency, infection, diabetes, neuromuscular degeneration

and cancer. There will be a heavy emphasis on understanding the basis of design, execution and interpretation of relevant scientific experiments. In the process of learning how to read and discuss

scientific literature, students will learn about and formulate their own hypotheses on mechanisms for

membrane roles in normal and disease states.

Class meetings Tuesdays, 11:00 am – 12:20 pm, York Hall 3010

Professor Dr. Amy Kiger

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Natural Science Building, Room 6109

Office Hours By appointment, typically Wed. & Fri. 3:00-4:00 pm

Natural Science Building, Room 6109

In email to instructor, please include BISP194 in the subject line and sign with your full name.

Website <http://www.biology.ucsd.edu/classes/bisp194-1.WI12>

All course information is posted on our class website, including:

- Course information
- Syllabus
- Research articles and relevant reviews (as PDF files)
- Presentation assignments and schedule
- Evaluation form
- Tips on “How to read a paper”
- Tips on “How to prepare a presentation”

You will be responsible for printing all research articles posted on the website.

Other Resources Textbooks. No text is required. You may find cell and developmental biology

textbooks to be useful references for review of relevant background material, such as these and similar texts: *Molecular Biology of the Cell* (Alberts et al), *Molecular Cell Biology* (Lodish et al) and *Developmental Biology* (Gilbert).

PubMed. Additional related research articles for support of your scholarly presentations can be found using the PubMed online database,

<http://www.ncbi.nlm.nih.gov/sites/entrez>.

Prerequisites It is highly recommended to have taken BICD100 (Genetics), BIBC102 (Metabolic Biochemistry), BICD110 (Cell Biology) and BIMM100 (Molecular Biology).

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Course Summary Through careful reading and discussions, each student will learn about both basic

fundamental concepts and recent discoveries underlying membrane trafficking, as well as the significance of its regulation within broader biological and biomedical contexts. The format of the course will be weekly seminar-style presentations, where each student will present at least once during the quarter. Each speaker will be responsible for providing a basic introduction of that week's topic and to lead class discussion on the specific aims and significance of the primary data. All students will be required to write a synopsis of assigned articles that will be due at the beginning of class. In addition, all students will write constructive peer evaluations of the presentations at the end of every class. The goal of the course is to not only learn about new discoveries in cell biology, but also to learn to read, critically evaluate and present primary data from research articles.

Grading Grades will be determined by the quality of student written work and oral presentations, as well as the level of preparedness and **participation** in all class discussions. Evaluations will be based on performance with these requirements:

(1) Presentations: Oral presentation of 1 assigned research article.

(2) Written Reviews: One-page synopsis of 4 articles.

(3) Participation: [Involvement in all weekly discussions of research articles.](#)

(4) Evaluations: Written peer evaluations done in class every week.

(5) Final Exam. Discussion format, with short essay questions.

(1) Presentations: Each student will be assigned **ONE** paper to present. You will make a ~1 hour

presentation of one of the assigned research articles either individually or as a small group, depending on class size. This includes approximately 10 minutes for questions and interrupted discussion. Each member of the group should be prepared to answer questions and engage in discussion of the presentation.

Presentations should be thoroughly prepared and clearly delivered. You may use the provided review articles to help introduce your subject. In addition, you may need to read additional publications to assist your understanding and presentation of each paper. Your job is to help the class gain a clear understanding of the conceptual context, purpose, approaches taken and significance of each paper. A good understanding of the experimental methods employed is essential for a critical reading of any paper. Leading the group discussion consists of taking the class step-by-step through the rationale, approach and results in each paper. This often requires judicious choices regarding which figures and concepts are central and which are secondary.

Presenters are encouraged to exchange contact information and arrange

multiple meetings to prepare your presentations. I suggest that each group meet at least twice before your presentation. These papers are complicated, and the level of background and experience within the class vary. Nevertheless, by working together, the group should achieve a common level of understanding of the research performed.

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(1) Presentations, Dr. Kiger will be available for consultation during the preparation of your **continued** presentations, both to help you understand the experimental and scientific content of the paper and to offer guidance on presentation organization and delivery. Additional tips and guidelines on presentation content and format are also available online (“How to present a paper”; “How to make powerpoint presentations”).

Presentation Content.

In general, each group presentation should include the following information:

I. Background/Introduction. Provide the necessary background that gives the context for the paper. i.e. What are the authors attempting to show? How does this work fit into the broader view of the field? What tools are used to approach the problem?

II. Discussion of Data/Results. Provide a thorough description of the techniques employed in the paper. Describe the specific experiments, highlighting any controls that are important for the interpretation of the data. Summarize the results of the experiment, including whether what *YOU* observe within the provided figures actually supports (or not) what the author’s write in the text. Discuss any reservations you may have about the data. Figures should be divided between members of the group.

III. Conclusions and implications. Discuss the major conclusions from the findings presented in the paper. Where possible, include a model (often included at the end of the paper) to provide an overview of the findings. Discuss any caveats to the interpretation, and discuss the long-term implications of the work.

Presentation Format.

Each presenter should prepare powerpoint slides and/or chalkboard drawings to assist in the clarity of your presentation. You are strongly encouraged to prepare electronic presentations using PowerPoint or Keynote. We will have a projector available for hook-up to your own or the instructor’s computer. In this case, the group’s entire presentation should be on one computer. **If you will use the instructor’s laptop computer to deliver your presentation, you must prepare a Mac-compatible presentation and bring it backed-up on a CD or memory stick before class.**

In addition, you will be assigned an individual data Figure to present in a joint classroom discussion during the first weeks.

(2) Written synopsis: You are expected to read EVERY paper before coming to class. In addition, you are

required to write 1-page *maximum* critical synopsis for **FOUR** of the assigned research articles (not of the paper that you present). One synopsis is due for January 17th article, and the other three may be dates of your choice. You will turn in your summaries at the beginning of class on the day that paper is to be discussed. The

write-up should include a brief summary of the authors' work, an analysis of the
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(2) Written synopsis: results, and an evaluation of how the authors support their claims.

Although each

(continued) individual should turn in their own write-up, I encourage you to discuss the articles together. Do not leave all reviews for the end of the quarter, so that you can get my feedback!

(3) Participation: You are expected to read EVERY paper before coming to class and to be prepared to

discuss it. Participation during discussions will be a major factor of my evaluation in assigning final grades. It is assumed that each student has read carefully, and is conversant with the contents of, each of the papers assigned for a given week. This includes the background information contained in the assigned reviews. Anyone in the class may at any time be called upon by the presenters or instructor to discuss a particular figure or finding in the paper under discussion. In addition, it is expected that each student will regularly make spontaneous contributions to the discussion. In many cases, participation may be simply asking a question or point of clarification, since it is understood that the material will be very new and challenging to most students. **Participation is THE MAJOR factor in the overall evaluation of your performance.**

(4) Evaluations: After each presentation, you will fill out a peer Evaluation Form (available online)

with *constructive* comments on the group's presentation of the background material and data in each paper. Additionally, you will have a chance to observe and comment on presentation styles of the presenters. Comments will be scanned and posted anonymously on the website so that all presenters can gain the most feedback.

(5) Final Exam: The format of the Final Exam will parallel the weekly presentations. I will present a

scientific article and pose several questions for short essay answers and discussion.

The best way to prepare for the exam is to attend and participate in every class discussion during the quarter.