

Spring 2014
PHRM 432 - Current Topics in Vision Science
Course Information
Tuesday and Thursday - 10:00 - 11:30
VSRC Conference Room (Room 109 - Institute of Pathology)
Course Director: Paul S.-H. Park, Ph.D. (email - paul.park@case.edu)

Course Description:

Vision research is an exciting and multidisciplinary area that draws on the disciplines of biochemistry, genetics, molecular biology, structural biology, neuroscience, and pathology. This graduate level course will provide the student with broad exposure to the most recent and relevant research currently being conducted in the field. Topics will cover a variety of diseases and fundamental biological processes occurring in the eye. Regions of the eye that will be discussed include the cornea, lens, and retina. Vision disorders discussed include age-related macular degeneration, diabetic retinopathy, infectious retinopathies, and glaucoma. Instructors in the course are experts in their field and are members of the multidisciplinary visual sciences research community here at Case Western Reserve University. Students will be exposed to the experimental approaches and instrumentation currently being used in the laboratory and in clinical settings. Topics will be covered by traditional lectures, demonstrations in the laboratory and the clinic, and journal club presentations.

Course Philosophy and Structure:

The purpose of this course is to provide the student with a broad overview of some of the current areas of research in vision science. Many basic science lecturers will provide two sessions. The first lecture will provide students with a foundation to understand the basic biology of a chosen ocular tissue or vision disorder. The second session will be either a lecture on a specified topic or demonstration of current techniques used in the laboratory. These sessions will illustrate the current frontiers in knowledge and technology in vision research. Basic science lectures will be supplemented with clinical lectures. In addition, a visit will be organized to the eye clinic for demonstrations of clinical instrumentation used to examine patients. The clinical section of the course will provide students an opportunity to experience the human implications of their research. Tasks that students will be graded on are designed to help students gain skills in areas critical for their success in a scientific career. Journal clubs will help students critically assess the literature and to practice presenting scientific work. The research proposal will help students practice putting together a research plan for a small grant application. The course material should not be the end of the conversation, but rather, only the beginning. Students are encouraged to probe deeper into topics that are of special interest to them and to take advantage of any resources that are presented during the course.

Textbook:

The Human Eye: Structure and Function by Clyde W. Oyster (Sinauer Associates, Inc., Sunderland, MA)

Students are not required to purchase the textbook. Two copies are available at the reserve desk in the Health Science Library.

Grading:

Journal club presentations (40%) – 2 presentations (20% each)

Research proposal (35%)

Class participation (25%) – attendance 10%; participation during lectures and presentations 15%

Journal Club:

Students will be required to give 2 journal club presentations. Presentations should be about 20 minutes in length with 5-10 minutes for questions and discussion. A list of articles for journal clubs will be provided to the students. All students in the course will be required to read articles being presented in order to participate in the question and discussion portion of the presentations. Presentations should include the following:

1. Objective: What was the purpose of the article? What hypothesis or question was addressed?
2. Background: Explain the rationale and significance of the topic. Why is this study important?
3. Methods: What methods and techniques were used? Is the approach appropriate? Are there better approaches to address the question?
4. Results: What are the key observations? How is the data interpreted? Are there alternate explanations or interpretations of the data?
5. Conclusion: What is the major finding from the study? Is the conclusion justified from the data presented and from previous studies?

Students will be graded on how well they cover the above five criteria. In addition, students will be graded on the following:

1. General presentation skills: Was the presentation clear? Did the student answer questions sufficiently?
2. Clarity of slides: Were slides clear? Were there mistakes or typos?

Research Proposal:

The research proposal is intended to simulate the research plan section of a short grant application. The student is free to choose any topic of their choice that is related to vision research and may consult any of the lecturers for suggestions. HOWEVER, the chosen topic cannot be the student's thesis topic or taken from their supervisor's grant. Failure to follow this criteria in addition to any suspicions of plagiarism is grounds for a failing grade in the course.

Students are allowed to choose a topic that is peripherally related to their thesis topic. A statement must be included in the proposal that explicitly states how the research proposal differs from the student's thesis topic. This is especially critical when there is overlap.

The research proposal should include the following components (adapted from Gerrin, W. (2006) Writing the NIH Grant Proposal. SAGE Publications, Inc., Thousand Oaks, California):

1. Background and Significance – should address the following:
 - The problem or question your study will address.

- Background material to provide context for your proposal.
- What others have done to address this problem, and why that wasn't sufficient.
- What you plan to do that is different from previous studies.
- Why your plan is novel, cutting edge, and should excite the reader.
- An overview of your methodology.
- Study hypothesis.

2. Research Design and Methods – should include the following subheadings:

- Rationale and hypothesis
- Experimental methods
- Anticipated results
- Potential pitfalls and alternative approaches

The proposal should be 4-5 pages, which includes tables and figures but excludes references. Proposals should be typed single-spaced with font sizes of 11 or 12 (Arial or Times New Roman). Margins should be set at 1 inch. Proposals will be graded based on how well each section was written according to the criteria outlined above. Grammar and spelling will also impact the grading of the proposal.

The following are resources students may find useful in preparing their proposals.

http://www.ninds.nih.gov/funding/grantsmanship_checklist.htm

<http://www.niaid.nih.gov/ncn/grants/app/default.htm>

<http://www.cs.cmu.edu/~sfinger/advice/advice.html>

Instructors:

Yoshikazu Imanishi – yxi19@case.edu

Sudha Iyengar – ski@case.edu

Timothy Kern – tsk@case.edu

Jonathan Lass – Jonathan.Lass@uhhospitals.org

Akiko Maeda – aam19@case.edu

Ram Nagaraj – nhr@case.edu

Paul Park – psp7@case.edu

Eric Pearlman – exp2@case.edu

Irina Pikuleva – iap8@case.edu

Douglas Rhee – Douglas.Rhee@uhhospitals.org

Carlos Subauste – css34@case.edu