

Syllabus
PHAR 9003
Molecular Targets
Spring Semester 2016, Block 1
UVA Department of Pharmacology

Course Coordinators

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Course Description

PHAR 9003: Molecular Targets. This advanced course explores in depth the classes of molecular entities that are popular for existing and new medicines and the strategies used to validate these targets for drug design and development. We discuss the catastrophic impact of diseases on human life, the evolution of drug discovery through time, and the vast chemical universe that may be exploited to cure, manage, and prevent diseases. Included are fascinating case studies focusing on how specific drugs were “born” and how they facilitated new understandings about biology and disease. Lectures will be balanced with discussions of original research journal articles (*i.e.*, case studies). Students will participate in the grant writing and review process by assembling an application focusing on how to validate a molecular target for drug discovery. *Class size limited to 15 students.*

Prerequisites. While there are no official prerequisites for this advanced graduate course, prospective students are expected to have an understanding and appreciation of human physiology, cell biology and signaling, and biochemistry. Students whose knowledge is deficient in these areas will be expected to perform outside reading(s) in consultation with the course coordinators in order to become conversant with the discussed subject matter.

Learning Objectives. Students will learn about and critically examine the classes of molecular targets that are the focus of drug discovery efforts. They will also gain an appreciation of the process(es) required to validate specific targets for drug discovery. Moreover, students will become familiar with the fascinating and integrated processes required to discover, develop and/or “resurrect” drugs using two case studies. Students will apply their newly acquired knowledgebase *via* grant writing exercises and “study section” scenarios. At the conclusion of this course, students will be able to design strategies to validate a molecular target and have an informed view of the grant writing process.

Class Meeting Times and Locations. The course will be held Mondays (3:30 – 5:30 pm) and Wednesdays (9:30 – 11:30 am) in Jordan Hall room 5023.

Textbook and Course Material. There is no textbook for this course. However, each lecturer will assign readings from scientific literature, provide handouts and/or PowerPoint slides for corresponding lectures.

Course Projects. Each student will prepare a specific aims page# and participate in mock study section to “review and score” the generated specific aims from the class. Each student will also prepare a grant application* which focuses on how to validate a particular drug target within the context of a disease. ***The molecular target and disease context to each student will be provided on “Match Day.”*** Each student will give a 10 minute timed Power Point presentation based on his/her grant application to UVA faculty guest moderators. A question and answer period will follow the student’s presentation. The grant application page limit includes figures but not references. The written component of the projects (*i.e.*, specific aims page and actual grant application) is due by 5 pm on the dates listed below and mimics deadlines a principal investigator would experience when submitting a grant application to a variety of funding agencies. For each writing component of the project, the student will receive a written Summary Statement.

#Specific Aims page

Maximum of 1 page

Includes abstract and specific aims

Related to your grant application

Due 5 pm, Thursday Mar 3, 2016

Please submit the project to Tammy Snow – tjs3n@virginia.edu

Cc Elizabeth Sharlow (ers7g@virginia.edu) and John S. Lazo (lazo@virginia.edu)

*Grant application

Maximum of 6 pages not including abstract, specific aims or references

Mimics NIH R21 grant submission (*i.e.*, Significance, Innovation & Approach)

Due 5 pm, Thursday Mar 17, 2016

Please submit the project to Tammy Snow – tjs3n@virginia.edu

Cc Elizabeth Sharlow (ers7g@virginia.edu) and John S. Lazo (lazo@virginia.edu)

Student Evaluation and Competencies. The system of student evaluation has a foundation in self-initiated learning, participation in class activities and discussions. Thus, attendance is mandatory for this course. The fundamental goal of the course is to foster critical thinking, problem solving and the development of concepts rather than short-term retention or memorization of specific details or isolated facts. Thus, the student’s final course grade will be determined according to the system below:

Metric	Percent of Grade
Specific aims page, written component submitted by due date and time	5%
Mock study section	20%
Grant application, written component submitted by due date and time	10%
Grant application, written component	25%
Grant application, oral presentation & question/answer	25%
Class participation	10%
Attendance	5%
Total	100%

Class Lecture Topics

Date	Lecture Topic	Faculty moderator
Mon 2/15	Disease, drugs & discovery The chemical universe Match day	Elizabeth Sharlow John S. Lazo
Wed 2/17	Targeting GPCRs	Kevin Lynch
Mon 2/22	Targeting ion channels	Ed Perez-Reyes
Wed 2/24	Targeting the kinome	John S. Lazo Elizabeth Sharlow
Mon 2/29	Targeting nuclear receptors	Ira Schulman
Wed 3/2	Drugging the undruggable	John S. Lazo
Mon 3/7	Mock study section – specific aims page	Elizabeth Sharlow, John S. Lazo & guest faculty
Wed 3/9	Target deconvolution	Elizabeth Sharlow
Mon 3/14	Case study – TBD	Kevin Lynch
Wed 3/16	Case study – Thalidomide	John S. Lazo
Mon 3/21	Enhancing Anti-Tumor Immunity With MEDI9447: A Biological Target Validation Story	Kris F. Sachsenmeier Senior Scientist Oncology MedImmune Gaithersburg, MD
Wed 3/23	Student presentations, grant application: How to validate your favorite molecular target?	Elizabeth Sharlow, Kevin Lynch (session chair), & guest faculty

Please note: Course coordinators reserve the right to make changes to the lecture schedule and course content when necessary.