IMUN 601 Molecular Immunology – Syllabus – Fall 2021

Course Directors: Janis Burkhardt: jburkhar@pennmedicine.upenn.edu
Will Bailis: bailisw@chop.edu

Purpose

The purpose of this course is to provide examples in which the cell biology topics covered in BIOM 600 are studied in the context of immune cells or used to explain immune system function. This course will help students become proficient at reading and critically assessing the published literature and encourage students to actively participate in scientific discussions with their peers.

Format

We will meet once weekly (Thursdays, 10:15 – 11:45 am, SCL 0104) to discuss one of the papers provided by participating faculty members. This is not necessarily the most cutting-edge article in the field, but one that demonstrates key cell biology concepts. **All articles are available as pdf files on the Canvas site.**

Each week, one student (as assigned) will give a 10-15 minute overview of the key concepts covered in the article. Presentations will be given in a chalk-talk format. After the assigned student introduces the paper, they will lead other students as they take turns presenting figures from the paper. Together with each week's faculty member, they should moderate the discussion, clarify key points, and assist students who might have difficulty with the figure they are presenting. All students are strongly encouraged to participate in the discussion every week.

The discussion of each figure will cover:

1) What is the question being addressed?
2) Describe the techniques being used.
3) State the results.
4) Explain the statistical analysis used to interpret the data.
5) What are the authors' conclusions?
6) Are there alternative explanations? Were the appropriate controls used?
7) How did this figure fit within the overall context of the paper?

As a group, we will also discuss:

1) Whether the paper is convincing, and why or why not.
2) The significance of the work to the fields of immunology and cell biology.
3) Unresolved questions for the field going forward.

On Canvas you will find copies of the course schedule as well as pdf files for the individual papers we will be considering. The course schedule contains contact information for all course faculty and a list of students assigned to each paper. Presenters are strongly encouraged to contact the faculty member associated with the paper to discuss your 10-15 minute overview before your scheduled date. Participation is a big part of your grade in this class. Be prepared to participate in discussion of all figures and all aspects of the papers. Don't feel that you need to fully understand everything – its equally good to discuss what you find confusing or don't know how to interpret.

Quarantine and COVID contingencies

We are sensitive to the fact that throughout the semester some students may find themselves in a situation where they need to quarantine due to the ongoing pandemic. In the event that you need to quarantine, we have established a hybrid learning contingency plan. We ask that you notify the course directors and the faculty leader for that week as far in advance as possible so that arrangements can be made for virtual participation. If you are required to quarantine the week you are schedule to present, arrangements will be made so you can present virtually.

While hope that it will not be necessary, we are also prepared to migrate the course to a fully virtual format if the University deems it necessary. In instances where virtual presentations are required, PowerPoint presentations are fine, but the format must be casual – don't go overboard!! If you have access to a drawing tablet, you can also use a chalk-talk format.

Final Project

At the end of the term there will be a short "final project". This final project will allow you to hone your analytical and writing skills while learning something new about a topic of interest. To complete this project you will select an immunology-focused paper that is related to a topic covered in BIOM 600. Based upon this published work you will write a brief (1- 2 page maximum) review of the key findings.

The paper can be organized in any way that works, but should include the following parts:

1) An introduction to the question being posed.
2) A summary of methods used.
3) A synopsis of the main conclusion(s) of the paper.
4) A discussion of how the paper draws upon cell biology and how this impacts our understanding of immune system functions.
5) A discussion of future questions related to this topic that remain unresolved.
6) Literature cited
7) Optional – a schematic model (illustration) of the findings. Note: In general, you should never reproduce figures from the published papers. If you must, give attribution.

Final projects must be submitted by December 23rd via email to Will Bailis (bailisw@chop.edu). Also please direct any questions about the project or other course requirements directly to Will Bailis and Jan Burkhardt.

Assessment and Course Grades

Grades for this course will be determined by:

1) The quality of your 10-15 minute overview (approximately 25%).
2) Your overall level of participation and intellectual engagement (approximately 50%)
3) The quality of your final project (approximately 25%).

Accommodations

This is a discussion format course where students can get to know one another and the faculty. To make it as lively as possible, it is important to attend and be engaged on a consistent basis. Please reach out to Will Bailis and Jan Burkhardt if you expect to miss a class, or if virtual participation proves a hardship for you in some way, in the event of quarantine or migrating the course online.

IMUN 601 Molecular Immunology 2021

Thursdays, 10:15 – 11:45 am (SCL 0104)

COURSE DIRECTORS

Janis Burkhardt
816D Abramson Research Center
267-426-5410
jburkhar@pennmedicine.upenn.edu

Will Bailis
1211B Abramson Research Center
267-590-9396
bailisw@chop.edu

FACULTY

David Allman
230 John Morgan Building
215-746-5547
dallman@mail.med.upenn.edu

Yair Argon
816A Abramson Research Center
267-426-5231
yargon@pennmedicine.upenn.edu

Megan Clark
312 BRB II/III
215-898-2212
megclark@udel.edu
jhena@pennmedicine.upenn.edu

Laurence Eisenlohr
1107B Abramson Research Center
215-590-0952
eisenlc@pennmedicine.upenn.edu

Bruce Freedman
389E Old Vet Building
215-573-8218
bruce@vet.upenn.edu

Michael May
200E Old Vet Building
215-573-0940
maym@pennmedicine.upenn.edu

Neha Nataraj
3800 Spruce Street
Old Vet Quad 390EE
215-746-8426
ibrodsky@vet.upenn.edu
natarajn@pennmedicine.upenn.edu

Paula Oliver
816F Abramson Research Center
267-426-2839
paulao@pennmedicine.upenn.edu

Andrew Wells
916E Abramson Research Center
215-590-8710
adwells@pennmedicine.upenn.edu

THEMES (based on BIOM 600)

Signal Transduction
- NFkB (May)
- Signal transduction (Wells)
- Ubiquitin regulation (Oliver)

Compartmentation
- Protein folding (Argon)
- Cell stress response (Allman)
- Immune endocytosis (Eisenlohr)
- Mitochondria (Clark, Bailis)

Cytoskeleton and Cell Motility
- Immune cell motility (Burkhardt)
- Cytoskeleton (Burkhardt)

Ion Channels
- Ca2+ ion channels (Freedman)

Cell Fate
- Apoptosis (Nataraj)
- Immune cell metabolism (Bailis)

~ 2021 ~

DATE	FACULTY	TOPIC	PAPER	STUDENT
9/2	May	NFkB: Gateway to cell signaling	Sen/Baltimore, Cell, 1986	Katlyn Lederer
9/9	Wells	Signal transduction	Wang, Nat Imm, 2002	Stephanie Schreiner
9/16	Oliver	Ubiquitin regulation of immune signaling	Ahmed, Nat Imm, 2011	Ebony Smith
9/23	Oliver	Ubiquitin regulation of T cell persistence	Onizawa, Nat Imm, 2015	Bernadette Deschaine
9/30	Argon	Protein folding or exocytic trafficking	Feige, Molecular Cell, 2009	Alana McSween
10/7	Allman	Plasma cell and the UPR	Zhang, JCI, 2005	Krittin Trihemasava
10/14	Eisenlohr	Endosome trafficking and antigen presentation	Belabed, Nat Comm, 2020	Nina De Luna
10/21	Bailis	Mitochondria biogenesis and adaptive immunity	Buck, Cell, 2015	Julia Chini
10/28	Clark/Henao-Mejia	Mitochondrial metabolism and innate immunity	Mills, Cell, 2016	Jason Shoush
11/4	No class	IGG Retreat	----------	----------
11/11	Burkhardt	Immune cell motility	Vargas, Nat Cell Biol, 2015	Adjoa Osei-Ntansah
11/18	Burkhardt	Actin control of T cell activation	Le Floc'h, J Exp Med, 2013	Leonel Torres
11/25	No class	Thanksgiving week	----------	----------
12/2	Freedman	Calcium ion channels	Berry, Cell Reports 2020	Lillian Sun
12/9	Bailis	Immune cell metabolism	Balgih, Immunity, 2015	Ashwin Skelly
12/16	Brodsky / Nataraj	Apoptosis	Philip, PNAS, 2014	Leena Babiker
12/23	No class	Paper due	----------	----------