IMUN 601 Molecular Immunology – Syllabus – Fall 2022

Course Directors: Will Bailis: bailisw@chop.edu
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Purpose

The purpose of this course is to provide examples in which the cell biology topics covered in BIOM 600 are relevant to the functions of immune cells, the immune system, or inflammatory disease states. This course will help students become proficient at reading and critically evaluating the published literature and facilitate scientific discussions with peers.

Format

We will meet weekly (Thursdays, 10:15 – 11:45 am, SCL 0104) to discuss the paper provided by participating faculty members. Article selection will emphasize papers that demonstrates the key cell biology concepts discussed in BIOM 600. **All articles are available as pdf files on the Canvas site.**

Each week, one student (as assigned) will lead the discussion starting with a 10-15 minute presentation that reviews the key concepts covered in the article. If an uncommon technique is utilized, this should also be briefly reviewed to ensure everyone is at a similar level of knowledge. 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, the leader will moderate the discussion, clarify key points, address questions, and assist students who might have difficulty with the figure they are presenting.

The discussion of each figure will cover:

1) The question being addressed
2) The techniques being used
3) The results
4) The statistical analysis used to interpret the data
5) The authors' conclusions (and if the data support them)
6) Are there alternative interpretations?
7) Were appropriate controls used?
8) How the figure fit within the overall context of the paper

As a group, we will 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 students will find copies of the course schedule as well as pdf files for the individual papers we will be discussing. The course schedule contains contact information for all course faculty and a list of students assigned to each paper. Presenters should contact the faculty member associated with their paper for a 10-15 minute discussion prior to the presentation. This discussion should be used by the student to clarify any questions they have about the article (not to review the article for the first time).

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.

Assessment and Course Grades

The students presentation of their paper, and their participation during other peoples presentations, are basis for the course grade. Students should read articles ahead of time and be prepared to participate in discussion of all figures and all aspects of the papers (not just the figure they are presenting). You need to fully understand everything prior to class – its equally good to discuss what you find confusing or don't know how to interpret.

Grades for this course will be determined by:

1) The quality of your 10-15 minute overview (approximately 33%).
2) Your overall level of participation and intellectual engagement (approximately 66%)

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 David Hill 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 2022

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

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THEMES (based on BIOM 600)

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

Compartmentation
- Cell stress response (Allman)
- Immune endocytosis (Eisenlohr)
- Mitochondria (Bailis)

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

Ion Channels
- Ca2+ ion channels (Freedman)

Cell Fate
- Apoptosis (Nataraj)
- Metabolism and immune cells (Hill)

~ 2022 ~

DATE	FACULTY	TOPIC	PAPER	STUDENT
9/1	May	NFkB: Gateway to cell signaling	Sen, Cell, 1986	Alexandra Lopez/ Mito Tariveranmoshabad
9/8	Wells	Signal transduction	Wang, Nat Imm, 2002	Shaneaka Anderson
9/15	Oliver	Ubiquitin regulation of immune signaling	Ahmed, Nat Imm, 2011	Tim Johnston
9/22	Oliver	Ubiquitin regulation of T cell persistence	Onizawa, Nat Imm, 2015	Nicolai Apenes
9/29	Henrickson	STAT Signaling	Lyons, J Exp Med, 2017	Nathan Dangle
10/6	Allman	Plasma cell and the UPR	Iwakoshi, Nat Imm, 2003	Lauren Cominsky
10/13	Eisenlohr	Endosome trafficking and antigen presentation	Blander, Nature, 2006	Suzanna Rachimi
10/20	Bailis	Mitochondria biogenesis and adaptive immunity	Buck, Cell, 2016	Irene Molina
10/27	Burkhardt	Immune cell motility	Vargas, Nat Cell Biol, 2015	Ivanna Molina-Lopez
11/3	No class	IGG Retreat	-	-
11/10	Gordon	Asymmetric cell division	Chang, Science, 2007	Simon Zhou
11/17	Burkhardt	Actin control of T cell activation	Le Floc'h, J Exp Med, 2013	Laura Anderson
11/24	No class	Thanksgiving week	-	-
12/1	Freedman	Calcium ion channels	Berry, Cell Rep, 2020	Harrison Wang
12/8	Brodsky	Cell death and inflammation	Medina, Nature, 2020	Kyle Rekedal
12/15	Hill	Metabolism and immune cells	Raines, Nat Imm, 2022	Molly Nelson