

Welcome to

Spring 2023

CBPH 853: Cell Biology & Physiology of Human Health and Disease: Section II
6200MBRB | 4.5 credit hours

Course Directors



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Dates TBD		Faculty	Lecture Topics (Journal Club Papers TBD)	Notes
			<i>Cell signaling and drug discovery/development</i> Block Director: Natasha Snider	
M	1/09	Jay Brenman	Kinases and post-translational modifications (PTMs)	
W	1/11	Ellen Weiss	G-protein coupled receptors (GPCRs)	
F	1/13	Mike Emanuele	Cell cycle regulation	
M	1/16	No Class	MLK day	
W	1/18	Mohanish Deshmukh	Cell death pathways	
F	1/20	Mark Peifer	Cell-cell adhesions	
M	1/23	Scott Parnell	Developmental signaling pathways	
W	1/25	Natasha Snider	From cellular target to a treatment: drug discovery and development	
F	1/27	TBD	<i>Journal Club Discussion – Cell Signaling</i>	Exam 1 Distributed
M	1/30	No Class	Reading Day for Exam 1	

			<i>Cell Biology and Physiology of the Renal and Digestive Systems</i> <i>Block Director: Lori O'Brien</i>	
W	2/1	Evan Zeitler	Introduction to the renal system: cellular composition and physiology	
F	2/3	Lori O'Brien	Cellular and molecular mechanisms of kidney development and disorders	
M	2/6	John Poulton	Podocyte cell biology and glomerular disorders	
W	2/8	Meghan Free	Cellular mechanisms in autoimmune disorders of the kidney	
F	2/10	Lori O'Brien	Cellular responses in acute kidney injury	
M	2/13	No Class	Wellbeing day	
W	2/15	TBD	<i>Journal Club Paper Discussion – Renal System</i>	
F	2/17	Natasha Snider/H. McCauley	Into to the GI tract: cellular composition, function and diseases	
M	2/20	Scott Magness	Stem Cells and Intestinal Repair in Homeostasis and Disease	
W	2/22	M. Azcarte-Peril	The gut microbiome	
F	2/24	John Hansen	Cell and molecular mechanisms in Inflammatory Bowel Disease (IBD)	
M	2/27	Natasha Snider	Hepatocyte cell biology and liver disease mechanisms	
W	3/1	TBD	<i>Journal Club Paper Discussion – Digestive System</i>	Exam 2 distributed
F	3/3	No Class	Reading Day for Exam 2	
			<i>Cell Biology and Physiology of the Respiratory System</i> <i>Block Director: Scott Randell</i>	
M	3/6	Tarran	Introduction to respiratory cell biology and physiology I	
W	3/8	Randell	Introduction to respiratory cell biology and physiology II	
F	3/10	Tilley	Cell biology and pathophysiology of asthma	
M	3/13	Tarran	Cell biology and pathophysiology of COPD	
W	3/15	Randell	Cell biology and pathophysiology of Cystic Fibrosis	

F	3/17	Cyr	CFTR trafficking mechanisms	
M	3/20	Pickles	Cell biology and pathophysiology of respiratory infections	
W	3/22	Tilley	Cellular mechanisms of lung fibrosis development and progression	
F	3/24	Hagood	Cellular mechanisms of pediatric respiratory diseases	
M	3/27	Butrico-Livraghi	Animal models of lung diseases	
W	3/29	Anderson	Pharmacogenomics in lung disease and treatment	
F	3/31	TBD	<i>Journal Club Discussion – Respiratory System</i>	Exam 3 distributed
M	4/3	No Class	Reading Day for Exam 3	
			<i>Cell Biology of Aging, Cancer, and Neurodegeneration</i> <i>Block Director : Jess Thaxton</i>	
W	4/5	Rob Downen	Cellular mechanisms in growth and aging	
F	4/7	No Class	University Holiday	
M	4/10	Jess Thaxton	Organelle stress in tumor immunity	
W	4/12	Jessica Bowser	Tissue integrity and repair in regenerative medicine and cancer	
F	4/14	Yuliya Pylayeva-Gupta	Role of immune cells in the tumor microenvironment	
M	4/17	TBD	<i>Journal Club Discussion - Cancer biology</i>	
W	4/19	Mohanish Deshmukh	Determinants of nervous system resilience	
F	4/21	Juan Song	Stem cells in the nervous system	
M	4/24	Todd Cohen	Cellular aging and proteostasis failure in neurodegeneration	
W	4/26	Sarah Cohen	Cell biology of neurodegenerative diseases	
F	4/28	TBD	<i>Journal Club Discussion – Neurodegeneration</i>	Exam 4 distributed

Mode of Instruction: Class meets in-person on M-W-F, from 9-10:30AM. Location is 6200 MBRB.

Overview: This course is ideal for first- or second-year graduate students with an interest in cell biology, physiology, experimental medicine, and translational approaches aimed at understanding and treating human diseases. **Sessions will emphasize the integration of cell biological principles into physiological paradigms, and vice-versa.** The course covers fundamental cellular processes, such as intracellular signaling, cell-cell communication, immune regulation, inflammation, fibrosis, and stem cells. Journal clubs will highlight research techniques, protocols, ethical and diversity issues, data analysis methods, and drug development strategies that are relevant to studies in human subjects, human tissue samples, and translational research.

Key educational elements:

- Background readings enhance your understanding of physiology
- Lecture sessions emphasize cell biology and molecular and cellular mechanisms of tissue homeostasis and disease
- Journal club sessions focus on use and interpretation of key methods (there will be approximately 1 Journal Club Session for every 5 lectures)
- Fulfills course requirements for the “Med into Grad” Translational Medicine Program
- Four take-home exams

Grading:

(a) Class attendance is expected. Because we have no textbook, most of your learning will be based on material that is delivered in class and in the pre-class materials. In addition, the class discussions are meant to be highly interactive so that your learning can be targeted to topics that are most interesting/relevant to you. This can't happen if you don't attend. Therefore, poor attendance will impact negatively on your grade. Obviously, exceptions can be made for illness or family emergencies, but please contact the course director about this as soon as is feasible.

(b) Everyone starts the course with a P. A student will earn a low P (or, in the worst-case, an F) if their attendance or performance in class and on exams indicates to the course faculty that they are performing at a level that is unsatisfactory for a trainee who intends to follow a career in the biological sciences. A grade of H will be given to students whose test scores and in-class contributions consistently rank them at or near the top of the class. The four take-home exams will be weighted equally. Strong class participation or frequent unexcused absences can move a student up or down, respectively, if they are near the P/H border.

(c) Exams may include any of 3 types of questions: we may ask you to (i) summarize and reframe key lecture concepts in your own words, as a test of your understanding and a mechanism to help you solidify your learning, (ii) design experiments or critically evaluate data, as a test of your logical thinking and your mastery of key information provided in class, or (iii) answer questions that are based on the journal club readings, as a way to give you practice with a format that is used by several departments for their qualifying exams.

Your feedback is critical for the development of this course. You can find a course evaluation form in the “Resources” section of Sakai.