BIOCHEMISTRY AND MOLECULAR BIOLOGY 802 **Spring 2019**
Metabolic Regulation & Signal Transduction

Faculty:

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General course information: This course will utilize the D2L course management system. You must be officially registered in the course to access the D2L site. Instructors will post lecture notes, assigned papers, and other relevant material on this site. The lecturers will assume that students have a solid foundation in understanding basic principles of biochemistry and molecular biology. For this reason, BMB801 is strongly recommended as a background for the course.

Overall objectives of the course: This course is intended to provide an advanced treatment of key concepts in signal transduction and metabolic regulation. Attention will be focused on general themes that are expected to dominate future research in a particular area. The choice of lecture topics is also intended to provide students with an appreciation of the similarities and differences in signal transduction systems found in diverse organisms, including animals, yeast, plants, and bacteria.

Examinations and Grading: There will be four examinations that will comprise the majority of the grade: (I) Monday, Feb. 4, 2019 at 7:00-9:00 p.m., Room BCH 101 and covering material Jan. 7 through Feb. 21 (Ferguson-Miller, Wang) (**110 pts.**); (II) Monday Feb 25, 2019 at 7:00-9:00 p.m., Room BCH 101 covering material from Feb. 4 through Feb 22 **(Howe; 90 pts.)**; (III) Open book take-home exam due April 5, 2019 by 5:00pm, and covering material from Feb 25 through March 29 (**Ducat; 120 pts.**); and (IV) Open book take-home exam due May 2 by 10:00am, covering material from April 2 through April 27 (total **120 pts**) (Martinez-Hackert, 30 pts; Howe, 90 pts). Final grades will be computed by summing grades (total 440 pts) from each examination. A fraction of points (<10%) may be assigned for in-class activities, per Instructor preferences.

BIOCHEMISTRY 802Spring 2018
Metabolic Regulation & Signal Transduction
Instructors: Ducat, Ferguson-Miller, Howe, Martinez-Hackert, Wang M,W,F 10:20-11:10 a.m.
Location: Rm. 111 Biochemistry (BMB)

Date	Instructor	Topic
M 1/7	**Ferguson-Miller**	**Lipids and Membranes**
W 1/9	**Ferguson-Miller**	**Membrane structure/asymmetry**
F 1/11	**Ferguson-Miller**	**Membrane protein organization**
M 1/14	**Ferguson-Miller**	**Phospholipids**
W 1/16	**Wang**	***Martin Luther King, Jr. Day - no classes***
F 1/18	**Wang**	**Phospholipases**
M 1/21	**----**	**Synthesis of eicosanoid hormones**
W 1/23	**Wang**	**Leukotrienes and prostaglandins**
F 1/25	**Wang**	**Prostacyclins and thromboxanes**
M 1/28	**Wang**	**Nitric oxide signaling**
W 1/30	**Ferguson-Miller**	**Sphingolipids and inositol lipids**
F 2/1	**Ferguson-Miller**	**Lipidomics**
First Exam	**Monday, February 4 -- 7:00-9:00 p.m. Room BCH 101 (1/7 through 2/1 material)**	
M 2/4	**Howe**	**Ligand-receptor interactions**
W 2/6	**Howe**	**G protein-coupled receptors I**
F 2/8	**Howe**	**G protein-coupled receptors II**
M 2/11	**Howe**	**Structure and function of trimeric G proteins I**
W 2/13	**Howe**	**Structure and function of trimeric G proteins II**
F 2/15	**Howe**	**Regulation of G protein signaling I**
M 2/18	**Howe**	**Regulation of G protein signaling II**
W 2/20	**Howe**	**Nuclear receptors**
F 2/22	**Howe**	**NK-kB signaling**
Second Exam	**Monday, Feb 25 – 7:00-9:00 p.m. Room BCH 101 (2/4 through 2/22 material)**	
M 2/25	**Ducat**	**Quorum Sensing I**
W 2/27	**Ducat**	**Quorum Sensing II**
F 3/1	**Ducat**	**Interspecies sensing and communication**
3/4-8	**----**	**SPRING BREAK**
M 3/11	**Ducat**	**Classical Small G Protein Signaling**
W 3/13	**Ducat**	**Hijacking of Small G Protein Signaling in Pathogenesis**
F 3/15	**Ducat**	**PII and Carbon/Nitrogen balance I**
M 3/18	**Ducat**	**PII and Carbon/Nitrogen balance & Light Integration**
W 3/20	**Ducat**	**Circadian Rhythms**
F 3/22	**Ducat**	**Ligand-gated ion channels**
M 3/25	**Ducat**	**Receptor Evolvability & Modularity**
W 3/27	**Ducat**	**Conservation and modularity in signal transduction pathways**
F 3/29	**Ducat**	**Engineering through modularity of signal transduction pathways**
Third Exam	**Take home exam due Friday, April 5 by 5:00 pm (2/25 through 3/29 material)**	

M 4/1	**Martinez-Hackert**	**TGF-β signaling I**
W 4/3	**Martinez-Hackert**	**TGF-β signaling II**
F 4/5	**Martinez-Hackert**	**TGF-β signaling III**
M 4/8	**Howe**	**Kinases in signal transduction I**
W 4/10	**Howe**	**Kinases in signal transduction II**
F 4/12	**Howe**	**Plant receptor kinases**
M 4/15	**Howe**	**Histidine kinases and two-component signaling pathways**
W 4/17	**Howe**	**Photoreceptors**
F 4/19	**Howe**	**Phosphatase-linked receptors**
M 4/22	**Howe**	**Ubiquitin ligase-linked receptors I**
W 4/24	**Howe**	**Ubiquitin ligase-linked receptors II**
F 4/26	**Howe**	**Engineering small-molecule sensors**

Fourth Exam (Final) Take-home exam; due Thursday, May 2 by 10:00am (4/1 through 4/26 material).