BIOCHEMISTRY AND MOLECULAR BIOLOGY 802 **Spring 2015**
Metabolic Regulation & Signal Transduction

Faculty:

Dr. Art Alberts
Office: Van Andel Institute
Phone: 616-234-5316
Email: art.alberts@vai.org

Dr. Daniel Ducat
206 Plant Biology
Phone: 432-5118
Email: ducatdan@msu.edu

Dr. Shelagh Ferguson-Miller
Office: 310 Biochemistry Building
Phone: 355-0199
Email: fergus20@msu.edu

Dr. Gregg Howe (Course Coordinator)
Office: 4275 Molecular Plant Sciences
Phone: 355-5159
Email: howeg@msu.edu

Dr. Erik Martinez-Hackert
Office: 509 Biochemistry Building
Phone: 355-1604
Email: emh@msu.edu

Dr. John Wang
Office: 402D Biochemistry Building
Phone: 353-9542
Email: wangj@msu.edu

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: (I) Monday, Feb. 9, 2015 at 7:00-9:00 p.m., and covering material Jan. 12 through Feb. 6 (Ferguson-Miller, Wang) (110 pts.); (II) Monday, March 16, 2015 at 7:00-9:00 p.m., and covering material from Feb. 9 through March 6 (Howe-Alberts) (120 pts.); (III) Open book take-home exam due April 6, and covering material from March 16 through April 3 (90 pts.); and (IV) Open book take-home exam due May 6, and covering material from April 6 through May 1 (total 120 pts) (Martinez-Hackert, 30 pts; Howe, 90 pts). Final grades will be computed by summing grades (total 440 pts) from each examination.

BIOCHEMISTRY 802 **Spring 2015**

Metabolic Regulation & Signal Transduction

Instructors: Alberts, 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 1/12	Ferguson-Miller	Lipids and Membranes
W 1/14	Ferguson-Miller	Membrane structure/asymmetry
F 1/16	Ferguson-Miller	Membrane protein organization
M 1/19	--	*Martin Luther King, Jr. Day - no classes*
W 1/21	Ferguson-Miller	Phospholipids
F 1/23	Ferguson-Miller	Sphingolipids and inositol lipids
M 1/26	Ferguson-Miller	Lipidomics
W 1/28	Wang	Phospholipases
F 1/30	Wang	Synthesis of eicosanoid hormones
M 2/2	Wang	Leukotrienes and prostaglandins
W 2/4	Wang	Prostacyclins and thromboxanes
F 2/6	Wang	Nitric oxide signaling
First Exam	**Monday, February 9-- 7:00 p.m. (1/12 through 2/6 material)**	
M 2/9	Howe	Ligand-receptor interactions
W 2/11	Howe	G protein-coupled receptors I
F 2/13	Howe	G protein-coupled receptors II
M 2/16	Alberts	Small G proteins I
W 2/18	Alberts	Small G proteins II
F 2/20	Alberts	Small G proteins III
M 2/23	Howe	Structure and function of trimeric G proteins I
W 2/25	Howe	Structure and function of trimeric G proteins II
F 2/27	Howe	Regulation of G protein signaling I
M 3/2	Howe	Regulation of G protein signaling II
W 3/4	Howe	Nuclear receptors
F 3/6	Howe	NK-kB signaling
3/9-13	---	SPRING BREAK
Second Exam	**Monday, March 16 -- 7:00 pm (2/9 through 3/6 material)**	
M 3/16	Ducat	Quorum Sensing I
W 3/18	Ducat	Quorum Sensing II
F 3/20	Ducat	Interspecies sensing and communication
M 3/23	Ducat	PII and Carbon/Nitrogen balance I
W 3/25	Ducat	PII and Carbon/Nitrogen balance II
F 3/27	Ducat	Ligand-gated ion channels I
M 3/30	Ducat	Ligand-gated ion channels II
W 4/1	Ducat	Conservation and modularity in signal transduction pathways
F 4/3	Ducat	Engineering through modularity of signal transduction pathways
Third Exam	**Take home exam due Monday, April 6 by 5:00 p.m (3/16 through 4/3 material)**	

M 4/6	**Martinez-Hackert**	**TGF-β signaling I**
W 4/8	**Martinez-Hackert**	**TGF-β signaling II**
F 4/10	**Martinez-Hackert**	**TGF-β signaling III**
M 4/13	**Howe**	**Kinases in signal transduction I**
W 4/15	**Howe**	**Kinases in signal transduction II**
F 4/17	**Howe**	**Plant receptor kinases**
M 4/20	**Howe**	**Histidine kinases and two-component signaling pathways**
W 4/22	**Howe**	**Photoreceptors**
F 4/24	**Howe**	**Phosphatase-linked receptors**
M 4/27	**Howe**	**Ubiquitin ligase-linked receptors I**
W 4/29	**Howe**	**Ubiquitin ligase-linked receptors II**
F 5/1	**Howe**	**Engineering small-molecule sensors**
Fourth Exam	**Take-home exam due Wed May 6 by 12:00 noon (4/6 though 5/1 material).**	

TOPIC CATEGORIES - BIOCHEMISTRY AND MOLECULAR BIOLOGY ASBMB abstracts will be judged for Thematic Best Poster Awards in Anaheim! ASBMB short talks are selected from the submitted abstracts! Submit Today!Â Genome dynamics topic categories - biochemistry and molecular biology. Share. Html.Â Doctor of Philosophy in Biochemistry FACULTY OF MEDICAL SCIENCE Naresuan University 73 Doctor of Philosophy in Biochemistry The Biochemistry Department at Naresuan University is a leader in lower northern. More information. Structure and Function of DNA. Includes two new chapters on signal transduction and responses to pathogens. Restructuring of section on cell reproduction for improved presentation. Dedicated website to include all illustrative material. Biochemistry and Molecular Biology of Plants holds a unique place in the plant sciences literature as it provides the only comprehensive, authoritative, integrated single volume book in this essential field of study. Molecular Biology and Biochemistry of Fungal Carbohydrates. Front Matter. Pages 145-145.Â This new edition provides a comprehensive look at the molecular genetics and biochemical basis of fungal biology, covering important model organisms such as Aspergilli while also integrating advances made with zygomycetes and basidiomycetes. This book groups a total of 15 chapters authored by expert scholars in their respective fields into four sections. Five chapters cover various aspects of gene expression regulation. These range from regulation in organismal interactions between parasitic fungi and their host plant, heavy metal stress and global control of natural product genes to conidiati BIOCHEMISTRY 802Spring 2018 Metabolic Regulation & Signal Transduction Instructors: Ducat, Ferguson-Miller, Howe, Martinez-Hackert, Wang Location: Rm. 111 Biochemistry (BMB). M,W,F 10:20-11:10 a.m.Â SPRING BREAK Ligand-receptor interactions G protein-coupled receptors I G protein-coupled receptors II Structure and function of trimeric G proteins I Structure and function of trimeric G proteins II Regulation of G protein signaling I Regulation of G protein signaling II Nuclear receptors NK-kB signaling.

Plants respond to environmental challenges inducing several physiological, metabolic, and molecular responses. These responses are oriented to avoid or endure the adverse environmental condition in...Â Hubbard KE, Nishimura N, Hitomi K, Getzoff ED, Schroeder JI (2010) Early abscisic acid signal transduction mechanisms : newly discovered components and newly emerging questions. Genes Dev 24:1695â€“1708PubMedPubMedCentralCrossRefGoogle Scholar. Iriti M, Faoro F (2009) Chemical diversity and defence metabolism: how plants cope with pathogens and ozone pollution. Includes two new chapters on signal transduction and responses to pathogens. Restructuring of section on cell reproduction for improved presentation. Dedicated website to include all illustrative material. Biochemistry and Molecular Biology of Plants holds a unique place in the plant sciences literature as it provides the only comprehensive, authoritative, integrated single volume book in this essential field of study. The BIO 2010 report recommends that biology pedagogy should use an interdisciplinary approach incorporating a strong basis in mathematics and physical sciences. Many of the aims of BIO 2010 can be met by an interdisciplinary major program such as that of Biochemistry and Molecular Biology at Kenyon College.Â Intracellular and extracellular communication is conducted through an intricate and interwoven network of signal transduction pathways. The mechanisms for how cells speak with one another are of significant biological importance to both basic and industrial scientists from a number of different disciplines.