BIOCHEMISTRY AND MOLECULAR BIOLOGY

Program Information

In addition to offering the Masters program in Biochemistry and Molecular Biology, the Biochemistry and Molecular Biology Department faculty mentor Ph.D. students in the College of Medicine interdisciplinary program (IDP) in medical sciences as well. Students interested in pursuing a doctoral degree can view specific features of the biochemistry and molecular biology concentration at http://biochem.med.ufl.edu/ and http://idp.med.ufl.edu. For admission information, visit the IDP website.

The Department offers a wide variety of courses for graduate students studying in the life sciences. The research expertise of the faculty spans the areas from cell biology, metabolism, and molecular biology to physical biochemistry/structural biology. Current research interests include viral protease inhibitors, viral RNA replication, bioenergetics and proton translocation, X-chromosome structure and function, cytoskeletal assembly and dynamics, enzyme mechanism and control, chromatin structure, gene expression and regulation, mitochondrial biogenesis and evolution, the genetics of inherited disease, nutrient membrane transporters, protein site-directed mutagenesis, ribosome structure and function, signal transduction, structural biology and dynamics of macromolecules, protein-nucleic acid interactions, transgenic animal models, and virus crystal structure.

Prospective graduate students should have adequate training in chemistry and biology. Minor deficiencies may be made up immediately after entering graduate school. Previous undergraduate experience in a research laboratory is highly recommended. Doctoral students are required to take a core IDP course in fall term of their first year; and beginning in spring term, students take advanced classes in areas of interest. Specific advanced-level courses may be recommended by the student's supervisory chair and committee. Courses are open to all graduate students and advanced undergraduates. Additional courses may be listed in the Advanced Concentration in Biochemistry and Molecular Biology section under the major of Medical Sciences.

Degrees Offered

Degrees Offered with a Major in Biochemistry and Molecular Biology

- Master of Science
  - no concentration
  - concentration in Reproductive Biotechnology

Requirements for these degrees are given in the Graduate Degrees (http://gradcatalog.ufl.edu/graduate/degrees/) section of this catalog.

Courses

Biochemistry and Molecular Biology Courses

Code	Title	Credits
BCH 5413	Mammalian Molecular Biology and Genetics	3
BCH 6040	Research Discussion in Biochemistry and Molecular Biology	1
BCH 6206	Advanced Metabolism	3
BCH 6207	Advanced Metabolism: Role of Membranes in Signal Transduction and Metabolic Control	1
BCH 6208	Advanced Metabolism: Regulation of Key Reactions in Carbohydrate and Lipid Metabolism	1
BCH 6209	Advanced Metabolism: Regulation of Key Reactions in Amino Acid and Nucleotide Metabolism	1
BCH 6415	Advanced Molecular and Cell Biology	3
BCH 6740	Physical Biochemistry/Structural Biology	3
BCH 6741C	Magnetic Resonance Imaging and Spectroscopy in Living Systems	1-3
BCH 6744	Molecular Structure Determination by X-ray Crystallography	1
BCH 6744L	Molecular Structure Determination by X-Ray Crystallography Laboratory	1
BCH 6745	Molecular Structure and Dynamics of NMR Spectroscopy	1
BCH 6745L	Molecular Structure and Dynamics by NMR Spectroscopy Laboratory	1
BCH 6746	Structural Biology: Macromolecular Structure Determination	1
BCH 6747	Structural Biology/Advanced Physical Biochemistry: Spectroscopy and Hydrodynamics	1
BCH 6749C	Numerical Methods in Structural Biology	1
BCH 6876	Recent Advances in Membrane Biology	1
BCH 6875	Crystallography and Cryo-Electron Microscopy	1
BCH 6877	Recent Advances in Structural Biology	1
BCH 6905	Independent Studies in Biochemistry and Molecular Biology	1-5
BCH 6910	Supervised Research	1-5
BCH 6936	Biochemistry Seminar	1
BCH 6971	Research for Master's Thesis	1-15
BCH 7410	Advanced Gene Regulation	1
BCH 7412	Epigenetics of Human Disease and Development	1
BCH 7414	Advanced Chromatin Structure	1
BCH 7515	Structural Biology/Advanced Physical Biochemistry: Kinetics and Thermodynamics	1

College of Medicine Courses

Code	Title	Credits
GMS 5905	Special Topics in Biomedical Sciences	1-4
GMS 6001	Fundamentals of Biomedical Sciences I	5
GMS 6003	Fundamentals of Graduate Research and Professional Development	1
GMS 6004	IDP Practical Laboratory	2
GMS 6008	Fundamentals of Physiology and Functional Genomics	2
GMS 6090	Research in Medical Sciences	1-10
GMS 6096	Introduction to NIH Grant Writing for Biomedical Sciences	1
GMS 6160	Introduction to Oral Biology I	2
GMS 6161	Introduction to Oral Biology II	2
GMS 6405	Fundamentals of Endocrine Physiology	1
GMS 6406	Fundamentals of Pulmonary/Respiratory Physiology	1
GMS 6408	Fundamentals of Renal Physiology	1
GMS 6411	Fundamentals of Cardiovascular Physiology	1
GMS 6415	Fundamentals of Gastrointestinal Physiology	1
GMS 6491	Journal Club in Physiology	1

GMS 6780	Addiction: Neuroscience and Trends	3
GMS 6845	Clinical & Translational Research Practicum	3
GMS 6865	Quantitative Literacy for Translational Research	2
GMS 6875	Ethical and Policy Issues in Clinical Research	2
GMS 6895	CTS Journal Club	1
GMS 6903	Manuscript and Abstract Writing for Clinician/Scientists	2
GMS 6905	Independent Studies in Medical Sciences	1-10
GMS 6910	Supervised Research	1-5
GMS 6940	Supervised Teaching	1-5
GMS 6971	Research for Master's Thesis	1-15
GMS 7093	Introduction to Clinical and Translational Research	2
GMS 7877	Responsible Conduct of Biomedical Research	1
GMS 7944	Practicum in Biomedical Science Education	3
GMS 7950	Fundamentals of Biomedical Science Education	2
GMS 7979	Advanced Research	1-12
GMS 7980	Research for Doctoral Dissertation	1-15

Student Learning Outcomes

Biochemistry & Molecular Biology (MS)

SLO1 Competency: Knowledge of Biochemistry & Molecular Biology
Students will identify and explain fundamental principles in biochemistry and molecular biology by applying this knowledge to solve problems, to explain the background to a research project, and to answer novel questions in a research setting

SLO2 Competency: Research Methods
Students will perform an independent research project that requires students to: develop technical expertise required to independently perform experimental work, independently analyze data, report key results from experiments in both written and oral formats, critically evaluate primary literature, and reproduce experimental methods from the literature

SLO3 Professionalism
Students will be professional in their conduct of research. They will adhere to and practice ethical conduct of research and implement established safety, regulatory, and administrative rules

Faculty

Professor

- Bloom, Linda B.
- Bungert, Jorg
- Denslow, Nancy D.
- Flanegan, James B.
- Huang, Suming
- Kilberg, Michael S.
- Kladde, Michael P.
- Long, Joanna R.
- Mareci, Thomas H.
- Mckenna, Robert
- Nick, Harry S.
- Purich, Daniel L.
- Stacpoole, Peter W.
- Wallace, Margaret R.

Associate Professor

- Bubb, Michael Raymond
- Lu, Jianrong J.
- Merritt, Matthew E.

Assistant Professor

- Caglayan, Melike
- Xie, Mingyi

Research Associate Professor

- Koroly, Mary J.

Affiliated Faculty

- Cousins, Robert J.
  Eminent Scholar
- Feldherr, Carl M.
  Professor
- Fujii, Kotaro
  Assistant Professor
- Gumz, Michelle L.
  Associate Professor
- Khemtong, Chalermchai
  Associate Professor
- Li, Chenglong
  Professor
- Licht, Jonathan D.
  Professor
- Qian, Zhijian
  Associate Professor
- Southwick, Frederick Seacrest
  Professor
- Zarrinpar, Ali
  Professor