BIOCHEMISTRY AND MOLECULAR BIOLOGY

Office: 4374 Scott Hall; 313-577-1511
Chairperson: Bharati Mitra
http://www.biochem.med.wayne.edu/

Students electing to study in the Department of Biochemistry and Molecular Biology will find faculty with a broad range of research interests, including structural studies of macromolecules by x-ray, role of metals in biology and disease, bioenergetics, enzymology, the molecular basis of drug resistance, and new approaches to therapy in cancer and cardiovascular disease. The variety of coursework available within the Department, elsewhere in the School of Medicine, and in various other University departments, allow the student to acquire a deep and appropriate contemporary scientific background for experimental research. The Department encourages the development of an individually designed thesis project in collaboration with a student’s research mentor.

The Department of Biochemistry and Molecular Biology offers programs leading to the Master of Science and Doctor of Philosophy degrees. The master’s degree is recommended for students who wish to enhance their academic and practical research training above the undergraduate level without committing to a complete Ph.D. program. This program is geared for students who wish to do research in the biotechnology or pharmaceutical industries, who seek admission to Ph.D. or M.D. programs, and those who wish do technical or regulatory writing. The Ph.D. degree is standard in the Department for students planning teaching or research careers in this field. The department attempts to pattern students’ programs according to their interests and at the same time, to provide them with diverse experiences in the major areas of biochemistry. An M.D./Ph.D. program with a major in biochemistry is also available.

ACKERMAN, SHARON H.: Ph.D., M.S., New York University; B.S., George Washington University; Associate Professor

AKINS, ROBERT A.: Ph.D., Ohio State University; B.A., Wittenberg University; Professor

BROOKS, SAMUEL C.: Ph.D., M.S., University of Wisconsin; B.S., Carnegie Institute of Technology; Professor Emeritus

BRUSILOW, WILLIAM S.: Ph.D., University of Wisconsin; B.A., Princeton University; Professor

EDWARDS, BRIAN F. P.: Ph.D., M.A., Harvard University; B.S., University of British Columbia; Professor

EVANS, DAVID R.: Ph.D., Wayne State University; B.S., University of Notre Dame; Professor

GATTI, DOMENICO L.: M.D., Catholic University of S. Cuore; Ph.D., University of Bari; Professor

KOVAR, LADISLAU C.: Ph.D., University of Tennessee; M.S., B.S., University of Bucharest; Professor

LI, CHUNYING: Ph.D., University of Tennessee Health Science Center; M.Ed., Shanghai Institute of Physical Education; B.S., Anhul Normal University; Assistant Professor

MITRA, BHARATI: Ph.D., Cornell University; M.S., Indian Institute of Technology; B.S., Calcutta University; Professor

NEEDLEMAN, RICHARD B.: Ph.D., City University of New York; M.S., State University of New York at Stony Brook; B.A., Brandeis University; Professor

TSENG, YAN YUAN: Ph.D., University of Illinois at Chicago; Assistant Professor

VINOGRADOV, SERGE N.: Ph.D., Illinois Institute of Technology; M.A., B.A., American University of Beirut; Professor

WANG, JIANJUN: Ph.D., B.Sc., Nanjing University; M.S. Beijing Medicinal Chemistry Institute; Professor

YANG, ZHE: Ph.D., Chinese Academy of Sciences; Associate Professor

• Biochemistry and Molecular Biology (M.S.) (http://bulletins.wayne.edu/graduate/school-medicine/programs/biochemistry-molecular-biology/biochemistry-molecular-biology-ms)
• Biochemistry and Molecular Biology (Ph.D.) (http://bulletins.wayne.edu/graduate/school-medicine/programs/biochemistry-molecular-biology/biochemistry-molecular-biology-phd)

BMB 7010 General Biochemistry Lecture Cr. 4
Introduction to biochemistry: structure of biological molecules, enzymes, bioenergetics, intermediary metabolism. Biosynthesis of DNA, RNA, and proteins. Offered Fall.
Restriction(s): Enrollment is limited to Graduate level students.

BMB 7020 Biochemistry Laboratory Rotation Cr. 3
Research projects with various faculty. Offered Every Term.
Restriction(s): Enrollment is limited to Graduate level students.

BMB 7030 Core Concepts in Technologies in Biochemistry and Molecular Biology Cr. 4
Methods-based approach to understanding core concepts in biochemistry and biotechnology. Students acquire competence enabling them to explain and implement these approaches. Offered Fall.
Corequisite: BMB 7010
Restriction(s): Enrollment is limited to Graduate level students.

BMB 7140 Foundations of Computational Biology Cr. 3
Introduction to basic concepts of linear algebra and their application to biomedical research data analysis. MATLAB programs are introduced and employed as the tool for practical implementation of computational methods. Offered Fall.
Restriction(s): Enrollment is limited to Graduate level students.

BMB 7320 Protein Structure and Function Cr. 3
Structure, function, and design of proteins: architecture, function, regulation, assembly and evolution of proteins and protein complexes; theory and techniques of kinetic analysis; newer techniques of protein design and engineering. Offered Winter.
Prerequisite: BMB 7010 with a minimum grade of C
Restriction(s): Enrollment is limited to Graduate level students.
BMB 7330 Advanced Molecular Biology Cr. 2
Modern topics in biochemistry, including nucleic acid dynamics, genomic structure, DNA replication and repair, transcription, RNA processing, translation and protein synthesis. Offered Winter.
**Prerequisite:** BMB 7010 (may be taken concurrently) with a minimum grade of C
**Restriction(s):** Enrollment is limited to Graduate level students.
**Equivalent:** IBS 7330

BMB 7360 Advanced Structural Biology Cr. 2
Determination of structure and dynamics of biological molecules by NMR and crystallography; emphasis on protein structure and function. Offered Winter.
**Prerequisites:** ([BMB 7010 with a minimum grade of C and IBS 7020 with a minimum grade of C] OR [IBS 7015 with a minimum grade of C])
**Restriction(s):** Enrollment is limited to Graduate level students.

BMB 7670 Advanced Biochemistry Laboratory Cr. 2-10
Advanced laboratory techniques as applied to investigations of biological materials. Offered Every Term.
**Restriction(s):** Enrollment is limited to Graduate level students.

BMB 7890 Journal Club Cr. 1
Student presentations of papers from recent biochemistry literature; recommended for graduate students in biochemistry only. Offered Fall, Winter.
**Prerequisite:** BMB 7010 with a minimum grade of C
**Restriction(s):** Enrollment is limited to Graduate level students.
**Repeatable for 6 Credits**

BMB 7996 Research Cr. 1-15
Offered Every Term.
**Restriction(s):** Enrollment is limited to Graduate level students.
**Repeatable for 30 Credits**

BMB 8999 Master's Thesis Research and Direction Cr. 1-8
Offered Every Term.
**Restriction(s):** Enrollment limited to students with a class of Candidate Masters; enrollment is limited to Graduate level students.
**Repeatable for 8 Credits**

BMB 9990 Pre-Doctoral Candidacy Research Cr. 1-8
Research in preparation for doctoral dissertation. Offered Every Term.
**Restriction(s):** Enrollment is limited to Graduate level students.
**Repeatable for 12 Credits**

BMB 9991 Doctoral Candidate Status I: Dissertation Research and Direction Cr. 7.5
Offered Every Term.
**Restriction(s):** Enrollment is limited to Graduate level students.

BMB 9992 Doctoral Candidate Status II: Dissertation Research and Direction Cr. 7.5
Offered Every Term.
**Prerequisite:** BMB 9991 with a minimum grade of S
**Restriction(s):** Enrollment is limited to Graduate level students.

BMB 9993 Doctoral Candidate Status III: Dissertation Research and Direction Cr. 7.5
Offered Every Term.
**Prerequisite:** BMB 9992 with a minimum grade of S
**Restriction(s):** Enrollment is limited to Graduate level students.

BMB 9994 Doctoral Candidate Status IV: Dissertation Research and Direction Cr. 7.5
Offered Every Term.
**Prerequisite:** BMB 9993 with a minimum grade of S
**Restriction(s):** Enrollment is limited to Graduate level students.

BMB 9995 Candidate Maintenance Status: Doctoral Dissertation Research and Direction Cr. 0
Offered Every Term.
**Restriction(s):** Enrollment is limited to Graduate level students.
**Course Material Fees:** $348.67
**Repeatable for 0 Credits**

BMB 9999 Doct Diss Rsch&Dir Cr. 1-16
Offered Every Term.
**Restriction(s):** Enrollment is limited to Graduate level students.