

DEPARTMENT OF MEDICINAL AND BIOLOGICAL CHEMISTRY

The Department of Medicinal and Biological Chemistry consists of 11 primary and joint faculty members. In addition to basic biochemistry, our faculty members are involved in research in neuroscience, autoimmunity and basic immunology, cancer therapy and vaccines, inflammation and obesity, kidney and cardiovascular diseases, toxicology, organic synthesis, and targeted drug design and development. Our faculty members are recognized authorities in their areas of specialization, conducting research that contributes to the development of new treatments, practices, and innovations.

The department is equipped with state-of-the-art computer-assisted instrumentation, providing facilities that allow for a wide variety of research approaches. These facilities are available for use by all students involved in graduate research.

The department is associated with the Center for Drug Design and Development, a university-wide resource and a focal point for developing collaborative research efforts with the pharmaceutical industry.

CONTACT

Department Chair, Dr. Katherine Wall
Phone: 419.383.1943
Fax: 419.383.1909
Email: katherine.wall@utoledo.edu

Dr. Liyanaaratchige Tillekeratne

Phone: 419.530.1983

Email: liyanaaratchige.tillekeratne@utoledo.edu

Degrees Offered

- Doctor of Philosophy in Medicinal Chemistry (<https://catalog.utoledo.edu/graduate/pharmacy-pharmaceutical-sciences/departments-programs/medicinal-biological-chemistry/phd-medicinal-chemistry/>)
- Master of Science in Medicinal Chemistry (<https://catalog.utoledo.edu/graduate/pharmacy-pharmaceutical-sciences/departments-programs/medicinal-biological-chemistry/ms-medicinal-chemistry/>)

Combined Degree Programs

- Pharm.D./Doctor of Philosophy in Medicinal Chemistry Dual Degree (<https://catalog.utoledo.edu/graduate/pharmacy-pharmaceutical-sciences/departments-programs/combined-pharmd-phd-medicinal-chemistry/>)
- Bachelor of Science in Pharmaceutical Sciences (Medicinal and Biological Chemistry) and Master of Science in Medicinal Chemistry (BSPS/MS) combined 5-year option (<https://catalog.utoledo.edu/graduate/pharmacy-pharmaceutical-sciences/departments-programs/medicinal-biological-chemistry/ms-medicinal-chemistry/#planofstudytext>)

MBC 5100 Ethical Conduct Research

[1 credit hour]

Consideration of the scientific, ethical and legal obligations of the graduate student researcher.

Term Offered: Spring, Summer

MBC 5310 Medicinal Chemistry I: Drug Action And Design

[2 credit hours]

An introductory course presenting the basic chemical principles governing the behavior of drugs and the design of new therapeutics.

Term Offered: Fall

MBC 5380 Medicinal And Poisonous Plants

[3 credit hours]

Lecture/field course examining medicinal and harmful properties of herbals and plants using pharmacognosy, clinical trials and local plant examples.

Term Offered: Summer, Fall

MBC 5550 Physiological Chemistry I: Structure And Function Of Biological Macromolecules

[3 credit hours]

An examination of the levels of structure of proteins, nucleic acids, other biomolecules and biomolecular assemblies.

Term Offered: Fall

MBC 5552 Physiological Chemistry II Cellular Metabolism and Homeostasis

[2 credit hours]

An examination of the chemistry and regulation of metabolic processes in cells, interacting cells and tissues.

Prerequisites: MBC 3550 with a minimum grade of D- or MBC 5550 with a minimum grade of D-

Term Offered: Spring

MBC 5620 Biochemical Techniques

[2 credit hours]

A detailed study of biochemical laboratory techniques necessary for the development of novel therapeutics, including bioassays and data analysis.

Term Offered: Fall

MBC 5860 Microbiology for Pharmaceutical Professionals

[2 credit hours]

This is a lecture and laboratory course with emphasis on microorganisms that cause disease. Special attention will be paid to structures and mechanisms present in microorganisms that can be exploited to inhibit the growth and survival of these organisms in a human host.

Prerequisites: MBC 3550 with a minimum grade of D- or MBC 5550 with a minimum grade of D-

Term Offered: Spring

MBC 5900 Medicinal Chemistry Seminar

[1 credit hour]

Presentation and discussion of advanced research topics in medicinal chemistry, with an emphasis on evaluating and criticizing emerging data as a way of testing hypotheses.

Term Offered: Spring, Summer, Fall

MBC 6100 Advanced Immunology

[2 credit hours]

Readings in and critical analysis of the recent literature in immunology and basic immunologic responses, especially as considered in immunotherapy.

Term Offered: Spring, Fall**MBC 6190 Advanced Medicinal Chemistry**

[4 credit hours]

Discussion of the qualitative and quantitative aspects of the design of new therapeutic agents. Approaches to the design of drugs and new therapeutic modalities directed at enzymes, receptors, membrane transport proteins and nucleic acids are examined.

Term Offered: Fall**MBC 6200 Biomedical Chemistry**

[4 credit hours]

Examination of the primary literature on approaches to the design of new therapeutic agents. Recent novel directions in the design of drugs will be examined and compared.

Prerequisites: MBC 6190 with a minimum grade of D-**Term Offered:** Spring**MBC 6300 Biomedical Chemistry Laboratory I**

[1 credit hour]

Experimental research problems in biomedical chemistry.

Prerequisites: (MBC 6190 with a minimum grade of D- and MBC 6550 with a minimum grade of D-)**Term Offered:** Spring, Fall**MBC 6310 Biomedical Chemistry Laboratory II**

[3 credit hours]

Additional experimental research problems in biomedical chemistry (see MBC 6300/8300).

Prerequisites: (MBC 6190 with a minimum grade of D- and MBC 6550 with a minimum grade of D-)**Term Offered:** Spring, Summer, Fall**MBC 6400 Cannabis Science: Plants and Products**

[3 credit hours]

CS Plants & Products considers in-depth the growth of Cannabis sativa and its subspecies as well as the production and physical properties of both chemical and consumer products derived from them. Examining the factors, procedures, and techniques that make for optimal medicinal and recreational outcomes, the course is designed for learners with diverse backgrounds, interests, and intents

Term Offered: Spring, Summer, Fall**MBC 6450 Advanced Synthetic and Medicinal Chemistry**

[2 credit hours]

Readings in and critical analysis of recent literature in synthetic and medicinal chemistry research.

Term Offered: Spring, Fall**MBC 6550 Biochemistry**

[4 credit hours]

A consideration of the structure and function of biological macromolecules as well as the basic and regulated metabolism of cells.

Term Offered: Fall**MBC 6960 M.s. Thesis Research In Medicinal Chemistry**

[1-15 credit hours]

Development and pursuit of research leading to an M.S. thesis in medicinal chemistry.

Term Offered: Spring, Summer, Fall**MBC 6980 Special Topics In Biomedical Chemistry**

[1-5 credit hours]

Selected study of topics in medicinal chemistry. New chemical and biochemical strategies in drug design are examined in detail.

Term Offered: Spring, Summer, Fall**MBC 7100 Ethical Conduct of Research**

[1 credit hour]

Consideration of the scientific, ethical and legal obligations of the graduate student researcher.

Term Offered: Spring, Summer**MBC 7620 Biochemical Techniques**

[2 credit hours]

A detailed study of biochemical laboratory techniques necessary for the development of novel therapeutics, including bioassays and data analysis.

Term Offered: Fall**MBC 7900 Medicinal Chemistry Seminar**

[1 credit hour]

Presentation and discussion of advanced research topics in medicinal chemistry, with an emphasis on evaluating and criticizing emerging data as a way of testing hypotheses.

Term Offered: Spring, Summer, Fall**MBC 8100 Advanced Immunology**

[2 credit hours]

Readings in and critical analysis of the recent literature in immunology and basic immunologic responses, especially as considered in immunotherapy.

Term Offered: Spring, Fall**MBC 8190 Advanced Medicinal Chemistry**

[4 credit hours]

Discussion of the qualitative and quantitative aspects of the design of new therapeutic agents. Approaches to the design of drugs and new therapeutic modalities directed at enzymes, receptors, membrane transport proteins and nucleic acids are examined.

Term Offered: Fall**MBC 8200 Biomedical Chemistry**

[4 credit hours]

Examination of the primary literature on approaches to the design of new therapeutic agents. Recent novel directions in the design of drugs will be examined and compared.

Prerequisites: MBC 8190 with a minimum grade of D-**Term Offered:** Spring**MBC 8300 Biomedical Chemistry Laboratory I**

[1 credit hour]

Experimental research problems in biomedical chemistry.

Prerequisites: (MBC 6190 with a minimum grade of D- and MBC 8550 with a minimum grade of D-)**Term Offered:** Spring, Fall

MBC 8310 Biomedical Chemistry Laboratory II

[3 credit hours]

Additional experimental research problems in biomedical chemistry (see MBC 6300/8300).

Prerequisites: (MBC 6190 with a minimum grade of D- and MBC 8550 with a minimum grade of D-)

Term Offered: Spring, Summer, Fall

MBC 8450 Advanced Synthetic and Medicinal Chemistry

[2 credit hours]

Readings in and critical analysis of recent literature in synthetic and medicinal chemistry research.

Term Offered: Spring, Fall

MBC 8550 Biochemistry

[4 credit hours]

A consideration of the structure and function of biological macromolecules as well as the basic and regulated metabolism of cells.

Term Offered: Fall

MBC 8960 Ph.D. Dissertation Research In Medicinal Chemistry

[1-15 credit hours]

Development and pursuit of research leading to a Ph.D. dissertation in medicinal chemistry.

Term Offered: Spring, Summer, Fall

MBC 8980 Special Topics In Biomedical Chemistry

[1-5 credit hours]

Selected study of topics in medicinal chemistry. New chemical and biochemical strategies in drug design are examined in detail.

Term Offered: Spring, Summer, Fall