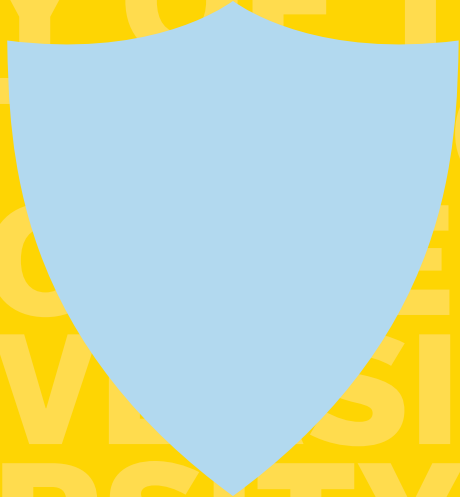




COLLEGE OF MEDICINE
AND LIFE SCIENCES

THE UNIVERSITY OF TOLEDO



THE UNIVERSITY OF TOLEDO

Biomedical Science
Graduate Program

UToledo's College of Medicine and Life Sciences provided me with a great education in bioinformatics, genomics, and proteomics, as well as an opportunity for me to work on advanced technologies like the application of artificial intelligence and machine learning in medicine.

I was very lucky to have this opportunity and because of that, I was able to secure an internship at Scripps Research Institute during my last semester and a permanent position as a Bioinformatics Specialist at La Jolla Institute for Immunology.”

AHMAD ALIMADADI, PH.D., '20
Bioinformatics Track





THE UNIVERSITY OF TOLEDO

17,000+ STUDENTS

ALUMNI NETWORK OF
165,000 WORLDWIDE

TOLEDO ROCKETS COMPETE IN
NCAA Division I
MID-AMERICAN CONFERENCE

\$61.1 million+
EXTERNALLY FUNDED ACTIVE
RESEARCH PROJECTS

The University of Toledo is a public research university. Established in 1872, the University offers undergraduate, graduate and professional programs in the arts, natural sciences, health sciences, education, engineering, business and law.

Students enjoy technologically advanced learning facilities on two campuses, the historic Main Campus and the Health Science Campus, as well as ancillary facilities to support research and scholarly activity that include the Lake Erie Center, the Stranahan Arboretum and the Frank Gehry-designed Center for Visual Arts at the Toledo Museum of Art.

The Health Science Campus has a state of the art Simulation Center used by clinicians, students, and residents for a variety of clinical training and research projects.

The mission of The University of Toledo College of Medicine and Life Sciences is to improve health in the communities and region we serve. We do this by educating excellent clinicians and scientists, by providing high quality, patient-centered care and by producing nationally recognized research in focus areas.



THE COLLEGE OF MEDICINE AND LIFE SCIENCES

The Biomedical Science Graduate Program (BMSP) at The University of Toledo prepares students for an independent career in research through advanced courses complemented by active participation in faculty-mentored laboratory research in one of our five BMSP Research Tracks.

50
PH.D.
STUDENTS

35
POSTDOC
FELLOWS

10
M.S.B.S.
STUDENTS

16
M.D./PH.D.
STUDENTS

68
BASIC
SCIENCE
FACULTY

Tracks are organized around research themes that relate to human disease processes. They are affiliated with basic science departments but are interdisciplinary and draw faculty members with common research interests from a variety of basic science and clinical departments.

The program's mission is to provide young scientists with a solid, cohesive foundation in biomedical sciences, while providing discipline-specific training in the basis of human disease. The BMSP gives trainees

the skills and knowledge necessary to pursue independent successful scientific careers in a wide variety of scientific areas, including academia, government, industry, and private or entrepreneurial scientific businesses.

- Team-taught courses during first-year core curriculum. Each track has advanced level courses.
- Students are not required to complete teaching assistantships.





VISIT US
on the Health Science
Campus at UToledo.

Biomedical Science Ph.D. research tracks

- Bioinformatics
- Cancer Biology
- Medical Microbiology and Immunology
- Molecular Medicine
- Neurosciences and Neurological Disorders

All tracks are eligible for M.D./Ph.D.
dual-degree program

Certificate Offered

- Bioinformatics

Programs start in August





LEARN MORE
about track specific
courses.

CURRICULUM

All Ph.D. research tracks (except Bioinformatics) share a common first-year curriculum. Following the first year, you'll take specific upper-level courses and complete your dissertation research.

First-year Curriculum

- Protein Structures
- Genes & Genomes
- Cell Membranes
- Methods in Biomedical Sciences
- On Being a Scientist
- Cell Biology & Signaling
- Systems Pathophysiology

Ph.D. Requirement

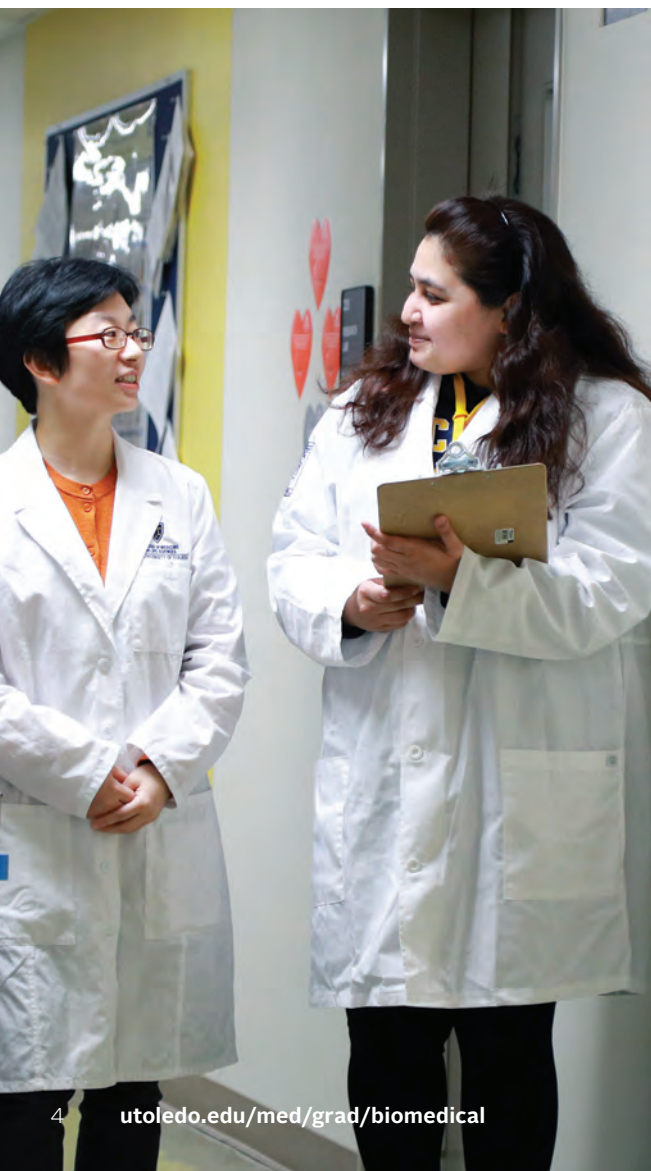
90 Credits

Finding a Research Mentor:

Finding a principal investigator (PI) is an important part of any research program. During the first year we host the "PI Parade" in which faculty present on their research areas. Students will identify faculty whose research they are interested in and will spend several months working in various faculty labs. This process helps to ensure the student/PI match is a mutual decision.

Lab Rotations for Ph.D.

Three seven-week rotations.



Our core values

- Professionalism
- Service
- Diversity
- Collaboration
- Discovery

EXPANDING YOUR EXPERIENCE

At The University of Toledo College of Medicine and Life Sciences, you'll have exciting opportunities to maximize your learning through in-depth, hands-on experiences.



The simultaneous training to become a dedicated leader and an integral team player was one of my most invaluable takeaways from the Biomedical Science Program.

I am thankful that UToledo has multiple opportunities for everyone to build these translational skills that will undoubtedly better prepare ourselves for successful careers.”

RACHEL GOLONKA, PH.D., 2022
Molecular Medicine Track



ACADEMIC RESEARCH TRACKS

The Biomedical Science Program includes five research specialized tracks. Opportunities for specialization, dual-degree programs and flexible scheduling options allow you to customize your degree progression.

Bioinformatics provides training in the rapidly developing interface between computer science and life sciences. Graduates are in high demand due to the explosion in genome sequence and proteomics analyses.

The Bioinformatics certificate also can be added to a Ph.D. program as a certificate by taking three Bioinformatics courses.

Cancer Biology takes an integrated approach to training the next generation of cancer researchers by developing broad knowledge and expertise in cancer biology.

Research areas include:

- Influence of tumor microenvironment on cancer progression and metastasis
- Stem cell/iPS cell technology to reprogram cancer cells to normal-like cells
- Epigenetic regulation of tumor suppressors and oncogenes
- Mechanisms of drug resistance, cancer diagnosis and treatment
- MicroRNAs in cancer etiology and progression
- Intracellular signal transduction
- Metabolic regulation in cancer
- Molecular genetics of cancer



Medical Microbiology and Immunology

provides you with education and research training on the microorganisms relevant to human health and on the immune system, diseases and rejection of transplanted organs. Microbiology faculty study individual microbes with a particular emphasis on virulence mechanisms, disease pathogenesis, genetic regulation and evasion of host defense.

Research areas include:

- Bacteria, viruses and fungi that cause human diseases, including pneumonia, diarrhea, skin infections and chronic infections
- Host responses to infection that lead to infection clearance, exacerbation of disease or autoimmune disease such as asthma, lupus and rheumatoid arthritis
- Development, differentiation and activation of the innate and adaptive immune systems
- Multidisciplinary research projects involving microbiology, immunology, cell biology, genetics, molecular biology, pathology and bioinformatics
- Novel approaches to vaccine development
- Mechanisms to prevent transplant rejection

Molecular Medicine provides interdisciplinary training for students in the genetics and pathophysiology of multiple diseases, including:

- Cardiovascular diseases such as hypertension, vascular functions and atherosclerosis
- Endocrine diseases such as diabetes, renal disease, obesity and infertility
- Immune diseases such as colitis and arthritis

Students participate in research through the University's Center of Hypertension and Precision Medicine, UToledo Microbial Consortium and Center for Diabetes and Endocrine Disease.

Research areas include:

- Physiological “-omics” of complex traits
- Systems biology
- Metabolism
- Endocrinology
- Reproductive physiology
- Skeletal physiology
- Cardiac, vascular and renal physiology and pharmacology

Neurosciences and Neurological Disorders

emphasizes training in both basic and translational neuroscience. You'll gain hands-on experience using a variety of state-of-the-art cellular/molecular biological, neuroanatomical and physiological approaches to investigate fundamental questions relating to synaptic function, neuronal signaling and development and plasticity of the nervous system.

Research areas include:

- Development, organization and maintenance of central and peripheral components of the nervous system
- Anatomy and function of neural circuits that control organs
- Mechanisms of regeneration and repair
- Synaptic biology
- Neuronal signaling
- Plasticity of the nervous system
- Neuropsychiatric disorders and behavior



Student Life

The Council of Biomedical Graduate Students (CBGS) is an organization representing students from all five tracks in the Biomedical Science program.

CBGS is involved with planning and execution of various events for graduate students throughout the year.

Key Events:

- The Graduate Research Annual Forum is an annual competition that allows students the opportunity to present their research through oral and poster presentations with awards given for best presentations. Students receive insight from a panel of judges and their peers to help prepare them for national and international scientific conferences.
- The Career Forum, held every fall, gives students the opportunity to meet with professionals in both academia and their industry of choice.
- CBGS also plans regular social events for students to get to know one another and relax between classes and bench work.

Celebrating Success

Your academic journey will be full of opportunities to celebrate your accomplishments. Faculty, staff and students come together to celebrate achievements and allow students to reflect on their journey.

Events include:

- New Student Orientation
- Welcome Picnic
- Lab Coat Ceremony
- Public Dissertation Defense
- College of Medicine and Life Sciences Graduate Awards Ceremony
- College of Medicine and Life Sciences Commencement



BIG CITY, CLOSE-KNIT TIES

Experience how good life is in the Glass City. Located on the western shore of Lake Erie, a short drive to beaches, lakeside parks and ferry access to popular island destinations, Toledo offers both the cultural amenities of a big city and the close-knit feel of a small town.



Being a part of the Council of Biomedical Graduate Students has also allowed me to improve my communication and leadership skills.

I am thankful to the Biomedical Science Program for helping me acquire all the transferable skills that I would need to succeed in any career after graduate school.”

SAYANI BHATTACHARJEE, PH.D.
Class of 2022

ABOUT TOLEDO

Toledo is the fourth-largest city in Ohio. You'll enjoy a superb quality of life in a vibrant metropolitan area with affordable cost of living, short commutes and welcoming neighborhoods.



You Will Do Better in Toledo

People of all ages enjoy Toledo's ballet, symphony, world-renowned art museum, theatre, zoo and aquarium, and Imagination Station science museum. For sports fans, catch a Toledo Mud Hens game at Fifth Third Field, named the nation's best minor league baseball stadium by Newsweek. Or, stop by the downtown arena to see the Toledo Walleye hockey team.

Explore Toledo's many historic neighborhoods to find special hidden gems scattered throughout the city, or explore beyond Toledo to find modern amenities, fine restaurants and more in suburban areas like Perrysburg, Sylvania and Maumee, all within a 15-minute drive.

Attractions

- Toledo Museum of Art
- Toledo Opera
- Toledo Zoo and Aquarium
- Toledo Symphony Orchestra
- Toledo Ballet
- Metroparks Toledo
- Maumee Bay State Park
- Toledo Walleye ECHL hockey
- Toledo Mud Hens AAA baseball
- National Museum of the Great Lakes
- Toledo Botanical Gardens

More exciting opportunities, a short drive away:

- Cedar Point Amusement Park
- Comerica Park (home of the Detroit Tigers)
- Ann Arbor Street Art Fair
- DTE Energy Music Theatre



Biomedical Science students learn biomedical research techniques and concepts from their advisors, their peers, postdocs, and their committees in a close-knit research environment.



A THRIVING MIDWEST COMMUNITY WITH MUCH TO OFFER AND CONVENIENT TO MAJOR METROPOLITAN AREAS

Toledo is a great place to live, and launch your graduate experience — or your career in medical research.

We are located in northwest Ohio near the Michigan border at the intersection of I-75 and I-80/90. Toledo is just an hour's drive away from the Detroit airport and within hours of most of the Midwest's major cities. That's important when it comes to fellowships and job hunting — or when you just need to get away for a weekend.

Visit ToledoRegion.com to explore life in Toledo.

Follow [#ItMattersWhereYouMakeIt](https://twitter.com/ItMattersWhereYouMakeIt) for an unfiltered view of Toledo living



**MAP
IT!**

College of Medicine and Life Sciences

The University of Toledo
3000 Arlington Ave.
Toledo, OH 43614

GETTING STARTED

Application Process and Admission Standards

Applicants for a Ph.D. or M.S. in the Biomedical Science Program will need to complete an online application through the College of Graduate Studies and submit additional materials and an application fee.

- Visit apply.utoledo.edu to apply. The application fee is \$75 for international applicants and \$45 for domestic applicants and permanent resident or green card holders.
- Applicants must hold an earned baccalaureate degree (or equivalent) from an accredited college or university and have a minimum overall GPA of 3.0 on a 4.0 scale.
- Official transcripts will be required via postal mail. Electronic transfer of transcripts by the applicant will not be accepted.
- Typically, applicants will have an undergraduate major in biology or a related discipline such as biochemistry or biophysics. Coursework should include chemistry through organic chemistry, physics, and math through calculus. Students with other majors such as chemistry or physics are encouraged to apply, but their coursework should include several semesters in biology.

- Applicants will be required to submit a resume and a statement of purpose. Relevant research experience is highly recommended to be a competitive applicant, especially for the Ph.D. training program, and should be discussed within the statement of purpose by the applicant.
- The Graduate Record Examination (GRE) is no longer required.
- International students also will need to provide scores for the Test of English as a Foreign Language (TOEFL/IELTS/PTE/Duolingo Requirements), unless they have already received a degree from a U.S. institution. A PBT score at or above 550 or an iBT score at or above 80 is required for admission into UToledo graduate studies.

Application Deadline

Dec. 15

- Three letters of recommendation are required. The online application process will provide you with the opportunity to send electronic requests for recommendation to people you select.
- Official transcripts are required from all universities/colleges you have attended.

TOEFL scores must be submitted through ETS (ets.org) using institution code: 1845.

Applications are considered for fall semester entrance only. The application deadline is Dec. 15.

International applicants should also have completed their current degree program by May 1. The number of available Ph.D. positions varies each year and depends upon faculty research funding. Only funded faculty can accept students into their lab. Ph.D. students receive tuition waivers, a living stipend, and health insurance.



LEARN MORE
about applying to
our programs.



COLLEGE OF MEDICINE
AND LIFE SCIENCES

THE UNIVERSITY OF TOLEDO

FUELING **TOMORROWS**

Learn More

utoledo.edu/med/grad/biomedical

Visit Campus

utoledo.edu/med/about/visit-directions

Apply Today

utoledo.edu/med/grad/biomedical/requirements

Connect

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College of Medicine and Life Science Graduate Office

biomedsciencegrad@utoledo.edu