

Where Science Meets Success

*A Guide to the Biomedical Sciences
PhD umbrella program at
UMass Chan Medical School*



Morningside
Graduate School of
Biomedical Sciences

Introduction

We are excited to learn of your interest in the PhD in Biomedical Science program at the Morningside Graduate School of Biomedical Sciences. In the pages that follow, you are invited to envision yourself studying alongside mentors and colleagues as you make an impact on biomedical research at UMass Chan Medical School. As the commonwealth's first and only public academic health sciences center, our mission is to advance the health and wellness of our diverse communities throughout Massachusetts and across the world by leading and innovating in education, research, health care delivery and public service.

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Morningside Graduate School of Biomedical Sciences

UMass Medical School is now UMass Chan Medical School and the Graduate School of Biomedical Sciences is now the Morningside Graduate School of Biomedical Sciences, thanks to a transformational gift from The Morningside Foundation.

Your first year as an umbrella PhD student at Morningside Graduate School of Biomedical Sciences

Get acclimated to the Morningside Graduate School of Biomedical Sciences

Imagine you've been accepted. What happens next?

You will join a community recognized for collaboration, achievements and outcomes on your way to becoming a science leader. Our mission is to develop future leaders in all sectors of biomedicine including research, education, policy and entrepreneurship.

A fully-funded umbrella PhD program

Once enrolled, you will receive a competitive financial package, including generous stipend for the duration of the program, transition assistance, health insurance at no cost to you and a full tuition and fee waiver. Because you are fully supported, you will be able to concentrate on biomedical research that culminates in the launch of a career in the biomedical sciences.

Map your way through the Morningside Graduate School of Biomedical Sciences

Our state-of-the-art facilities, including a new VA outpatient clinic and forthcoming new education research building, provide the optimal environment for learning alongside faculty and growing as a PhD researcher. You are invited to explore the primary areas on campus, including the Albert Sherman Center and Aaron Lazare Research Building, to picture yourself conducting research on campus. [Watch more on the core facilities on campus and learn about a recent \\$2.8 million grant obtained for advanced cryo-EM microscope.](#)

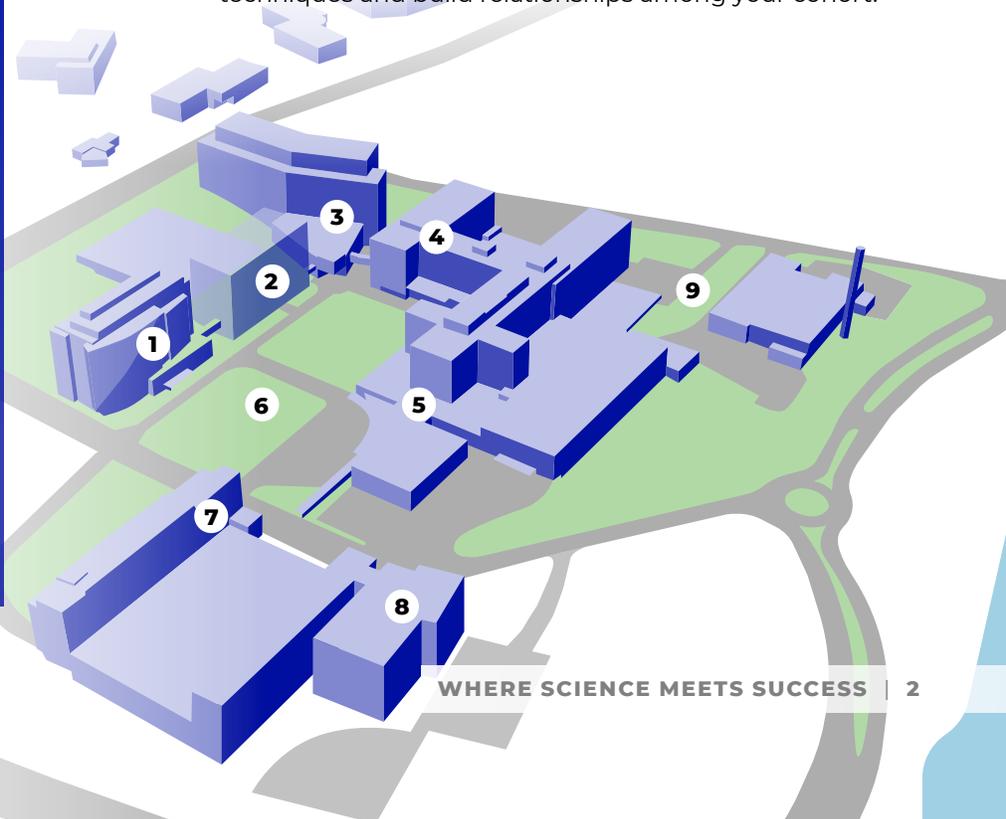
The UMass Chan Medical School umbrella program: what it is and why it's beneficial

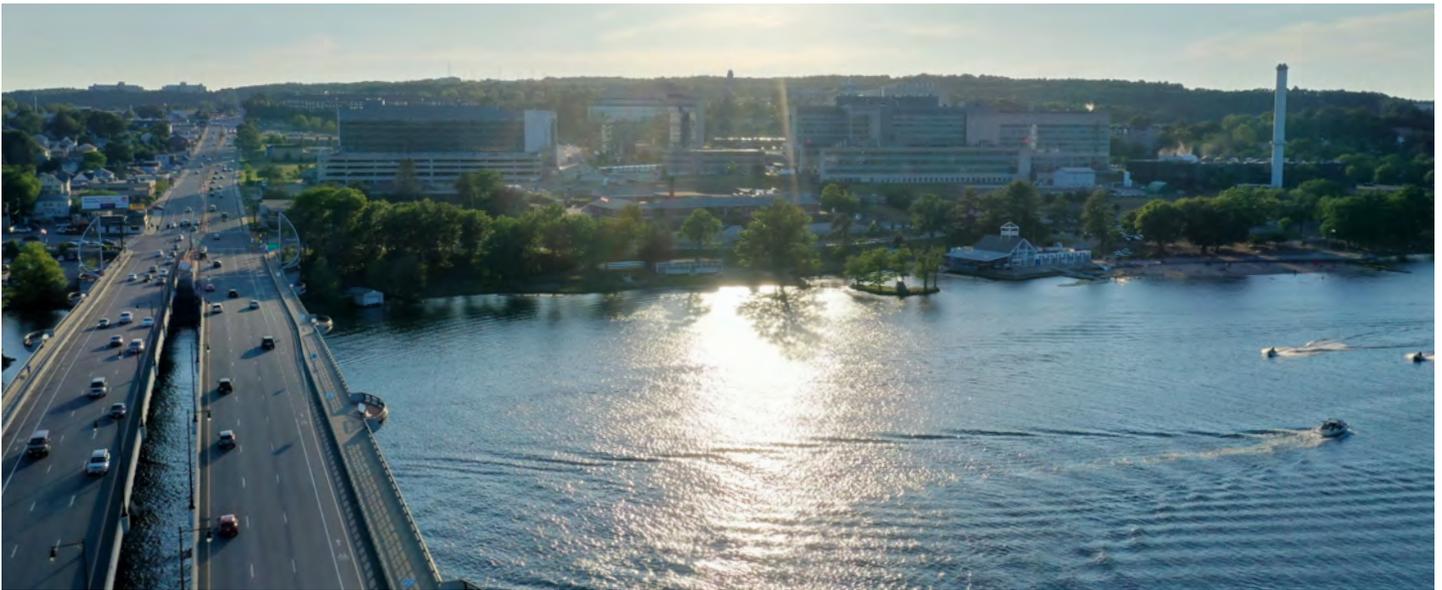
You begin your journey as a knowledge consumer in the undergraduate setting and transform into a knowledge producer on your way to becoming an independent PhD scientist. When you enter the program, you will begin by taking the Foundations course. In Foundations, you will learn to critically evaluate scientific literature on a graduate level, develop advanced scientific communication skills, gain essential computational techniques and build relationships among your cohort.

Welcome to campus!

- 1 Aaron Lazare Medical Research Building
- 2 New Education and Research Building (opening 2023)
- 3 Albert Sherman Center
- 4 Medical School
- 5 UMass Memorial Medical Center
- 6 Campus green
- 7 Ambulatory Care Center
- 8 Veterans Affairs Outpatient Clinic (opening 2021)
- 9 Community garden and outdoor recreation

[Take a virtual tour](#) 





During your first year, you will experience the benefits of the umbrella program, embarking on three exciting research rotations in varied areas. Prior to joining a specific group and program of study at the end of the first year, you will explore departments and programs to home in on specific research interests. The umbrella program, much like the Morningside Graduate School of Biomedical Sciences itself, is truly interdisciplinary. The rotations reflect the school's emphasis on intellectual curiosity during your first year, with the opportunity to participate in research in biochemistry and molecular pharmacology, neurobiology and neurology, medicine, pathology, and microbiology and physiological systems, and more. Ultimately, with the support of faculty and staff, you will determine your best-fit research group and program of study from seven options.

Our world-class faculty is dedicated to training future science leaders in our learner-centered curriculum. Our core curriculum is focused on developing essential research skills and competencies, while the advanced elective curriculum focuses on deepening specific knowledge in the research areas of your choice. The course offerings provide the full breadth and depth of biomedical sciences from fundamental biological questions through patient-oriented research.

The core and elective curriculum prepare students for success in the qualifying exam during the second year. You will write, present, and defend an original research proposal, and gain valuable feedback from our dedicated faculty that will further your growth as a scientist.

Following the qualifying exam, your thesis research will be your primary focus. However, you will also gain valuable insight into your post-graduation career opportunities through Career Pathways Communities and career and professional development resources built right into the curriculum. You will take an active role in positively impacting your chosen field of specialization, planning your dissertation defense and taking the next step in your career.

Third-year student Stephanie Becker recalls why she chose to study at UMass Chan Medical School,

"I chose the PhD program simply because it was the best fit for me. I wanted an umbrella program that was interdisciplinary enough to pursue and learn about neuroinflammation. Furthermore, the collaborations commonly initiated interdisciplinary projects. Finally, I desired an inclusive community. The research and student communities have really proven to be such communities."

Fourth-year student Hannah MacMillan shares a similar perspective,

"There are an impressive array of labs to join, and although I knew I was interested in studying RNA, I was happy to learn that the institution highly encourages new students to check out fields they haven't tried yet when rotating labs. I felt as though UMass Chan cared about the experience of the student and would be invested in shaping us into amazing scientists. I felt a sense of community and collaboration when I interviewed, and this has been proven to be true along my degree journey."

Program guide

UMass Chan Medical School is proud to be in the top 25 percent of medical schools and number two in New England for NIH funding, receiving nearly \$300 million in 2020. The Medical School consistently ranks exceptionally high relative to peer institutions based on the world-changing achievements of faculty.

Faculty are internationally recognized leaders in areas including RNA biology, systems and computational biology, neuroscience, immunology, metabolic biology, quantitative and population health sciences, cancer biology, and gene editing and regulation.



Craig Mello, PhD, the *Blais University Chair in Molecular Medicine* and Howard Hughes Medical Institute Investigator, is awarded the Medical School's first Nobel Prize. Dr. Mello shared the 2006 Nobel Prize in Physiology or Medicine with Andrew Fire, PhD, of Stanford University, for their discoveries related to RNA interference.

The Morningside Graduate School of Biomedical Sciences has **365** faculty members with distinguished honors, including:

Breakthrough Prize winner

Lasker Award winner

Nobel Laureate

Howard Hughes Medical Institute professors
National Academy members

Keck Award winners

Presidential Early Career Award for Scientists/
Engineers recipients

Additionally, **340** students were enrolled in Morningside Graduate School of Biomedical Sciences in fall 2020, including an average class size of **40-50** for the umbrella PhD. Forty students graduated in 2020, and student accomplishments include **7** Weintraub awardees and **6** Howard Hughes Medical Institute Predoctoral fellows.

Photo: the Associated Press

Programs

Bioinformatics & Computational Biology Program [🔗](#)

Rapidly accumulating data on DNA sequences, protein structures and complex signaling networks has created an unprecedented demand for new approaches and a new generation of interdisciplinary scientists.

The Bioinformatics & Computational Biology Program focuses on the development and application of computational and mathematical models to biological problems, with an emphasis on the now-available, high-throughput genomic and proteomic data. Specific topics

of study include systems biology; analysis of regulatory and metabolic networks; structure of the genome and comparative genomics; population genetics and molecular evolution; protein-protein and protein-DNA interactions; RNA; modeling of large-scale biological systems; structural biology; protein folding and modeling; and biological physics. Students receive rigorous training in modern bioinformatics and computational biology through integration of guided research, coursework and participation in seminar programs.

The program aims to bridge the gap between wet-lab biologists and computational scientists to their mutual benefit, and prepares students for careers in cutting-edge, highly quantitative biomedical research. Currently, one faculty member is developing an algorithm to predict protein-protein interactions, consistently scoring among the best in the CAPRI competition and another a method to find the signatures of natural selection in the genomic data. Additionally, Nikolaus Grigorieff, PhD, and Bronwyn Lucas, PhD, received a \$1.3 million grant to develop new computational and data collection tools for locating specific molecules with near-atomic accuracy within cells using cryo-EM imaging technology.



Elaine Lim, PhD
Assistant Professor
Molecular, Cell & Cancer Biology
Bioinformatics and Computational Biology

"I started my lab at the Medical School in 2020, and our group is interested in understanding the genotype-to-cell type relationships in common neurological diseases (such as autism and Alzheimer's Disease).

Our group is an interdisciplinary human genomics lab, and we develop integrated experimental and computational methods around cutting-edge technologies (such as brain organoids, bulk/single-cell RNA sequencing, CRISPR), to enable us to gain new insights into the cellular and transcriptomic mechanisms of neurological diseases.

I am excited about all the ongoing projects in our lab! Some current projects are to interrogate the role of herpesvirus infections in Alzheimer's disease using human brain organoids, and identifying the precise developmental timepoints, cell types and cell type specific co-expressed networks in specific genetic subtypes of autism.

The cost of living in Worcester is very low compared to Boston, but the stipend at UMass Chan is comparable to the schools in Boston. And parking on-campus is \$16 a month! The savings will help students with having a higher quality of life during graduate school. I remember having to live in a really cold, basement apartment near Boston that was a 45-min walk from campus, because parking on-campus was more than \$200 a month. Yet, Worcester is only about an hour drive away from Boston and Cambridge, so students can visit these cities on weekends. At the same time, the research at UMass Chan is top tier and cutting edge, so the students who graduate from here are well-trained researchers who have no shortage of post doc or job opportunities wherever they choose to go to.

I think the UMass Chan environment is a perfect fit for most graduate students, because most labs are relatively small and there will be ample direct interactions with the PIs and other mentors. UMass Chan research is groundbreaking too, so there is no compromise between the research training and direct mentorship."

Biochemistry & Molecular Pharmacology

The Biochemistry & Molecular Pharmacology Program offers graduate study and research focused in the areas of molecular, cellular and regulatory biochemistry; molecular biophysics; chemical biology; and structural biology. Biochemistry and Molecular Pharmacology students participate in a rigorous foundation in modern biomedical science through an integrated program of laboratory research, advanced coursework in chemical biology or molecular biophysics, and seminar programs. Students also organize a weekly informal seminar series in which they present recent research results.

Specific areas addressed within program laboratories include: protein folding and design; regulation of gene expression and epigenetics; RNA processing and trafficking; protein synthesis and transport; membrane transport and ion channel function; drug action at cellular membranes and signal transduction; structural basis of protein and enzyme function; computational investigation of protein dynamics; cell cycle control; DNA replication and repair; neural development, differentiation and neurodegenerative disease.

The program is proud to have students awarded the prestigious Harold Weintraub Graduate Student Award, as well as predoctoral training grants from the National Institutes of Health and the Department of Defense. Additionally, there is an NIH program project grant focused on HIV drug resistance and protease inhibitor design and a faculty member who patented discoveries in RNA interference. Let's hear from Program Director Nick Rhind, who shares more on his work and the faculty at UMass Chan Medical School:

"I love solving puzzles. I took a lot of math in high school and college and really enjoyed the challenge of proving theorems. But I also loved the hands on problem solving of experimental science, and genetics seemed like a perfect combination of the two. I did my graduate work on worm developmental genetics, which was great fun, but with 1,000 cells, worms were way too complicated for my taste. So, for my postdoc I chose to work on yeast cell biology. My lab spans cell biology, genetics, genomics, bioinformatics and computational biology. And I try to keep up with all of it."



Nick Rhind, PhD
Program Director
Biochemistry & Molecular Pharmacology

Cell size control is the most exciting project I am working on now. I started working on yeast cell biology 25 years ago to figure out how cells know how big they are. It turns out that cell size control is a really hard problem, and I have spent much of my career working on other questions in cell cycle and DNA replication. However, about 10 years ago a very brave grad student took up the cell size project and made a seminal observation that changed the way we think about the size control. He showed that Cdc25, a key activator of mitosis, is expressed in a size dependent manner. We have been making steady progress ever since and I think we now can say we are close to understanding how size control works. And that is very exciting.

A lot of schools offer a broad, collaborative approach to biology, but I think UMass Chan does it really well. The collaborative culture encourages students to follow their projects wherever the data takes them. And it allows students to follow their interests, even if it means expanding their lab's expertise.

We have a great track record of faculty retention. Very few faculty members leave here for other positions. This fact does not affect students directly, but it speaks loudly about the culture and how much folks like being here. This is a really great place to do science."

Cancer Biology Program [🔗](#)

The Cancer Biology Program seeks to improve the prevention, diagnosis and treatment of human cancers. Students interested in pursuing a career in cancer biology are provided rigorous training in biochemistry, genetics and molecular and cell biology, and an understanding of the clinical aspects of cancer.

An excellent example of the interdisciplinary nature of the institution, the Cancer Biology Program includes faculty from ten departments, including most basic science and several clinical ones. The strength and diversity of the faculty enable students to explore different approaches to the study of cancer in their research rotations and develop interdisciplinary collaborations during their thesis research, all to translate achievements from the basic sciences to the clinical management of human cancers.

Sharon Cantor, PhD, and her lab have rethought how common chemotherapy drugs work in breast and ovarian cancer. Specifically, she looked at a PARP inhibitor, a common chemotherapy drug for these cancers, and a new application for the BRCA cancer genes. This follows



2020 research that earned a multimillion dollar grant from the National Cancer Institute on how tumors without the BRCA genes show sensitivity to chemotherapy. Dr. Cantor's work is just one example of the groundbreaking research in our Department of Molecular, Cell & Cancer Biology.

Immunology & Microbiology Program [🔗](#)

The Immunology & Microbiology Program comprises faculty from multiple departments with diverse research interests, including molecular and cellular basis of immune responsiveness; molecular mechanisms of viral replication; host-pathogen interactions; and the control of viral, bacterial and parasitic infections. Immunology, virology and bacterial pathogenesis are active interdisciplinary biomedical fields with studies ranging from molecular mechanisms to clinical trials.



Students acquire a broad base of knowledge in biochemistry, genetics, and cellular and molecular biology through the core curriculum. Specialized training in immunology, virology and bacteriology is initiated in a first year course, Infection and Immune Response, which introduces students to the immune system, basic principles of bacteriology and virology, and the interaction of bacteria and viruses with the host. Emphasis is placed on experimental systems and analysis of primary research papers. Further training continues in the fall of the second year with at least one of three courses: Advanced Virology, Advanced Molecular and Cellular Immunology or Advanced Bacterial Pathogenesis. Advanced courses emphasize reading and critical analysis of recent research papers. Additional training in the second year includes seminars, journal clubs, and tutorials to explore the most active areas of current research.

The Immunology and Microbiology Program is proud to be partly supported by a competitive NIH training grant, allowing for one to two years of fellowship support to students working alongside one of about 25 faculty members listed on the grant. The fellowships, in their 30th year of funding, provide monetary support beyond the stipend as well as funds for professional development.



Katherine Fitzgerald, PhD
Professor and Vice Chair
Department of Medicine

Internationally recognized innate immunologist Katherine Fitzgerald, PhD, the Worcester Foundation for Biomedical Research Chair and colleagues identified a new molecule with potentially positive results for antiviral response, including COVID-19. Let's hear more from Dr. Fitzgerald, below.

"I am an immunologist whose research in the field of innate immunity focuses on understanding the activation and resolution of inflammatory responses. I joined the UMass Medical School faculty in 2004, where I am currently professor of medicine and vice chair of research in the Department of Medicine. I am also director of the Program in Innate Immunity. Additionally, I serve as president of the International Cytokine and Interferon Society. I have an extensive record of service at the Medical School, nationally, and internationally, and serve as an advisor to several national foundations and societies as well as pharmaceutical and biotechnology companies. I am proud to be recognized for my work as an elected member of the National Academy of Sciences, the Royal Irish Academy and the American Academy of Microbiology.

A major focus of my work is understanding how the innate immune system distinguishes friend from foe to drive protective inflammatory responses. My early work on Toll-like receptor signaling established some of the founding principles underlying the induction of pathogen-specific responses. Similarly, my group's discovery of TANK-Binding Kinase-1, the kinase that phosphorylates and activates interferon regulatory factors, paved the way for a greater understanding of interferon gene regulation and induction of antiviral immunity. My research to characterize inflammasome activation also led to new breakthroughs, including the discovery of Absent in Melanoma-2 as a new inflammasome forming sensor, new mechanisms of NLRP3 inflammasome activation in response to

infection and sterile inflammation, and the role of succination in limiting inflammasome driven cell death. My laboratory has also defined the central role of nucleic acids as triggers of antimicrobial immunity and described new sensors and regulators of these pathways. These days we are exploring how the inappropriate activation of nucleic acid-sensing pathways and inflammasome pathways underlies the pathogenesis of inflammatory and autoimmune diseases. The long-term goal of all of my work is to determine how the inappropriate activation of innate immunity underlies the pathogenesis of infectious, inflammatory and autoimmune diseases in humans

I am excited about several projects in the lab including our work on DNA and RNA sensing pathways and how self nucleic acids incite noxious inflammation. Further, work on the role of long noncoding RNAs in the inflammatory response is also shedding new light on inflammatory disease particularly in the intestinal tract. We are also applying our interest on long noncoding RNAs to SARS-CoV-2, leading to exciting discoveries on host noncoding RNAs involved in viral pathogenesis.

UMass Chan Medical School has a collegial and collaborative culture that is an outstanding environment in which to do science. Our faculty are world-class and invested in each other's success and the success of our trainees. Further, the institution has made substantial investments in research infrastructure during the last two decades, constructing four new buildings dedicated to basic and clinical research with a combined total of more than a million sq. ft. In October 2020, the Medical School received approval from the Board of Trustees to construct a \$325 million nine-story Biomedical Research and Education Facility. The new building will include program space for a projected 77 principal investigators. Thus, this is truly an exciting time to start graduate studies as our institute continues to expand and recruit new faculty members.

UMass Chan Medical School is a highly collaborative and collegial institution. Students will receive essential training that spans multiple fields of study, thus, gaining a deeper and more comprehensive knowledge of their projects and opportunities to perform work as part of multidisciplinary collaborations—a critical skill for today's research. Our institution is dedicated to providing our trainees with resources to help them develop the skills they need to become independent researchers. The Medical School also has a unique career development center (initiated with funds from an NIH BEST grant—one of only a handful in the nation), to provide critical support, including development an individual development plan to ensure future success."

Interdisciplinary Graduate Program [↗](#)

The Interdisciplinary Graduate Program is an exemplary model of the research opportunities available to students. The program supports interdisciplinary approaches to graduate training, with more than 130 labs and 13 basic and clinical science departments participating. Research employs a wide range of instrumentation and experimental approaches including: classical and molecular genetics, proteomics and genomics, X-ray crystallography and nuclear magnetic resonance, and digital imaging and laser confocal microscopy of single cells and tissues. Specialized core facilities in gene chip analysis, mass spectroscopy, transgenics, DNA sequencing, analytical ultracentrifugation and biomedical imaging enhance the research capabilities.

Characterized by a streamlined and flexible graduate curriculum that is tailored to the specific needs of individual students, the program hosts a weekly seminar series featuring distinguished lecturers from around the world. Students also host one or two of these seminars each semester and participate in weekly journal clubs and research forums.

Program Director Craig Peterson, PhD, shares his background and more on the Interdisciplinary Graduate Program:

"Prior to coming to the Medical School in 1992, I was an undergraduate at the University of Washington in Seattle, followed by my PhD research at UCLA and a postdoctoral position at UCSF. In reality, my first introduction to the East Coast was Worcester, Massachusetts. Needless to say, I've enjoyed these past nearly 30 years in central Mass, which actually has a lot of similarities to the Northwest. My research background has focused on the regulation of transcription, using biochemical approaches as a PhD student, followed by training in yeast molecular genetics during my postdoc.

My research group is focused on the role of epigenetics/ chromatin dynamics in the regulation of gene transcription and the maintenance of genomic stability. My laboratory group has essentially two halves— one group uses genome-wide approaches, such as nascent transcript sequencing and ChIP-seq, to probe transcriptional regulatory mechanisms in budding yeast, while the other half of the lab uses sophisticated



Craig Peterson, PhD
Program Director
Interdisciplinary Graduate Program

chromatin biochemistry to probe the mechanism of action of large, multi-subunit chromatin remodeling machines. Students performing thesis research in my group (I've trained 16 PhD students) typically learn both biochemistry and molecular genetic/bioinformatic methodologies in the course of their thesis research.

The Interdisciplinary Graduate Program (IGP) was initiated in 2003 in response to a need for a graduate training program that was not department based, but rather focused on providing PhD students a training program that was tailored to the individual needs of students, combining multiple approaches to tackle their thesis questions. Consequently, our curriculum is highly flexible, allowing students to fulfill their advanced coursework requirements with courses offered by any program. In 2003 I was a founding co-director of the IGP, and I have been the director since 2015. Currently, the IGP is the largest graduate program on campus, represented by at least half of all Morningside Graduate School of Biomedical Sciences faculty. This further emphasizes the extremely collaborative and unusual research environment of UMass Chan where there are no department boundaries to your research, and students and faculty from different departments freely and frequently interact."

Neuroscience Program [🔗](#)

The Neuroscience Program is interdepartmental, housed in the Department of Neurobiology. Participating faculty have appointments in several departments, with the largest concentration of faculty coming from the Departments of Neurology; Psychiatry; Molecular, Cell & Cancer Biology; Microbiology & Physiological Systems; and Neurology.

Expansion of neuroscience investigation on campus has led to both the formation of the Department of Neurobiology and the opening of the Irving S. and Betty Brudnick Neuropsychiatric Research Institute (BNRI) within the Department of Psychiatry. The atmosphere is especially conducive to the scientific growth of graduate students as they study areas such as the neural, molecular, and genetic mechanisms that underlie nervous system development, learning and memory, addiction, glial responses to neuronal injury, and circadian rhythmicity; mechanisms of synaptic neurotransmitter release, analysis of how neurotransmitter receptors and membrane channels operate and how drugs act on these processes to modify cellular function and behavior; and

disorders of the central nervous system, with special emphasis on neurodegenerative disorders, autism spectrum disorders and other developmental disabilities. The program maintains a schedule of seminars and intramural research presentations that ensures a cohesive program.

Fourth-year student Heather Learnard, who researches frontotemporal dementia in the Fen-Biao Gao lab, initiated a research project. She says of her experience, "I've been very fortunate that Dr. Gao allowed me to bring in my personal training and encouraged me to take on a project that is very new for the lab and is in a new direction they haven't looked at before."

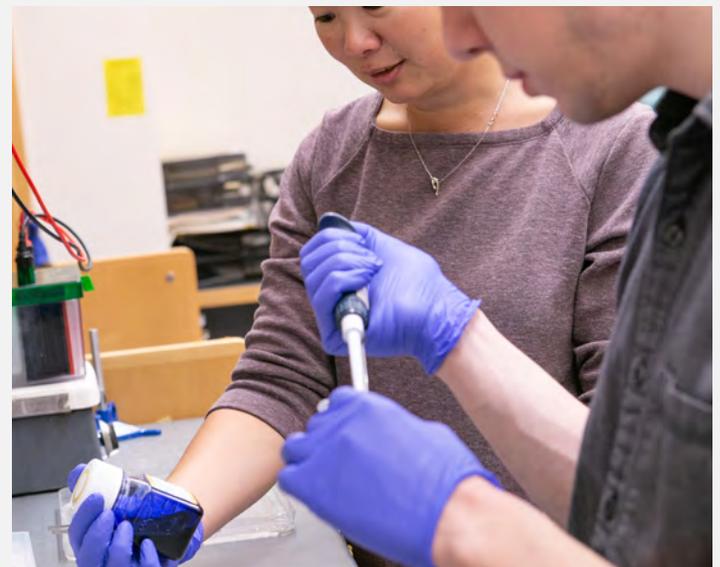
Watch faculty member Dorothy Schafer, PhD, discuss her work on unlocking the mystery of microglia cell function, brain cells that play a crucial role in providing immune defense of the nervous system. Dr. Schafer shares that UMass Chan Medical School is "such a special place, I was blown away by the scientific community. Everybody says they collaborate, but here, they really mean it."

Translational Science Program [🔗](#)

A major goal of biological research is to acquire insight and tools to solve problems in medicine. The Translational Science Program addresses this goal and trains graduate students to bring the power of cutting-edge biological tools to apply to clinical problems. Program faculty members have broad expertise in both basic and clinical research and are drawn from 15 academic departments and programs.

The program incorporates several unique features to provide focused training at the interface between basic and clinical sciences. Program students are co-mentored by both a basic scientist and a clinical scientist. Regular meetings with both mentors ensure the student gains a broad understanding of the application of basic biological methods to clinical problems. Courses have been developed to provide students with an understanding of the principles of translational science and tools for carrying out translational research. Additional program specific activities include yearly retreats, a seminar program and opportunities to interact directly with clinicians.

Fifth-year student Javier Solivan-Rivera works to understand adipose tissue biology through stem cells toward an understanding of the genetic and molecular basis of obesity and diabetes, and how adipose tissue affects and influences those conditions.



Life outside the lab

What's life like outside the lab at UMass Chan Medical School?

Outside of the lab, there are numerous student support resources. Student success is achieved through approaches such as individual advising and wellness offerings, advocating for student needs, supporting individual and institutional training grants and fellowships, and co-creating an environment to support personal and professional well-being. Some of those resources include a well-equipped gym, free Counseling Center and a Center for Mindfulness.

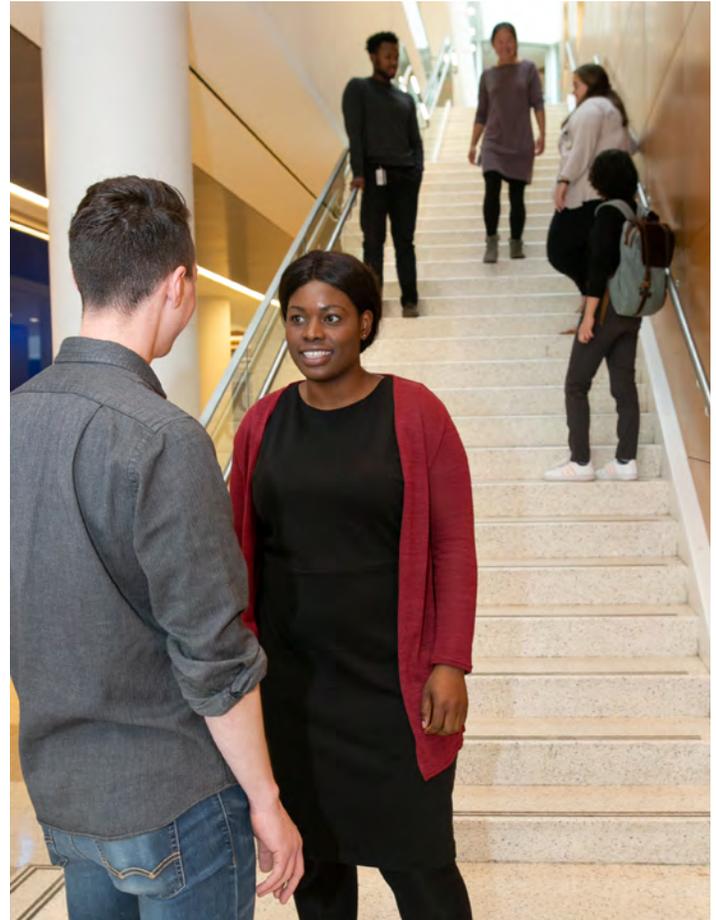
Students can get involved through the many clubs and organizations on campus, including student government, diversity-based groups and a peer mentorship program. The Graduate Student Body Committee (GSBC) is a group of elected students who serve as a voice for graduate students on campus. By serving on committees with faculty, they represent student interests and contribute to decision-making. One of the major goals of the GSBC is to strengthen relationships between graduate students on campus, in addition to interprofessional relationships with both the medical and nursing students. Social events are offered throughout the year to foster friendships and support groups and take part in local volunteer activities such as Working for Worcester and Habitat for Humanity.

Watch two students in action as they share how getting involved with GSBC and the student support resources available contributed to making UMass Chan Medical School the right place for their graduate study.

Diversity Initiatives

UMass Chan Medical School is proud to support diverse learners from all backgrounds. Our Diversity in Action website provides an overview of recent diversity, equity and inclusion (DEI) initiatives. One example is the NIH-supported Initiative for Maximizing Student Development (IMSD). It has been critical to fostering a healthy academic scientific environment for students.

The DEI focused Diversity Interest Group (DIG) is a student-run organization with a welcoming environment



within which to discuss issues through the lens of social justice, equity, advocacy and inclusion. Among the efforts are two programs aimed at bringing the community together to share knowledge and learn from each other. Stories in Science highlights the intersection of science and identities through storytelling and the Diversity and Injustice in Current Events and Science Series are journal clubs centered on educating participants and the community on societal issues through facts and data.

One of the DIG leaders, Cesar Bautista Sotelo discusses how DIG's initiatives touch on "topics ranging from advocacy to diversity work to just building community amongst ourselves to strengthen those ties" on campus.



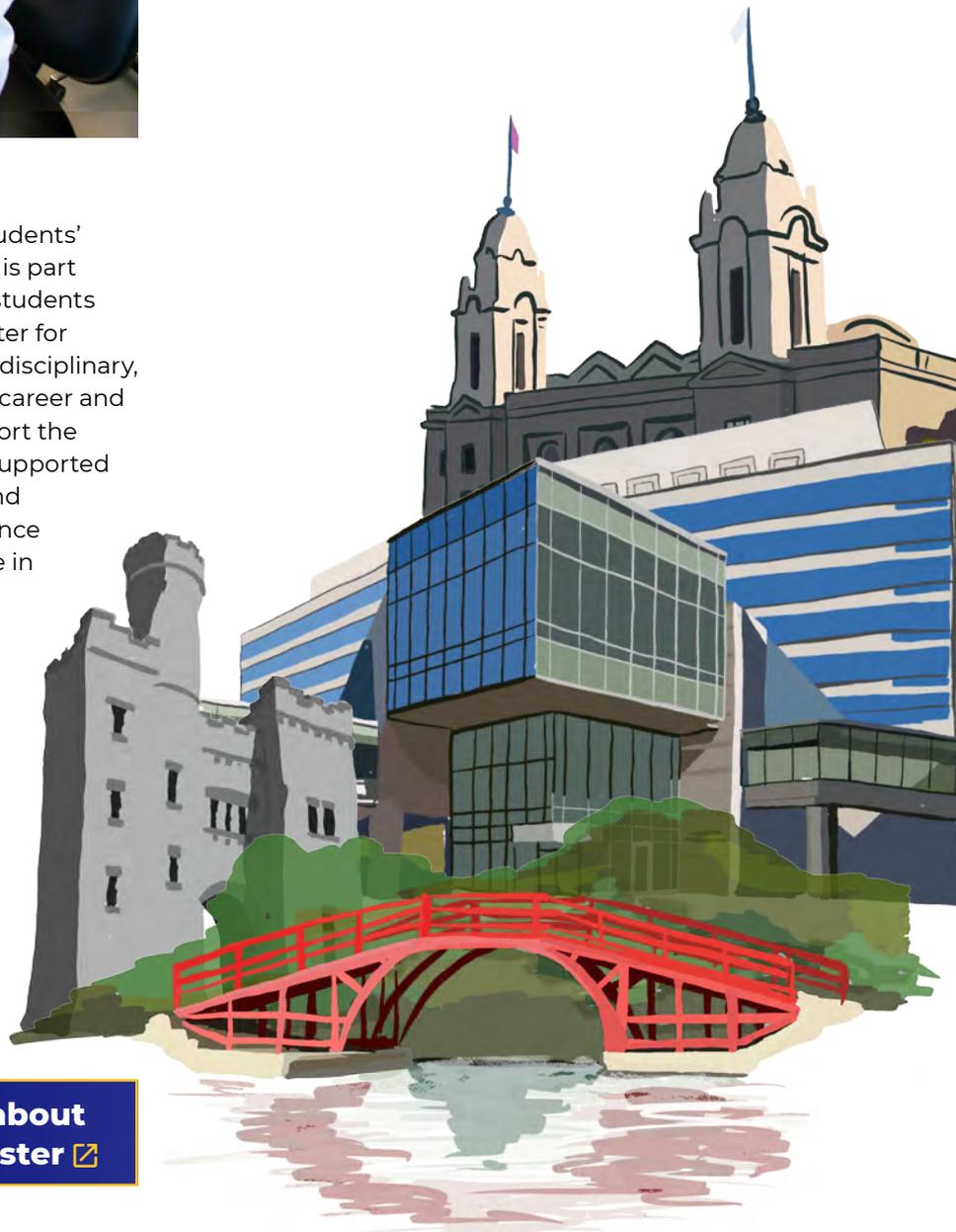
Life in Worcester, Massachusetts

Why Worcester?

UMass Chan Medical School is proud to be located in New England's second largest city. There are many benefits to living in the Worcester area, including affordable housing options in close proximity to campus, attractions such as the Red Sox minor league baseball stadium, various breweries, more than 1,250 acres of parks, top-rated restaurants, museums and more. Additionally, Worcester is centrally located in Massachusetts, with quick access to Boston and other destinations such as the White Mountains of New Hampshire and beaches of Cape Cod. Learn more about our diverse and vibrant city.

Career and professional development

Time at UMass Chan Medical School shapes students' career journeys, and proactive career planning is part of the culture that recognizes the varied ways students can contribute to society and science. The Center for Biomedical Career Development takes an interdisciplinary, scholarly approach to develop and implement career and professional development resources that support the training experience of students. Students are supported with a unique integration of career planning and professional development in the curriculum. Once in their third year of study, they may participate in small group Career Pathways Communities to learn about academic and industry research options, policy and regulatory affairs, business and commercial development, and more. One initiative is the Industry Exploration Program, a student-run group for students to explore careers in the biotechnology and pharmaceutical industries through site visits around the region. All of the center's initiatives recognize a range of student needs and promote open discussion and support for career exploration.



[Learn more about life in Worcester](#) 

Admissions process

Eligibility requirements

Applicants are required to have:

- A bachelor's degree earned prior to matriculation
- Significant lab research experience
- Prerequisite coursework
The following prerequisite coursework is strongly recommended, with successful applicants typically having the classes completed with a B or better prior to enrolling in the program:
 - Introduction to Biology I and II with labs
 - General Chemistry I and II with labs
 - Organic Chemistry I and II with labs
 - General Physics I and II with labs
 - Biochemistry I

- One semester of math, including calculus or statistics
- Advanced biology such as genetics or immunology
- TOEFL or IELTS scores that meet the minimum score requirements, for applicants whose native language is not English
 - TOEFL: 100 or above on the internet-based test, all subsections 17 or higher
 - IELTS: 7 or above overall, all subscores 6.5 or higher
- The GRE is not required nor considered, applications are reviewed holistically

Admission process

Complete applications contain the following, with a December 1 deadline. Interviews are held by invitation only at the beginning of the year.

Applications are reviewed holistically, considering cognitive and non-cognitive variables, as well as fit for the program. Admissions committees look for strong academics, prerequisite coursework, research and other relevant experience, and career aspirations and research interests that align with the program.

- Application and \$80 fee, through BioMedCAS
- Unofficial transcripts from any college attended

- International applicants are required to submit an official course-by-course evaluation from a NACES member
- Resume
- Personal and Research Statements (see prompts below)
- Three letters of recommendation
- Unofficial TOEFL or IELTS scores

Please note all official transcripts, and English test scores if appropriate, are required prior to matriculation.

Statements

The statements are a very important part of your application, used to evaluate your scientific interests, research background, knowledge and potential fit for the program.

Please provide two statements in one document:

- 1** Personal Statement: In 500-750 words, please detail your personal experience, including academic preparedness, motivation for pursuing graduate study, challenges that have informed your development and what you learned, and why you have chosen to apply to the program. Then, please discuss your career aspirations and how attending

UMass Chan Medical School will help you reach your goals.

- 2** Research Statement: In 500-750 words, please discuss your research experience, including at least one project in which you were significantly involved. Please describe hypotheses tested or project goals, approaches taken, your role, the outcome, publications that may have resulted, and what you learned. Additionally, please share your research interests, how they are aligned with our program and UMass Chan Medical School, and which faculty members' research is of most interest to you.

Are you ready to be a driving force behind scientific discovery?

We hope this overview of the PhD in Biomedical Science program at UMass Chan Medical School helped you discover the people, places and research that will impact your experience if you join our community of scholars in the Morningside Graduate School of Biomedical Sciences. Embark on your journey to become a leader in biomedical science today!

Get in touch!

[Book a meeting with admissions](#) ↗

[Request more information](#) ↗

Have more questions?

Contact our admissions team for more information by emailing gsbsadmissions@umassmed.edu or calling 508-856-4135.

Explore our programs and learn more at umassmed.edu/gsbs ↗

Student Testimonials



Stephanie Becker

I am a third-year PhD candidate at UMass Chan Medical School. I am Guatemalan and German. I come from New York. I have conducted Alzheimer's research at Cornell University in New York and the University of Bonn in Bonn, Germany. My research interest is

at the intersection of neuroscience and immunology. I am currently researching inflammation in Alzheimer's disease. My ultimate goal is to become a principal investigator at a private institution.

I chose the umbrella PhD program simply because it was the best fit for me. I wanted an umbrella program that was interdisciplinary enough to pursue and learn about neuroinflammation. Furthermore, the collaborations at the Medical School commonly initiated interdisciplinary projects. Finally, I desired an inclusive community. The research and student communities have really proven to be such communities.

The multitude of research cores available to us, the willingness of colleagues to be resources to one another sets the institution apart from others.

UMass Chan is similar to a private research institution in that there are no undergraduates and the graduate program does not have a teaching requirement. I believe the environment itself and the conversations I've had with people here have helped prepare me to become a leader at a private research institute.



Daniel Hidalgo

I was born in Veracruz, Mexico, but spent the majority of my early years in Guatemala City. When visiting Massachusetts for the first time, I was impressed by the diversity and the way people made me feel welcome, which led me to pursue my

education here. Merav Socolovsky, MD, PhD, offered me the opportunity to join the Medical School family by joining her lab as a research associate, an experience that changed my outlook on my future. I enjoyed working with Dr. Socolovsky so much that I decided to commit to her lab as a PhD student. My decision was largely influenced by the strength of the Medical School's research community. There are strong scientists here, many of them leaders in their specific field of research, yet they are down to earth and highly approachable.

The connections I have made during my time as a student go beyond

my research colleagues; I have had the chance to meet people in many student body organizations, some of whom have become good friends. Despite its size, the institution ensures my voice is heard and taken into consideration, which makes me feel comfortable. The collaborative spirit at UMass Chan, combined with the expertise of the professionals here, means that you can find many ways to accelerate your research interests while also beneficially impacting the work of others. The proximity of the hospital is another resource that makes it easy to translate your research to modern medicine, which impacts the lives of many.



Heather Learnard

I am a fourth-year student in the lab of Fen-Biao Gao, PhD, in the Neuroscience Program. A personal battle with a neurological autoimmune disease blossomed my love for research, and I hope to help patients like someone else's research helped me.

After training and collaborating as a technician at the Medical School for almost three years, I knew this would

be the best place for me to pursue a graduate degree. In addition to the excellent learning community, collaboration, and mentorship, I was drawn to the umbrella program that allows students to rotate through different research areas before deciding on a program of study. This opportunity for exploration allowed me to be confident and enthusiastic about my decision to choose the lab and program.

UMass Chan Medical School has more than 200 investigators on site and draws researchers and doctors from all over the world. We are also competitively ranked in both funding and publication records. While this may make UMass Chan seem like a place where you could feel like a small fish in a big sea, it's the exact opposite! Professors go by first names, they get excited at emails for help or advice and everyone wants to collaborate

and see students excel. All of these aspects combined make this an excellent place to support a trainee in becoming an independent researcher.

During my training I have realized I am very passionate about exploring the frontline of drug and treatment development, therefore I would like to become an industry scientist. To continue building my bench work, teamwork and communication skills I am afforded the opportunities to participate in data club presentations through the graduate seminar series, neurobiology seminars and research retreat presentations. We are also fortunate to have the Center for Biomedical Career Development that offers opportunities to meet with current professionals in career paths we want to explore, as well as things like resume services, help with goal accountability and networking opportunities!



Hannah MacMillan

I am a fourth-year graduate student in the lab of Athma Pai, PhD, in the RNA Therapeutics Institute. I am excited to be using wet lab and dry lab techniques to research the dynamics of RNA splicing in different disease contexts.

I've lived in Florida and New York City, but Massachusetts feels like home to me! I love concerts, rock climbing, hanging with friends, skating, hiking and cooking!

UMass Chan Medical School has an impressive array of labs to join, and although I knew I was interested in studying RNA, I was happy to learn that this institution highly encourages new students to check out fields they haven't tried yet when rotating labs. I felt as though the Medical School cared about the experience of the student and would be invested in shaping us into amazing scientists. I felt a sense of community and collaboration when I interviewed, and this has been proven to be true along my degree journey!

The courses that I have taken as a part of the academic credits have proven immediately applicable to my research, and did not feel like general curriculum for the sake of checking off classes. We are encouraged to work closely with other students and take part in team projects! UMass Chan also has several wellness initiatives that promote a sense of work life balance, and I feel as though someone always has my back.

I plan on working in the biotechnological industry, my excitement for which has been even more catalyzed after taking part in the career planning courses offered at the institution. We are able to converse with industry professionals, carry out simulation exercises for tasks oriented in this field, and create plans for bolstering our resume and network!