

RESEARCH PROGRAMS IN BIOMEDICAL SCIENCES

PhD, MD/PhD, MS DEGREES

COLLEGE OF GRADUATE STUDIES



STATE UNIVERSITY OF NEW YORK

UPSTATE
MEDICAL UNIVERSITY

COLLEGE OF GRADUATE STUDIES

2023 - 2024



INVESTIGATE WITH US

Transforming Students From Consumers of Information into Producers of Knowledge

SUNY Upstate Medical University's College of Graduate Studies is part of an academic medical center, one of only 140 in the country, and is home to a well-funded interdisciplinary research enterprise.

Our graduate students in the biomedical sciences enjoy a student-faculty ratio of nearly one-to-one. Our students consistently praise the individual attention they receive from their advisors, and they also enjoy mentoring from upper-level graduate students and other researchers across the campus.

Right from the start, graduate students are empowered to make the best choices for their future careers. They choose three lab rotations their first year before deciding on a faculty research advisor and a lab. They are given responsibility for research projects, and take ownership of their work. Soon, the students are also the experts.

Consider joining us as we transform students from consumers of information into producers of knowledge.

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CHOOSE SUNY UPSTATE

- Outstanding Research
- Students publish in high-level journals
- Daily Interaction with Faculty Research Advisor
- Well-Funded, Modern Labs
- Teaching duties are not required but opportunities are available
- Choice of Multiple Degree Programs
- Tuition Waiver and Competitive Stipend
- Extensive Health Benefits, including Dental and Vision
- Affordable Cost of Living
- Formal Training in Grant Writing
- Funding for travel to national and international conferences

Opposite page: Caden Bonzerato, a Pharmacology student, studies Bcl-2 family proteins and the importance of the Bok/IP3R interaction in regards to calcium signaling and apoptosis. Bonzerato says he chose to come to Upstate's College of Graduate Studies because of the diverse research opportunities and the welcoming nature he found among mentors.

RESEARCH CONCENTRATIONS IMPROVING HUMAN HEALTH BY LINKING

OUR MISSION

Our mission is to educate students through our biomedical science programs to be discoverers, leaders, and innovators in biomedical research. Research labs at Upstate are exploring both common and complex illnesses that affect people all over the world. These include potential treatments and cures for cancer, cardiovascular diseases, diabetes, infectious diseases, neurodegenerative disorders, blinding diseases, and many more.

Our scientists use technological advances to explore diseases at a molecular and cellular level and to develop targeted treatments. Basic research in structural, molecular and systems biology informs and supports all our research, and our scientists include nationally recognized experts in these fields.

As our College is closely aligned with Upstate's College of Medicine and its teaching hospitals, our interests span the range from basic research to clinical trials. Upstate also has partnerships — on campus and around the world — to deepen and broaden understanding and discovery.



Upstate's Neuroscience Research Building is home to several basic and clinical departments collaborating on neuroscience research.



OUR BASIC AND TRANSLATIONAL RESEARCH

OUR RESEARCH FOCUS

Upstate has strong basic, translational and clinical research portfolios that are concentrated within five basic science departments and 13 clinically oriented departments.

Collectively, our researchers have diverse expertise with particular strengths in cancer, neuroscience, vision, molecular genetics, genomics, structural biology, infectious disease, diabetes/metabolic disorders, behavior disorders, cardiovascular disease and clinical trials. In addition, we have strong collaborative relationships with our neighboring institutions — Syracuse University, SUNY College of Environmental Science and Forestry, and the Syracuse VA.

STRONG RESEARCH CENTERS AND INSTITUTES

To encourage strong collaborative and inter-disciplinary research on important medical problems, Upstate has developed focused research centers and institutes.

- **The Center for Global Health and Translational Science** (CGHATS) is tackling global problems in infectious disease and disease outbreak modeling. In partnership with the Department of Defense, CGHATS is developing the next generation of vaccine testing protocols, including human infection models for dengue fever. In addition, CGHATS has research satellite sites in Ecuador, Thailand, Granada and Kenya, providing for student research opportunities abroad.
- **The Center for Vision Research**
These investigators bring to bear expertise in molecular genetics, biochemistry, biophysics, state-of-the-art imaging and stem cells to understand and develop treatments for ciliopathies, retinitis pigmentosa, birth defects of the eye, diabetic retinopathy, macular degeneration and injury recovery.
- **The Upstate Cancer Center** is the University's home for an integrated program in clinical cancer treatment and clinical, translational and basic cancer research. With the opening of our Cancer Center, the university is investing in and re-imagining our cancer research programs to create integrated research initiatives to rapidly take discovery from the bench to the bedside. Construction of a molecular genomics laboratory will facilitate big data approaches to perform research and provide precision and personalized cancer care.

MODERN LABORATORIES

Upstate investigators have at their disposal beautiful and highly functional laboratory space that is equipped with highly advanced instrumentation. The space is located in three dedicated research buildings — Weiskotten Hall, the Institute for Human Performance and the Neuroscience Research Building (NRB). The NRB brings together neuroscience researchers from the departments of Neuroscience and Physiology, Ophthalmology, Psychiatry, Neurosurgery and Anesthesiology to work on important problems in neurodevelopment, neuro-oncology, neuronal stem cells, physiological basis of behavior and psychiatric genetics.

POWERFUL CORE FACILITIES

Upstate has invested in research cores that provide faculty and students with the opportunities to leverage the latest technologies to advance their research programs. Capabilities within our cores include whole genome sequencing and analysis, proteomics and mass-spectrometry, confocal and two-photon imaging, super-resolution microscopy (STED), an 800MHz NMR, cryo-electron microscopy, flow cytometry, *in vivo* computed tomography and new microscope core.

RESEARCH OPPORTUNITIES

It is impossible to summarize in such a short space all of the research opportunities available to our graduate students. Suffice to say no University will put as much emphasis as Upstate on your career development, whether your interests lie in academia, industry or using your PhD to develop a sustainable career in a related field.



RESEARCH DEGREE PROGRAMS IN BIOMEDICAL SCIENCES

The College of Graduate Studies at SUNY Upstate educates students to be research scientists at the PhD or master's level. We educate graduate students through five biomedical science programs featured here. Upstate's previously described areas of research focus are integrated throughout its degree granting programs.

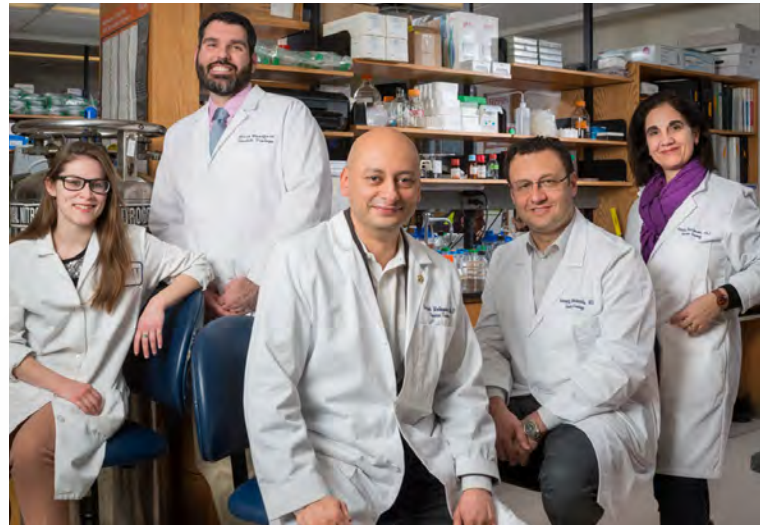
BIOCHEMISTRY & MOLECULAR BIOLOGY

Faculty researchers in Biochemistry and Molecular Biology seek to understand the molecular and cellular bases of human health and disease. We apply a broad range of tools ranging from structural biology and biophysics to cell biology and genomics. Other faculty members employ modern genetics and genomic technologies to generate a broader understanding of cellular pathways and systems biology. We use a number of different model systems, including mice, flies and single-celled organisms to model disease processes and development.

Areas of focus in the Department of Biochemistry and Molecular Biology include structure and function of membrane transporters, DNA replication and repair, transcription and epigenetics, mitochondrial biology, and cellular responses to stress. These studies are relevant for many human diseases, including cancer, neurodegeneration, and infectious disease.

Our department boasts a robust and longstanding record of extramural funding.

This program awards a PhD and an MS degree.

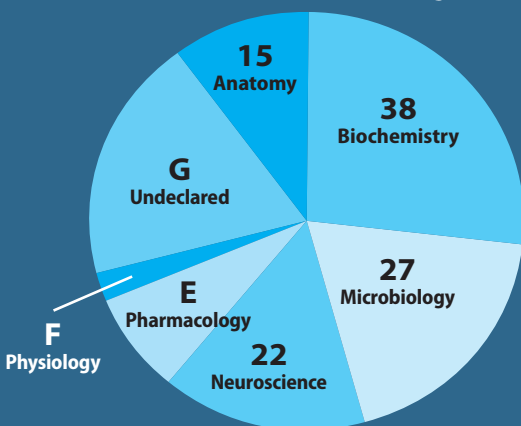


CELL & DEVELOPMENTAL BIOLOGY

Research in the Department of Cell and Developmental Biology explores the molecular and biochemical mechanisms of cellular function and development. Models used in the research include: zebrafish, avian embryos, cell culture lines, *C. elegans*, yeast, rats and mice. Students and faculty use a variety of research methods including sophisticated light microscopy (laser scanning confocal microscopy, spinning disc confocal microscopy, wide-field deconvolution imaging, real-time fluorescence microscopy, TIRF microscopy), high sensitivity digital cameras and image processing, electron microscopy, tissue culture, stereotactic surgery, and a complete range of molecular and biochemical techniques.

This program awards a PhD and an MS degree.

DISTRIBUTION OF CURRENT STUDENTS BY PROGRAM



A. Anatomy	15
B. Biochemistry	38
C. Microbiology	27
D. Neuroscience	22
E. Pharmacology	11
F. Physiology	3
G. Undeclared (First-year students)	27
TOTAL	143

TOTAL:
143
students

MICROBIOLOGY & IMMUNOLOGY

Major research areas in the Department of Microbiology & Immunology are in diseases caused by viruses and parasites, the host response to infection, the development and function of the immune system, and global health.

The focus of virology research is on pathogenesis, gene regulation, molecular interactions between the virus and the host cell, antiviral agents, and viral replication as well as cancers caused by EBV and KSHV.

Immunology research focuses on autoimmune diseases, macrophage function, T and B cell function, K cells, antigen processing and presentation, viral immunity, immunotoxicology and vaccine development. A central theme is understanding how the immune system prevents or causes diseases.

Research is conducted at the molecular, biochemical, genetic and population levels with goals of developing vaccines and therapeutics for infectious diseases.

Our Department is integrated and supports the Institute of Global Health and Translational Sciences.

This program awards a PhD and an MS degree.

NEUROSCIENCE

The graduate program in neuroscience is a multidisciplinary interdepartmental program. The program is anchored in the department of Neuroscience & Physiology but composed of faculty across multiple departments at SUNY Upstate.

The overall goal of the program is to provide students with broad foundational knowledge in the neurosciences while enabling students to tailor their curriculum toward their specific research interests and areas of expertise.

Program research has strengths in neurodevelopment and neurodevelopmental disorders, neuropsychiatric disorders and diseases, addiction, neurodegenerative disorders and neural trauma, aging, sensory and cognitive systems, eye development and disease, and neuro-oncology and neuro-immunological disorders.

This program awards a PhD.

PHARMACOLOGY

Current research in the Department of Pharmacology focuses on cancer biology, drug development and delivery, structure based drug design, cell signaling, cardiovascular electrophysiology and disease, and neurodegeneration.

This work is supported by extramural funding, particularly from NIH. To continue this excellent tradition in research and teaching and to keep pace with changes in Pharmacology, our department is enhancing its research strengths and expanding into new research areas.

This program awards a PhD and an MS degree.



RESEARCHER RESOURCES FOR...

Our laboratories are structured so that new students quickly gain a sense of ownership in a project. Biomedical students at SUNY Upstate have the opportunity to train alongside productive faculty engaging in exciting new discoveries.



ALAJI BAH, PHD

Scholarship honored by Pew

Alaji Bah, PhD, assistant professor in the Department of Biochemistry and Molecular Biology at Upstate Medical University has been named as a 2021 Pew Scholar in the Biomedical Sciences.

Bah was one of only 22 individuals out of 198 nominations submitted by leading U.S. academic and research institutions to receive four years of funding to invest in exploratory research.

Bah's research studies

how proteins that lack a fixed structure form membraneless cellular sub-compartments support biological processes.

"The goal of my lab is not only to understand the Post-Translational Modifications, or PTM-mediated conformational transitions (e.g. folded vs. disorder transitions) and/or monomer: phase-separation transitions in specific examples, but to also develop tools/protocols to enable characterization of such

properties in other biological systems," he has explained.

Upstate Vice President for Research David Amberg, PhD, praised Bah for being Upstate's first Pew Scholar. "We are all so very pleased to see Dr. Bah recognized in this way. He is the first Pew Scholar named at Upstate, it is very prestigious award and is typically given to young research faculty at the top biomedical research universities in the country."

Grant backs work on transplant research

Gary Chan, PhD has been awarded a five-year \$3.2 million grant National Institute of Allergies and Infectious Diseases to find a treatment for one of the most dangerous infections for transplant recipients.

Chan, an associate professor of microbiology and immunology at SUNY Upstate Medical University, said his lab is focused on studying host-pathogen interactions involving human cytomegalovirus (HCMV) and understanding how HCMV-mediated alterations to cellular function lead to human disease.

HCMV is endemic and infects the majority of people in the world; up to 80 percent of the population by some reports. Typically, a healthy person isn't aware of the infection, but HCMV can cause severe and sometimes fatal disease in immunocompromised individuals and newborns. This can be especially



GARY CHAN, PHD

dangerous for people needing an organ transplant.

"HCMV is the most common opportunistic viral pathogen in transplant recipients leading to significant disease in these patients,"

explains Chan. "Yet, there are very few approved antiviral drugs against HCMV, which have severe side effects."

Current anti-viral treatments delay replication but don't eliminate the infected cells.

...STUDENT SUCCESS

OUR STUDENTS GO PLACES!



CAREER DEVELOPMENT INITIATIVES:

- Students create an annual Individual Career Development Plan identifying professional development needs and career objectives. The plan serves as a communication tool for graduate students and their faculty advisors.
- A formal Peer Mentoring program that matches incoming students with upper-level graduate students.
- “Six Steps to Success,” a discussion series designed to help incoming students get off to a strong start.
- Career Development workshops (approximately a dozen) throughout the year.
- Lunch with the Dean – feedback sessions for students to discuss suggestions, successes or concerns.
- Certificate program in Anatomy Teaching



SPECIAL EVENTS

BIOMEDICAL SCIENCES RETREAT:

A day-long event, featuring poster presentations by students and presentations by faculty and invited guests, including alumni.

STUDENT RESEARCH DAY:

This annual event showcases interprofessional research by Upstate students. Students are selected to give platform presentations, and dozens of others give poster presentations. The day includes a keynote by a distinguished visiting researcher.

3-MINUTE THESIS

An 80,000-word PhD thesis would take nine hours to present. The 3-Minute Thesis (3MT) allows graduate students, at any stage, three minutes to do just that in this exciting competition.

TRAVEL OPPORTUNITIES:

STUDENTS ATTEND PRESTIGIOUS CONFERENCES

A well-deserved perk for students in the College of Graduate Studies is the chance to travel to prestigious conferences to present their research. It's not just a free trip. It's a valued opportunity to improve presentation skills, learn what other researchers are doing and foster professional relationships and networks. Here's a sampling of places our students visited to present their research:

- Charlottesville, VA
- Chicago, IL
- Denver, CO
- Japan
- Montreal, Canada
- New London, NH
- New Orleans, LA
- New York, NY
- Portland, OR
- San Diego, CA
- Washington, DC.

YOUR ACADEMIC PATH

NEW STUDENTS CAN LEAN ON SUPPORT FROM FELLOW STUDENTS

Fiza Hashimi, a student in the Biochemistry & Molecular Biology program, completed “Six Steps to Success” as a first-year student and now helps other students by serving as a panelist in this series designed to help new students start strong.

Students can feel overwhelmed navigating their first semester and this course helps them through the transitional phase. Hashimi’s experience confirms the merit of Six Steps. “Throughout my research career at Upstate, I definitely incorporated the concepts and material presented during Six Steps to Success, she said. “I really appreciated the breadth of topics presented from choosing a mentor to writing like a scientist, as well as speakers’ personal anecdotes. When I was invited to be a panelist, I looked back to the information I learned, what was valuable to me, and catered my comments to what I would have liked to have known as a first-year.”

Hashimi is one of several more-senior students who contribute to the program. New students at Upstate can count on a vibrant network of support through structured programs, such as Six Steps, as well as more independent projects, such as peer mentors and recreational events including a weekly social tea. “Student feedback has been excellent and has helped us to keep modifying and improving it,” Dr. Mark Schmitt said.

Indeed, after six meetings her first year, Angelina Regua felt at ease. “It helped calm me down a lot,” she said. “I wasn’t worried so much, and I could focus on school.”

Upstate’s size and atmosphere help new arrivals as well. “It’s a very cooperative institution,” Angelina said. “I know most of the grad students here.”

Angelina said she considered going to medical school, but that changed the summer after her junior year at Molloy College, a small school near her home on Long Island.

“I love research, the whole aspect of asking questions and taking time to find answers,” Angelina said. “I could do this forever.”



PHD DEGREE TIMELINE

FIRST YEAR

All first-year students participate in three lab rotations of their choosing. Lab rotations expose students to diverse research environments and help them select a mentor for their dissertation research.

First-year students also participate in a core curriculum that provides the essentials of an education in the basic biomedical sciences and develops community and collegiality.

First-year students also take electives and participate in Journal Club, where they practice analyzing papers and giving oral presentations. At the end of the first year, students select a mentor and become affiliated with a degree-granting program.

SECOND YEAR

By the start of the second year, most PhD students have begun work on the research project that will lead to their dissertation. Students take the Responsible Conduct of Scientific Research course, which examines the moral and philosophical issues confronting scientists, and continue to take electives based on their research interests as well as courses required by their program.

In Grant Writing, students learn to write grant applications under the supervision of a professor.

Students pass a qualifying exam to become candidates for the doctoral degree. This exam is scheduled by the end of the second year.

LATER YEARS

Immediately after passing the qualifying exam, students put together a dissertation advisory committee of three to six faculty members from different departments. The committee meets every six months to review the student’s progress, make suggestions and provide direction. After completing their research projects, students write a dissertation and defend it.

MOST STUDENTS COMPLETE THEIR PHD REQUIREMENTS IN FIVE TO SIX YEARS.

SUPPORTIVE ENVIRONMENT MAKES THE DIFFERENCE



Allysya Kemraj has always loved science. In third grade, she dressed as Marie Curie for a school project. Having been diagnosed with a rare disease, she found her focus: research into rare diseases.

At Upstate, Kemraj said she found a tight-knit community that made her feel welcome. "There are days when research is challenging and frustrating, however, I am truly grateful to be in an uplifting and fostering environment on difficult days," she said.

Her love of science has helped Kemraj face challenges, as has Upstate's commitment to student success. "As a student with a disability, I often also face various challenges different from the

norm. During my time at Upstate, I have been in close contact with the Student Disability Support Office. My coordinator helped me tailor my accommodations to my specific needs, and helped me communicate them to my professors."

Kemraj enjoys sharing stories about the work being done at Upstate. "I love talking about the novel research and exciting advancements being made around me. I've had the opportunity to learn from professors who have made groundbreaking discoveries in their field. We often meet scientists from a variety of fields, all of whom are excited to share their knowledge and passion!"

EXCELLENT EDUCATION

The College of Graduate Studies has a long history of providing an excellent education. Our institution is dedicated to the development of independent, competitive and well-trained professionals who can succeed in the biomedical research field. The specific programs are designed to provide graduates with the necessary skills and knowledge to pursue high-end research in either academic or industrial careers.

Our graduate students receive training in the latest scientific techniques using modern technology and instrumentation. Our research focuses on some of the most critical diseases that affect human health, and our outstanding faculty features international experts in many areas – neuroscience, diabetes, cardiovascular disease, molecular genetics, stem cell research, structural biology, infectious disease and cancer.

FOCUS ON RESEARCH

Unlike many graduate programs, most of our PhD candidates are not required to teach undergraduate or lower level graduate courses. This means our students focus on what they came to do: research. However, there are opportunities for our students to gain teaching experience if they wish. For example, some graduate students assist in medical school laboratory courses.

MASTER'S DEGREE

TWO TO THREE YEARS

Four programs in the College of Graduate Studies offer master's degrees: Biochemistry & Molecular Biology, Cell & Developmental Biology, Microbiology & Immunology, and Pharmacology. The master's degree program typically takes two to three years. Master's students participate in selected parts of the core curriculum along with PhD students.

Unlike PhD students who usually affiliate with a degree-granting program at the end of their first year, master's students join a program from the start. Master's students write and defend a thesis, but they don't take a qualifying exam. Additional requirements vary depending on the program.

NEW COURSES FOR DIVERSE CAREERS

'NANOCOURSES' EXPLORE NEW TERRITORY

Nanocourses are short courses that meet for a total of about eight hours and typically address a new or evolving area not covered by the standard graduate curriculum. The course could be given in a week, or two days or even over several weeks. Each Nanocourse is worth 0.5 credit and is graded Satisfactory/Unsatisfactory.

Complete list: <http://www.upstate.edu/grad/curriculum/nanocourses.php>

TEACHING FOR THE BASIC SCIENTIST

This course prepares the graduate student who desires to pursue an academic track to teach by exploring the process for the design, delivery and assessment of any academic course for adult learners. The student will learn to write objectives and plan content as well as deliver content with an emphasis on active learning. The student will also learn appropriate assessment methods that fit the delivery and objectives of the course.

MICROCREDENTIAL IN ANATOMY TRAINING

This competency-based valuable microcredential demonstrates interest and ability in teaching.

Students will be trained in anatomical dissection as well as instructional best practices for the classroom setting .

YOUR ACADEMIC PATH

MD/PHD PROGRAM

Upstate's MD/PhD program combines the graduate program in biomedical sciences with medical school. Graduates pursue careers in medical research and academic medicine. The program offers a wide selection of research areas.

The program is committed to the recruitment of students with diverse educational and cultural backgrounds who, having a passion for research in the biomedical sciences and clinical care, are dedicated to becoming caring academic physicians.

Students accepted in the program receive tuition waivers and a yearly stipend.

For more information on the MD/PhD program, visit www.upstate.edu/mdphd or email admiss@upstate.edu.



Gargi Mishra, an MD/PhD student and member of Xin Jie Chen, PhD's lab in the Department of Biochemistry and Molecular Biology, has been awarded an American Heart Association Predoctoral Fellowship to help fund her studies for the next two years.

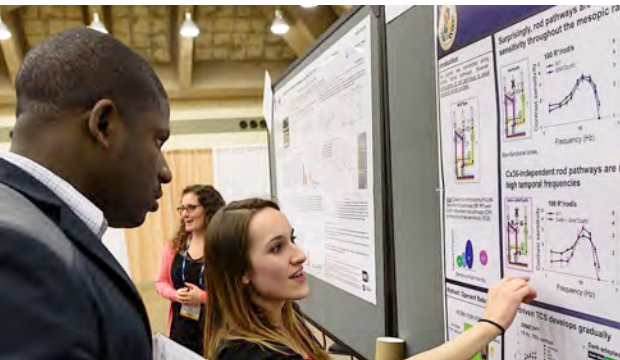
Mishra was selected on the strength of her proposal to study the impact of the dysfunction of mitochondria in cells, and how this can

contribute to heart disease. While the mitochondria require about 1,500 different proteins to function, they must import them to fuel the body's organs.

"If import is halted, perhaps by a protein getting clogged in a transport channel, mitochondria cannot function properly," Mishra explains. "This phenomenon is like a clogged sink causing a flooded kitchen."

She's hoping a better understanding of the basic science behind mitochondrial dysfunction can lead to future drug and therapeutic discoveries.

"While there are many drugs that treat heart disease, very few target mitochondrial function in the heart," she said.



PROGRAM STRUCTURE

YEAR 1	Summer Research Rotation	First-Year Basic Science Medical School Classes		
YEAR 2	Summer Research Rotation	Second Year Basic Science Medical School Classes	USMLE STEP I	
YEARS 3-6	Grant Writing	Qualifying Exam	Dissertation Work	Defend Thesis
YEARS 7-8	Clinical Clerkships	Apply to Residency	USMLE STEP II	Graduation

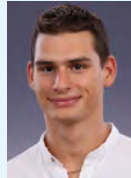
FIRST-AUTHOR STUDENT PUBLICATIONS

2022

SUNY Upstate graduate students frequently publish first-author articles in professional journals and books. The following is a sampling of recent publications. For the full list of our student first-authors, visit www.upstate.edu/grad/students/publications.php.



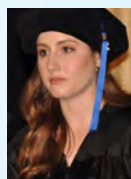
Backe Sarah, Ahanin Elham et al. Impact of Co-chaperones and Posttranslational Modifications Toward Hsp90 Drug Sensitivity. *Sub-Cellular Biochemistry*



Papp C. Stable Bulged G-Quadruplexes in the Human Genome: Identification, Experimental Validation and Functionalization. *Nucleic Acids Research*



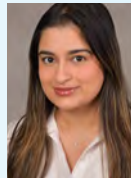
Barnett Eric Analysis of the Relationship of Attention-Deficit/Hyperactivity Disorder With Posttraumatic Stress Disorder Clarifies Relationship Directionality. *Biological Psychiatry*



Phillips Hannah et al. Dorsomedial prefrontal hypoexcitability underlies lost empathy in frontotemporal dementia. *Neuron*



Belkevich AE Distinct Interaction Modes for the Eukaryotic RNA Polymerase Alpha-like Subunits. *Molecular Cell Biology*



Singh V. It is Premature for a Unified Hypothesis of SUDEP: A Great Amount of Research is Still Needed to Understand the Multi-System Cascade. *Epilepsia*



Bonzerato CG Bok: real killer or bystander with non-apoptotic roles? *Frontiers in Cell and Developmental Biology*



Waldran MJ, Wegman AD, Bahr LE Soluble NS1 Antagonizes IgG- and IgA-Mediated Monocytic Phagocytosis of DENV Infected Cells. *Journal of Infectious Diseases*



Fazana Tuli et al. Chimeric α -subunit isoforms generate functional yeast V-ATPases with altered regulatory properties in vitro and in vivo. *Molecular Biology of the Cell*



Zehrbach NM Paxillin Regulates Rab5-mediated Vesicle Motility through Modulating Microtubule Acetylation. *Molecular Biology of the Cell*

OTHERS RECENTLY PUBLISHED:

Khan MM, Knight K. Tender love and disassembly: How a TLDc domain protein breaks the V-ATPase. *BioEssays*

Pedicone Chiara et al. Obesity control by SHIP inhibition requires pan-paralog inhibition and an intact eosinophil compartment. *iScience*.

Pimm ML Purification of Human β - and γ -actin from Budding Yeast. *Journal of Cell Science*

Razavi Ali Shervin et al. Machine Learning and MRI-based Diagnostic Models for ADHD: Are We There Yet? *Journal of Attention Disorders*

MAKE FRIENDS, PURSUE YOUR INTERESTS

GRADUATE STUDENT ASSOCIATION

This organization is devoted to increasing interaction among Upstate's graduate students. Events sponsored include:

- New-student orientation
- Class get-togethers
- Winter holiday party
- Speaker in May
- End-of-Year picnic
- Softball tournament

UPSTATE STUDENT GOVERNMENT

The student government organization represents all Upstate students. It provides a forum for student opinion, facilitates cooperation and communication with the administration, faculty and community and allocates the student activity fee.

FACULTY-STUDENT ASSOCIATION

The Faculty-Student Association administers scholarships, loan funds and student activity fees, and sponsors special projects.

INTERNATIONAL STUDENT ASSOCIATION

Our International Student Association (ISA) is very active. The ISA promotes the diversity of the International student population through cultural meetings and events, including the annual International Festival. SUNY Upstate also has a designated International Student advisor.

SYRACUSE: A COLLEGE TOWN

The SUNY Upstate campus sits on the edge of downtown, on University Hill – home to restaurants, theatres, shops and the JMA Wireless Dome.

Combine Upstate with five nearby campuses and you have a city filled with students, academics, research centers, libraries and great sports. Add abundant affordable housing and a cost of living below the national average, and you have a great place to go to graduate school.

Just outside the city you will find numerous parks, lakes and mountains with golf courses, ski slopes, hiking trails and beaches. Syracuse is just a 4- to 5-hour drive from New York City, Boston, Toronto and Montreal.

CAMPUS ACTIVITIES

SUNY Upstate offers dozens of student clubs and organizations and an intramural sports program. Student Affairs schedules social, cultural and recreational programs for students, including a guest lecture series, comedy hours, weekend trips and discount tickets to local sports and cultural events.

The Campus Activities Building (CAB), has a computer lounge, snack bar, TV lounge, as well as a gym featuring a pool, sauna, tennis and basketball courts, billiards, ping-pong and cardio and free-weight equipment

CAMPUS HOUSING

The renovated Geneva Tower offers housing for students, post-docs and medical residents at SUNY Upstate. The apartments are fully furnished, including a flat-screen television in each unit. Geneva Tower has a fitness facility, social rooms and laundry facilities, and is a non-smoking, pet-free environment. The residence is only for the Upstate community and provides a clean, modern place to call home. It is a short walk from campus.



Geneva Tower:
Housing for Upstate students.

OFF-CAMPUS HOUSING

Most graduate students choose to live off-campus in apartments near the university. The College of Graduate Studies maintains a list of off-campus apartments, duplexes and houses to help students searching for housing.

STUDENT SERVICES

SUNY Upstate offers numerous student services including 24-hour security and escort service to all on-campus locations; a child care center with an elite accreditation that reserves spaces for the children of students; and a student health center providing primary care for acute conditions, illnesses and injuries to all students. A complete listing of student services can be found at www.upstate.edu/currentstudents/support

WE'RE SUNY

SUNY Upstate is part of the State University of New York, the largest university system in the world, with 460,000 students on 64 campuses. SUNY is one of the top 10 U.S. institutions for patents issued each year.



FACES & PLACES

1. Syracuse Mets game
2. Campus Activities Governing Board
3. Learning Community Olympics
4. Clinton Square skating rink
5. Gone fishing
6. Honoring anatomical donors
7. COGS Squad



ENJOY LIFE!

It's true that the demands upon students in the College of Graduate Studies are rigorous. But there are also many opportunities to have fun at SUNY Upstate and in the community. From well-organized activities on campus (picnics, free or inexpensive comedy shows and concerts), to spontaneous outings with friends and short day trips, our students know how to find healthy

releases from the laboratory. Central New York's four seasons, numerous cultural offerings and wide range of entertainment options help our students lead well-balanced lives. As one of our PhD students said, "If you're going to spend four or five years somewhere, it's important to have some fun."

LOTS OF THINGS TO DO — CENTRAL NEW YORK ATTRACTIONS AND EVENTS

Adirondack Mountains
 Armory Square
 Balloon Fest
 Beaver Lake Nature Center
 Chittenango Falls
 Clark Reservation State Park
 Destiny USA
 Downtown Arts and Crafts Festival
 Everson Museum of Art

Finger Lakes Wine Country
 Green Lakes State Park
 Highland Forest
 Labrador, Toggenburg and Song
 Mountain Ski Areas
 LaFayette Apple Festival
 Multicultural Festivals
 Museum of Science and Technology

New York State Fair
 Old Forge
 Onondaga Lake Parkway
 Regional Farmers Market
 Rosamond Gifford Zoo at Burnet Park
 Salmon River Fishing
 Skaneateles Lake
 Symphoria

Syracuse Mets AAA Baseball
 Syracuse Crunch Hockey
 Syracuse Jazz Fest
 Syracuse Opera
 Syracuse Stage
 Syracuse University Athletics at the Carrier Dome
 Whitewater Rafting
 Winterfest

ADMISSIONS

HOW TO APPLY

Visit upstate.edu/grad/admissions for step-by-step instructions for applying online.

ADMISSION REQUIREMENTS

Candidates for admissions are selected holistically on the basis of their record and qualifications for independent scholarship in a specialized field of study.

All PhD and Master's applicants should have:

- Bachelor's degree or its equivalent.
- Three original letters of recommendation from people familiar with your academic record and potential for investigative research.
- Transcripts from all undergraduate and graduate schools attended.
- Competitive applicants will have prior research experience.
- Prerequisite courses for students without a degree in Science, Technology, Engineering or Math:
 - Biology, 1 year
 - Mathematics, 1 year
 - Chemistry, 1 year
 - Physics, 1 year

APPLICATION DEADLINES

PhD: The Biomedical Sciences **PhD program application deadline** for full consideration is **January 1**.

Requests for submitting an application beyond this date will be considered until the class is full. All students interested in the Biomedical Sciences PhD program apply to the undeclared program.

Master's programs in:

- Anatomy
- Biochemistry and Molecular Biology
- Microbiology and Immunology
- Pharmacology

have an **application deadline of April 1**.

MD/PhD: Applications for the **MD/PhD program** require the AMCAS application to be completed by **October 1** and the Upstate supplemental application by **November 1**. For more information on the MD/PhD program, see page 10.

INTERNATIONAL

STUDENTS

Students from outside the United States must meet the same admission requirements as candidates from within the United States regardless of whether they earned their bachelor's degree abroad or in the U.S.

INCOMING CLASS SCORES

GPA

2023 **3.55**

2022 **3.5**

2021 **3.57**

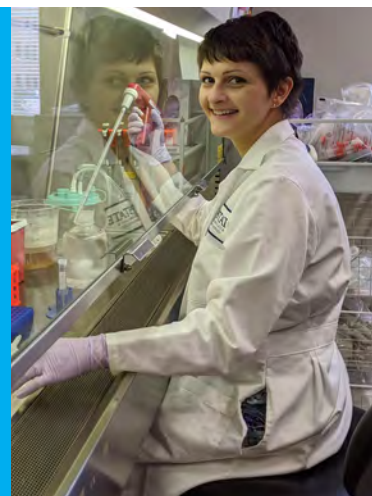
RIISING (QUICKLY) TO MEET THE CHALLENGE

Krista Newell completed her PhD in under four years due to her ambition and dedication to getting the job done right. This was even more apparent to when she answered the call to contribute to the Upstate COVID-19 testing efforts. Familiar with Centers for Disease Control and Prevention (CDC) Real-Time PCR Diagnostic Panels from professional experience prior to her doctoral education, Newell contributed to Upstate Medical University's evaluation of hundreds of tests. She also played an active role in SARS-CoV-2 research as part of Upstate's COVID-19 Working Group, publishing part of this work in early 2021.

The chief executive of the State University of New York system recognized Krista's commitment to excellence in areas such as academics, leadership, campus involvement, and community service by awarding her the SUNY Chancellor's Award for Student Excellence. This award is inclusive of 63 SUNY campuses and is the highest honor bestowed upon a student by the university.

Upon entering the college, Newell's research was on immune responses to intracellular bacterial infection. In her post doctorate career that focus has shifted to the study of immune responses to viral infection and vaccination. She credits her research experience and having the opportunity to have such an active role in the COVID response to the university's embrace of student contributions.

Newell says, "As a second career PhD candidate, I appreciated belonging to a university that sees the value in diversity and thoughtfully crafts an experience that brings everyone to an equal field of advantage for their career aspirations."





WEISKOTTEN HALL This Classical Revival building with comfortable lecture halls and some of SUNY Upstate's most advanced research laboratories is the College of Graduate Studies' central academic and research facility.

STIPENDS, TUITION, FEES AND FINANCIAL AID

PHD PROGRAM

All PhD students receive a full-tuition scholarship and are paid a 12-month stipend. By receiving stipends, PhD students are represented by the SUNY Graduate Student Employees Union, which provides periodic and automatic increases in stipend awards in addition to other benefits including a low-cost health care package.

The comprehensive health benefits include: coverage for medical services; hospitalization; prescription drugs; and mental health, dental, and eye care.

Student stipends are derived from a variety of university sources including departmental and university fellowships, research grants and research assistantships.

Students are encouraged to apply for individual predoctoral fellowships which could lead to higher stipends.

In fact, some of our current students receive their own extramural funding.

The SUNY Graduate Diversity Fellowship Program was enacted with the expressed goal of enhancing diversity and academic excellence in SUNY's graduate programs by recruiting outstanding students from different backgrounds, including individuals from groups that have been historically underrepresented, and providing them with the support necessary for achieving academic success.

MASTER'S PROGRAM

The tuition for master's students can be found at www.upstate.edu/current_students/financial_resources/accounts/.

ADMISSIONS ADVISING

Pre-advisement appointments are available in person or by Zoom to help you apply for any of our programs.

SYRACUSE COSTS LESS

Syracuse was named the most affordable mid-size city in America, according to *The Simple Dollar* website.

Syracuse topped the list of the personal finance website's list of the 150 most affordable mid-size cities in the U.S. (50,000 to 150,000 pop.).

The affordability rankings were based on median house prices, average rent of a one-bedroom apartment, median household income, and a cost of living index that considers housing, utilities, groceries, transportation and healthcare costs.

The rankings also took into account quality of life, including climate, job opportunities, cultural and recreational facilities.



CONTACT US

For more information on any of our programs, please contact:

College of Graduate Studies Admissions Office

315-464-4570 or email admiss@upstate.edu.

For more information on financial aid, please contact:

The Office of Financial Aid

315-551-2057/ finaid@upstate.edu

Tuition and fees are subject to change without notice.

<https://www.upstate.edu/grad>



GREAT CAREERS AHEAD

UPSTATE RESEARCHER AWARDED NIMH GRANT FOR BRAIN RESEARCH

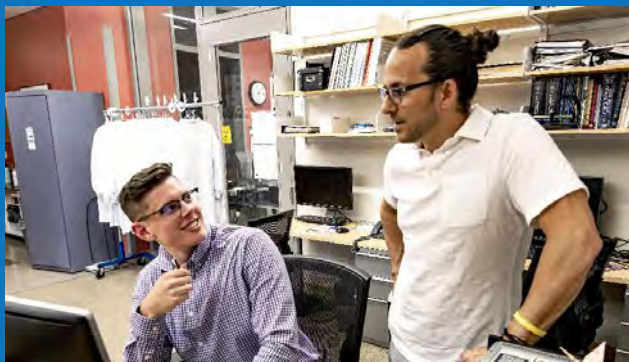
An Upstate Medical University researcher has been awarded a grant from the National Institute of Mental Health for a novel approach to studying how biological changes in the brain contribute to psychiatric disease.

Jonathan Hess, PhD, has spent three years developing BrainGENIE, which stands for Brain Gene Expression and Network Imputation Engine. Hess applied for the NIMH grant and learned he was awarded the \$445,500 NIMH R-series funding.

The method uses existing data on gene markers from brain tissue samples from deceased donors and compares it to new data on those same gene markers in blood samples from patients living with psychiatric disorders. Those illnesses could include schizophrenia, bipolar disorder and major depressive disorder as well as autism spectrum disorders and Alzheimer's disease. BrainGENIE is new and could be influential in the field of psychiatric genomics because studying living brain tissue in human subjects is notoriously difficult.

Brain tissue samples can help scientists understand psychiatric disorders. But studying those samples must usually occur after death because a brain biopsy in a living person is complicated and impractical. Studying tissue samples from a cadaver also has limitations since the person has likely taken many medications over the years to treat that mental illness. That and age can change the brain's biological makeup over time.

Conversely, blood does not usually yield enough data about what's happening in the brain to make psychiatric disorder diagnoses. BrainGENIE, however, combines the two by creating a link or correlation between tissue sample data from deceased patients and blood data from new patients.



BrainGENIE “leverages biological comparability between blood and brain gene expression to predict transcriptome profiles for brain tissue based on blood gene-expression profiles. BrainGENIE is fundamentally different from other transcriptome-imputation methods, and captures a much larger proportion of the variance in—and larger fraction of—the brain transcriptome,” according to a summary of the method.

“With the use of BrainGENIE and the use of blood data in people who are alive we may be able to capture some useful biomarkers of their illness state and then make better predictions in people who are not yet diagnosed but are showing signs of illness,” Hess said. “This touches on an important issue in psychiatry – screening for and diagnosing mental illness early, before the symptoms become harder to treat.”

“If we could have a simple, blood-based test of mental illness relying on BrainGENIE to make reliable predictions of the state of their brain, then maybe we can have more insights into what illness they may have or how best to treat it.”

Hess grew up in Cicero and earned his bachelor's degree at Le Moyne College before pursuing his master's and doctorate degrees from Upstate. He earned his PhD in 2017 and is an assistant professor in the Department of Psychiatry and Behavioral Sciences. He works closely with Stephen V. Faraone, PhD, distinguished professor and vice chair of research in Upstate's Department of Psychiatry and Behavioral Sciences, and Prof. Stephen J. Glatt, professor of Psychiatry and Behavioral Sciences. Glatt has served as Hess' mentor for several years and said his former student and colleague is adept at turning an idea into practical science. The NIMH grant, he said, is proof that his work is important and could have profound implications for the field.

“Jon is a phenom. He's the type of person who is very self-determined. Jon will see a problem and bring me five ways to solve it,” Glatt said.

Beyond BrainGENIE, Glatt said Hess also developed a novel approach to study resilience, which was heavily responsible for a grant they received from the National Institute on Aging focusing on resilience to Alzheimer's Disease. Hess also received a Young Investigator Award from the Brain & Behavior Research Foundation to study resilience to schizophrenia, bipolar disorder and major depressive disorder.

Jonathan Hess, PhD, left, and Stephen Glatt, PhD, have collaborated on the BrainGENIE.

**100% JOB
PLACEMENT**

PHD STUDENTS WHO GRADUATED IN 2022
AND WERE SEEKING PLACEMENT, RECEIVED JOBS
OR POST-DOCTORATE POSITIONS IN THEIR FIELDS.

THE COLLEGE OF GRADUATE STUDIES AT A GLANCE

(Numbers as of Fall 2022)

DEGREE-GRANTING PROGRAMS:

- Biochemistry & Molecular Biology
- Anatomy & Cell Biology
- Microbiology & Immunology
- Neuroscience
- Pharmacology
- Physiology

AREAS OF CONCENTRATION:

- Cancer
- Neuroscience
- Vision
- Molecular Genetics
- Structural Biology
- Infectious Disease
- Diabetes
- Behavioral Disorders

DEGREES OFFERED:

PhD, MS, MD/PhD

STUDENTS: 127

(55% women, 13% from unrepresented populations, 38% international)

FACULTY: 110

SUNY UPSTATE

CURRENT FUNDING:

Approximately \$43 million

SUNY UPSTATE

RESEARCH PROJECTS: 578

STIPEND/TUITION:

All PhD students receive a full tuition scholarship and an annual stipend of \$32,000. Master's students pay tuition at the SUNY rate (see page 15).

SUNY Upstate Medical University does not discriminate on the basis of race, sex, sexual orientation, color, creed, age, national origin, disability, marital status, or veteran status, in the recruitment and employment of faculty or staff; in the recruitment of students; or in the operation of any programs or activities, as specified by federal and state laws and regulations. For more information, contact the Office of Diversity, Equity and Inclusion at diversity@upstate.edu.

MESSAGE FROM THE DEAN



As dean of the College of Graduate Studies, I am often asked what career options there are with a PhD in biomedical research.

The labor market for a biomedical scientist is one of the best in the country. Their unemployment rate runs at less than half of the national average, and the growth rate for jobs is projected at a healthy 31% over the next 10 years.

Many of our graduates follow the traditional academic track leading to faculty positions at both research and teaching universities. However, an increasing number of graduates are landing in biotechnology, pharmaceutical or start-up research settings.

Another growth area for our graduates has been in non-research scientific careers. These include patent law, national and international science policy, national defense and homeland security, journal editors, management consulting and finance.

The training we provide our students opens doors to opportunities that would otherwise be difficult to achieve.

We hear back from our alumni often. Their excitement over their occupations and lives is clear. They are working at what they love, which makes a job fun instead of a burden.

I would encourage you to apply to Upstate. You will receive a first-rate education from faculty dedicated to your intellectual growth, career development and long-term success. I hope you will take time to examine this brochure and see for yourself what we have to offer. I promise you will be impressed and want to join our endeavor and be part of our noble mission.

Mark E. Schmitt, PhD
Dean, College of Graduate Studies

ON THE COVER WEISKOTTEN HALL:

This Classical Revival Building is the College of Graduate Studies' main academic and research facility. The building is named in honor of former Syracuse University College of Medicine dean Weiskotten, MD, PhD. In 1936, President Franklin Delano Roosevelt presided over the cornerstone ceremony. Weiskotten is home to SUNY Upstate's administrative offices and health sciences library, plus lecture halls, classrooms and laboratories.



UPSTATE AT THE FOREFRONT OF COVID-19 EFFORTS

Upstate Medical University has risen to the challenge of COVID-19, serving as a primary testing site for the Pfizer vaccine, developing less-invasive and more affordable testing methods and sending assistance to harder hit areas as the pandemic grew.

Stephen Thomas, MD, professor and chair of Microbiology and Immunology at Upstate Medical University, served as lead principal investigator for the Pfizer/BioNTech global phase 3 COVID-19 vaccine trial, and coordinating principal investigator for the late-stage Pfizer/BioNTech global vaccine. During the year, his work appeared twice in the pages of the New England Journal of Medicine.

Upstate Associate Professor Frank Middleton, PhD (seen below), developed a mouth-swab test for COVID-19 that allowed testing to be conducted for a much lower cost. That, among other things, allowed the State University of New York to test students regularly, detecting outbreaks and preventing their spread.

Upstate students stepped forward to help in multiple capacities, including assisting in research, helping to explain COVID to worried members of the public, and organizing blood drives.



STATE UNIVERSITY OF NEW YORK

UPSTATE
MEDICAL UNIVERSITY

COLLEGE OF GRADUATE STUDIES

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