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NORTON COLLEGE OF MEDICINE

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NORTON COLLEGE OF MEDICINE
2022 ANNUAL REPORT

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2022 ANNUAL REPORT

STATE UNIVERSITY OF NEW YORK
UPSTATE
MEDICAL UNIVERSITY

Lawrence Chin, MD, Dean of the Norton College of Medicine at Upstate Medical University

Welcome to the Norton College of Medicine

I am so pleased to introduce you to our medical school, the second oldest in New York State (founded in 1834).

This annual report is unique because it is the first one as the Alan and Marlene Norton College of Medicine. I want to thank our Upstate alumnus Class of 1966, Dr. Alan Norton and his wife Marlene for their transformational gift. I think it is particularly significant because Dr. Norton is a graduate of Upstate and represents the ways in which our students go out and influence the world. As a result of his gift, we are able to start planning the most significant changes ever to our curriculum. Future editions of this report will highlight those changes and their effect on education.

In this edition, I will present to you the impact that Upstate researchers are making on the world. We have seen amazing work through the pandemic by our infectious disease and epidemiology experts, and we continue to see scientific breakthroughs from our faculty in vision research, neuroscience, and cancer, to name just a few.

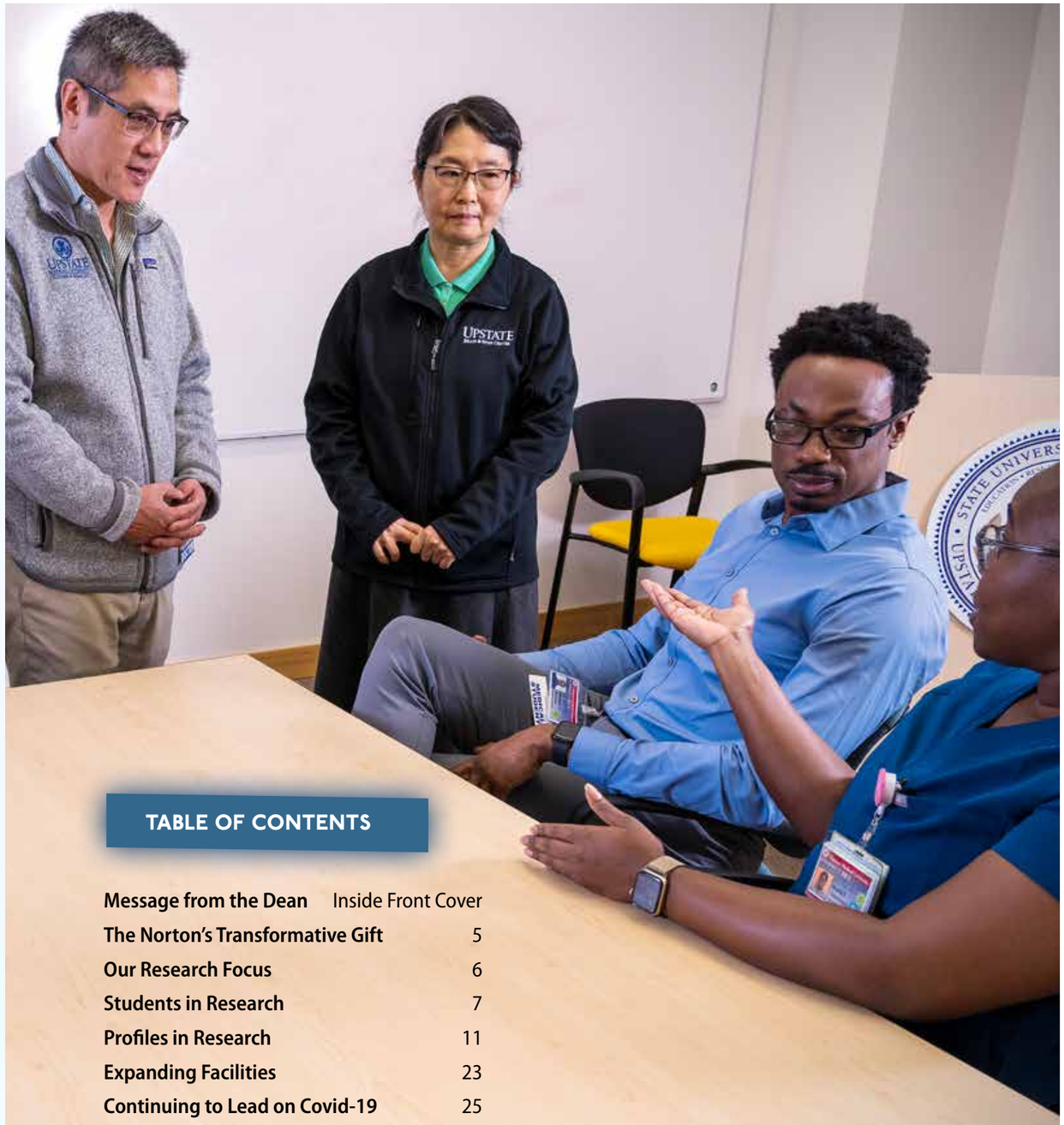
Our research funding has grown at an annual rate of 10 percent for the past five years, and we continue to surpass our publication output each year. Our students are also more involved than ever in research. The Office of Research for Medical Students coordinates this activity matching students to faculty investigators and provides scholarships and stipends for travel.

In addition to advances in research, we are attracting more students into our class and continue our trend of matriculating a more diverse student population and providing a welcoming environment for them.

A return to more in-person activity also meant we were able to hold our very successful workshop called PAW aimed at bringing more Indigenous students to Upstate. We have also started several initiatives that not only specifically address well-being in our students and residents, but also provide a safety net for those who are in need.

I am proud to serve the local community as dean of the Norton College of Medicine. Through our work in education, clinical care and research, we continue to strive for a better and more equitable healthcare system.

Lawrence Chin, MD
Dean



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Dean Lawrence Chin, MD, and Prof. Li -Ru Zhao, Phd, meet with students.

In recognition of their generous gift to the institution, the College will now be known as the Alan and Marlene Norton College of Medicine at Upstate Medical University.

New name recognizes generous gift

Upstate Medical University College of Medicine has received the largest estate gift in its history, and, in recognition of the gift, the College of Medicine has been named the Alan and Marlene Norton College of Medicine at Upstate Medical University.

Alan Norton is a 1966 alumnus of the Upstate College of Medicine.

"We are extremely grateful to the Nortons for this most generous gift," said Mantosh Dewan, MD, president of Upstate Medical University. "This remarkable gift will help us retain and develop outstanding faculty and teaching to benefit our students. The Norton's gift will elevate the college's stature and set us on a solid future of sustained excellence for years to come."

Lawrence Chin, MD, dean of the Alan and Marlene Norton College of Medicine at Upstate Medical University, applauded the gift. "A gift of this magnitude from an alumnus of the college is accepted with great appreciation and underscores the role the college had in an individual's successful medical career."

"I am grateful for the quality education that I received from the SUNY Upstate Medical University," Norton said. "This provided me the opportunity for a career in medical research and practice. Our estate gift to the Upstate College of Medicine is to demonstrate our appreciation and help the college to continue its excellence in teaching and innovation."

After graduating from the University of Chicago with a degree in biochemistry, Alan Norton entered the SUNY Upstate Medical University College of Medicine. As a medical student his greatest interest was in research and while at Upstate he co-authored two articles on the electrophysiology of the eye.

Upon graduation from Upstate in 1966, Alan Norton completed a residency in ophthalmology at the Wilmer Eye Institute of Johns Hopkins University and a fellowship at Harvard University's Massachusetts Eye and Ear Infirmary, now known as Massachusetts Eye and Ear. He spent two years with the National Institutes of Health doing research on the electrophysiology of the retina and published more than a dozen research articles in peer review journals.

Alan Norton served as a visiting faculty member at the Stein Eye Institute at UCLA for more than 20 years. He also had his own ophthalmology practice and served as a consultant to three different hospitals in his subspecialty of retinal diseases.

Marlene Norton was raised in the Midwest, where she obtained her nursing degree. She worked in hospitals and became specialized in assisting with ophthalmological surgeries. She was highly regarded for her expertise by several ophthalmologists and served as an office manager with numerous responsibilities.

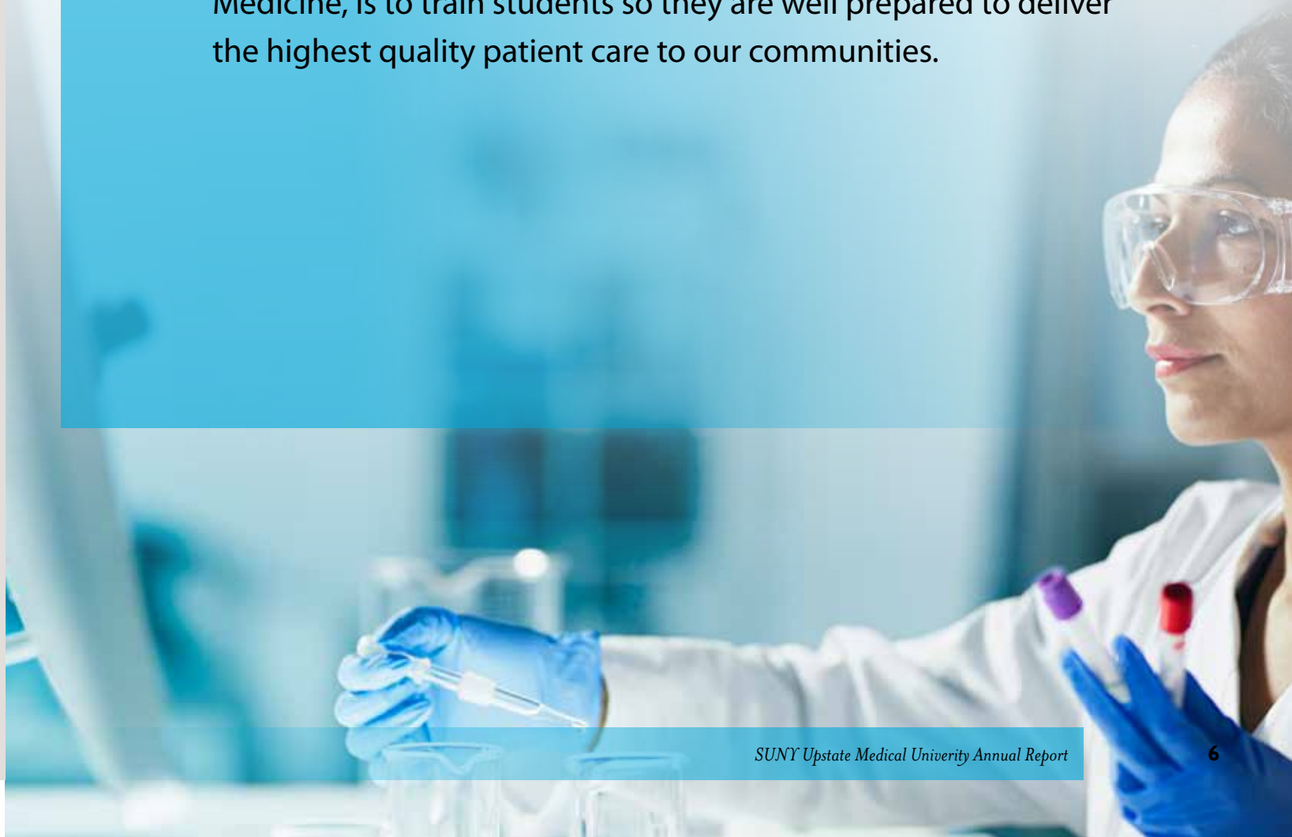
"The Norton's gift will forever have a positive influence on the future success of our College of Medicine," said Medical Alumni Foundation Executive Director Paul Norcross. "I personally add my sincerest thanks to Alan and Marlene for choosing Upstate for this significant gift."

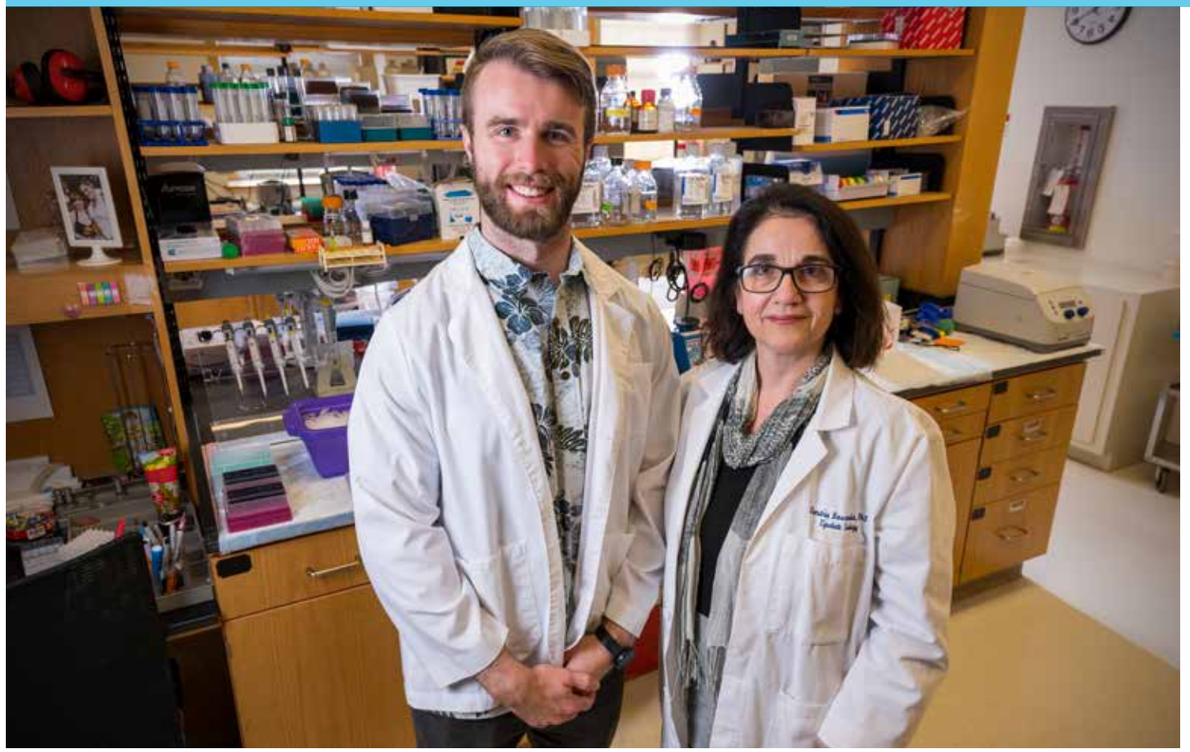
Our research focus.

As one of America's academic medical centers, Upstate Medical University provides patient care, education and research.

Faculty at the Norton College of Medicine have long been active researchers, using the latest techniques and equipment to challenge medical mysteries. This report shares stories of faculty members whose research have led to advances in the detection, treatment and prevention of illnesses.

A concerted effort to involve students in research has brought a growing number of students into the lab to assist, to explore and to learn. The effort, like all efforts at the Norton College of Medicine, is to train students so they are well prepared to deliver the highest quality patient care to our communities.





Dimitri Bourboulia, PhD, and fourth-year student Mark Derbyshire in the lab.

Program linking students to research finds success

In the four short years since its founding, Upstate's Office of Research for Medical Students (ORMS) has become an integral part of education for medical students and a source of help and inspiration for Upstate researchers.

Recognizing how essential research experience is for our medical students, Dimitra Bourboulia, PhD, became the assistant dean for Undergraduate Medical Education and Graduate Medical Education research and founding director of ORMS in 2018. "Acquiring research experience brings perspective, awareness and broader knowledge of a disease," she said. "Essential skills that lead to better practices are acquired by our future physicians, while helping medical school graduates secure excellent residencies." Under her leadership, ORMS created an online portal where students' interests and researchers' needs are matched. The program was designed to encourage students starting from their first days at medical school.

Student participation in research has soared, Bourboulia reported, and more than 100 Upstate Faculty have submitted projects to the ORMS database. Projects from all College departments have been submitted with significant involvement from Pediatrics, Pharmacology, Internal Medicine, as well as Psychology and Behavioral Science and Ear, Nose and Throat. The research can take all forms, Bourboulia explained. "Benchwork, clinical, translational, epidemiological, computational, quality projects, case report studies, clinical trials," she said. "Projects are mostly multidisciplinary, hypothesis-driven."

By reviewing the website and reviewing open opportunities, students find a research topic and recognize, "I'm interested in that and I want to be part of this project," Bourboulia said. In 2022, ORMS facilitation resulted in 55 medical students presenting at Upstate's Student Research Day in the spring of 2022.

The Faculty/Student relationships sparked by the ORMS can result in publications, mentoring and continuing work in a research field that students might not otherwise have recognized as of great interest.

Student participation in research has soared and more than 100 faculty have submitted projects for student involvement.

"Our Faculty are on board with this initiative, it wouldn't be possible without their participation, we are so grateful." Bourboulia noted that because the program enlists students as soon as their first year in medical school, relationships between students and their mentors have time to grow and broaden, providing students the opportunity for deep understanding of a topic and offering researchers the inspiration that can come from working with someone fresh to the field.

Mark Derbyshire is a fourth-year student in the Norton College of Medicine. He found himself drawn to research early in his time at Upstate. "Since coming to Upstate, I've spent much of the last three years in Dr. Andrea Viczian's lab helping her study the role played by the transcription factor TBX3 in mammalian retinogenesis and retinal angiogenesis."

Work in Viczian's lab has yielded important information, Debryshire explained. "We found that mice that cannot express TBX3 in their retinas fail to properly develop a certain subtype of retinal ganglion cells (RGCs), the cell type that is ultimately responsible for transmitting visual information from the retina to the brain via the optic nerve. This particular population of RGCs in turn plays a critical role in the development of retinal vasculature, which helps to explain why we see a malformed retinal vasculature in these same mice." This, he said, might help pave the way for new treatments for retinal hypovascular diseases in humans.

The research experience gained during medical school is invaluable for all medical trainees, Bourboulia said. "It can help them distill information from different resources." It can also benefit future patients, she added. "Getting deeply involved in a research project shapes our minds to think critically and objectively in the long run; a medical student with such skills will have a better idea of how to diagnose, treat and prevent return of a disease. Research experience impacts decision-making for patients' health and well-being."

Future physician Derbyshire, agrees. "I think one big thing I've been able to take away from this time is how to take a more analytical approach to medicine. Thinking about how your most recent experimental results fit into your current experimental model requires the same sort of approach as when you are considering whether new test results you receive for a patient support or refute your working diagnosis."

Gift helps put students on path to research

The Norton College of Medicine's efforts to encourage student research beyond the first year took a great step forward with the help of one of the school's most accomplished alumni. Recipients receiving this prestigious award are named: "The Rogers Research Scholar"

The Rogers Research Scholarship was created to enable Norton College of Medicine second-, third- or fourth-year medical students to dedicate their time for research. Student applicants must demonstrate strong evidence of past research activities and talent. Research would be conducted during a continual period of 10 weeks or part-time over a period of one to two years. Students should produce a scholarly work-product, present their research in a relevant conference and publish their work.

The program is made possible by the support of Mark C. Rogers, MD, MBA, and Elizabeth Rogers. Mark Rogers graduated from Upstate Medical University College of Medicine in 1969. He went on to a pediatric internship at Massachusetts General Hospital, a pediatric cardiology fellowship at Duke University Medical Center and served in the Army Medical Corps.

He was a pioneer in developing pediatric intensive care, founding the first World Congress of Pediatric Intensive Care and published what became to be known as "Rogers' Textbook of Pediatric Intensive Care," now in its fifth edition.

After earning an MBA from the Wharton School, Mark Rogers became CEO of Duke Hospital and Health Network and went on to work for and later founded medical technology companies.

During an August visit to the Upstate campus in 2021, he had a question, Bourboulia recalled: "He asked, 'Do you have very bright, hardworking highly motivated students that you would like to see engage in research?'"

For its maiden year in 2022, five students were accepted into the program. Applications are currently open for the 2023 program.

During a visit to campus, Mark Rogers, MD, MBA, got to meet some beneficiaries of the Mark and Elizabeth Rogers Research Scholarships as well as Norton Faculty. From the left are, Aamer Imdad, MBBS; Rogers Scholar Anjilee Panjwani; Mark Rogers, MD, MBA; Dimitra Bourboulia, PhD; and Rogers Scholars Adam Hatala and Samuel Chen.

Summer research program offers opportunity for First Years

For first-year medical students, the Norton College of Medicine Office of Research for Medical Students annually disseminates the Summer Research Fellowship. This is a competitive program that requires students to connect with an Upstate Faculty Mentor, formulate and design an eight-week research project, write the research proposal and perform the research in the coming summer.

The purpose of this program is to offer first-year medical students an invaluable opportunity to gain research experience during their summer recess. Additionally, awarded students are required to produce a poster summarizing their summer research and must present their research at both the annual Charles R. Ross Memorial Student Research Day and to a specific, relevant research conference based on their research. "We see many innovative projects coming up and students are very enthusiastic and eager to start their research as soon as possible," said Dimitra Bourboulia, PhD, program director.

Medical Student Research Microcredential launched

Microcredentials, short, focused credentials designed to provide in-demand skills, know-how and experience, are rapidly growing at the Norton College of Medicine.

Stackable, these microcredentials can help students deepen their understanding of areas of interest and provide residency programs a clear indication of the quality and dedication of the students.

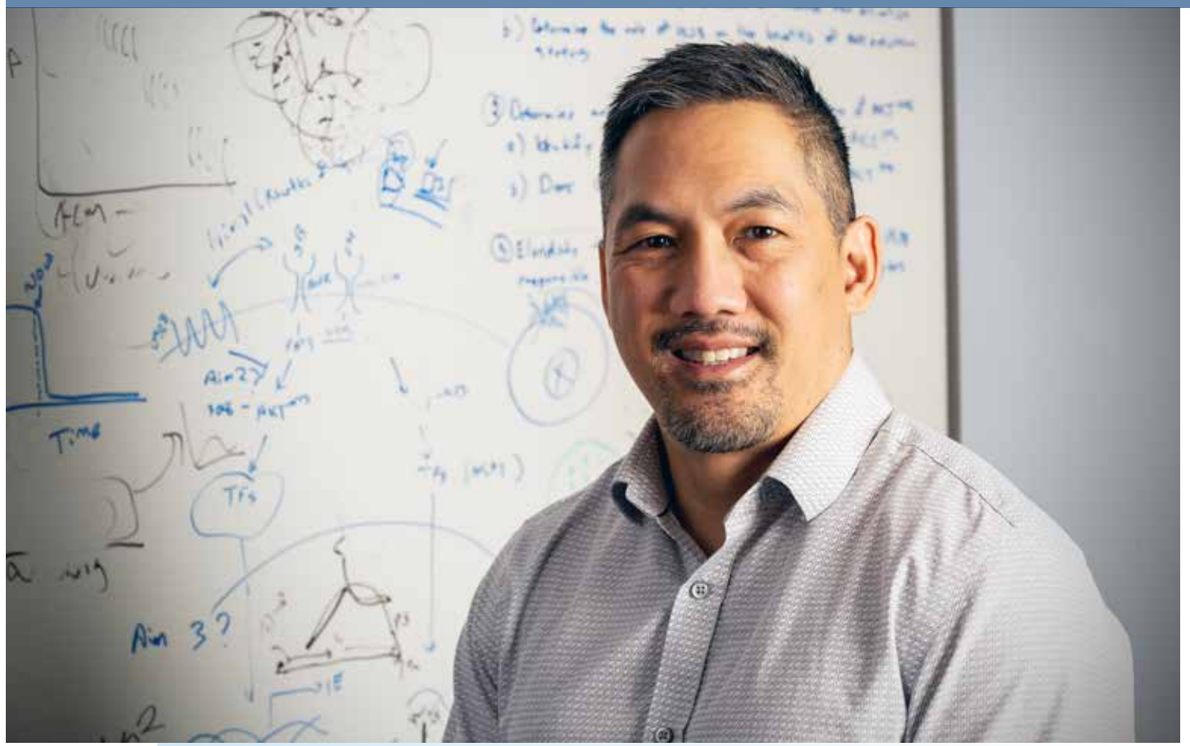
Upstate has pursued expanding the availability of microcredentials. It's an effort repeated across the State University of New York system. Today, SUNY offers more than 500 microcredentials in more than 60 discipline areas.

Microcredentials offered in the Norton College of Medicine include the Medical Student Research Microcredential to recognize medical students who gain research experience or take part in research with faculty in a meaningful way.

The microcredential requires 240 hours of effort, explained Dr. Dimitra Bourboulia, PhD. Students are required to produce a scholarly work and must apply to present their research at an annual institutional, national or international meeting.

"Students can apply for this microcredential at any time during medical school career provided they have met the requirements. Students who complete the microcredential have contributed in significant ways to one or more research project with the oversight of an Upstate faculty mentor," said Kathryn Stuenzi, project manager.

The microcredential in Medical Student Research is one of several microcredential programs launched at Upstate, and one of hundres launched across the SUNY system.



GARY CHAN, PHD

Associate Professor of Microbiology and Immunology

Human cytomegalovirus (HCMV) is an endemic pathogen with approximately 70 percent of people infected in the industrialized world and nearly 100 percent in developing nations.

HCMV is a major public health burden with HCMV-associated diseases costing an estimated $4.4 billion annually to treat in the United States. In particular, the virus is a significant cause of disease and illness in newborns and adults with immunocompromised immune systems.

"The goal of my research is to understand how HCMV spreads from the initial site of infection and to develop antivirals to limit spread," said Gary Chan, PhD. **"This could have major impact on the prognosis of transplant patients where HCMV in the No. 1 infectious cause of disease."**

Chan traces his interest in virology to a hepatitis B infection acquired by his father during a blood transfusion.

Chan noted that his research, which could be of particular benefit to transplant recipients, could have more far-reaching impact on other HCMV-associated diseases. He said he is surprised at times by the lack of awareness of HCMV despite the enormous medical strain it creates on patients and the healthcare system.

RACHEL FABI, PHD

Assistant Professor of Bioethics and Humanities

As a public health ethicist Rachel Fabi, PhD, studies moral questions that have significance to health care, including the delivery of health care. Her particular focus is on health care for immigrant communities.

"I was initially drawn to this topic by a project on undocumented immigrant health that I worked on as an intern at the Hastings Center, a bioethics think tank," Fabi explained. "That project turned into my dissertation work as a graduate student, and it continues to drive a lot of my research around immigrant health."

When talking with people unfamiliar with her field, Fabi says "I love to tell people that bioethics is the ethics of health, science, and medicine, and I work on the ethics of "exciting" things like Medicaid policy. **I try to answer questions about the moral and practical reasons that justify particular policies or recommended policy changes** – for instance, why are undocumented immigrants ineligible for most publicly funded health insurance?"

Her take: "It's not practical, because in general, society's health care costs go up and health outcomes are worse when some people don't have health insurance. I argue that it's not morally correct either, because undocumented immigrants live and work in a society with everyone else, and those kinds of social and economic ties generate moral obligations to support each other."

Every year Fabi works with one or two Norton College of Medicine students on research projects, most of which are qualitative, training them to analyze interview or focus-group data, which they then write about for publication.

"The goal of my research is to identify the most ethical health policies for a just and fair society, and then to recommend ways to make those policies a reality that are grounded in both ethical and practical reasoning," Fabi said. "My hope is that my work can inform policymakers and other stakeholders who create policy that impacts immigrant communities that will improve health for everyone."

THE MULTIPLE SCLEROSIS TEAM

The Multiple Sclerosis Team at Upstate Medical University provides care and pursues research into a MS and related diseases. Led by Corey McGraw, MD, assistant professor of Neurology and associate program director for the Neurology Residency Program, the team has made Upstate one of only three Centers for Comprehensive MS Care in the state recognized by the National Multiple Sclerosis Society.

Norton College of Medicine students are an integral part of the team, McGraw said. "I am honored to have the opportunity to have them join me weekly for direct patient care. Additionally, I engage with many of our students to produce scholarly work including posters and publications in peer reviewed journals."

The goal of the team's research, said MS Team member Sandra E. Gibson, PA, MSCS, "includes bringing cutting-edge technology and advancements to our population." The region has some of the highest rates of MS in the nation, she added. Other goals are improving outcomes for patients and bringing hope to patients and the community.

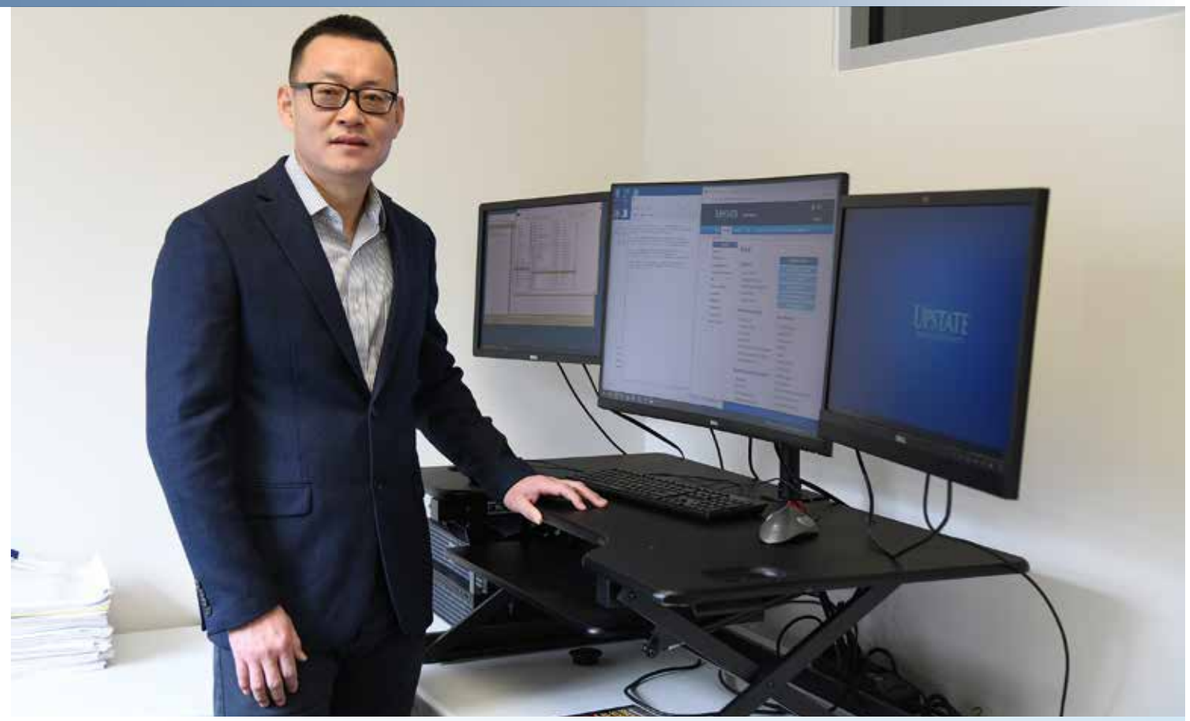
"We participate in many multicenter phase 3 and 4 trials for therapeutics for MS and related diseases," McGraw said. "We are proud to have a special focus on research as it relates to under-resourced people of our community. Additionally, we have multiple investigator-initiated projects underway, which include work by residents and medical students.

Both McGraw and Gibson were drawn to the field by their interest in medicine and experience with family members diagnosed with MS. "Neurology, I discovered, was the simultaneous pursuit of understanding of both the body and the mind; a great motivation to learn more," McGraw said. "I would consider my most important evolution, though, to be the discovery of my passion for caring with people living with Multiple Sclerosis and related diseases. Providing comprehensive care for people with the complex disease gives me great personal and professional satisfaction."

Likewise, Gibson said there is great satisfaction that comes from helping patients who might otherwise be frustrated. "We are able to offer patients an outlet to be heard, understood, and cared about. We are their ally in life. This, at times, can prove to be more therapeutic than any of the pharmacological treatments we provide."

That said, McGraw noted that while some think an MS diagnosis is a guarantee of serious disability, there is now hope. "In fact, with our many highly effective treatments, the goal of no disability and no new symptoms is highly attainable. The key, though, is that people living with MS need to be evaluated by experts in the field early. So much has changed in the last five to 10 years that plans and treatments that might have made sense then, are now out of date."

The Upstate Comprehensive Multiple Sclerosis Center, a leading provider of care for people living with multiple sclerosis in Syracuse, has been recognized as a Center for Comprehensive MS Care through the National Multiple Sclerosis Society's Partners in MS Care program. Seen at the presentation of the certificate are Kimberly Laxton, MD; Deborah Bedford, FNP-C; Stephanie Kunes, president of the Upstate NY Chapter, National MS Society; Corey McGraw, MD; Meredith L. Sheehan, director, Healthcare Stakeholder Engagement, National MS Society; and Sandra Gibson, PA-C, MSCS.



DONGLIANG WANG, PHD

Associate Professor of Public Health and Preventive Medicine
Director of the Center for Research & Evaluation

Stories are great. Everybody likes a good story but science requires data. Dongliang Wang, PhD, takes data to the next step: "As a biostatistician, **we strive to turn data into knowledge to answer medical or public health questions,** such as whether a treatment regimen works, which population is more likely to get cancer or other disease, and whether the new diagnostic test is accurate and reliable."

Wang is an associate Professor of Public Health and Preventive Medicine and director of the Center for Research & Evaluation (CRE). The CRE serves as Upstate's biostatistical and methodological core facility and offers consultations and collaboration on the design, conduct, analysis and interpretation of research projects. Over the past 12 years, Wang has worked with Norton College of Medicine faculty and students to help them achieve research goals with numerous publications and conference abstracts, and served as key personnel on grants from public and private funding agencies.

Along with statistical practice, Wang is particularly interested in methodology research on predictive modeling and causal inference. The age of Big Data has created a rich trove of information, Wang said, "such as those from electronic medical records, wearable devices and social media, the opportunity for biostatisticians to contribute to the development of biomedical sciences has never been better."

ROGER WONG, PHD, MPH, MSW

Assistant Professor of Public Health and Preventive Medicine
Data & Analytics Concentration Director, Public Health Program

Not everyone has the same chance of developing dementia. There are distinct disparities with racial and ethnic minorities being at a higher risk than the population at large. Roger Wong, PhD, is **using large national data sets to figure out why this is, and how to minimize these disparities.**

"My interest in gerontological research was prompted through my grandparents, who were my primary caregivers during my youth," he said. "While I was in high school, my grandmother started experiencing symptoms from Parkinson's disease, which inspired me to study neurobiology during my undergrad at Cornell University and eventually led to my current research on Alzheimer's disease and related dementias (ADRD)."

Students play an active role in his research. "At any given time, I have about five to 10 Norton College of Medicine students that serve as collaborators on active projects I am working on. The majority of these students are in the Upstate Master of Public Health (MPH) program, and several in the MD/MPH dual degree or Certificate of Advanced Study in Public Health (CASPH) at Upstate. Most of these students have taken one of my biostatistics courses, which equips them with skills to analyze large data sets."

His students also gain the opportunity to publish. "I am fortunate to have multiple student co-authors each year, as well as at least one student first author every year publishing their final projects from my Advanced Biostatistics course from the Upstate Public Health program."

Wong's research has garnered national acclaim. He was recently selected as the finalist for the James G. Zimmer New Investigator Research Award and the finalist for the Rural and Environment Research Award in November 2022 during the American Public Health Association annual meeting.

In one of his recent projects, older adults living in neighborhoods with more litter, graffiti and other signs of disorder have about a 10 percent increased risk for dementia. "Black and Hispanic older adults had much higher levels of neighborhood physical disorder throughout their lifetime compared to non-Hispanic White older adults," he added. That leads to the recommendation that physical disorder in neighborhoods be tackled to help reduce racial and ethnic disparities in dementia risk.

Wong shares that many people wrongly assume memory loss is a normal part of aging and that there are effective treatments to reverse Alzheimer's and related dementias. "Both of these beliefs are not true, and this is the reason why prevention science is critical for ADRD, especially since the global population is aging due to longer lifespans."

MARTHA WOJTOWYCZ, PHD

Associate Professor of Public Health and Preventive Medicine
Associate Professor of Obstetrics and Gynecology
Director of the Upstate Public Health program
Vice Chair for Education, Department of Public Health and Preventative Medicine

Martha Wojtowycz, PhD, sometimes finds people surprised to find she is working today on the same issue on which she did her dissertation: disparities in birth outcomes.

"I have always had a strong interest in the intersection of health and medical care with social science. This led me to double major in biology and economics at the undergraduate level, and then to do a doctorate in economics with a concentration in health and medical care," she said. As a doctoral student she worked on a project looking at the association between non-clinical factors and cesarean section.

She was able to use the same data set for her dissertation on social determinants of birth outcomes in New York state. The work led her to Upstate Medical University where she became a perinatal quality improvement coordinator for the Regional Perinatal Program (RPP). With a state grant, the RPP developed a Regional Perinatal Data System that could be used to improve maternal and newborn outcomes. The system was adopted by the state Health Department as the Statewide Perinatal Data System and today is used for birth registration, quality improvement, program evaluation and research.

"There are significant disparities in outcomes by race, socioeconomic status, geography. **The causes of these disparities are very complex and interrelated. I want to do something to reduce those disparities,"** Wojtowycz said, adding the work is a team effort at Upstate and in the community. "I want to acknowledge Pamela Parker in the Department of Obstetrics and Gynecology, who is the Perinatal Data coordinator for the RPP, and valuable team member."

Public health and medical students at the Norton College of Medicine use the SPDS for their experiential learning, their capstones and theses, program evaluation and research, Wojtowycz said. "Some students develop their own research question or questions, review the literature, analyze data, and make recommendations for practice and policy."

The Onondaga County Health Department is very important in this effort. They receive grants and together with community agencies provide services, such as home visiting, that enhance the clinical efforts.

While some may be surprised that Wojtowycz continues to focus on the same topic, she has a different perspective. "I am not surprised that we have not made significant improvements since I started my professional career. It has taken a long time to acknowledge some of the causes of disparities, and I am hopeful that we can finally make some progress."

SARAVANAN THANGAMANI, PHD

Professor of Microbiology and Immunology
Director of the Upstate Vector Biocontainment Lab

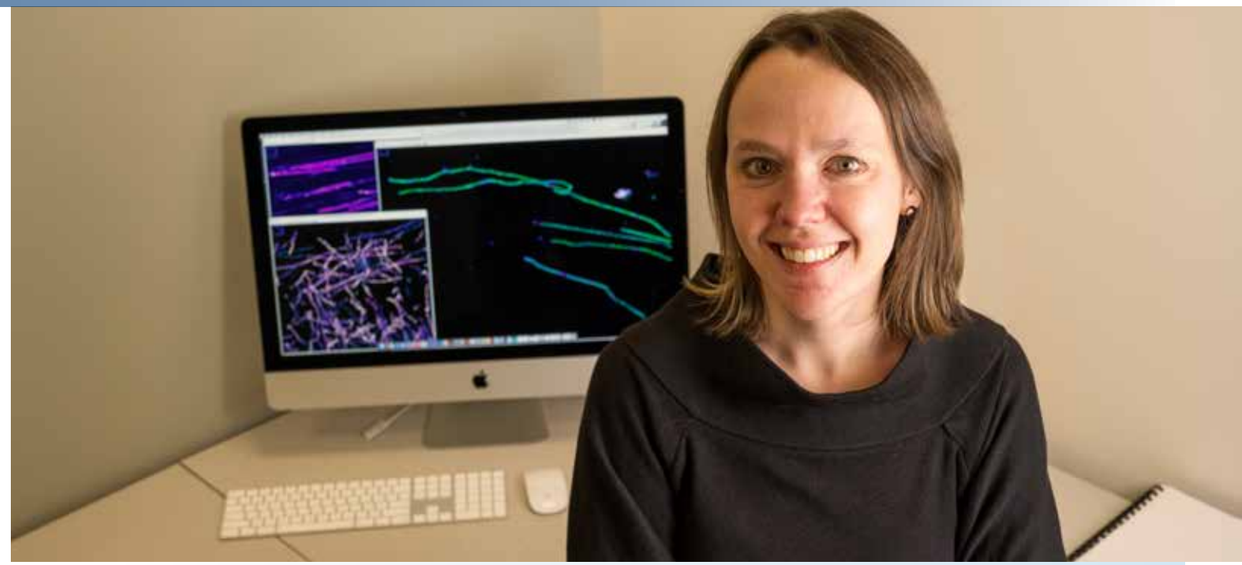
Saravanan Thangamani, PhD, is advancing understanding of tick- and mosquito-borne diseases and educating the public about the multiple threats posed by these small and increasingly common arthropods.

Raised in India, Thangamani saw firsthand the high cost vector-borne diseases can impose on society and on families. Malaria claimed the life of his best friend at a young age. This, and mentors in the field, led him to his research focus.

Ticks and mosquitoes are blood-feeding arthropods that require blood for survival and reproduction. To facilitate feeding, ticks an mosquitos inject saliva into skin, delivering a pharmacopeia of proteins that, among other things, prevent blood clotting and suppress pain at the feeding site. Along with this cocktail of proteins, they also inject disease-causing agents.

"My lab aims to understand how these salivary secretion dynamics facilitate virus transmission at the tick or mosquito-feeding interface," Thangamani explained. **To reduce the public burden due to tick and mosquito born disease, Thangamani's team is working on anti-tick vaccines and transmission-blocking vaccines.**

Thangamani conceived a citizen-scientist tick-gathering program that invites members of the public to properly remove ticks they find and send them in secure packaging for testing. This has proven wildly popular and has helped spread understanding that along with Lyme Disease, ticks carry the virus responsible for Powassan encephalitis.



MARIE BECHLER, PHD

Assistant Professor of Cell and Developmental Biology
Assistant Professor of Neuroscience and Physiology

"Every thought and action you make, conscious and unconscious, is due to signals transmitted by neurons," explained Marie Bechler, PhD. "Many neurons have numerous lipid-rich wrappings around them called myelin sheaths. Myelin sheaths speed up neuron signaling speed immensely and shuttle nutrients to the neurons to keep them alive. In diseases such as multiple sclerosis, myelin sheaths are lost."

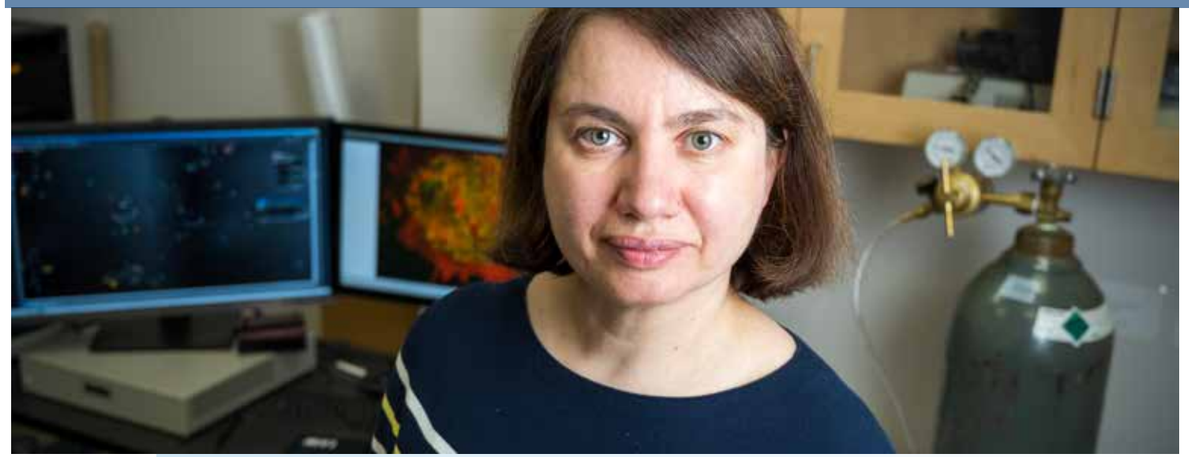
The resulting symptoms can be numerous and unpredictable: numbness, tingling, mood changes, memory problems, pain, fatigue, blindness and even paralysis. "Everyone's experience with MS is different and these losses may be temporary or long lasting," said Bechler.

One surprise has been that the brain and spinal cord cells that make myelin sheaths only require the shape of a neuron to make myelin sheaths. **"The fact that these cells can make myelin sheaths on artificial neuron-shaped structures changes our thinking and raises all sorts of questions about why myelin formation fails in some diseases."**

Drawn to laboratory science at a young age, over time Bechler became focused on cell biology. "As I progressed through graduate school, I became fascinated with answering questions about how cells organize their molecules and, in turn, cell shape to allow for specialized functions. For example, how does the composition and shape of a kidney cell or brain cell enable them to contribute to the distinct functions of the kidney and brain? At a scientific conference, I first heard about specialized cells called oligodendrocytes — the myelin sheath-forming cells in the brain and spinal cord — and was hooked."

Bechler's research team includes students — "the real research momentum and discoveries come from the students," she said — and is focused on determining the molecular and cellular mechanisms that control the process of myelin sheath formation during normal development and how the properties of myelin sheaths help shape the function of the healthy nervous system. "By determining mechanisms that control the natural occurring process of myelin formation, we aim to find therapeutic targets that restore myelin sheaths to that seen during healthy nervous system development."

PROFILES IN RESEARCH



MIRA KRENDEL, PHD

Associate Professor of Cell and Developmental Biology

Mira Krendel, PhD, uses a simile to explain the work kidneys do. "Our kidneys filter out waste products from the blood without allowing useful proteins to leak out. They do so by acting as a spaghetti strainer or a coffee filter. The coffee filter prevents the coffee grounds from spilling into your mug of coffee in the same way as the kidney filter prevents useful proteins and blood cells from spilling into urine."

Krendel's lab is trying to figure out how some of the components of the kidney filter work, and why mutations in these components cause inherited kidney disease. Research is also focused on how the same cellular components contribute to cell migration during immune response and to invasion and metastasis in cancer.

"When the filter is ripped or misshapen, we end up with muddy coffee. When the kidney filter is not formed properly, for example, due to a genetic malfunction, the patients end up with proteins in their urine."

Her mentor at the Moscow Cancer Center helped Krendel develop her interest in the role of the cytoskeleton and cell motility in disease. "Professor Yuri Vasiliev's work was instrumental in highlighting the connections between cell migration and cancer," she recalled. "Some researchers in the Vasiliev lab were able to use molecular markers of specific cell types to determine where the primary cancer had originated in the patients who were diagnosed with metastatic cancer of unknown origin."

"I became fascinated with the idea of a crossover between fundamental cell biological research and clinical practice, and I am happy that I was able to develop a research program here at Upstate that combines both basic science and translational aspects of research."

Students, including MD/PhD students have done their research in the lab. The lab has also hosted students on summer or short-term projects. "One benefit of working with medical students is that they bring a clinical and patient-oriented perspective to our research and can help us think of the more translational applications of basic science."

One translational goal is to improve genetic testing for familial kidney diseases to be able to predict whether specific mutations are pathogenic and likely to be the cause of the disease, Krendel said. "Genetic testing can help figure out whether the patient's family members are good candidates for serving as living kidney donors or if they have a predisposition to kidney disease and should not donate a kidney."

Currently there is not a rapid means to test each mutation for its impact, Krendel said. "We are hoping to improve the ability to determine whether specific gene variants are pathogenic or neutral to help in disease diagnosis and treatment. This would improve the outcome of kidney transplantation and help avoid unnecessary treatments that are ineffective in patients with familial kidney disease."

LI-RU ZHAO, PHD

Professor of Neurosurgery
Professor of Neuroscience and Physiology

Threats to the human brain are many, including the frightening prospect of traumatic brain injury (TBI), the too common Alzheimer's disease and, explained Li-Ru Zhao, PhD, the lesser-known disease referred to as CADASIL.

CADASIL is the acronym for Cerebral Autosomal Dominant Arteriopathy with Sub-cortical Infarcts and Leukoencephalopathy. It is a disease passed down from parents that thickens blood vessel walls to limit the flow of blood to the brain.

Zhao's research looks at the three threats and is working toward finding a common solution. **"Our research work reveals that we can use bone marrow stem cell factors for brain repair.** Our previous studies have demonstrated that injection of bone marrow stem cell factors beneath the skin can promote brain repair months after severe TBI and slow the disease's progression in animal models of Alzheimer's disease and CADASIL disease.

The challenge now, she said, is to explore and explain "how it works." With National Institutes of Health funding, Zhao's lab's investigations have pushed forward to understand the processes involved with an eye to someday find new treatments for devastating brain injuries and diseases.

Norton College of Medicine students participate in literature review and discussions about why and how severe TBI leads to long-term disability, what is the major problem affecting severe TBI recovery, what is the key feature of brain structural changes in the different times after severe TBI, why it is important to develop treatment for improving severe TBI recovery, and Zhao said, "how to explain the changes of some special genes in the brain months after brain injury."

In fact, Zhao explained, her interest in TBI came from a discussion with Lawrence Chin, MD, a brain surgeon who in 2021 became dean of the College of Medicine. He saw a teaching opportunity for neurosurgery residents. "Dr. Chin encouraged me to do TBI research, which would provide opportunities to train department residents for obtaining research experience in TBI."

PROFILES IN RESEARCH

FREDERICK WERNER, MME, PE

Professor of Orthopedic Surgery

The wrist is more complicated than one might think, said Frederick Werner, MME, PE, a leading researcher on the joint. That complexity has led to diverse research challenges that have kept him busy for decades. **"I do research on how injury or disease changes how the wrist joint moves or is stressed and then how well various surgical repairs do in restoring the normal motion or function."**

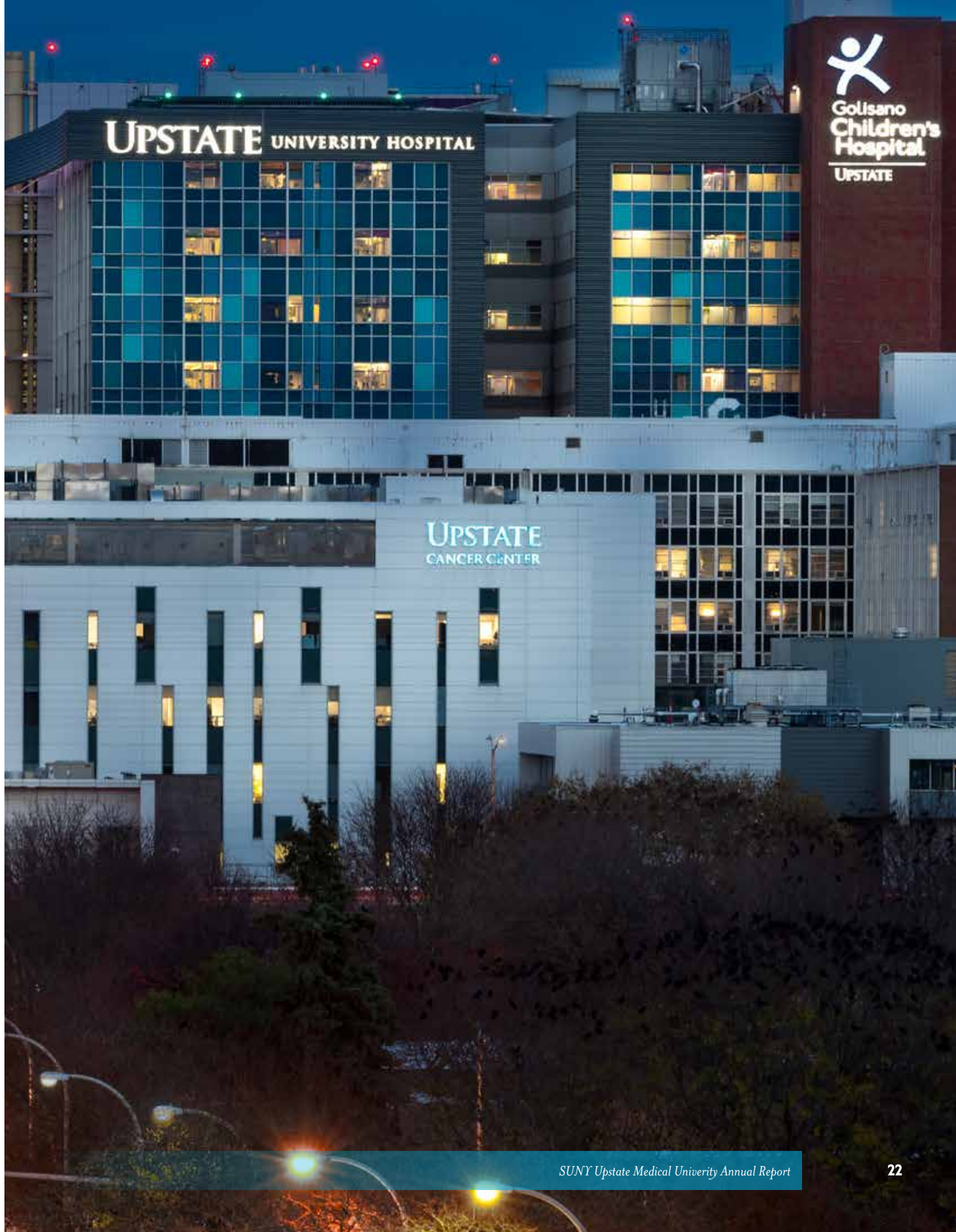
Werner worked briefly in a classic mechanical engineering job before discovering his fascination with the wrist. His work, he noted, is helped greatly by the anatomical gift program at Upstate which has provided the cadaver material to simulate wrist injuries and to perform different repairs.

Norton College of Medicine students are an integral part of Werner's research. "They have helped greatly with dissection of cadaver material to prepare them for experimental testing, as well as helping with the simulated surgical procedures we perform. Their skills learned in the Gross Anatomy course have been a major reason why they have proven to be valuable assistants in this research."

More than 20 medical students have spent summers working in Werner's lab on biomechanical projects over the years and another 10 to 15 have helped in collecting data for clinical research projects. At last count there have been 26 publications in which medical students were authors, some of which as first author. In addition, Werner said, "half of my publications have included orthopedic surgery residents and hand fellows."

Work at Upstate has helped move forward understanding of the wrist. "We have termed new structures, such as the Triangular Fibrocartilage Complex, which has helped surgeons better understand their function and the importance of optimizing repairs," Werner said. "We have provided clarity on the importance of the scapholunate interosseous ligament in stabilizing the wrist. Many of our research studies have focused on testing surgical reconstructions of ligaments or repairs to better see which ones have a better long-lasting effect in patients."

"The primary goal of my research is to help individuals have a better quality of life after experiencing a musculoskeletal injury or disease."



FACILITIES

AT UPSTATE MEDICAL UNIVERSITY

As part of the only academic medical center in Central New York, the Norton College of Medicine integrates student learning with medical care. Faculty often include discussions of current medical cases as part of their teaching.

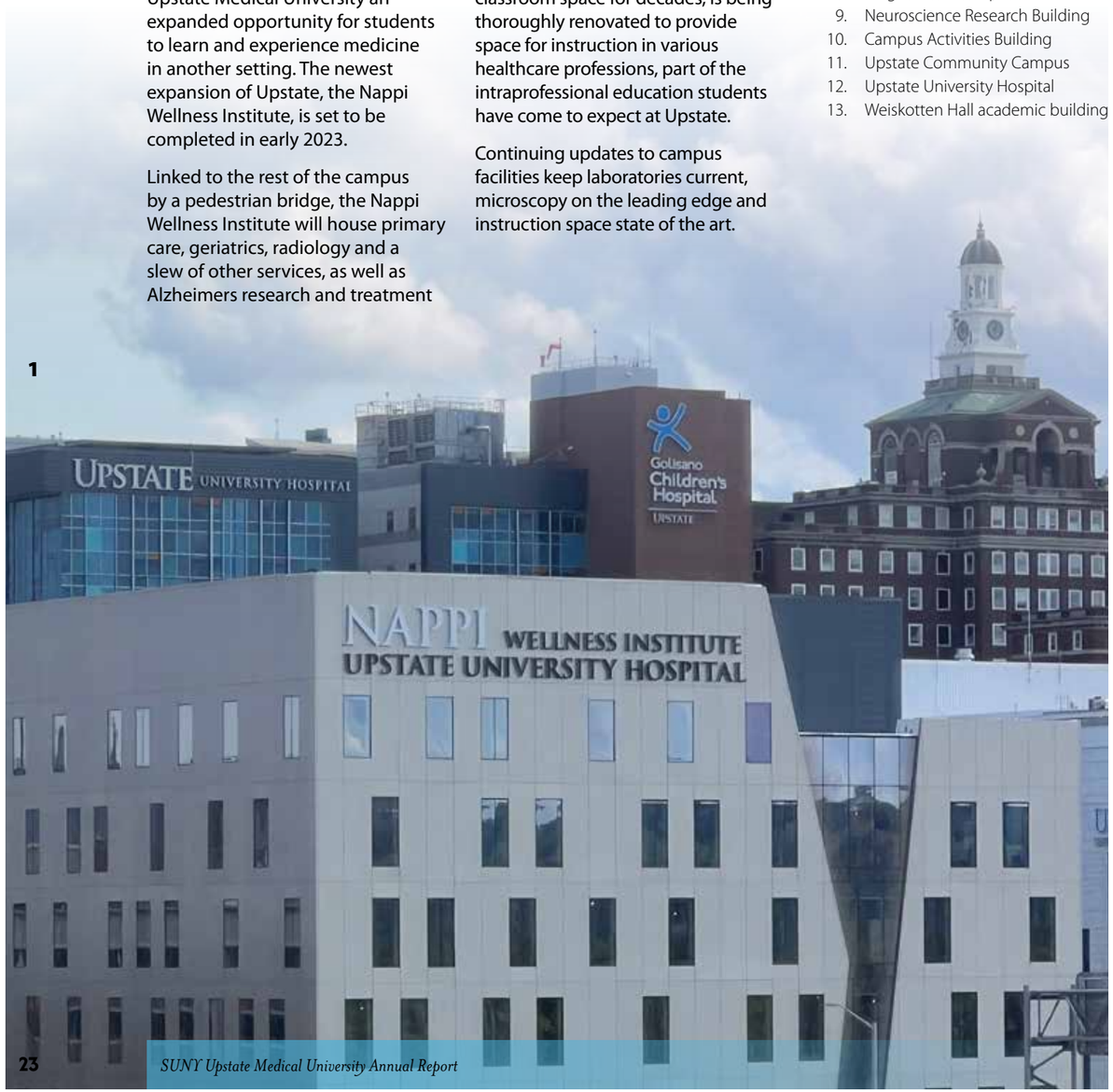
That makes each expansion of Upstate Medical University an expanded opportunity for students to learn and experience medicine in another setting. The newest expansion of Upstate, the Nappi Wellness Institute, is set to be completed in early 2023.

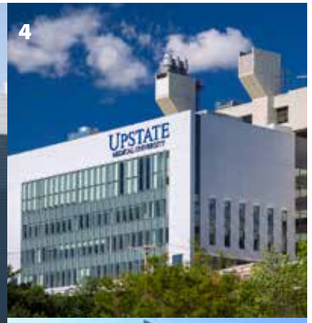
Linked to the rest of the campus by a pedestrian bridge, the Nappi Wellness Institute will house primary care, geriatrics, radiology and a slew of other services, as well as Alzheimers research and treatment and the Joslin Center for Diabetes. The variety of services to be offered in the 209,000 square-foot space has led administrators to refer to five-story building as "a hospital without beds."

Silverman Hall, which once served as the City Hospital and has been classroom space for decades, is being thoroughly renovated to provide space for instruction in various healthcare professions, part of the intraprofessional education students have come to expect at Upstate.

Continuing updates to campus facilities keep laboratories current, microscopy on the leading edge and instruction space state of the art.

1. Nappi Building
2. Upstate Cancer Center
3. Upstate Golisano Children's Hospital
4. New Academic Building
5. Upstate Health Care Center
6. Biotech Accelerator
7. Geneva Tower (student housing)
8. Binghamton Campus
9. Neuroscience Research Building
10. Campus Activities Building
11. Upstate Community Campus
12. Upstate University Hospital
13. Weiskotten Hall academic building





Faculty continue to research, share knowledge about Covid-19

The Covid pandemic brought out the best in Norton College of Medicine faculty and students, indeed, all of Upstate Medical University.

From the start, Upstate took measures to prepare even before the virus had made it to the region. When metropolitan New York was hard hit, Upstate faculty took on the challenging task of organizing and running the very large emergency infirmary set up at the Jacob Javits Convention Center in New York and Upstate nurses volunteered to travel downstate to help relieve the strained staff at Stony Brook.

Students who had completed their studies graduated early so they could join the fray. Students scoured literature and the internet for findings they then shared with frontline clinicians. Other students took phone calls to inform and reassure worried callers to Upstate's Covid Information Hotline.

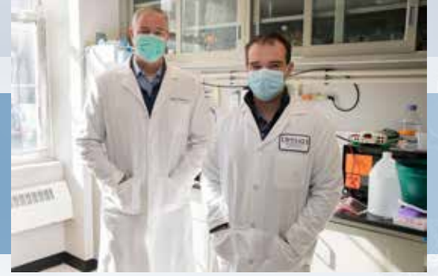
As an academic medical center, Upstate continued to serve the community's Covid-related needs — and still does. More than 100 people have stayed on a third incident command through the first Omicron wave and have stayed on morning safety huddles for the hospital every morning, all along. Additionally, Christopher Morley, PhD, MA, and Telisa Stewart, DrPH continued to do outreach providing updates to and collaboration with police, fire agencies and rural hospitals, as well as the region's manufacturers' association.

Norton College of Medicine went on the offense against Covid. Stephen Thomas, MD, served as the coordinating principal investigator for the Pfizer/BioNTech global phase 2/3 COVID-19 vaccine trial. The work involved enrolling and following more than 40,000 people at more than 150 sites in countries around the world.

Thomas represented investigators' views before the Federal Drug Administration's Vaccines and Related Biological Products Advisory Committee. The next day, the vaccine was authorized for use by the FDA.

That monumental accomplishment — a study published in the Lancet estimated somewhere between 14.4 million and 19.8 million lives were saved by the availability of the Pfizer vaccine and the other vaccines that began reaching the public in late 2020 —was followed by more work. The Pfizer trial was completed, as was a trial assessing the effectiveness of booster doses against variant strains and the original Covid.

Frank Middleton, PhD, who created the saliva test that made it possible for universities and other institutions to safely restart, continued work monitoring Covid's undulating presence in the population.



In 2022. Upstate faculty published more than 70 papers concerning Covid. Research touched on nearly every department at Upstate including Psychiatry, Endocrinology, Medical Education, Neurology, Emergency Medicine, Pharmacology, Family Medicine, Public Health and more. Subjects included endocrine issues with Covid, the accuracy of predictive models, the effect of Covid on pre-existing herpes infections and the impact the disease had on medical trainees.

Other research included work by Kathryn B. Anderson, MD/PhD, on how various populations, including healthcare personnel, viewed Covid vaccination.

Jana Shaw, MD, MPH, MS, published, along with Anderson and other members of Upstate's Institute for Global Health and Translational Science, a study on vaccination attitudes among refugee populations. Included in the findings: "Among those who initially intended to get vaccinated, nearly 1 in 5 changed their mind and decided to forego vaccination, and among those who initially did not plan on getting vaccinated, 1 in 3 changed their mind and got vaccinated."

Adam Waickman, PhD, undertook immunology studies looking at Covid virus cross reactivity and Covid vaccination in people with cancer. His findings suggest that even those undergoing anti-cancer treatments developed "vaccine-elicited cellular immunity." Indeed, a level of immunity, "exists even in the absence of significant quantities of SARS-CoV-2 specific antibodies."

To help ensure hard-won knowledge was available to people regardless of who they are or where they are from, Upstate organized a virtual conference, "Bridging Cultures to Defeat COVID-19." Presentations covered testing and diagnostics, telemedicine, biochemical markers, along with neurological and cardiac complications across 10 days.

In late 2022, Thomas was named the Frank E. Young, MD '56 and Leanne Young Endowed Chair of Microbiology. The appointment was announced by Norton College of Medicine Dean Lawrence Chin, MD.

In his 2022 State of the University Address, Upstate President Mantosh Dewan, MD, summed things up: "I think it is true that we have done more to respond to the pandemic than any other university in the country."

Norton faculty has helped lead the way through the Covid pandemic and continue to pursue research to better understand and learn from the disease.

UPSTATE MEDICAL UNIVERSITY NORTON COLLEGE OF MEDICINE

BY THE NUMBERS

Accredited Residency programs

52

Women represent

58%

of the **incoming class**

Underrepresented in Medicine (URiM) students represent

19%

of the class

Number of Applications:

5587

52%

of graduates enter a **primary care specialty**

Number of papers on COVID-19 published by **Upstate faculty** in **2022:**

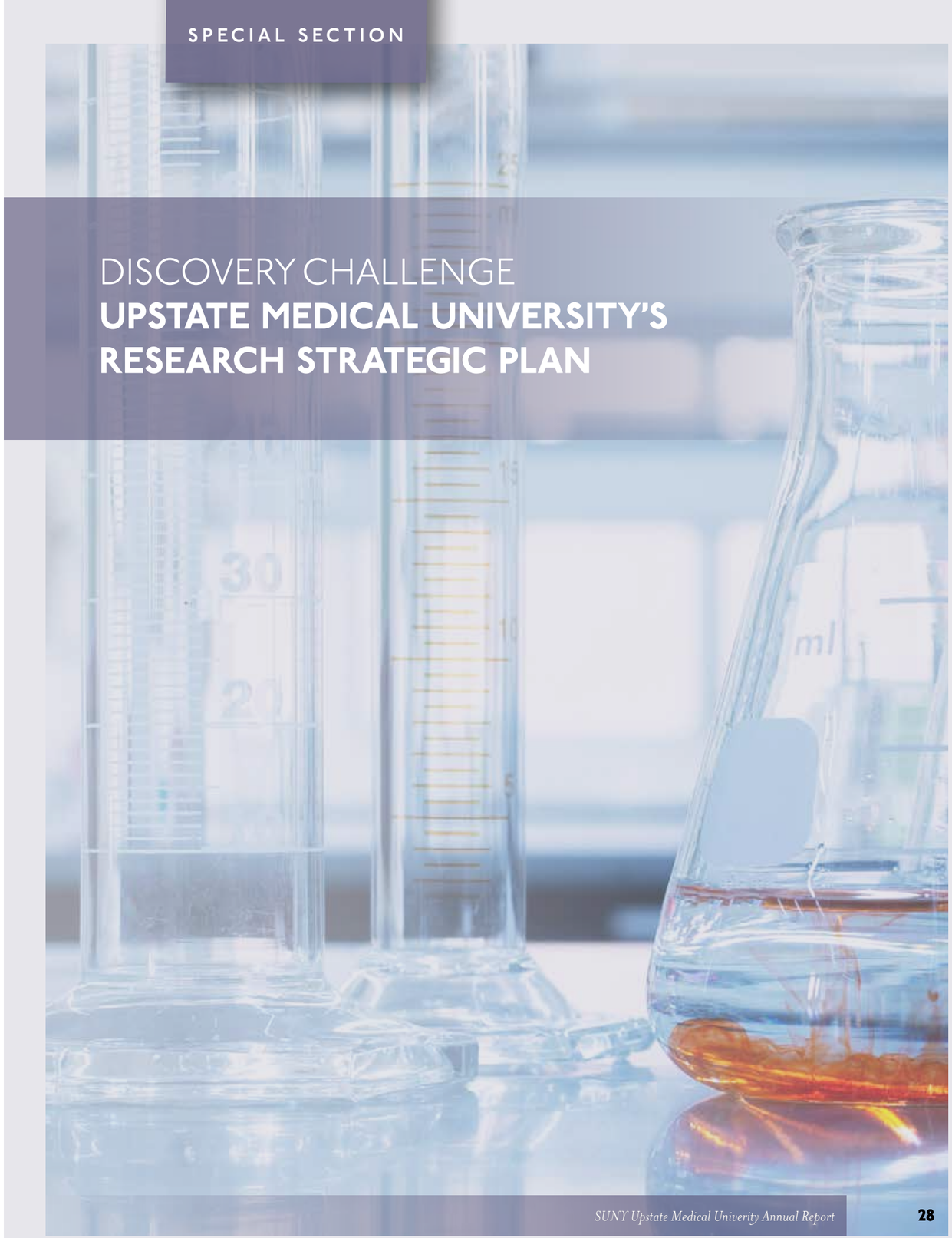
74

174%

increase in **students completing research interest profiles**

98%

increase in **faculty and resident requests** for student research



DISCOVERY CHALLENGE
UPSTATE MEDICAL UNIVERSITY'S RESEARCH STRATEGIC PLAN

DISCOVERY CHALLENGE

UPSTATE MEDICAL UNIVERSITY'S RESEARCH STRATEGIC PLAN

Upstate Medical University's Research Strategic Plan is the result of a highly inclusive and participatory process, led by Vice President for Research David Amberg, PhD. The resulting 142-page "Discovery Challenge," summarized in this special section, challenged faculty and leadership to work collaboratively to discover the foci and initiatives that will advance research capabilities and productivity in their areas of interest, and advance the impact and reputation of the University's research mission.

The Discovery Challenge process was first designed and successfully implemented at The SUNY College of Environmental Science and Forestry (ESF) by Upstate's Amberg when he was acting as interim president at ESF. At Upstate groups of, on average 10 faculty and staff, participated in eleven "working groups" focused on an area of strength and/or strategic priority. These included:

- Bioinformatics
- Cancer
- Clinical Research
- Educational Research
- Immunity and Autoimmunity in Disease
- Mechanisms of Disease
- Neuroscience
- Entrepreneurship and Industry Relations
- Environmental Health and Environmental Medicine
- Facilities, Technology and Operations
- Global Health, Infectious Disease and COVID-19

The goal was to include highly successful researchers at all stages of their careers, including early career investigators, to include the fresh ideas they bring and their strong investment in the future of this institution.

With an eye to driving inter-SUNY campus collaboration, working group members included one faculty member from SUNY Oswego on the Bioinformatics Working Group and four faculty from SUNY ESF on the Environmental Health and Environmental Medicine Working Group.

David Amberg, PhD, vice president for Research, with his office companion, Bramble the Airedale Terrier.

The research interest area (i.e. those with a specific research topic) working groups shared a generic charge and deliverables, while some groups required a topic-specific charge, including Clinical Research, Educational Research, Entrepreneurship and Industry Relations, and Facilities, Instrumentation and Operations.

At the completion of the working groups' reports, a "Synthesis Committee" was assembled, chaired by the VPR, that included the chairs of the working groups, the dean of The College of Medicine, senior staff of Research Administration, a representative from Marketing and Communications, and a representative from the Upstate Foundation. The work of the Synthesis Committee was to meld the ideas from the working group reports into a cohesive and synergistic draft strategic plan.

The new Research Strategic Plan is not merely inspirational with lofty goals but seeks to address what holds the faculty back from achieving their full potential. The research enterprise is fundamentally healthy with 35 percent growth in research expenditures over the past five years. This last fiscal year Upstate set a record for total research expenditures, breaking the $40 million mark to $42.5 million. Some of this success has resulted from increased, focused support of research faculty through investment in new cores, bridge and pilot grants, and targeted hiring of new highly productive faculty, such as Empire Scholars.

In addition, we have seen many more faculty with multiple, large federal grants. However, there is the perception that in several key areas and capabilities we lag behind our competitors, and that will continue to present us with reputational, recruiting and retention challenges. For Upstate to accelerate the growth of its research enterprise, we must begin to address the challenges identified by our research faculty. These are issues and initiatives identified by many of the research strategic plan working groups as cross-cutting initiatives that, if addressed, will have an impact across the research enterprise. They are briefly summarized in this section and ordered by their perceived level of importance.

1. Establish a research-dedicated information technology core.

Progress has been made in providing more support from Information Management Technology for research needs, however this was still identified by all research strategic plan working groups as an area that could yield results with greater investment. The needs include support for data storage and data sharing, experts in the many facets of bioinformatics including machine learning and artificial intelligence, data sourcing and hygiene, ready availability of institutional data, and data integration with electronic health records.

This goal has been accomplished with the staffing of a three person IT core dedicated to support research.

2. Develop an incentive strategy to provide protected time for clinical faculty.

There are currently disincentives for clinical faculty to

CLINICAL RESEARCH

This group identified a need for an increase in seasoned clinical researchers on campus to serve as mentors and, of course, protected time for both senior and junior clinical researchers, as well as increased support staff for research including research nurses and coordinators. If an aspirational goal is to submit a Clinical and Translational Science Award (CTSA) application, we need to develop our clinical research education and training programs with funded training grants. Increased collaboration in clinical research with our partners in the Syracuse VA was identified as a great opportunity. Additional recommendations: Implement more of the research functionalities of EPIC and solve the issues around contacting our patients to be on clinical research studies; address disparate demographics of research subjects; develop a Clinical Research Coordinator (CRC) certificate program to address the shortage of well-trained CRCs; a sub-committee on the Clinical Research Unit (CRU) suggested expanding the CRU and developing more satellite sites near the sites of patient care, for example The Nappi Longevity Institute.

engage in clinical and translational research which boils down to the absence of compensated protected time for research. This challenge was highlighted by strategic plan working group members from both clinical and basic science departments. It was cited by both sides as a major challenge to develop the kind of collaborative, translational research projects that drive innovations from "the bench to the bedside" that will distinguish Upstate as a premier academic medical center.

No progress yet on this goal, hope to focus on this in the coming year.

3. Develop new core facilities in histopathology and electron microscopy.

The SUNY Upstate Research Pathology (SPORE) Core has been established and is up and running. The TEM core is almost completed and will come online in the next couple of months.

4. Expand the Biobanking Core to support data integration.

As a part of the Cancer Center initiative, a new core for biobanking was established with dedicated space, a single technician and equipment. This core has reached capacity servicing the needs for banking cancer-specific samples. This has now been identified as a need outside of cancer by several of the research strategic plan working groups and there are currently plans to expand the core to support needs in rheumatology; further expansion may be required to meet the extensive needs of well-funded investigators in neuroscience. Biobanked samples across the spectrum of our research enterprise would be most powerful if they were coupled to electronic health records data and genetic data including genome sequence data. This may require additional investment in the sequencing capabilities of the Molecular Analysis Core (SUNY MAC).

An addition 0.5FTE technician has been added to core increasing capacity and the biobanking software eSample has been implemented which increases efficiency and provides some level of data integration with the EHR.

4. Improve the research institutional profile.

All research strategic planning working groups asserted that there needs to be better marketing and communication of the accomplishments and capabilities of the research enterprise to external audiences. They cited a lack of a research-focused social media presence and a weak web presence. Unfortunately, the research mission of Upstate is a well-kept secret and this most negatively impacts the recruiting of talent across the research enterprise including the recruitment of chairs, faculty, post-docs and students.

EDUCATION RESEARCH

This group identified a need for supporting staff and faculty interested in educational research to address the challenges to obtaining and analyzing institutional data. Also highlighted was the impact of educational initiatives on patient care, as were ways to incentivize, reward and support educational research. Particularly impactful would be developing a Center for Educational Innovation and Excellence that would house capabilities, including the IDEA lab.

A dedicated marketing and communications person has been added to Research Administration. The position is 100 percent focused on creating content, publicity materials and communicating the accomplishments of the research arm of the University through various platforms including Twitter (@InnovateUpstate) and LinkedIn.

5. Strengthen the postdoctoral fellows program in numbers and prestige.

Many of our research labs are highly reliant on PhD students as the primary workforce beyond research technicians. However, it takes two to three years for graduate students to become optimally productive. Postdocs, on the other hand, arrive well-trained from day one and as such can be incredible drivers of productivity, innovation and increased competitiveness to obtain

new federal grants. Therefore, supporting an increase in postdocs on campus will have an impact across the research enterprise. Tangible initiatives that would move the needle in this area include increased marketing to support a postdoc recruiting strategy, better support and encouragement for postdocs to apply for F32 grants with an eye to future institutional postdoc training grants, and better support for career development.

To increase competitiveness, all post-doc salaries have been raised to 90 percent of the NIH guidelines. In addition, the enhanced research profile will positively impact post-doc recruiting efforts.

6. Develop formal mentoring programs to support the success of our research faculty.

Mentoring of research faculty across the career spectrum, in particular for junior faculty, needs to be supported at an institutional level. We frequently invest large amounts of resources in recruiting research faculty to campus, and need to follow with the kind of mentoringand support that will ensure success. Some departments and units do this well, while others struggle, and thus institutional-level support and guidance is required. This will be an area to focus on in the coming year.

7. Develop pipeline and development programs to diversify our research work force.

The diversity of our research workforce does not meet our aspirations and should include a better reflection of our community. In addition to making Upstate a welcoming environment for underrepresented minority (URM) learners and faculty, a prime goal of the Office of Diversity and Inclusion (ODI) Task Force, we need to be better at recruiting diverse individuals and retaining them by providing high-quality support, mentoring and career development. A strategy proposed by many of the research strategic plan working groups is to develop relationships and pipeline programs with institutions that have diverse populations and then to retain those URM learners and faculty by providing opportunities and high-quality career support.

Upstate is in its second year of the Post-Baccalaureate Research and Education Program (PREP-UP). As a result, four students of diverse background have entered our PhD or MD/PhD programs. A PREP grant was submitted to the NIH for funding to expand the program; a funding decision is pending.

8. Create an easily searchable, public, web-based resource of faculty expertise.

There is currently a lack of ability for researchers on campus to identify colleagues with specific experience and expertise for either consultative purposes or to establish collaborative research projects. Funding agencies are asking for multi-disciplinary research proposals that also tend to come with larger budgets, so there is strong incentive for us to encourage collaboration between researchers on campus. An additional benefit of creating this resource is for researchers outside of Upstate to identify potential collaborators and for industry to identify potential partnerships for intellectual property (IP) development or possible consultative/contract arrangements that would bring additional financial support to our research labs.

A number of potential software solutions are being explored including the creation of a "Find a Researcher" search tool similar to the successful "Find A Doc." A project has been submitted to IMT and hopefully will be started in early 2023.

FACULTY HIRING

There is consensus that the SUNY Empire Scholar program is a powerful means to recruit highly functioning research leaders to our campus. There is strong indication that SUNY sees the value and ROI of the EIP program and as such there is every reason to believe the program will continue.

To ensure alignment of EIP position applications with the Research Strategic Plan EIP proposals should be drawn from the priority hiring areas identified by the science focused working groups.

In parallel, a strategy for recruiting underrepresented minority (URM) research faculty needs to be developed and implemented as described in the cross-cutting initiative above.

THIS IS A LIVING PROCESS

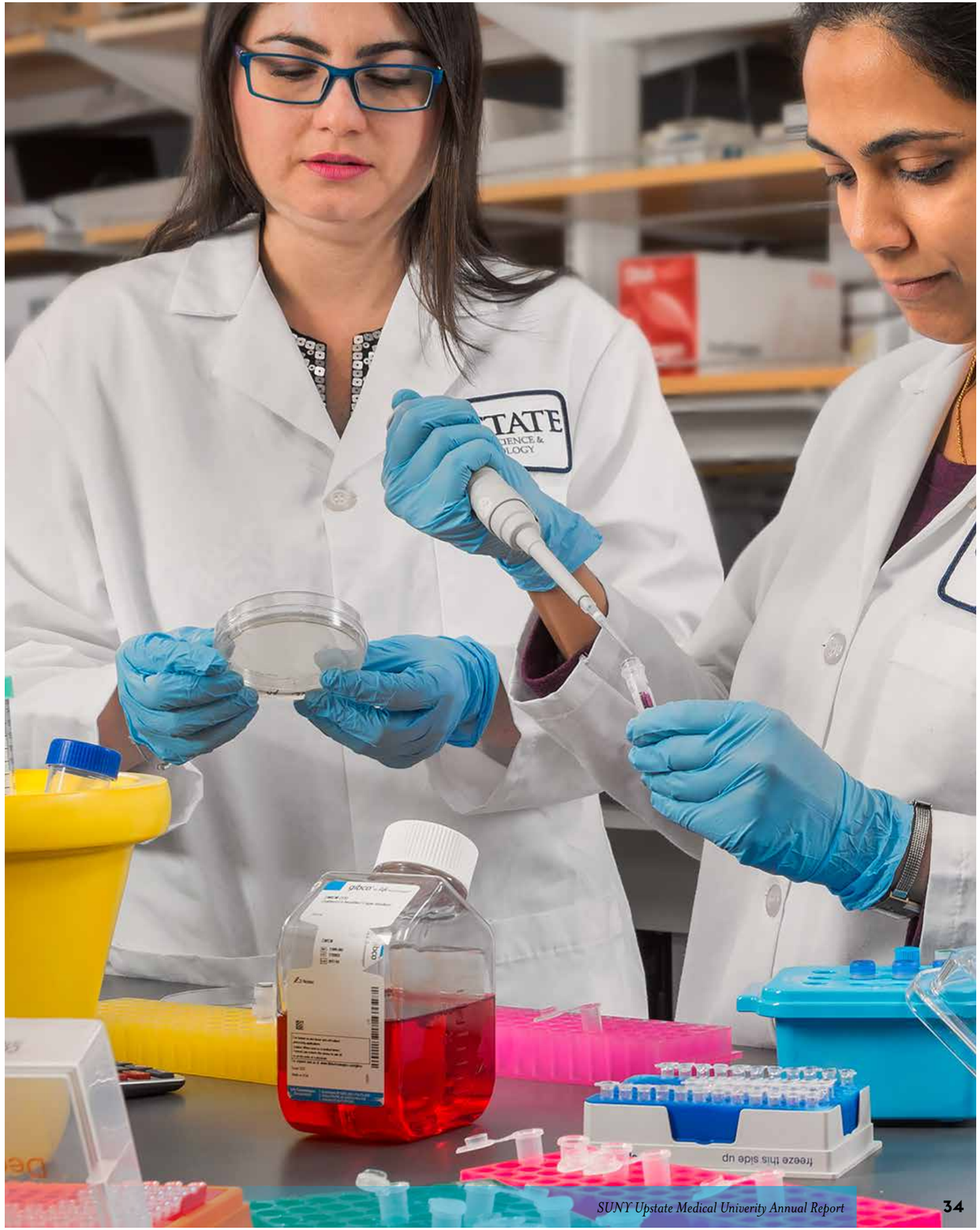
One criticism of strategic plans is that they are a snapshot in time that sits on a shelf, never to be implemented. To prevent this from happening to this plan, we have to make this not merely a document, but a living process that has the opportunity to evolve. The Office of the Vice President of Research is committed to reconvening working groups on an annual basis to evaluate progress, lack of progress, establish new priorities for the coming year for implementation, identify new areas of focus and develop a report that documents progress toward the goals and initiatives of the research strategic plan.

UPSTATE'S RESEARCH INFRASTRUCTURE

Supporting a biomedical research enterprise and its faculty and staff requires a large and highly functioning infrastructure to enable the faculty to focus on their research programs, publishing, mentoring students and obtaining grants. For this reason, there was a Research Strategic Planning Working Group specifically focused on Facilities, Technology and Operations. The working group focused on the space needs for the research enterprise. They recommended the creation of a research space planning committee and the finalization of a research space allocation policy to create transparency in research space decisions. They were also mindful, that the science-focused working groups recommended additional core facilities and advocated for identifying appropriate space for these cores and/or to look at consolidation of some core facilities. In addition, it was recommended to resume the schedule of research floor renovations in Weiskotten Hall in anticipation of research growth.

The Clinical Research and Evaluation Core (CRE) that resides in the Department of Public Health and Preventive Medicine (PHPM), will only become more important for the growth of clinical research and, as such, needs to be evaluated for missing expertise and capacity. In conversations with the chair of PHPM and the CRE core director, it was ascertained that the current business model does not work in that much of the important support they provide to faculty, students, and residents is uncompensated. Ideally, the CRE should evolve to a business model that accepts the CRE as an institutionally supported asset that serves both the research enterprise and the educational missions of all four colleges.

Concerns in operations were also noted and recommendations were made about adequate staffing of the pre-award office. Grant submissions have been rising significantly and the current level of staffing is too busy to provide the faculty training provided by most pre-award offices. This group also echoed the call from their colleagues in other working groups for a dedicated grant writer in the Research Development Office. Other priorities included data management policies and support, a dedicated office of institutional research, the development of data dashboards for chairs and principal investigators (PIs), a faculty-development series on our processes and procedures, and in general more efficient and user-friendly support services across the life cycle of grant awards. A new Technical Scientific Writer (grant writer) position has been approved to support large institutional grants, writing groups for faculty and individual faculty consultation.



Public Facing: Faculty inform and inspire the public

Upstate head and neck surgeon Sherard 'Scott' Tatum, MD, traveled to Ukraine in September to perform facial surgeries on civilians and soldiers injured in the war with Russia. He was among a team of eight surgeons, two nurses, one surgical technician, and four support staff who made the trip with Face to Face (F2F), the humanitarian arm of the American Academy of Facial Plastic and Reconstructive Surgery.

SUNY Upstate Medical University's role in the community it serves includes providing information and guidance to officials and the public at large. Experts from the Norton College of Medicine are frequently called upon to explain complicated issues and, on occasion, debunk misinformation.

Leszek Kotula, MD/PhD

Some find their work of interest to a wide audience.

One such member of the faculty is **Sherard Tatum, MD,** who traveled to Ukraine in the midst of war to help rebuild those wounded by bullets and bombs. He rebuilt eye sockets, jaws and faces. Tatum is professor of Otolaryngology and Communication Science as well as professor of Pediatrics at the College and serves as Upstate's director of Facial Plastic and Reconstructive surgery.

Leszek Kotula, MD/PhD has been researching how to apply his discoveries in prostate cancer to breast cancer. The Covid pandemic has caused many people to delay regular medical visits, including mammograms. This, he said, could lead to cancers being discovered later, when they may be tougher to treat.

Kotula discovered the ABl1 gene in 1998, finding it is involved in slowing the growth of prostate cancer. Seeing similarities between prostate and breast cancer, Kotula hopes his research will open another avenue, along with mammograms, to find and effectively treat breast cancer.

Gregory Connors, MD, MPH, MBA
and Jana Shaw, MD, MPH, MS

Some are given the responsibility to warn about health dangers

The legalization of marijuana and the growing popularity of "edibles" have had an unintended consequence, **Michael Hodgman, MD,** has explained to the public. Children are being poisoned by eating edibles that they think are "gummies." Mistaken for a sweet treat, the edibles have driven up the numbers of children poisoned by marijuana with 60 percent of those cases involving edibles.

Michael Hodgman, MD

The rapid rise of RSV cases was made dramatically clear in late 2022 when Upstate Medical University professors of Pediatrics **Gregory Conners, MD, MPH, MBA and Jana Shaw, MD, MPH, MS,** explained the reach of the problem and its cause. The Golisano Children's Hospital at Upstate was full, and about half the patients had RSV, Conners said. Shaw explained that the deluge of cases came about because pandemic precautions delayed exposure for many. "Babies who would usually get infected in winter, including with RSV, have not been infected over the past two to three years,"

Online news source Gizmodo asks several experts what they thought was the single most dangerous emerging technology. While others were concerned about facial recognition software, quantum computers and artificial intelligence, "xenotransplantation," was the answer given by **L. Syd M. Johnson, PhD,** associate professor at the Center for Bioethics and Humanities at SUNY Upstate Medical University. She explained that animal illnesses crossing into human populations could lead to devastating results for millions.

L. Syd Johnson, PhD

Upstate continues its rich history of diversity

One of Upstate Medical University's core values is to respect people by treating all with grace and dignity and embracing diversity. Consistent with its mission and values, a primary goal is to attract and cultivate a dynamic and culturally sensitive faculty, staff and student body that exemplifies, promotes and celebrates diversity. This definition of diversity includes recognition and appreciation of the uniqueness of each individual.

The Upstate community includes persons of various races, ethnicity, gender, sexual orientation, socio-economic status, age, physical and cognitive ability, religion and political belief. The Norton College of Medicine is committed to valuing and sharing the strength of differences in a safe, positive and nurturing environment.

This commitment to diversity can be traced back 163 years. That's when Elizabeth Blackwell became the first woman to graduate from an American college of medicine. It was known as the Geneva Medical College back in 1859. Today, it's Upstate Medical University where Blackwell is honored, as is Sarah Loguen Fraser, an 1876 graduate who became the fourth African-American woman doctor in America.

In the 21st century that commitment to valuing all people continues. Upstate has stressed diversity in its quest to find the finest faculty and best students, regardless of background. The changing demographics of students is clearly reflected in the Norton College of Medicine's pool of applicants and the students offered acceptance.

Fully 19 percent of the incoming class in 2022 was students from groups historically underrepresented in medicine. Students from such backgrounds were invited in for interviews at an increased rate and accepted to the Norton College of Medicine at a rate eight times higher than applicants on the whole.

In addition, Upstate has created programs to help prepare those historically underrepresented to not only get into medical school, but to thrive. The AMSNY Buffalo post-baccalaureate program and Medical Scholars Program and the Public Health Scholars Programs are all dedicated to this mission. The MedPrep program, a master's program designed to prepare students to successfully apply to medical school, achieved 100 percent success with its first three classes.

Other programs, including the Pre-Admission Workshop (PAW) and Upstate Accelerated Scholars, open pathways to medical school that might not otherwise be available to students from underrepresented minority groups.

Norton College of Medicine's efforts to make it plain to underrepresented students that they are welcome includes current students. According to Jennifer Welch, PhD, associate sean of Admissions and Financial Aid, members of our local Latino Medical Student Association and the Student National Medical Association chapters are actively involved, answering questions from potential students, encouraging them to complete their applications, and making phone calls to accepted students.

"Our current students are extremely dedicated to helping us recruit and matriculate a diverse student population," said Welch. "Through these efforts and the efforts of our admissions staff, as well as utilizing a holistic approach in our admissions process, we are seeing a significant increase in those we interview coming from a wide variety of backgrounds, including first generation, out-of-state, rural, low socio-economic and ethnic minorities."

The Upstate Accelerated Scholars program has created a new, MCAT-free path for student wishing to study at the Norton College of Medicine. Students in the program come to campus during the summer.

DIVERSITY

Native American students return for pre-admission workshop

After two years as a virtual event, in 2022 Upstate Medical University's Pre-Advisement Workshop (PAW) returned to campus, bringing more than two dozen Native American students from as far away as New Mexico on the Navajo Nation and as close as Onondaga, Oneida, and Akwesasne Nations.

A joint effort of Upstate with the Association of American Indian Physicians as well as The University at Albany, University at Buffalo and the University of Rochester, the PAW shared with students how they can best prepare themselves and present themselves, so they get admitted to the medical school, nursing school, health professions college or research university of their choice. Upstate funds student travel, food and lodging for PAW.

The program included group discussions on what to look for when researching schools and how to handle questions during college and graduate school interviews.

Participants also learned about "imposter syndrome," in which people, even quite accomplished people, doubt their competency and fear being exposed as frauds. Studies have found relationships between imposter syndrome and racial identity and graduate-level coursework, among other attributes.

Held at the Upstate campus for the first time since the Covid pandemic forced it to go online in 2020, the two-day event included interactions with members of the Central New York Native American community. Events included a traditional dinner by one of the PAW organizers, and Upstate's director of Patient Quality and Safety, Trina Northardt, and her daughter, at the Onondaga Longhouse with world-known Native American Faithkeeper of the Turtle Clan and SUNY Distinguished Professor, Oren Lyons.

They heard from Onondaga Nation Cultural Caretaker, Jake Edwards, who shared insights on culture and practices. Brian Thompson, MD, a member of the Oneida Nation, who studied medicine at Upstate and practices obstetrics and gynecology at Upstate, discussed what it means to be a Native American doctor.

Dalton LeBarge, a member of the Akwesasne Mohawk Nation and medical student at the University of Rochester, led PAW participants in a smudging ceremony near the shore of Onondaga Lake. The ceremony, meant to ritually cleanse participants, was attended by Upstate faculty members, including Upstate University Hospital CEO Robert Corona, DO, MBA, FCAP, FASCP.

An unplanned highlight of the visit to SkaNonH center, was the sighting of a bald eagle flying above Onondaga Lake. PAW participants offered positive impressions from the two-day event:

"I felt truly safe, loved, and welcome into your community. It was amazing to hear the history, eat traditional foods, and be among our indigenous family."

"I appreciated hearing from Dr. Thompson and hearing the vision/philosophy about what it means to be a Native doctor who works at Upstate and understanding that differentiation."

Krystal Ripa, PhD, director of Special Admissions Programs at Upstate, and one of the organizers of the event said, "Having our PAW students back together in-person, and seeing them in our Upstate and Syracuse community learning of our indigenous culture and history, fills our cups. We hope these future healthcare providers can see themselves here, not just to attend medical or graduate school, but also engaging with the local nations and participating in ceremonies and the overall community long-term." She added that planning is already underway for the 2023 PAW.

RURAL MEDICINE

RMED gives students a glimpse of life as a rural doctor

When traveling, those from Upstate New York sometimes find themselves explaining that their part of New York is not quite like New York City. While Manhattan has more than 70,000 people per square mile, there are sections of Upstate that are far more rural than urban.

Among the counties served by Upstate is St. Lawrence County, with 40.31 people per square mile; Lewis County, with 20.75 per square mile and Hamilton County, in the Adirondacks, with a population density of 2.58 people per square mile. (Among states, only Alaska has a lower population density at 1.3 people per square mile.)

Upstate's Rural Medical Education Program (RMED) was created in 1989 to help ensure that people in these and other less-populated areas of New York state can receive quality medical care.

In 2007, the program expanded to include preclinical classes and was renamed the Rural Medical Scholars Program (RMSP). The program is designed to actively identify, recruit, and nurture those interested in future rural, or small town, practice. The University's commitment to rural training means that the Office of Admissions seeks small town applicants and provides a holistic review of those applications for the College of Medicine. Interested applicants apply by selecting the Rural Medicine Supplemental option on Upstate's secondary application.

More than 370 doctors have spent part of their time in medical college working alongside physicians in rural New York practices in such places as Ogdensburg, population 10,064; Jamestown, population, 28,393 and Hudson, population 5,898.

RMSP is not a clinical-track program, explained Program Director Carrie Roseamelia, PhD, assistant dean of rural medicine, but offers four years of elective courses focused on rural health issues and culminates in a Microcredential in Rural Medicine.

The program is made possible by community preceptors who enthusiastically mentor rural medicine students in communities across the state. Each year the program honors a "Preceptor of the Year." This year's honoree is Felix Oben, MD, whose practice is in Carthage, NY, population 3,236. When he received the award, he noted that working with RMED students prompts him to stay on top of medical developments, if only so students don't tell him some bit of medical knowledge he shares is out of date.

Students consistently praise the program and preceptors. "These physicians are not strangers to patients; they are everywhere in a community like these," said Dan DeNoble, a student in the Norton College of Medicine.

Roseamelia explained that students interested in the program are encouraged to apply for RMED before they are admitted to the Norton College of Medicine.

Rural Medical Scholar Gabe Alagna, seen here with his father, Paul Alagna, MD, gained more than 500 hours of clinical experience during his summer elective.

BASIC SCIENCE

Biochemistry and Molecular Biology

Chair: Patricia Kane, PhD
Postdoctoral Fellow, Institute of Molecular Biology, University of Oregon
PhD: Cornell University, 1987

The Biochemistry and Molecular Biology Department is active in research and in graduate and medical student education. Our researchers are particularly interested in mitochondrial function, membrane proteins and transport, gene expression and genome stability, cellular stress responses, and cytoskeletal structure. We address these topics using state-of-the art techniques in structural biology, genomics, and quantitative microscopy, and often use model systems in our investigations. Our work is providing fundamental insights into a number of human diseases ranging from cancer to neurodegenerative disorders. Department faculty collaborate extensively with other researchers, both within and outside Upstate. The department continues to have a very strong record of extramural research funding, primarily from NIH. In the past year, Dr. Xin Jie Chen, who is internationally recognized for his work in cellular mechanisms of aging, was named a Distinguished Professor, the highest honor for SUNY faculty.

The Department hosts a vibrant interdepartment graduate program. This program currently has 45 graduate students working toward their Ph.D. or M.D./Ph.D. degrees in multiple departments, including Urology, Medicine, Ophthalmology and Visual Science, as well as Biochemistry. In the past year, four of our graduate students received highly competitive extramural fellowships from NIH and American Heart Association. We are also active in medical student education, particularly in teaching first year medical students.

Cell and Developmental Biology

Interim Chair: Margaret Maimone, PhD
PhD: Washington University, 1990

Our department has two core missions: research and education. Our research advances the understanding of fundamental molecular and biochemical mechanisms of cellular function and development, while our teaching is focused on the anatomical sciences as well as cell and developmental biology. The aim of our training and educational programs is to apply biological knowledge to critical medical problems and empower the next generation of scientists, clinicians, and educators.

Research in the Department of Cell and Developmental Biology explores the molecular and biochemical mechanisms of cellular function and development in several exciting areas including cancer biology, cardiovascular development and disease, skeletal muscle development, kidney disease, immune response, and leukocyte inflammatory phenotype. Other areas include understanding the mechanisms regulating actin cytoskeletal dynamics during endocytosis and cell migration, studying cell adhesion regulation, and analyzing the biology of oligodendroglia and myelin formation during development, remyelination and repair in spinal cord injury and multiple sclerosis. This year, Dr. Marie Bechler was selected for the prestigious Klingenstein-Simons Fellowship Award in Neuroscience.

One of the core areas of our education mission is to provide cadaver-based gross anatomy education to medical students (years 1, 3 and 4), residents and fellows in the Norton College of Medicine, as well as to students in the colleges of Health Professions and Graduate Studies. Gross Anatomy is taught in small groups allowing for active learning strategies and more personalized education. During the pandemic, laboratory-based gross anatomy was taught safely by reducing the number of students in the lab and delivering instruction multiple times, ensuring that our learners received a high-quality anatomy education.

Microbiology and Immunology

CHAIR: Stephen Thomas, MD
MD: Albany Medical College, 1996

Research in the Department of Microbiology and Immunology focuses on exploring the etiologies and mechanisms of high impact human health issues caused by infection, autoimmune disorders, malignancies, and neurologic diseases. Lupus, multiple sclerosis, immune mediated hypersensitivity reactions, cancer, dementia, and mosquito borne diseases such as dengue, Zika, and Powassan are all of interest. Our scientists are virologists, immunologists, and vector biologists working on a broad range of DNA and RNA viruses to include flaviviruses, CMV, HIV, VZV, and SARS-CoV-2, among others. We explore virologic and innate and adaptive immune responses to infection, and we study how viral infections affect cellular metabolism. We research how viruses evade the immune system, remain dormant, and then reactivate to cause disease. Infectivity, gene regulation, DNA replication, virus/host interactions, and animal and human models of disease are also of interest. Explorations are conducted at the molecular, biochemical, and genetic levels, with goals of developing gene therapies, vaccines, and improved treatment options. Research tools include cell culture, animal models, samples from human infection models, molecular genetics and gene therapy, single cell RNA sequencing, state-of-the-art microscopy, and a full complement of traditional humoral and cellular immunologic assays. Finally, the Department is a home to three cores: Flow Cytometry, Electron Microscopy and Metabolic Analysis.

Neuroscience and Physiology

Chair: Francesca Pignoni, PhD
PhD: University of California at Los Angeles
Postdoctoral Fellow: University of California at Los Angeles

The Department of Neuroscience and Physiology includes 12 faculty who serve the institutional missions of biomedical research (10) and medical education (2 full-time educators). In the area of Cell and Molecular Neuroscience, several laboratories investigate a wide range of fundamental processes that underlie neuronal function. Topics of interest include the regulation of gene expression in the nervous system, the physical basis of neuronal excitability, mechanisms of signal transduction, and the molecular foundations of neurological disease and disorders. In the area of Development and Regeneration, the research focus is on mechanisms that control nervous system assembly and repair.

These laboratories investigate the regulation of gene expression during nervous system development and regeneration, the cellular and molecular mechanisms that drive development of the cerebral cortex, and the mechanisms that underline cellular regeneration in the central nervous system. In the area of Systems and Cognitive Neuroscience, multiple laboratories study the mechanisms and outcomes of neuronal function and dysfunction. Topics of interest include: fetal and adolescent neuronal plasticity and its role in drug addiction; neurodevelopment in individuals with neurological or psychiatric disorders; developmental models of autism; the control of behavior

by specific aspects of neuronal activity; and, how disease manifests alterations in neuronal function. Diseases that receive particular attention include retinitis pigmentosa and Usher syndrome, Alzheimer's disease, amyotrophic lateral sclerosis, schizophrenia, autism, fetal alcohol syndrome, glioblastoma, and neuromuscular dystrophies.

Pharmacology

Chair: Richard J.H. Wojcikiewicz, PhD
PhD: University of Sheffield, UK, 1985

The Pharmacology Department faculty and staff serve the dual Institutional missions of research and education. Our research programs emphasize mammalian systems and translation to the clinic. Specific focus areas are molecular pharmacology, drug development and delivery, nanomedicine, cancer biology and therapeutics, cardiovascular science, epilepsy, metabolic disease, wound healing, sepsis, immunotherapy and cell signaling. These programs are strongly supported by extramural funding, primarily from NIH. Collaborations with other Departments are encouraged and promoted. Notably, Dr. Juntao Luo has recently helped establish SIRC — the Sepsis Interdisciplinary Research Center — with a group of researchers, particularly from the Department of Surgery. In recent years, a priority has been the recruitment of talented assistant professors conducting high-quality research to advance and perpetuate the Department's legacy of excellence: in 2019 Dr. David Auerbach (cardiovascular, epilepsy) and Dr. Nori Urao (wound healing, metabolic diseases) were recruited, and Dr Yamin Li (lipid nanoparticles, drug delivery) joined the Department in early 2022.

The delivery of high-quality education in Pharmacology to both Medical and Graduate students is also a priority. A thread leader manages the teaching of Pharmacology to medical students, including the recruitment of teaching faculty from the Pharmacology Department as well as Clinical Departments. Graduate students receive high- quality classroom and laboratory instruction in preparation for successful careers in academic research and/or industry.

CLINICAL

Anesthesiology

Chair: Xiuli Zhang, MD
MD: Qingdao Medical College

The Department of Anesthesiology at the Norton College of Medicine, SUNY Upstate Medical University, delivers high quality care and uncompromising safety to all perioperative patients requiring anesthesia services at the Upstate University Hospital, trains the next generation of anesthesiology clinicians and educators, and engages academic activity to further knowledge in the field of anesthesiology. Our faculty includes 30 physicians representing every subspecialty area in anesthesiology—cardiothoracic anesthesia, pediatric anesthesia, critical care, neuro-anesthesia, regional anesthesia, and pain medicine. Together with our residents and CRNAs, these teams handle the most complex cases, including cardiovascular surgery, invasive cardiology, ENT, neurosurgery, orthopedic surgery, transplant, trauma, urology, gastroenterology, oncology, and so on.

There is a diverse educational experience for our residents and fellows in the Department. At Upstate University Hospital, a level I trauma center and the only children's surgery center in the region, residents see a broad-based patient population as they learn the practice of anesthesiology and its subspecialties. Hands-on patient care combined with traditional didactic education forms the basis of our trainees' educational experiences. We have acute and chronic pain management services, including six fellows, so that we can provide a continuous spectrum of care. Pain fellows encounter an equally diverse patient population as they build a knowledge base in both acute and chronic pain. With the newly established regional pediatric anesthesia service at Children's Surgery Center and anesthesia simulation curriculum at the state of art Upstate Simulation Center, our trainees are experiencing better learning than ever before. As a result, our current senior class residents achieved 50% percentile of ABA ITE, and numbers of them matched into highly competitive fellowship program in the nation. One resident also earned a letter of commendation from ABA for his outstanding performance in Anesthesia Basic Exam.

Many of our faculty and residents very actively engage in academic activities. Numbers of abstracts and presentations have been accepted for this year's ASA and PGA annual meeting. We continue research efforts in the areas of neuro-anesthesia, neuro-monitoring, subarachnoid hemorrhage, intraoperative neuro-monitoring, neuroprotection, brain ischemic injury, intra- operative fluid management, pediatric anesthesia, optimizing the perioperative epidural infusion.

Emergency Medicine

Chair: William Paolo, MD
MD: Albert Einstein College of Medicine, 2005

The Department of Emergency Medicine at SUNY Upstate Medical University exists to promote the specialty of Emergency Medicine and related specialties through excellence in patient care, education and research. Our Department continues to serve the community through primary and tertiary emergency care, medical education at many levels, and robust academic work. We strongly support all four years of the medical school as well as EM residency training, prehospital provider programs and eight different fellowship training programs. The emergency departments we staff serve over 110,000 patient

visits per year and function as the gateway for inpatient care at University Hospital and specialty care for our region. This year, our Pediatric ER received Upstate's Patient Experience Award. In August 2020, Upstate Women in Emergency Medicine committee was founded to provide a network of professional and personal support, mentorship, education and information for women in the department. We continue our academic work and have, this past year, contributed more than 30 publications and presentations to the peer reviewed science. Our ED staff has persevered throughout the COVID pandemic with grace, resolve and served the Central New York region with caring and compassion.

Family Medicine

Chair: Clyde Satterly, MD
MD: Medical College of Pennsylvania, 1994

Upstate's Department of Family medicine focuses on a patient-centered approach to care. Primary care and preventive services are provided to patients though the practice of evidence-based medicine. The department has adopted the Quintuple Aim as its mission; to provide better health, improved outcomes at lower costs while focusing on health equity and provider well-being. The mission of our Family Medicine Residency Program is to prepare exceptional family medicine trained physicians who will provide exemplary care to urban, suburban and rural communities. The program focuses on policies that support community health and a holistic approach to healthcare and prevention.

The Rural Medical Scholars Program offers four years of rural health electives, culminating in a Micro-Credential in Rural Medicine. The program hosts innovative pre-clinical sessions developed by rural medical students. Clinical rotations with mentorship opportunities across specialties in rural communities throughout New York State highlight the program. Currently most of the host communities have at least one Rural Medicine graduate serving as a voluntary faculty member to precept the next generation of small-town physicians.

The Occupational Medicine Program focuses on the widespread effect the workplace has on chronic disease, mental health and substance abuse. This effect is under-recognized and unexplored leaving approaches to disease treatment and prevention lacking in efficacy. The program functions largely through grant support but also offers consultation services to industry.

Geriatrics

Chair: Sharon Brangman, MD
MD: Upstate Medical University, 1981

The SUNY Upstate Medical University Department of Geriatrics offers outpatient services through our University Geriatricians for a geriatric assessment and our Center of Excellence for Alzheimer's Disease (CEAD). It has established itself as an innovative leader in the management of Alzheimer's disease. The Center is supported in part by a grant from the New York State Department of Health.

Our staff includes geriatricians who work in conjunction with geriatric nurse practitioners, social workers and nurses with expertise in geriatrics. Case management services are provided by our social workers with a particular emphasis on elders at risk, especially those who live alone or with frail caregivers. An individualized care and management plan is developed for each patient, and depends on the disease stage, patient's level of function, and amount of support that is available. Referrals are made to appropriate community resources, such as adult day care, home care, respite or long term care, and the social worker follows each care plan so that it can be adjusted or revised, as needed. The goal of all treatments and care plans is to reduce the stress and burden Alzheimer's disease has on the patient and family.

The Department of Geriatrics offers a wide variety of medical learning opportunities including the ability to shadow during undergraduate years, Clerkships and electives during Med School, required Inpatient and Outpatient rotations during Residency and a 1 year Fellowship in Geriatrics for those interested in furthering their knowledge on the specifics of Geriatric Medicine.

Our Department also has a clinical trials program with a dedicated team and a growing number of clinical trials for new treatments for Alzheimer's Disease.

Our inpatient consult service, located both Downtown and on the Community Campus, is called the Acute Care of the Elderly (ACE) Team. This year we led the establishment of the Ortho CoCare program which provides perioperative team management of older adults with hip fractures.

Medicine

Interim Chair: Stephen Knohl, MD
MD: SUNY Upstate, 1997

The Department of Medicine values one another and the community it cares for; in collaboration with our colleagues from other departments, we are tasked with delivering excellent and responsible care for the adult population in our region. We are a family of providers, staff, and students that serves as the pivot point for roughly a third of all clinical, educational, and research activities at Upstate. We are organized into 11 divisions (alphabetically listed: cardiology; dermatology, endocrinology, diabetes, and metabolism; gastroenterology; general internal medicine; hospitalist medicine; hematology and oncology; infectious disease; nephrology; pulmonary and critical care; and rheumatology) allowing for comprehensive and collaborative care of nearly any medical condition. We are actively involved in the education of our nearly 300 students and trainees (both in the classroom and at the bedside) and engaged in numerous research projects (with a concentration in infectious disease, immune-mediated diseases, diabetes, cancer, lung disease, and patient safety and quality improvement).

Over the last year, we have continued to manage the bulk of COVID-related illness in the region while also readying ourselves for other concerning infectious diseases (such as mpox and polio). Nearly every division has grown (we've seen a 7% increase in faculty overall) and we have expanded services at both University and Community Hospitals, collaborated with Auburn Hospital to help deliver care to communities to the west, and prepared for the opening of additional cancer services to the east in central New York. Notable accomplishments include the opening of the Connect Care Clinic which has successfully bridged the transition between inpatient and outpatient care in our community and the launching of our first research retreat to highlight the wonderful innovations and discoveries that are advancing clinical care, education, and quality. Finally, we continue preparations for our move into the Nappi Wellness Institute where, in collaboration with our colleagues from multiple departments, we will deliver excellent clinical care in a state-of-the-art facility that will serve our community for years to come.

DEPARTMENTS

Neurology

Chair: Luis Mejico, MD
MD: Catholic University de Cordoba, Argentina, 1993

The Neurology team at SUNY Upstate Medical University is dedicated to providing state of the art neurological care to the community and region. The Neurology Department faculty serve the educational needs of graduate students, medical students, residents in neurology and other fields plus fellows in various aspects of basic and clinical neuroscience. Physicians and staff routinely work with patients to educate and inform them about treatment options and matters related to their health and well-being. In addition, the Department is engaged in basic, clinical, and translational research in Neuroscience with the goals of furthering understanding of neurological diseases, and developing new treatments that will improve the lives of patients.

The recently created Upstate Neurological Institute with the Department of Neurosurgery has continued expanding services, improving patient access and advancing quality improvement initiatives. This year the services of Stroke, Neurocritical Care, ALS, MDA and Epilepsy maintained the highest level of national accreditation. Our Multiple Sclerosis Center was recognized as a Center for Comprehensive Care by the National MS Society for the first time. The telehub suite at UHCC is fully operational, improving the delivery of care in the ambulatory setting. The Upstate Headache Center and Neurology Infusion Clinic located at the Upstate Campus East opened this Fall, bringing unique services to the entire Central NY community.

Neurosurgery

Interim Chair: Satish Krishnamurthy, MD, MCh, FAANS
MD: Mysore Medical College, India, 1984

The Department of Neurosurgery has a long history in basic, translational and clinical research aimed at finding new treatments and improved strategies for disorders of the brain and spine.

There are several well-established research laboratories in neurosurgery. Research in brain tumors (Viapiano) focus on novel treatment strategies for drug delivery and has one of the longest standing brain tumor banks with well-catalogued specimens. Research into neural repair mechanisms for treatment of brain injury and stroke (Zhao). Research on macromolecular clearance out of the brain is focused on developing a viable pharmacological treatment for hydrocephalus (Krishnamurthy). Electrophysiology laboratory (Calancie) focused on identifying an electrophysiologic biomarker in ALS and in cerebral vasospasm. Vision research laboratory (Tso) is focused on studying neurovascular coupling in retinal disease for early diagnosis of diabetic retinopathy and other disorders.

Newly established single neuron recording lab (Babu and Kaminski) are studying cognition in human subjects with implanted electrodes. We are one of the few sites in the country to recruit subjects for regenerative human cell therapy for treatment of epilepsy. Beutler (neurointensive care) and Gould (cerebrovascular) are involved in funded clinical trials. New efforts are underway to foster collaborative research into novel methods of diagnosing and treating neurosurgical disorders through devices with Watson College of Engineering at Binghamton.

We publish an average of 23 peer reviewed articles and 8 book chapters every year for the last four years. There are over a dozen medical students who have demonstrated interest in neurosurgery by their active participation in research and publications. Hall has edited two books. Currently, neurosurgery has ten active grants.

The Department's clinical practice - the Upstate Brain & Spine Center - offers the largest neurosurgical team in Central New York. Faculty and residents provide services to patients at both Upstate University Hospitals, Crouse and the VA. https://www.upstate.edu/neurosurgery/research/index.php

Obstetrics and Gynecology

Interim Chair: John Nosovitch, MD
MD: University of Texas Medical Branch at Galveston, Texas, 1986

Clinical research is actively pursued both in the department and with the collaboration of other departments within the medical university. Each resident is expected to become involved with one of the ongoing projects or initiate a new line of investigation with a faculty advisor.

Third- and fourth-year residents present papers on their case studies and research investigations at the annual Senior and Chief Residents' Departmental Scientific Forum, now in its eleventh year. The research rotation with academic, faculty and fellowship tracks, prepare our residents for these pursuits and a career of lifelong learning.

Clinical research trials are available to our patients through our participation in the National Cancer Institutes' cooperative group, Gynecologic Oncology Group (GOG), or through a pharmaceutical-sponsored study. The research trials are currently open for ovarian cancer, uterine cancer and endometrial cancer.

The research team is composed of Mary Cunningham, MD, as principle investigator; W. Douglas Bunn, MD; Margaret Mahan, RN NP, and Elizabeth Anderson, clinical research associate.

Ophthalmology and Vision Sciences

Chair: Robert D. Fechtner, MD
MD: University of Michigan Medical School

The Department of Ophthalmology and Visual Science has continued its growth and progress in research, education, and clinical care. In celebration of our 25 years of vision research, the Center for Vision Research hosted an all-day Symposium featuring leading experts in vision research. Speakers included the Director of the National Eye Institute; guest vision scientists from Harvard University, Washington University, UC Berkley as well as a panel of leaders in research funding and many alumni/ae of the CVR. Our keynote address was presented by the Honorable David A. Paterson, 55th Governor of New York, and author of *Black, Blind and In Charge*. We continue to enjoy substantial extramural funding for our work, and have just completed recruitment of two Empire Innovation Program scientists. Our scientists are seeking fundamental understanding of vision, from molecules to cell, from tissue to visual perception. We will apply this knowledge to finding cures for blindness

The Center for Vision Care is the home of our residency training program and clinical practice. We have eight core faculty members and 40+ community faculty volunteers covering all ophthalmology subspecialties. The residents work with the faculty learning clinical, diagnostic and surgical skills. Our residency program was recognized this year as ranking #6 out of 18 in the state

of New York in the most recent Doximity survey. This year, with the support of University Hospital and the faculty, we have acquired a surgical simulator for training our residents. This system allows surgeons to practice and master essential microsurgical skills in a virtual environment before moving to the operating room environment. We also hope to use this simulator as a resource to expose medical students to the field of ophthalmology and ophthalmic surgery.

The Department values community involvement. We are the eye care resource for a diverse immigrant and refugee community and for our financially disadvantaged community members. Our full-time faculty, volunteer faculty, residents, students and staff are committed to this mission to serve Central New York and care for patients with an extraordinary variety of interesting, unusual, and challenging ophthalmic problems.

Orthopedic Surgery

Chair: Stephen Albanese, MD

MD: SUNY at Buffalo, 1980

The Department of Orthopedic Surgery offers easy access to multiple clinical programs that provide the latest in basic and advanced musculoskeletal care. Recent additions to the program include hip arthroscopy, innovative spine deformity treatment techniques including vertebral tethering, robotic surgery for total joint replacement and the expansion of the pediatric orthopedic division. Upstate orthopedic surgeons continue to provide level 1 trauma care for children and adults from throughout the region. The Department is a community resource for the management of complex musculoskeletal issues in hand, foot and ankle, pediatrics, oncology, spine and sports medicine.

The Department provides well balanced clinical and research experiences for medical students and residents. Medical students rotate on several of the clinical services and frequently participate in research projects under the guidance of orthopedic surgery faculty members. The 5-year residency program has expanded to a total of 25 residents with 5 graduates per year. Residents rotate through a variety of clinical settings that provide experience in all the major subspecialties of orthopedic surgery. Many of the program graduates currently practice in the Upstate New York region.

There is strong collaboration between research scientists and clinicians, leading to many research projects that result directly from the practice of orthopedic surgery at Upstate. Research is currently focused in the areas of orthopedic oncology, joint replacement, spine surgery, sports medicine, osteoporosis and bone biology, upper and lower extremity biomechanics and fracture fixation.

Otolaryngology

Interim Chair: Amar Suryadevara, MD

MD: SUNY Upstate Medical, 2003

The physicians and staff of the Department of Otolaryngology are committed to excellence in patient care, teaching, and research. The department has dedicated specialists in each area of Otolaryngology who provide expert care for patients. The Department's academic program has a rich history, with the first Professorship of Otology dating back to 1872. The first full-time chair, Dr. George Reed, took his position in 1964. Since then, many faculty and residents have come through the program.

The residency program provides strong clinical training in all subspecialties of otolaryngology. The Department takes three residents a year. Approximately half of our residents go on to fellowship training and usually match in their top choices. There is also a one-year fellowship in craniomaxillofacial surgery.

The clinical and surgical experience is enhanced through weekly basic science and subspecialty lectures, Grand Rounds Lectures, Multi-Specialty conferences, Morbidity and Mortality Conference, and Journal Club. Throughout the year, a series of surgical anatomy laboratories are held in the College of Medicine gross anatomy lab and a temporal bone dissection course is performed within the department's temporal bone laboratory. PGY-5 residents also partake in a microvascular anastomosis laboratory. Residents also have a total of four months dedicated to research during the PGY-3 year.

Research by faculty covers an array of interests, including intracranial hypertension, Menieres disease, outcomes in cleft and craniofacial surgery, cosmetic and reconstructive facial surgery, head and neck oncologic surgery, health disparities in cochlear implantation, voice disorders, head and neck and sinonasal/skull base malignancies.

Pathology

Interim Chair: Michel R. Nasr, MD, FRCPC

Kursk State Medical University, 1999

The Pathology Department has a long history of scholarship, discovery, education and innovation. A fully integrated academic department with Divisions that cover most pathology specialty areas, Pathology is innovating in digital imaging, telepathology, bioinformatics and molecular diagnostics. In response to the COVID-19 pandemic, we established an efficient collaboration between Microbiology and Molecular labs to support the increased demand for COVID-19 testing providing over 400,000 diagnostic tests in the community. This year, we established a new UpState PatholOgy REsearch Core (SPORE) lab with the goal to coordinate activities of clinical and research components in the department, ensuring fully integrated services. The Pathology Department is a key component of the Upstate Cancer Center. This is a program focused on preparing pathology residents and fellows to be partners in delivering care that is predictive, preventative, personalized, and participatory.

The Department has a faculty of 29 physicians and laboratory scientists representing the most comprehensive roster of specialty pathologists in the region. The depth of the expertise is offered as a resource to other laboratories and physicians in the region. As the science progresses in identifying specific disease targets making personalized medicine a reality, the Pathology Department is prepared to be a resource in providing guidance to clinicians and patients to make informed treatment decisions based on evidence.

Research in the Department is currently focused on developing and validating prognostic and predictive biomarkers and models for improved disease prognostication and management of cancer patients using machine learning approaches. Other areas of research focus on utility of technology for rapid on-site evaluation of fine needle aspirates, and use of various analytical techniques to identify and quantify evidence of exposures to potentially toxic materials in tissues.

DEPARTMENTS

Pediatrics

Chair: Gregory Conners, MD, MPH, MBA
MD: SUNY Stony Brook, 1989

Committed to serving children and families across the region, the Pediatric Department's mission includes delivery of the highest quality pediatric care, provision of excellent teaching and development of life-long learning skills for all levels of learners, discovery through important research, and support of our community through outreach and advocacy.

The Upstate Golisano Children's Hospital, the only children's hospital in the region, is integral to health care for children across an 18-county region, with faculty and staff who build a better community by providing comprehensive primary care and specialty pediatric services and educating the next generation of pediatricians. Our expert staff provide great care in great spaces. Young patients can play video games, enjoy their favorite cartoons, stay in sync with friends and classmates, and act like the kids and adolescents they are. They can connect with their families, day or night. Facilities include pediatric intensive care rooms, pediatric operating rooms, 12 single-patient rooms customized for patients with cancer and blood disorders, epilepsy / seizure monitoring capability, school and playrooms, and specialized procedure rooms and equipment, all for children.

Our new Golisano Center for Special Needs provides for children with developmental disorders. During the COVID-19 pandemic, we have continued to support children's health through widespread viral testing, development of virtual clinic visits, safe hospital visitation practices, COVID-19 vaccination and vaccine research, and education of area medical and nursing professionals and of school leaders through numerous Project ECHO sessions. We also continue to address the growing needs for mental health care in children in adolescents.

Physical Medicine and Rehabilitation

Chair: Robert Weber, MD
MD: Ohio State University, 1971

The Department of Physical Medicine and Rehabilitation supports clinically and educationally based scholarship. Faculty and residents focus on function, disability, neurophysiology, technology, quality, and health and wellness. Resident physicians complete at least one project during their 3-year training program that results in an accepted scholarly submission with a PM&R national professional society, publication, educational module, or quality improvement activity.

This year, we partnered with the VA to sponsor a one-year joint Spinal Cord Injury Medicine (SCIM) fellowship. Upstate's Level I Trauma Center designation for adults and children brings the vast majority of patients with spinal cord injuries to University Hospital, and the VA Medical Center's state-of-the-art Spinal Cord Injury and Disorders (SCI/D) Center is among the largest facilities of its kind in the nation.

Recently, the focus of PMR's clinical research turned to the concern for health and well-being of people with disability. Initially using the TriNetX Research Network, a global federated network of electronic medical record (EMR) data, Department researchers were among the first to recognize the high risks for people with intellectual and developmental disabilities (IDD) and disparities in outcomes related to the pandemic. Collaborations with Syracuse University Aging Studies Institute researchers resulted in publications further defining the risk for mortality among adults with IDD, and influencing equitable vaccination policy at a national level.

Additionally, the Department remained active with research and publications in the areas of neuro-physiology, neuro-robotics in spinal cord injury, and health care disparities and differences for people with a variety of disability conditions.

Psychiatry and Behavioral Sciences

Chair: Thomas Schwartz, MD
MD: Upstate Medical University, 1995

The Psychiatry and Behavioral Sciences Department is a multidisciplinary group of faculty members where psychiatrists, psychologists, social workers, nurse practitioners and others work together to provide care to our patients, train students, interns, fellows, residents, and conduct new and innovative research projects. Our trainees are able to learn research methods, to provide psychotherapy, pharmacotherapy and engage in interventional approaches. In regard to clinical practice and access to care, we have been able to triple the number of patients seen over the last 2-3 years. Despite COVID limitations, our researchers have had a record number of publications and continue to obtain federal funding consistently.

Over the last year we conducted a strategic mission retreat and have started to develop new plans and programs based upon our findings. We have created the roles of Quality, Diversity, and Wellness Officers and have added them to our organization chart with cross-cutting reporting across our 10+ divisions. These officers sit on key committees within the department to better address our faculty needs in all of these key areas. We are committed not only to improving patient care, teaching and research, but also more widely to improving the academic faculty experience over time.

The Department prides itself on protecting its academic nature and continuing to provide high-quality research and teaching while providing for an ever-expanding clinical population and facing increased administrative demands placed on our faculty. We have seen expansions in the number of trainees on site and have attempted to match that with new faculty hires. The Department has accepted these challenges with grace and have been able to expand in all areas of administration, research, teaching and clinical care.

Radiation Oncology

Chair: Jeffrey Bogart, MD
MD: Upstate Medical University, 1989

The Department of Radiation Oncology at SUNY Upstate Medical University continues to be at the forefront of the latest treatment technology and clinical research, providing residents with a rich and comprehensive training environment. In the 2021-22 academic year, departmental faculty had major presentations at national meetings presenting results of national clinical trials in both pediatric and adult malignancies. We also oversee the radiation oncology section of that annual RSNA meeting, one of the largest meetings in the world. Our continued focus on quality and implementation of advanced technology throughout our system to further reduce the risk of treatment-related side effects. Our basic science initiatives with Dr. Pawar and Dr. Simone continue to advance with the goal of improving the therapeutic ratio for patients undergoing radiotherapy for cancer treatment. In order to expand our geographical reach and provide quality care to surrounding areas, we have developed a strong partnership in both Cortland to the south and Auburn to the west to provide radiation oncology services, and we will be a core part of the planned cancer center in Verona.

DEPARTMENTS

Radiology

Interim Chair: Michele Lisi, MD
MD: Upstate Medical University, 1997

The Department of Radiology provides imaging and interpretation services to all clinical and research departments at University Hospital, as well as to three outpatient facilities.

The department provides a full complement of tertiary care radiologic services, including Neuroradiology and Interventional-Neuroradiology, Interventional Radiology, specialized Musculoskeletal, Thoracic and Abdominal Radiology, Women's Imaging, and Molecular Imaging.

The Department includes our Diagnostic Radiology Residency program. Within the program, we offer Early Specialization in Interventional Radiology and a 16-month pathway for specialization in Molecular Imaging. We also have post-graduate fellowship programs in Neuroradiology and Interventional Radiology. Faculty and staff are deeply committed to providing the highest quality patient care and resident education possible. For the Department, these goals are not only compatible, but complementary. The success of the program is manifested by residents' performance on the Core and Certifying Board Examinations and by the ease with which they are able to obtain desirable fellowships, academic or private practice positions.

The department is involved in several studies. For example, a post-radioiodine treatment dosimetry and staging by I-131 SPECT/CT and the ARROW study, which is looking at using the PSMA targeting small molecule 1095 with I-131 as a targeting radioligand therapy (RLT) to treat metastatic prostate cancer. Additionally, we have partnered with the Urology Department on a new molecular diagnostic imaging protocol using Tc99m sestamibi to differentiate Oncocytoma from Renal Cell Carcinoma. There is also a collaborative study with MD Anderson and Northwestern called DoorwaY-90. This is a liver-directed therapy trial for individualized dosimetry for treatment of liver tumors.

Surgery

Chair: Robert Cooney, MD
MD: University of Vermont College of Medicine, 1985

The Department of Surgery at Upstate is a diverse group of general surgeons, subspecialists, and researchers. With over 40 surgeons, University Surgical Associates is one of the largest surgical practices in CNY. The Department specializes in treating complicated illnesses and conditions serving as a regional referral center for the CNY population of over a million. Our surgical expertise is extensive with fellowship trained surgeons offering specialized surgical care for breast disease, burns, cardiac conditions, colorectal and emergency surgery, endocrine surgery, general and hernia surgery, hepatobiliary and pancreas surgery, pediatric surgery, minimally invasive and bariatric surgery, surgical oncology and thoracic surgery, transplant and trauma surgery, as well as comprehensive vascular surgery.

Our faculty are committed to education and training the next generation of physicians and surgeons. The surgery clerkship is highly rated and our general surgery residency training program attracts outstanding students from medical schools around the country, graduating six chief residents per year. The operative experience for trainees is extensive and diverse including rotations at Upstate University and Community Hospital, Crouse Hospital and the VA Medical Center. Many residents pursue research opportunities as part of their surgical training at Upstate and are recognized nationally for their research.

The Department of Surgery has research facilities that house both surgical and basic research scientists who are full-time members of the Department. Funding from the NIH and DoD supports research in multiple areas including: gastrointestinal, cardiovascular, pulmonary, sepsis, organ injury, trauma and burns, immunology, metabolism and cancer.

Urology

Chair: Gennady Bratslavsky, MD
Albany Medical College, 2000

The Department of Urology at Upstate Medical University is a diverse academic group representing numerous urologic subspecialties across various backgrounds and subspecialized trainings. Our mission focuses on education, research, health care, and improving the lives of our community.

Over the past 10 years, the Department of Urology has increased nearly ten-fold in faculty and is now the home of nearly 30 outstanding clinicians and translational scientists covering nearly 20,000 square miles of Central NY. We provide support and outstanding care to every county in CNY and we staff numerous nearby collaborating hospitals and healthcare systems. The clinical expertise is unparalleled with every urologic subspecialty covered by its fellowship trained faculty including urologic oncology, female & pelvic floor medicine, endourology, reconstructive and transgender medicine, pediatric urology, all aspects of men's and women's health, robotic and minimally invasive surgery, as well as general urologic health.

We remain committed to research with several active wet and dry labs headed by world class scientists in biochemistry and molecular biology, genetics, bioinformatics and artificial intelligence. They are a source of numerous PhD graduates trained internally. Currently, the translational scientists are supported by numerous extramural grants, including R01, R21, DOD, NIH MIRA grant, NY Empire scholarship as well as several intramural and foundation awards. The Department of Urology is home to numerous educational projects for local high school students, medical students as well as resident physicians in training, and is a continuous source of high impact, high quality publication in the field of biomedical research.

Our faculty are committed educators with many serving on committees or participating in projects aimed at improving the quality of education within the College of Medicine.

OTHER ACADEMIC

Bioethics and Humanities

Interim Chair: Amy Caruso Brown, MD, MS
MD: Emory University, 2008

The Center for Bioethics and Humanities, a department of the College of Medicine, advances the scholarly and professional understanding of bioethics, law and health humanities. Our goal is to promote health care and health policy that is patient- and family-centered, compassionate, and just. The Department provides education to learners in all of Upstate's colleges and affiliated hospitals, conducts a wide range of empirical and theoretical scholarship, publishes a literary journal, *The Healing Muse,* and provides clinical ethics consultations at both the Downtown and Community Campus and at Crouse Hospital.

Our faculty's research interests include the ethics and law of pediatric treatment disagreements, the impact of social media on trust in medicine, ethical issues related to brain injuries and disorders, particularly disorders of consciousness and brain death, and ethical issues related to policies that affect immigrant health and immigrant access to health care. In addition, Bioethics and Humanities faculty also chair Upstate's Hospital Ethics Committee, lead the Upstate Bias Checklist Collaborative, and direct courses such as Patients to Populations, the Clinical Bioethics Clerkship and the Physicians and Social Responsibility sequence for medical students.

Throughout the COVID19 pandemic, our faculty have continued to advise on ethical aspects of hospital policies and operations and to educate faculty, staff and students regarding ethics in the context of the pandemic, including at community and rural hospitals in our referral region.

Public Health and Preventive Medicine

Chair: Christopher Morley, PhD

PhD: Syracuse University, Social Science, 2009

The Department of Public Health and Preventive Medicine (PHPM) is committed to educating students and conducting research in public health, preventive medicine, health promotion, and health services. PHPM members recognize the social determinants of health, and the pursuit of health equity, at the core of their training and departmental mission. PHPM operates through four divisions, the largest of which is the Division of Education (Martha Wojtowycz, PhD – Vice Chair for Education), which encompasses our Master of Public Health Program (MPH, CAS, MD/MPH, and Public Health Scholars), Preventive Medicine instruction in the MD program, and statistical instruction for bio-medical graduate students. PHPM is also an active participant in efforts to support diversity, equity, and inclusion.

The Research Division is centered on the Center for Research & Evaluation (CRE – Dongliang Wang PhD, Director), a core facility offering consultation on research design and analysis. The Division of Practice and Outreach (Telisa Stewart DrPh, Director) focuses upon engagement with external partners to improve use of public health sciences in real-world settings, and is an outgrowth of departmental efforts to support community partners to navigate the realities of the COVID-19 pandemic. Finally, the Division of Administration (Alyssa Indelicato BS, Executive Coordinator) provides coordination and support across divisions.

Cutting across divisions, faculty research includes studies on community violence, healthy aging and dementia, health workforce and primary care development, maternal/child care, medical education, cancer screening and prevention, behavioral health, disabilities, and COVID-19 epidemiology. Activities include the development of surveillance systems and reports, the design of behavioral messaging campaigns, and program planning and evaluation. All faculty and professional staff contribute to the intellecutual life of the department.