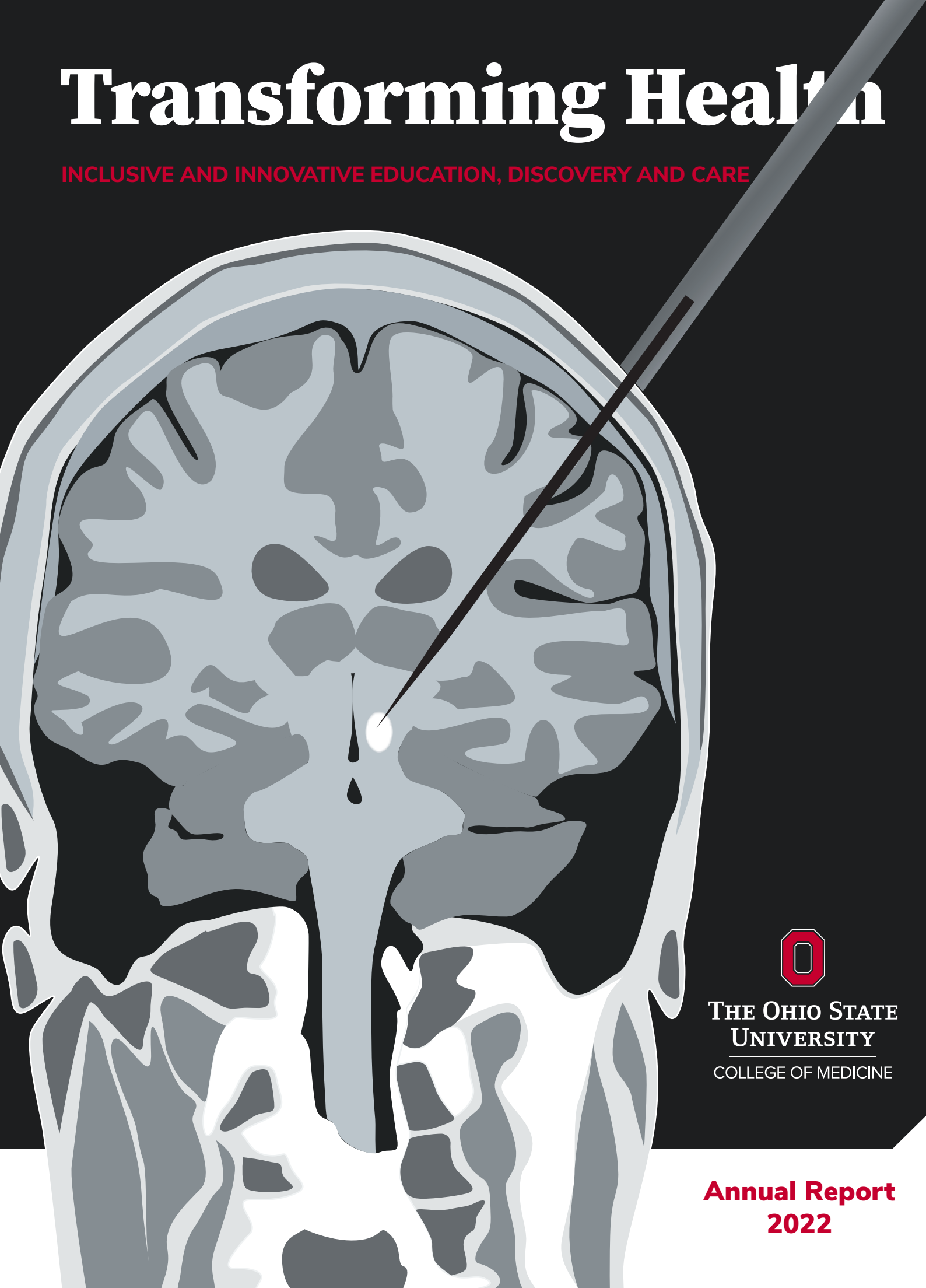
Transforming Health

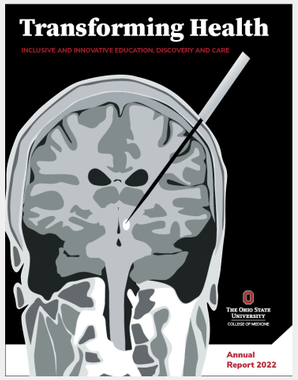
INCLUSIVE AND INNOVATIVE EDUCATION, DISCOVERY AND CARE



THE OHIO STATE UNIVERSITY
COLLEGE OF MEDICINE

Annual Report 2022

Each year, more than 200 medical students graduate from Ohio State and go on to be collaborative and compassionate leaders in medicine.



About the Cover:

Ohio State is one of the only institutions with most of its gene therapy trials delivering targeted gene therapy to the midbrain. Our cover illustration depicts a technique developed by researchers at The Ohio State University College of Medicine, where they monitor the direct infusion of genetic material into the brain using real-time MRI imaging, perfectly targeting an area to effect a cure. Ohio State's Gene Therapy Institute is a groundbreaking initiative to centralize gene therapy research through collaboration.

Illustration by **Megan Moore**, senior graphic designer, The Ohio State University Wexner Medical Center.

Printed November 2022

Letter from the Dean

As I celebrate my two-year anniversary at The Ohio State University College of Medicine, I can say without a doubt that Buckeyes are passionate, collaborative and laser focused. I see tremendous growth and innovation happening here. With our bold new curriculum for interprofessional education, ground-breaking novel discoveries partnered with record research funding, high-quality patient-centered care and our talented team of more than 2,800 faculty, nearly 5,000 learners and over 4,000 staff members, we are transforming the health of our communities. It's been a great year, so I am excited to share these highlights with you.

Education

With the goal of preparing more physicians to practice medicine in rural or smaller communities, this summer we announced a new Community Medicine MD Track in partnership with Bon Secours Mercy Health to train 15 additional medical students each year. I am also proud to share that *U.S. News & World Report* ranked us 30th for Best Medical School – Research, 32nd for Best Medical School – Primary Care (the best in Ohio) and 14th for Most Diverse Medical School in the country. And our medical students enjoyed a 97% match rate this year.

Research

Last fiscal year, we had a record $221.9 million in National Institutes of Health (NIH) funding and our total research funding increased by 22% to more than $367 million. Biomedical innovations and breakthrough discoveries occurred in key areas like cancer, neuroscience, heart, immunology and informatics. One of our skilled scientists, Maria Mihaylova, PhD, was selected as a Pew Biomedical Scholar for research to advance knowledge of metabolism and diet's effect on aging intestinal cells.

Clinical care

We are leaders in clinical care. Ohio State holds one of the largest first-in-human clinical trial portfolios in gene therapy and is one of the only institutions with most of its gene therapy trials delivering targeted gene therapy to the midbrain. We also have two renowned surgeons who pioneered a minimally invasive surgical technique to remove skull-base tumors, which are some of the rarest and most dangerous head and neck tumors. Patients come from all over the world to seek treatment by Ohio State's brilliant physicians. Be sure to read about our Gene Therapy Institute and skull-base surgery in this report!

Capital improvements

The Ohio State University has one of the most comprehensive health sciences campuses in the nation, and we continue to grow with more than $3 billion planned for capital investments. In coming years, we will have a new interdisciplinary health sciences center, an 820-plus bed inpatient tower, new outpatient care centers and an interdisciplinary research building.

People make the difference

While new facilities are important, the strength of the Ohio State College of Medicine remains its people. Our new Chief Health Equity Officer Chyke Doubeni, MBBS, MPH, is leading efforts to reduce health disparities among our patients and communities, and every day our learners, faculty and staff fulfill each facet of our mission to transform the health of our communities. In fact, our teams' community transformation efforts are so powerful and palpable that the Association of American Medical Colleges presented us with its prestigious Spencer Foreman Award for Outstanding Community Engagement this year. This honor truly exemplifies our incredible work, and I could not be more proud.

Sincerely,

Carol R. Bradford, MD, MS, FACS
Dean, The Ohio State University College of Medicine
Vice President for Health Sciences
Leslie H. and Abigail S. Wexner Dean's Chair in Medicine

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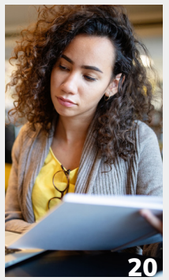

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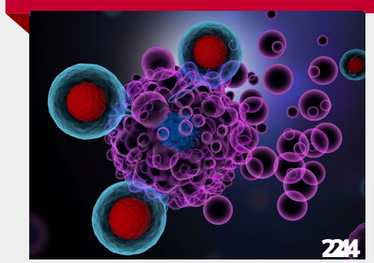

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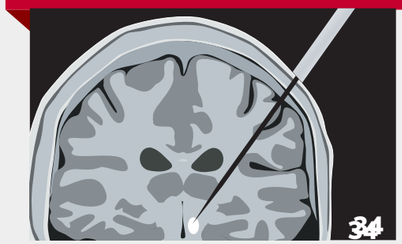

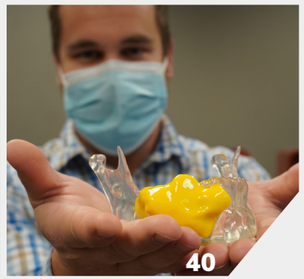

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medicine.osu.edu/annualreport

Building the future of health care innovation

The Interdisciplinary Research Facility includes a five-story laboratory space for researchers to make groundbreaking discoveries.

More than 100 years ago, a group of forward-thinking central Ohioans recognized the value of integrating medical education with innovative research and science-based care. From that foundation grew seven health science colleges and a school of health and rehabilitation sciences. Today, The Ohio State University is one of the most comprehensive health science campuses in the nation. The academic institution continues to lead health care expansion through innovation and a growth mindset. This sets the standard for academic medical centers of the future, creating dynamic research spaces and inventive clinical and learning environments.

The size and scale of Ohio State's efforts to transform the way medical care is learned, advanced and delivered is starting to come into view. Progress on multiple renovations, construction projects and new facilities are changing more than the campus and community landscape — they're revolutionizing health education and care.

"We need modern tools, technology and state-of-the-art environments to practice 21st century medicine and provide innovative clinical care," says Carol R. Bradford, MD, MS, FACS, dean of The Ohio State University College of Medicine. "Our new health care education facility is designed to ensure our learners, researchers and practitioners continue to lead scientific discovery."

The Ohio State College of Medicine's **Anatomy Wing**, a three-story, 42,000-foot addition to Hamilton Hall as part of the new **Interdisciplinary Health Sciences Center** (IHSC), opened in January 2022, and includes six large dissection rooms with capacity for 115 tables. With modern laboratory technology and flexible spaces, the facility enables a learning experience that is both multifaceted and collaborative. Instructors can project live demonstrations from the "command center," which is equipped with high-tech surgical lights and a high-definition camera. Learners can view the demonstrations via TVs in the laboratory in "real time" and revisit recordings using their iPads.

"We need modern tools, technology and state-of-the-art environments to practice 21st century medicine and provide innovative clinical care."

— **Carol R. Bradford, MD, MS, FACS**
dean of The Ohio State University College of Medicine

The Classroom Wing, which is included in the second phase of construction at Hamilton Hall, will deliver flexible classroom designs, allowing educators to meet expansive and diverse educational needs. There is space for interdisciplinary collaboration among learners and spaces for people to meet, study and relax.

The Classroom Wing is slated to open in July 2023. **The Hamilton Hall Wing**, which is part of the third phase of construction, will open in January 2024. It will house the leadership and administrative support services for the College of Medicine as well as a beautiful event space in the Forum and food and beverage options in the café.

Ohio State is taking a major step forward with the development of a new inpatient hospital, which will combine state-of-the-art diagnostic, treatment and inpatient services, outstanding clinical training and world-class patient care. The 1.9 million-square-foot inpatient hospital is the largest single facilities project ever undertaken at Ohio State. The inpatient hospital nearly doubles the existing number of rooms to 820 and provides private-room settings equipped to elevate patient-centered care and accommodate the growing demand for high-acuity care. Scheduled to open in 2026, the new inpatient hospital will facilitate teaching team-based health care and the adoption of new technology.

The Anatomy Wing of the new IHSC building, where interdisciplinary students from our seven health science colleges learn together.

“This new facility leverages the brilliant minds across one of the largest universities in the world to come together and collaborate to solve some of life’s most pressing challenges.”

— **Peter Mohler, PhD**
vice president of Research forThe Ohio State University

Construction on the **Interdisciplinary Research Facility**, located at Carmenton, is 80% complete. The five-story building, with a basement, will house both wet and dry laboratories and serve researchers across the university. Two floors will be dedicated to The Ohio State University Comprehensive Cancer Center, including the Pelotonia Institute for Immuno-Oncology. The facility is scheduled to open in June 2023.

“This new facility leverages the brilliant minds across one of the largest universities in the world to come together and collaborate to solve some of life’s most pressing challenges,” says Peter Mohler, PhD, vice president of Research for The Ohio State University and chief scientific officer for the Ohio State College of Medicine. “By working together in one space, scientists can explore solutions more easily and advance the translational science at a quicker pace.”

Expanding access to high-quality care

The Ohio State Wexner Medical Center continues to grow its convenient access to primary and specialty care services in central Ohio with the opening of **Outpatient Care Dublin**. The $161.2 million, 272,000-square-foot building is the second of three outpatient care centers that are part of the medical center’s strategic expansion of outpatient services. The goal is to offer patients access to the advanced health care of Ohio State’s nationally ranked experts in a convenient community setting — right in their own neighborhood.

Outpatient Care Dublin

Ensuring access to health care increases participation in preventive care, which in turn keeps patients healthier and engages them in health and cancer screenings.

At the Dublin location, patients can have multiple appointments with different health care providers all in the same place — and often on the same day. Patients can take care of all their major health care needs, from prevention to surgery, in just one building.

Ohio State has remained on the leading edge of discovery and patient care while staying true to its enduring land-grant mission commitment to serve people and communities across the state.

“We are creating new environments that inspire new ways of collaborating, new approaches to problem-solving and new ideas to explore and evaluate. When discovery, care and education have no boundaries, our future accomplishments are limitless.”

— **Carol R. Bradford, MD, MS, FACS**
dean of The Ohio State University College of Medicine

Ohio State has remained on the leading edge of discovery and patient care while staying true to its enduring land-grant mission commitment to serve people and communities across the state.

Transforming the health of Ohio: AAMC recognizes college's commitment to community

From filling gaps in resources and health care for Columbus residents to implementing evidence-based intervention in Ohio communities battling the opioid epidemic, The Ohio State University College of Medicine and The Ohio State University Wexner Medical Center are deeply invested in community health. Teams are delivering on the mission of transforming the health of communities through inclusive and innovative education, discovery and care.

In recognition of Ohio State's ongoing work to improve health and wellness across the state, the Association of American Medical Colleges (AAMC) has awarded the college its **2022 Spencer Foreman Award for Outstanding Community Engagement**. This prestigious award acknowledges the college's commitment to partnering with diverse stakeholders and community residents to identify and address community needs.

Carol R. Bradford, MD, MS, FACS, dean of the Ohio State College of Medicine, says the college's deep commitment to community engagement is illustrated through decades-long programming and community health initiatives, which are possible due to the passion and commitment on the part of more than 30,000 faculty, staff, learners and community partners.

"It is not just one or two projects we focus on. Serving communities throughout Ohio is ingrained in everything we do at the college," Dr. Bradford says. "We work with different communities to discover their needs and implement ongoing solutions that can be sustained. Our primary goal is to transform the health of Ohio and beyond."

> **"We work with different communities to discover their needs and implement ongoing solutions that can be sustained. Our primary goal is to transform the health of Ohio and beyond."**
>
> — **Carol R. Bradford, MD, MS, FACS**
> dean of The Ohio State University College of Medicine

The projects behind the recognition

Partners Achieving Community Transformation (PACT)

When the Columbus Public Health Department identified Columbus' Near East Side as a community in need of expanded access to health care, the Ohio State College of Medicine and Wexner Medical Center partnered with the city of Columbus and the Columbus Metropolitan Housing Authority to form PACT, pledging more than $10 million to improve health and wellness in this community. One of PACT's first projects was to restore properties in the area, acquiring home repair grants for 26 homes and initiating down-payment grants that encouraged 31 Ohio State employees to move into neighborhoods on the Near East Side.

From left: *Dr. Steven Gabbe, Elizabeth Seely, MHA, Fred Ransier, Dr. Carol R. Bradford, Beth NeCamp, MHI and Dr. Mary Howard.*

The Health Sciences Academies (HSA)

In 2014, PACT, Columbus City Schools and the Ohio State Wexner Medical Center teamed up to establish the HSA at six Near East Side public schools, where every student participates in health science education. Each week, high school students participate in the Health Science Career Connections Club and learn from professionals in health science fields, engage in mentoring opportunities with Ohio State medical students, complete community service projects and learn professional skills. They then have opportunities to attend Ohio State career fairs, and MD and veterinarian camps. Sixth-grade students are given a White Coat Ceremony to mark their transition into the HSA each year. HSA also provides training programs for students' parents to help them understand the HSA, how to make healthier choices and how to access medical care.

MOMS2B

This community-based pregnancy program for low-income women was established by Ohio State in 2010 and is supported by Wexner Medical Center. Moms2B's goal is to improve the health of at-risk communities, empower pregnant women to deliver full-term healthy babies, reduce the number of low birthweight infants, reduce infant mortality and eliminate racial and economic disparities. Mom2B is using research, treatment programs and community outreach to reduce those disparities, and has helped more than 3,000 parents. Since the establishment of Moms2B, preterm births, very preterm births and low birthweight have been reduced by 20% and infant mortality has been reduced 55%.

The Interprofessional Community Scholars Program

Learners work directly in the community to improve the reach and quality of health care. The program brings students from multiple disciplines together with people living in the Near East Side to address care gaps. The Community Health Education course pairs medical students with approximately 30 community organizations, where they improve community health as part of their education.

The Columbus Free Clinic

This primary and urgent care walk-in clinic is managed by Ohio State medical students under the supervision of volunteer physicians and serves more than 1,400 underserved and uninsured patients annually. Students work alongside social workers, pharmacists, lab technicians, nurses and faculty mentors in a collaborative setting to address medical, social, mental health and even housing needs. In addition, patients are referred to specialty clinics in psychiatry, gynecology, law, orthopedics, LGBTQ patient care and others for additional treatment.

HEALing Communities Study

With our Carnegie R1 status as one of the country's leading research institutions, Ohio State holds many grants that address community health. One of the largest, the HEALing Communities Study, aims to reduce opioid overdose deaths by 40% over three years in participating communities, under a cooperative agreement supported by the National Institutes of Health's National Institute on Drug Abuse. A statewide effort, Ohio State is partnering with the University of Cincinnati, Case Western, RecoveryOhio and 19 at-risk Ohio counties, along with cabinet-level state officials and community leaders, to identify which components of evidence-based interventions lead to a reduction in opioid overdose deaths. This is accomplished through a mix of clinical interventions, health-based communications and data systems to improve community outcomes in a state that is commonly considered "ground zero" for the opioid epidemic.

"Our commitment to communities throughout Ohio continues. Improving the world around us is core to our land-grant mission.

It is who we are as Buckeyes."

— **Carol R. Bradford, MD, MS, FACS**
dean of The Ohio State University College of Medicine

"It is truly an honor to be recognized for our dedication to building stronger and healthier communities," Dr. Bradford says. "Our commitment to communities throughout Ohio continues. Improving the world around us is core to our land-grant mission. It is who we are as Buckeyes."

“Students will have hands-on experience with patients from less densely populated areas. Faculty who practice at St. Rita’s will provide students with the education to care for these patients’ most pressing health needs.”

— Jennifer McCallister, MD
clinical professor and associate dean for Medical Education at the Ohio State University College of Medicine

New MD track to produce the next generation of Community Medicine physicians

With a growing physician shortage nationwide, the United States continues to face health care disparities not only because of socioeconomic status, race, ethnicity, age, sexual identity and disability, but due to geographic location as well. Although Ohio is the seventh most populous state in the nation, it struggles with this issue, too, as more than 26% of its citizens are living in rural communities. According to data in the 2021 County Health Rankings & Roadmaps’ annual report, Franklin County, where The Ohio State University’s main campus is located, has more than 1,300 primary care physicians — one for every 990 residents. By comparison, Morrow County, 40 miles away, has only six primary care physicians — one for every 5,850 residents.

With its commitment to serve all of Ohio, The Ohio State University College of Medicine has set out to make a difference and increase the number of community medicine physicians to care for patients in midsize and rural communities.

Partnering with Bon Secours Mercy Health, one of the largest and most expansive health care systems in the country, a new Community Medicine Medical Degree Track will be offered at Ohio State, with unique clinical experiences at Mercy Health – St. Rita’s Medical Center. This community hospital, located in Lima, Ohio, a city with a population of almost 40,000, serves patients in northwestern Ohio — some who drive over an hour to seek care.

“The Community Medicine MD Track provides a new option for medical students who are interested in practicing medicine in a community setting,” says Carol R. Bradford, MD, MS, FACS, dean of the Ohio State College of Medicine. “They will benefit from the Ohio State College of Medicine’s innovative curriculum, the community care expertise of Bon Secours Mercy Health and student support resources at The Ohio State University at Lima, one of our regional campuses.”

Scheduled to start in 2024, medical students accepted into the program will complete their first two years of training at Ohio State’s Columbus campus and the remaining two years of core clinical training at St. Rita’s Medical Center.

“Students will have hands-on experience with patients from less densely populated areas,” says Jennifer McCallister, MD, clinical professor and associate dean for Medical Education at the Ohio State College of Medicine. “Faculty who practice at St. Rita’s will provide students with the education to care for these patients’ most pressing health needs.”

Along with learning the science of medicine, great physicians also need to learn empathy, integrity and compassion. The connections students and faculty make with their patients is critical to the trust they build with doctor-patient relationships, especially in less densely populated areas where patients may have to travel a long way to receive care.

“Working as engaged leaders in the community will enable our students to become more empathetic and compassionate caregivers and help them to quickly build relationships within the community where they serve,” says Dr. McCallister. “As leaders within these communities, they will be uniquely positioned to bring together teams who can effectively address the challenges their patients face and to work collaboratively to eliminate local inequities in care.”

Serving the community is an integral part of the college’s curriculum and of its Interprofessional Education Program, which emphasizes student learning in an interprofessional, team-based environment, where students learn and work alongside clinicians and students of pharmacy, nursing, therapy, social work and behavioral health. This structure allows students to gain a holistic perspective of the value each discipline offers to health care and how team-based collaborative care improves patient outcomes. This is particularly important for physicians who will be working in less densely populated areas, where resources are often scarce and reaching across sectors and professions is essential to serve patients who have health determinants unique to those areas.

The program, the first of its kind in the region, is the result of the Healthy State Alliance, a strategic initiative between The Ohio State University Wexner Medical Center and Mercy Health, designed to tackle Ohio’s most critical health needs. A long-standing partnership with Nationwide Children’s Hospital, where the college houses its Department of Pediatrics, informed the partnership between Ohio State and Mercy Health, which began through the building of joint transplant clinics and cancer centers across Ohio.

“We are deeply committed to our land-grant mission and uplifting all of Ohio,” says Dr. Bradford. “Partnering with Bon Secours Mercy Health to develop the physician-leaders of tomorrow will help reduce health care disparities in counties across our state and transform the health of all our communities.”

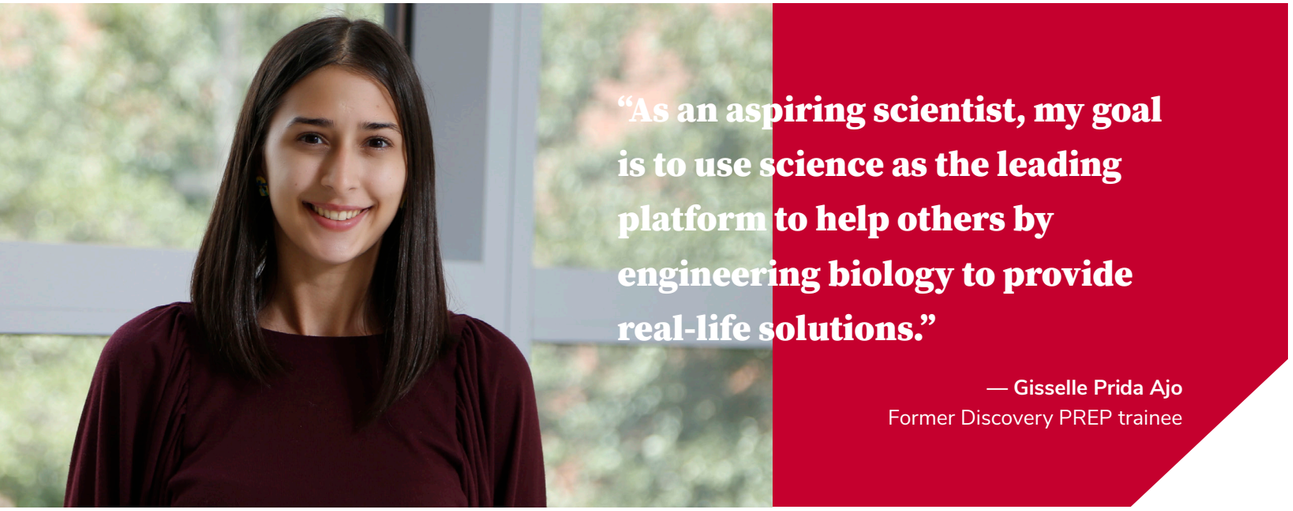
> **“We are deeply committed to our land-grant mission and uplifting all of Ohio.”**
>
> — **Carol R. Bradford, MD, MS, FACS**
> dean of The Ohio State University College of Medici

Creating more diversity in biomedical sciences

Similar to many other professional arenas, the field of scientific research lacks a varied and diverse workforce. According to the National Science Foundation, underrepresented minorities were awarded 11% of research doctorates despite making up 27% of the population and about 30% of the labor force. The Ohio State University College of Medicine is focused on increasing these numbers because diversity drives innovation by bringing new ideas and perspectives to the research field.

Discovery Postbaccalaureate Research Education Program (PREP) is a pipeline program designed to bridge the gap between an undergraduate education and a PhD program. This is a National Institutes of Health-funded program that provides an intense, paid research experience in outstanding research facilities across the country. This one-year program also delivers comprehensive professional development experiences and workshops that are designed to prepare individuals for admission to a biomedical sciences PhD program.

Discovery PREP trainees spend 75% of their time in the laboratory with an experienced Ohio State research mentor. At the bench, trainees gain invaluable hands-on research experience, completing a research project and working toward the presentation and publication of their research findings. The remaining 25% of their time is devoted to academic and professional development. In order to prepare participants to enter a biomedical PhD graduate program, the college offers access to GRE test preparation services and tutoring opportunities, exposes them to graduate-level coursework that supplements and reinforces information learned



“As an aspiring scientist, my goal is to use science as the leading platform to help others by engineering biology to provide real-life solutions.”

— Gisselle Prida Ajo
Former Discovery PREP trainee

in lab and provides one-on-one career counseling and graduate school application preparation.

Additionally, the curriculum exposes participants to many aspects of the work and research conducted by physician-scientists, a role that is in great demand to further biomedical science.

“When I joined the lab my sophomore year, I had planned to pursue a career in medicine,” says Deborah Olagbenro, a former Discovery PREP trainee and Neuroscience student. “My experiences in Dr. Barrientos’ lab helped me discover that my true passion lies in research.”

Ohio State distinguishes itself in this research program by providing trainees with a competitive salary for 12 months of paid research experience as well as health care and other benefits. Trainees also gain research mentoring from renowned leaders in their chosen field and have access to modern facilities.

“The Discovery PREP Program at The Ohio State University is impacting the way science looks in the future,” says Candice Askwith, PhD, associate professor and vice chair of research in the Department of Neuroscience. “We are dedicated to ensuring all people, no matter their background, have access to resources that will change lives.”

According to Peter Mohler, PhD, vice president of Research for The Ohio State University and chief scientific officer for the Ohio State College of Medicine, research is an integral part of what makes Ohio State such a force in the global medical community. Its investment in research and commitment to the investigative process has led to many breakthroughs and innovative discoveries.

“The process is highly collaborative, with over 260 principal investigators performing research in the biomedical sciences,” Dr. Mohler says. “Many research programs cross disciplines to involve multiple investigators across campus, which provides an exceptional environment for training for scientists and affords ample opportunities for networking.”

Gisselle Prida Ajo, a former Discovery PREP trainee, says she joined Discovery PREP with a commitment to learning and acquiring the research skills needed to continue with her education.

“As an aspiring scientist, my goal is to use science as the leading platform to help others by engineering biology to provide real-life solutions,” says Prida Ajo.

The Ohio State College of Medicine is committed to transforming the health of our communities. The Discovery PREP program is key in diversifying the field of biomedical science and preparing future researchers to enable scientific breakthroughs.

Building resilience: A hopeful approach to student mental health care

The college years — often romanticized as a time of learning and liberation — can also be a time of stress, exhaustion, anxiety and depression. According to the National Alliance on Mental Illness, 73% of students experience some variation of a mental health crisis and suicide is the second leading cause of death among college students.

To address these burgeoning challenges head-on, The Ohio State University College of Medicine’s Department of Psychiatry and Behavioral Health has initiated a different conversation around mental health. One rooted in open conversations, peer-to-peer support, easy navigation to resources, and prevention and early action.

At the end of 2021, the department and The Ohio State University Wexner Medical Center launched TALK, a campaign to prevent suicide, with information and resources to get people to open up and begin to break the stigma around mental health challenges.

According to K. Luan Phan, MD, professor and chair of the Ohio State College of Medicine’s Department of Psychiatry and Behavioral Health, this innovative shift is fueled by research that centers on resilience. Dr. Phan says that by identifying what makes people bounce back from — and even thrive during — adversity, they can apply these insights to develop tangible resources and interventions, so students and other young adults feel safe and supported accessing care at the first sign of trouble.

“We’re developing a playbook for building a resilient brain just like we have for a resilient heart,” Dr. Phan says. “And in the process, normalizing the need for cultivating emotional and cognitive resilience skills to weather inevitable ups and downs in life.”

In partnership with Ohio State, a new $10.15 million funding initiative, the Jeffrey Schottenstein Program for Resilience, will develop a support system that connects students struggling with mental health with those peers who have overcome these challenges.

“People with lived experience have a lot of know-how to help others who struggle,” Dr. Phan says. “Cancer support groups are run by survivors. We need to connect students to peers who sought help and got better.”

Proposed new initiatives will help students better navigate and engage existing and new behavioral health and wellness resources in multiple ways, including using digital platforms such as an app available on smartphones. A recent $1 million gift from Ryan Day, head coach of The Ohio State University football team, and his wife, Nina, will fund further research around the science of resilience and fuel the development of new and effective resilience-building strategies that focus on prevention, and complement and could improve existing treatments.

“The Nina and Ryan Day Resilience Fund allows researchers to determine factors that cultivate resilience, be they biological, psychological or social, with the end goal of creating new ways to intervene and help individuals under difficult-to-manage stress,” Dr. Phan says.

Understanding risk and protective factors so they can be modified through resilience and prioritizing prevention is shifting intervention for behavioral health treatment upstream. This not only benefits students and other young adults, it also trains a new generation of mental health advocates and providers on this innovative model of care.

Expanding innovative health care education programs across the nation

As the world of health care evolves, The Ohio State University College of Medicine and School of Health and Rehabilitation Sciences continue innovating to expand learning opportunities, advance health care careers and welcome a global community of students into the Buckeye family.

To provide flexible virtual learning, increase access to Ohio State's educational programs and provide students the opportunity to earn a certificate 100% online, this year we introduced many new online learning programs:

The **Biomedical Informatics Certificate** program is ideal for those who would like to supplement their careers in biomedical and clinical research. Students will explore biomedical informatics theories and principles.

The **Master of Arts in Bioethics** program focuses on the theories behind ethical reasoning as well as the tough questions one might encounter during medical practice and research. The degree equips students with the necessary skills to be ethically conscious leaders in their health care fields.

The **Master of Science in Translational Pharmacology** is perfect for graduates and professionals who desire a career specializing in trial design and safety studies or pharmaceuticals.

"The MS in Translational Pharmacology program has allowed me to grow as a student and a multidisciplinary research professional. The combination of asynchronous flexibility and a body of caring professors and thoughtful peers allows me to engage deeply with the curriculum. What is most surprising about the program is the community it has forged, despite being entirely remote."

— Patrick Rowan, learner

The next four degrees listed are offered by the School of Health and Rehabilitation Sciences:

The **Assistive and Rehabilitative Technology Certificate (ARTC)** program provides students with a strong foundation for the Rehabilitation Engineering and Assistive Technology of North America exam. The ARTC program allows students to expand their skills with assistive technology.

The **Associate of Science to Bachelor of Science in Radiologic Sciences** program guides students through administering and managing various radiologic techniques and primes them for the Certified Radiology Administrator examination.

The **Bachelor of Science in Health Sciences** program is the ideal stepping stone for those who wish to continue on to a graduate-level health program. In this program, students receive a high-quality education with a high degree of flexibility.

The **Usability and User Experience in Health Care Certificate** program offers individual and group case-based projects to demonstrate mastery according to national standards.

Two new in-person programs develop world-class scientists

The Master of Science in Immunology and Microbial Pathogenesis program prepares students for an exciting and rewarding career in medically essential research fields. The program imparts a foundational understanding of human health-related immunology and microbial pathogenesis through core coursework while providing a research experience through the completion of a master's thesis in one of Ohio State's top-tier research laboratories.

"Through Ohio State's Immunology and Microbial Pathogenesis MS program, I have gained a greater understanding of laboratory techniques. I am now comfortable and confident in my independent lab work skills."

— Sydney Scace, learner

As the threat of current and future global pandemics and the ability to broaden the use of immunotherapies against cancer continues, the PhD in Immunology and Immunotherapeutics program supports the need for PhD-level immunologists. A doctorate in Immunology and Immunotherapeutics provides learners with the skills and expertise to be leaders in the academic, pharmaceutical, biotech, government or public health fields.

Learn more about Ohio State's efforts in expanding immunology research on page 24.

By volunteering in the clinic, students put their didactic knowledge into practice in a supportive environment, while serving a diverse patient population.

Comprehensive programs, experienced faculty train top-notch health and rehabilitation science professionals

In May 2022, the School of Health and Rehabilitation Sciences (HRS) in The Ohio State University's College of Medicine, handed out diplomas, advanced degrees and certificates to its largest graduating class in the school's 56-year history. For some, this milestone marked the beginning of health-related careers and for others, career advancement in medicine, athletic training, dietetics and nutrition, physical therapy, occupational therapy, dentistry and other fields.

HRS boasts multiple academic programs that are ranked in the top 10 in the nation for their academic achievements and student outcomes, including the Occupational Therapy Doctorate and the Doctorate of Physical Therapy programs, which have a 100% pass rate on national certification exams and rank in the top 10% of programs nationwide.

These impressive achievements only tell part of the story. Much of the school's success boils down to foundational and practice-based learning provided by exceptional faculty, many of whom serve in prominent positions in national leadership in the profession. This inspires everyone in the school to service.

Since opening in 2016, the school's student physical therapy clinic has offered 1,242 treatment sessions to community members who would have not otherwise received physical therapy treatment. By volunteering in the clinic, students put their didactic knowledge into practice in a supportive environment, while serving a diverse patient population. Board members, mentors and physical therapists guide the students through new experiences, such as working with language interpreters and non-English speaking patients. One student says, "this helped me appreciate the role that health care providers play both in our own culture and other cultures."

Academic programs

4 Certificates

- Assistive and Rehabilitative Technology
- Medical Laboratory Science
- Medical Coding and Health Care Data Analytics for Practice
- Usability and User Experience in Health Care

3 Minors

- Aging
- Integrative Approaches to Health and Wellness
- Medical Laboratory Science

7 Graduate

- Master of Athletic Training
- Master of Dietetics and Nutrition
- Master of Respiratory Therapy
- Master of Science in Health and Rehabilitation Sciences
- Clinical Doctorate of Occupational Therapy
- Clinical Doctorate of Physical Therapy
- PhD in Health and Rehabilitation Sciences

8 Undergraduate

- AS to BS Completion Degree in Radiologic Sciences
- Health Information Management and Systems
- Health Sciences
- Medical Laboratory Science
- Radiation Therapy
- Radiography
- Respiratory Therapy
- Sonography

2022 *U.S. News & World Report* Rankings

- Health Sciences – No. 7
- Best Online Bachelor's Program
- Doctorate of Physical Therapy – No. 9
- Best Physical Therapy Program
- Occupational Therapy Doctorate – No. 13
- Best Occupational Therapy Program

2021-2022 HRS MILESTONES:

- **Deborah Larsen, PhD, PT** retired after 32 years of exemplary service to Ohio State, serving as the school's director for the last 17 years.
- **Amy Darragh, PhD, OTR/L, FAOT**, was named as the interim director for HRS.
- **The Office of Diversity, Equity and Inclusion** was created to strengthen HRS' commitment to foster a diverse and equitable community of learners.
- The International Research Council on Biomechanics of Injury awarded **Gretchen Baker, PhD** student, with the Murray Mackay Young Researcher Award, which encourages young researchers to make contributions to the field of crash injury research, biomechanics and vehicle safety.
- **Emily Patterson, PhD**, was awarded $1.06 million in funding from the DARPA Edge Program – Enhancing Design for Graceful Extensibility (EDGE) to provide human factors design to study the effectiveness of autonomous vehicles when they must perform outside the bounds of what they were designed for.
- Faculty and students from the IBRC participated in the annual International Research Council on Biomechanics of Injury conference. **Mandy Agnew, PhD, Yun Kang, PhD, Randee Hunter, PhD**, and **Angela Harden, PhD**, each won best presentation in their section. IBRC faculty and students were co-authors on nine papers and short communications — the most of any university in their field.
- **Holly Estes Doetsch, MS, RD**, was selected as Ohio's 2022 recipient of the Outstanding Dietetics Educator Award.
- **Monica Robinson, MS, OTR/L, OTD**, was elected as a distinguished fellow of the National Academies of Practice in Occupational Therapy.
- **The Respiratory Therapy Program** received the prestigious President's Award for Excellence in Credentialing Success from Commission on Accreditation for Respiratory Care.
- HRS will host **the Occupational Therapy Summit of Scholars**, the preeminent scientific meeting in the field, at Ohio State in June 2023.
- **Chris Taylor, PhD, RD, LD**, received the Society for Nutrition Education and Behavior's Mid-Career Achievement Award.
- Five Physical Therapy faculty members hold national leadership positions: **Tonya Apke, PT, DPT**, is president of the Ohio Physical Therapy Association; **Susan Appling, PT, DPT, PhD**, is vice president on the APTA board of directors; **John Buford, PT, PhD**, serves on the board of directors of the American Council of Academic Physical Therapy; **John DeWitt, PT, DPT**, serves on the APTA nominating committee; and **Laura Schmitt, PT, PhD**, is president of the APTA Academy of Research.
- Two Occupational Therapy faculty members hold national leadership positions: **Carmen DiGiovine, PhD, ATP SMS, RET**, is the president of the Rehabilitation Engineering and Assistive Technology Society of North America, and **Erika Kemp, OTD, OTR/L, BCP**, is inaugural chair of the doctoral capstone coordinators on the Academic Leadership Council for the American Occupational Therapy Association.

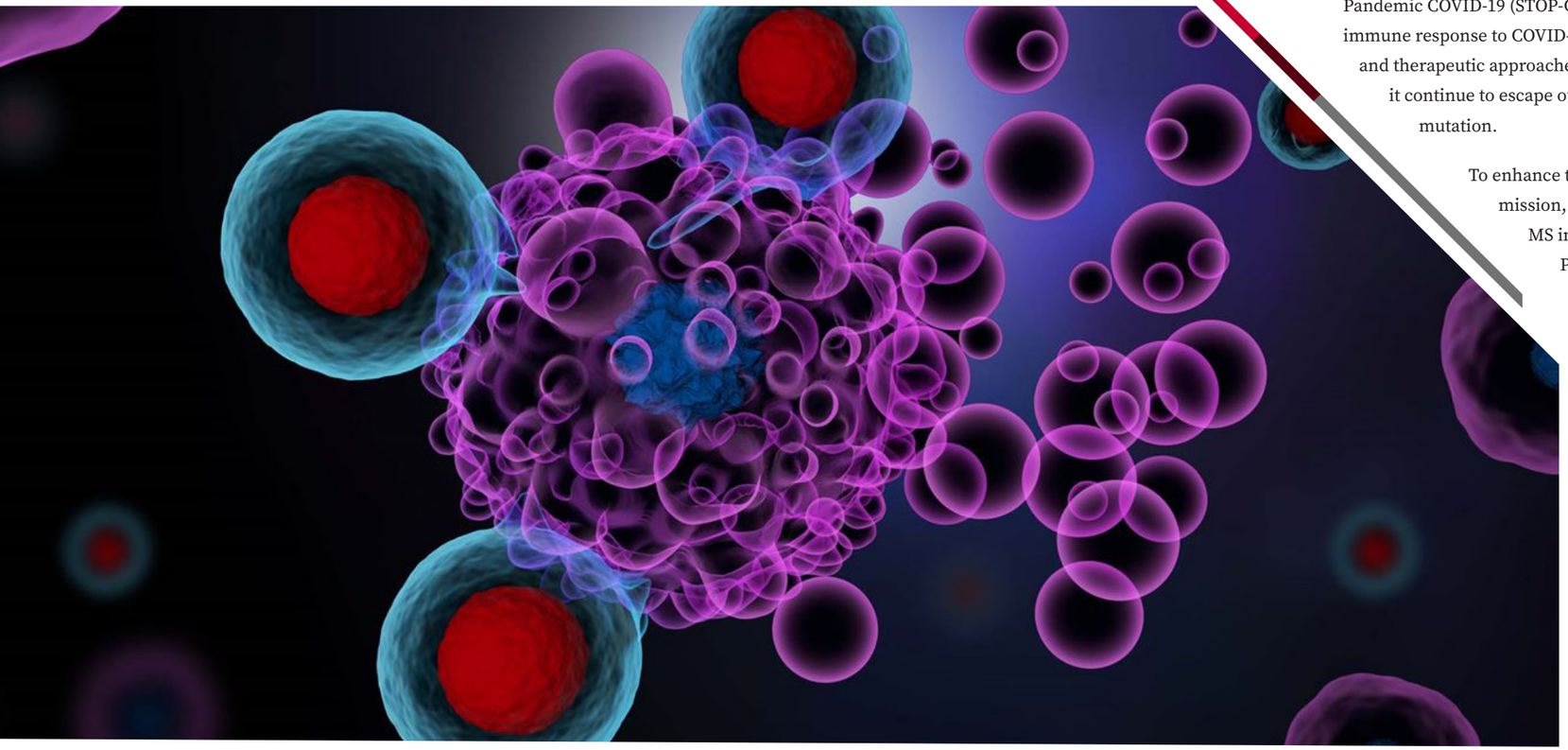
Building a research powerhouse in microbial infection and immunity

In early 2019, months before the global pandemic, Eugene Oltz, PhD, became chair of the Department of Microbial Infection and Immunity at The Ohio State University College of Medicine. His first task — initiate a vision to address the urgent and increasing prevalence of cancer, autoimmune disorders and disease due to bacteria, viruses and chronic inflammation.

In short order, this dynamic research department became a hub for interdisciplinary research in microbial pathogenesis and immunology across campus and within the greater scientific community. The existing faculty collaborated to hire eight new faculty who study a multitude of approaches to harness the immune system for destroying cancer, inhibiting autoimmune responses and fighting constantly evolving microbes.

"Decades of research have furthered our understanding of how the immune system serves as our most natural defense against cancer and pathogens of all sorts," Dr. Oltz says. "This is revolutionizing the treatment of almost every disease."

The onset of COVID-19 made it imperative to bring together outstanding scientists from disparate fields to develop new diagnostics, vaccines and other leading-edge treatments. To meet this critical need, the department expanded existing partnerships with Ohio State's Infectious Disease Institute, Comprehensive Cancer Center – Arthur G. James Cancer Hospital and Richard J. Solove Research Institute, Pelotonia Institute for Immuno-Oncology and Nationwide Children's Hospital.



"Decades of research have furthered our understanding of how the immune system serves as our most natural defense against cancer and pathogens of all sorts. This is revolutionizing the treatment of almost every disease."

— Eugene Oltz, PhD
chair of the Department of Microbial Infection and Immunity at the Ohio State University College of Medicine

These interactions were galvanized further by a number of new venues for scientific exchange, including new pilot grant programs, faculty work-in-progress meetings, and regular seminars by students and postdoctoral researchers.

Dr. Oltz says that having an established infrastructure and some of the best scientific minds in the nation contributed to Ohio State receiving a $10 million grant from the National Cancer Institute of the National Institutes of Health to fund the Center for Serological Testing to Improve Outcomes from Pandemic COVID-19 (STOP-COVID). Better understanding the immune response to COVID-19 will translate into vaccination and therapeutic approaches, as this virus and others like it continue to escape our immune responses through mutation.

To enhance the college's educational mission, the department launched MS in Immunology and Microbial Pathogenesis, a program focused on foundational and advanced knowledge of these fields, accompanied by a laboratory research practicum. A doctorate level program in Immunology and Immunotherapeutics will begin in 2023, focusing on basic and clinically applied aspects of research, including fundamental cellular and molecular immunology, immunology of infectious diseases, and systems and translational immunology.

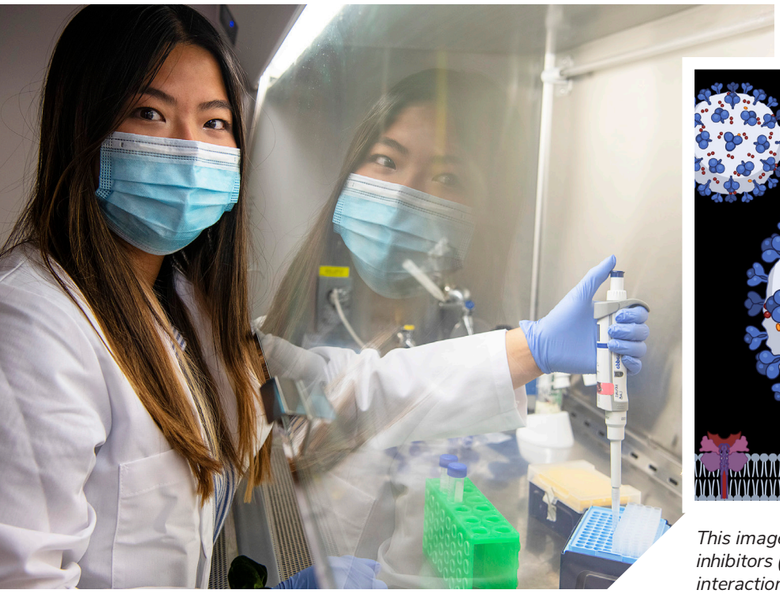
Addressing immune system challenges

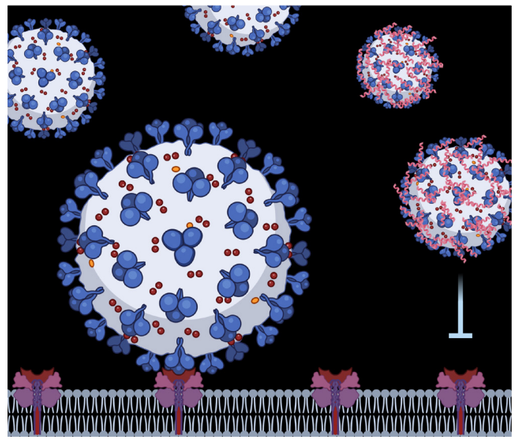
From developing mechanisms to prevent the destruction of immune cells during chronic responses against cancer or pathogens, to blocking a virus' ability to enter a human host, researchers at Ohio State continue to push the boundaries of science.

Jacob Yount, PhD, associate professor of Microbial Infection and Immunity and program director of the Viruses and Emerging Pathogens Program Area at Ohio State's Infectious Diseases Institute, investigates interferon-induced transmembrane protein 3 (IFITM3) to develop infection prevention approaches and therapies. This naturally produced protein can block all strains of influenza virus that have been evaluated in laboratories, as well as many other viruses, such as Ebola and West Nile.

"This single protein is particularly important for limiting the severity of influenza virus infections, which becomes apparent in patients with defective IFITM3 due to a genetic mutation," says Dr. Yount. "Increasing the level of IFITM3 in cells prior to infection could potentially prevent flu infections and provide new tools to fight existing and emerging viral diseases."

Adriana Forero, PhD, assistant professor of Microbial Infection and Immunity, heads a lab that identifies viral and host factors that promote maladaptive interferon responses and contribute to the development of immunopathologies.





This image shows laboratory-designed small peptide inhibitors (pink ribbons) which competitively block the interaction of SARS-CoV-2 spike with ACE2 receptors on the host cell membrane.

“We’re interested in understanding the contribution of cell identity to the protective and potentially harmful effects of an unabated innate immune response,” Dr. Forero says. “This will reveal tissue-specific vulnerabilities in signal transduction cascades targeted by pathogens or disrupted in autoimmune and proliferative diseases, which can be exploited for the management of deleterious inflammation.”

In her lab, Fernanda Novais, PhD, assistant professor of Microbial Infection and Immunity, investigates the crosstalk between infected tissues and immunity. Her team focuses on host-directed therapies to treat cutaneous leishmaniasis. Antiparasitic drugs are often ineffective in the most severe forms of the disease, and in some cases, the magnitude of the disease can result from an uncontrolled inflammatory response rather than parasite replication.

“There’s substantial evidence that host-directed therapies are likely to be beneficial beyond autoimmune diseases and cancer, and thus should be a critical component in the armamentarium to modulate the severity of cutaneous leishmaniasis,” Dr. Novais says.

Dr. Oltz added that Ohio State is in a unique position to translate such discoveries into personalized treatments and vaccines that can mitigate or prevent the devastating effects of infection, emerging pathogens and immune responses.

“Infectious diseases and immune disorders represent the primary threats to human health,” Dr. Oltz says. “We’re poised to blaze new trails into the prevention and treatment of these health threats, many of which were once thought intractable.”

Pictured: an intestinal organoid that has cells that are highly proliferating stained in red.

Maria Mihaylova selected for prestigious Pew Scholars Program

Maria Mihaylova, PhD, assistant professor of Biological Chemistry and Pharmacology at The Ohio State University College of Medicine, has more than just a gut feeling about metabolism and the diet’s effect on aging intestinal cells. Her research reveals new biology that may explain age-associated pathologies. Researchers in her lab employ advanced methods in gene expression analysis, metabolomics, biochemistry and bioinformatics to track age-related changes in nutrient transporters across the intestine.

This forward-thinking research has gained attention and support throughout the field of bioscience. Dr. Mihaylova is among 21 early-career scientists selected for the Pew Scholars Program in the Biomedical Sciences. She’ll receive four years of funding and join a community of more than 500 Pew scholars, whose ranks include multiple recipients of Nobel Prizes, Lasker Awards and MacArthur Fellowships.

> **“Interacting with scientists from various disciplines has been integral to the success of my research and lab. We learn from each other.”**
>
> **— Maria Mihaylova, PhD**
> assistant professor of Biological Chemistry and Pharmacology at The Ohio State University College of Medicine

“I am so grateful to Pew for investing in my research and for the chance to collaborate with other Pew scholars,” Dr. Mihaylova says. “Interacting with scientists from various disciplines has been integral to the success of my research and lab. We learn from each other.”

Support to pursue new research paths

Pew biomedical scholars are selected by a national advisory committee, composed of eminent scientists, based on proven creativity in previous research. What sets Dr. Mihaylova's Pew-funded studies apart is their emphasis on building analytical tools as well as culture systems that better mimic the intestinal architecture and environment.

The intestinal tract provides a rich environment for study because it coordinates important tasks that facilitate food digestion and nutrient absorption with the help of the microbiome. Trillions of microbes that live in the gastrointestinal tract coexist with the human host to accomplish important tasks necessary to maintain life, including nutrient digestion that facilitates absorption.

The gut contains non-dividing mature cells, as well as stem cells that are in a state of constant division and cell replacement to replace the gut lining in four to five days. As we age, these rejuvenating stem cells begin to lose function and the ability to proliferate as they once did, which may contribute to altered expression of nutrient transporters within them.

"This way we can study whether or not proteins, which are responsible for transport of nutrients to cells, are negatively impacted by age or if it is the dysregulation of signals to these proteins that affect the uptake of nutrients," Dr. Mihaylova says.

Dr. Mihaylova and her team will examine intestinal stem and progenitor cells to gain insight into how cellular changes contribute to metabolic and digestive issues common in the elderly population. This insight could then be harnessed to better understand how these cells are repaired after an infection or cancer diagnosis and subsequent treatment.

"This could lead to incorporating dietary strategies in managing disease," Dr. Mihaylova says. "And lead to new strategies for slowing or reversing the age-related decline in intestinal function, boosting metabolic health and facilitating tissue repair."

"Her association with the Pew Scholars program will allow her to interact with some of the best scientists in the country, which is likely to provide new opportunities to expand her research program. Maria represents the new generation of scientists who are bringing world-class research to Ohio State."

— Mark Parthun, PhD
professor and chair of Biological Chemistry and Pharmacology at the Ohio State University College of Medicine

The ability to conduct single cell analysis will allow fellow researchers to better understand how specialized cells develop and what can go wrong over the course of that development. It also offers clues to improve cellular function or even interrupt the aging process to ensure more functional tissues remain in the body over time.

Mark Parthun, PhD, professor and chair of Biological Chemistry and Pharmacology at the Ohio State College of Medicine, explains that the Pew Scholar Award is a well-deserved recognition of Dr. Mihaylova's innovative and impactful work.

"Her association with the Pew Scholars program will allow her to interact with some of the best scientists in the country, which is likely to provide new opportunities to expand her research program," Dr. Parthun says. "Maria represents the new generation of scientists who are bringing world-class research to Ohio State."

Dr. Mihaylova was previously selected as the second recipient of Ohio State's Block Lectureship Junior Faculty Award, where she was mentored by the 2019 Block Memorial Lectureship awardee — Elaine Fuchs, PhD, a preeminent cancer scientist at The Rockefeller University in New York City.

Leading research in the emerging field of cardio-oncology

Within the past decade, Sakima Smith, MD, MPH, FAHA, associate professor in the Division of Cardiovascular Medicine at The Ohio State University College of Medicine, and his colleagues noticed a puzzling trend among their patients.

A small percentage of those who had previously been treated for cancers were developing heart conditions. Because life-saving cancer treatments meant survivors were living longer, the link between treatment and adverse impacts to the heart was a new discovery.

Researchers around the globe began exploring a new field called cardio-oncology, with the goal of understanding the connections between cancer treatments and the heart. Dr. Smith, who holds the Bob Frick Research Chair in Heart Failure and Arrhythmia at Ohio State, set his sights on developing cardioprotective mechanisms and ways to detect early signs of heart problems in patients undergoing cancer treatment.

For nearly 10 years, Dr. Smith has split his time between the research lab and the bedside of patients undergoing treatment at The Ohio State University Comprehensive Cancer Center – Arthur G. James Cancer Hospital and Richard J. Solove Research Institute (OSUCCC – James). This continual process allows him to take what he learns in the lab and translate it into better treatments for patients. According to Dr. Smith, this work is especially vital to patients because if negative impacts to a patient's heart are detected early, treatment can be altered or adjusted.

"The goal isn't to take patients off these life-saving therapies," Dr. Smith says. "The goal is to support and protect the heart while continuing to effectively treat their cancer."

A five-year, $2 million grant from the National Heart, Lung and Blood Institute at the National Institutes of Health will allow Dr. Smith and his team to study the rise in the incidence of cancer treatment-related cardiotoxicity.

The grant, "Defining Novel Cardiovascular Mechanisms For TKI-Induced Excitability," will focus on cancer-treatment drugs called tyrosine kinase inhibitors (TKIs) to determine their role in modulating cardiomyocyte (heart muscle cell) excitability and to define therapeutic strategies for mitigating TKI-induced cardiac dysfunction. A form of targeted therapy for some cancers, TKIs block the action of tyrosine kinase enzymes in cancer cells to help prevent them from growing and spreading.

"TKIs can be life-saving therapies for many patients," Dr. Smith says, "but unfortunately, adverse cardiovascular side effects are common and can lead to the discontinuation of this life-saving therapy. This grant study is motivated by our hypothesis that TKI-induced arrhythmia acts in part through activation of a key cardiac protein in heart cells and increased late sodium current in cardiac cells leading to arrhythmias."

The researchers' data supports the premise that TKIs can modify and inhibit cardiac voltage-gated Na+ sodium channel Nav1.5, a cardiac isoform that plays a key role in heart excitability and conduction. Also, TKIs have been shown to increase reactive oxygen species (ROS) in cardiomyocytes. In turn, ROS "is known to activate the multifunctional Ca2+/calmodulin-dependent kinase II (CaMKII), which resides at the hub of a pro-arrhythmia signaling hub in cardiac myocytes."

"Study results will inform clinical decision-making regarding drug-induced arrhythmias, inform mechanistic approaches to prevent Ca2+ (calcium ions) overload, and define an innovative approach using drugs readily available on the market as cardioprotective agents for patients during TKI therapy," Dr. Smith says.

Grants over $2 million: 2021-2022

$16,114,184
Jennifer Bogner, PhD, professor of Physical Medicine and Rehabilitation; Cynthia Beaulieu, PhD, associate professor of Physical Medicine and Rehabilitation; John Corrigan, PhD, professor emeritus of Physical Medicine and Rehabilitation; and Tim Huerta, PhD, professor of Family and Community Medicine and associate dean for Research Information Technology, received a grant from the National Institute of Neurological Disorders and Stroke for "Comparing treatment approaches to promote inpatient rehabilitation effectiveness for traumatic brain injury (CARE 4 TBI)."

$14,392,628
Krystof Bankiewicz, MD, PhD, professor of Neurological Surgery, was awarded a grant from the National Institute of Neurological Disorders and Stroke for "A safety and efficacy study of AAV2-hAADC for AADC deficiency."

$5,514,565
Lang Li, PhD, professor and chair of the Department of Biomedical Informatics; Lijun Cheng, PhD, assistant professor of Biomedical Informatics; Maged Costantine, MD, professor of Obstetrics and Gynecology; and Megan Gregory, PhD, assistant professor of Biomedical Informatics, received a grant from the National Institute of Child Health and Human Development to support the Indiana University-Ohio State University maternal and pediatric precision in therapeutics data, model, knowledge, and research coordination center (IU-OSU MPRINT DMKRCC).

$5,198,350
Cara Whalen Smith, DPT, project director for the Ohio Colleges of Medicine Government Resource Center, and Heather Reed Robinson, MA, associate director for the Ohio Colleges of Medicine Government Resource Center, received a grant from the Centers for Medicare & Medicaid Services for the Medicaid Stimulation Project (Federal).

$4,189,808
Ginny Bumgardner, MD, PhD, professor of Surgery, and Rama Mallampalli, MD, professor and chair of the Department of Internal Medicine, received an award from the National Institute of General Medical Sciences to support the Medical Scientist Training Program at The Ohio State University.

$4,055,359
Timothy Sahr, MPH, director of research and analytics for the Ohio Colleges of Medicine Government Resource Center, received a grant from the Centers for Medicare & Medicaid Services for the 2021 Ohio Medicaid Assessment Survey (Federal).

$3,834,504
Sandor Gyorke, PhD, professor of Physiology and Cell Biology; Jonathan Davis, PhD, professor of Physiology and Cell Biology; Andriy Belevych, PhD, assistant professor of Physiology and Cell Biology; Paul Janssen, PhD, professor of Physiology and Cell Biology; Przemyslaw Radwanski, PhD, PharmD, assistant professor in the Division of Outcomes and Translational Sciences in the College of Pharmacy; Svetlana Tikunova, PhD, research assistant professor of Physiology and Cell Biology; and Rengasayee Veeraraghavan, PhD, associate professor in the Department of Biomedical Engineering in the College of Engineering, received a grant from the National Heart, Lung, and Blood Institute for "Regulation and dysregulation of cardiac EC coupling by calmodulin."

$3,757,220
Nicholas Funderburg, PhD, associate professor of Health and Rehabilitation Sciences in the Division of Medical Laboratory Science; Namal Malimbada Liyanage, PhD, assistant professor of Microbial Infection and Immunity; Patrick Collins, PhD, assistant professor of Microbial Infection and Immunity; and Jesse Kwiek, PhD, professor of Microbiology, were awarded a grant from the National Institute of Allergy and Infectious Diseases for "The role of trained immunity and mitochondrial dysfunction on innate immunity in children and adolescents aging with PHIV (TIMING-PHIV)."

$3,729,205
Daniel Wozniak, PhD, professor of Microbial Infection and Immunity; Stephen Abedon, PhD, professor of Microbiology in the College of Arts and Sciences; Valerie Bergdall, DVM, professor of Veterinary Preventive Medicine in the College of Veterinary Medicine; Mark Mitton-Fry, PhD, assistant professor of Medicinal Chemistry and Pharmacognosy in the College of Pharmacy; and Matthew Sullivan, PhD, professor of Microbiology in the College of Arts and Sciences, received a grant from the National Institute of Allergy and Infectious Diseases for "The impact of bacteriophage therapy on wound infection dynamics."

$3,708,345
Dan Merfeld, PhD, professor of Otolaryngology, received a grant from the National Institute on Aging for "Towards healthy aging: Quantifying vestibular contributors to age-related changes in balance and fall risk."

$3,581,244
Paula Rabidoux, PhD, associate professor of Psychiatry and Behavioral Health, and Andrea Witwer, associate professor of Psychiatry and Behavioral Health, were awarded a grant from the Health Resources and Services Administration to support the Maternal Child and Health interdisciplinary leadership training program.

$3,461,114
Lei Wang, PhD, professor of Psychiatry and Behavioral Health, received a grant from the National Institute on Aging for "A harmonized medial temporal lobe subregion segmentation protocol: an essential element for dementia research."

$3,441,331
Timothy Sahr, MPH, director of Research and Analytics for the Ohio Colleges of Medicine Government Resource Center, and Michael Nau, PhD, research scientist for the Ohio Colleges of Medicine Government Resource Center, received support from the Centers for Medicare & Medicaid Services for the Ohio Medical Community Engagement Evaluation (Federal).

$3,435,000
David Ellsworth, MPH, health policy services specialist for the Wexner Medical Center, and Susan Havercamp, PhD, associate professor of Psychiatry and Behavioral Health, received a grant from the Centers for Disease Control and Prevention for the Ohio Disability and Health LinkAGES partnership: Linking individuals to achieve greater equity in services.

$3,364,006
Ce Shang, PhD, assistant professor of Internal Medicine in the Division of Medical Oncology; John Bridges, PhD, professor of Biomedical Informatics; Jian Chen, PhD, associate professor of Computer Science and Engineering in the College of Engineering; and Bo Lu, PhD, professor of Biostatistics and Statistics in the College of Arts and Sciences, received a grant from the National Institute on Drug Abuse for "The impact of excise tax structures for retail marijuana on marijuana consumption."

$3,326,977
Joshua Joseph, MD, assistant professor of Internal Medicine; Daniel Walker, PhD, assistant professor of Family and Community Medicine; Seuli Brill, MD, associate professor of Internal Medicine; Guy Brock, PhD, research associate professor of Biomedical Informatics; Aaron Clark, DO, associate professor of Family and Community Medicine; Jennifer Garner, PhD, assistant professor of Food and Nutrition Policy in the School of Health and Rehabilitation Sciences; Jennifer Hefner, PhD, associate professor of Family and Community Medicine; Daniel Jonas, MD, MPH, professor of Internal Medicine and director of the Division of General Internal Medicine; Ann McAlearney, ScD, MS, professor of Family and Community Medicine and associate dean for Health Sciences Research; Eric Seiber, PhD, professor of Public Health in the College of Public Health; and Cynthia Sieck, PhD, former associate professor of Family and Community Medicine, were awarded a grant from the National Institute of Diabetes and Digestive and Kidney Diseases for "Linking education, produce provision, and community referrals to improve diabetes care (LINK)."

$3,326,148
Vadim Fedorov, PhD, professor of Physiology and Cell Biology, received a grant from the National Heart, Lung, and Blood Institute for "Targeting the arrhythmogenic sources of human atrial fibrillation."

$3,217,523
Nicholas Denko, MD, PhD, professor of Radiation Oncology; Zihai Li, MD, PhD, professor of Internal Medicine and founding director for the Pelotonia Institute for Immuno-Oncology; Jeremy Brownstein, MD, assistant professor of Radiation Oncology; Konstantin Shilo, MD, assistant professor of Pathology; and Lai Wei, PhD, research assistant professor of Biomedical Informatics, received a grant from the National Cancer Institute for "Overcoming hypoxic resistance in non-small cell lung cancer by targeting mitochondrial metabolism."

$3,052,295
Harpreet Singh, PhD, associate professor of Physiology and Cell Biology; Mahmood Khan, PhD, associate professor of Emergency Medicine; and Konstantinos Boudoulas, MD, professor of Internal Medicine, received a grant from the National Heart, Lung, and Blood Institute for "Molecular Identity of exosomal BK channels."

$3,011,857
Erica Glasper, PhD, associate professor of Neuroscience, was awarded a grant from the National Institute of Neurological Disorders and Stroke for "From social disruption to neural compromise: Establishing markers and mediators."

$3,000,000
Kin Fai Au, PhD, associate professor of Biomedical Informatics, received a grant from the National Human Genome Research Institute for "Quantitative and function analysis platform for repetitive genes and gene isoforms in pluripotency regulation and differentiations."

$2,992,560
Nuo Sun, PhD, assistant professor of Physiology and Cell Biology, received a grant from the National Heart, Lung, and Blood Institute for "Neddylation and mitophagy in cardiac aging."

$2,919,490
Mohamed Abdel-Rahman, MD, PhD, associate professor of Ophthalmology and Visual Sciences, was awarded a grant from the National Cancer Institute for "Spectrum of clinical phenotype of the BAP1-tumor predisposition syndrome (BAP1-TPDS)."

$2,910,572
Jesse Plascak, PhD, MPH, assistant professor of Internal Medicine; Peter Stanich, MD, associate professor of Internal Medicine; and Xinyi Xu, PhD, professor of Statistics in the College of Arts and Sciences, received a grant from the National Cancer Institute for "Time-varying relationships between built environment factors, colon and rectum cancer prognosis, and survival."

Grants over $2 million: 2021-2022 *(cont'd.)*

$2,883,718
Lapo Alinari, MD, PhD, assistant professor of Internal Medicine; Gregory Behbehani, MD, PhD, assistant professor of Internal Medicine; James Blachly, MD, assistant professor of Internal Medicine; Rosa Lapalombella, PhD, professor of Internal Medicine; Kami Maddocks, MD, professor of Internal Medicine; and Xiaoli Zhang, PhD, associate professor of Biomedical Informatics, received a grant from the National Cancer Institute for "Targeting c-Myc stability in c-Myc overexpressing large B-cell lymphoma."

$2,880,482
Kevin Kerber, MD, professor of Neurology and co-director of Health Services, and Jim Burke, MD, professor of Neurology and co-director of Health Services Research, received a grant from the National Institute on Deafness and Other Communication Disorders for "Dizziness treatment through implementation & clinical strategy tactics (DIZZTINCT-2) project."

$2,879,765
X. Margaret Liu, PhD, professor of Chemical and Biomolecular Biological Engineering in the College of Engineering, and Lufang Zhou, PhD, professor of Surgery, were awarded a grant from the National Cancer Institute for "Combine mitochondrial gene therapy and synthetic lethal chemotherapy to treat triple-negative breast cancer."

$2,876,936
Orlando Simonetti, PhD, professor of Internal Medicine in the Division of Cardiovascular Medicine; Rizwan Ahmad, MBBS, assistant professor of Internal Medicine; Thura Harfi, MD, assistant professor of Internal Medicine; Ayesha Hasan, MD, professor of Internal Medicine and director of the Heart Failure and Transplant Fellowship Program; Sabrena Noria, MD, associate professor of Surgery; Saurabh Rajpal, MBBS, assistant professor of Internal Medicine; Matthew Tong, DO, assistant professor of Internal Medicine; Juliet Varghese, PhD, assistant professor of Biomedical Engineering in the College of Engineering; and Vedat Yildiz, MS, senior biostatistician in the Center for Biostatistics, received a grant from the National Heart, Lung, and Blood Institute for "Development and validation of cardiovascular MRI techniques on a low-field, ultra-wide bore system to assess patients with severe obesity."

$2,851,573
Pari Pandharipande, MD, MPH, professor and chair of the Department of Radiology, was awarded a grant from the National Cancer Institute for "Improving treatment selection in advanced ovarian cancer."

$2,834,451
Tina Bickert, MA, project director for the Ohio Colleges of Medicine Government Resource Center, received an award from the Centers for Medicare & Medicaid Services to support Cardi-OH.

$2,834,119
Nicholas Funderburg, PhD, associate professor of Medical Laboratory Science in the School of Health and Rehabilitation Sciences; Thura Harfi, MD, assistant professor of Internal Medicine; Susan Koletar, MD, professor of Internal Medicine; Ken Riedl, PhD, associate director of the Department of Food Science and Technology; Chris Taylor, PhD, professor of Medical Dietetics in the School of Health and Rehabilitation Sciences; and Randell Wexler, MD, professor of Family and Community Medicine, received a grant from the National Heart, Lung, and Blood Institute for "Plaque and blood derived macrophages: a multi-omic assessment of CVD pathogenesis in PLWH."

$2,827,320
Jay Zweier, MD, professor of Internal Medicine; David Carbone, MD, PhD, professor of Internal Medicine and director of the Thoracic Oncology Center; Mohamed Elmahdy, PhD, research scientist at the Wexner Medical Center; and Alexandre Samouilov, MD, PhD, research assistant professor of Internal Medicine, received a grant from the National Cancer Institute for "Electronic cigarette derived free radicals, oxidative stress and inflammation in lung cancer development."

$2,822,322
Zihai Li, MD, PhD, professor of Internal Medicine and founding director for the Pelotonia Institute for Immuno-Oncology; Tianmin Fu, PhD, assistant professor of Biological Chemistry and Pharmacology; Qin Ma, PhD, associate professor of Biomedical Informatics; and Xingjun Wu, PhD, former research assistant professor, received a grant from the National Cancer Institute for "Targeting GRP94-TGF-beta pathway for cancer immunotherapy."

$2,770,913
E. Douglas Lewandowski, PhD, professor of Internal Medicine and director of Translational Research at the Dorothy M. Davis Heart and Lung Research Institute and Diabetes and Metabolism Research Center; and Andrew Carley, PhD, research assistant professor of Internal Medicine, were awarded a grant from the National Heart, Lung, and Blood Institute for "Transendothelial transport and CD36 in the dysregulated lipid trafficking of failing hearts."

$2,754,943
Tamar Gur, MD, PhD, assistant professor of Psychiatry and Behavioral Health, and Qin Ma, PhD, associate professor of Biomedical Informatics, received a grant from the National Institute of Mental Health for "Prenatal neuroinflammation: maternal microbiome contributions and behavioral consequences."

$2,722,963
Shyam Bansal, PhD, assistant professor of Physiology and Cell Biology, was awarded a grant from the National Heart, Lung, and Blood Institute for "TNFR1 expressing exosomes are critical mediators of pathological immune activation in the spleen post-myocardial infarction."

$2,676,224
Aaron Moberly, MD, associate professor of Otolaryngology, received a grant from the National Institute on Deafness and Other Communication Disorders for "Predicting speech recognition in adults receiving cochlear implants."

$2,544,576
Bethany Mundy-Bosse, PhD, assistant professor of Internal Medicine; Aharon Freud, MD, PhD, associate professor of Pathology; Christopher Oakes, PhD, assistant professor of Internal Medicine and Biomedical Informatics; and Xiaoli Zhang, PhD, associate professor of Biomedical Informatics, received a grant from the National Cancer Institute for "Dysregulation of innate lymphoid immunity in acute myeloid leukemia."

$2,504,999
Shahid Nimjee, MD, PhD, associate professor of Neurological Surgery, received a grant from the National Institute of Neurological Disorders and Stroke for "A novel thrombolytic targeting Von Willebrand Factor (VWF) to treat ischemic stroke."

$2,373,462
Harry Fu, PhD, assistant professor of Neuroscience, was awarded a grant from the National Institute on Aging for "Ectodermal-neural cortex 1 and neuronal vulnerability to tau pathology in Alzheimer's disease."

$2,362,500
Steve Oghumu, PhD, assistant professor of Pathology, received a grant from the National Institute on Drug Abuse for "X chromosome inactivation in sex disparities to substance use disorder."

$2,294,692
Billur Akkaya, MD, DPhil, assistant professor of Neurology, received a grant from the National Institute of Allergy and Infectious Disease for "Deciphering the specificity and molecular mechanisms of regulatory T cells using novel approaches."

$2,247,129
Jacob Yount, PhD, associate professor of Microbial Infection and Immunity; Purnima Dubey, PhD, associate professor of Microbial Infection and Immunity; and Murugesan Rajaram, PhD, associate professor of Microbial Infection and Immunity, received a grant from the National Institute of Allergy and Infectious Diseases for "Mechanisms of innate resistance to virus infections."

$2,226,248
Rama Mallampalli, MD, professor and chair of the Department of Internal Medicine, received a grant from the National Heart, Lung, and Blood Institute for "Regulation of the interferon lamda receptor by influenza."

$2,202,552
Jill Rafael-Fortney, PhD, professor of Physiology and Cell Biology, and Shyam Bansal, PhD, assistant professor of Physiology and Cell Biology, received a grant from the National Institute of Neurological Disorders and Stroke for "Mechanisms of mineralocorticoid receptor antagonism on inflammation in muscular dystrophy."

$2,165,561
Abhay Satoskar, MD, professor of Pathology and Microbiology, and Xiaoli Zhang, PhD, associate professor of Biomedical Informatics, were awarded a grant from the National Institute of Allergy and Infectious Diseases for "A multidisciplinary approach to study ecotypes driving transmission and pathogenesis of Visceral Leishmaniasis (VL) and Post kala-azar dermal leishmaniasis (PKDL) in Eastern Africa."

$2,161,890
Nagaraj Kerur, PhD, associate professor of Ophthalmology and Visual Sciences, received a grant from the National Institute of Allergy and Infectious Diseases for "Non-canonical cGAS signaling in DNA damage response."

$2,123,076
Raphael Pollock, MD, PhD, professor of Surgery and director of the Comprehensive Cancer Center – Arthur G. James Cancer Hospital and Richard J. Solove Research Institute, and Valeria Grignol, MD, associate professor of Surgery in the Division of Surgical Oncology, received a grant from Army Medical Research Acquisition Activity for "Extracellular vesicle MDM2 DNA cargo: New methods to access a novel liposarcoma candidate biomarker (Pollock)."

$2,115,728
Fernanda Novais, PhD, assistant professor of Microbial Infection and Immunity, and Patrick Collins, PhD, assistant professor of Microbial Infection and Immunity, received a grant from National Institute of Allergy and Infectious Diseases for "Distinct functions for CD8 T cells in cutaneous leishmaniasis."

$2,114,755
Kin Fai Au, PhD, associate professor of Biomedical Informatics, was awarded a grant from the National Institute of General Medical Sciences for "Experimental and bioinformatics platform for epigenome analysis using nanopore sequencing."

$2,110,490
Arthur Burghes, PhD, professor of Biological Chemistry and Pharmacology, received a grant from National Institute of Neurological Disorders and Stroke for "Genetic suppression of SMN mutations in spinal muscular atrophy."

$2,051,718
K. Luan Phan, MD, professor and chair of the Department of Psychiatry and Behavioral Health, and Tim Lucas, MD, PhD, professor of Neurological Surgery, received a grant from the National Institute of Mental Health for "Magnetic resonance-guided focused ultrasound ablation of the anterior thalamus as a novel treatment for paradigm for anxiety."

New Gene Therapy Institute positions Ohio State as a leader in translational science

Krystof Bankiewicz, MD, PhD

Russell Lonser, MD

Three years ago, Krystof Bankiewicz, MD, PhD, a leading physician-scientist in translational gene therapy, was presented with a unique opportunity. His colleague, Russell Lonser, MD, professor and chair of Neurological Surgery at The Ohio State University College of Medicine, proposed a partnership, one with the potential to change the trajectory of gene therapy science.

Dr. Bankiewicz is renowned for his development of translational approaches to drug, gene and cell replacement therapies. He pioneered delivery of gene therapeutics directly to the brain to treat neurological disorders, such as Parkinson's disease, Alzheimer's disease, Huntington's disease, pediatric neurotransmitter deficiency and lysosomal storage disorders.

Dr. Lonser laid out his case for Dr. Bankiewicz joining his team to accomplish the college's goal of pioneering foundational, translational and clinical gene therapy platforms. To accomplish rapid clinical advancements, they would need to foster a unique, collaborative environment between academia and industry. Ohio State offered one of the best environments to do this. Dr. Bankiewicz seized the opportunity.

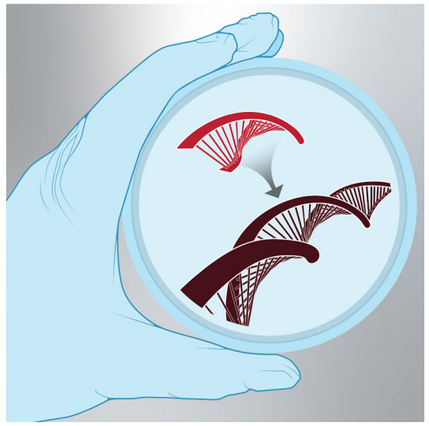
Together, Drs. Lonser and Bankiewicz developed a technique where they monitor the direct infusion of genetic material into the brain using real-time MRI imaging so they can perfectly target an area to effect a cure.

"We knew from experience that the successful translation of gene therapy science is a complex process spanning research, product development and production, quality control, clinical trials, regulatory assessment and public-private collaborations," Dr. Lonser says. "Our work alongside industry partners, including Battelle, Medtronic, Biogen and Bayer, enabled us to swiftly advance existing science."

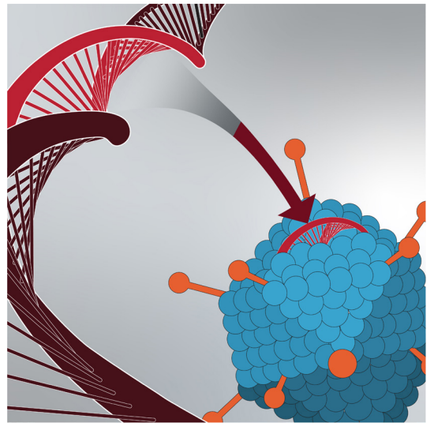
Together, Drs. Lonser and Bankiewicz developed a technique where they monitor the direct infusion of genetic material into the brain using real-time MRI imaging so they can perfectly target an area to affect a cure. The brain then integrates the new functioning gene into its circuitry, which is composed of a cluster of neurons. These neurons receive electrochemical information that the circuit then modifies and transmits to other circuits in the brain that need this modified genetic material to function properly.

Ohio State holds one of the largest first-in-human clinical trial portfolios and is one of the only institutions with most of its gene therapy trials delivering targeted gene therapy to the midbrain.

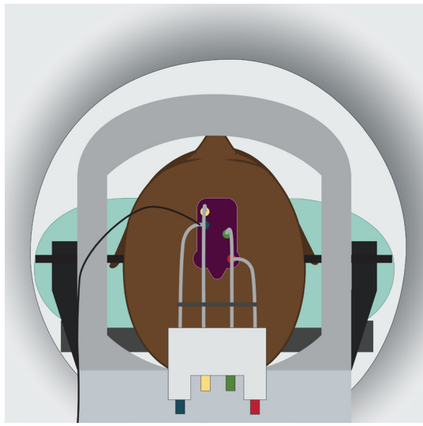
"We have 10 active trials, grant support of $14.6 million for a first-in-human nervous system gene therapy trial and $4.8 million for translational CRISPR-gene therapy research from the National Institutes of Health," says Dr. Bankiewicz, who now serves as professor of Neurological Surgery at the Ohio State College of Medicine.



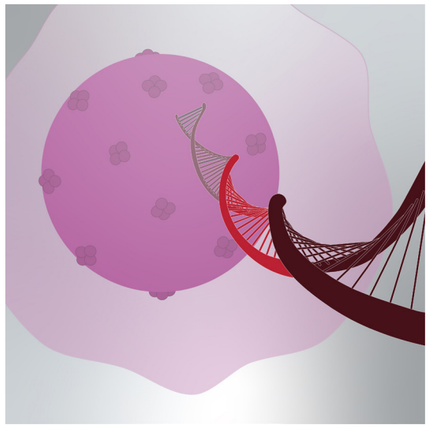
Scientists modify the genetic code of the patient's DNA.



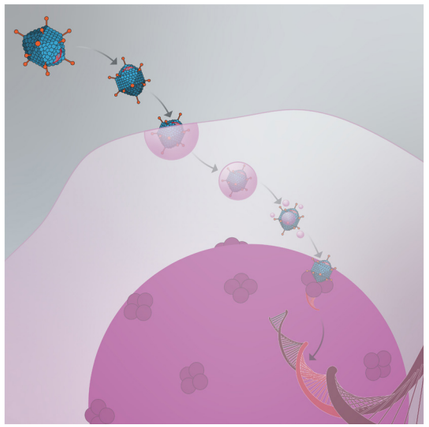
Modified DNA is injected into a vector. The vector is typically a harmless virus that serves as a vehicle to deliver the modified DNA to the cell.



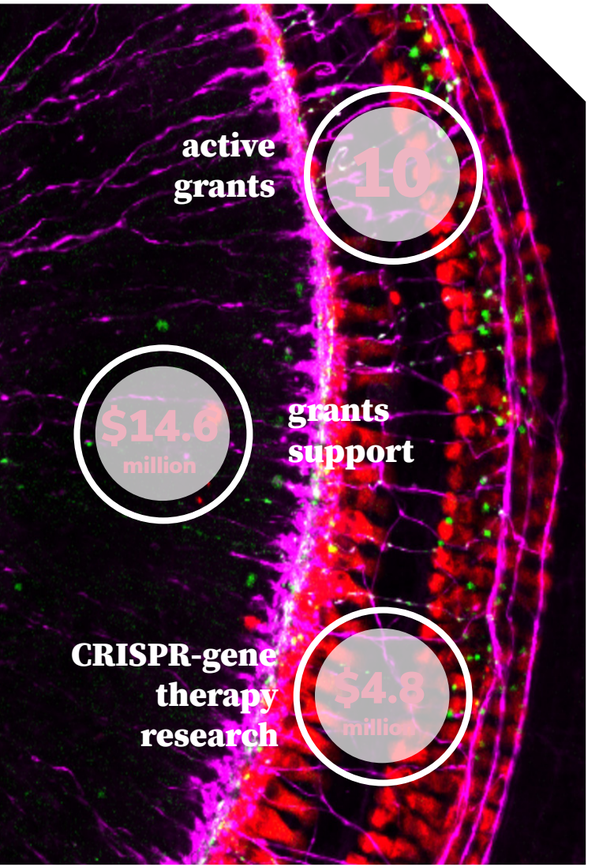
The vector is injected through the skull to a targeted cell within the brain.



The vector attaches to the cell and releases the new gene into the cell's nucleus.



The cell makes new protein using the new gene.



"Bringing together our experts from a broad range of disciplines will lead directly to new, life-changing treatments for patients as well as new discoveries in fundamental biology."

— Peter Mohler, PhD
vice president of Research at The Ohio State University

Together, Drs. Bankiewicz and Lonser, co-lead Ohio State's Gene Therapy Institute, a groundbreaking initiative to centralize gene therapy research being conducted by over 50 Ohio State faculty across the colleges of Medicine, Arts and Sciences, Law, Business, Veterinary Medicine, Engineering and Pharmacy.

Peter Mohler, PhD, vice president of Research for The Ohio State University and chief medical officer for the Ohio State Wexner Medical Center and College of Medicine, says this new institute will be a model for how collaboration can solve some of medicine's most pressing challenges.

The results have been nothing short of a miracle. Especially for pediatric patients with an extremely rare genetic condition known as AADC deficiency. These children lack an enzyme that produces dopamine in the central nervous system, leaving them unable to control their muscles, speak or hold up their heads.

This new gene therapy has enabled patients to learn to walk and parents to hear their children's voices for the first time.

"The chance to be able to get kids somehow restored, that really has made a huge, huge impact on me," Dr. Bankiewicz says. "It has been the most profound experience of my whole professional career."

Dr. Lonser attributes their success to the leadership and culture at the university which supports and prioritizes innovation and discovery. This built framework allows researchers to build on shared knowledge, redesign cells and organisms by engineering them to have new abilities and functions and is being applied to disorders that affect millions of people around the world.

"Both Dr. Bankiewicz and I have worked on both coasts throughout our careers, and I think what's really been unique about Ohio State is that they have incredible leadership that can see the innovative pieces," Dr. Lonser says. "Ohio State is positioned to become the world leader in gene therapy."

Improving the well-being of mind, body and spirit at the Center for Integrative Health

“My belief is that anyone can be well — someone in hospice, someone with cancer, someone struggling with a chronic disease. We are all called to be the best versions we can be. Well-being is the invitation to do that and find ways that support us being well.”

— Maryanna Klatt, PhD
director of the Center for Integrative Health

What is well-being? In the age of quiet quitting and the amount of people struggling with anxiety and depression on the rise, The Ohio State University College of Medicine is transforming the idea of well-being through a body, mind and spirit approach. At the newly reconfigured Center for Integrative Health (CIH), conventional and complementary medicine are expertly combined to promote optimal health, prevent and treat disease and meet the physical, emotional and spiritual goals of patients.

“It’s not just physical wellness, not just mental wellness, not just spiritual wellness,” says Maryanna Klatt, PhD, director of the Center for Integrative Health and well-known researcher. “Rather, all three of those important aspects of wellness come together so you have the ability and the confidence to live life to the fullest potential possible.”

The CIH offers conventional medical care combined with scientifically proven therapy practices such as tai chi, qigong and yoga. Qigong exercise, similar to tai chi, consists of a series of breathing practices with body movement and meditation to attain deep focus and a relaxed state. Yoga is a spiritual and ascetic practice that includes breath control, meditation and posture-based physical fitness. Benefits include reducing stress, combating anxiety and improving muscle strength, flexibility, balance and aerobic conditioning.

In addition to patient care, the CIH faculty conduct funded research. Their funding includes more than $2 million in support through grants and collaborations to provide Mindfulness in Motion to first responders, health care professionals and other groups, including municipalities and employers, who can benefit from this programming.

“Mindfulness in Motion is an eight-week program for people to learn stress reduction and resiliency building,” says Dr. Klatt, who is also a clinical professor of Family and Community Medicine at the Ohio State College of Medicine. “People today are burned out, overstressed and don’t know what to do with it. This program gives them some strategies to try.”

Dr. Klatt says the program has been shown to have positive benefits for its participants through a combination of gentle yoga moves and mindfulness concepts like awareness of what you’re doing while you’re doing it.

The CIH team also provides integrative health education to all levels of health science learners — from rotations and shadowing to an undergraduate minor in Integrative Approaches to Health and Wellness, an advanced competency for fourth-year medical students and an integrative health physician fellowship.

The fellowship program is designed to provide physicians, future leaders in health care organizations, academic medical centers, government and industry with the wide range of knowledge and skills necessary to be successful practitioners in the field of Integrative Medicine. At the heart of this program, Ohio State-trained providers can work with patients to take an active part in their healing and well-being journey.

“My belief is that anyone can be well — someone in hospice, someone with cancer, someone struggling with a chronic disease. We are all called to be the best versions we can be,” says Dr. Klatt. “Well-being is the invitation to do that and to find ways that support us being well.”

Mindfulness in Motion

Training promising surgeons to remove rare skull base tumors

Each year, two clinical fellows arrive at The Ohio State University College of Medicine and The Ohio State University Comprehensive Cancer Center – Arthur G. James Cancer Hospital and Richard J. Solove Research Institute to hone their skills in removing some of the rarest and most dangerous head and neck tumors. They come to learn from a pair of renowned surgeons who pioneered minimally invasive surgical techniques to remove skull base tumors.

According to the National Cancer Institute, head and neck cancers account for 4% of all cancers in the body. The skull base, a high real estate area of the body where the brain, nerves, vessels and major sensory organs all intersect, is involved in about 0.01% of cancers. It's a high-risk area with little to no margin for error.

Ricardo Carrau, MD, professor of Otolaryngology – Head and Neck Surgery at the Ohio State College of Medicine, was one of the first surgeons in the world to use an endoscope to enter the nasal cavity and create a surgical path to remove skull base tumors.

His longtime surgical partner, Daniel Prevedello, MD, professor of Neurological Surgery at the Ohio State College of Medicine, removes the tumor if it's intracranial. They collaborate surgically if the tumor has invaded other areas. The pair then closes together, rebuilding the skull base and nasal passageway.

Dr. Prevedello is one of only a few neurosurgeons in the world who have performed more than 1,000 endoscopic endonasal approach surgeries. Dr. Carrau has completed an estimated 2,000 endoscopic endonasal approach surgeries.

"It is only through mentorship and fellowship that we can properly teach these techniques to our fellows. They are our legacy, and they will properly take care of the patients in other parts of the world and in the future."

— Daniel Prevedello, MD
professor of Neurological Surgery at
The Ohio State University College of Medicine

Their combined experience is highly sought after at Ohio State's Comprehensive Cancer Center – James Cancer Hospital and Solove Research Institute. Patients come from all over the world to seek treatment. Therefore, Ohio State fellows obtain experience with some of the most challenging skull base tumor cases in the world.

"Our idea is to train the next generation," Dr. Carrau says. "To acquire the experience and to have the volume necessary to continue evolving as a surgeon is unique."

Both Drs. Carrau and Prevedello host a clinical fellow each year to impart their surgical craft. Clinical fellowships, now in place at Ohio State for 11 years, typically last one to two years depending on the fellow's previous training.

"When fellows leave Ohio State, they're able to independently complete their portion of the surgery," Dr. Prevedello says. "Many go on to work at academic hospitals and some even find their way back to Ohio State."

Kyle VanKoevering, MD, assistant professor of Otolaryngology at the Ohio State College of Medicine, was an otolaryngology clinical fellow in the program and was later hired to be part of the skull base surgical team at the OSUCCC – James. He now runs the skull base fellowship program for the Department of Otolaryngology – Head and Neck Surgery. Dr. VanKoevering, who previously studied engineering, also directs Ohio State's Medical, Modeling, Materials and Manufacturing (M4) Lab to create realistic 3D printed surgical models for surgeons to sharpen their skills before performing complicated tumor surgeries and to plan the reconstruction.

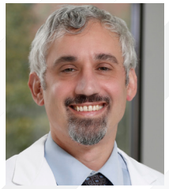
Another former fellow, Douglas Hardesty, MD, associate professor of Neurological Surgery at the College of Medicine, was recruited back to Ohio State to expand the program on the neurological side and serve as co-director of the Anatomy Laboratory Toward Visuospatial Innovation in Otolaryngology and Neurosurgery, a research and education lab.

"It is only through mentorship and fellowship that we can properly teach these techniques to our fellows," Dr. Prevedello says. "They are our legacy, and they will properly take care of the patients in other parts of the world and in the future."

Appointing New Leaders

New Leaders

Chyke Doubeni, MBBS, MPH
Chief Health Equity Officer, The Ohio State University Wexner Medical Center
Associate Director for Diversity, Equity and Inclusion, The Ohio State University Cancer Center – Arthur G. James Cancer Hospital and Richard J. Solove Research Institute
Professor of Family and Community Medicine



Thomas Hund, PhD
The William D. and Jacquelyn L. Wells Chair and Director, Davis Heart and Lung Research Institute
Professor of Internal Medicine and Biomedical Engineering

Laxmi Mehta, MD, FACC
Faculty Director of Gabbe Health and Well-Being Program
Clinical Professor of Internal Medicine
Sarah Ross Soter Endowed Chair in Women's Cardiovascular Health

Bryan Pyles, MBA
Associate Vice President of Finance, The Ohio State University Office of Health Sciences and Ohio State University Physicians, Inc.

Department Chairs

Mark Bechtel, MD
Professor and Chair, Department of Dermatology

Catherine Krawczeski, MD
Professor and Chair, Department of Pediatrics

Pari Pandharipande, MD, MPH, FACR
Professor and Chair, Department of Radiology

Richard Urman, MD, MBA
Professor and Chair, Department of Anesthesiology

Deans

Ginny Bumgardner, MD, PhD
Associate Dean for Physician Scientist Education
Co-Director, Medical Scientist Training Program
Professor of Transplant Surgery

Ricardo Carrau, MD, MBA
Associate Dean for Faculty Advancement, Mentoring and Engagement
Professor of Otolaryngology – Head and Neck Surgery and Neurological Surgery

Alex Grieco, MD
Associate Dean for Student Life
Assistant Professor of Biomedical Education and Anatomy
Assistant Professor of Radiology

Richard Gumina, MD, PhD
Associate Dean for Convergent Research
Associate Professor of Internal Medicine

Paco Herson, PhD
Associate Dean for Research Innovation
Professor of Neurological Surgery

Timothy Huerta, PhD, MS
Associate Dean for Research Informatics
Professor of Family and Community Medicine

Ann Scheck McAlearney, ScD, MS
Associate Dean for Health Services Research
Professor of Family Medicine

Dana McTigue, PhD
Associate Dean for Foundational Research
Professor and Vice Chair for Research in the Department of Neuroscience

Tatiana (Tania) Oberyszyn, PhD
Vice Dean for Faculty Affairs
Jack C. Geer MD Endowed Professor of Pathology

Lauren Wold, PhD, FAHA, FAPS
Associate Dean for Research, Operations and Compliance
Professor of Physiology and Cell Biology
Assistant Dean in the College of Nursing

The Ohio State University

One of the largest universities in the country, The Ohio State University boasts more than **12,000 courses**, more than **200 undergraduate majors**, **18 colleges and schools**, **278 graduate and professional programs**, and **500-plus specializations**.

It's a land-grant, sea-grant and space-grant research university. As a member of the Association of American Universities, Ohio State is **ranked No. 1 in sending Fulbright Scholars abroad** who go on to make lasting contributions to their communities.

Ohio State has earned national recognition for the quality of its programs and teaching. *U.S. News & World Report* has ranked Ohio State as one of the nation's top public institutions for more than a decade. In the 2022 Best Colleges rankings, Ohio State was **No. 16 among public universities nationwide** and was recognized in the **Best Undergraduate Teaching** and **Most Innovative Schools** categories.

FAST FACTS

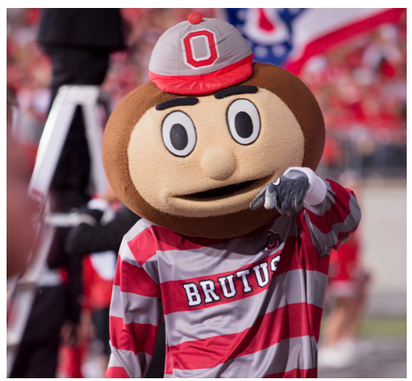
Past and present alumni and faculty include **5 Nobel Prize laureates, 9 Rhodes Scholars, 7 Churchill Scholars, 1 Fields medalist, 7 Pulitzer Prize winners, 64 Goldwater Scholars, 6 U.S. senators, 15 U.S. representatives** and **108 Olympic medalists**.

In addition to the main campus in Columbus, there are **six regional campuses** throughout central Ohio.

There are nearly **66,000 enrolled students** and more than **7,500 faculty** who call themselves Buckeyes.

66K

2002 boasts a record **17,067 minority students** enrolled across all levels and all campuses. The percentage of minority graduate students has grown steadily over the past five years, and now represents **20.1% of all graduate students**.



Captivating Columbus

The Ohio State University College of Medicine is home to exciting new research, innovative health care delivery and unique, multidisciplinary education. Columbus, the city surrounding the university, has also grown and expanded with many exciting new developments.

INTEL COMING TO COLUMBUS

Intel is investing an initial $20 billion to build two chip fabrication facilities in the area. Intel first announced the Ohio project in January 2022 and is on track to begin construction later this year. When complete, the 1,000-acre site will house two factories and employ at least 3,000 people at an average salary of $135,000 each. The Mid-Ohio Regional Planning Commission also expects central Ohio to be a region of 3 million people by 2050.

BIG

- Columbus is the nation's 14th largest city and the second largest in the Midwest, behind Chicago
- The Columbus metro area is No. 1 in the Midwest for population, job and GDP growth

AFFORDABLE

- With the cost of living 10% below the national average, Columbus offers an affordable market for young professionals

DIVERSE

- More than 130 nations and more than 100 languages are represented
- More than 41% of the residents identify as non-white
- Continually scores 100% on the Human Rights Campaign Foundation's Municipal Equality Index

RANKING ABOVE THE REST

- Columbus has been listed on the top 52 Places to Visit list by *The New York Times*
- One of the top 10 best cities to live in by *Money* magazine
- Named one of the 30 Most Fun Places to Live in the U.S. by *U.S. News & World Report*

ACCESSIBLE

- The average commute is 23.5 minutes, one of the lowest in the nation
- Public transportation includes buses, taxis, rideshare vehicles — all accessible for those who use mobility devices
- Facilities and bike lanes are maintained for those who use bicycles as a green and healthy means of travel. The city has been selected for a bronze award from the League of American Bicyclists

LOCATION THAT MATTERS

- Over 400 metro and city parks and 230 miles of existing greenways trails
- Within 500 miles of nearly half of the U.S. population

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COLLEGE OF MEDICINE

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Columbus, OH 43210

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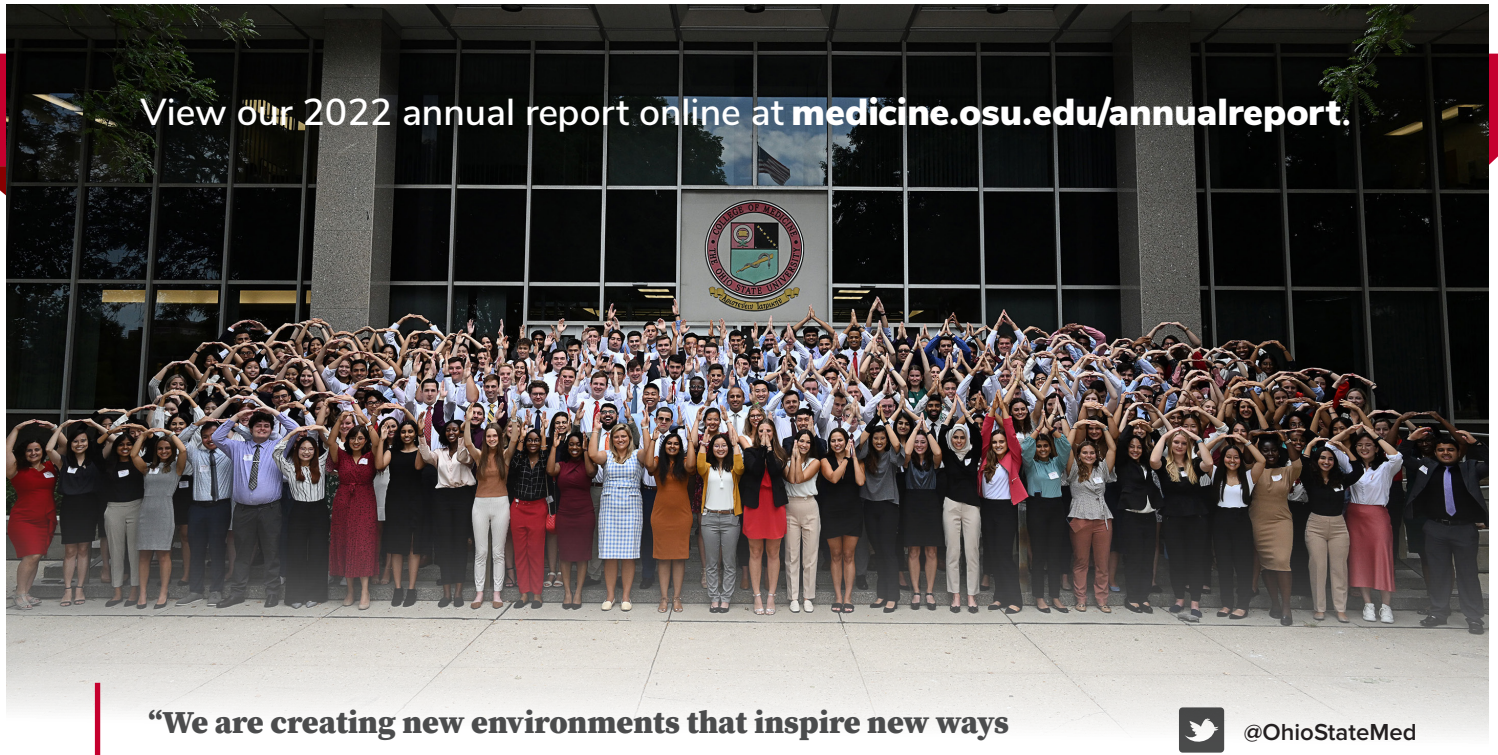

"We are creating new environments that inspire new ways of collaborating and new approaches to problem-solving. When discovery, care and education have no boundaries, our future accomplishments are limitless."

— **Dean Carol R. Bradford**, MD, MS, FACS

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