

# Prevail

*Fox Chase Cancer Center \* Annual Report 2022*



**QUOTE:**

*“We learn what  
we can, teach  
what we  
know, and  
hopefully, make  
our mark.”*

# From Pioneer to Protégé

In science and medicine, there exists an interconnectedness from generation to generation as well as among contemporaries. Our work cannot be contained if we are to be successful. Knowledge and experience must carry over from pioneer to protégé; new insights can emerge and breakthrough discoveries become possible because of collaboration among colleagues.

Fox Chase Cancer Center is unique because the relationships that form here so often stay here. Our legacy of great mentorship attracts bright recruits at various stages of their careers. Our culture encourages such connections to flourish in meaningful ways.

In this year's *Prevail*, our annual report, we reflect on our close ties. Some of our scientists and clinicians share their stories, revealing how the bonds they've formed—within our institution—have nurtured their professional growth while doing something even greater.

Being here—absorbing the special qualities of this place, interacting with the people who make Fox Chase what it is, and understanding the history and culture of our center—has shaped how many of us relate to our patients, how we connect with our mission to prevail over cancer, and how we view our place within the larger world of cancer research.

We may emulate our leaders in some ways, while evolving in our personal quests to become uniquely who we are. With the support we receive here, we pursue our passions—studying what strikes us as interesting—and leave ourselves and our work open to the many possibilities that lie ahead. All the while, we want to see others succeed just as much as ourselves.

We learn what we can, teach what we know, and hopefully, make our mark—united in the knowledge that if we've done our jobs well, truly honoring our vocations, the impact of our work and the impressions we've made on the people we've known will carry on well beyond our time.

QUOTE:

*“New insights can emerge and breakthrough discoveries become possible because of collaboration among colleagues.”*



Jonathan Chernoff, MD, PhD  
Cancer Center Director



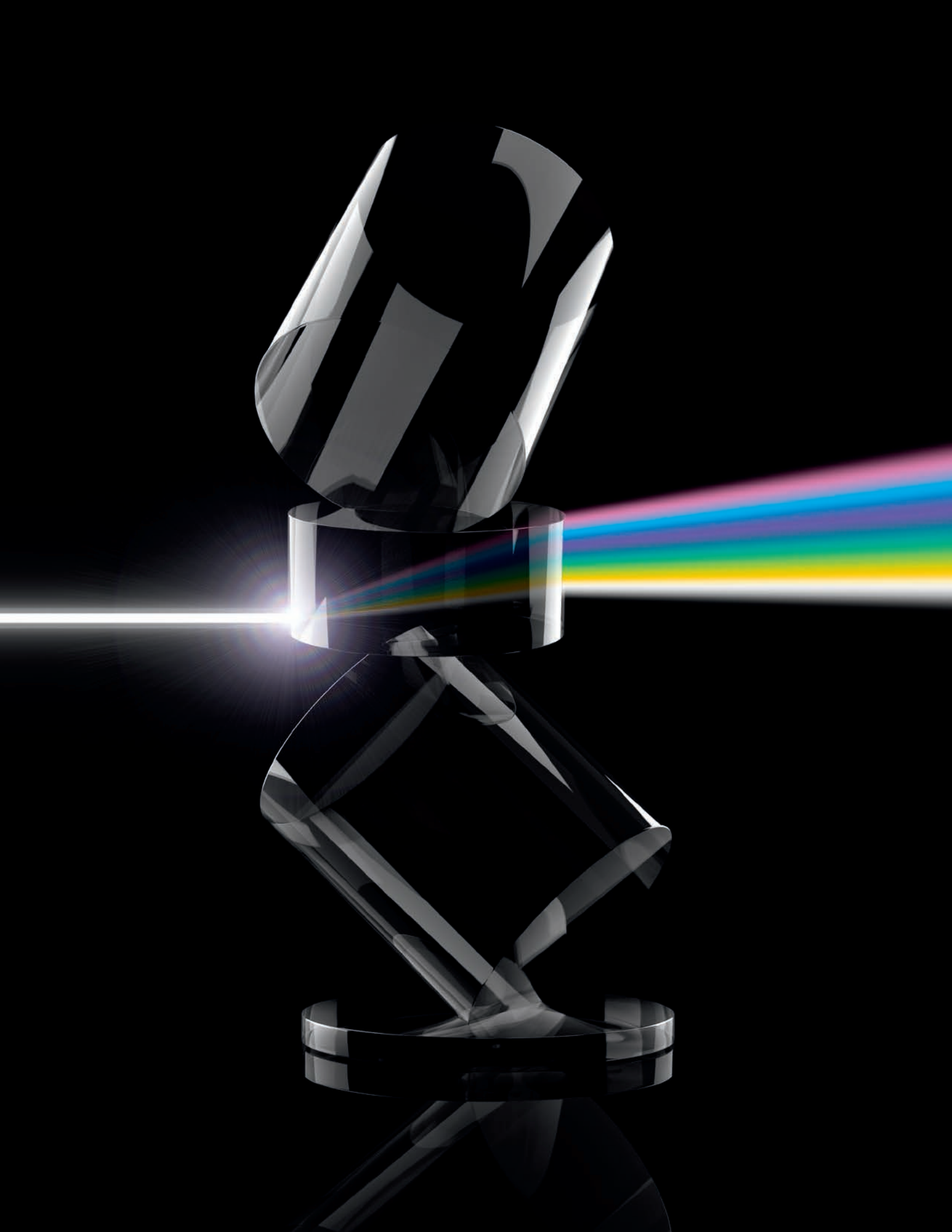
Robert Uzzo, MD, MBA, FACS  
President and CEO



ROBERT UZZO, MD, MBA, FACS (LEFT) AND JONATHAN CHERNOFF, MD, PHD (RIGHT).

Institutional





# Unique Faculty Relationships Underscore Mission of Comprehensive Care

Since its founding, Fox Chase Cancer Center has built a legacy of distinctive comprehensive cancer care fostered through professional relationships that span not only specialties but generations.

These relationships remain a fundamental part of Fox Chase's unique approach to innovative and effective cancer treatment. For scientific leaders like Jonathan Chernoff, MD, PhD, Cancer Center Director, generational leadership has played an important role. Chernoff, who came to Fox Chase in 1991, pointed specifically to his work alongside Anne Skalka, PhD, professor emerita and senior advisor to the president.

"In any career there are times when things aren't going so smoothly and you can get lost in the moment. She has always offered sage advice when seas got choppy," said Chernoff.

Skalka was recruited to Fox Chase in 1987 as Scientific Director and served in that role until 2008. In addition to her mission of coordinating the outstanding research that was going on at Fox Chase, she was also tasked with recruiting additional scientists, one of which was Chernoff.

Chernoff said Skalka not only served as a mentor in his earlier years at Fox Chase but has continued to play an important role as a key collaborator and advisor as he transitioned into his more recent role as Cancer Center Director.

Both Skalka and Chernoff noted the importance of these kinds of relationships, particularly in the scientific field.

"We choose our recruits with great care, and then we work very hard to create a situation where they can succeed. That's done by

mentoring, giving advice, and support. That's really one of the key features of our institution—to encourage young people and to help them," said Skalka.

"More than most institutions," Chernoff added, "we can trace back many of the faculty who are here and doing great work to others before them. These faculty members were ultimately hired to continue that legacy, that heartbeat that's so important to meaningful scientific discovery."

While Fox Chase leaders like Chernoff often look to their predecessors for inspiration, others like Robert Uzzo, MD, MBA, FACS, President and CEO, have learned lessons from the physicians and scientists that they have worked with on what defines a truly comprehensive cancer center.

When he first arrived at the center in 2000, Uzzo said a small team of professionals who worked alongside each other in separate specialties served as the cogs and gears that made the center run at its best.

It was the relationships he formed with these colleagues and how he saw them working cohesively that influenced his current leadership philosophy.

"This has allowed me to see the value of multiple perspectives in the care of patients with very difficult problems surrounding their cancer. Multidisciplinary care doesn't happen by accident," said Uzzo.

"One of the best things about being at a comprehensive cancer center is that it aligns the incentives of healthcare providers. This allows you to deliver more meaningful care every time, and that is ultimately what we strive for."

**QUOTE:**

*"That's really one of the key features of our institution—to encourage young people and to help them."*

— ANNE SKALKA, PHD,  
Professor Emerita and Senior  
Advisor to the President





**ANNE SKALKA, PHD, PROFESSOR EMERITA AND SENIOR ADVISOR TO THE PRESIDENT.**





**ELIZABETH PLIMACK, MD, MS, CHIEF OF THE DIVISION OF GENITOURINARY MEDICAL ONCOLOGY,  
WAS APPOINTED DEPUTY DIRECTOR.**

### Camille Ragin Named Associate Director of DEI

Camille Ragin, PhD, MPH, a professor in the Cancer Prevention and Control research program at Fox Chase, was appointed Associate Director of Diversity, Equity, and Inclusion (DEI).

“We recognize the importance of welcoming diverse voices, valuing different skill sets and backgrounds, and celebrating the collective richness of our individuality. This appointment formalizes leadership to move us forward in this area,” said Jonathan Chernoff, MD, PhD, Cancer Center Director.

In this newly created role, Ragin will be responsible for enhancing hiring practices to encourage diversity, facilitating more diverse leadership at all levels of the institution, providing training and education on race-related issues to the community, and facilitating collaboration among the Lewis Katz School of Medicine at Temple University, Temple Health, and Fox Chase on issues of diversity and inclusion.

“DEI is a significant focus of the Fox Chase Cancer Center Support Grant, reflecting the serious commitment of Fox Chase and its collaborators to affect positive change that draws on the talent and experience of the center’s growing faculty and staff,” Chernoff said.

Drawing inspiration from her family, Jamaican roots, and professional experiences, Ragin has dedicated her career to understanding why Blacks have the highest incidence and death rates as well as the shortest survival for most cancers in comparison to all other racial and ethnic groups.

### Elizabeth Plimack Appointed Deputy Director

Elizabeth Plimack, MD, MS, chief of the Division of Genitourinary Medical Oncology and professor in the Department of Hematology/Oncology at Fox Chase, has been appointed Deputy Director.

“Conducting world-class cancer science is an integral part of our Fox Chase mission and identity as a National Cancer Institute-designat-

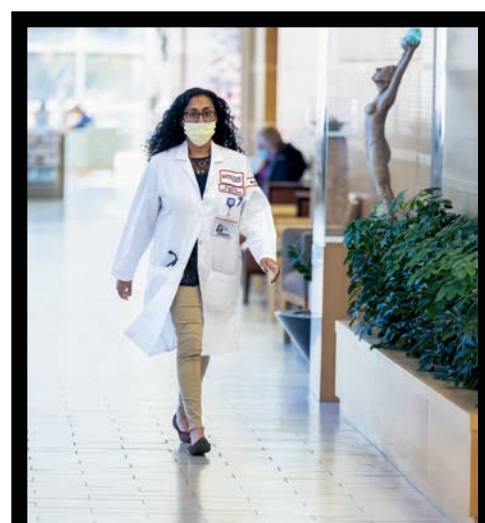
ed Comprehensive Cancer Center. Strong leadership in this area is critical to supporting our research enterprise and to promoting progress and success. That’s why I am so pleased to announce the appointment of Dr. Plimack to this key position,” said Jonathan Chernoff, MD, PhD, Cancer Center Director at Fox Chase.

Plimack will oversee the Clinical and Translational Research Plan as she takes on this newly created role. Her primary areas of focus will include:

Programmatic scientific strategy, in which she will lead the growth of interdisciplinary

**FACT:**

*Elizabeth Plimack, MD, MS, will oversee the Clinical and Translational Research Plan in her role as Deputy Director.*



translational science by building alliances across clinical disciplines and among clinical and basic science research faculty both at Fox Chase and throughout Temple Health.

Further development of the Fox Chase Bladder Cancer Program towards an integrated and collaborative research program by addressing NCI requirements for collaborative project funding and promoting the establishment of a Genitourinary Center of Excellence.

Development of institutional diversity, equity, inclusion, and accessibility (DEIA) initiatives by addressing DEIA as an integral part of the Cancer Center Support Grant renewal and by improving the Fox Chase culture to aid retention and recruitment of women and Underrepresented in Medicine faculty and staff.

### David Wiest Appointed Scientific Director of the Research Institute

David Wiest, PhD, has been appointed Scientific Director of the Research Institute of Fox Chase Cancer Center. Prior to taking on this new role, Wiest served as a Deputy Chief Scientific Officer for the center. Wiest is a professor in the Nuclear Dynamics and Cancer research program.

In 2017, Wiest was appointed to the National Cancer Institute's Board of Scientific Counselors for Basic Sciences, which conducts site visits and evaluations of laboratories and research programs to advise the NCI on the future and direction of intramural research programs. Among his many distinctions are a recent Merit Award from the National Institute of Allergy and Infectious Diseases, the Temple Senior Research Excellence Award, the American Cancer Society Southeastern Pennsylvania Research Award, and the Norman F. Conant Award for Excellence in Research.

### Immersion Science Program Directors Win Award

The two leaders of the Immersion Science Program (ISP) at Fox Chase, which allows students to explore science in a hands-on way

while also providing valuable data that can help working researchers, have received the prestigious Elizabeth W. Jones Award for Excellence in Education from the Genetics Society of America.

"To be recognized by such an exceptional group of scientists for the educational work we are doing is truly an honor, especially as it recognizes the importance of making genetics accessible to the public through research-based education efforts," said Alana M. O'Reilly, PhD, the scientific director of the ISP and associate professor in the Cancer Signaling and Microenvironment research program.

"The National Cancer Institute has recognized that education and community engagement are core parts of their mission to conquer cancer. Our efforts align with this mission and help uphold the ideals of the NCI," she added.

Dara Ruiz-Whalen, PhD, the ISP's education director, said the program serves a vital role in science education. "Giving all students an equitable platform to engage in research is key. Our programs give participants a place to express themselves without fear and provides an outlet to support them in seeking answers to questions that impact their loved ones or communities."

### New Hires, Appointments Underscore Integration

Fox Chase Cancer Center has long been known for the interdisciplinary nature of the work done between different research programs, and over the last several years, those efforts have come to include researchers from Temple Health and the Lewis Katz School of Medicine at Temple University. This integration has continued over the last year with new cross-institutional appointments and hires, a unique hiring collaboration between Fox Chase and the medical school that provides important benefits for education and research. Among the new hires and appointments are the following:

- **John Karanicolas, PhD**, co-leader of the Cancer Signaling and Microenvironment

**FACT:**

*Raised at  
In Vino Vita  
in support  
of a new  
mobile  
screening  
unit:*

**\$1,787,966.**





research program at Fox Chase, was named director of the Moulder Center for Drug Discovery Research at the Temple University School of Pharmacy.

- **Sergey Karakashev, PhD**, was hired as an assistant professor in the Nuclear Dynamics and Cancer research program at Fox Chase and in the Department of Cancer and Cellular Biology at the Katz School of Medicine.

- **Christian Hurtz, PhD**, was hired as an assistant professor in the Nuclear Dynamics and Cancer research program at Fox Chase and in the Department of Cancer and Cellular

Biology and the Fels Cancer Institute for Personalized Medicine at the Katz School of Medicine.

- **Lucia Borriello, PhD**, was hired as an assistant professor in the Cancer Signaling and Microenvironment research program at Fox Chase and in the Department of Cancer and Cellular Biology at the Katz School of Medicine.

- **Pedro Torres-Ayuso, PhD**, was hired as an assistant professor in the Cancer Signaling and Microenvironment research program at Fox Chase and the Department of Cancer and Cellular Biology at the Katz School of Medicine.



## Collaboration With Other Institutions, Industry

Collaborative research has long been a mainstay at Fox Chase, but over the past year, those efforts have reached beyond the walls of the institution. In one partnership, Fox Chase announced the opening of an investigator-initiated, phase 1 clinical trial to evaluate the safety and efficacy of gamitrinib in patients with advanced cancer that is being headed by Anthony J. Olszanski, MD, RPh, vice chair of clinical research.

Gamitrinib is a first-in-class, mitochondrial-targeted inhibitor of the molecular chaperone heat shock protein-90 (HSP90) that works by inhibiting tumor cell metabolism and survival. Gamitrinib was developed at The Wistar Institute, an international biomedical research leader in cancer, immunology, infectious disease, and vaccine development, and the two Philadelphia institutions are collaborating to bring this potential new therapy to patients.

In another initiative, Fox Chase announced a research partnership between the Cancer Epigenetics Institute and Saliarius Pharmaceuticals Inc. to help identify new indications and potential biomarkers for Saliarius' lead drug candidate, seclidemstat.

The drug is an enzyme that plays a key role in the development and progression of several cancers; therapies designed to inhibit LSD1's cancer-promoting activity represent a growing field of research. Johnathan Whetstone, PhD, the institute's director, was part of the team that originally discovered LSD1. His laboratory will be conducting research as part of the partnership with Saliarius.

## In Memory of Beatrice Mintz, PhD

Beatrice Mintz, PhD, a professor in the Cancer Biology Program who came to Fox Chase in 1960, passed away on January 3, 2022, at the age of 100. She is remembered not only as an inspirational researcher but as a pivotal figure in Fox Chase's history.

"I, and my colleagues at Fox Chase, were privileged to know her. She was truly one of a kind, one of the key scientific figures of the last 50 years," said Jonathan Chernoff, MD, PhD, Cancer Center Director.

Mintz is responsible for developing many scientific tools and techniques that have changed how science is conducted. Among some of the highlights of a storied career is the list of recognitions and awards Mintz received.

### FACT:

*A dedicated group of*  
**358**  
*volunteers donated*  
**81,608**  
*hours of service.*





**JOHN KARANICOLAS, PHD, WAS NAMED DIRECTOR OF THE MOULDER CENTER FOR DRUG DISCOVERY RESEARCH  
AT THE TEMPLE UNIVERSITY SCHOOL OF PHARMACY.**

She was an elected member of the National Academy of Sciences since 1973 and an elected fellow of the American Association for the Advancement of Science since 1976.

Mintz was the first recipient of the Genetics Society of America Medal in 1981 and became an elected fellow of the American Academy of Arts and Sciences in 1982. In 1990, she was the first recipient of the Ernst Jung Gold Medal for Medicine, and in 1997, she was awarded the National Medal of Honor for Basic Research by the American Cancer Society.

### Jerome Maddox Joins Center as New General Counsel

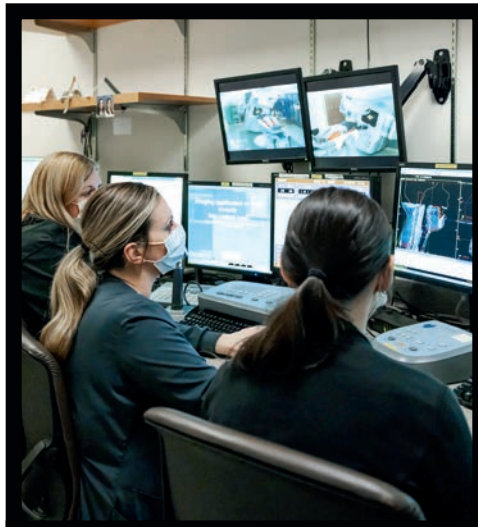
Jerome Maddox, JD, PhD, has joined Fox Chase as general counsel, a hiring whose international experience reflects the advances the center is making in its leadership. Maddox will lead and oversee the legal and governance functions for the center.

Maddox joined Fox Chase after serving as vice president of global commercial and public policy in the legal department at Moderna Inc. Prior to that, he had roles of increasing responsibility at GlaxoSmithKline in Philadelphia, including as vice president, legal operations for global and U.S. vaccines, and as senior counsel for R&D and Global Legal Operations – Oncology.

“Maddox is an exciting addition to our Fox Chase leadership team,” said Robert Uzzo, MD, MBA, FACS, President and CEO of Fox Chase. “His deep experience in commercialization, research and development, sponsored research, and clinical trials at world-class organizations will be exceptionally helpful in supporting our strategy of expanding clinical trials for the benefit of our patients and to further advance the science of our researchers.”

### Excellence in Pancreatic Cancer Recognized

Fox Chase and the Marvin and Concetta Greenberg Pancreatic Cancer Institute were renewed as a Clinical Center of Excellence and named for the first time as an Academic Center



of Excellence for Pancreatic Cancer by the National Pancreas Foundation. This distinction makes Fox Chase and the institute one of the few selected centers in the nation to hold this dual distinction.

“The process for this application was rigorous. The foundation needs to see that we have true multidisciplinary care, not just that we have the clinical expertise but the academic backbone as well. Because of the Marvin and Concetta Greenberg Pancreatic Cancer Institute, we were able to highlight and showcase what we’ve done in the space of



pancreatic research,” said Sanjay S. Reddy, MD, FACS, who co-directs the institute with Igor Astsaturov, MD, PhD, and Edna “Eti” Cukierman, PhD.

Since its launch in 2017, the Greenberg Pancreatic Institute has established the pancreatic cancer translational research group, which has 15 funded grants in pancreatic cancer. Additionally, the translational research group also has 12 ongoing Clinical/Institutional Review Board protocols, with four studies awaiting approval or activation, according to Reddy.

### Patient Experience Awards

Fox Chase has been recognized for excellence in patient care with two Press Ganey Awards, the Pinnacle of Excellence Award and the Guardian of Excellence Award.

Press Ganey works to support healthcare organizations by providing important assistance with healthcare challenges. According to the organization, their work includes data capture and analysis, as well as supporting sustainable improvement for quality and delivery of care.

Fox Chase was recognized for outstanding patient experience with the Guardian of Excellence Award, which recognizes organizations that have reached the 95th percentile for patient experience, employee or physician engagement, or clinical quality performance based on one year of data.

“Our nursing staff lead and participate in many process improvement and redesign efforts centered on improving the patient experience. These awards highlight and recognize our staff efforts and the institution’s ongoing commitment to exceptional patient experience,” said Anna Liza Rodriguez, MSN, MHA, RN, OCN, NEA-BC, Chief Nursing Officer and Vice President of Nursing and Patient Services at Fox Chase.

Fox Chase also received the Pinnacle of Excellence Award, which is given to the three top-performing organizations in each category. It recognizes institutions that have maintained

consistently high levels of excellence over three years in patient experience, employee engagement, physician engagement, or clinical quality performance.

### Grant Award to Expand Undergrad Research

Fox Chase was awarded an \$822,000 Research Education Program grant that will allow the center to expand the reach of its University of Delaware-Fox Chase Cancer Center Summer Research Fellowship.

“The goal of this program is really to allow students who may not even consider a career in STEM the opportunity to see what it’s like to have a hands-on experience in a lab and possibly change their career trajectory,” said Amanda Purdy, PhD, director of Academic Affairs at Fox Chase. “With the funds from this grant, we will be able to expand this existing pilot program from serving four students per summer to 12.”

The goals of the program, which will be funded by the National Cancer Institute, will include fostering a better understanding of biomedical, behavioral, and clinical research and its implications, as well as enhancing the training of a workforce to meet the nation’s biomedical, behavioral, and clinical research needs. Programs such as this help strengthen the educational pipeline. Its growth will surely continue and similar educational programs will be added in the future.

The fellowship is a partnership between the University of Delaware and Fox Chase. The pilot program aimed to serve as a way to bring talented students from the University of Delaware to Fox Chase for enhanced summer internships that would provide them not only research training, but also mentoring on creating and giving presentations, reading scientific literature, and developing useful professional networks.

Through the summer research fellowship, the students are provided with paid, full-time, and immersive summer research opportunities.

**FACT:**  
*Investigator-*  
*initiated*  
*clinical*  
*research*  
*studies:*  
**105.**

Clinical





# Generational Growth Leads to Bright Future for Cancer Medicine

Fox Chase Cancer Center has long been grounded on meaningful relationships. Among these are mentorships and friendships forged between veteran faculty and the next generation of healthcare providers. These relationships not only serve as a beneficial tool for both mentors and mentees but reach further, impacting patients as well.

Sanjay S. Reddy, MD, FACS, associate professor in the Department of Surgical Oncology, is one of many leaders at Fox Chase who have benefitted from close relationships with their predecessors. For much of his success, he credits his friend and mentor, John Hoffman, MD, FACS, professor emeritus and the Marvin S. Greenberg, MD, Chair in Pancreatic Cancer Surgery.

“When I stayed on as faculty in 2014 after training at the center, I was lucky that John didn’t retire. I’ve been incredibly fortunate to gain not only a wealth of information from him, but also the reassurance that he was there if I needed a hand or advice,” said Reddy, who is also co-director of the Marvin and Concetta Greenberg Pancreatic Cancer Institute and program director of the Complex Surgical Oncology Fellowship.

Hoffman joined Fox Chase in 1986 as a surgical oncologist and specialized in treating cancers of the upper abdomen. He spent much of his career focused on the development of new care and treatment methods for pancreatic cancer. Under Hoffman’s direction, Reddy learned some of the most advanced surgical techniques to treat the disease.

Fox Chase has long been an advocate for therapy that uses more than one type of treatment to attack pancreatic cancer, and the

combination of chemotherapy and radiation can add a layer of complexity to these procedures. Hoffman was a pioneer in this area.

“Every Whipple procedure that I do, I do it in the exact way that it was taught to me by Dr. Hoffman. From the instruments, to the suture, I find a sense of pride knowing that our current fellows in training will take some of this with them to their next positions.”

Hoffman echoed Reddy’s sentiments, recalling that among the 40 or 50 applicants for the fellowship in 2012, Reddy was easily a top pick.

“In the two years that he was a fellow, he was one of the best I have ever mentored in over 30 years at Fox Chase. I had very little to do other than assist him and watch him develop into a great surgeon,” said Hoffman. “We’d discuss cases he hadn’t done before and made lots of decisions during surgery together.”

Of the many positive traits of Hoffman, Reddy said the one that he emulates the most is his genuine care for patients: “John had the incredible ability of connecting with patients and building a level of trust that was special.”

Hoffman said that is something he believes he has passed on to his mentees. “After my 30 years at Fox Chase, I think my most important legacy would be that I taught my fellows the most effective way to approach patients, one that focused on best-care practices.”

Reddy said he feels fortunate to be able to continue that legacy of exceptional patient care through his work at the Pancreatic Cancer Institute and looks forward to creating more valuable relationships that make Fox Chase a distinctive leader in cancer care.

“What truly makes Fox Chase unique is that these mentorships encourage people to stay

**FACT:**

*Actively enrolling clinical research studies:*

**291.**



FOR OVER 30 YEARS, JOHN HOFFMAN, MD, FACS, THE MARVIN S. GREENBERG, MD, CHAIR IN PANCREATIC CANCER SURGERY, HAS MENTORED UP-AND-COMING SURGEONS.





SANJAY S. REDDY, MD, FACS, ASSOCIATE PROFESSOR, DEPARTMENT OF SURGICAL ONCOLOGY.

here, and when you look at all the different departments you see that generational growth,” said Reddy. “You don’t find that at a lot of other institutions, and this adds to what we call that ‘Fox Chase-ness’ sentiment.”

### Interdisciplinary Survivorship Clinic

Survivors of head and neck cancers might benefit from an interdisciplinary survivorship clinic that includes assessment and screening by rehabilitation specialists, according to Fox Chase researchers. That’s because many of these survivors exhibit late dysfunction that is best identified by a rehabilitation specialist and may be amenable to treatment by that specialist.

Late dysfunction is a problem or problems that occur five years or more following cancer treatment. In head and neck cancer survivors, late dysfunction might include difficulty swallowing or limited neck range of motion.

“These are patients that will tell you, ‘I’m doing great,’ and then when you watch them swallow or move their shoulders and you see they’re somewhat impaired,” said Thomas J. Galloway, MD, chief of the Division of Head and Neck Radiation Oncology. “The hope is this clinic can preemptively address these issues before they become clinically evident, which would be a really big advantage for head and neck cancer patients.”

During the study’s baseline year, patients visiting the Fox Chase head and neck cancer survivorship clinic were assessed by a single provider, a nurse practitioner who checked their general wellness. Although the provider did ask patients about symptoms of late dysfunction, only 3% of patients were referred to ancillary or support services.

In the study year, the head and neck survivorship clinic transitioned to an interdisciplinary model in which patients received the general wellness assessment along with an objective assessment by a speech pathologist and a screening by a physical therapist and other providers as needed. That year, referrals for ancillary or support services jumped to 63%.

#### QUOTE:

*“What truly makes Fox Chase unique is that these mentorships encourage people to stay here.”*

— **SANJAY S. REDDY, MD, FACS,**  
Associate Professor,  
Department of Surgical  
Oncology

“When you have this diverse group of specialists looking at certain known dysfunctions, it made sense they were going to find more. The magnitude of how much more was unexpected from the clinician end,” said Galloway.

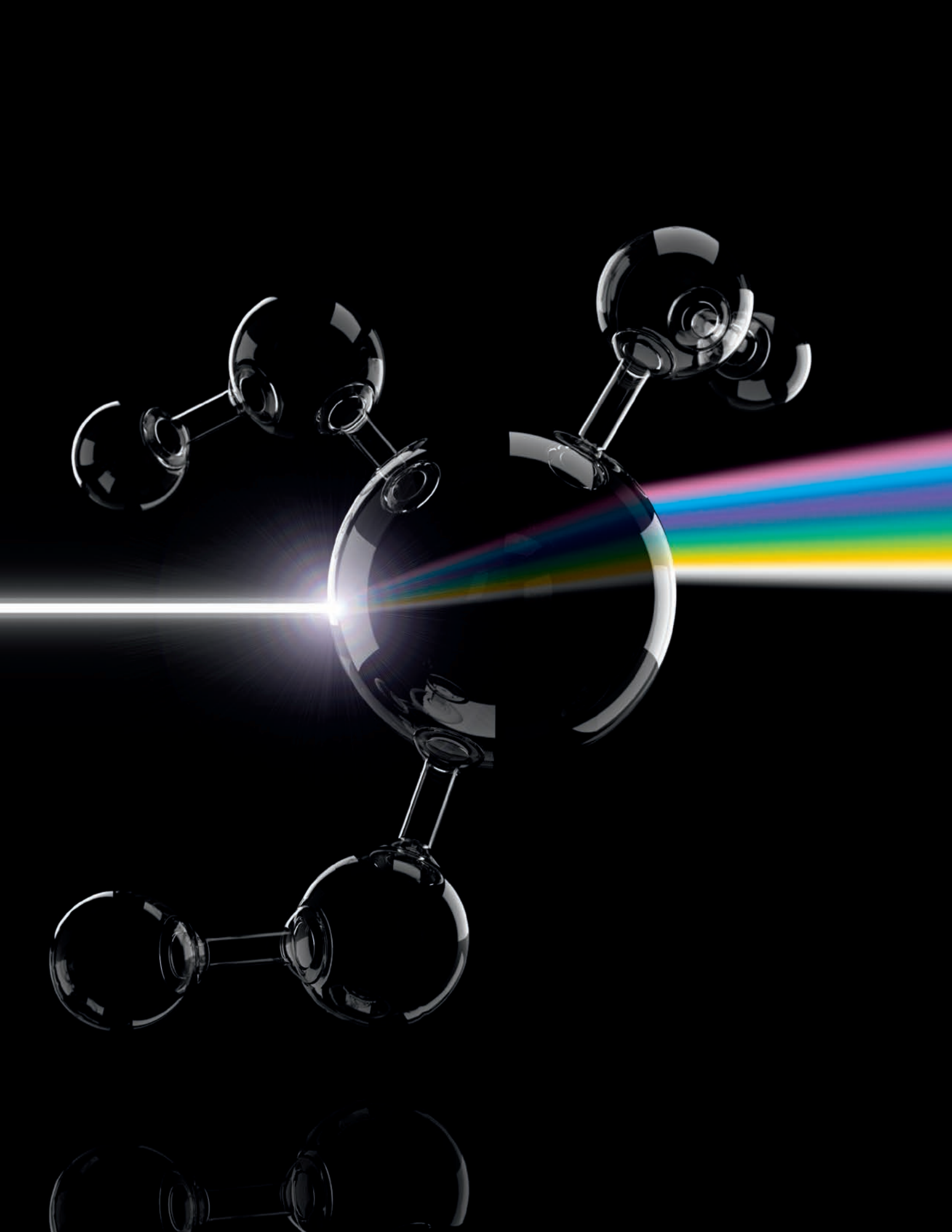
Of the patients referred, 47% attended the referred service. “Not only were we identifying dysfunction that was probably, to some extent, there previously, but also patients have good interest in attending those appointments for further workup,” said Liane McCarroll, MS, CCC-SLP/L, the senior speech pathologist who helped organize the clinic.





Research





# Fox Chase Research Leaders Foster a Future for Scientific Success

For many researchers at Fox Chase Cancer Center, innovative problem solving and a culture of collaboration among faculty are keys to the legacy they hope to leave. Among these individuals are Siddharth Balachandran, PhD, a professor in the Cancer Signaling and Microenvironment research program, and Johnathan Whetstine, PhD, director of the Cancer Epigenetics Institute, whose roles at Fox Chase are helping define the future of cancer research and care.

For scientists like Balachandran, seeking answers outside the parameters of cancer has been a key aspect in finding new and innovative treatments, a method he noted was practiced by several great scientists before him, including Baruch Blumberg, MD, PhD, a fellow virologist.

Blumberg was a Fox Chase researcher who received a Nobel Prize in 1976 for his isolation of the hepatitis B virus and the creation of its vaccine. As a result, liver cancer rates plummeted because hepatitis B was one of its major causes.

Much like Blumberg's discovery of hepatitis B, Balachandran has been able to make discoveries that could impact cancer care while investigating processes seemingly unrelated to cancer.

In a recent study published in the prestigious journal *Nature*, Balachandran demonstrated how using a particular compound to mimic the flu virus in tumor cells can make them more responsive to immunotherapy.

He said an important legacy he wants to leave behind is to foster the encouragement of broad basic scientific work that leaves doors open to the possibility of groundbreaking discoveries.

"It's important to pursue knowledge for its own sake," said Balachandran. "Great innovative treatments have come from someone just investigating an area they found interesting. It's essential that we keep that in mind."

For leaders like Whetstine, taking cues not only from those who came before him, but from current faculty, has been an important strategy for developing a scientific environment that will continue to thrive.

"Dr. Jonathan Chernoff is a leader here and a mentor," Whetstine said of Chernoff, Cancer Center Director. "Jon truly cares about Fox Chase and the people in it. This caught my attention, as it is a rare trait. One of the reasons I joined Fox Chase was that I found a leader that I trusted and knew would help me grow and develop the next phase of my career. And I knew he trusted me to build something and would support it and provide subtle guidance when needed."

Whetstine said this collegiality, which was nurtured by early Fox Chase leaders like Beatrice Mintz, Jack Schultz, Stanley Reimann, Alfred Knudson, and others, continues to live on today.

He said he hopes he can leave the kind of legacy that continues to cultivate this collaboration so that scientific discovery can continue to flourish at Fox Chase.

"In my view, a leader builds and develops a team that lasts beyond their time. We can never replace leaders or be as grand as the original scientific founders, but one can hope to make additional breakthroughs, be another pillar for the legacy of Fox Chase in the world, and leave a lasting mark in scientific history," said Whetstine.

QUOTE:

*"One of the reasons I joined Fox Chase was that I found a leader that I trusted and knew would help me grow and develop the next phase of my career."*

— JOHNATHAN WHETSTINE, PHD,  
Director of the Cancer Epigenetics Institute



JOHNATHAN WHETSTINE, PHD, DIRECTOR OF THE CANCER EPIGENETICS INSTITUTE.

## Abbosh Lab Represented at AACR Meeting

In addition to his focus on translational research, Philip Abbosh, MD, PhD, an assistant professor in the Nuclear Dynamics and Cancer research program at Fox Chase, is also a dedicated mentor whose lab had trained many postdoctoral and clinical fellows, as well as undergraduate and medical students, from the United States and internationally.

This year, the Abbosh lab, which focuses on bladder cancer, had a bumper crop of researchers present their work at the American Association for Cancer Research (AACR) Annual Meeting.

Among the half dozen research projects from the Abbosh lab presented at the meeting, Laura Bukavina, MD, MPH, a Urologic Oncology Fellow, shared findings from a recent study on the gut microbiome.

“Microbiome” refers to the collection of all microbes and genomes in a community within the body, such as the gut. “We suspected that the microbiome was different in patients with and without cancer, and this study supports that hypothesis,” said Bukavina.

The research team hypothesizes that the microbiome in the gut primes the immune system to respond differently to both cancer cells and chemotherapy.

In another presentation at the meeting, Rashida Ginwala, PhD, a postdoctoral fellow in the Abbosh lab, presented research on the changes that occur in the microbiome during bladder carcinogenesis—the development of bladder cancer.

“Our findings might explain why we see these differences in the incidences of bladder cancer between men and women,” said Ginwala, who added that the findings from the Abbosh lab are the first step toward harnessing microbes or their metabolites in an effort to improve chemotherapy response.

## Fighting Tumors by Mimicking the Flu

In a study published in the prestigious journal *Nature*, Fox Chase Cancer Center researchers

showed that a drug candidate may help re-initiate immune responses by mimicking influenza virus infections in patients whose cancer is unresponsive to immunotherapy.

Immunotherapy, which harnesses the power of the body’s immune system to attack cancer cells, has great potential for patients who do not respond to other treatments. But the number of patients who are successfully treated with immunotherapy is small because many tumors are immunologically silent, or “cold,” meaning they have adapted characteristics which trick the immune system into ignoring them as a threat.

Siddharth Balachandran, PhD, of the Cancer Signaling and Microenvironment research program, and his colleagues were able to identify a particular compound called CBL0137 that can trigger necroptosis, a highly inflammatory form of cell death within tumors, and turn these “cold” tumors “hot.”

The researchers found that by administering CBL0137 directly into tumors in mice, an antiviral response is induced within the tumor mass and the immune system is alerted to its presence.

“This is an important study for patients who have failed first-line immunotherapy, because it offers the opportunity to rekindle an immune response and make immunotherapy effective in otherwise unresponsive patients,” Balachandran said.

Clinicians at Fox Chase will be conducting a phase 1 clinical trial in which the compound will be used alongside immunotherapy drugs for testing in immune-relapsed melanoma.

## Historic Discovery of ThPOK Gene Honored

The white blood cells called T-cells play a critical role in immune function. However, for many years, scientists didn’t know why these cells divided into so-called CD8 “killer” T-cells, which fight and destroy pathogens, and CD4 “helper” T-cells, which play a supporting role by triggering the body’s wider immune response.

Then a discovery in 1997 by Dietmar J.

### FACT:

*The most common types of cancer among patients treated at Fox Chase:*

PROSTATE  
**(22%),**  
BREAST  
**(14%),**  
LUNG  
**(10%),**  
and  
GYNECOLOGICAL  
**(6%).**





Kappes, PhD, director of the Transgenic Mouse Facility at Fox Chase, solved that mystery, laying the foundation for a generation of research and new therapies in immunology.

Kappes' discovery that ThPOK plays a critical role in the division of T-cells is now the subject of a historical retrospective in a "Pillars of Immunology" article that appeared in *The Journal of Immunology*.

The identification of ThPOK as the defective gene in HD mice led to key developments in immunology research and also opened the door for therapeutic advances. For example, Kappes

said, it may lead to therapies that involve using ThPOK to manipulate T-cell function to fight diseases, including cancer.

The Kappes lab has also demonstrated that over-expressing ThPOK in certain cells can actually cause cancer, including breast cancer. Subsequent research has focused on understanding how this happens and how to prevent it.

### COVID-19 Vaccines Using mRNA Are Safe for Cancer Patients

A study from researchers at Fox Chase concluded



**FOR SIDDHARTH BALACHANDRAN, PHD, A PROFESSOR IN THE CANCER SIGNALING AND MICROENVIRONMENT RESEARCH PROGRAM, THE EXAMPLE OF EARLIER FOX CHASE RESEARCH LEGENDS INFORMS HIS OWN WORK.**



**FACT:**  
*Fox Chase  
 researchers  
 had  
 715  
 scientific  
 articles  
 published  
 in fiscal  
 year 2022.*

that the mRNA vaccine for COVID-19 is just as safe for people with cancer as it is for cancer-free individuals.

The researchers tracked short-term side effects from more than 1,753 recipients of the Pfizer BNT162b2 vaccine and found no additional reactions for patients undergoing active cancer treatment (surgery, chemotherapy, immunotherapy, or radiation therapy) or who had completed treatment.

“Patients, their families, and their medical caregivers should absolutely find these results reassuring. We surveyed almost 2,000 patients and found that cancer patients aren’t at risk for any unexpected reactions to being vaccinated compared to people without cancer,” said Eric M. Horwitz, MD, FABS, FASTRO, lead researcher and chair of the Department of Radiation Oncology at the Lewis Katz School of Medicine at Temple University and Fox Chase.

“It’s crucial that cancer patients get vaccinated against COVID-19 because we know they can be particularly vulnerable to infection and its consequences, but some people have expressed concerns about possible reactions from the vaccines,” Horwitz said.

### Using Artificial Intelligence to Develop New Drugs

The Fox Chase Cancer Signaling and Microenvironment research program has begun using a new artificial intelligence technology called AlphaFold2 that was developed by DeepMind, a scientific discovery company. DeepMind is part of Alphabet, the parent company of Google.

AlphaFold2 allows researchers to more accurately predict the 3D structures of proteins, the primary targets for most drugs.

“DeepMind developed a deep-learning program, a mathematical and computational algorithm that takes huge amounts of protein structural data and uses it to make predictions of protein structures,” said Roland Dunbrack, PhD, professor in the Cancer Signaling and Microenvironment research program and director of the Molecular Modeling Facility at Fox Chase.

“AlphaFold2’s structure predictions are near experimental accuracy for most well-folded protein domains and much more accurate than previously available methods,” he said. The Molecular Modeling Facility is using AlphaFold2 to assist Fox Chase and Temple University investigators in utilizing structural information to understand the behavior of proteins involved in cancer development, prevention, and treatment.

“Instead of confidently knowing the structure of maybe a quarter of all human proteins, now we have confident predictions of the structure of the well-defined regions of almost all of them” due to AlphaFold2, said John Karanicolas, PhD, co-leader of the Cancer Signaling and Microenvironment research program at Fox Chase and director of the Moulder Center for Drug Discovery Research at the Temple University School of Pharmacy.

“By using AlphaFold2, we can make predictions for how individual pairs of proteins can associate with one another—shedding light on their function—which could potentially lead to novel therapies,” he added.

### Certain Cancer Disparities Driven by Risk Factors, Not Race

Researchers at Fox Chase found that disparities in the incidence of head and neck cancer (HNC) among Black populations are driven by behavioral and environmental risk factors rather than race. They demonstrated this in the first-ever study to compare HNC incidence in Black patients in the United States, the Caribbean, and Africa.

HNC is comprised of subsites such as the oral cavity and larynx. Different subsites are associated with different primary risk factors, with tobacco and alcohol abuse and human papilloma virus infection being the two most prevalent.

Existing research shows that in the United States, Blacks have a higher incidence of HNC overall and in tobacco- and alcohol-related subsites than whites, suggesting that race may be a factor in the incidence of HNC.



**QUOTE:**  
*“DeepMind developed a deep-learning program, a mathematical and computational algorithm that takes huge amounts of protein structural data and uses it to make predictions of protein structures.”*

— **ROLAND DUNBRACK, PHD,**  
Director of the Molecular Modeling Facility

However, in a study led by Camille Ragin, PhD, MPH, a professor in the Cancer Prevention and Control research program at Fox Chase, researchers found that the HNC subsites and their associated risk factors showed significant variation by geography and region.

“It tells us that a lot of the disparities in incidence that we see for head and neck cancer are being driven primarily by behavior and these risk factors, not necessarily because of Black race,” said Ragin, who is also associate director for Diversity, Equity, and Inclusion at Fox Chase.

### Grant Funds Platform to Test New Drug Therapies

Fox Chase researchers received a \$497,000 multi-year grant from the National Cancer Institute within the National Institutes of Health to develop a way to evaluate novel drug therapies in patients with pancreatic cancer.

“There are very few biologically deep studies in pancreatic cancer where we use ex-vivo patient material to understand biology, so we decided to figure out a way to do it,” said Igor Astsaturov, MD, PhD, associate professor in the Department of Hematology/Oncology and a co-director of the



**ROLAND DUNBRACK, PHD, DIRECTOR OF THE MOLECULAR MODELING FACILITY, IS USING ARTIFICIAL INTELLIGENCE TO MORE ACCURATELY PREDICT THE 3D STRUCTURES OF PROTEINS, THE PRIMARY TARGETS FOR MOST DRUGS.**



Marvin and Concetta Greenberg Pancreatic Cancer Institute at Fox Chase.

Astsaturov said the long-term goal of this study is to establish an investigative platform in which a patient's tumor is studied in-depth to determine its composition and understand what happens to a tumor after treatment. Having this platform, he said, will allow researchers to apply this method to any therapeutic investigational drug that may be beneficial.

"We wanted to come up with any potential treatment that could be useful and test whether it does what it's supposed to do. We call it a 'window trial.' We apply any drug that we think may be helpful and see if the drug penetrates the tumor and if it has any biological effects," he said.

### Pilot Funding for Research Collaborations

Researchers at Fox Chase, the Lewis Katz School of Medicine at Temple University, and Temple University have received pilot grants that will fund research into a number of areas and encourage further collaboration between faculty at the institutions.

Sanjevani Arora, PhD, and Joshua E. Meyer, MD, of Fox Chase, received \$50,000 for their project, "DNA Damage Response Biomarkers of Chemoradiation Therapy in Gastroesophageal Junction Adenocarcinoma."

Daniel M. Geynisman, MD, and Carolyn Fang, PhD, of Fox Chase, received \$50,000 for their project, "Reducing Inequities in Cancer Care by Increasing Financial Health Literacy."

Carolyn Fang, PhD, of Fox Chase, and Omar Martinez, PhD, of Temple, received \$50,000 for their project, "Assessing the Feasibility and Acceptability of Juntas Contra el Virus del Papiloma Humano, an HPV Self-Sampling Intervention for Under-Screened Latinas."

Denise C. Connolly, PhD, of Fox Chase, and Marc A. Ilies, PhD, of Temple, received \$50,000 for their project, "Carbonic Anhydrase IX-Targeted Liposomal Doxorubicin as a Novel Synergistic Therapeutic Agent for Ovarian Cancer."

Vladimir Kolenko, MD, PhD, of Fox Chase, and Nathaniel W. Snyder, PhD, MPH, DABT, of the Katz School of Medicine, received \$50,000 for their project, "Acyl-CoA Metabolism and Androgen Receptor Acylation in Drug Resistant Prostate Cancer."

Lori Rink, PhD, of Fox Chase, and Nathaniel W. Snyder, PhD, MPH, DABT, of the Katz School of Medicine, received \$50,000 for their project, "Quantifying and Exploiting Metabolic Rewiring in Succinate Dehydrogenase Deficient Gastrointestinal Stromal Tumor."

Suzanne M. Miller, PhD, of Fox Chase, and Michael A. Diefenbach, PhD, of Northwell Health, received \$50,000 for their project, "Health System Stakeholder Acceptability of a First Phase Human-Centered Design Intervention to Improve Shared Decision Making for Early Stage Prostate Cancer Treatment."

David Wiest, PhD, of Fox Chase, and Tomasz Skorski, MD, PhD, DSc, of the Katz School of Medicine, received \$50,000 for their project, "Opposing Functions of ERK Substrate Binding Domains in MPN Pathogenesis."

Edna "Eti" Cukierman, PhD, of Fox Chase, and Bojana Gligorijevic, PhD, and Erkan Tuzel, PhD, of Temple, received \$50,000 for their project, "Digital Pathomics of Invadopodia for Metastatic Risk Assessment in Breast Cancer."

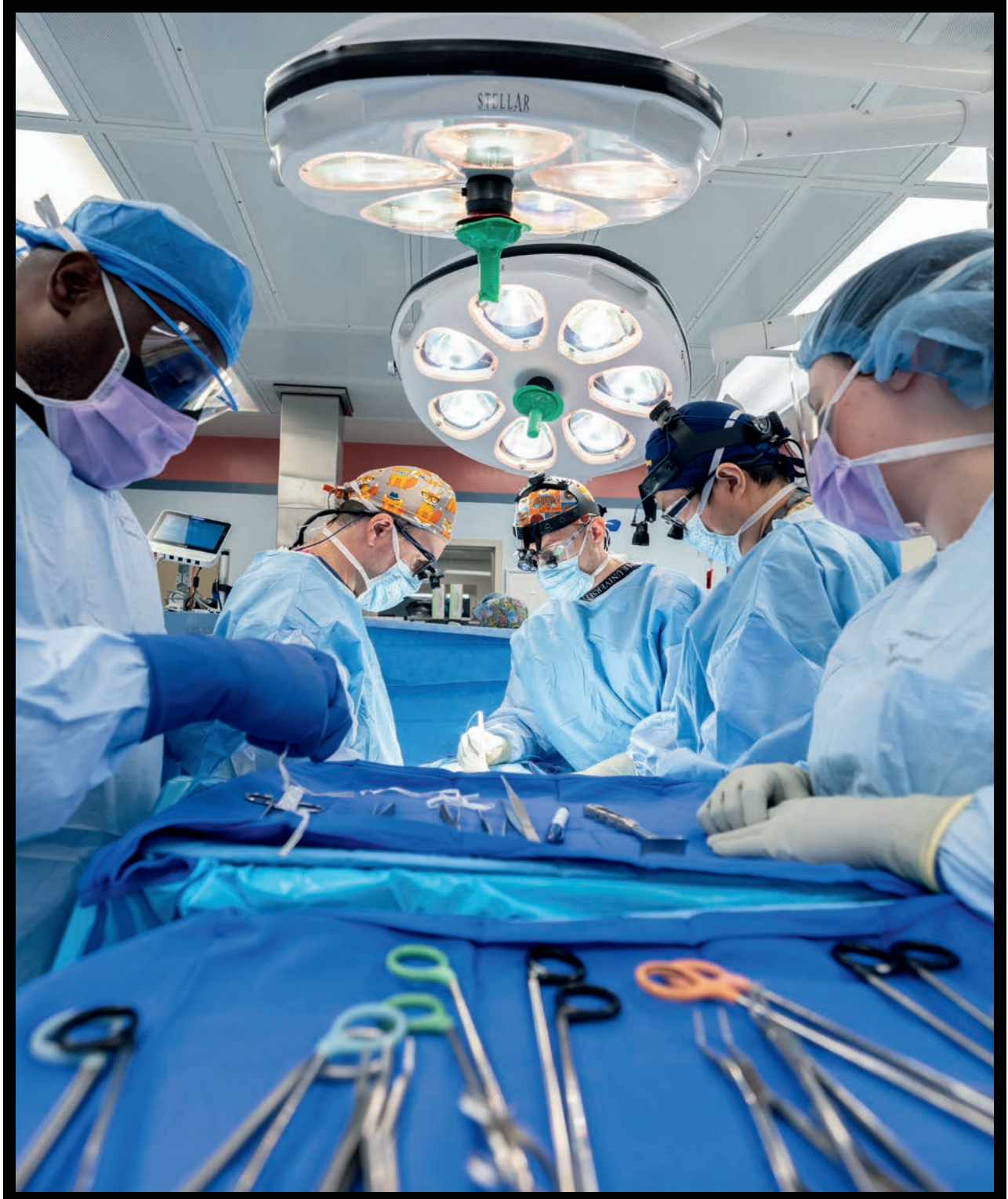
Edna "Eti" Cukierman, PhD, of Fox Chase and Bojana Gligorijevic, PhD, of Temple, received \$25,000 for their project, "Hitting the Nerve in Cancer."

John Karanicolas, PhD, and Marcus Messmer, MD, of Fox Chase, and Ross Wang, PhD, of Temple, received \$25,000 for their project, "Reactivating Mutant TP53 in Aggressive Non-Hodgkin Lymphoma."

Margie Clapper, PhD, Zeng-jie Yang, MD, PhD, and Yibin Yang, PhD, of Fox Chase, received \$25,000 for their project, "The Critical Role of Tumor Cell Dormancy in Lung Cancer Brain Metastasis."

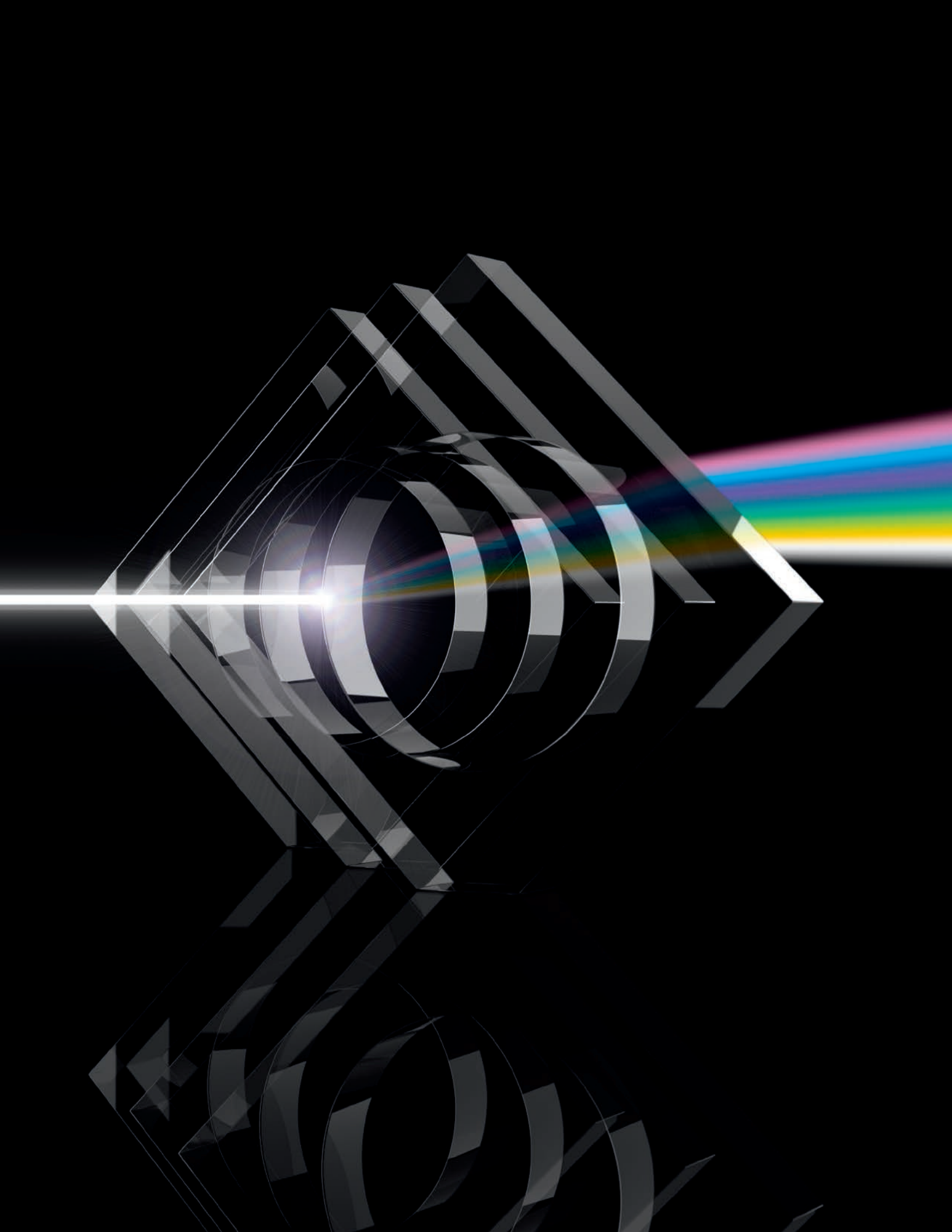
#### FACT:

*Researchers received a \$497,000 grant from the National Cancer Institute to develop a way to evaluate new drugs in patients with pancreatic cancer.*



Philanthropy







## Program Mentors Med School Physician-Researchers

Training the next generation of cancer researchers is a core element of the Fox Chase mission. In 2017 Amanda Purdy, PhD, Director of Academic Affairs, saw that while the faculty included many physician-researchers, there was an opportunity to bring more future clinicians into the research fold.

Her colleagues, surgeons Jeffrey M. Farma, MD, FACS, and Sanjay S. Reddy, MD, FACS, were recruiting medical students for research opportunities and Purdy wanted to expand the program.

“At that time, we offered many opportunities for future scientists from high school through postdoctoral, and I wanted to increase the number of mentored research opportunities available for medical students,” Purdy said. “It became my goal to encourage more physicians-in-training to engage in translational and clinical cancer research.”

She developed a pilot summer program to expose medical students to laboratory-based cancer research and help them build the professional skills needed for careers in clinical and translational research. The program is exclusively available to students at Temple University’s Lewis Katz School of Medicine (LKSOM). Since that first summer, 44 second-year medical students have participated.

This year, Purdy began working toward making this a permanent, sustainable program that can host 10 LKSOM students every summer. She earned grants from the J. Roland Gilbert, Mary R. Gilbert, and Elizabeth A. Gilbert Memorial Fund; the H.G. Barsumian, MD, Memorial Fund; and is seeking additional financial support.

The program is valuable for students, Fox Chase, and the medical and scientific fields. Students gain experience collecting and

analyzing data as part of a functioning research lab, as well as the opportunity to submit and possibly present their work at a national professional conference. They receive a stipend for the summer and financial support if they attend a conference.

Archana Raghunath, a second year student at LKSOM, has interests in women’s health, gynecologic cancer, and sexual and reproductive health. She participated in the program in 2022 in the lab of Jennifer Barsky Reese, PhD, in the Cancer Prevention and Control research program. Raghunath contributed to an ongoing project by performing qualitative analysis of dialogue about sexual health between breast cancer patients and their doctors. She also studied the kind of communication that happens when patients discuss these issues in the clinic.

“Archana’s work will allow us to understand when, why, and how women raise sexual health topics with their oncologists,” Reese said. “These concerns are common among cancer patients, but are not often communicated with doctors, although ideally they would be routine.”

Raghunath returned to medical school in the fall and joined Reese in November at Yale University for the 8th Conference of the Scientific Network on Female Sexual Health and Cancer. Together they presented a poster about her summer research project. Raghunath said the experience of conducting and presenting research will undoubtedly make her a better physician.

“If we emphasize the importance of research to students on their path to becoming physicians, we open new avenues for them to contribute to advances in cancer discovery,” Purdy said. “They go back to school having been immersed in the full cycle, from an idea, to data collection and analysis, to dissemination.”

**FACT:**

*Fox Chase has developed a pilot summer program to expose medical students to laboratory-based cancer research.*



JENNIFER BARSKY REESE, PHD, ASSOCIATE PROFESSOR, CANCER PREVENTION AND CONTROL RESEARCH PROGRAM.



**ARCHANA RAGHUNATH, A SECOND YEAR STUDENT AT THE LEWIS KATZ SCHOOL OF MEDICINE, BELIEVES THE EXPERIENCE OF CONDUCTING AND PRESENTING RESEARCH WILL UNDOUBTEDLY MAKE HER A BETTER PHYSICIAN.**

## Another Banner Year for Fox Chase Philanthropy

Strong philanthropy is central to the mission of any cancer center, so the continuing success of fundraising at Fox Chase bodes well for the institution's future. In fiscal year 2022, the Institutional Advancement team again exceeded its annual fundraising goal, raising \$21.3 million from more than 11,000 donors to enable new programs, expanded offerings, and more cancer research.

The 2021 *In Vino Vita* Benefit and Wine Auction raised more than \$1.7 million at an in-person event at the National Constitution Center following a successful virtual event in 2020. Gifts to IVV 2021 allowed for the purchase of a mobile screening unit to advance Fox Chase's leadership in cancer prevention and early detection with updated technology and greater capacity. Longtime corporate partner West Pharmaceutical Services Inc. generously donated \$500,000 toward this important project. The new vehicle, which will launch in 2023, will double Fox Chase's community screening capacity.

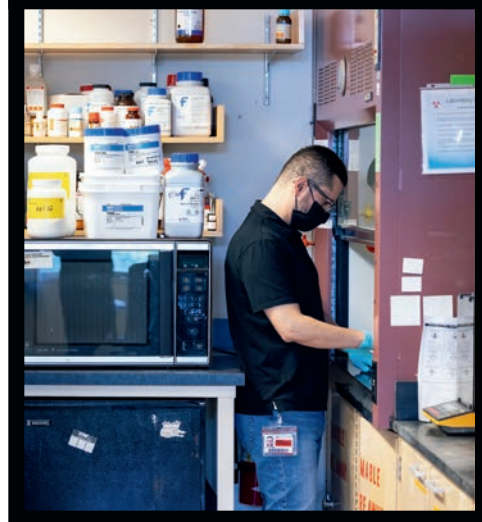
Temple Health is making significant contributions to Fox Chase and is now in the midst of a multiyear \$175 million investment in the center. Fox Chase is already seeing the impact in terms of new faculty and staff, the latest equipment, and enthusiasm about the future.

In addition to these institutional achievements, there have been many individual milestones. In May, more than 50 Fox Chase doctors were included on *Philadelphia* magazine's annual Top Doctors list. In June, the clinical and research faculty celebrated 13 promotions. At a spring event to honor all members of the Laurel Society, Tom and Judy Leidy received the Laurel Society Award. The Leidys were recognized for exceptional service to Fox Chase and for setting a compelling example of purposeful philanthropy over many years.

### Grateful Patient Doubles Gift

John M. Ballinger Jr. was a retired chemist who lived with head and neck cancer for 11 years. Last spring, he knew he was running out of options for

**FACT:**  
*Fox Chase again exceeded its annual fundraising goal by raising*  
**\$21.3 million.**



keeping his disease in check. But the welfare of others was on his mind. "In waiting rooms over the years, I've seen so many patients worse off than me," he said at the time. "I want treatment to be better for them."

He got in touch with George Beschen, a Fox Chase gift officer, and made a plan to leave \$350,000 from his estate to head and neck cancer research and clinical care at Fox Chase. But a few weeks later, when he met Beschen in person, he came with the news that his gift intention had grown to \$750,000.

Ballinger had been a reliable donor, giving



annual gifts between \$3,000 and \$5,000 in honor of his care team, led by John “Drew” Ridge, MD. But a planned gift of this size was truly a surprise. His gift is one of the largest by a single donor to head and neck cancer at Fox Chase.

Ballinger died in June 2022 at age 67. Cecelia E. Schmalbach, MD, MSc, FACS, the recently hired chief of the Division of Head and Neck Surgery, said she’s planning to leverage this gift for maximum impact to benefit both patients and their physicians. Ballinger’s generosity will reverberate for many years.

### ***In Vino Vita* Raises More Than \$1.5 Million**

On Saturday, October 1, 2022, more than 500 members of the Fox Chase Cancer Center community came together for the Ninth Annual *In Vino Vita* Benefit and Wine Auction. The event raised more than \$1.5 million on that momentous evening to establish a Nursing Simulation and Innovation Lab at Fox Chase.

There were many poignant moments throughout the celebration. President and CEO Robert Uzzo, MD, MBA, FACS, presented the second Fox Chase Cancer Center Corporate Philanthropy Award to Wawa in recognition of

decades of support. The Special Pledge was memorable, as always, as two long-time survivors spoke about the care they received from Fox Chase nurses.

Proceeds will help to develop an experiential learning space where nurses and advanced practice providers can continuously train on new techniques and equipment, develop research, and maintain overall excellence in patient care. This new Simulation and Innovation Lab will enhance the delivery of care throughout Fox Chase and beyond.

This year’s event co-chairs were Fox Chase Foundation Board member Tina Pidgeon and her husband, Tim Fitzpatrick. Her fellow Board member, Louis E. Della Penna Sr. and his wife Carol A. Della Penna returned as wine co-chairs.

*In Vino Vita* has now raised nearly \$10 million for cancer research and patient care since it began in 2014.

### **Paws for the Cause Raises \$85,000 for Research**

On September 18, 2022, the Board of Associates hosted the 23rd Annual Paws for the Cause dog walk. More than 600 friends of Fox Chase registered for a morning that included

#### **FACT:**

*Paws for the Cause has now raised \$800,000 since its inception.*





local vendors, entertainment, children's activities, and contests, in addition to the mile-long walk. The record crowd raised more than \$85,000 for research at Fox Chase Cancer Center.

Gina Mantia-Smaldone, MD, associate professor in the Department of Surgical Oncology, was the event's physician ambassador,

and Felicitia Beideman, a lymphoma survivor, served as patient ambassador. Lori Giampaolo, a breast cancer survivor who has been a top fundraiser, served as event chair.

Paws for the Cause has raised \$800,000 since its inception.

# Donors



## The Laurel Society

The Laurel Society is the signature donor society of Fox Chase Cancer Center, honoring our most generous supporters—individuals, corporations, foundations, community fundraisers, and Fox Chase faculty and staff. Individual members demonstrate their commitment by providing annual support of \$1,000 or more during Fox Chase's fiscal year (July 1 through June 30). Corporations, foundations, and community fundraisers become members at the \$5,000+ level.



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\$500,000+

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# Financials

## 2022 By the Numbers

715

Scientific  
Publications

122,823

Outpatient Visits

10,671

New Patients

11

New Faculty  
Members

## Philanthropy Snapshot

\$21,274,290

Total Philanthropic Support

\$1,787,966

Raised at *In Vivo Vita* in support of  
a new Mobile Screening Unit

11,159

Total Donors

3,901

Total New Donors

835

Current Donors 30+ years

\$433,451

Board of Associates Total Gifts

Numbers represent Fiscal Year 2022

## Volunteer Snapshot

358

Volunteers

81,608

Total Volunteer Hours

\$2,444,160

Value of Hours

\$2,130,157

Net Value Added to Fox Chase

105

Investigator Initiated  
Clinical Research Studies

291

Actively Enrolling  
Clinical Research Studies

## Clinical Snapshot (In Thousands)

FY22

### TEMPLE UNIVERSITY HEALTH SYSTEM CANCER SERVICE LINE REVENUES — CLINICAL ACTIVITY\*

Patient Care Revenue — Hospital	\$582,334
Patient Care Revenue — Physicians	\$35,068
Philanthropy, Outreach & Other	\$4,722
<b>Clinical Revenue</b>	<b>\$622,124</b>

### TEMPLE UNIVERSITY HEALTH SYSTEM CANCER SERVICE LINE OPERATING EXPENSES — CLINICAL ACTIVITY\*

Salaries & Benefits	\$219,562
Supplies & Pharmaceuticals	\$201,664
Purchased Services	\$74,647
Other Expenses	\$17,911
<b>Clinical Expenses</b>	<b>\$513,784</b>

### KEY PATIENT CARE STATISTICS

New Patients	10,671
Hospital Admissions	3,488
Surgical Procedures	5,069
Chemotherapy Infusions & Related Procedures*	43,619
Radiation Therapy Treatments*	37,793

\*Numbers are for the Temple University Health System Cancer Service Line and include revenue and expenses related to oncology from both Fox Chase Cancer Center and Temple University Hospital Inc.

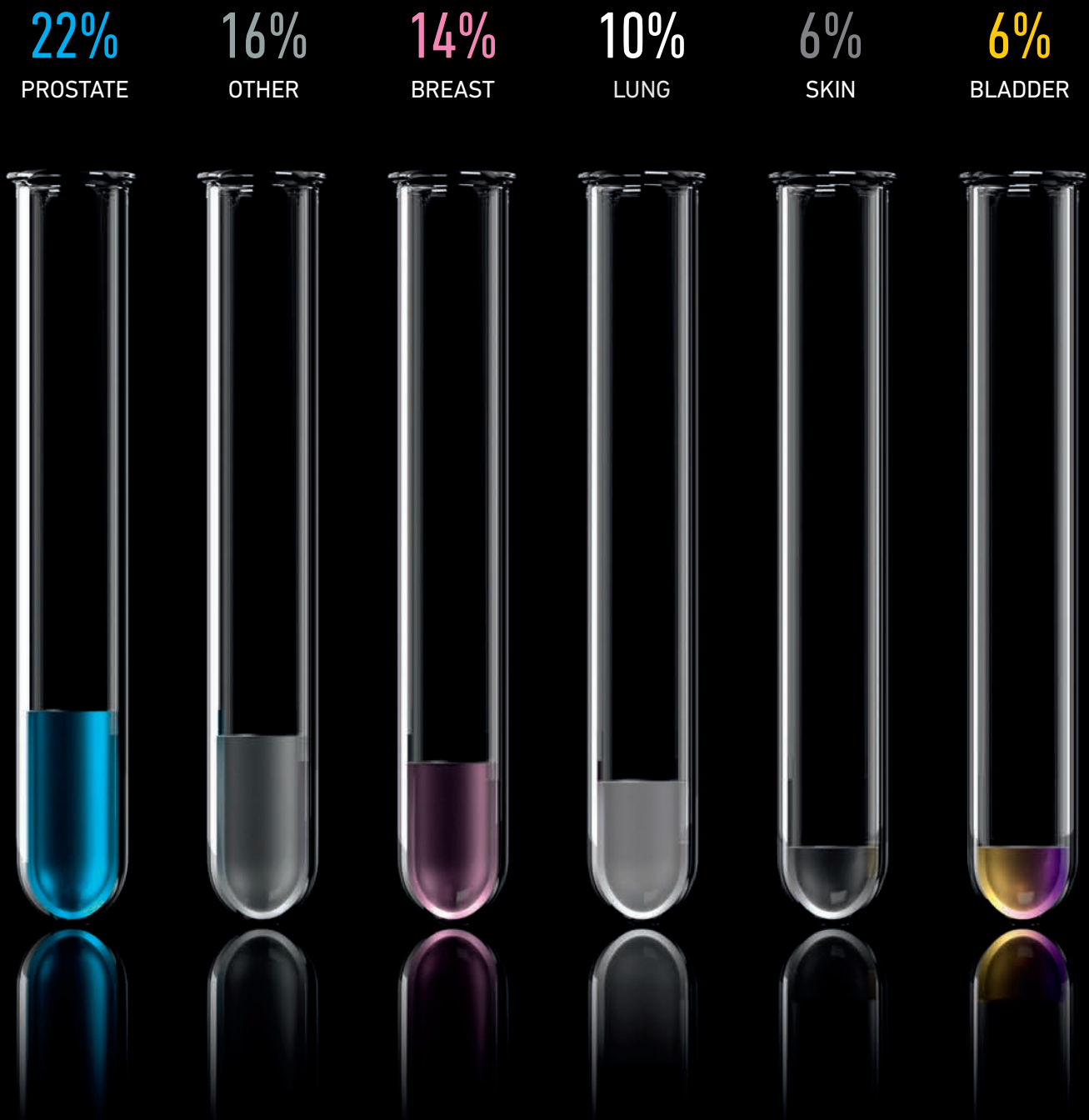
## Research Snapshot

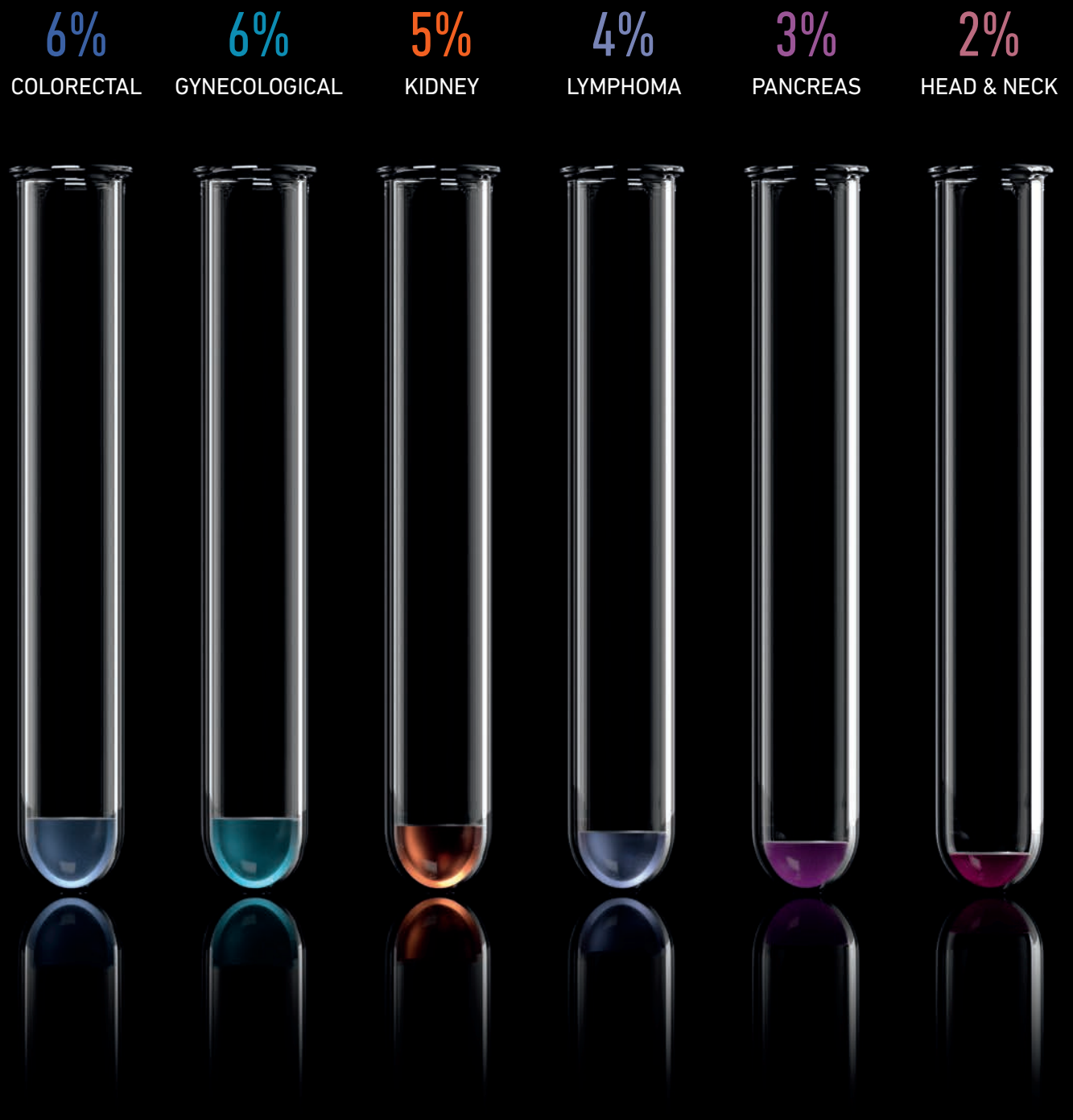
### Active Funded Projects

Funding Source	Number of Projects	Direct Costs	Total Costs
<b>PEER-REVIEWED</b>			
NCI	122	\$14,511,638	\$22,592,847
Other NIH	63	\$13,057,730	\$19,731,847
Other	36	\$3,956,275	\$5,854,321
<b>Subtotal of peer-reviewed</b>	<b>221</b>	<b>\$31,525,643</b>	<b>\$48,179,015</b>
<b>NON PEER-REVIEWED</b>			
Industry	189	\$12,087,205	\$16,112,750
Other non peer-reviewed	54	\$4,526,684	\$5,012,791
<b>Subtotal of non peer-reviewed</b>	<b>243</b>	<b>\$16,613,889</b>	<b>\$21,125,541</b>
<b>GRAND TOTAL</b>	<b>464</b>	<b>\$48,139,532</b>	<b>\$69,304,556</b>



## Types of Cancers Treated





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- 2 Newly recruited faculty at Fox Chase Cancer Center
- 3 Member of the Fox Chase Cancer Center clinical faculty
- 4 Faculty based at Temple University
- 5 Emeritus



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