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Prevail

Fox Chase Cancer Center • Annual Report 2021



On the Cover

Over the past year, Fox Chase Cancer Center has prevailed together. The photos on the cover and inside feature some of our faculty, staff, patients, caregivers and volunteers who have played a key role in this great accomplishment. This list is continued on the inside back cover.

Fox Chase People

Continued From the Inside Cover

Row 1

Aangi Shah
Abeerah Wasti
Aesha Collins
Aisha Randall
Alex Leonovich
Alexa Cannon
Richard Bleicher

Row 2

Alicia Schubert
Rohit Kumar
Amanda Hunton
Amy Magagna
Angela Kaewell
Anil Rengan
Anissa Blake
Ann Gorman
Ann Skalka
Anne Shelinsky
Anshu Giri
Anthony Kendust
Anthony Villano

Row 3

Arlene Walsh
Ashley Zucker
Atiya Bruce
Avishekh Gautam
Baiqing Tang
Barb Wallace
Barbara Sheehan
Belinda Pulaski
Beverly S. Thomas
Bob Beck
Bonnie Brown
Brenda Auerbach
Breyana McClain

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Karen Smith
Katherine Alpaugh
Kathleen Egan-Spain
Kathy Rich
Katie Ansel

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Katie Prince
Kelly Kaing
Kelly Kinyon
Kellyanne Furlong
Kerry Clay
Kevin Zarrabi

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Keyron Pearson
Kim Thompson
Kirsten Gordon
Konstantin Budagyan
Kristine Gohl
Lakeyya Grasty

Row 4

Brian Sheridan
Brittany Rennie
Bulat Faezav
Carol Caruso
Shannon Colangelo
Cassandra Mason
Catherine McCullough
Chao Wu
Fu Chen
Chris Martin
Christen Dillard
Christina Passio
Christopher Burks

Row 5

Sheida Alvarado
Claire Wu
Johnathan Whetstine
Sheila Koreck
Colleen Turrisi
Conchetta Savage
Daisy Coffey
Dana DeLellis
Dana Smith
Daneen Bettner
Daniel Chakhalian
Daniel Rudolph
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Lawrence Chopp
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Lesly Cottrell
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Lorraine Crozier
Lu Ge
Lucy Santos
Carol Lynn Duffy
Malhar Parikh

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David Wilson
Deanna Steinbach
Deborah Elsenbeck
Delinda Pendleton
Denise Connolly
David DiGiovanni
Diana Turkowski
Diane Dilonardo
Diane Faison
Diane Martin
Donna Hnosko
Donna O'Neill

Row 7

Edna Cukierman
Edward Walczak
Eileen Fagan-Fittery
Elaine Spieller
Elena Demidova
Elisha Alivera
Elizabeth Thomas
Sheldon Gibbs
Elsie Concepcion
Emily Walzer
Eric Horwitz
Erika Fish
Erin Neumann-Domer

Row 8

Etleva Jorgji
Eugene F. Weisenberger
Eve Tenenbaum
Fang Du
Franklin Viz
Fred Dembrowski
Gaurav Barot
Guetchina Sanon
Gulnaz Alekbaeva
Helen Gordon
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Marc D. Cherimond
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Yulan Gong
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Jane McCurdy
Jaqueline Talarchek
Jarrett Handell
Jayati Basu
Jeff Lurie
Jeffrey Farma
Jeffrey Tokar
Jena Dickson
Sanjay Reddy
Jessenia Inchautegui-Williams

Row 10

Mowafaq Jillab
Jillian Johnston
Jim Toczylowski
Jo-Dina Hazel
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Joe Clarici
Joe Kaminski
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Megan Bodor
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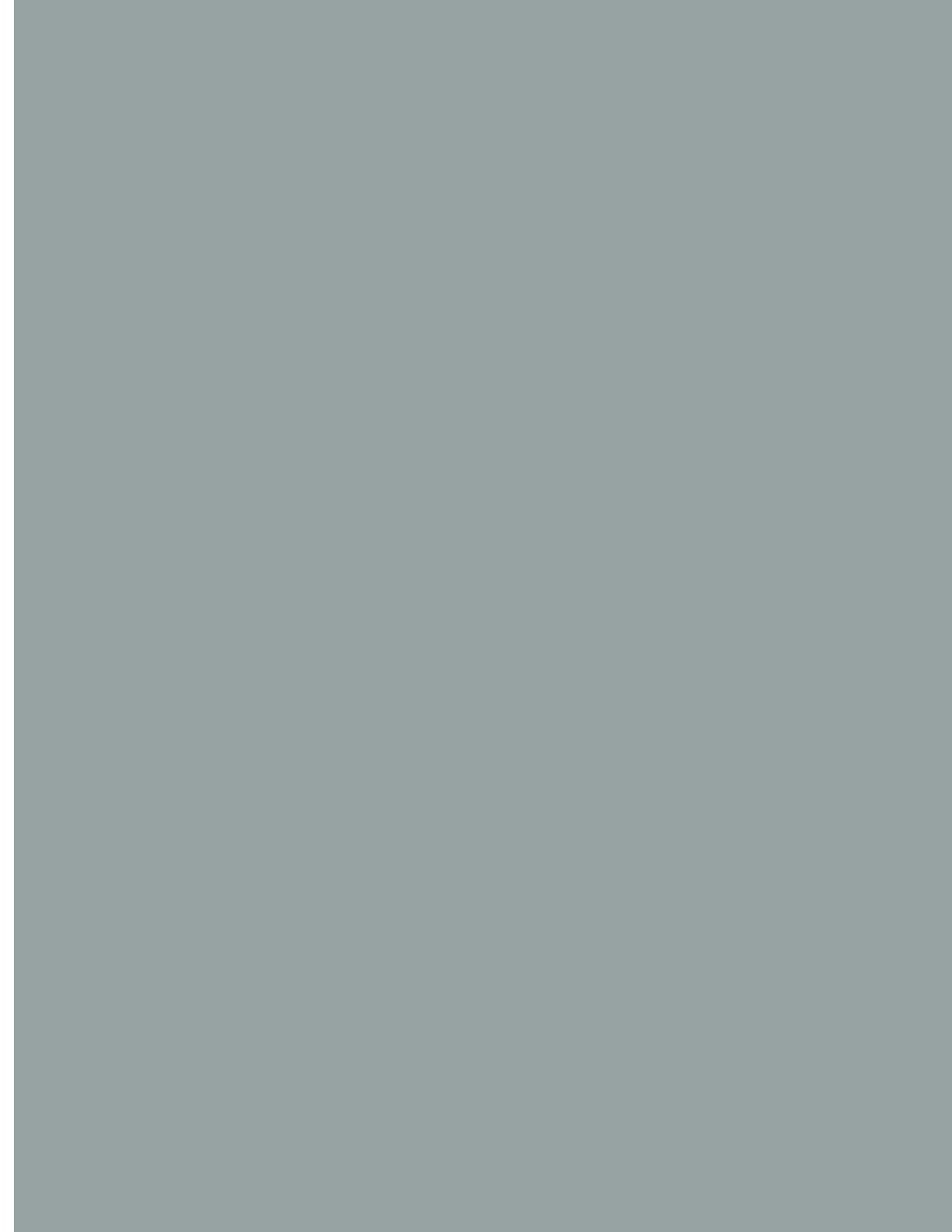
Michelle Tharp
Mohan Doss
Molly Miraglia
Monica Po
Monica Scanlan
Morgan Dermer

Row 11

John Stedge
Jonathan Shinefeld
Jonmeir Christian
Jose Torres
Joseph Testa
Joyce L. Trotman
Julia Forbes
Karen Sheehan

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Nikkole Robinson
Muhammad Atiq
Neal Topham
Neida Martinez
Nicole Doto
Nicole Villafane



THIS PAST YEAR, PERHAPS MORE THAN ANY OTHER TIME WE CAN REMEMBER, WE HAVE PREVAILED TOGETHER. ROBERT UZZO, MD, MBA, INTERIM CEO (R), AND JONATHAN CHERNOFF, MD, PHD, CANCER CENTER DIRECTOR (L)

PREVAILING TOGETHER

When we come together, we often can achieve much more than if we had set out alone. Our strength is found in joining with each other, united in a common cause. For us at Fox Chase, it is *prevailing over cancer*.

This past year, perhaps more than any other time we can remember, we have prevailed *together*. This idea is solidified in our fervent pursuit of cancer discovery and cancer delivery.

Through our renewed integration with the Temple University Health System, we are pursuing growth in new and exciting ways. With significant capital funding and access to a broader range of resources, we are building on and expanding research collaborations; investing in new technologies, equipment, and upgrades; and accelerating progress to offer the most advanced cancer treatments to our patients.

We have welcomed new senior leaders who are infusing new energy into our institution, and we are seeing longtime faculty members step up to guide us further along in our journey. Basic scientists are working with physicians to translate laboratory

discoveries into clinical studies of immunotherapies and other treatments. Our surgeons are using new technology to pinpoint and remove breast cancer more precisely, and nurses are providing support beyond their typical duties to help patients cope with cancer amid the challenges of a global pandemic.

Our scientists are studying potential biomarkers, including one that could help starve pancreatic cancer cells and awaken the immune system to attack them. Researchers at Fox Chase and peer institutions are collaborating to develop new therapies for patients with hard-to-treat head and neck cancers. And donors are shepherding the innovative ideas of our faculty to help them gather data needed to garner even greater funding from larger sources for their research.

So much of what we learn and accomplish in cancer science and medicine comes from working together. We each draw inspiration from different places, but mutual respect and compassion for one another connect us. When we face obstacles and suffer setbacks, it is

often more tolerable when shouldered together. And when we achieve success and celebrate our triumphs, it is that much sweeter when it is shared.

We need each other. And together, we offer our talents and dedication so that we may prevail.



Robert Uzzo, MD, MBA, FACS
*Interim CEO of the Hospital at
Fox Chase Cancer Center*



Jonathan Chernoff, MD, PhD
Cancer Center Director







Institutional

INVESTMENTS UNDERSCORE CONTINUING INTEGRATION OF FOX CHASE AND TEMPLE

When Fox Chase Cancer Center became part of the Temple University Health System (TUHS) in 2012, leaders at both centers touted the potential that the integration of two storied organizations offered for quality patient care, as well as for supporting excellence and innovation in education and research.

That integration is as strong as ever, as evidenced by the \$20 million that TUHS spent in fiscal year 2021 to provide new state-of-the-art surgical, imaging, and basic research tools at Fox Chase.

It also signifies a major step forward, aligning with the vision set forth publicly by **Michael Young, MHA, FACHE**, the president and CEO of Temple Health, to spend \$100 million over five years at Fox Chase. Upcoming capital investment will focus on upgrading ICU facilities and creating private patient rooms at Fox Chase—projects that will further enhance the inpatient experience.

“As we continue to strengthen the integration between Fox Chase and Temple Health, we move toward greater competitive advantage in the Philadelphia region,” said **Robert Uzzo, MD, MBA, FACS**, Interim CEO of the Hospital at Fox Chase Cancer Center. “Temple’s success in positioning itself for a stronger future affords greater investment in Fox Chase, and we are seeing this progress taking place.”

Integration also extends to faculty. In March 2021, **Erica Golemis, PhD**, Deputy Chief Science Officer at Fox Chase, was named chair of the newly created Department of Cancer & Cellular Biology at the Lewis Katz School of Medicine (LKSOM) at Temple University.

“Dr. Golemis’ LKSOM appointment is significant as we move toward greater integration with Temple Health,” said **Jonathan Chernoff, MD, PhD**, Cancer Center Director. “The formation of the Department of Cancer & Cellular Biology will help us to bring together researchers with associated interests

and expertise from across the health system, capitalize on our strengths, create synergy of efforts, increase funding, promote diversity, and ultimately, raise the national profile of this program and our institutions.”

In addition to Golemis, another dual appointment is **Tomasz Skorski, MD, PhD, DSc**, who is a director of the Fels Cancer Institute for Personalized Medicine at LKSOM, and an associate director and associate professor in the Blood Cell Development and Function Program at Fox Chase. **Glenn Rall, PhD**, Chief Academic Officer at Fox Chase, is also Assistant Dean of Faculty Affairs at LKSOM.

Fox Chase will also be expanding its high-risk breast cancer and prostate cancer clinics, with appointments one day per month for each service at Temple University Hospital. There are also plans for Fox Chase staff to provide genetic counseling services at Temple University Hospital. “These integration efforts with Temple will further position Fox Chase as leader of all oncology-related services throughout the health system and draw upon Temple’s patient base to further grow our clinical enterprise,” Uzzo said.

THE TEMPLE UNIVERSITY HEALTH SYSTEM IS PLANNING TO INVEST
\$100 Million
IN IMPROVEMENTS AT FOX CHASE
OVER FIVE YEARS.



IN MEMORY OF JOHN M. DALY, MD, FACS

It was with great sadness that Temple University Health System announced the passing of former Fox Chase Cancer Center faculty member **John M. Daly, MD, FACS**, on March 26, 2021. Daly was an internationally known surgeon and educator whose clinical work and research spanned the fields of surgical

ERICA GOLEMIS, PHD,
WAS NAMED CHAIR OF
THE NEWLY CREATED
DEPARTMENT OF CANCER
& CELLULAR BIOLOGY
AT THE LEWIS KATZ
SCHOOL OF MEDICINE AT
TEMPLE UNIVERSITY.



oncology, metabolism, and nutrition. A native of Philadelphia, Daly received his medical degree from Temple in 1973; from 2002 through 2011, he served as dean of his medical alma mater. In 2011, he returned to the practice of surgical oncology as the Harry C. Donahoo Professor of Surgery at Fox Chase Cancer Center, where he specialized in the care of patients with cancers of the gastrointestinal tract and breast.

A true servant-leader, he led multiple medical associations and mentored numerous research trainees, and also received numerous teaching awards and two honorary fellowships for his dedication to students and residents.

In 2019, he returned as dean of the Lewis Katz School of Medicine at Temple, where he led it through a restructuring, worked hand-in-hand with students to address racial and social justice issues in medical education, and navigated the school through a once-in-a-generation pandemic.

Daly will be remembered as a skilled teacher, mentor, and surgeon, a loving father and grandfather, a devoted husband, and an exceptional, tireless, and remarkably kind human being. He was predeceased by his first wife,



BETWEEN DECEMBER 2020
AND JUNE 2021,
MORE THAN
7,000
FOX CHASE PATIENTS WERE
VACCINATED AGAINST COVID-19.

Mary F. Daly, and is survived by their six children, his wife, Palma, and many grandchildren.

ROLLOUT OF COVID-19 VACCINE

The dark shadow of COVID-19 loomed over the world in 2020 and 2021, and healthcare facilities were no exception. But that darkness began to dissipate in December of 2020 when Fox Chase began vaccinating frontline staff at the Main Campus and then steadily expanded efforts to reach an increasing number of people, with patient clinics opening in early February and clinics being set up at the Buckingham

and East Norriton locations. When the effort wound down in June 2021, more than 14,000 shots had been administered to more than 7,000 patients, and many Fox Chase employees had been vaccinated against COVID-19, with an even higher percentage of vaccinations in many clinical areas.

“This is a tremendous achievement,” said **Robert Uzzo, MD, MBA, FACS**, Interim CEO of the Hospital at Fox Chase Cancer Center. “It is because of an incredible team of professionals and volunteers—both clinical and non-clinical—that Fox Chase carried out the





planning, staffing, and daily operations of such an immense project to provide needed vaccinations to both our patients and our employees.”

NURSES ON THE FRONT LINES OF COVID-19

In March 2020, Fox Chase Cancer Center was among thousands of healthcare facilities around the country facing the challenge of providing a continued high standard of care while adapting to changing information and protocols surrounding the emergence of COVID-19 in the United States.

At the forefront of this pandemic were nurses who, day in and day out, are charged with not only caring for the physical health and mental well-being of their patients, but also with an immeasurable amount of behind-the-scenes work that ensures that operations run smoothly.

One of the most significant challenges for nurses was the emotional toll of the virus. **Rebecca Farrell, MSN, RN**, clinical manager at Fox Chase Cancer Center - Huntingdon Pike, said their phone triage was flooded with concerned patients in the first few weeks of the pandemic.

“Patients were very scared and had a lot of questions. They wanted to know if they could still have treatment for their cancer. My nursing staff was in overdrive and very overwhelmed. Our calls went from about 400 calls a day to about 800 to a thousand calls a day,” she said.

Unfortunately for nurses, working from home wasn't an option. “From the beginning, we were here every day and maintaining our volumes,” said **Tara DelGrippo, MSN, RN, NE-BC, OCN**, clinical director of Ambulatory Care and Infusion Services.

NURSES CONTINUE TO GIVE

Despite the many challenges that the COVID-19 pandemic has presented, nurses at Fox Chase Cancer Center consistently found ways to encourage and care for patients who are still navigating their cancer journey. One example of this is the We Care Project,

created by ambulatory care nurse **Kelly Bailey, RN, BSN**.

Bailey had a young patient with colon cancer and she found out it was his birthday, but he was by himself because patients weren't allowed to have visitors due to the pandemic.

"She ran all over the building to find a birthday gift for him," said **Christine Kappler**, a clinic assistant at Fox Chase who helped Bailey develop the project.

"She came up with the idea that we needed to do something for these



GLENN RALL, PHD,
WAS NAMED ASSISTANT
DEAN OF FACULTY
AFFAIRS AT THE
LEWIS KATZ SCHOOL
OF MEDICINE AT
TEMPLE UNIVERSITY.





patients during COVID because they're anxious, they're sad, and we should just let them know they're loved and we're here for them," Kappler added.

Bailey took the idea to management, who then implemented the program. Nurses in the department helped donate gifts, and as news spread throughout Fox Chase, Kappler said they have been receiving donations from co-workers, doctors, and outside donors.

Kappler recalled one instance where a patient was brought to tears by a gift. "His wife had just died about a month ago and

this was probably the only present he would be getting for his birthday. So it has just been really touching."

JOEL HELMKE JOINS CENTER AS NEW CHIEF OPERATING OFFICER

Joel Helmke, MSHP, FACHE, has joined the Fox Chase Cancer Center senior leadership team as chief operating officer, where he will be in charge of directing clinical and business operations.

"By bringing industry best practices and new perspectives, he will help us refine our processes and enhance our facilities

to match the talent and expertise we already have in our faculty and staff," said **Robert Uzzo, MD, MBA, FACS**, Interim CEO of the Hospital at Fox Chase Cancer Center.

Uzzo said Helmke will continue to propel integration efforts between Fox Chase and Temple University Health System, which Fox Chase is a part of. Before joining Fox Chase, Helmke served nearly five years as senior vice president of clinical operations at City of Hope National Medical Center in Duarte, Calif., a National Cancer Institute-designated comprehensive cancer center and 32-site cancer network.

ANNA LIZA RODRIGUEZ NAMED NEW CHIEF NURSING OFFICER

Anna Liza Rodriguez, MSN, MHA, RN, OCN, NEA-BC, has become chief nursing officer and vice president of nursing and patient services at Fox Chase Cancer Center. Rodriguez's role will include providing leadership and administrative oversight for all nursing practice at Fox Chase.

"She will be responsible for fostering the magnet culture, ensuring that the delivery of patient care is evidence based and innovative, with attention

FOX CHASE REGISTERED
140,503
 OUTPATIENT VISITS AND
8,631
 NEW PATIENTS.





to the individual needs of every patient, supporting our nursing professionals and leaders, and further advancing the quality of care both at Fox Chase and throughout Temple University Health System," said **Robert Uzzo, MD, MBA, FACS**, Interim CEO of the Hospital at Fox Chase Cancer Center.

Before coming to Fox Chase, Rodriguez served for nearly five years as associate nursing officer at Vanderbilt University Medical Center and Vanderbilt-Ingram Cancer Center in Nashville, Tennessee. Vanderbilt is a

top National Cancer Institute-designated comprehensive cancer center.

FOX CHASE RECEIVES GUARDIAN OF EXCELLENCE AWARD

Press Ganey has recognized Fox Chase Cancer Center with its 2020 Guardian of Excellence Award for providing outstanding clinical performance for patients in its outpatient clinics.

Press Ganey is an independent market leader in helping healthcare institutions measure patient satisfaction and better understand the

patient experience. "This kind of recognition is meaningful because it originates from feedback provided by our own patients," said **Robert Uzzo, MD, MBA, FACS**, Interim CEO of the Hospital at Fox Chase Cancer Center.

Performance data comes from the Clinician and Group Consumer Assessment of Healthcare Providers and Systems survey, which is administered by the U.S. Department of Health and Human Services through its Agency for Healthcare Research and Quality.

BONE MARROW TRANSPLANT DEPARTMENT RECOGNIZED FOR EXCEPTIONAL SURVIVAL OUTCOMES

The Fox Chase-Temple University Hospital Department of Bone Marrow Transplant and Cellular Therapies was recently recognized for exceptional performance in successful transplant procedures, making it the second year in a row that the center has achieved this distinction.

Each year, the Center for International Blood & Marrow Transplant Research (CIBMTR) performs a center-specific survival analysis providing one-year survival rates among 170 centers in the United States. The report contains outcomes for transplants using both related and unrelated donors.

The CIBMTR identified Fox Chase as having some of the best survival outcomes, a distinction it shares with only 16 other centers across the nation. Fox Chase is the only center in the tristate area listed for two years in a row.

Henry Chi Hang Fung, MD, FACP, FRCPE, chair of the department, said the honor is due to several essential factors, including strong program leadership, an expert multidisciplinary team, and close collaboration with community physicians.



A DEDICATED GROUP OF
277
VOLUNTEERS DONATED
67,034
HOURS OF SERVICE.

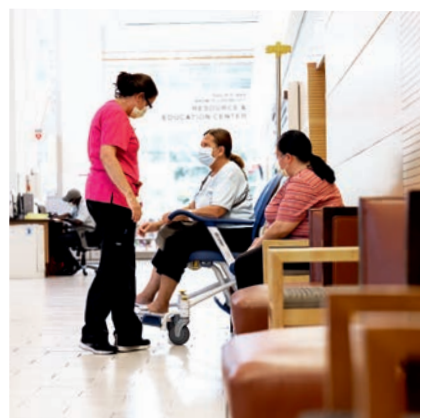
NURSES HONORED WITH PRESTIGIOUS 'I AM PATIENT SAFETY' ACHIEVEMENT AWARD

A nursing team was honored as a recipient of the 2021 I AM Patient Safety award from the Patient Safety Authority. The team was awarded the Executive Director's Choice award, making it one of 11 healthcare facilities in Pennsylvania to be recognized for their advancements, outcomes, and commitment to patient safety.

The third floor surgical nursing team was recognized for reaching the significant milestone of one year with

no patient falls on their three south unit. This milestone supports the nursing department's Zero Harm program, a patient safety initiative that focuses on limiting preventable harm in the healthcare environment.

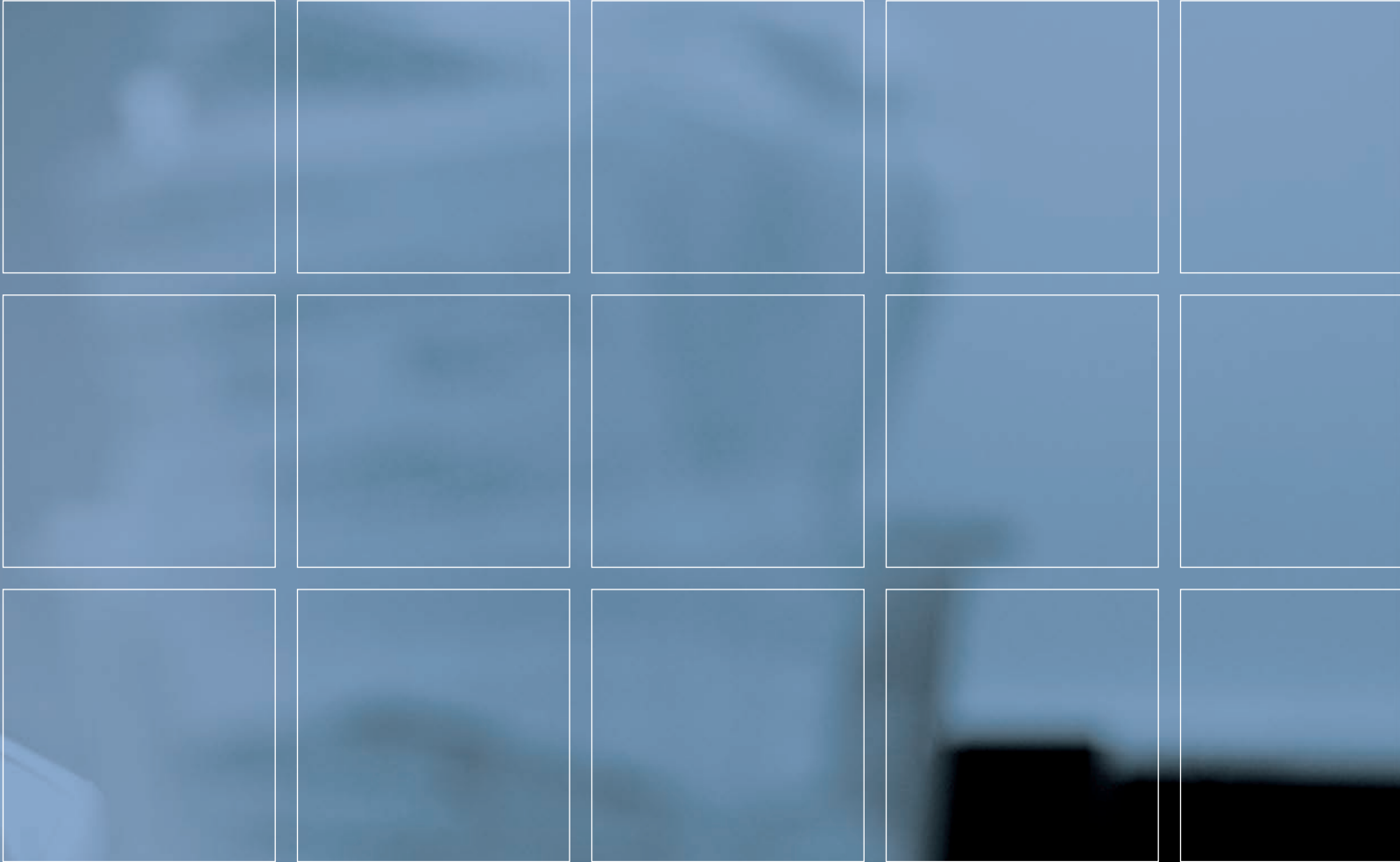
"We are so proud of this Magnet team and their leaders for their commitment to target zero patient harm. That quest and dedication led to the achievement of no patient falls for one year and well-deserved statewide recognition," said **Kathleen Wolf**, Magnet Program/Nursing Quality Director.



TOMASZ SKORSKI, MD,
PHD, DSC, HAS DUAL
APPOINTMENTS
AT TEMPLE AND
FOX CHASE, WHERE
HE IS AN ASSOCIATE
DIRECTOR.







Clinical

CLINICAL TRIALS PAVE THE WAY FOR LIFE-CHANGING TREATMENT

Clinical trials are the method that doctors use to develop and bring new drugs to patients. Phase 1 cancer therapy trials are the first step in that process. Clinical trials are one of the most important stepping-stones on the path to finding new treatment methods and options for patients with cancer.

"Sometimes these trials are your last hope," said **Stephanie Heart**, a malignant melanoma patient who was treated at Fox Chase with a cutting-edge drug that was tested in a clinical trial. Although she did not participate in that trial, she ultimately benefitted from it.

Fox Chase Cancer Center is one of few institutions in the Philadelphia area that conducts these essential trials for patients with cancer. Fox Chase conducts hundreds of clinical trials a year, including studies that involve giving patients treatment for their disease and non-interventional studies that are lab-based or observational. Many of these trials, particularly those that

make it to the later stages, have helped patients live longer and have a higher quality of life.

Fox Chase is very active in clinical trials, with 121 intervention/treatment studies presently accepting patients in phases 1, 2, and 3. There are also over 100 non-interventional studies currently ongoing.

"This institution has pioneered a number of major drugs going back decades, including drugs like Taxol," which was approved for use in 1993, said **Martin Edelman, MD**, chair of the Department of Hematology/Oncology at Fox Chase and Deputy Cancer Center Director for Clinical Research.

"More recently, we were involved in many of the targeted agents, and most recently, immunotherapeutics. As one of my colleagues put it, 'In general, patients at Fox Chase have the potential to get one of these drugs years before it becomes available to the general public.'"

Anthony Olszanski, MD, RPh, a medical oncologist at Fox Chase and director of the Early Clinical Drug Development Phase 1 Program, said that despite their benefit, there is a lot of misinformation about clinical trials.

"Sometimes patients' family members will talk patients out of participating in them, not fully understanding why the research was offered. They often misunderstand the amount of care they will get in a clinical trial. Most guidelines like the National Comprehensive Cancer Network guidelines actually state that the best way to receive cancer care is through a clinical trial."

In addition, Olszanski said, it is important for patients and their families to recognize that all clinical trials are completely voluntary. "That means a patient can sign up for a clinical trial but decide not to participate in the clinical trial at any point. They can stop doing it at any point in time if they get uncomfortable about it, if they have side effects because of the drug, or if some other life-changing event happens. Participation is always in the patient's control."

ACTIVELY ENROLLING
CLINICAL RESEARCH
STUDIES:

294.



HOLISTIC APPROACHES TO GERIATRIC ONCOLOGY

There is nothing standard about caring for the oldest cancer population in the United States. Cancer care can be complicated, and treatment can become even more complex as patients age. Geriatric oncology is an area of medicine that considers the best ways to treat such patients.

**ANTHONY OLSZANSKI,
MD, RPH, IS A MEDICAL
ONCOLOGIST AND
DIRECTOR OF THE EARLY
CLINICAL DRUG
DEVELOPMENT PHASE 1
PROGRAM.**



Experts in the field say physicians need to look at older patients more holistically by considering not just how to treat their cancer, but also other factors such as comorbidities like diabetes and heart disease, as well as their cognitive function and social environment. Researchers say they also hope to advance the field by obtaining more clinical data specific to the care of older adults with cancer.

Perhaps no one is more familiar with these needs than **Efrat Dotan, MD**, a medical oncologist at Fox Chase specializing in gastrointestinal cancers. Dotan has been working in geriatric oncology since 2010 and has been at the forefront of researching and developing new ways of thinking about the field.

"Medical oncology is an art. There's no one treatment that fits all," said Dotan. "The way to think about this is that we have to look at the patient in front of us and understand their



INVESTIGATOR-INITIATED
CLINICAL RESEARCH
STUDIES:

91.

overall goals and ability to tolerate therapy as we develop a personalized treatment plan."

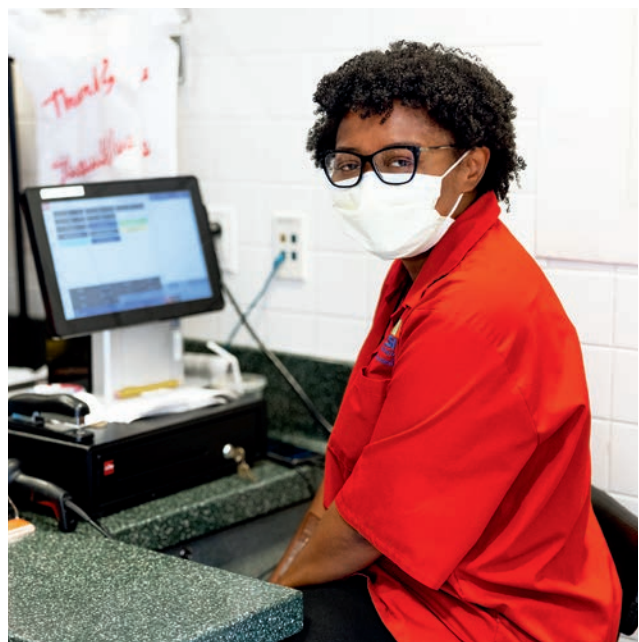
**OFFERING CUTTING-EDGE
CELLULAR THERAPIES**

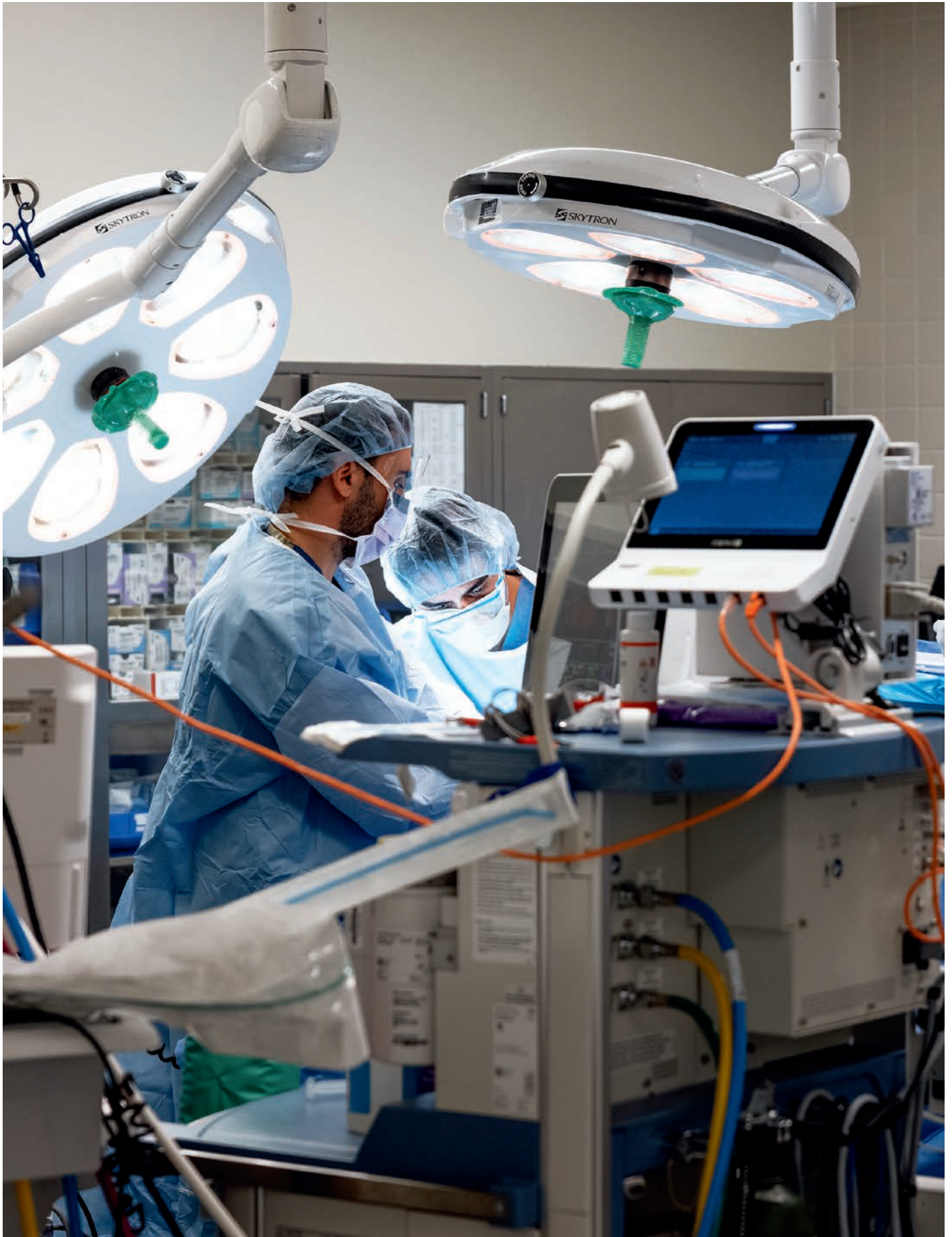
Fox Chase's Department of Bone Marrow Transplant and Cellular Therapies, which is chaired by **Henry Chi Hang Fung, MD, FACP, FRCPE**, is now certified to offer five cellular

therapy options for patients with blood cancers, changing the outlook for these patients. In these therapies, a patient's T cells are collected and modified to fight cancer before being infused back into the patient's body.

The five cellular therapy options include:

- ABECMA: Approved to treat patients with relapsed or refractory multiple myeloma.







- BREYANZI: Approved to treat patients with relapsed or refractory large B cell lymphoma.
- KYMRIA: Approved to treat patients with relapsed or refractory large B cell lymphoma and patients ages 18 to 25 with relapsed or refractory B-cell acute lymphoblastic leukemia.

- TECARTUS: Approved to treat patients with relapsed or refractory mantle cell lymphoma.
- YESARTA: Approved in 2017 to treat patients with relapsed or refractory large B cell lymphoma and in 2021 for patients with relapsed or refractory lymphoma.

NEW SURGICAL NAVIGATION TECHNOLOGY FOR BREAST-CONSERVING SURGERIES

Fox Chase Cancer Center has become the first cancer center in the Northeast to feature a new tumor marker technology that has been described as the next generation of surgical navigation, one that will make breast excisional biopsies and breast-conserving surgeries more precise.

Breast surgeons have had few tools available to guide them in the removal of cancerous breast tissue, but with the EnVisio real-time Surgical Navigation System and SmartClip Tumor Marker technology, surgeons will be better able to navigate to the precise location of malignant breast tissue during a lumpectomy, significantly advancing breast care.

“The EnVisio navigation system is a step up from other technologies on the market for localization of tumors because it shows the tumor relative to the detector in three dimensions on a screen, making it easier for the surgeon to assess where the tumor is and how best to resect it,” said **Richard J. Bleicher, MD, FACS**, a professor in the Department of Surgical Oncology.

THE MOST COMMON TYPES OF CANCER AMONG PATIENTS TREATED AT FOX CHASE:

PROSTATE
(21%),
BREAST
(17%),
LUNG
(10%),
AND GYNECOLOGICAL
(8%).



“THIS INSTITUTION
HAS PIONEERED A
NUMBER OF MAJOR
DRUGS GOING BACK
DECADES, INCLUDING
DRUGS LIKE TAXOL.”

MARTIN EDELMAN, MD,
CHAIR OF HEMATOLOGY/
ONCOLOGY







Research

CENTER RECEIVES SPORE GRANTS FOR HEAD AND NECK CANCER RESEARCH COLLABORATION

Several researchers at Fox Chase Cancer Center have received grants through the National Institute of Dental and Craniofacial Research-funded Specialized Program of Research Excellence (SPORE) for Head and Neck Cancer.

Head and neck cancers are a group of malignancies that start in the lining of the mouth, throat, voice box, or nose. Mostly squamous cell carcinomas, they account for approximately 4% of all cancers in the United States and can require complex treatment, according to the National Cancer Institute.

A five-year, \$11.7 million grant will fund a SPORE collaboration among researchers at Fox Chase Cancer Center, Yale Cancer Center, and the University of North Carolina Lineberger Cancer Center to address obstacles in treating head and neck squamous cell carcinoma.

"It's an exciting opportunity to focus sustained effort on improving treatment for this devastating disease," said **Erica Golemis, PhD**, Deputy Chief Science

Officer and co-leader of the Molecular Therapeutics Program. Golemis co-leads one of the central projects supported by the SPORE with a collaborator at Yale, Barbara Burtness, MD, and is site director for Fox Chase.

"This collaborative project aims to develop a new therapy for patients that have resistance to normal forms of treatment for advanced head and neck cancer. As a SPORE project, it's designed fundamentally to connect insights in the labs directly to clinical trials taking place at Yale, Fox Chase, and Lineberger," Golemis added.

"SPORE grants are among the most prestigious awards bestowed by the National Institutes of Health and fund critical translational research by teams of basic scientists and clinical researchers," said **Jonathan Chernoff, MD, PhD**, Cancer Center Director. "Under the exceptional leadership of Dr. Golemis, we at Fox Chase are honored to collaborate with the other centers to bring about important treatment advances for patients with head and neck cancers."

The United States Congress established SPOREs to promote interdisciplinary research and help basic research findings move quickly from the laboratory to the patient. The grants are highly competitive. In order to earn one, institutions must demonstrate a high degree of collaboration between first-rate scientists and clinicians, and show excellence in translational research projects.

John A. "Drew" Ridge, MD, PhD, FACS, chief of the Division of Head and Neck Surgery, will play a key role in advising the research funded by the grant. Ridge has been at Fox Chase since 1991, when he came to join one of the country's first multispecialty head and neck cancer teams, and is a nationally recognized figure in the field.

Camille Ragin, PhD, MPH, a professor in the Cancer Prevention and Control Program, received competitive funding from the Developmental Research Program within the SPORE. The funding supports promising early stage projects that may develop into full projects. Ragin's study will focus on differences in cancer risk and disease course between Black and white populations, which is aligned with one of Ragin's research interests, disparities in cancer care for underserved patient populations.

Sanjeevani Arora, PhD, assistant professor in the Cancer Prevention and Control Program, also received a related grant from the SPORE's Career Enhancement Program Award program. Arora will receive a one-year grant of \$50,000 and eligibility for a second year of funding to support development of

FOX CHASE RECEIVED A FIVE-YEAR,
\$11.7 Million
GRANT TO FUND RESEARCH
INTO HEAD AND NECK CANCERS.



DISPARITIES IN CANCER CARE FOR UNDERSERVED POPULATIONS IS ONE AREA OF RESEARCH FOR **CAMILLE RAGIN, PHD, MPH**, OF THE CANCER PREVENTION AND CONTROL PROGRAM.



Research

new research directions that enhance head and neck cancer prognosis. Golemis will be Arora's primary mentor on this research.

Other Fox Chase faculty participating in the SPORE research include **Eric Ross, PhD, ScM**; **Denise Connolly, PhD**; and **Douglas Flieder, MD**.



RESEARCHERS HAD
526
SCIENTIFIC ARTICLES
PUBLISHED.

NEW CANCER EPIGENETICS INSTITUTE LAUNCHED

Fox Chase Cancer Center has launched a new Cancer Epigenetics Institute (CEI) that will create a locally based national hub for epigenetics study and collaboration focused on mechanisms promoting cancer and therapeutic resistance.

Epigenetics is the study of how modifications to DNA and the environment surrounding DNA impact the way genes are expressed and the stability of DNA without changing its sequence. In cancer research, epigenetics is used to understand how cancer cells react to their environments and discover ways to control those reactions.

The mission for the new CEI is to facilitate academic-to-industry and academic-to-academic partnerships

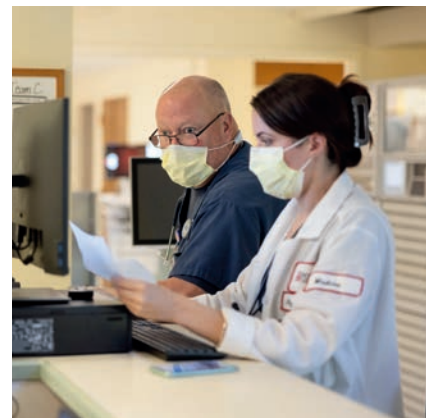
with the goal of promoting discovery in cancer epigenetics. The aim of those discovery efforts is to reduce the morbidity and mortality associated with cancer by focusing on biomarker research and therapeutic interventions.

"The benefit of the new institute is that it increases the focus on epigenetic mechanisms driving cancer and helps facilitate center-wide collaborations," said **Johnathan R. Whetstine, PhD**, founding director of the institute, who is also a professor and co-program leader for the Cancer Signaling and Epigenetics Program.

RESEARCHER RECEIVES 2020 NIH DIRECTOR'S NEW INNOVATOR AWARD

Joan Font-Burgada, PhD, an assistant professor in the Cancer Signaling and Epigenetics Program, has received a National Institutes of Health (NIH) Director's New Innovator Award from the NIH Common Fund.

"I am really grateful to the NIH for promoting the High-Risk, High-Reward Research program and supporting early stage investigators like myself. This initiative encourages us to be imaginative and bold in tackling unsolved biomedical issues," said Font-Burgada.





His research focuses on cancer metastasis, which is the direct cause of over 90% of cancer deaths. Historically, research has focused on determining specific properties of the metastatic cells that could be used to develop therapies. This approach has become unattainable because of the high genetic diversity of metastatic cells, resulting in multiple “unique” tumors in a single patient.

Font-Burgada proposes switching the spotlight from metastatic cells to the so-called metastasis-interacting resident cells. If successful, this

approach could result in effective treatments for many patients regardless of cancer type, with the additional benefit of reduced resistance, since the cells being targeted are not cancer cells and therefore devoid of escape strategies.

ROLE OF LIPIDS IN CONTROLLING PANCREATIC CANCER AGGRESSIVENESS

Altering lipid metabolism may contribute to sustaining tumor growth in patients with pancreatic ductal adenocarcinoma, a finding that could

help overcome a major problem in pancreatic cancer treatment resistance and metastatic spread.

“The initial assumption was that if we block biosynthesis of cholesterol in cancer cells, that should prevent cancer development,” said Igor Astsaturov, MD, PhD, of the Department of Hematology/Oncology, the lead author of the study, which was a complex, multifaceted investigation involving a number of Fox Chase Cancer Center researchers. The study was published in the prestigious journal *Cancer Cell*.

But they were not able to prove the hypothesis, he said. "Working collaboratively, we found, quite disturbingly, that patients who take statins and have a lower level of blood cholesterol have a higher prevalence of the EMT cells in their tumors," Astsaturov said. EMT stands for epithelial-mesenchymal transition, which is the hallmark feature of a subtype of pancreatic cancer known as basal.

He added that researchers are now beginning to look at a larger collection of human samples to determine how blood lipids correlate with a patients' nutrition, medicines they are taking, and the percentage of EMT cells in their tumors.



A TOTAL OF
479
RESEARCH PROJECTS WITH
\$72 Million
IN TOTAL COSTS RECEIVED FUNDING.

'DORMANCY' IN AML ALLOWS CANCER CELL SURVIVAL

A study has helped to identify a cellular resilience mechanism through which acute myeloid leukemia (AML) cells survive cancer treatment, causing disease relapse. The research also suggests that certain drugs could be used to destroy these treatment-surviving AML cells.

Cihangir Duy, PhD, assistant professor in the Cancer Signaling and Epigenetics Program at Fox Chase, who led the study, had observed in earlier research that AML cells enter a senescent state in response to chemotherapy that has the potential to re-initiate leukemia. Senescence, another word for cellular aging, is the point at which cells lose their ability to divide and grow.

Past studies suggested that AML relapse was caused by the presence of inherently more resistant leukemia stem cells. Instead, Duy and colleagues found that when patient-derived AML cells were treated with chemotherapy, many cells died, but a fraction survived, regardless of whether they were

leukemia stem cells. These residual cells were large, stopped growing, and showed markers of cellular senescence.

Temporarily entering this senescence-like phase allows AML cells to endure chemotherapy; subsequently, these protected AML cells awaken and are able to begin dividing again.

NEW TARGET COULD STARVE CANCER AND ACTIVATE IMMUNE SYSTEM

Researchers identified a new biomarker and potential novel treatment target for pancreatic ductal adenocarcinoma (PDAC) that could help starve cancer cells and allow the immune system to attack tumors.

The target is a brain synaptic protein called Netrin G1 (NetG1), which was found to be ectopically expressed in the fibroblastic cells of the pancreas and also found to have a dual role in supporting PDAC survival. The role of NetG1 was discovered in the lab of **Edna Cukierman, PhD**, a professor in the Cancer Signaling and Epigenetics Program.

"It is difficult for the pancreatic cancer cells to get nutrition," Cukierman said. "When we got rid of the NetG1 protein in cancer-associated fibroblasts, the cells looked the same but stopped providing nutritional benefit to the cancer cells."

The researchers also found that NetG1-positive cancer-associated fibroblasts are intrinsically immunosuppressive and prevent the immune system from attacking cancer cells. The study was published in the prestigious journal *Cancer Discovery*.

Most importantly, Cukierman and colleagues used an antibody to neutralize NetG1 in an animal model. This antibody helped kill the tumor and showed evidence of reactivation of the immune system to effectively stall tumor progression.

"In pancreatic cancer we have been hungry for something that could help us to rehabilitate the immune system to be able to kill cancer," Cukierman said. "This paper proposes a new target to awaken the immune system while starving cancer cells at the same time."







Philanthropy

PHILANTHROPY FUNDS ENDOMETRIAL CANCER RESEARCH

Research at Fox Chase Cancer Center is fundamental in the discovery and implementation of new and effective cancer treatments. Much of this research, however, would not be possible without help from organizations whose goals align with the mission of Fox Chase.

For some organizations, like Peggy's Pathway for Women's Cancer Care, the work being done at Fox Chase has sparked inspiration to aid in the development of new therapies that could potentially help patients with few options.

Peggy's Pathway was started in honor of former Fox Chase patient **Peggy Pettinato**, a bookkeeper, real estate agent, and avid community volunteer who passed away from serous endometrial carcinoma. **Natalie O'Hara**, Peggy's daughter and one of the founders of Peggy's Pathway, began searching for organizations that fund endometrial cancer research. To her surprise, there were not many to choose from.

As a result, O'Hara's father, **Bob Pettinato**, began speaking with **Gina M.**

Mantia-SmalDONE, MD, associate professor in the Department of Surgical Oncology, about raising money for endometrial cancer research along with O'Hara, her three siblings, and their spouses.

"Dr. Gina treated my mother's endometrial cancer. Despite her best efforts, the standard treatment protocol of the time was not able to save my mother's life," said O'Hara. "During the course of her treatments, my parents grew close to Dr. Gina and came to rely on her."

Mantia-SmalDONE worked with **James S. Duncan, PhD**, an associate professor in the Cancer Signaling and Epigenetics Program, to develop a proposal for the initial phase of research that ultimately became the project for Peggy's Pathway.

Using a technology called multiplexed inhibitor beads and mass spectrometry, Duncan and other researchers profiled the kinome of endometrial tumors and normal endometrial tissues and identified a network of kinases that were overexpressed, including serine/arginine-rich splicing

factor kinase 1 (SRPK1). Duncan and colleagues are planning to further explore how SRPK1 works by applying proteomic technology.

"This project really sums up the concept of a lot of the work that Fox Chase is trying to do when it comes to research," Duncan said. "Peggy's Pathway selected our project for funding because they thought our approach of looking at kinase signaling looked interesting, and, as a result, we have found something that may be actionable."

Peggy's Pathway now has the goal of raising at least \$200,000 over the next two years to fund some of this research at Fox Chase. Because of COVID-19, they had to cancel their annual fundraisers in 2020 and 2021, but they are planning to hold one in 2022. The Pettinato's 12 grandchildren pitch in by helping with fundraisers.

"We see the role of Peggy's Pathway for Women's Cancer Care as that of a seed or catalyst to get the research far enough along that it becomes viable for a larger funding source to bring it to fruition," said Bob Pettinato. "Our goal here is to save women's lives by creating an innovative treatment to successfully treat the serous endometrial carcinomas that can't be eliminated by current protocols."

FOX CHASE PHILANTHROPY GOING STRONG

Despite the challenge of operating amid the pandemic, the Institutional Advancement team, the philanthropic arm of Fox Chase Cancer Center, had many noteworthy accomplishments. Below are a few highlights from the past fiscal year:

THE 7TH ANNUAL *IN VINO VITA* BENEFIT AND WINE AUCTION RAISED MORE THAN

\$700,000

IN SUPPORT OF CANCER RESEARCH.





PEGGY'S PATHWAY
WAS STARTED IN
HONOR OF FORMER
FOX CHASE PATIENT
PEGGY PETTINATO
BY HER HUSBAND,
BOB PETTINATO,
AND HER DAUGHTER,
NATALIE O'HARA.

Philanthropy

- Fox Chase again exceeded its annual fundraising goal by raising nearly \$17 million, enabling new and expanded programs and services, and more cancer research.

- Although spending time together in person is certainly preferable, Institutional Advancement has become adept at producing high quality virtual and hybrid events. In addition to *In Vino Vita*, Fox Chase's signature fundraising event, the team held a month-long virtual version of Paws for the Cause, the annual Tree of Life lighting ceremony, and a President's Reception for members of the Laurel Society. It also produced several educational programs on a variety of cancers as part of the popular "Together Facing" series.

- Longtime supporters **Lauren and Don Morel** made a commitment of \$1.2 million to fund early-stage cancer research.

- Fox Chase's Teen Research Internship Program is now eligible for support through the Pennsylvania Educational Improvement Tax Credit (EITC) program. EITC status allows businesses to receive a significant reduction in state tax in exchange for supporting this innovative educational program. For more information, contact giving@fcc.edu.

IN VINO VITA RAISES MORE THAN \$700,000

Fox Chase Cancer Center presented its signature fundraising event, *In Vino Vita*, on October 2, 2020. The seventh annual event was held virtually for the first time and raised over \$700,000 for cancer research at Fox Chase.

Each year, *In Vino Vita*, which is usually held in Center City Philadelphia, has featured live music, a multicourse dinner, and an auction of high-end wine and related experiences. This year, guests were invited to participate from home. The online event still included entertainment, as well as live and silent auctions where the highest bidder could win experiences from top winemaking talent.

As in previous years, the event featured the Special Pledge as the highlight of the evening. The purpose of the pledge is to focus fundraising efforts on a significant opportunity that will directly impact the future of cancer research, treatment, and care at Fox Chase.

This year's pledge focused on funding young investigators in cancer research with the goal of providing resources to young researchers who are poised to make breakthroughs. The funding will enable them to pursue original research,

earn advanced degrees, and collaborate with their peers in an environment where competition for funding is extremely fierce and opportunities are limited. Of the \$700,000 raised this year during *In Vino Vita*, \$400,000 was for the Special Pledge.

PAWS FOR THE CAUSE A VIRTUAL EXPERIENCE IN 2020

Although attendees could not gather at Fox Chase Cancer Center for the 21st annual Paws for the Cause dog walk, the event's new virtual format offered the opportunity for participants to connect and walk together virtually, creating a spirit of warmth and camaraderie throughout the month-long October celebration.

Thanks to 341 donors and sponsorship support led by title sponsor West Pharmaceutical Services Inc., Paws raised more than \$131,000 in support of cancer research.

Hosted by the center's Board of Associates, the event highlights included a kickoff "Pup Rally" video featuring emcee **Sue Serio** from Fox 29 and her dog Rufus, remarks from senior leadership, Physician and Patient Ambassadors, and more.



MONEY RAISED BY
PEGGY'S PATHWAY
FUNDED RESEARCH INTO
KINASE SIGNALING BY
JAMES S. DUNCAN, PHD,
OF THE CANCER
SIGNALING AND
EPIGENETICS
PROGRAM.



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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*Deceased

Financials

2021 By the Numbers

526

Scientific Publications

140,503

Outpatient Visits

8,631

New Patients

14

New Faculty Members

Philanthropy Snapshot

\$16,800,060

Total Philanthropic Support

\$700,000

Raised at *In Vino Vita*

\$400,000

In Vino Vita Money That Will Go to Pilot Research Funding

11,073

Total Donors

4,054

Total New Donors

764

Current Donors Who Have Given 30+ years

\$367,408

Board of Associates Total Gifts

Numbers represent Fiscal Year 2021

Volunteer Snapshot

277

Volunteers

67,034

Total Volunteer Hours

\$235,432

Volunteer Department Budget

\$1,913,150

Value of Hours*

\$1,677,718

Net Value Added to Fox Chase

*Based upon the independent sector value of \$28.54/hr.

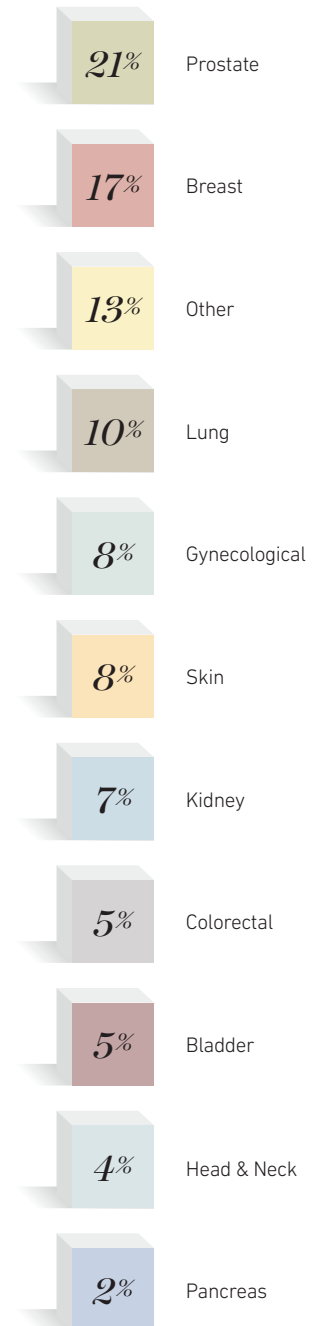


Actively Enrolling Clinical Research Studies



Investigator Initiated Clinical Research Studies

Types of Cancers Treated





Clinical Snapshot *(In Thousands)*

FY21

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

<i>Patient Care Revenue — Hospital</i>	\$506,960
<i>Patient Care Revenue — Physicians</i>	\$33,939
<i>Philanthropy, Outreach & Other</i>	\$15,676
Clinical Revenue	\$556,575

TEMPLE UNIVERSITY HEALTH SYSTEM CANCER SERVICE LINE OPERATING EXPENSES - CLINICAL ACTIVITY*

<i>Salaries & Benefits</i>	\$212,492
<i>Supplies & Pharmaceuticals</i>	\$185,479
<i>Purchased Services</i>	\$66,922
<i>Other Expenses</i>	\$13,939
Clinical Expenses	\$478,832

KEY PATIENT CARE STATISTICS

<i>New Patients</i>	8,631
<i>Hospital Admissions</i>	3,484
<i>Surgical Procedures</i>	4,940
<i>Chemotherapy Infusions & Related Procedures*</i>	39,643
<i>Radiation Therapy Treatments*</i>	33,344

*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

<i>Funding Source</i>	<i>Number of Projects</i>	<i>Direct Costs</i>	<i>Total Costs</i>
PEER-REVIEWED			
<i>NCI</i>	115	\$13,286,474	\$21,836,242
<i>Other NIH</i>	80	\$14,431,471	\$22,760,460
<i>Other</i>	35	\$3,859,410	\$5,590,244
<i>Subtotal of peer-reviewed</i>	230	\$31,577,555	\$50,186,946
NON PEER-REVIEWED			
<i>Industry</i>	203	\$13,040,739	\$17,262,687
<i>Other non peer-reviewed</i>	46	\$3,616,616	\$4,237,047
<i>Subtotal of non peer-reviewed</i>	249	\$16,657,355	\$21,499,734
GRAND TOTAL	479	\$48,234,910	\$71,686,680

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Interim CEO of the Hospital at
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- 1 Newly promoted faculty at Fox Chase Cancer Center
- 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

*Deceased



The Annual Report is produced by the Communications Department of Fox Chase Cancer Center. Contact us at editor@fcc.edu.

Temple Health refers to the health, education and research activities carried out by the affiliates of Temple University Health System (TUHS) and by The Lewis Katz School Temple University School of Medicine. TUHS neither provides nor controls the provision of health care. All health care is provided by its member organizations or independent health care providers affiliated with TUHS member organizations. Each TUHS member organization is owned and operated pursuant to its governing documents.

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