LEWIS KATZ SCHOOL OF MEDICINE AT TEMPLE UNIVERSITY | TEMPLE UNIVERSITY HEALTH SYSTEM

Temple Health Magazine

SUMMER 2018

Rare Air

Temple Lung Center:
Tough Cases, Exceptional Options

QUERY THEORY
A TRIBUTE TO
BEATRICE MINTZ, PHD

IN SICKNESS & IN HEALTH
MEDICAL STUDENTS
COMMIT TO
COMMUNICATION

TEMPLE HEALTH

The Anatomy of Reputation

An organization's reputation is affected by many things. Three recent Temple Health examples:

The United Network for Organ Sharing has announced that Temple performs more lung transplants than any other center in the United States; *U.S. News & World Report* counts Temple Health's Fox Chase Cancer Center and Lewis Katz School of Medicine among the nation's best; and the American Heart Association has recognized Temple's Walter Koch, PhD, with its highest national honors for basic research.

Accomplishments like these elevate Temple's name.

But what about the Temple medical students who saved the life of a man at a homeless shelter in Philadelphia earlier this year? Their altruistic (and, might I add, clinically impeccable) actions are no less important.

To a greater extent than we might imagine, the thoughtful, sometimes heroic, and mostly unsung things that students and faculty do every day define the reputations of our nation's medical schools and teaching hospitals.

National awards and ratings are just part of the reputational equation.

Like heartbeat and respiration, reputation moves in human time. It rises and falls with every gesture of the human heart and human brain.

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Senior Executive Vice President for Health Affairs, Temple University
The Lewis Katz Dean at the School of Medicine
Professor of Surgery, Lewis Katz School of Medicine
President & CEO, Temple University Health System

HEALTH SCIENCE CAMPUS: JOSEPH V. LABOLITO; KAISER: COURTESY KAISER

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13th IDBF WORLD DRAGON BOAT RACING CHAMPIONSHIPS

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ON THE COVER: The rare air of advanced expertise. That's what thousands of patients with advanced lung disease seek at Temple every year. Photo illustration by Ann Cutting.

OPPOSITE: TOMMY LEONARDI; THIS PAGE, TOP: CLINT BLOWERS; BOTTOM LEFT: DAN BEJAR; BOTTOM RIGHT: SIMON PRADES

CURRENTS

Alzheimer's Update

Can extra-virgin olive oil preserve memory and protect the brain against Alzheimer's? According to research done at Temple, it can.

In a laboratory study led by Domenico Praticò, MD, the Scott Richards North Star Foundation Chair in Alzheimer's Research at Temple, extra-virgin olive oil reduced the formation of amyloid-beta plaque and neurofibrillary tangles in the brain, classic markers of Alzheimer's disease. The study, published online in the *Annals of Clinical and Translational Neurology*, received global media attention from *Newsweek* magazine, *USA Today*, Yahoo!, the *Daily Mail*, and the *Philadelphia Inquirer*.

Two other Praticò Alzheimer's studies attracted widespread attention, too. One was the first to demonstrate the ability of a substance called PD146176 to reverse well-established cognitive decline and neuropathology. "In this exciting new study, the authors provide support for a new experimental treatment approach that works by helping nerve cells digest toxic proteins that might otherwise cause cell death," said John Krystal, Editor of *Biological Psychiatry* and Chair of the Department of Psychiatry at the Yale University School of Medicine.

In another study, published online in *Translational Psychiatry*, Praticò was the first to elucidate several mechanisms involved in declining glucose levels in the brain, a classic trait of Alzheimer's. This study was also the first to identify a brain protein called p38 as a potential drug target in the treatment of Alzheimer's.

Photograph by CLINT BLOWERS

HIV Cure in Sight

The gene-editing company Excision Biotherapeutics, spun out of the Lewis Katz School of Medicine at Temple University, has secured $10 million in venture capital funding to continue to seek a cure for HIV. The announcement was covered by various media outlets, including the *Wall Street Journal* and the *Philadelphia Business Journal*.

Due to the virus's ability to hide away in latent reservoirs, a permanent cure for HIV infection has remained elusive. But in 2017, using a powerful gene-editing technology known as CRISPR/Cas9, scientists at Temple and the University of Pittsburgh became the first to excise HIV DNA from the genomes of living animals to eliminate further viral replication.

The research, reported by media outlets around the world and funded in part by NIH, marks a major step forward in the pursuit of a permanent cure for HIV infection. "Our eventual goal is a clinical trial in human patients," says Kamel Khalili, PhD, Chair of the Department of Neuroscience, Director of the Center for Neurovirology, and Director of the Comprehensive Neuro-AIDS Center at Temple.

Khalili led the work in collaboration with Wenhui Hu, MD, PhD (now Associate Professor in Temple's Center for Metabolic Disease Research), and Won-Bin Young, PhD, who was at the University of Pittsburgh at the time of the research and is now on the Temple Neuroscience faculty.

CLINT BLOWERS

Forensic Files

"When a young, seemingly healthy person dies suddenly, we can often determine the cause through DNA testing," says Glenn Gerhard, MD, Chair of Medical Genetics and Molecular Biochemistry at Temple. "Often, we'll find a genetic heart condition that was never diagnosed."

To this end, Sam P. Gulino, MD, Chief Medical Examiner of the Philadelphia Medical Examiner's Office, has partnered with Temple's Cardiac Genetics Program.

"Genetic testing can provide answers. It can also help prevent another loss in the family — enabling siblings of the deceased to be tested and treated for any genetic anomalies found," says Joshua Cooper, MD, Professor of Medicine in the Section of Cardiology.

Regional medical examiners call upon Temple's Arthur Washburn, PhD, too. Trained in physical anthropology, the Associate Professor of Anatomy and Cell Biology has been consulting in forensics since 1991. He's consulted on numerous cases involving the excavation and skeletal analysis of human remains.

Rankings on the Rise

"Temple's high rankings by *U.S. News and World Report*, *Princeton Review*, *MONEY*, *Washington Monthly*, and other purveyors of higher education send a clear message: Temple University and its graduates continue to rise," says Larry R. Kaiser, MD, FACS, Temple Health's CEO.

Temple earned places on lists such as "Northeastern Regional Best Colleges," "Great Schools," "Most Active Student Government," "Top 'Green' Colleges," "Best Colleges for Your Money," and dozens more. *Kiplinger's Personal Finance* recognized Temple as one of the 100 best values among public colleges and universities nationwide.

In the 2018 *U.S. News and World Report* "Best Global Universities" edition, Temple earned all-time highs in numerous disciplines, including clinical medicine and public health.

Diet and Drift

For nearly a century, we've known that calorie restriction lengthens lifespan. But no one understood why until 2017, when research at Temple revealed that the mechanism is an epigenetic one — in other words, it's related to nongenetic influences on gene expression, notably the process of DNA methylation. Methylation alters how DNA is read by the cell, influencing whether a gene is turned on or off.

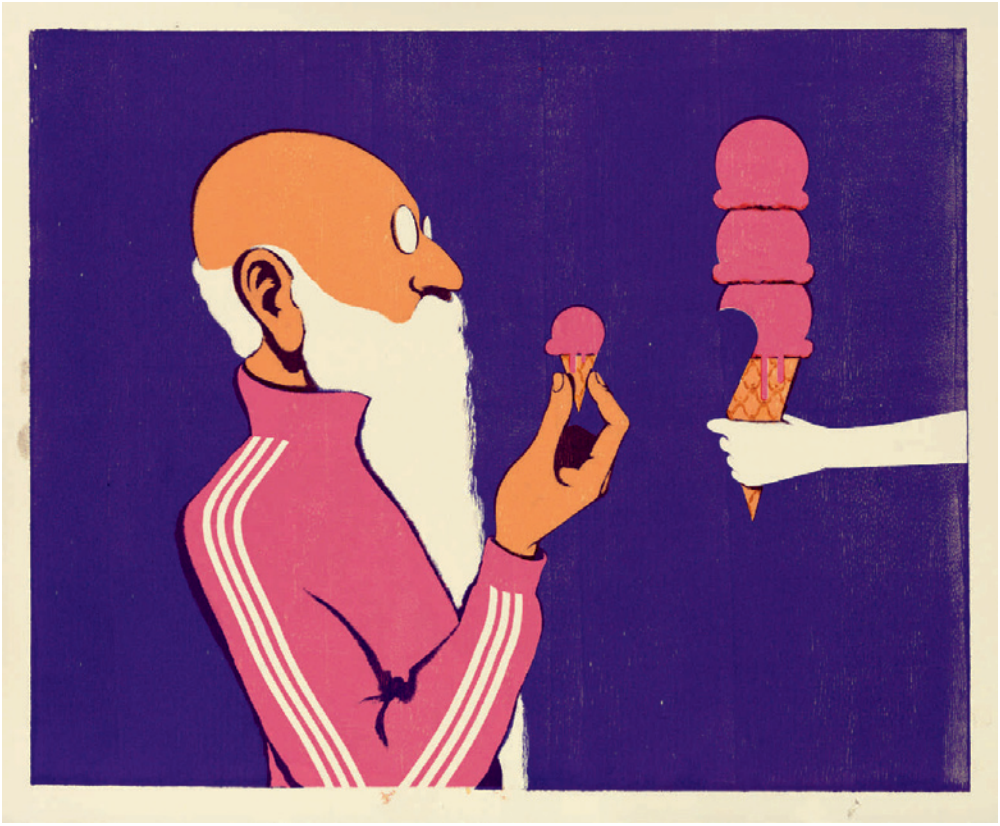
The research, published last fall in *Nature Communications*, shows that the speed of epigenetic change (or drift) occurs more rapidly in mice than in monkeys — and more rapidly in monkeys than in humans, "explaining why mice live only about two to three years, rhesus monkeys about 25 years, and humans 70 or 80 years," says Jean-Pierre Issa, MD, Director of the Fels Institute for Cancer Research, senior investigator.

Issa and team are the first to document that the greater the epigenetic change — and the more quickly it occurs — the shorter a species' lifespan. The team demonstrated that epigenetic drift can be slowed, via calorie restriction, to increase lifespan. Cutting calorie intake by 40 percent in young mice and by 30 percent in middle-aged monkeys significantly reduced epigenetic drift in both species. In fact, the methylation-related changes in old animals on calorie-restricted diets were comparable to those of young animals.

"Thus we propose a new mechanism — the slowing of epigenetic drift — to explain how calorie restriction prolongs life in animals," Issa says.

Greater amounts of epigenetic drift increase the risk of age-related diseases, including cancer. Therefore, the findings have important implications. "We believe that modifying epigenetic drift will modify disease risk," says Issa.

This research, a collaboration with the University of Texas MD Anderson Cancer Center, the Wisconsin National Primate Research Center, and the University of Wisconsin, was funded in part by National Institutes of Health and the Ellison Medical Foundation.



DAN BEJAR

Five Fellows

Jonathan Chernoff, MD, PhD, Chief Scientific Officer and the Stanley P. Reimann Chair in Oncology Research at Fox Chase Cancer Center, has been named a Fellow of the American Association for the Advancement of Science.

Eric Horwitz, MD, FABS, FASTRO, Chair, Radiation Oncology at Fox Chase Cancer Center, has been named a Fellow of the American Society for Radiation Oncology.

Nausheen Jamal, MD, Assistant Professor of Otolaryngology-Head and Neck Surgery, and **Miriam Lango, MD, FACS**, Associate Professor of Surgical Oncology and Otolaryngology, have been named Fellows of the Triological Society.

Eric Tetzlaff, MHS, PA-C, a Physician Assistant at Fox Chase Cancer Center, has been named a Distinguished Fellow of the American Academy of Physician Assistants.

Top Nurses

Cindy Blank-Reid, RN, MSN, CEN, Trauma Clinical Nurse Specialist at Temple University Hospital, has been named President of the international Society of Trauma Nurses.

Elizabeth Craig, DNP, CRNP, FACHE, Chief Nurse Executive and Vice President at Temple University Hospital, and **Elizabeth Menschner, RN, MAS, MSN, NEA-BC**, Associate Chief Nurse Officer, were named "60+ Hospital and Health System CNOs to Know" by *Becker's Hospital Review*.

Sound the Siren

The NIH has established a national clinical trials network aimed at improving patient outcomes in emergency care. It's called SIREN (Strategies to Innovate emeRgENcy care). As one of 11 clinical hubs in the U.S. to be selected for SIREN, Temple will coordinate the efforts of a large group of emergency medical systems throughout Pennsylvania and New Jersey.

"SIREN is covering all areas of emergency research, from the most critical, such as heart attack and traumatic brain injury, to chronic conditions such as asthma and migraine headache — conditions that frequently lead people to emergency departments," says Nina Gentile, MD, Professor of Emergency Medicine and lead physician for Temple's participation in the network. Gentile says SIREN has the potential to improve emergency medicine practices nationwide.

Temple is a tertiary care, level-1 trauma center that averages more than 127,000 emergency visits yearly. SIREN includes Massachusetts General Hospital, Boston, and the University of California, Los Angeles.

$110.4
MILLION
IN NIH FUNDING
TO THE LEWIS KATZ
SCHOOL OF
MEDICINE, 2017

COLIN LENTON

Concetta Greenberg

Transformational Gift

The largest private donation in Fox Chase Cancer Center's history — made by Philadelphia philanthropist Concetta "Chet" Greenberg — has established The Marvin and Concetta Greenberg Pancreatic Cancer Institute at Fox Chase Cancer Center.

"A longtime supporter, Chet Greenberg has already helped position Fox Chase as a definitive leader in pancreatic cancer research — a difficult, vitally important area of oncology," says Fox Chase CEO and President Richard I. Fisher, MD.

In 2008, she established The Marvin S. Greenberg, MD, Endowed Chair in Pancreatic Cancer Surgery, held by John Hoffman, MD, FACS. She's made other large donations benefitting pancreatic cancer as well — helping Fox Chase to achieve designation as a National Pancreas Foundation Center in 2016. And now, she's endowed The Marvin and Concetta Greenberg Pancreatic Cancer Institute — philanthropy that Fisher calls "transformational."

The Marvin and Concetta Greenberg Pancreatic Cancer Institute will be codirected by Igor Astsaturov, MD, PhD, and Edna Cukierman, PhD.

A clinician and researcher who treats pancreatic cancer and studies pancreatic cancer metabolism, Astsaturov is Associate Professor of Hematology/Oncology. Cukierman is Associate Professor and Co-Leader of the Pancreas Research Interest Group at Fox Chase. She is an expert in the tumor microenvironment.

Pancreatic cancer is expected to become the nation's second-leading cause of cancer death by 2023. Generally asymptomatic in early phases, it is typically diagnosed late. Therefore, The Greenberg Institute will focus on early detection — and on treatment strategies to alter the communication between the tumor and the molecular pathways promoting its development. The training of promising postdoctoral researchers in the field will also be integral to the Institute's mission, along with the establishment of national and international research collaborations.

Greenberg's gifts honor her late husband, Marvin S. Greenberg, MD (1920 - 2005), a dermatologist who helped patients, mentored young physicians, and loved his family.

You Can't Worm Out of It

Worms, thanks to Scott Rawls, PhD, are demonstrating the impact of addictive drug use to public school students in the middle-Atlantic states. Why worms (small aquatic flatworms called planarians, to be exact)?

"Just like humans, they have receptors for dopamine, a chemical in the brain's reward and pleasure system," says Rawls, Professor in the Department of Pharmacology and Temple's Center for Substance Abuse Research (CSAR).

During his school visits, Rawls has students soak the worms in alcohol, nicotine, caffeine, and other (legal) addictive substances — then watch as stimulants rile them up and depressants slow them down.

To demonstrate addictive behavior, Rawls places a piece of black paper under half of the petri dish that the worms live in. Flatworms prefer the dark. But if the drug is on the light side, that's where they'll go. "Going where one wouldn't normally go is classic drug-seeking behavior," Rawls explains.

Programs like DARE (Drug Abuse Resistance Education) urge kids to "just say no." Rawls's program offers a more powerful alternative. "We're *showing* students the effects of addiction," he says.

The program, the Science Education Against Drug Abuse Partnership, reaches students in grades 6 through 12 in more than 100 schools in the Mid-Atlantic region of the U.S. It is funded by the National Institutes of Health.

Back on Temple's campus, Rawls and 30 colleagues in the CSAR are working to elucidate the biological basis of drug addiction and the medical consequences of opioids, cannabinoids, psychostimulants, nicotine, alcohol, hallucinogens, and sedative-hypnotics.

"This work is essential to building strategies to prevent and treat addictions," says Ellen Unterwald, PhD, Director of the CSAR, one of 14 research centers in the nation designated a Core Center of Excellence by the National Institute on Drug Abuse.

Best Scan for Prostate Cancer

Fox Chase is the first in the Philadelphia region to offer a new imaging tracer for prostate cancer patients concerned about recurrence.

The diagnostic study, a PET scan, uses a new imaging agent, fluorine-18-labeled synthetic amino acid, to reveal elevated levels of amino acids in cancer cells — helping to identify the location of a cancer recurrence in men with elevated prostate-specific antigen (PSA) levels.

"This is the best scan available for prostate cancer," said Jian (Michael) Yu, MD, FACNM, FRCPC, Chief of Nuclear Medicine and PET at Fox Chase and Temple University Hospital.

Prostate cancer is the second-leading cause of cancer death in men in the United States. Approximately one in seven men will be diagnosed with the disease in their lifetime. Between 20 and 30 percent of treated men will experience a recurrence.

FOX CHASE CANCER CENTER IS ONE OF

8

IN THE U.S. TO RECEIVE THE ASSOCIATION OF COMMUNITY CANCER CENTERS INNOVATOR AWARD, 2017

BILL MAYER

Star Performance

Walter Koch, PhD, Director of Temple's Center for Translational Medicine, won the American Heart Association's prestigious Basic Research Prize, 2017. The national honor, recognizing "seminal contributions to basic cardiovascular research," lauds Koch for identifying novel molecular targets for treating heart failure. The William Wikoff Smith Chair in Cardiovascular Medicine and Chair of Pharmacology at Temple, Koch is an internationally recognized expert on GRK2 enzymes, the molecular signaling mechanisms of cardiac injury and repair, and cardiovascular gene transfer.

Tahseen Al Saleem, MD, a pathologist at Fox Chase Cancer Center, earned the Lifetime Achievement Award of the Iraqi Society of the United Kingdom.

Margaret Bellerjeau, MSN, RN, OCN, BMTCN, CHTC, has been honored with the 2018 Nursing Special Interest Group Lifetime Achievement Award of the American Society for Blood and Marrow Transplantation. Bellerjeau is the Bone Marrow Transplant Coordinator of the Fox Chase-Temple Bone Marrow Transplant Program.

Paul F. Engstrom, MD, FACP, Chief, General Hematology/Oncology, and Special Advisor to the President at Fox Chase Cancer Center, received the Prevent Cancer Foundation's Laurel Award for Lifetime Achievement. He has also been named a Lifetime Achiever by Marquis Who's Who.

Henry Fung, MD, FACP, FRCPE, received the Andy Talley Bone Marrow Foundation's inaugural Game Changer Award. Fung is Vice Chair of Hematology/Oncology and Director, Fox Chase-Temple Bone Marrow Transplant Program.

Lori J. Goldstein, MD, FASCO, Director of the Naomi and Phil Lippincott Breast Evaluation Center at Fox Chase Cancer Center, is one of 27 breast oncologists across the country recognized by *Forbes* as an exemplary physician in oncology.

JOSEPH V. LABOLITO

Larry R. Kaiser, MD, FACS, CEO of Temple Health, is recipient of several recent regional and national honors — among them, inclusion in *Modern Healthcare's* "50 Most Influential Physician Executives and Leaders" and *Becker's Hospital Review's* "Great Healthcare Leaders to Know."

Jean Kozempel, PT, DPT, Manager of Physical Medicine and Rehabilitation at Fox Chase Cancer Center, received the 2017 American Physical Therapy Association's Oncology Section President's Award. The award recognizes therapists considered pioneers in their practice areas.

Natalia Ortiz-Torrent, MD, FAPA, Associate Professor, Psychiatry, has been honored with the 2018 Hispanic Health Leadership Award of the National Hispanic Medical Association.

Domenico Praticò, MD, Professor of Pharmacology, Immunology and Microbiology, has been named the Scott Richards North Star Chair for Alzheimer's Research at the Lewis Katz School of Medicine.

Stephen Rubin, MD, Chief of Gynecologic Oncology at Fox Chase Cancer Center, was recognized with the American Cancer Society's 2017 Scientific Achievement Award (Philadelphia Chapter).

Elina Toskala, MD, PhD, MBA, Chief, Otolaryngology-Head and Neck Surgery at Jeanes Hospital, received the 2017 American Academy of Otolaryngic Allergy President's Award.

Robert G. Uzzo, MD, FACS, Chair of Surgical Oncology at Fox Chase Cancer Center, received the Society of Urologic Oncology's Distinguished Service Award.

Walter Koch, PhD

Got GERD? Get "Linxed"

Temple is offering a new option for patients with gastroesophageal reflux disease (GERD): a device called the Linx, a ring of tiny magnetic titanium beads that gently wraps around the muscle between the esophagus and stomach, the lower esophageal sphincter (LES).

A weak LES will allow gastric contents to reflux back into the esophagus, causing the burning pain of GERD. The Linx is designed to keep that from happening. When a patient swallows food or water, the device expands, allowing the bolus to enter the stomach. Then its magnetic beads gently come back together again, preventing stomach contents from re-entering the esophagus.

"The Linx is implanted in a minimally invasive laparoscopic procedure. Most patients go home from the hospital the very same day," says Abbas El-Sayed Abbas, MD, Temple Health's Thoracic Surgeon-in-Chief.

The Linx is a great option for patients who don't want to stay on lifelong medication. And it is a great step up from the surgery commonly used to help patients with GERD: fundoplication, which uses part of the stomach to reinforce the LES — a surgery commonly associated with side effects like gas and bloating.

"GERD can be serious," says Frank Friedenberg, MD, MS, Chief of the Section of Gastroenterology and Hepatology at Temple. "Prolonged exposure to refluxed acid in the esophagus can lead to serious complications, including Barrett's esophagus and esophageal cancer."

The Linx Reflux Management System is manufactured by Torax Medical, Inc.

Offsite Insight

Clinical partnerships and satellites such as Temple Health Oaks (PA) and Temple Health Ft. Washington (PA) bring Temple's expertise closer to patients throughout southeastern Pennsylvania and western New Jersey. The newest is the Fox Chase Cancer Center East Norriton Hospital Outpatient Center (East Norriton, PA).

"This new outpatient oncology center gives patients easy access to one of the top cancer hospitals in the nation," says Richard I. Fisher, MD, President and CEO of Fox Chase.

Temple Health recently partnered with St. Luke's University Health Network to bring solid organ and bone marrow transplant services closer to home for patients in Pennsylvania's Lehigh Valley.

Additional Temple clinical partnerships include Brandywine Hospital (Coatesville, PA): cardiac services; Holy Redeemer Hospital (Huntingdon Valley PA): neurological and vascular services; and Lower Bucks Hospital (Bristol, PA): stroke telemedicine services.

TEMPLE UNIVERSITY HOSPITAL RANKED

#1

IN THE NATION FOR LUNG TRANSPLANT VOLUME IN 2017

IMAGE COURTESY OF TORAX MEDICAL, INC.

Leading Roles

Abbas El-Sayed Abbas, MD, has been elected President of the Eastern Cardiothoracic Surgical Society. Abbas is Temple Health's Thoracic Surgeon-in-Chief.

Rene J. Alvarez, Jr., MD, FACC, FAHA, FACP, has been named President-Elect of the American Heart Association of Southeastern Pennsylvania. Alvarez is Vice Chief of Cardiology and Medical Director of Heart Failure/Cardiac Transplantation at Temple.

Gary Cohen, MD, a faculty member since 1993, has been named Chair of Radiology at the Lewis Katz School of Medicine and Radiologist-in-Chief for Temple Health.

Verdi DiSesa, MD, MBA, has been named to Becker's Healthcare Advisory Board, a panel of 15 healthcare leaders who advise the trade magazine and website, *Becker's Hospital Review*. DiSesa is President and CEO of Temple University Hospital, and Temple Health's Senior Vice Dean of Clinical Affairs and Chief Operating Officer.

Martin J. Edelman, MD, Chair of Hematology/Oncology and Deputy Cancer Center Director for Clinical Research, has been named the G. Morris Dorrance Jr. Chair in Medical Oncology at Fox Chase Cancer Center.

Enrique Hernandez, MD, FACOG, FACS, the Abraham Roth Professor and Chair of Obstetrics, Gynecology and Reproductive Sciences, has been elected to the Board of the College of Physicians of Philadelphia, one of the oldest medical organizations in the country.

Jonathan Kersun, MD, Assistant Professor of Clinical Psychiatry, has been elected to the leadership council of The American Balint Society and the Gold Humanism Honor Society.

Alexander Kutikov, MD, has been named Chief of Urologic Oncology at Fox Chase Cancer Center, assuming the role held by Richard Greenberg, MD, for 22 years. Greenberg remains on staff.

Deric Savior, MD

Mary Morrison, MD, Vice Chair for Research in Psychiatry, has been named to the National Institute of Mental Health's Translational Neuropsychopharmacology Task Force.

David O'Gurek, MD, FAAFP, Assistant Professor of Family and Community Medicine, has been named President of the Pennsylvania Academy of Family Physicians.

A. Koneti Rao, MD, FACP, FAHA, has been elected to the Board of the North American Society on Thrombosis and Hemostasis. Rao is the Sol Sherry Professor of Medicine and Co-Director, Sol Sherry Thrombosis Research Center.

Deric Savior, MD, has been named Director of Medical Oncology of the Fox Chase Cancer Center at Temple University Hospital.

Margot Savoy, MD, has joined Temple as Chairperson of Family and Community Medicine, replacing Stephen Permut, MD, JD, who stepped down in 2018 after 14 years in the role, remaining on faculty.

Ahmed M.S. Soliman, MD, Interim Chair of Otolaryngology-Head and Neck Surgery, has been named President of the Pennsylvania Academy of Otolaryngology-Head and Neck Surgery.

Susan Wiegers, MD, FACC, FASE, Senior Associate Dean for Faculty Affairs and Graduate Medical Education, has been named to the Medical Imaging Drugs Advisory Committee of the FDA.

David Wiest, PhD, Deputy Chief Scientific Officer at Fox Chase Cancer Center, has been appointed to the National Cancer Institute's Board of Scientific Counselors for Basic Sciences.

EDWARD CUNICELLI

TEMPLE LUNG CENTER:
TOUGH CASES,
EXCEPTIONAL OPTIONS

RARE AIR

IF YOU CAN'T BREATHE, THE LAST THING YOU WANT TO do is travel 96 miles to see yet another physician. But then again, maybe you do. Robert Sweetin of Chatham, New Jersey, calls his trip to the Temple Lung Center in Philadelphia the excursion that saved his life. The Lung Center helps really sick people, offering options most hospitals don't.

By GISELLE ZAYON
Photo illustration by ANN CUTTING

INSPIRATION: BOTH KINDS

Inspiration is the drawing in of breath. Inspiration is also ambition.

Gerard Criner, MD, FAAP, FCCP, knows all about both. As Director of the Temple Lung Center, he's inspired to help patients inspire. He's made the Temple Lung Center the place to go for serious lung conditions in the Philadelphia area, and, increasingly, far beyond.

Criner founded the Lung Center (in 1994) for patients, of course. But also to help researchers develop new ways to prevent, diagnose, and treat lung disease. And to give the next generation of pulmonary experts a premier place to train. And last but not least, to give referring physicians the resources their sickest patients need.

Devoted to diseases that affect the thorax — and to setting the standards for future care — the Temple Lung Center is a multidisciplinary medical-surgical center that couples research and clinical care. Staffed by 50+ experts in two dozen different specialties (ranging from pulmonology and thoracic surgery to immunology, nutrition, social work, and critical care), it is the nation's first truly comprehensive resource for lung care.

"We specialize in advanced diseases of the lung — with more than 25 nationally recognized specialty programs — all facilitated by the experience and expertise of our faculty," Criner says.

These programs include Chronic Obstructive Pulmonary Disease (COPD) and Emphysema; Interstitial Lung Diseases; Lung Cancer; Pleural Space Diseases; Acute and Chronic Respiratory Failure; Pulmonary Hypertension; Pulmonary Embolism; Sleep Disorders; and Chronic Cough.

"Temple's Sarcoidosis Program is one of only 27 in the world recognized by both the Foundation for Sarcoidosis Research and the World Association for Sarcoidosis and Other Granulomatous Disorders," Criner says. "We also have a program that recognizes the special impact that lung disorders can have on women."

According to Criner, these programs attract more than 75,000 patient visits to the Lung Center annually. Significant demand notwithstanding, the Lung Center offers next-day appointments.

"Every patient is important, and we focus on each one — to create a comprehensive pulmonary care plan incorporating promising new drugs, devices, surgeries, and rehabilitation strategies," Criner says. "Very few places can offer the type and range of options that Temple can, especially for disease that's advanced or refractory to usual treatment."

Thanks to a history of collaboration between clinical investigators and patients, Temple has participated in multiple sentinel studies in COPD, emphysema, respiratory failure, and pulmonary fibrosis over the past three decades.

"We've designed, run, and led enrollment in many of these trials," Criner says, crediting patient-physician partnership for shaping the standards for future care.

COMMON AND RARE

Some conditions treated by the Lung Center are rare — like pulmonary alveolar proteinosis. Others are common, yet no less challenging — like COPD, the third-leading cause of death in the United States and a leading cause of disability, affecting an estimated 30 million.

"We treat about 18,000 COPD patients every year — one of the largest numbers in the United States — and have the most studies underway," says Criner, a COPD expert and a lead author of the state-of-the-art recommendations for managing COPD, released in 2016 by the Global Initiative for the Management of Obstructive Lung Disease (GOLD).

"In the 34 years I've been treating COPD, things have come a long way — and Temple has been instrumental to that progress," he says. "For example, for emphysema patients who suffer from severe air-trapping or hyperinflation, a major lesson is that less can literally be more."

"A smaller lung is a better-functioning lung," he explains. "It's easier to breathe when the hyper-inflated, diseased portions of the lungs are surgically removed or mechanically blocked off. This enables the healthier portions to function more efficiently. It also reduces the burden on the breathing muscles."

Temple was the first to conduct a prospective randomized and controlled study to examine the effects of lung volume reduction surgery. And was a primary site of a large NIH study called the National Emphysema Treatment Trial. The results (*New England Journal of Medicine*, 2003) confirmed that lung volume reduction surgery can improve survival, lung function, and quality of life for many patients.

That said, lung volume reduction surgery is still surgery, and surgery entails risk. Criner and team wanted to find safer ways to achieve the same result — using coils, valves, and biological glues to block off the most diseased areas of the lung — which enables the healthier portion of the lung to work more efficiently. The approach is much less invasive than surgery.

"We've designed studies for every lung valve and coil — in fact we've done more lung reduction strategy studies than any other center in the country — all part of our quest to get maximal results for our patients at minimal risk," Criner says. "FDA review is pending on many of these studies. Hopefully some of these devices will soon be commercially available."

> "I fight back the tears every time I talk about it," Sweetin says of the new lung he received at Temple nine months ago. "And my doctor, James Mamary? What a doctor! If he doesn't instill confidence in you, then you are simply not capable of being reassured."

Robert Sweetin, getting ready for work just 9 months after his lung transplant.

JOSEPH V. LABOLITO

Maximal results, minimal risk. This is a Lung Center mantra, a guiding principle and philosophy in the quest to find innovative ways to manage disease. For instance, the Lung Center faculty recently created a smartphone app to help patients with COPD. It's called the COPD Co-Pilot. Every day, using easy-to-use screens and a hand-held meter to measure lung airflow, more than 500 Temple patients use the COPD Co-Pilot to report their symptoms to the Lung Center.

"Anyone who doesn't report in by noon gets a reminder from the system," Criner told the *Wall Street Journal* last June. "We look at patients' data every day. If the data indicate that an exacerbation might be coming, we adjust the patient's treatment right away."

Reacting quickly makes a big difference. Better symptom control means fewer flare-ups. A five-year study showed that emergency department visits and hospitalizations among COPD Co-Pilot users dropped by 60 percent. And now, patients who've undergone lung transplantation have begun using the app — here again, providing the clinical staff with daily updates about how the new lung is functioning — so that any trouble can be addressed almost before it starts.

The national leader in the telemedicine-based treatment of advanced lung disease, Temple offers a unique "app" for patients with idiopathic pulmonary fibrosis, too.

"We also use registries, which are databases, as tools to improve medical care," Criner explains. "We are very active in several registries, including the Pulmonary Fibrosis Foundation registry — which is the largest of its kind in the United States — and the first to collect information about rare forms of the disease, like idiopathic pulmonary fibrosis."

Remember Mr. Sweetin, who traveled to Temple from northern New Jersey? He was diagnosed with idiopathic pulmonary fibrosis (IPF) four years ago when he was 54.

In this chronic, irreversible disease, collagen fibers build up in the tissue between the air sacs — causing the lungs to scar and stiffen — progressively making it harder to breathe.

A husband, father, police officer, and decorated military veteran, Sweetin used to be upbeat, energetic. But now he was sick. And depressed. Who wouldn't be? IPF is a fatal disease.

"There's only one good thing you can say about IPF," Sweetin notes. "If you have IPF, you get priority on the Lung Allocation Score, the system that ranks lung transplant candidates nationwide."

Absolutely true. IPF is the primary indication for lung transplantation in the United States, surpassing all other diseases.

"I fight back the tears every time I talk about it," Sweetin says of the new lung he received at Temple nine months ago.

Gerard Criner, MD, and James Mamary, MD (right), with Maria Elena Vega-Sanchez, MD.

"And my doctor, James Mamary? What a doctor! If Dr. Mamary doesn't instill confidence in you, then you are simply not capable of being reassured."

"I did three tours of duty during Operation Desert Shield/Desert Storm. My background is in military engineering. I'm not easily impressed. But the Temple Lung Center is one hell of an operation. Not a single dropped ball or miscommunication," Sweetin boasts.

Experience counts. In 2017, Temple performed more lung transplants than any other hospital in America (131) — and maintained its role as a leading center of minimally invasive thoracic surgery.

NO AND YES

One reason Sweetin is sweet on Temple is that Temple evaluated and approved him for transplant surgery promptly, while the first medical center he'd visited left him languishing for an answer. Temple has helped other patients in this circumstance. In fact, a significant percentage of Temple's lung transplant patients were turned down elsewhere first.

Given Temple's complex, high-risk patient pool, you might expect its lung-transplant mortality rate to be high. But recent data show that its patients' three-year survival rates are 5.49% better than the national average. "It's because we've had years of experience with risk," Criner says.

As Sweetin puts it, "Temple's pretty much seen it all. You have a complication? They anticipated it. They're ready. This is a great comfort, believe me. And the people? Is there a word that means better than best?"

Sweetin says he was amazed when he learned that Yoshiya Toyoda, MD, PhD, the surgeon who did his lung transplant, is world-famous for pioneering the newest method of lung transplant surgery: the antero-axillary approach. Toyoda's innovation makes cutting and rewiring the sternum a thing of the past — and also spares important muscles and major arteries and veins. It has produced better clinical outcomes. Patients recover more quickly. The old operations (the posterolateral thoracotomy and clamshell thoracotomy) are becoming relics of the past.

"I got rare expertise and TLC at the TLC," Sweetin says. "Down to the last detail, they took care of everything. Transportation. Home medical equipment. Dealing with my insurance. They embraced me — and my wife — like family," he says. "You're not just getting new lungs, you're getting a new life."

"I don't care if you are religious or spiritual or not," Sweetin concludes. "When you can breathe again you are born again."

EDWARD CUNICELLI

RARE AIR

Most people don't think of the lung as an organ of the immune system but it is. Like our skin, it's an interface between us and the world. Every minute, we move five liters of air in and out. That's 7,000 per day, more than 2.5 million liters a year. And it's not just air we expose our lungs to — but particulates, chemicals, and pathogens.

"The air we breathe is both a requirement of life and a threat to life," Criner notes. "Environmental exposures and genetic predispositions make respiratory disease the third-most frequent cause of death in the United States. Wide-ranging pulmonary research programs like Temple's are imperative."

In the modern laboratories of Temple's Lewis Katz School of Medicine, Lung Center scientists are studying the tissue samples of more than 300 patients and organ donors to uncover the genetic and molecular mechanisms of advanced lung disease. Meanwhile, in the clinical offices, physicians are managing about 50 clinical trials for new drugs and devices addressing more than a dozen different conditions, including COPD, respiratory failure, alpha 1-antitrypsin deficiency, asthma, and pulmonary fibrosis.

"Temple consistently ranks among the busiest sites for pulmonary clinical research anywhere," Criner says. "But the people who really deserve the credit in all this are the patients. They're helping us define next-generation lung care. Right now, for example, our patients are helping us study a great new technology for lung cancer screening. It's called the Archimedes System. Temple is the only hospital in the eastern United States to have it," Criner says.

"Temple consistently ranks among the busiest sites for pulmonary clinical research anywhere," Criner says. "But the people who really deserve the credit in all this are the patients. They're helping us define next-generation lung care."

As described on page 38, the Archimedes System fits perfectly with the Lung Center mantra: maximal results, minimal risk. The new, minimally invasive technology is designed to access nodules previously accessible only through transthoracic needle aspiration or surgery.

"We offer rare options. Nevertheless, we are extremely selective about what treatments are best — because best is different for every patient," Criner says.

To this end, the Temple Lung Center uses advanced testing, including radiographic characterizations and cellular markers, to make diagnoses and to formulate treatment plans incorporating each patient's overall health and living conditions. Throughout diagnosis, treatment, recovery, rehabilitation, and long-term health maintenance, it's a customized approach.

With four locations in Pennsylvania (Philadelphia, Oaks, Ft. Washington, and the Chestnut Hill section of Philadelphia), the Lung Center is easily accessible to patients throughout the greater Philadelphia area. Its main hub — a contemporary, spacious facility occupying an entire floor of Temple University Hospital in Philadelphia — centralizes the resources its sickest patients need: a dedicated bronchoscopy suite, a thoracic surgery suite, a 28-bed respiratory care ICU, a 50-bed high dependency respiratory care unit, and much more.

"We have a management team dedicated exclusively to meeting the needs of out-of-town patients and families — arranging hotels, transportation, parking — anything they might need," Criner says.

"Likewise, we're all about serving referring physicians — providing test results, scheduling consults, returning calls promptly. We make sure their concerns — and their patients' — are fully addressed," he says.

Every year, more than 3,500 physicians throughout the Mid-Atlantic region and beyond refer their patients to the Temple Lung Center. And an out-of-town referral for a seriously ill patient is serious business.

As Deborah Yommer, CRNP, a clinician at WellSpan Pulmonary & Sleep Medicine in York, PA, will attest, a long trip for an oxygen-dependent patient isn't just an inconvenience. It can be life-threatening.

This WellSpan practice — part of WellSpan health system's network of pulmonary and sleep centers in south central Pennsylvania — is 100 miles away from Temple. Nevertheless, Yommer and colleagues have referred several high-risk patients to Temple over the years. And the results have proved worthy of the risk.

"We count on Temple to help us attain the highest level of health possible for our patients," Yommer says. "And when a cure is impossible, providing patients with comfort and better life quality are the goals."

Yommer and her colleagues believe that never giving up is the most important thing. Not even when people have end-stage disease. This is what WellSpan believes. And Temple has the same philosophy.

"It's gratifying to see two organizations coming together to make a difference for people who might not have options otherwise," she says.

Robert Sweetin couldn't agree more. Just nine months ago, his lungs were just 20 percent functional. It's hard to believe that someone that sick so recently, and who had transplant surgery, is back at work full-time — and flourishing — but he is.

"Where there are options — and Temple gave me many — there's hope," he says. "And with hope, amazing things are possible."

To schedule an appointment with the Temple Lung Center, call (215) 707-5555 or email breathe@temple.edu. To review current clinical trials, visit lung.templehealth.org/clinicaltrials

Inflammation: The Internal Inferno

Taming the Flame

By GISELLE ZAYON

Illustration by YUTA ONODA

All over the world, thousands of underground coal-fed fires are scorching the planet from the inside out, slowly releasing toxins into the environment. One has been burning in Centralia, PA, for 56 years. Every attempt to extinguish it has failed.

In human health, there's a counterpart to the long-smoldering fire: chronic inflammation. It's nearly impossible to quell.

A cascade of mechanisms, inflammation is integral to the immune response, the body's natural reaction to injury, infection, or irritation. Its classic signs are swelling, pain, and heat.

"The aim of inflammation is to marshal extra blood and specialized cells to cleanse the body of an offending problem and initiate healing," says Glenn F. Rall, PhD, Associate Chief Academic Officer at Fox Chase Cancer Center. "But when the process goes awry — it does more harm than good."

There are two types of inflammation: short-term, acute inflammation and chronic, unresolved inflammation. Their molecular and cellular building blocks are the same, but their results definitely aren't. Like a brush fire that clears the way for new growth, short-term inflammation is helpful. But long-term inflammation is destructive. It is a vicious cycle, sometimes even a systemic one, of repair-destruct, repair-destruct.

Inflammation comes in many forms: catarrhal, granulomatous, interstitial, purulent, serous, traumatic, ulcerative (and the list goes on).

Inflammation is also a key feature of (no exaggeration) a hundred different diseases: Heart disease, vascular disease, diabetes, lung disease, appendicitis, colitis, conjunctivitis, encephalitis, gastritis, hepatitis, and pancreatitis, to name a few. "Itis" *means* inflammation.

And when it comes to autoimmune disease, inflammation isn't just a feature; it is *the* feature. In inflammatory bowel disease, inflammation attacks the lining of the intestine. In rheumatoid arthritis, the connective tissues and joints. Dozens of autoimmune disorders affect the body in a stunning variety of ways, but all have a common root: inflammation run amok.

"With nearly every disease and injury tied to it, the demands that inflammation makes on the medical industry would be hard to overstate," Rall says. "Controlling inflammation is a huge focus of medical care and research across all fields of medicine, all over the world. It's spawned entire careers and industries. It's the target of countless drugs."

You can't turn your head without running into inflammation, it seems.

Triggers Everywhere

A cut or scratch. Sun exposure. Extreme heat and cold. Foods high in sugar or contaminants. Practically everything triggers inflammation.

"Inflammation can be triggered by our own body fat," says Assistant Professor Ekaterina Koltsova, MD, PhD, an immunologist and vascular biologist at Fox Chase Cancer Center.

According to Koltsova, who works with a group studying the links between inflammation and cancer, the Inflammation Working Group, there's a definite correlation between obesity, specifically waist circumference, and systemic inflammatory response.

There are two types of fat, white and brown. White fat, Koltsova explains, incites the inflammatory process. It signals immune cells to rush in — which release various inflammatory mediators called cytokines. Soon the blood is a brew of circulating inflammatory chemicals that make cells more resistant to insulin. This is how the stage for metabolic syndrome and type 2 diabetes is set. And diabetes isn't the only worry. There's cardiovascular disease. Additionally, the low-grade chronic inflammation associated with obesity can predispose us to certain types of cancer — most notably liver and colon cancer, Koltsova says.

Moreover, inflammation that is *not* related to obesity increases the risk for cancer, too. For example, according to Phillip Abbosh, MD, PhD, Assistant Professor at Fox Chase, bladder inflammation due to chronic infection, or resulting from chronic catheterization, can increase the risk of squamous cell bladder cancer.

Normally the body recognizes and removes precancerous cells. But constant exposure to inflammatory signals can make immune cells blind to threats they'd normally attack — leaving cells with damaged DNA free to replicate.

So in some cases inflammation can help trigger cancer.

And then cancer itself triggers yet more inflammation.

"Tumors actually enlist inflammation to promote their growth, progression, or resistance to therapy," says Sergei Grivennikov, PhD, Assistant Professor at Fox Chase.

To add insult to injury, many forms of cancer treatment spark inflammation, too.

For example, the drug Cisplatin, which is used to treat a variety of solid tumors, frequently causes kidney inflammation. Even the persistent fatigue associated with chemotherapy treatment is rooted in a systemic inflammatory response.

> In human health, there's a counterpart to the long-smoldering fire: chronic inflammation. It's nearly impossible to quell.

Hearts & Lungs Afire

Years ago, when Michael Autieri, PhD, Associate Director of Temple's Cardiovascular Research Center, began studying the role of lipids in heart and vascular disease, he bumped into inflammation. It's a familiar story. Its ubiquity makes it a target (intended or not) of research across every conceivable field.

Central to Autieri's work is the study of vascular diseases like atherosclerosis, which block blood flow to tissues, causing ischemia.

A slow, insidious process, atherosclerosis starts when lipids circulating in the blood accumulate in blood vessels, usually at branch points. Trapped lipids spark an immune response — marshalling specialized cells to start the cleanup. Then those cells get trapped, too. On the process goes, with the

DANIEL BURKE

Lung disease (this magazine's lead story, page 12) is primarily *inflammatory* disease, says Thomas Rogers, PhD, Director of Temple's Center for Inflammation, Translational and Clinical Lung Research.

accumulation hardening into plaque, like a logjam in a river. If the plaque ruptures or a piece breaks off and gets stuck downstream in the heart or brain, a heart attack or stroke can result.

"We once thought of atherosclerosis as a disease of 'clogged plumbing.' But it's really a lipid-driven chronic inflammatory disease," Autieri says. "The vessels are simmering with inflammation. Inflammation starts the process and keeps it going, year after year."

When it comes to heart attack and stroke, lipids are not the problem in and of themselves; it's the inflammation they trigger. And in breakthrough research published in *The Journal of Biological Chemistry* in 2015, Temple researchers discovered that lipids also trigger the inflammatory process that prevents blood-vessel repair.

"We learned that when lipids and homocysteine reach dangerous levels in the circulation, they trigger a cytokine called caspase-1 to initiate inflammation in the lining of the vessel, the endothelium. This is what keeps the vessels from healing. It also keeps new vessels from growing — increasing risk for heart attack, stroke, even loss of limb," says Hong Wang, MD, PhD, EMBA, Director of Temple's Center for Metabolic Disease Research.

"We used to think it was impossible for endothelial cells to produce harmful cytokines, but our research proves otherwise," she says.

This discovery provided an important clue: Might blocking caspase-1 open the door to a new approach to ischemic vessel repair? A series of NIH-funded experiments published in the *Journal of Arteriosclerosis, Thrombosis and Vascular Biology* proved that the approach worked.

Xiao-Feng Yang, MD, PhD, FAHA, Professor in the Center for Metabolic Disease Research, and Eric T. Choi, MD, Chief of Vascular and Endovascular Surgery, showed that inhibiting caspase-1 in endothelial cells improved the process of blood vessel repair. In addition, it lessened the vessel damage caused by heart attack, peripheral artery disease, and chronic kidney disease.

Another NIH-funded study targeting inflammation is an $11.6 million grant to explore the use of exosomes in heart repair.

"Exosomes are tiny packets of ribonucleic acids, proteins, and other regenerative goodies. They're secreted by stem cells and absorbed by neighboring cells," says Raj Kishore, PhD, Director of the Stem Cell Therapy Program.

So why not just use stem cells?

"Stem cells haven't worked for the heart as well as we hoped," Kishore says. "Inflammation may be the culprit. Once administered to the heart, stem cells become injured by the inflammatory process underway there."

In addition, he explains, it may be that stem cells and

exosomes that come from patients with chronic inflammatory disease are compromised in the first place.

Therefore, Kishore wants to figure out how exosomes are affected by inflammatory stimuli. "That should help us create 'designer' exosomes that could be the key to cardiac repair," he says.

Like heart disease, most lung disease is chronic inflammatory disease, too.

Asthma, for example, is the ongoing inflammation of the bronchial tubes. And it's the old familiar story, with inflammation begetting yet more.

"As people with diseased lungs struggle to get air, their lungs over-distend with each breath. Repetitive over-stretching damages cells — provoking cytokine release in alveolar cells, which triggers inflammation," says Gerard Criner, MD, FACP, FACCP, Director of the Temple Lung Center.

As detailed in the story on page 12 of this magazine, Temple Lung Center clinicians fight inflammation in creative ways. The Center even employs a research team dedicated to inflammatory lung ailments. It's called the Center for Inflammation, Translational, and Clinical Lung Research. Professor Thomas Rogers, PhD, its director, studies G protein-coupled receptors (GPCRs), which play a significant role in regulating inflammatory responses in the lung.

"Some GPCRs induce inflammation while some inhibit it. Some even change the role of others, using a process called heterologous desensitization," Rogers says. Can that process be manipulated to create a treatment strategy — changing bad guys into good guys? Rogers is working on it.

Professor Laurie Kilpatrick, PhD, also studies the molecular mechanisms of lung inflammation. Among her interests are M1 (pro-inflammatory) and M2 (immunomodulatory) macrophages in inflammatory gene expression. A mainstay of the immune system, a macrophage is a type of white blood cell that gobbles up microbes, debris, anything that does not belong. (Macrophage means "big eater" in Greek.)

> The ubiquity of inflammation makes it a target (intended or not) of research across every conceivable field.

Joint Efforts

M1 and M2 macrophages captivate Philip Cohen, MD, too, but for a different reason. He's Emeritus Professor of Rheumatology at Temple.

"M1s secrete cytokines that perpetuate inflammation in rheumatoid arthritis — while M2s reduce it," Cohen says. "The trick is to tip the balance in favor of the helpful M2s."

Cohen believes this can be done by activating a molecule called Mer tyrosine kinase (MERTK). This would stimulate M2s to clear out the damaged cells that provoke the M1 bad guys in the first place. Success here could produce a new treatment for rheumatoid arthritis someday.

"More wins are also needed for systemic lupus erythematosus (SLE), an especially vexing inflammatory rheumatic disease affecting 1.5 million Americans," says Roberto Caricchio, MD, Director of the Temple Lupus Clinic and Interim Chief of Rheumatology.

With funding from the NIH and the Lupus Research Alliance, Caricchio and Stefania Gallucci, MD, and Çagla Tükel, PhD, are investigating the mechanisms by which the inflammation induced by common bacterial infections triggers or exacerbates SLE.

"Learning more about these complex interactions could point to novel ways to control inflammation and the damaging effects of SLE," says Caricchio — who recently led a study of a new drug for SLE called anifrolumab.

"The drug worked so well that the FDA actually granted it fast-track approval," he says. "This is one of the most promising new drugs for SLE in more than 50 years. And a real advantage is that it's nonsteroidal."

Steroids have been the mainstay treatment for SLE and many other conditions. And they do a good job of controlling inflammation. But used long-term, they can cause high blood pressure, weight gain, osteoporosis, and other serious side effects.

"That's why nonsteroidal anti-inflammatory drugs (NSAIDs) like ibuprofen are so important — although they're not perfect either," says Walter Koch, PhD, Temple's Chair of Pharmacology, who studies inflammatory processes in heart disease.

"NSAIDs work by reducing the production of prostaglandins, chemicals that promote inflammation and pain. But it isn't a good idea to repress prostaglandins for too long. Prostaglandins protect the lining of the GI tract. That's why stomach irritation can result from NSAID use," he explains. NSAIDs can also elevate blood pressure, damage the kidneys, and increase the risk of heart problems.

"The goal is to create drugs that immunomodulate — in other words, control the inflammatory response selectively — rather than suppressing immune activity overall," Koch notes. Examples here include anti-TNFa therapies, anti-adhesion molecule therapies, and methods to inhibit just the specific cytokine(s) associated with a specific disease.

Even just one enzyme can make a huge difference — as demonstrated by Temple and Columbia University in a study funded by the American Heart Association and the NIH.

"The enzyme we're talking about is NOX2. It's a big player in sepsis, the systemic infection that threatens the lives of a million Americans each year — and kills a fifth of them," says Konstantinos Drosatos, PhD, Assistant Professor of Pharmacology at Temple.

And most die with a dramatically impaired cardiovascular system.

"The raging inflammation of sepsis can ravage the heart so quickly that anti-inflammatory drugs simply don't have time to work," he says. "But we discovered that blocking NOX2 helps cardiac energy production return to near-normal levels — essentially buying time for anti-inflammatory therapies to work."

As detailed in the journal *JCI Insight* (2017), the strategy could save thousands someday.

DANIEL BURKE

Belly, Brain & Beyond

According to Robin D. Rothstein, MD, Medical Director of Temple's Inflammatory Bowel Disease program, standard drugs only provide symptom relief for patients with inflammatory bowel disease, a crippling autoimmune condition affecting about 1.3 million Americans. "But a newer class of drugs — biologics — actually heals the ulcerated intestinal lining," she says.

One biologic for IBD under study at Temple is called curli, a protein in a naturally occurring biofilm.

"In addition to forming a protective film over the lining of the intestinal tract that helps protect it from inflammation, curli activates the lining of the bowel to secrete an anti-inflammatory cytokine called interleukin-10," notes Çagla Tükel, PhD, Assistant Professor of Microbiology and Immunology.

So the news is getting better for the bowel. What about the brain?

In a recent study that received global media attention (by *Newsweek*, *USA Today*, and Yahoo!, among others), Domenico Praticò, MD, the Scott Richards North Star Foundation Chair in Alzheimer's Research at Temple, demonstrated extra-virgin olive oil's effectiveness in protecting the brain against Alzheimer's disease. Alzheimer's (of course) is a neuroinflammatory condition.

"In addition to reducing brain inflammation, olive oil activates autophagy — the process by which cells clear out intracellular debris and toxins, such as amyloid plaques and tau tangles," Pratico says.

In other brain research related to neuroinflammation, Yuri Persidsky, MD, PhD, Chair of Pathology and Laboratory Medicine at Temple, is studying inflammation-caused dysfunction of brain endothelial cells and supporting cells called pericytes — a condition leading to demise of the blood-brain barrier. The blood-brain barrier is weakened by the chronic inflammation associated with conditions such as HIV-1 AIDS.

"AIDS, incidentally, isn't just considered a condition of immunodeficiency," Persidsky says. "Today it's considered a chronic inflammatory disease."

Nearly everything, it seems, is singed with inflammation. It's the healer that harms. It's both cause and effect.

"The cost to human health and health care spending is enormous," says Persidsky. "But we reduce suffering, death, and health care spending with every flame we contain."

Laurie Kilpatrick, PhD, Professor in Temple's Center for Inflammation, Translational and Clinical Lung Research, studies the molecular mechanisms of lung inflammation.

For more information about research at the Lewis Katz School of Medicine, visit medicine.temple.edu/research


BG Gels
normal genotype
graft
teratocarcinoma
PGC development
(days 8-12)
germinal ridge
graft
teratocarcinoma
"embryo"
day 6 embryos
day 12 fetuses
sterile mutant
graft
teratocarcinoma
PGC impairment
graft
(no tumor)

(A Tribute to Beatrice Mintz, PhD)

QUERY THEORY

By GISELLE ZAYON

BIG QUESTIONS. That's what Beatrice Mintz, PhD, the Jack Schultz Chair of Basic Science at Fox Chase Cancer Center, has dedicated her career to answering. Small questions, in her opinion, are not worth the time or effort. • As a result of this philosophy — and through sheer force of personality — Mintz's opus, according to Jonathan Chernoff, MD, Chief Scientific Officer at Fox Chase, contains the platforms of several fields, including developmental genetics, gene-transfer technology, epigenetics, and the tumor microenvironment. • "To pioneer in one major area of science is remarkable. But more? Otherwordly," he says. • An elected member of the National Academy of Sciences since 1973, Mintz, now 97, has collected scientific honors that are coveted, prestigious, and rare. But accolades were never the point. The point, Mintz says, is "simply the pursuit of a series of questions that I've enjoyed answering."

PROFOUNDLY PONDERABLE

In 1960, Mintz left her teaching position at the University of Chicago to accept a post at Fox Chase Cancer Center in Philadelphia to do full-time research. It was an exciting opportunity to answer a question she'd been pondering since her days as a PhD candidate at the University of Iowa in the 1940s.

The question was: How can a complex individual arise out of a small number of cells in an embryo — and how do these cells become so widely diversified and specialized?

"The question had been asked for decades, but it was still being approached with classical methods, such as adding dye to a cell and tracking its path," Mintz says. "But I thought the only really relevant marker for tracing how cells diversified was the gene."

To follow the gene trail, Mintz did something never done before*: she combined early embryo cells of two genetically different mouse strains. She created allophenic mice — mice containing multiple, genetically identifiable populations of cells.

"She knew that the genetic differences would serve as markers of development — creating a path she could trace," Chernoff explains.

Using allophenic mice, Mintz demonstrated that just a handful of embryonic stem cells generate the remarkable complexity of the fully developed animal.

Mintz observed that normal development is a hierarchical process, with ever-more specialized clusters of stem cells expanding clonally, proliferating and differentiating in an orderly manner.

"Recognizing that stem cells could generate a complete organism not only told us a lot about development, but also pointed to the possibility of using such cells to replace defective cells in humans," Mintz says.

"That kind of innovative thinking was unheard of in the 1960s," says Margaret Foti, PhD, MD (hc), a Temple graduate and CEO of the American Association for Cancer Research (AACR), the world's oldest and largest cancer research organization.

Mintz then asked herself another big question: Is cancer basically an aberration of development in which stem cells multiply rather than differentiate?

To answer it, Mintz created special allophenic mice that revealed that the answer is yes. Carcinogenesis

Dr. Mintz

favors proliferation, not differentiation.

"Very few scientists believed in the clonal basis of cancer in the 1960s, but that's precisely what Dr. Mintz's findings demonstrated," Foti explains. "Observing that cancers develop from a single cell rather than a combination, she established clonal regulation as cancer's fundamental unit of development."

Then something really interesting happened. Mintz introduced teratoma stem cells into a normal mouse embryo, expecting the mouse to develop the cancer so she could analyze its progression. But to her surprise — and that of scientists worldwide — normal, tumor-free mice resulted, with both genetic cell strains present in all tissues.

It defied logic. How could animals produced with cancer stem cells possibly be cancer-free?

Mintz realized something crucial: The normal embryo into which she'd inserted the teratoma cells had somehow reprogrammed cancer cells to develop normally. And with this, she deduced something unequivocally important: Teratoma stem cells are chromosomally normal— but can be developmentally induced to become cancerous.

In subsequent work, Mintz replicated the results of that first experiment, proving what she'd posited. The stem cells of an early carcinoma can be normalized if transferred to a normal environment appropriate for their developmental stage.

Today we know that a gene can express itself in many different ways. Today we recognize a complex confluence of factors that go well beyond the gene itself. And Mintz was among the first to recognize this, to appreciate the prodigious influence the microenvironment has on the behavior of cells — at a time when, as Foti points out, the fields of epigenetics and the tumor microenvironment did not even have names.

"Who else was even working with mammalian embryos in the 1960s?" Foti says. "The technology to manipulate them didn't even exist. She had to invent it."

But what Foti calls "revolutionizing the tools and techniques of molecular biology" was, for Mintz, simply a means to an end.

"I came from a do-it-yourself family—and I enjoyed the fact that I had to work out everything myself," Mintz says.

And "myself" is precisely what she means. A scientist of Mintz's stature could easily command an army of assistants, but Mintz, as Chernoff says, "prefers to go it alone. She is a solo act par excellence. Unfettered, one might say, by the limitations of others."

Meticulous and precise, she maintains impeccable standards. "This gives her a somewhat dichotomous personality," Chernoff says. "She is delightful company — smiling, laughing, a wonderful raconteur. But she can also be highly critical — which can be off-putting — until you remember that she subjects herself to the same scrutiny."

BEA YOUR OWN BOSS

Anna Marie (Ann) Skalka, PhD, was Fox Chase's Director of Basic Science Research for 22 years. When she took the job in 1987, her mentor, Barbara McClintock, PhD — the 1983 Nobel Laureate in Medicine or Physiology — gave her some advice.

"You've got someone very special in Philadelphia — and you've got to take care of her," Skalka recalls McClintock saying. "I thought that was a wonderful tribute from one legend to another."

And what it really meant, Skalka learned, was to do anything Mintz asked —but otherwise stay out of her way.

"On paper, I was Bea's boss. But no one is Bea's boss except Bea," Skalka says. "She's entirely self-directed. With unrivaled powers of observation and deduction. An uncanny ability to think outside the box."

"For instance, before anyone else, she observed that melanoma cancer cells make abnormal proteins. This was a novel insight. Absolutely no one else was talking about tumor-associated neoantigens in those days. Now everyone is," Skalka says.

Another example of her futuristic vision: In 1974, she and Rudolf Jaenisch, PhD, a visiting fellow at Fox Chase, created the first mice ever to harbor foreign DNA — in this case, viral DNA.

In the 1980s, Mintz became one of the world's first** to create transgenic mice — introducing human DNA into a fertilized mouse egg — enabling the DNA to be transmitted to offspring.

"Her technique to create animal models of human cancers changed everything," Chernoff says. One of the most important is her model of cutaneous melanoma that mimics the human disease. An aggressive cancer, it causes more skin cancer-related deaths than any other kind of skin cancer. Mintz's mice, a staple of melanoma research worldwide, may hold the key to future advances.

BEATRICE MINTZ → Selected Honors

2013 — Inaugural Class of Fellows
American Association for Cancer Research

2012 — Lifetime Achievement Award
American Association for Cancer Research

2011 — Szent-Györgyi Prize for Progress in Cancer Research
National Foundation for Cancer Research

2008 — Pearl Meister Greengard Prize
Rockefeller University

1997 — National Medal of Honor for Basic Research
American Cancer Society

1996 — Prize in Developmental Biology
March of Dimes
(first recipient, shared with Ralph Brinster)

1990 — Ernst Jung Gold Medal for Medicine
(first recipient)

1982 — Elected Fellow
American Academy of Arts and Sciences

1981 — Genetics Society of America Medal
(first recipient)

1980 — Lewis S. Rosenstiel Award in Basic Medical Research
Brandeis University

1979 — New York Academy of Sciences Award in Biological and Medical Sciences

1976 — Elected Fellow
American Association for the Advancement of Science

1975 — President's Biomedical Research Panel
(Developmental Biology Group)

1973 — Elected Member
National Academy of Sciences

1951 — Fulbright Fellowship
(Universities of Paris and Strasbourg)

Left: In characteristically vivacious form. Top right: Making allophenic masterpieces. Below: Dr. Mintz and Pope John Paul in 1986, when the Pope invited her to serve on the Pontifical Academy of Sciences — an elite group of the most respected names in science.

HEARTFELT HONORS

Margaret Foti — one of the world's most influential voices in cancer research — calls Mintz's contributions "groundbreaking."

"Dr. Mintz has had a major influence on the entire landscape of cancer research, with scientific insights prompting new directions in developmental cancer biology and genetics," Foti says. "She's a pioneer not just in developmental genetics but in the developmental genetics of cancer — shaping our understanding of stem cell behavior and the tumor microenvironment. She's provided us with many important scientific tools and techniques, including allophenic and transgenic mice that have created an unprecedented opportunity to study cancer in a living organism throughout its life. Simply extraordinary."

"And I was witness to the extraordinary in 2012," Foti adds, "watching Dr. Mintz, then 91, captivate an audience of 15,000 when the AACR gave her the Lifetime Achievement Award. Beatrice Mintz is a compelling personality. What charisma!"

Dr. Mintz has been celebrated with many awards and with fellowships in elite scientific societies. Five colleges have awarded her honorary doctorate degrees. Her AACR honors are particularly important to her. But the honor closest to her heart is probably the Jack Schultz Chair in Basic Science at Fox Chase Cancer Center.

Jack Schultz, PhD (1904-1971) was a geneticist and biochemist who came to Fox Chase in 1942 and chaired the Division of Biology from 1957 to 1969. He, too, served on important editorial boards and committees. Like Mintz, he was an elected member of the National Academy of Sciences.

After his death (of a heart attack—in his lab at Fox Chase—in 1971), Fox Chase established a chair in his honor to recognize a scientist of outstanding distinction. There was no question about who that should be. Mintz was installed in 2002.

"It was the only time I ever saw Dr. Mintz in tears," Chernoff recalls. "She and Jack were very close. It was Jack who'd recruited Bea to Fox Chase. He enthusiastically supported her plan to produce mice of two different genetic strains — and watched as she pursued that plan with single-minded rigor unequalled."

Born on January 24, 1921, in New York City to immigrant parents, Mintz values "originality, bravery, and thinking outside the box."

But she did not set out to become one of the first to recognize the central role of stem cells in cell development and cancer. Nor to shatter the belief that malignant cells are irreversibly abnormal. Nor to become one of the most inventive genetic engineers the world has ever seen.

It was not her goal to advance the world's understanding of genetic modification and cellular differentiation. Nor to inspire scientists to study the role of the microenvironment.

It was never her intent to refute or confirm any theories. She merely wanted to answer some important questions.

Because what she prizes most (along with the Shultz Chair) is simply "the freedom to go from one really tantalizing question to the next, and to recognize and follow clues along the way."

** In the 1960s, Andrzej K. Tarkowski, PhD (1933–2016) also produced allophenic mice, combining two embryos at the eight-cell stage. Mintz went on to create embryos composed of cells from up to 15 different mice — and developed a technique for producing mice with four parents — to trace genetic diseases.*

*** Mintz and Ralph Brinster, PhD, of the University of Pennsylvania, independently developed techniques to create transgenic mice — now staples of research in labs worldwide.*

COLOR PHOTO: TOMMY LEONARDI; BLACK & WHITES COURTESY OF THE SMITHSONIAN INSTITUTION

PROGNOSIS
NEED HELP
ABNORMAL
TELLING FAMILY
WORSENING
TREATMENT
sick
COMPASSION
ADVOCACY
UNEXPECTED
Test RESULTS
EMPATHY
Clinical
CONSIDERATION
SYMPTOMS
QUESTIONS
DISABILITY
SIDE EFFECTS
FEAR
SICK
MINIMIZE RISK
RESPECTFUL
ACCESSIBLE
EYE CONTACT
HELP ETHICS
GATHER FACTS
WHY
me

In Sickness and in Health

Medical Students Commit to Communication

"The first time I thought about how to tell a family that a loved one had died," says David Karras, MD, Associate Dean for Pre-Clerkship Education at the Lewis Katz School of Medicine, "was when a family's loved one had died." Neither he nor the family was ready for it. "It was horrible," Karras says. • Likewise, the first patient Karras ever encountered was a patient in the hospital. "We didn't know it could be any other way," he says. "Back then, medical students learned by practicing on patients. It was awkward. There were mistakes. A lot of it didn't go well." • Alisa Peet, MD, Associate Dean for Clinical Education, understands.

By Kalani Simpson
Illustration by Bernard Maisner

"I remember

talking to the wife of a patient," Peet says. "She asked me whether he was dying. She asked me whether their nine-year-old son should come in to the room and say goodbye. I remember not knowing what to say."

Medicine is a world of science, technology, and procedures. But most important is the profession's human side. And humans are… well, so human. Each an individual, each so complex. Patients don't stick to a script.

"You never know what patients are going to say or ask," says Denise Salerno, MD, Doctoring Course Director and Associate Dean of Academic Affiliations. "But we have to help medical students be prepared."

Physicians must know their science in and out; that's a given. But tough medical situations come with difficult human conversations.

"I feel like those happen almost every day," says Hamna Zafar, MD, who just completed medical school at Temple.

But Zafar has an advantage that most of her professors never had: communication training. Temple ingrains communication skills-building into its MD program curriculum.

"Just as we insist that students develop competency in medical knowledge and clinical skills, we require they become proficient communicators, too," explains Gerald Sterling, PhD, Senior Associate Dean for Medical Education.

And Temple does so from Day One. Sooner, actually. The emphasis on communication begins during the medical school interview phase, when applicants are assessed for their aptitude for communication.

"During medical school, simulation exercises enable students to practice clinical skills before trying them on real patients," Sterling says. "With communications training, it's similar. We create a spectrum of scenarios for students to practice. We even simulate heart-wrenching conversations."

Flip City

Decades ago, medical schools spent two years on medical science before even introducing students to the idea of relating to patients.

"We've flipped that model on its head," Karras says. Almost immediately, Temple students interact with standardized patients — real, live people — actors who give real faces to practice scenarios.

Students start small. How to enter a room. How to present nonjudgmental, nonverbal cues. Breaking bad news will come later. Now, it's about how to carry oneself. Establish rapport. Gather information. It's also about realizing that physicians are in a privileged position, even in a casual conversation. Patients don't get to ask personal questions back, after all.

Students learn how to make the patient feel comfortable. Comfortable enough to let the physician know what is really going on. What brought them here today?

"Now, with the electronic medical record, the patient is sitting in front of the physician, but there's often a computer between the two," Salerno says. "How do we make sure patients know they are really being listened to?"

"Through human empathy," she says. And practice. Lots of practice. The standardized patients, trained to respond as real patients might, are invaluable here.

The encounters between students and standardized patients are check-listed and scored. Faculty observe the interactions through a one-way mirror, sometimes calling time out to discuss what went right or wrong.

Some sessions are videotaped. When students see what they look like, hear what they sound like, sometimes it blows their minds. The awkward body language. The fidgets and ums. The realization that what they thought they were saying is not what the patients heard.

"Interpersonal communication skills are evaluated in the U.S. Medical Licensure Examination — and they are an essential part of the competencies students need to demonstrate to graduate," Sterling notes.

Effective communication not only improves patient satisfaction, but leads to better outcomes — with patients more likely to follow their physician's advice, or invest in their own medical care. Studies have also shown that physician communication — or lack thereof — is a significant factor in malpractice suits.

While some medical specialties entail less patient interaction than others, "You can't really practice medicine without communicating," Peet says. "You have to communicate with other doctors, with other members of the patient care team. Any clinical finding, any discovery, any status change. At some point, all of these are going to be communicated."

Group communication skills are essential given that patient care is delivered by teams. Interaction is the mainstay of educational exercises that medical students share with nursing students, social work students, and students in other health profession programs — all organized by Larry Kaplan, MD, the medical school's Associate Dean for Interprofessional Education.

Better and Worse

In the third and fourth years, things really come together for the medical students. They combine their clinical and communication skills to lead the discussion with patients.

"In the fourth year, we turn them loose. It's incredible to see them adapt and evolve," says Peet.

Now that the students are more advanced, it's time to prepare for the really tough communications challenges — like delivering the worst kinds of news imaginable. Again, the standardized patients come through.

"Those sessions are very difficult," Salerno says.

"It becomes incredibly realistic," Karras adds. "We know it's a simulation, but both students and actors become very emotionally invested."

"Giving bad news is the hardest thing to do," Peet says. "It's a hard thing to think about being good at. Yet, in time, you become more comfortable with the uncertainty."

Bad news takes its toll. On patients, families — and the person delivering it. "So our medical students learn to acknowledge their emotions and how to deal with them," Salerno notes. "We empathize with our students. We let them know that it's okay to feel this way. In medicine, we often deal with very tragic situations. The pressure can be difficult."

Hamna Zafar, MD '18, knows that communication is medicine. The new graduate is a resident in internal medicine at Mount Sinai in New York City.

JOSEPH V. LABOLITO

Zafar, a a newly minted physician with a great, giving spirit, knows this all too well. She's seen how *not* to do it, and is determined to never commit those mistakes.

Her mother-in-law died last year, in New York. "She was in the hospital a long time," Zafar says. She had congenital kidney disease, and a transplant some 30 years ago; that kidney finally failed, too. "She had so many problems. One after another. A heart attack. She was intubated. We couldn't get her off the ventilator. It was devastating," Zafar says.

Zafar, and her husband, also a medical student, were in the hospital day and night. They were frantic, begging the physicians for information as each new crisis hit. "We kept pestering them. To little avail," she says.

When her mother-in-law died, it was shattering. But it was also an epiphany.

"It made me realize I want to be the kind of physician who wants the patient to understand what we are doing, who wants the family to understand. They need to feel like they are the ones making the decisions," Zafar says.

A tough conversation doesn't always involve delivering a devastating diagnosis. It can mean getting patients to realize they need to take their medication. People, being people, may not think they need to. "When they feel okay, they think they are okay," Zafar says.

It can also mean nudging a patient through the use of "motivational interviewing," helping them realize they're ready to make a life change when it comes to drug use or another high-risk behavior.

"You're delving into personal areas of life," Salerno says. "Social history, sexual history, the use of illicit drugs — things you usually don't talk with people about. But doctors must."

That brings up another point. Zafar was raised to not make a big deal of others' religious, ethnic, or cultural differences. "It's not polite. But in medicine, these things really do matter," Zafar said.

People of different cultures and backgrounds can have different expectations of how physicians and patients should speak and behave. And with its multicultural staff, diverse patient population, and Office of Health Equity, Diversity & Inclusion, Temple is a natural learning "lab" for cultural competency.

To deliver the best care, physicians must be able to relate to everyone, no matter who they are or where they're from. Zafar, born and raised in Brooklyn, NY, wants to serve the underserved. She loves that Temple medical students are trained to relate to their patients as humans, to treat everyone with respect.

As Peet says, "You have to approach patients in an empathetic and nonjudgmental way. You have to remember that you have not experienced what they have experienced."

Knowing how to communicate effectively is just as essential to the practice of medicine as clinical knowledge.

Temple's curriculum provides ample opportunity to learn medicine and to learn communication. What's more, students can delve more deeply into the art of human engagement with elective courses such as Fundamentals of Improvisation; Disability Through the Lens of Self-Representation; An Exploration of Meaning Through Stories; Bioethics at the Movies; and Early Clinical Reflections — among others.

At Temple's Lewis Katz School of Medicine, students learn about populations, environments, and social determinants of health.

"Most of all, they learn about being human," Zafar says.

To learn more about medical education at Temple, visit medicine.temple.edu/education

Stories of the Human Side of Medicine

"ALONG WITH THE PHYSICIAN'S TOUCH, stories are at the core of the patient-physician relationship," says Michael Vitez, Pulitzer Prize-winning author and Director of Temple University's Narrative Medicine Program. "Stories–like these, written by physicians-in-training at the Lewis Katz School of Medicine—have the power to heal, inspire, build relationships, and change the world," says Vitez.

A Few Cups of Coffee

My friend loves coffee. I mean really loves it. Two cups at a time, morning, noon and night, lots of milk, two packs of sugar, loves it.

Day one. I knock on seven doors and offer water, straws, a hand, a walk, anything I can think of to wake these people up or stop their moaning or remind them that they're still human. Some of them, I can't tell if they're looking at me, can't even tell if they have eyes anymore. Most are asleep, lost in a haze of morphine. Burns are incredibly painful.

I knock on door eight and look in to see a small man under white sheets. I launch into my speech: "Hi, I'm Katya. I'm a new volunteer. Can I get you anything?" In a British accent out of a movie, I get back: "Hello, dear. Nice to meet you. Could I please have some coffee?"

I rush in, grab a cup from the scattered array, and add too much milk, not enough sugar, spill a little on the clean white sheets. I'm so nervous and he can tell, and he doesn't have enough fingers left to hold the cup. Can't stretch his neck to sip. I panic and look around the room for something, anything to help him. I stick a few straws together and hold everything in place while he tastes the coffee he's been waiting for. And now it's too cold.

I sit with him once a week, an hour here, an hour there. I get the feeling he's been here a while. We watch *Judge Judy* and do crossword puzzles. I write our answers. I try to think of things to talk about, try not to ask questions, try to avoid the word "fire."

The week before I started, he'd just come out of a three-month coma. The surgeons knew he was going to die, but they did everything they could, and he lived.

His family is overseas, but he has great friends in the States. I ask about his day and he asks about my classes. I try not to talk about running because he woke up from his coma without legs. I slip up and talk about running anyway.

The fire took his fingers, his eyebrows, his hair, the sight in his eye, the skin on his head, on his arms, on his face, on his back, so much of the skin on his back. I think he was lying on his back when they found him. The surgeons took his legs. They took them without asking, and he woke up after months of everything and found out that his ex-wife had made the call. "Do everything you can." So, they did.

But they saved his life, and we can talk about what it's like to wake up without legs. We can talk about a lot of things these days, but what we don't talk about is the difference between could and should.

His arms are sewn up, so his elbows can't bend and they cut skin, to patch skin, to sew skin back together, but there isn't enough left. His back is an open wound. He wants to die. He loves Christmas. He wants to live.

They cut into his elbows, so he can bend them again, and he gets mad when I write our answers to the puzzle. He gets mad when he still can't hold the pencil. This goes on for almost a year.

I see him before surgeries and after surgeries, see him trying to recover, hating the physical therapist, hating the nurses, hating the surgeons, hating the people that brought him here and kept him alive and don't have answers to his questions. "Where am I going next?" "What happens when my insurance runs out?"

I learn it's okay not to know what to say.

When his insurance does run out, the social worker scrambles like only social workers can and gets him a few more weeks. We make birthday cards and take the Christmas decorations down from the window.

My shift falls on the day before discharge. His insurance is gone, the social worker is leaving for a new job, the nurses are tired. They've tended his back for hours and hours, day after day, until the wounds have finally closed. They had to be closed to transfer him to rehab.

I make a cup of coffee without asking. I don't remember what we talk about. I go to leave and say goodbye without tears — first time in my life. I'm actually proud of myself for holding in my emotions.

He tells me to "Take care, dear," and I have to sit at the bus stop outside until I can stop dry heaving from crying so hard. I know I'll never see him again, and I drag myself home asserting that this was never about me or my feelings. That he needs to go to this place to get … better?

The nurses talk about making an email list, but no one is sure how to proceed without blurring the line between patient and friend. We all tread lightly. I never email him because I feel weird about it.

I walk onto the unit months later, still thinking about him whenever I pass his room. The nurses whisper to each other. "You should tell her."

One of them comes over, the one he loved to hate.

"Just so you know, he died last week. I don't know what happened. They might do a memorial."

Illustrations by SIMON PRADES

And I can't think or breathe, but I try to pull myself together in front of this woman who has seen too many things to possibly sleep at night, things I couldn't even describe if I tried. And she's crying and I'm crying and it isn't okay but we walk down the hall in opposite directions and knock on the doors to see if anyone needs anything.

My friend makes me think about the days we spend walking away from the hospital. The days we spend walking on our legs. The days we wake up and our legs are still there.

Sometimes life is exams and scans and cuts and blips and sky and trees and we get to see all those things without asking to.

Sometimes life is *Judge Judy* and crossword puzzles. Sometimes life is a few cups of coffee.

— KATYA AHR
(MD Class of 2021)

Psych Poem

To him I'm Doctor Taylor Swift
To her, a suspicious banker
To some patients who float adrift
My familiar face is an anchor

To him I'm part of a conspiracy
To her I'm comforting and warm
To some I'm just another ship lost at sea
In their ongoing emotional storm

To him I'm "bright eyes Miss Kate"
To her I'm someone from long ago
To some I'm the harbor that awaits
For others the rocks below

— KATHERINE DONCHES
(MD Class of 2018)

When Rain Meets Light

Today, I hugged a stranger. And I didn't know his name.

We had just operated on a young man in his late teens. He had sustained multiple gunshot wounds to the chest and abdomen and was in critical condition. When he lost pulses in the trauma bay, we cut his chest open and spread his ribs. His lifeless body lay there as we held his heart in the palms of our hands, and pumped it — over and over again — to mimic life.

We pumped tirelessly, afraid to let go, afraid to give up, afraid to say "enough." And just when we thought we had lost him forever, his heart began to beat again. We rushed him to the operating room, where we were met by a team of anesthesiologists, nurses, and residents. We worked together quietly and efficiently, all too well rehearsed.

"Male in his late teens, multiple gunshot wounds to the thorax and abdomen. He has a left femoral cordis, and two large-bore peripheral IVs. A resuscitative thoracotomy was performed in the trauma bay. Aortic cross-clamp time was 2053." That was all the information they needed as we prepared his body for surgery.

Two hours passed. We were not able to control the bleeding. He was in critical condition. We packed his chest and temporarily closed it. He will need massive resuscitation to survive more surgery.

I was unsure if we would save his life. I was unsure if this young man would ever get married, have children, or see the colors that form when the sunlight meets rain. I left the operating room, defeated.

And there he was, sobbing in a corner, alone.

He was in his mid-40s, wearing a grey shirt and muddy boots. Judging by the mud on his soles — remnants of rain mixed with earth — I could tell he worked in construction. He had a muscular build. And by the smell of his shirt, I could tell he had been working all day. I walked up to him as he held his face in the palms of his calloused hands, and stared as single tear drops fell onto his worn jeans like summer rain. I grabbed his head and pulled him into my chest. I embraced this stranger as he sobbed into my chest, leaving tear stains like little patches of despair and pain.

Today, I hugged a stranger. I hugged him with the hope that I could lift some of this pain, with the hope that I could take on some of the burden of his hopelessness. And I felt my eyes well up as I thought of my patient — a young male with so much to live for. As I held this man, I felt his sobs slow to a whimper. I wiped my tears and walked away without saying one word, without looking at him in his eyes.

I went to a nearby bathroom and sat on the floor. I needed time to think, to feel, to gather myself. After a few minutes, I washed my hands, washed my face, and walked back to the operating room to check on the patient. The chief resident had re-opened his chest, and was massaging his heart.

"He lost pulses," she said, as she motioned me to take over compressions.

I pumped his heart in the palm of my hands — over and over again — to mimic life, but his heart lay still. Everyone went quiet. We bowed our heads in understanding.

I stood behind as the team left to prepare for new cases. The air was warm and thick in the operating room as I cleaned his motionless body of blood. The nurse and I moved his body onto a stretcher — his bloody Tommy Hilfiger boxers remained on the operating room table. We worked together somberly and efficiently, all too well rehearsed.

The phone rang — like an old, nasty alarm clock — and pierced the thick air. It was a nurse telling us that the family had arrived and wanted to see their son.

We wheeled him to the recovery unit, and the nurses prepared the room with boxes of tissues and cups of water. I took one last look at him before I departed, and felt my eyes well up with indignant pain — another young victim of gun violence, taken too soon.

As I left the room, there he was walking toward me, toward his son's body — in his grey shirt and muddy boots. He took one look at my tearful eyes and embraced me. He pulled my head into his chest, and by the smell of my scrubs, he could tell that I had been working all day. He embraced me as I sobbed into his chest, leaving behind small little patches of hopelessness and pain.

Today, I hugged a stranger.

— EDWIN ACEVEDO, MD
Resident, Surgery

Pedagogy

Scrubs, gloves, goggles,
Gown draped around my body
forming an insulating layer
between mine and yours,
Shielding me
from your parts
which are now so openly exposed.

But what mental tools do I have
to insulate myself against
the ambiguity I feel
when I invade you?
When I wield my scalpel
and peel back the tough flesh
of your hand,
I know not,
whether I am fulfilling your Wish,
whether I am stripping you
of your Personhood, your Dignity,
or whether I am simply inadequate,
an amateur doing gross injustice
to your complex Beauty.

I have no insulating layer
to protect me from the sadness I feel,
when I see your lifeless body;
the vessel of your humanity,
from which there once radiated
Light, joy, wisdom.
No insulating sheath:
I am just as vulnerable as you.

Perhaps my vulnerability is preferable
to desensitization, to indifference,
to the absence of that very humanity
that drives me to learn from you.
Perhaps the piercing gaze of my eyes,
my prying probe,
searching your vessels, fibers, crevices,
is giving you meaning,
even in death —
I can only hope that it does.

It is certainly imbued with meaning for me,
a privilege,
a gift of the most intimate kind,
the vessel of your life being
preciously transferred to me,
so that I can in turn help others.
And while you have reminded me
that my Fate
is the same as yours,
I am forever thankful
for your presence,
for your pedagogy,
for your gift.

— KURT KOEHLER
(MD Class of 2021)

New Frontiers in GIST

In 2002, when Gleevec (imatinib mesylate) was approved for patients with advanced or metastatic gastrointestinal stromal tumors (GIST) — a breakthrough advance — **Lori Rink, PhD**, was just beginning her doctoral degree program in biology at Temple University. Her goal: to perform translational research that could potentially make an impact in people's lives. Today she's Assistant Professor in Molecular Therapeutics at Fox Chase Cancer Center. And GIST — a rare cancer — is her area of expertise.

"First identified about 34 years ago, GIST can arise anywhere in the digestive tract, but typically grows in the stomach or small intestine" Rink says. About 6,000 patients in the U.S. are diagnosed with a GIST each year.

Most cancers are carcinomas, composed of epithelial cells. GIST is a less-common cancer called sarcoma, a cancer that develops in connective tissues. Sarcomas are made of mesenchymal cells, found in bone, muscle, fat, and cartilage. "It is believed that GIST is derived from special cells in the gut called interstitial cells of Cajal, the pacemaker cells that stimulate digestive contractions," Rink explains.

GIST is nonresponsive to traditional chemotherapies and radiation. Until recently, surgery was its only treatment option. "Fortunately, that changed in 1998, when scientists discovered that about 85 percent of GIST harbors a mutation in a gene called KIT or less frequently, a gene called PDGFRA. These mutations are the drivers of these tumors. This was really important, because it opened the door to molecular therapy as a path to treatment," says Rink. And in 2002, the FDA granted approval for GIST to be treated with a molecular therapy called Gleevec.

Although the drug was originally designed to target a genetic defect in patients with chronic myeloid leukemia, it binds to mutant forms of KIT and PDGFRA too — essentially shutting down the driving force of the defective gene, halting tumor growth.

"GIST became the first solid tumor to be treated molecularly. It's served as a sort of paradigm for precision medicine in solid tumors," Rink notes. "There's no question that Gleevec revolutionized GIST therapy. Nevertheless, challenges remain."

For example, while about 80 percent of GIST patients respond well to Gleevec initially, most develop resistance to the drug in about two years. Rink is working on tactics to combat resistance. In one approach, she combined Gleevec with an AKT inhibitor in the laboratory and showed that it can significantly extend Gleevec's window of effectiveness (*Clinical Cancer Research*, 2017). She's also testing novel agents and combinations. "By elucidating the molecular pathways associated with resistance, we can develop novel strategies," she explains.

Patients who never respond to Gleevec represent another challenge. This is true of a subtype of GIST that lack mutations in both KIT and PDGFRA. Over the last few years Rink's lab has been looking for drivers of these tumors that they might be able to exploit.

An early finding, that these tumors have high levels of a protein called insulin-like growth factor 1 receptor (*Proceedings of the National Academy of Science*, 2008), led to the development of a clinical trial targeting this protein sponsored by Margaret von Mehren, MD, Chief of Sarcoma Medical Oncology at Fox Chase. More recently Rink and her colleagues demonstrated that these tumors often exhibit a defect in the succinate dehydrogenase pathway, an important component of cellular metabolism (*Genes, Chromosomes and Cancer*, 2013).

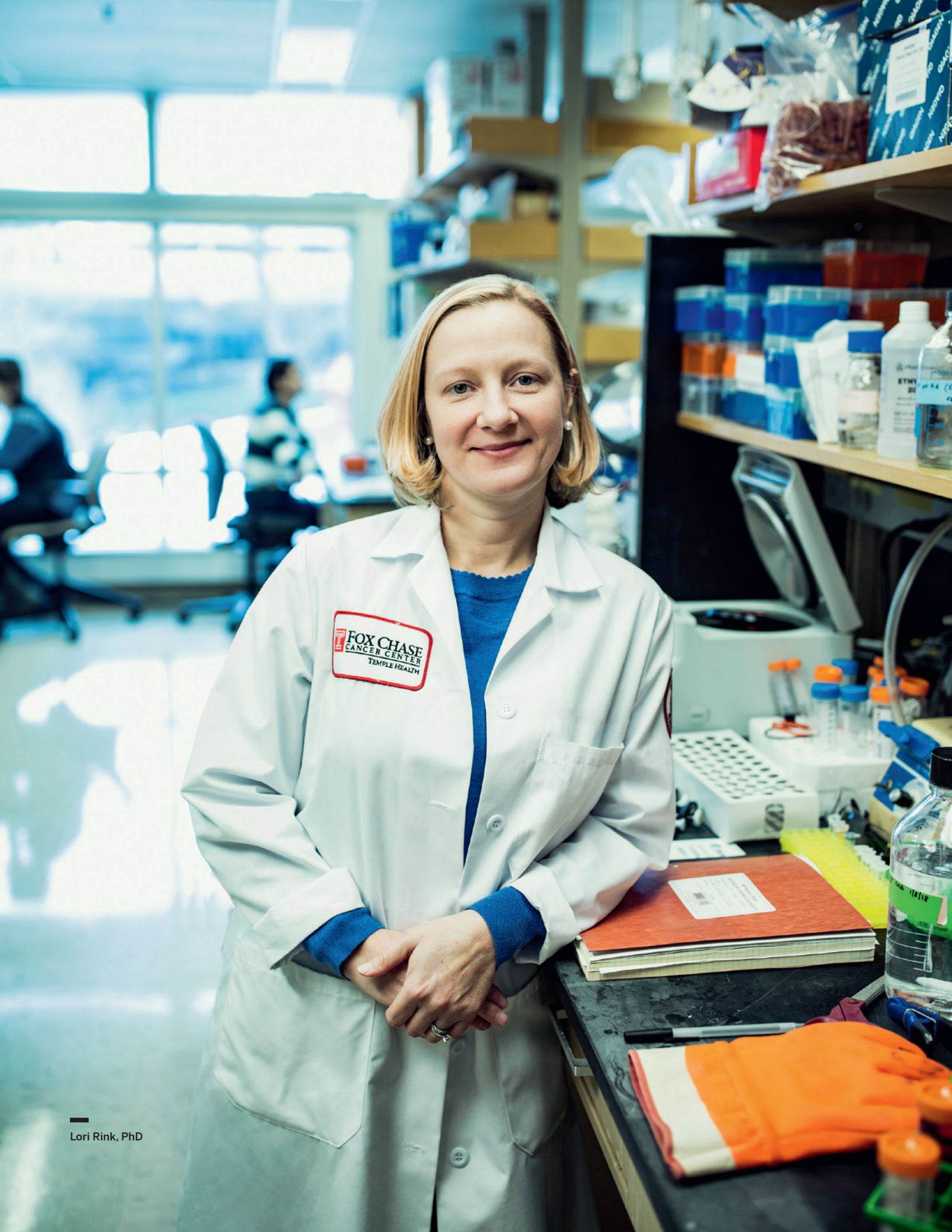
Rink says targeted therapies for cancer represent a new frontier, and she's enthusiastic to explore this territory.

Rink was recently awarded a five-year NIH grant that will enable her to perform preclinical studies to exploit vulnerabilities in GIST using novel combination therapies to extend Gleevec's effectiveness. Of course, development of strategies targeting AKT will be a top priority on her list.

Rink began her training when the precision medicine era first began.

"I'm amazed at the impact that basic science can have on patients' lives in a relatively short period of time," she says, "and I am motivated to inspire the momentum."

Photograph by CARDONI



Lori Rink, PhD

New Tool for Lung Biopsy

A new technology could revolutionize the way that potentially cancerous, hard-to-reach nodules in the lung are biopsied. It's called the Archimedes™ System. Temple Health is the first medical center in the Mid-Atlantic region to use it.

"The safety and effectiveness of the Archimedes System have already been proven. Now we're doing a stage IV study to evaluate its effects long-term," says Gerard Criner, MD, MD, FACP, FACCP, Director of the Temple Lung Center, principal investigator of the EAST 2 clinical study at Temple.

With approximately 220,000 new cases diagnosed yearly, lung cancer causes more deaths in the United States than any other type of cancer. Wide utilization of a technology like the Archimedes System could increase the number of potentially life-saving early diagnoses obtained due to its ability to accurately access small lesions, regardless of where they're located in the lung.

Nodules located in easily accessible airways can be biopsied in a standard bronchoscopic procedure. Some nodules, however, are located in hard-to-reach areas outside airways or in the periphery of the lung. Until now, they could only be biopsied surgically.

But the Archimedes System provides bronchoscopic access to the entire lung — using an innovative method called bronchoscopic transparenchymal nodule access (BTPNA). The process involves positioning a bronchoscope as close to the nodule as possible, then tunneling through lung tissue to reach it.

"No other technology on the market can do this. Moreover, BTPNA is less invasive than surgery — reducing patient recovery time and risk of complications. This is especially important for medically vulnerable patients," Criner says. "What's more, its diagnostic yield is better than conventional methods. Using the Archimedes System increases the likelihood of obtaining the tissue needed to establish a diagnosis."

An added benefit is that, after taking the tissue sample, the physician can deliver catheter-based bronchoscopic treatment options — minimizing the number of procedures a patient must undergo.

Also, as shown on page 39, the Archimedes System is small, streamlined, and easily transportable. It is manufactured by Broncus Medical, Inc., based in San Jose, CA.

HOW IT WORKS

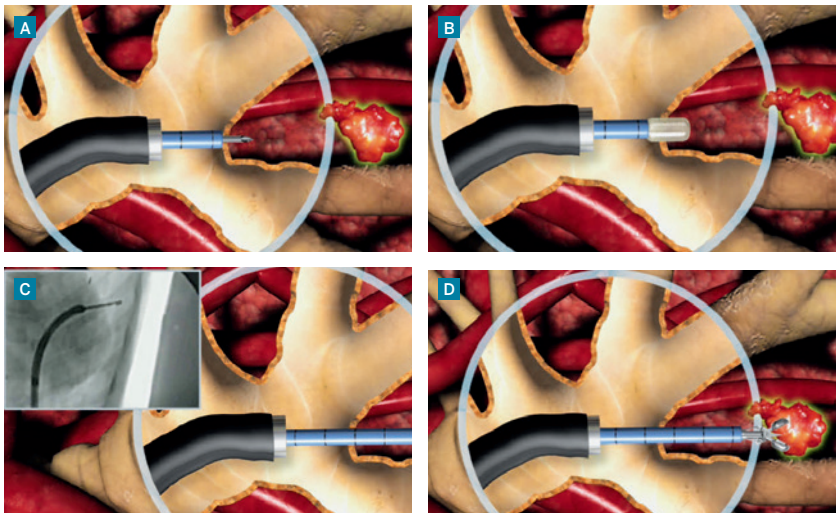
Using computerized tomography (CT), Archimedes creates a 3D model of the patient's lungs to pinpoint the site to access during the bronchoscopy. The team then maps out the most efficient nonvascular path through the airways to reach it. When the navigation plan is complete, the patient is given a mild anesthetic to relax, and the procedure begins.

The physician inserts a flexible, narrow bronchoscope into the patient's mouth, down through the windpipe, down into the airways of lung — using image-guided navigation to get as close as possible to the nodule.

When the destination is reached, the physician uses a tiny tool called a FlexNeedle to make a small hole in the airway wall in the direction of the nodule, as shown below in Image **A**.

The physician gently widens the hole with the Archimedes Dilation Balloon, depicted in **B**. Then the physician extends the Archimedes Sheath, shown in **C**, to tunnel through nonvascular tissue toward the nodule.

Finally, as depicted in Image **D**, the physician uses a tiny tool to extract a tissue sample from the nodule, then pulls it back inside the bronchoscope, which is gently withdrawn from the patient's lung.



Lung nodules previously accessible only through surgery can now be reached safely with a new minimally invasive technology called bronchoscopic transparenchymal nodule access (BTPNA).

IMAGES COURTESY OF BRONCUS MEDICAL, INC.

Streamlined, portable, and powerful, the Archimedes System has transformed the way physicians biopsy hard-to-reach lung nodules. Temple is the first medical center in the Mid-Atlantic region to offer this technology.

Jeanes Hospital at 90

The only Quaker-founded community hospital in the nation, Jeanes Hospital, located in Philadelphia (the Quaker City), turns 90 this year.

Created by a bequest from Philadelphia philanthropist Anna T. Jeanes (1822-1907), Jeanes Hospital opened its doors in January 1928 with 46 beds and a mission to care for "those with cancerous, nervous, and disabling ailments." The hospital's land — a bucolic 54-acre tract in the Fox Chase section of Philadelphia — was once the Jeanes family farm.

The youngest child of a wealthy Philadelphia merchant, Jeanes inherited the family fortune — and spent it to improve conditions for vulnerable populations. At less than 100 pounds, she was a diminutive woman of impressive historical stature, dedicating her life to social justice. For example, in 1907 she worked with the U.S. General Education Board and Booker T. Washington to establish a $1 million "Fund for Rudimentary Schools for Southern Negroes." The teachers in the long-lived program were known as "Jeanes teachers." In Philadelphia, she supported health and social welfare enterprises that still flourish today — Jeanes Hospital among them.

By 1946, to meet the needs of its growing community, Jeanes Hospital had become

1907

Anna T. Jeanes leaves a bequest to the Quaker Meeting of the Friends to build a hospital in Philadelphia for "those with cancerous, nervous, and disabling ailments."

1946

Expanding beyond its founding mission, **Jeanes** becomes a general community hospital with 100 beds (it is licensed for 146 today).

1967

Fox Chase Cancer Center is built adjacent to Jeanes on the Jeanes family farm, with a bridge connecting the two hospitals.

1900

1928

Jeanes Hospital — built on the Jeanes family farm — opens its doors on January 25, 1928. It has 46 beds.

1954

The first patient of Jeanes's new Emergency Department is a **toddler** with a marble lodged in her throat.

1988

Jeanes opens its Surgery-Rehabilitation building — a facility later rededicated as the hospital's Heart & Surgery Center — and in 1992 opens its new **Patient Care Center**, featuring modern patient-care facilities in a home-like setting.

a 100-bed general community hospital — and continued to expand. In 1996, it joined Temple Health. In 2012, its next-door neighbor, Fox Chase Cancer Center, joined Temple Health as well — further advancing collaborative patient care.

"For 90 years, Jeanes has served Philadelphia and its northern suburbs," says Marc P. Hurowitz, DO, MBA, FAAFP, President and CEO of Jeanes Hospital. "With academic-level services and special certifications, we've advanced far beyond our founder's original directive — yet hold fast to the humanistic values of our Quaker roots."

Well-known for community health and social advocacy, Jeanes provides critical resources, connecting thousands of people to education and community-based social services yearly — all while providing sophisticated programs in cardiac surgery, gastroenterology, neuroscience, and other specialties that have been cited for clinical excellence by *Consumer Reports*, *U.S. News & World Report*, Healthgrades, Leapfrog, and other evaluators.

In 2017, Jeanes Hospital served more than 120,000 inpatients, outpatients, and emergency patients, plus visited over 20,000 patients in their homes. The hospital also serves as a clinical training site for students of Temple's Lewis Katz School of Medicine.

1996

Jeanes joins the Temple University Health System, enabling a major expansion of programs and services.

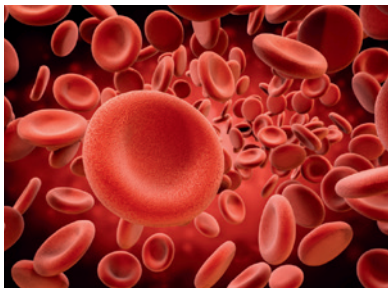
2010

Six years after Jeanes launches its cardiac catheterization program and just three after performing its first **open-heart surgery**, Independence Blue Cross names Jeanes a Blue Distinction Center for Cardiac Care.

2018

Healthgrades names Jeanes a Distinguished Hospital for Clinical Excellence™, citing it for distinction in patient safety, critical care, neuroscience, cardiac care, and other services.

2020



1999

The hospital establishes its inpatient **Bone Marrow Transplant program** (its outpatient arm launched in 2016).

2015

Jeanes establishes its inpatient **palliative care program**.

1999 AND 2015 IMAGES: DREAMSTIME; ALL OTHERS COURTESY OF JEANES HOSPITAL AND TEMPLE HEALTH MARKETING

Robert McNamara, MD, MAAEM

EMERGENCY MEDICINE

Q & A

In addition to chairing Emergency Medicine at Temple Health — the busiest emergency service in Philadelphia, with 200,000 emergency patients yearly — you're also the most successful Dragon Boat coach in the United States.

Yes, I've been head coach of the U.S. National Dragon Boat Team since 1986. My teams have won more than 100 World Championship medals, including 23 Gold medals and two Nations Cup Awards.

Q: *You believe in the General Patton theory of leadership. What does that mean?*
A: To me, it means directing the action from the "front lines," not from afar. In the emergency department, it means being out on the floor like everyone else — seeing patients, working nights and weekends. In coaching, it means going through the same training and testing as all rowers. I have paddled in every world championship to date.

Q: *Dragon boat racing originated in China 2,500 years ago. Is emergency medicine that old?*
A: It is as old as mankind. But the field as we know it today dates back to the 1960s, when more patients began seeking immediate, unscheduled care at hospitals. To meet that demand, physicians in other specialties started working shifts as "emergency physicians." Soon it became obvious that specialized skills and knowledge are required to do the job well.

Q: *Board certification for emergency medicine was created in 1979, three years before you became a resident. Does that make you one of the first "real" emergency medicine physicians?*
A: I am in the first generation of "real" emergency physicians, and my program was one of the first accredited residency programs. After 1989 you could only become board-certified after completing an accredited emergency medicine residency. This eliminated the "grandfathering" option for those who did not complete a residency. It also caused conflict, with physicians splintering into groups, lobbying for exceptions. Even today, there are physicians working in emergency departments who aren't board-certified or board-eligible in emergency medicine.

Q: *Is that what drove you to establish the American Academy of Emergency Medicine (AAEM) in 1993?*
A: Yes, that was a large part of it. The AAEM is composed solely of board-certified and board-eligible physicians. We believe that physicians working in emergency medicine must complete an accredited emergency medicine residency program and pass the board exam. This is in the best interest of patients. We also believe that physicians must be able to practice medicine as we do at Temple: unencumbered by profit motives. Emergency physicians must be free to provide quality care to all, regardless of financial or insurance status. They can also help improve patient outcomes through education and research.

Q: *Research in emergency care?*
A: Certainly. Research drives innovation in all fields of medicine. Emergency medicine is no exception. Temple has managed many research programs in emergency medicine over the years. We are nationally recognized for research that improves emergency care.

Q: *You helped shape the national curriculum for emergency medicine training. You helped establish the Council of Emergency Medicine Residency Program Directors. You are a Master of the American Academy of Emergency Medicine and recipient of multiple honors. There's even a national award named in your honor, the Robert McNamara Award, recognizing outstanding academic leadership. What gives you the most pride?*
A: My Temple colleagues and residents — and the great care they give to patients. They're exceptional.

Photograph by TOMMY LEONARDI

Robert McNamara, MD, MAAEM

IMPACT

1970s

Mark Creager, MD '74, FAHA, Lyme, NH, is Director of the Dartmouth-Hitchcock Health System's Heart and Vascular Center and Professor of Medicine at the Geisel School of Medicine. Prior to this appointment, Creager, a nationally known expert in cardiovascular diseases, was associated with Harvard University and Brigham and Women's Hospital in Boston. In 2015-16 he served as President of the American Heart Association.

Raphael Lee, MD '75, Chicago, IL, received the 2017 Distinguished Alumni Award of the University of South Carolina. A plastic surgeon and biomedical engineer, Lee is the Paul S. and Allene T. Russell Professor at the University of Chicago, where he holds appointments in plastic surgery, dermatology, and biomechanics. Lee is a former MacArthur Prize fellow. He is also the recipient of an honorary doctoral degree from the University of Southern California for his investigation of the health consequences of the Chernobyl nuclear accident.

Altha Stewart, MD '78, Memphis, TN, has been named President of the American Psychiatric Association. Stewart is Associate Professor of Psychiatry and Director of the Center for Health in Justice Involved Youth at the University of Tennessee. Her career spans three decades of public sector behavioral health system administration in Michigan, New York, and Pennsylvania.

Christopher Rumpf, MD '79, Charleston, SC, an internist and geriatrician, is Vice President and Senior Medical Consultant at SE Healthcare Quality Consulting. Prior to accepting this post, he served as Senior Vice President and Chief Medical Officer for Valley Health System in Winchester, VA, having also held leadership positions for Blue Cross and Aetna.

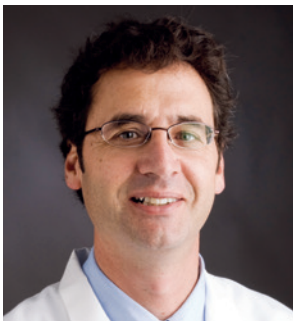
1980s

Roberta Gartside, MD '81, FACS, Fairfax, VA, has been elected Chair of the Society for Women's Health Research. A plastic surgeon in the Washington, D.C., metro area, Gartside is former VP of the American Society of Aesthetic Plastic Surgery and American Society of Plastic Surgeons. A nonprofit based in Washington, D.C., the Society for Women's Health Research promotes research on biological differences in disease with an eye toward improving the status of women's health.

Theodore Jones, MD '82, FACOG, Bloomfield Hills, MI, Associate Professor of Obstetrics/Gynecology at Wayne State University School of Medicine, and Vice Chair of Obstetrics/Gynecology and residency Program Director at Beaumont Dearborn Hospital, was recently named President of the Wayne County Medical Society of Southeast Michigan. Jones founded the perinatal infectious disease clinic at the Detroit Medical Center University Health Center, the only obstetrical clinic in the state for pregnant women with HIV infection.

Cynthia Macri, MD '83, Kensington, MD, is Senior Vice President and Chief Medical Officer at EagleForce Associates, Inc., an advanced analytics company. A retired captain of the U.S. Navy Marine Corps, Macri formerly served as the Special Assistant to the Chief of Naval Operations for diversity and served as chief strategist for the Navy's 21st Century Sailor Office. She also served on the Navy's Population Health Advisory and Psychological Health Advisory Boards.

Mary Reich Cooper, MD '85, JD, South Salem, NY, has been named Vice President and Chief Quality Officer (CQO) of the Connecticut Hospital Association. Prior to accepting this post, she was Senior Vice President and CQO for the Rhode Island-based Lifespan. She holds a faculty appointment in medicine at Brown University. She is also Associate Professor, Population Health, at Jefferson College of Population Health, Thomas Jefferson University.



John Lauriello, MD '86, Columbia, MO, is Chair of Psychiatry at the University of Missouri, where he's also the Robert J. Douglas MD and Betty Douglas Distinguished Faculty Scholar in Psychiatry. Prior to accepting this post, he was Clinical Vice

STEWART: MICKI MARTIN; GARTSIDE: COURTESY OF THE SOCIETY FOR WOMEN'S HEALTH RESEARCH; COOPER: COURTESY OF THE CONNECTICUT HOSPITAL ASSOCIATION; LAURIELLO: COURTESY OF THE UNIVERSITY OF MISSOURI

Chair of Psychiatry at the University of New Mexico (UNM) and Executive Medical Director of the UNM Psychiatric Center. Lauriello was the Lewis Katz School of Medicine's 2011 Paige M. and Henry P. Laughlin Alumnus of the Year.

Julie Speicher, MD '86, Peckville, PA, an internist, was recognized for her work with HealthStream's Excellence through Insight award, a national honor recognizing outstanding patient satisfaction ratings and commitment to excellence in patient care. Speicher practices with Commonwealth Physicians Health Alliance.

Beth-Ann Lesnikoski, MD '87, FACS, West Palm Beach, FL, an oncoplastic breast surgeon, is Director of the Breast Program at Baptist Health in Jacksonville. She recently chaired the American Cancer Society's Florida Division.

David Musser, MD '89, Paducah, KY, practices with Lourdes and Mercy Medical Vascular Specialists and Mercy Medical Associates. A fellowship-trained vascular surgeon, Musser practiced with WellSpan Vascular Surgery in Lebanon, PA, prior to accepting the post.

1990s

David Nace, MD '90, Wexford, PA, is Associate Professor of Medicine and Director of Long Term Care and Influenza Programs in the Division of Geriatric Medicine at the University of Pittsburgh. He's also Chief of Medical Affairs for the University of Pittsburgh Medical Center Senior Communities program and involved in federally sponsored research and quality improvement projects addressing a variety of population health concerns.

Jennifer Childs-Roshak, MD '93, Boston, MA, is President and CEO of Planned Parenthood League of Massachusetts and also serves as the President of the Planned Parenthood Advocacy Fund of Massachusetts. She is former Regional Medical Director for Atrius Health.

Robert Harrington, MD '93, SFHM, Charleston, SC, is President of SurveyVitals, Inc., a health care analytics firm specializing in patient experience surveys. Prior to this post, he served as CMO for both Reliant Post-Acute Care Solutions and Locum Leaders. Harrington is a past president of the Society of Hospital Medicine.

Hoangmai Pham, MD '95, MPH, Washington, DC, is Senior Policy Fellow at the Duke-Margolis Center for Health Policy. She is former Chief Innovation Officer and Director of the Seamless Care Models Group at the Center for Medicare and Medicaid Innovation. She was also Senior Health Researcher and Co-Director of Research at the Center for Studying Health System Change and Mathematica. Her interests include care coordination, quality reporting and improvement, health disparities, and provider market trends — and the intersection of these with payment policy.

Andrea Zynda-Weiss, MD '98, Honeoye Falls, NY, is Associate Professor of Clinical Imaging Sciences at the University of Rochester School of Medicine and Dentistry. An MRI specialist, Weiss's research interests include neuronal growth cone guidance.

2000s

Angela Lewis-Traylor, MD '00, FACS, Houston, TX, a fellowship-trained surgical oncologist, is Surgeon-in-Chief with Lakeshore Surgical, a practice associated with several hospitals in the Pasadena area. Lewis-Traylor's expertise includes breast, gastrointestinal, endocrine, colon and rectal cancer, and advanced laparoscopic and general surgery.

Simon Ahtaridis, MD '03, MPH, Tacoma, WA, is National Clinical Advisor and Chief Medical Officer for Sound Physicians, an organization focused on improving outcomes and financial performance for hospital partners in acute care. Prior to accepting this post, he was Chief of Medicine at Mercy Medical Center in Springfield, MA.

Sarah Moyer, MD '10, MPH, Louisville, KY, is Director of the Department of Public Health and Wellness for the metro-Louisville area. As the city's chief health strategist, Moyer also co-chairs the Louisville Health Advisory Board, a group of government, business, and community leaders working to improve the well-being of Louisville residents. Moyer is boarded in family medicine.

Devin Oller, MD '13, Boston, MA, is an Assistant in Medicine and a Fellow in Rural Health Leadership at Massachusetts General Hospital.

NEWS TO SHARE?
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From Temple to Tanzania

Albert Alley and the World Blindness Outreach

By MICHAEL IZZO, MD '18

I was primed for the phone interview, eager to convince Dr. Alley to let me go with him on the eye-surgery mission to Tanzania.

But the first thing he said was: "Michael, how can I make this trip valuable for *you*?"

He's President of World Blindness Outreach — this incredible organization — and I was a medical student he'd never met. Yet he's concerned about my needs.

It was almost anticlimactic that he accepted me for the mission sight unseen. Was it because he knew that my dad is an ophthalmologist and my mom is a nurse — and they wanted to go on the mission, too?

Later Dr. Alley said those factors were icing on the cake — but he took me because I was a Temple med student. "I knew you'd be an excellent addition," he said.

THE ALLEY MAGIC

Albert Alley, MD, a 1964 graduate of Temple's medical school, President and Co-Founder of World Blindness Outreach (WBO), is one of the most caring and attentive people you could ever hope to meet. He practiced ophthalmology in Lebanon, PA, for four decades. And in 1990 (two years before I was born) he and his WBO volunteers began traveling the world to perform sight-restoring surgeries for people who would otherwise remain functionally blind.

They travel to Ecuador and the Dominican Republic annually to do this amazing work — and have completed about 90 other missions in 25 countries, including Cambodia, El Salvador, Ghana, India, and Vietnam. All told, the WBO has done more than 10,000 cataract, corneal transplant, glaucoma, and strabismus surgeries — an awe-inspiring amount of service. Yet Dr. Alley laments that 42 million people in the world remain functionally blind.

"Avoidable blindness is a tragedy," he says.

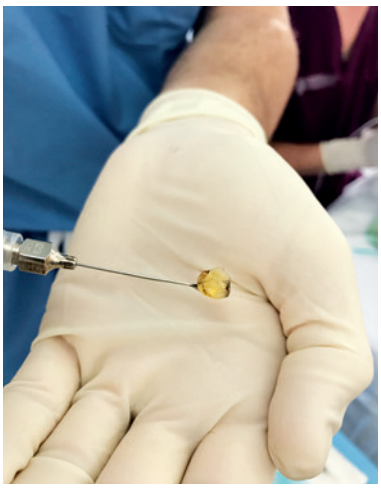
Honestly, I understand why this unmet need keeps the WBO mission urgent and keen. And three decades of experience has made WBO a well-oiled machine. It fascinated me to learn how much prep work Dr. Alley puts into each mission.

Months ahead of each trip, he works with physicians at the destination to identify patients and to secure operating room space and post-op accommodations. If needed, they'll even arrange transportation for patients from remote villages. Patients will be picked up before surgery, then once cleared for release, be taken safely home again.

Early on, WBO learned that one missing tool can jeopardize an entire mission. Therefore, they either pre-ship, or travel with, all supplies and instruments they'll need: microscopes, slit lamps, surgical instruments, autoclave, lens implants, everything down to sutures and eye drops. At the end of each mission, they leave behind whatever they can for the local physicians.

Of course, Dr. Alley recruits volunteers from the U.S. to accompany him on each mission. Many people with Temple connections have participated over the years, including Dr. Alley's daughter, Cynthia Alley, MD, a 2000 graduate of Temple's medical school and former director of Temple's ophthalmology residency program. Naturally, professionals at the destination volunteer on the patient care team, too. WBO has trained hundreds of people at the mission sites over the years. "And we've learned quite a lot from them too," Dr. Alley says.

The mission I went on in July 2017 was WBO's first to Dar es Salaam, the largest city in Tanzania. Dr. Alley had networked with local ophthalmologists to screen patients



Far left: Cataract surgery in progress. Above: Dr. Albert Alley with some of his fans. Lower left: Minutes after surgery. Lower right: A large cataract.

IMAGES COURTESY OF MICHAEL IZZO

and reserve an operating room at the Killman Road Police Hospital, a small facility on the southern outskirts of the city. Nine of us went on this mission, including Dr. Alley, me, my parents, an ophthalmology resident, a surgical tech, an instrument tech, Dr. Alley's wife, and his nephew, a primary care physician. Our team also included four Tanzanian ophthalmologists and nurses who we relied on to communicate with patients who spoke Swahili.

Most of our patients came in on buses from outlying villages. It awed me to see them patiently awaiting their turns. Most were in their 50s and 60s, with cataracts as dense as marble — too large, in fact, for the procedure normally done in the United States called phacoemulsification. So we did open surgery, a more "old-fashioned" approach.

What an amazing experience it was. I got to serve as Dr. Alley's first assistant on many of the cases. I was afraid I'd fumble, hand him the wrong instrument, or break the sterile field. But Dr. Alley remained cognizant of my ability level. He was as patient and understanding as can be — doing superlative surgery — and teaching me each step of the way.

To do the most good it can on each mission, WBO focuses on patients with correctable blindness only. And typically will only operate on just one eye of each patient. That way, more patients can benefit. The team works 10 hours per day, doing about 85 surgeries in five days.

The post-op transformations were incredible to witness. Just the day before the patients were barely able to see. But when we removed their bandages, we watched them experience sight — often for the first time in years. "*Asante, asante*," they said, crying tears of joy. Talk about emotional! It was even more special to share all this with my parents. Not too many families get to share a medical mission abroad — let alone with an amazing family like the Alleys. In fact, in the Dominican Republic, WBO operates in the Linda Alley Clinic — named by the Dominicans in honor of Dr. Alley's other daughter, Linda, who's had an incredible passion for the country ever since her time in the Peace Corps in the 1990s. They love Dr. Alley so much in Ecuador they named a *street* after him in Nagua: Albert Alley Way.

Dr. Alley is beloved at home in Pennsylvania, too. He gives to the residents of central Pennsylvania through another nonprofit he started: Mission Cataract Lebanon Valley. He's also been an active member of Rotary since 1976. He was president of the Lebanon Rotary Club and governor of District 7390.

"The people we help might be financially poor, but they are emotionally rich," Dr. Alley says.

That is part of the Alley magic. He cares about every person he meets. You feel like a friend instantly. And after a week, you feel like family.

SMALL-WORLD STORY

When I first heard about Dr. Alley, I had no idea we had Temple in common. Later we discovered other connections, too. We found out, for example, that we're both Eagle Scouts.

Dr. Albert Alley embodies every trait to which an Eagle Scout and Temple Owl could possibly aspire. Professionalism and high standards, courtesy and compassion. And an amazing spirit of generosity. No wonder he received the medical school's Alumni Achievement Award in 1999.

Dr. Alley has been incredibly generous to Temple. In fact, he and Cynthia created the Albert Alley and Cynthia Alley Endowed Scholarship fund for medical students. All the good he's done in this world truly amazes me.

I am so fortunate to have Dr. Alley and my dad in my life. And, yes, I intend to follow in their footsteps and pursue ophthalmology.

I know that service work will be part of my future, continuing the rich tradition of cataract surgery mission work that Dr. Alley has shown me.

"Give, and you'll be amazed at the benefits you receive," Dr. Alley says.

Absolutely.

Michael Izzo, MD, a 2018 graduate of the Lewis Katz School of Medicine, is pursuing his residency in ophthalmology at Georgetown University in Washington, D.C.

"Our academic-level services have advanced far beyond our founder's original directive — yet we hold fast to the humanistic values of our Quaker roots."
— MARC P. HUROWITZ, DO, MBA, FAAFP, PRESIDENT & CEO, JEANES HOSPITAL

"The things that affect academic medicine affect the health of all Americans."
— LARRY R. KAISER, MD, FACS, PRESIDENT & CEO, TEMPLE HEALTH

2

Fox Chase Scientists won Nobel Prizes for their work:

Irwin Rose (2004)

Baruch Blumberg (1976)

"As far back as I can remember, I felt compelled to make a difference for vulnerable people."
— ELLEN TEDALDI, MD, MACP, PROFESSOR OF MEDICINE

"We are working to decrease the cost of human disease."
— SUSAN FISHER, PHD, CHAIR, CLINICAL SCIENCES

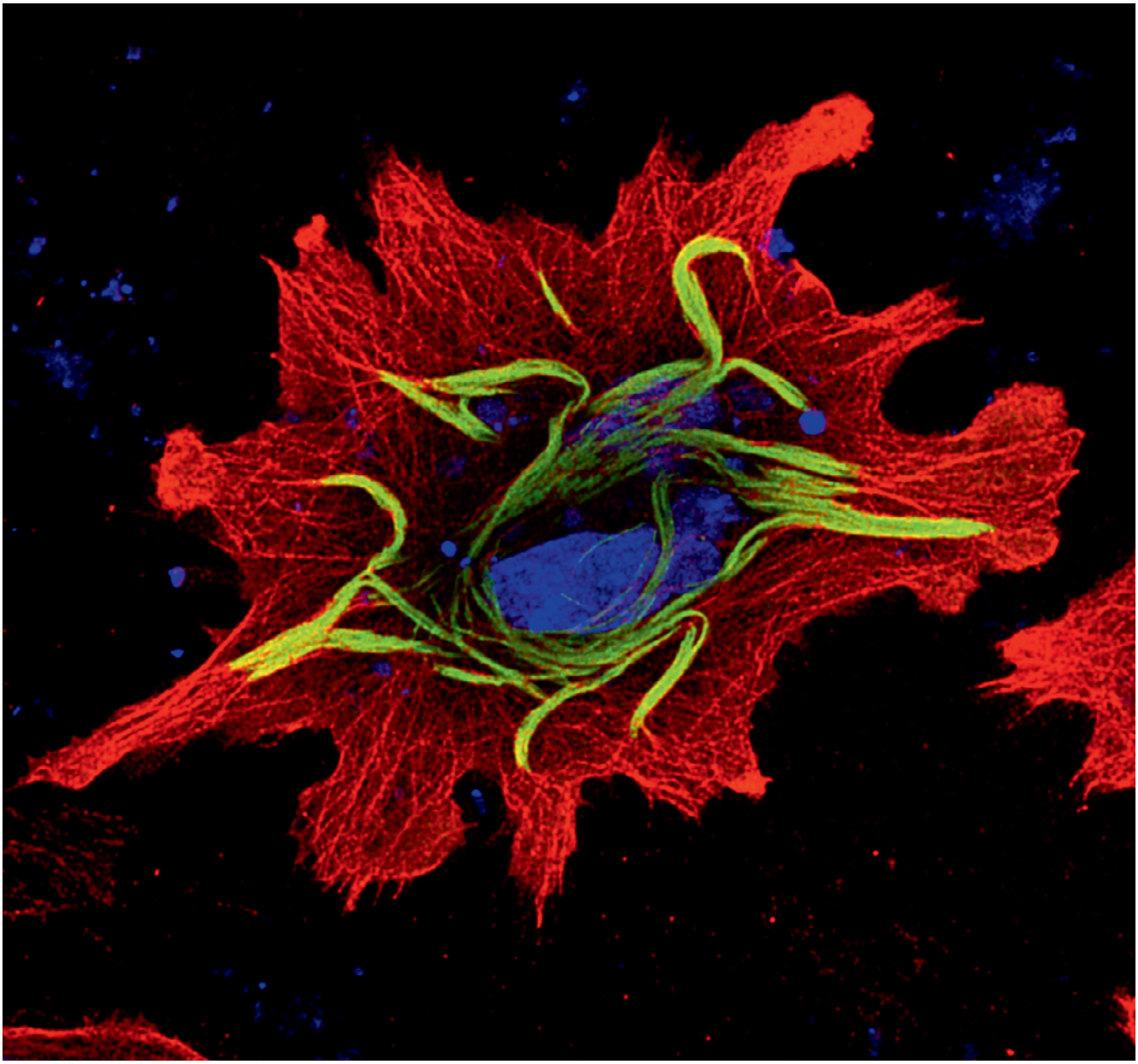
Jeanes Hospital, the nation's only Quaker-founded community hospital, turns 90 this year. It opened in 1928 with 46 beds. With 146 beds and 1,014 employees today, it accommodates 140,000+ patient visits per year.

With **5 campuses** in Pennsylvania, Temple University supports more than **43,000 jobs** statewide, generating **$205 million** in annual tax revenue for the Commonwealth.

U.S. NEWS & WORLD REPORT LISTS TEMPLE UNIVERSITY'S LEWIS KATZ SCHOOL OF MEDICINE AMONG THE NATION'S "BEST MEDICAL SCHOOLS," 2018.

"WE NEVER STOP REFINING WHAT IT MEANS TO PROVIDE EXCEPTIONAL CARE."
— RICHARD I. FISHER, MD, PRESIDENT & CEO, FOX CHASE CANCER CENTER

Temple University is the **5th largest** provider of professional education in the United States.



XIAOWEI CHEN, PHD, AND RICHARD A. KATZ, PHD

Turning a New Leaf in Breast Cancer Research

A group of Fox Chase Cancer Center investigators led by Xiaowei Chen, PhD, and Richard A. Katz, PhD, discovered the way in which a breast cancer gene called CCDC170 might contribute to risk and progression. They found that the CCDC170 gene produces a protein that localizes to the cell's Golgi apparatus (its protein-sorting organelle), engaging microtubules that control the direction of cell migration.

"This mechanism may explain the hallmark changes in cell movement that are characteristic of breast cancer," says Chen. "Not only that, it could open the door to a new therapeutic approach."

This image, originally published on the cover of *EBioMedicine* (July 2017), shows a form of the CCDC170 protein (green) as it bundles microtubules (red) away from the cell nucleus (blue).

Temple Health
Magazine

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