

# NYU LANGONE HEALTH MAGAZINE

FALL 2017

A Battle Plan for  
Pancreatic Cancer

Blue in the Face  
(and Everywhere Else)  
A Medical Mystery

The World's  
Heaviest Medical  
Textbook

## Course Correction

For patients with severe inflammatory  
bowel disease, doctors at NYU Langone Health  
are redefining what's possible.

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# What's in a Name?

## Message from the Dean and CEO



In 2008, a year after I became dean and CEO, our institution was renamed the NYU Elaine A. and Kenneth G. Langone Medical Center, in honor of our chairman of the Board, Kenneth G. Langone and his wife Elaine, whose \$200 million gift was the largest in the institution's history. Back then, I would never have imagined that I would preside over another name change, and yet I find myself doing so. As of July 20, we are now NYU Langone Health. To reflect our new identity, and the core of our mission, we have also renamed this magazine, formerly *NYU Physician*.

Many people resist change, but I've always been one to embrace it. To me, change signifies growth, development—progress—and it's only possible at organizations that are forward thinking, nimble, and dynamic.

Our new name is important for several reasons. First, it adds a vital new dimension that reflects the essence of our role: to help people maintain or regain their well-being. We're about health first and foremost. Second, the name more aptly reflects the future of healthcare, as we continue to expand beyond the walls of our hospitals and deliver a broader range of clinical services closer to where our patients live and work. Finally, it captures the collaborative spirit that brings forth the brightest ideas and allows us to provide the best possible care to our patients.

What will not change, however—what will never change—is our commitment to excellence in patient care, medical education, and scientific research. This issue spotlights shining examples of each, including a surgeon who does what others cannot—or will not—do to treat the most dire cases of inflammatory bowel disease; a researcher who illuminates the enduring and daunting genetic puzzle of adaptive immunity; and a graduate, born and raised in one of the world's poorest countries, who came to NYU School of Medicine to fulfill his dream of becoming a doctor—and did it in just three years.

"What's in a name?" Shakespeare famously asked. Plenty.

A handwritten signature in black ink, reading "Bob".

Robert I. Grossman, MD, Saul J. Farber Dean and CEO





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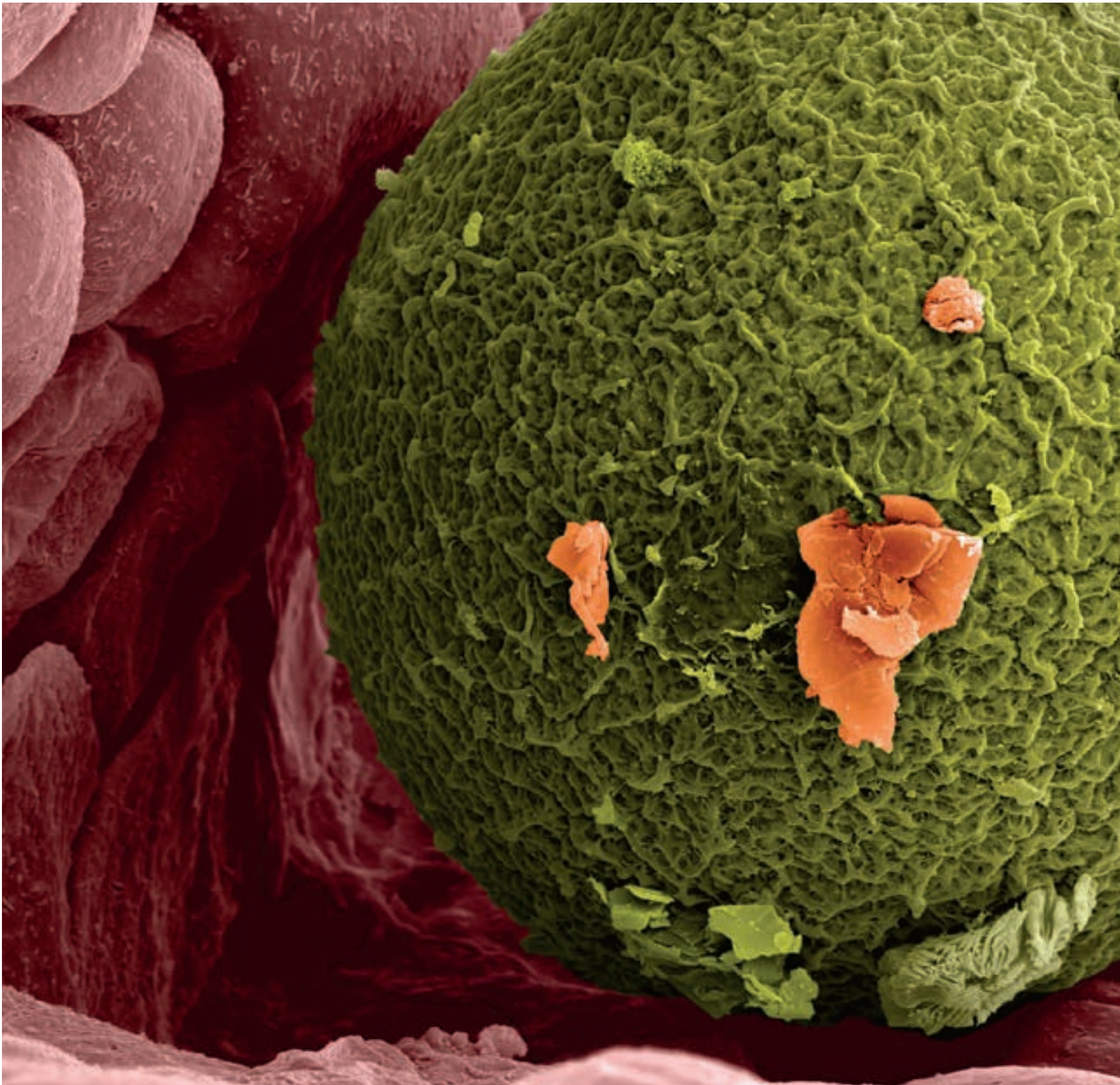
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BY KENNETH MILLER





**“Patients, including young girls, face devastating choices as they try to balance cancer treatment against their ability**





NEWS FROM MEDICINE — FALL 2017

# Scope

**to have children in the future. We need more options.”**



# New Clues to an Ovarian Fountain of Youth

An experimental cancer drug shown to protect egg cells from the ravages of chemotherapy could extend women's reproductive window.

By Karen Hopkin

Each year, an estimated 13,000 American women under the age of 40 are diagnosed with breast cancer. It's an age when worries of survival are compounded by worries of reproductive survival, because while cancer treatments can save lives, they can also leave women permanently infertile.

That heartbreaking reality inspired reproductive endocrinologist Kara Goldman, MD, to pursue a solution in 2014, during a research fellowship at NYU Langone Health. "Patients, including young girls, face devastating choices as they try to balance cancer treatment against their ability to have children in the future," says Dr. Goldman, assistant professor of obstetrics and gynecology, who treats patients at the NYU Langone Fertility Center. "We need more options."

Working with an interdisciplinary team of investigators, Dr. Goldman has plucked hope from an unlikely source: an immunosuppressant drug used to prevent organ rejection in transplant patients and even treat some cancers. Using female mice as a model, the researchers have shown that administering a drug called everolimus alongside chemotherapy protects the animals' ovaries and preserves their fertility. The study appears in *Proceedings of the National Academy of Sciences*.

Currently, women diagnosed with cancer can elect to freeze their eggs or embryos prior to starting chemotherapy. That approach, however, has its limitations: the procedure is expensive and invasive, requiring hormonal stimulation and surgical retrieval of mature oocytes. "And it only works

about 50 percent of the time," says study coauthor David Keefe, MD, the Stanley H. Kaplan Professor of Obstetrics and Gynecology, chair of the Department of Obstetrics and Gynecology, and professor of cell biology at NYU Langone. "So a patient can lay out \$15,000 and undergo six weeks of extensive exposure to hormones to find it didn't work." Many women can't afford the procedure—or the delay in treating their cancer.

Chemotherapy attacks a woman's reserve of eggs on two fronts. Women are born with a finite number of oocytes—I million to 2 million, each encased in a protective follicle. By puberty, about 300,000 remain. During each menstrual cycle, a small clutch

Many young women with cancer can't afford the expense of egg freezing—or the delay in treatment.

of these primordial follicles begins to develop "like a faucet set on trickle," explains Dr. Keefe. One of the maturing follicles will release its egg during ovulation, and the others will degenerate. Chemotherapy agents, which kill rapidly dividing tumor cells, also destroy these actively growing follicles. The ovaries overcompensate "so the trickle of follicles becomes a gush," adds Dr. Keefe. That overreaction can lead to infertility by prematurely depleting a woman's ovarian reserve—an effect dubbed "follicular burnout."

A 2008 study from the Karolinska Institute revealed that this follicular activation is regulated by a signaling pathway known as mTOR, which helps direct cellular growth. Blocking that pathway with an mTOR inhibitor like everolimus, the investigators reasoned, should dampen this follicular overreaction and thereby block the adverse effects of chemotherapy.

That's where Robert Schneider, PhD, comes in. Dr. Schneider, the Albert B. Sabin Professor of Microbiology and Molecular Pathogenesis, professor of radiation oncology, and associate dean for therapeutics alliances at NYU Langone, has spent years studying the role mTOR plays in breast cancer, and he was keen to explore whether the pathway could help preserve fertility.

"Our protocol was aligned as closely as possible with those used to treat humans," says Dr. Schneider, a senior author on the study. "So an equivalent duration and dose of drugs, adjusted for the mouse."

What they saw [CONTINUED ON P. 8]









was that mice treated with everolimus were left with up to three times as many follicles as those treated with the chemotherapy drug Cytoxan alone. The treated animals also showed higher levels of anti-Müllerian hormone, a molecule that serves as a clinical marker of ovarian reserve in humans.

More important, the mTOR inhibitor preserved the animals' fertility: treated mice gave birth to an average of seven pups, essentially the same number as those untreated. Mice treated with Cytoxan alone had litters that were, on average, half the size, and a few produced no pups at all.

The treatment strategy could not only preserve fertility, but also enhance it, pointing to new therapies for healthy women struggling to conceive. Preliminary data show that the mTOR inhibitor, when given at an early age, can extend reproductivity in healthy young mice. "But those studies are very early," cautions Dr. Schneider.

For now, the researchers are focused on translating their results to the clinic. "First, we need to demonstrate that mTOR inhibitors can preserve ovarian function in women," says Dr. Goldman. To gather that data, she has contacted clinicians who are already treating women with mTOR inhibitors for tuberous sclerosis and lymphangioleiomyomatosis, rare conditions unrelated to infertility or cancer, so she can assess their ovarian reserve.

If all goes well, Dr. Goldman and team expect to launch a clinical trial in a year or so, an unusually speedy transition facilitated by the use of a medication already approved for other indications, and by the collaborative culture at NYU Langone. "Our research fellows really help improve the way we practice," says study coauthor Jamie Grifo, MD, PhD, professor of obstetrics and gynecology, director of the Division of Reproductive Endocrinology and Infertility, and director of the NYU Langone Fertility Center. "Kara chose and executed a great project, and if we can turn this into something that results in a clinical tool, it will have a huge, huge impact."

## Graduation 2017

Wednesday, May 17  
8:56 pm

Growing up in the West African nation of Togo, one of the world's poorest countries, Dr. Kamalou Yaya ('17) never gave a thought to becoming a physician. Togo's population of 7.3 million is served by one doctor for every 20,000 citizens, so to most people the only medical practitioner is the town herbalist. When 7-year-old Kamalou followed his parents to the U.S. in 1996, he not only met physicians, but set his sights on becoming one. After earning degrees from Bronx Community College and Manhattan College, and working as a radiology technologist at several local hospitals, he applied to NYU School of Medicine's highly competitive Three-Year MD Degree Pathway program to trim a year off his journey toward a six-year residency in interventional radiology at NYU Langone. "It all feels like a dream come true," says Dr. Yaya, who has another one in mind: Eventually establishing Togo's first imaging center.



PHOTO CREDIT





**Stat**

# 19

The number of 2017 graduates in NYU School of Medicine's prestigious Three-Year MD Degree Pathway Program who graduated one year early, with guaranteed residencies at NYU Langone Health

## ARTIFACT

## The Scarifier



Behold the “scarifier,” a finely crafted yet crude relic from the history of medicine. Invented in the early 18th century as an alternative to lancets, scarifiers were widely used by physicians to practice the ancient art of bloodletting, also known as phlebotomy, a procedure practiced in one form or another for nearly 2,000 years. Fever, hypertension, and pulmonary edema were among the most common ailments believed to benefit from blood loss.

This model from the 1800s—one of hundreds of artifacts housed in NYU Langone Health’s Lillian and Clarence de la Chapelle Medical Archives—is made of brass, but others were typically fashioned from silver. Some were decorated with elaborate scrollwork.

The name “scarifier” derives from an ancient Greek word meaning “to make a slight scratch.” The curved lever of the device compresses a spring attached to four steel blades. The razors would slice into a vein at the elbow, blood vessels at the temples, behind the ears, or at the base of the spine. A twist of the knob adjusted the depth of the incisions. Blood was typically drained into a bowl until the patient fainted.

Remarkably, scarifiers were common until the 1940s when antibiotics—and evidence—began to revolutionize healthcare.

# What We Can Learn from Angry Cold Sores

NYU Langone Health researchers discover how the cold sore virus, jostled from dormancy, sidesteps the immune system.

By Julie Grisham

Anyone who’s ever suffered a cold sore knows the intermittent agony of coexisting with the herpes simplex virus type 1, or HSV-1. As many as 6 in 10 people in the US harbor the virus without symptoms, but an unlucky few endure unpredictable outbreaks in which a painful blister erupts, festers, and fades away, only to re-emerge months or even years later. In rare cases, infections can lead to serious conditions like blindness and encephalitis. Now, a multidisciplinary research team at NYU Langone Health has discovered how the virus evades the immune system—a critical discovery that paves the way for novel therapies to treat and potentially eradicate HSV-1 and other herpes viruses.

Infectious viruses engage in a kind of molecular arms race with the immune system, as both invader and host compete to take the lead. If all goes well for the host, the immune system eventually overwhelms the virus and eliminates it. But some viruses, including herpes simplex viruses, have evolved a clever tactic to linger on: a hibernation state known as viral latency, which allows viruses to lie dormant in a host’s cells, out of

sight of the immune system. “Viruses can lurk in a human forever without causing disease,” explains Ian Mohr, PhD, professor of microbiology. “But they can also reactivate, cause symptoms, and spread to a new host.”

Dr. Mohr, along with other colleagues at NYU School of Medicine, recently published a paper in the journal *Cell Reports* describing intriguing new details about how HSV-1 reawakens and, in the process, evades the host’s immune system to reproduce.

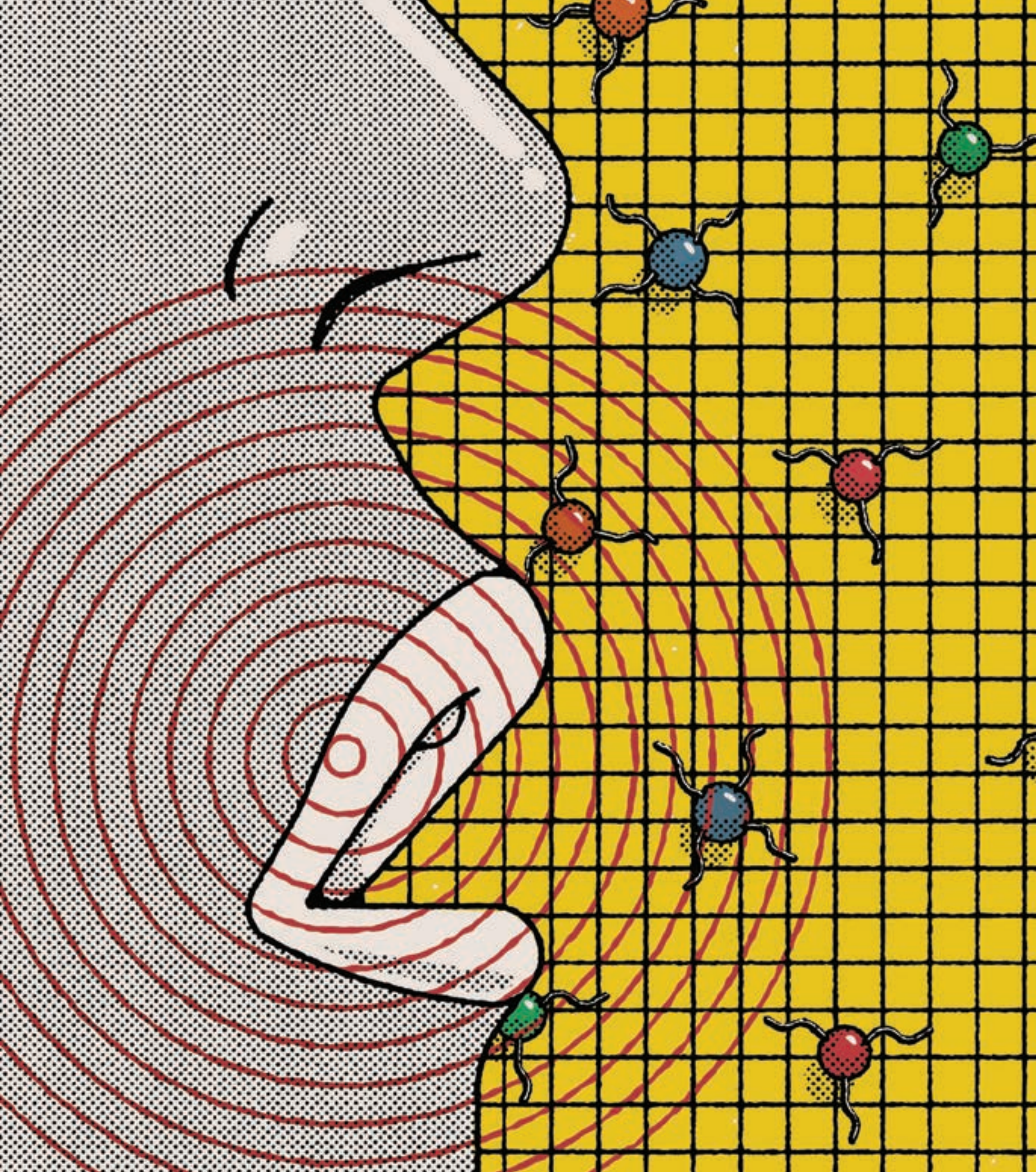
As with all herpes virus infections, HSV-1 infections are cureless and lifelong. The virus burrows into the nervous system, nesting deep inside the base of the brain, in an area of nerve cells called the trigeminal ganglion. “These nerve cells represent a stable place in which a latent virus can remain unperturbed for years,” explains study co-author Moses Chao,

PhD, professor of cell biology, and neuroscience and physiology. But how viruses emerge from this sanctuary has been poorly understood, in part because it’s difficult to study ganglion cells in isolation. “The ganglion is like a miniature organ,” explains Dr. Mohr. “It contains many different types of cells, in- [CONTINUED ON P. 12]



“Viruses can lurk in a human forever without causing disease,” explains Ian Mohr, PhD, professor of microbiology at NYU School of Medicine. “But they can also reactivate, cause symptoms, and spread to a new host.”







cluding immune cells.”

The researchers’ solution was an innovative culturing technique “made of nothing but neurons,” says Dr. Mohr. “It allows us to study the molecular signaling and circuitry in depth, without interference from other cells.” With a clear window onto the infected cells, the researchers made a startling discovery: when jostled awake by stress, HSV-1 bursts into action, releasing a flood of proteins that jams the host’s immune reaction to interferon signals from infected cells, effectively disarming the cells’ alarm system. “This happens in the very first instant that HSV-1 reactivates,” explains Angus Wilson, PhD, an associate professor of microbiology and another of the paper’s coauthors.

The findings may have implications for understanding other, more harmful pathogens that also exhibit latency, like varicella zoster, a herpes virus that causes chicken pox and shingles, and even tuberculosis and HIV. “This work is very exciting,” says Elisabeth Cohen, MD, professor of ophthalmology who is leading a federally funded, multicenter study of varicella zoster infections of the eye, a potentially serious complication that can result in blindness and chronic pain. “When these viruses come out of latency, they can cause many problems,” adds Dr. Cohen, who was not involved in the herpes simplex research. “If you can understand the process by which that happens, you might be able to find new ways to prevent them from causing harm.”

Currently, infections with both HSV-1 and varicella zoster are treated with antiviral drugs. These medications block the virus from replicating, which can eliminate symptoms of infections, but they are not a cure.

“The holy grail of this research is to one day eradicate latency either by getting the virus out or sealing it up permanently,” says Dr. Mohr. “Understanding all the interactions between viruses and hosts could yield findings that result in better treatments for a number of viral diseases. There are many implications, and we’ve only scratched the surface.”

# THEY WROTE THE BOOK ON IT

Four Questions for Psychiatrists Drs. Benjamin and Virginia Sadock

**THIS MAY MARKED THE** 50th anniversary of *Kaplan & Sadock’s Comprehensive Textbook of Psychiatry*, the gold-standard reference for clinicians in training and seasoned professionals alike. Over the years, the seminal tome has grown from 600 pages to more than 5,000 pages in two volumes, drawing on 650 experts in the mental health field. We caught up with NYU School of Medicine coeditors Benjamin J. Sadock, MD, the Menas S. Gregory Professor of Psychiatry, and his wife, Virginia A. Sadock, MD, professor of psychiatry, to discuss the book, now in its 10th edition, and the milestone. The book’s other coeditor is Pedro Ruiz, MD, professor of psychiatry at Baylor College of Medicine.

**The latest edition weighs 25 pounds. Has it always been so expansive?**

**Dr. Benjamin Sadock:** Yes. The original concept was brought to several major medical publishers, all of whom turned it down. There were so many schools of thought back then that they feared getting a large group of psychiatrists to agree would be like herding cats. But we got people to work together and express their points of view without attacking each other. Our contributors write whatever they want and are never censored. If they take issue with a concept or declare, “This drug shouldn’t be used,” we encourage them to say it. Our goal is to improve and maintain the professional competence of practitioners.

**What has been the biggest shift in psychiatry since you began this project?**

**Dr. Benjamin Sadock:** Over the past 25 years, we’ve witnessed a pharmacologic revolution due to the vast array of drugs developed to treat all types of mental disorders. It’s crucial, however, that drugs not supplant psychotherapy. The doctor-patient relationship is the cornerstone of psychiatry, and drug therapy combined with psychotherapy has been found to be more effective than either used alone. Words matter. They can damage the brain, but they can also heal the brain. A second revolution is called neuroregulation, in which

pulses of electricity are delivered to specific areas of the brain to help patients with obsessive-compulsive disorder and major depression. Although the science is in its infancy, it holds great promise for advancing our field.

**Which topics in this edition are new or extensively updated?**

**Dr. Virginia Sadock:** One new section is transgender identity disorder, which has undergone many conceptual changes. Most children have a pretty solid gender identity as early as two or three years of age. But in some people, there is confusion, a dissonance. A transgender person is saying, “You may look at me and see a woman, but inside I’m a man.” Or vice versa. We now know that gender





# The Quest for a Liquid Biopsy

Investigators at the Laura and Isaac Perlmutter Cancer Center are developing simple blood tests to monitor metastatic melanoma.

identity is not black and white—it's a spectrum. Our approach to therapy has become much more nuanced.

**Dr. Benjamin Sadock:** As our population ages, psychiatrists are getting much more involved with end-of-life issues. Several areas of the text cover the experimental use of some hallucinogenic drugs to treat patients who are dying, suicidal, or addicted to substances such as cocaine, alcohol, or opioids. We also added a chapter on caring for the caregivers of patients with dementia. They bear a tremendous burden, and psychiatry has much to offer them.

## What's on the horizon for your field?

**Dr. Benjamin Sadock:** In 50 years of editing this textbook, we know as little about the cause of schizophrenia now as we did when we started. But things are beginning to change. If we can understand how the 100 billion neurons in the brain connect—or don't—we can potentially influence them to find a cure. We can finally do more than just treat the symptoms. Neuroscience is the future of psychiatry.

DEVON JARVIS

By Julie Grisham

In the emerging era of personalized medicine, tissue biopsies play an increasingly important role in cancer management. A tiny sample, acquired by needle or by surgery, can provide not only material for routine diagnosis, but also reveal a universe of information about gene mutations driving tumor growth and point to highly targeted treatments. Trouble is, biopsies can be invasive, painful, and costly.

"There's a big push for alternatives," says David Polsky, MD, PhD, the Alfred W. Kopf, MD, professor of dermatologic oncology at NYU Langone Health and a researcher at the Laura and Isaac Perlmutter Cancer Center. Dr. Polsky, for his part, is developing a series of novel blood tests, known as "liquid biopsies," that can detect tumor DNA circulating in the bloodstream and help identify gene mutations linked to melanoma, the deadliest type of skin cancer. "Our tests could be useful for up to 75% of melanoma patients," he says.

The majority of melanomas are caught early and can be surgically removed before they spread, thanks to routine skin exams, but for metastatic tumors, the new tests, developed in conjunction with Bio-Rad Laboratories, could eventually improve how the disease is managed. "The abili-

ty to capture DNA that's shed in the blood allows us to overcome the wrinkle of inaccessible tissue," says Iman Osman, MD, professor in the Ronald O. Perleman Department of Dermatology and director of the Interdisciplinary Melanoma Cooperative Group at NYU Langone. The long-term goal, Dr. Polsky explains, is to analyze a



patient's blood for tumor mutations at follow-up visits to determine as early as possible when a treatment has stopped working, cancer growth has resumed, and the patient needs to switch therapies.

Liquid biopsies hold profound implications for many other cancers as well, in particular lung cancer, the leading cancer killer among both men and women

in the US. "Molecular diagnosis is an essential component of how we treat many lung cancers today because some medications target molecular changes within a tumor," says Leena Gandhi, MD, PhD, director of the Thoracic Medical Oncology Program at NYU Langone. "We know that some tumors that have alterations evolve resistance to treatment and frequently need to be reanalyzed. The idea that we may be able to follow their progression with a simple blood draw rather than doing a more invasive procedure is a game changer."



# GUT

## INSTINCTS

How colorectal surgeon Feza Remzi, MD, and his team  
at NYU Langone's Inflammatory Bowel Disease Center are  
tackling the toughest of tough cases

BY ADAM PIORE

PHOTOGRAPHS BY JONATHAN KOZOWYK





# By the time Sarah Johnson

(not the patient's real name) met Feza Remzi, MD, in 2003, she was facing her 27th operation to cope with the complications of a chronic bowel disorder. Surgeon after surgeon had delivered some version of the same bad news: the safest way forward was life with a permanent ostomy bag. That was an intolerable fate for the 53-year-old homemaker with a passion for elephant polo and ambitious plans to travel the world.

Over the course of nearly three decades in medicine, Dr. Remzi has made a name for himself as a colorectal surgeon of last resort, doing what others cannot—or will not—do to treat the most dire cases of inflammatory bowel disease (IBD), an umbrella term for two debilitating gastrointestinal conditions, Crohn's disease and ulcerative colitis. Dr. Remzi, Johnson was told, was her best hope.

"Sarah was not the type of person to give up," recalls Dr. Remzi, professor of surgery and director of NYU Langone's Inflammatory Bowel Disease Center. Dr. Remzi assumed the post last September after serving as chair of the department of colorectal surgery at the Cleveland Clinic for eight years. "Like so many of my patients," Dr. Remzi adds, "she asked me to make the impossible possible."

Dr. Remzi balks at a challenge but as he examined Johnson's medical records, he realized just how difficult her case would be. A lifelong battle with severe ulcerative colitis, a condition in which the immune system attacks the lining of the colon, had left

Johnson's large intestine scarred and perforated seemingly beyond repair. So in her mid-40s, she'd had her colon and rectum removed—an eventuality for one in five people with ulcerative colitis.

One of the body's least heralded organs, the colon absorbs water, prepares waste for elimination, and allows for its temporary storage. Without it, patients must eliminate stool through an external bag attached to a stoma, a surgically created opening in the abdominal wall. Or—if inflammation is limited to the colon, as it is in many ulcerative colitis cases—they can undergo a more complex operation in which surgeons form an internal reservoir, or pouch, out of the small intestine. The pouch is sutured directly to the top of the anal canal, eliminating the need for an external bag.

That procedure, however, is fraught with risk. The failure rate for pouches is as high as 15%. Dozens of sutures or staples are required to sculpt the reservoir out of fragile intestinal tissue that tends to tear, scar, and puncture. The chances of complications rise dramatically, Dr. Remzi explains, when surgeons remove the colon and create a pouch during the same operation, as they did for Johnson, rather than performing two or three separate procedures that give the intestinal tissue time to heal and strengthen.

As a result, she endured an astonishing number of revision surgeries, 26 in all, to deal with a chronic string of leaks and infections that would haunt her for years.

Dr. Remzi, whose failure rate is less than 4%, understood keenly why so many other surgeons were now recommending that Johnson simply surrender and accept a permanent bag. Even under the best of circumstances, a redo of pouch surgery is challenging due to the cramped space within the pelvic cavity and the ease with which adhesions form between scar tissue, obscuring healthy tissue. What, Dr. Remzi wondered, would the contents of this patient's pelvic cavity look like after 26 surgeries?

Recalling Johnson's remarkable case in his office on an overcast day last April, Dr. Remzi pulled up a video of the procedure he performed. The case, he explained, provides the kind of complexity he lives for. "When you have a situation like this, commitment in the operating room means pushing the limits and challenging the norm," he says. "I fell in love with this part of colorectal surgery because it was an opportunity to alleviate human suffering. I want to give these patients a second chance."

To date, Dr. Remzi has performed more than 1,000 IBD surgical procedures, and more pouch revisions than any other surgeon in the world. His extensive experience, coupled with his passion for the problematic, made him the ideal choice to direct NYU Langone's rapidly expanding Inflammatory Bowel Disease Center, whose multidisciplinary approach to care requires a strong surgical team. Although some medications exist to treat symptoms, up to 45% of people

Since arriving at NYU Langone from the Cleveland Clinic last September, Feza Remzi, MD, has already performed more than 450 IBD-related surgical procedures. "His recruitment was a home run all around," says Leon Pachter, MD, (right) chair of the Department of Surgery.





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## **“In many Olympic sports, you’re judged on a degree of difficulty from 0 to 10. The degree of difficulty in what he’s doing is a 10. All the time.”**

**H. LEON PACHTER, MD, THE GEORGE DAVID STEWART PROFESSOR OF SURGERY AND CHAIR OF THE DEPARTMENT OF SURGERY**

with ulcerative colitis, and up to 75% of people with Crohn’s disease, will eventually require some form of surgery to remove diseased areas that can lead to abscesses, blockages, and other potentially life-threatening complications, including cancer.

“In many Olympic sports, you’re judged on a degree of difficulty from 0 to 10,” says H. Leon Pachter, MD, the George David Stewart Professor of Surgery and chair of the Department of Surgery, who helped recruit Dr. Remzi. “The degree of difficulty in what he’s doing is a 10. All the time.”

**D**R. REMZI’S ARRIVAL MARKS the latest phase of NYU Langone’s ambitious plan to build a model IBD center that draws patients from around the world. Mark B. Pochapin, MD, the Sholtz/Leeds Professor of Gastroenterology and director of the Division of Gastroenterology, set the plan in motion in 2012, when he joined NYU Langone. The gold standard, he believes, is a multi-disciplinary team working in close collaboration to offer the most advanced care. Today, the center’s expertise includes everything from the latest medical and surgical interventions to nutritional counseling and psychological support to help patients cope with the ordeal of IBD.

“This disease ends up affecting so much more than bowels,” says gastroenterologist Lea Ann Chen, MD, associate professor of medicine, who researches the underlying causes of

IBD and investigates new treatments. “The idea is to coordinate care and take the pressure off the patients to make sure that their providers are on the same page. It’s a team approach to clinical care that leads to better decision making.”

Unfortunately, most medical centers lack coordinated specialists devoted solely to IBD, notes Dr. Pochapin. “Patient care is typically a phone call from one doc to another,” he says. “There’s no unifying center, no biobanking of tissue, no patient database, no best practices. No one’s measuring outcomes or tracking quality metrics of inpatient care.”

Dr. Pochapin saw a promising model for a new approach to IBD in the way his gastroenterologists dealt with their cancer cases. They held regular cross-departmental meetings that have since been formalized into a weekly confab that draws some 50 specialists in surgery, medicine, oncology, radiology, pathology, and other fields. Clinicians present individual cases so that all disciplines gain familiarity and share their perspectives, which helps them meld a cohesive treatment plan.

“IBD is very similar to cancer in the sense that you need a lot of expertise from a lot of different areas of specialty in the room to figure out the best care for a patient,” Dr. Pochapin explains. “It doesn’t just live in the Division of Gastroenterology or the Department of Medicine, because so much of what we do is dependent on Surgery and Radiology and Pathology.”

IBD is poorly understood. Ulcer-



**“Commitment in the operating room means pushing the limits and challenging the norm,” says Dr. Remzi, seen here in a surgical suite at Tisch Hospital last May.**

ative colitis involves chronic inflammation of the large intestine, while Crohn’s disease is a more general condition and can affect other parts of the digestive system, from the mouth all the way to the small intestine and anus. The number of diagnosed cases in the Western world exploded between 1940 and 1990 and has continued to grow at a slower rate ever since. Some 1.6 million Americans currently have IBD, an increase of about 200,000 from 2011, according to the Crohn’s and Colitis Foundation of America. Children account for as many as 80,000 of these cases. In recent years, epidemiologists have seen a surge of cases in places where IBD has traditionally been rare, such as Africa, Asia, and Eastern Europe.

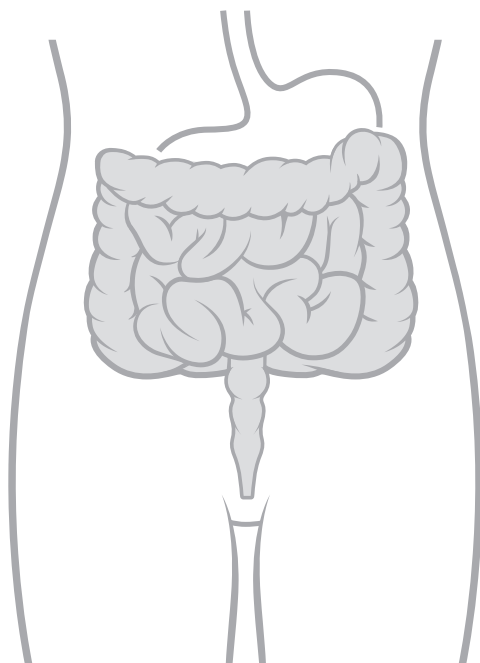
Yet the causes remain a matter of debate and exploration. To many, the recent rise in cases outside the Western world suggests that while genetics are key in determining who develops IBD (more than 200 genes have been linked to the disease), environmen-



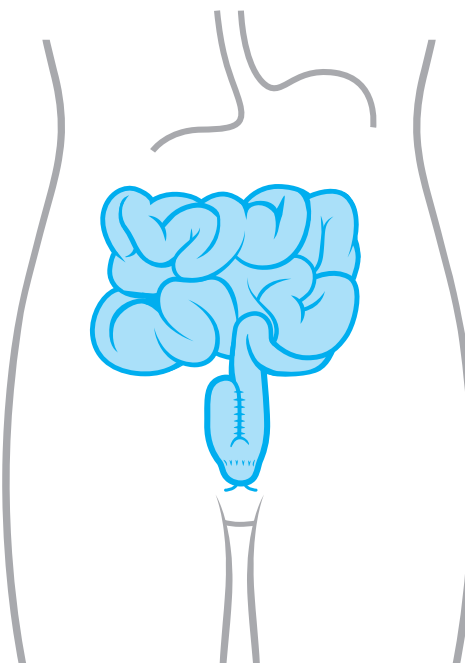
## A New Role for the Small Intestine When the Large Intestine Fails

In 1969, a Swedish surgeon named Nils Kock introduced the first intestinal reservoir to replace a diseased colon and rectum. The technique was life changing for patients because it allowed them to eliminate solid waste normally without the need for a permanent external bag. Today, a J-shaped reservoir fashioned from the patient's small intestine—known as a J-pouch—is considered the gold standard for treating severe ulcerative colitis unresponsive to medical therapies. NYU Langone Colorectal surgeon Feza Remzi, MD, has performed more J-pouch procedures than any other surgeon in the world.

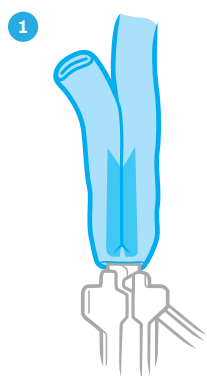
NORMAL  
INTESTINES



J-POUCH



### SIX STEPS TO BUILDING A J-POUCH



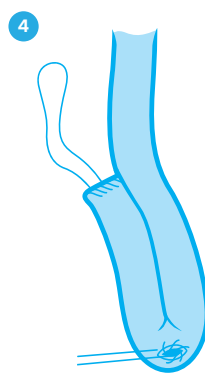
1 A surgeon removes the colon and rectum, then pulls the end of the small intestine down into the pelvic cavity, forming a J-shaped loop.



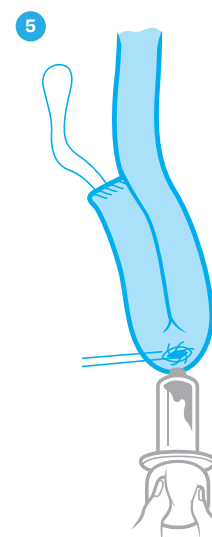
2 The loop's upturned and descending sections are sewn or stapled together to create an internal storage reservoir for stool.



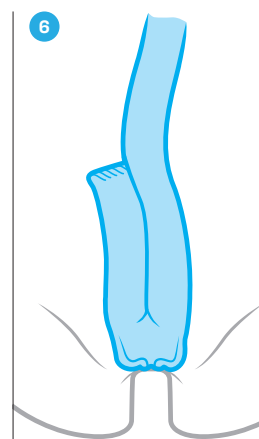
3 A staple gun is used to seal the end of the small intestine.



4 Dr. Remzi reinforces the staples with sutures.



5 Saline is injected into the pouch to test for leaks.



6 In the final step, the surgeon connects the bottom of the J to the perineum and the anus.

**“What defines me professionally—and what defines our team—is the concept that we can do the things that others cannot, or will not, do. Our ability to take on the most challenging cases elevates even the most routine procedures.”**

**FEZA REMZI, MD, DIRECTOR OF NYU LANGONE'S INFLAMMATORY BOWEL DISEASE CENTER**

tal factors, such as antibiotic use and diet, may also play an important role.

The multifaceted nature of IBD demands multifaceted clinical care. The year before Dr. Pochapin arrived, gastroenterologist Lisa B. Malter, MD, clinical assistant professor of medicine, began to notice that a significant number of patients coming through New York City's public hospitals were suffering from IBD and weren't receiving the care they needed, in part because they lacked access to specialists who understood the full spectrum of the disease. On her own, and with few resources, she set up an IBD clinic at Bellevue Hospital Center.

To match her effort at Tisch Hospital, Dr. Pochapin recruited gastroenterologist David Hudesman, MD, assistant professor of medicine, and appointed him medical director of the Inflammatory Bowel Disease Center. (Dr. Malter and Dr. Hudesman continue to collaborate closely and have coauthored numerous papers.) Dr. Pochapin also recruited gastroenterologist Seymour Katz, MD, clinical professor of medicine, a renowned IBD expert with a thriving practice on Long Island. Dr. Katz now directs NYU Langone's Inflammatory Bowel Diseases Outreach Programs, which help educate community physicians about IBD.

With a roster of veteran gastroenterologists, colorectal surgeons, nurses, nutritionists, and other kinds of specialists on call, NYU Langone was poised to create a premier multidisciplinary IBD center. Although

a cadre of highly trained colorectal surgeons already performed IBD procedures, care wasn't available as a uniform program, notes Dr. Pochapin. “You would have to find the surgeon who would do it, and then find the gastroenterologist who would care for you afterwards.” That all changed with Dr. Pochapin's vision and the arrival of Dr. Remzi, who is helping to quickly transform NYU Langone into a global destination for complex cases. Already, he has performed more than 450 IBD-related surgical procedures.

“What defines me professionally,” Dr. Remzi says, “and what defines our team is the concept that we can do the things that others cannot, or will not, do. Our ability to take on the most challenging cases elevates even the most routine procedures. We can handle the unexpected.”

**A** NATIVE OF ANKARA, TURKEY, Dr. Remzi grew up around medicine. Both of his parents were physicians trained in the US who chose to return to their homeland to help bring modern medicine there. Dr. Remzi's mother was a pediatrician, and his father was a surgeon who established the first modern urology department in Ankara. Dr. Remzi intended to follow in his father's footsteps when he arrived at the Cleveland Clinic in 1989 for a one-year surgical fellowship. But when he did a surgical rotation with Victor Fazio, MD, a pioneering colorectal surgeon who headed one of the nation's busi-

est departments, everything changed.

Dr. Fazio was already routinely performing the kind of grueling, complex surgeries Dr. Remzi himself would come to master. It was Dr. Fazio who introduced Dr. Remzi to the J-pouch and taught him many of the techniques he had pioneered to ensure the success of the pouch.

When performing the J-pouch procedure, a surgeon removes the colon and rectum, then pulls the end of the small intestine down into the pelvic cavity. The next step is to loop the end of the small intestine and staple or sew together the loop's upturned and descending sections to create a storage reservoir for waste. The connected loop has the shape of the letter J, with the upturned reservoir end shorter than the tube of intestine that feeds into it. The surgeon then connects the bottom of the J to the perineum and the anus.

Over the years Dr. Remzi learned and developed a number of his own techniques—both big and small—that helped him deal with the challenges of redo surgeries. Like how to unstick a clump of inflamed tissue and separate it into its component parts: you spray it with saline solution. Or how to make sure the ends of a chronically infected J-pouch can heal properly. Part of what makes him one of the world's top IBD specialists, beyond the requisite technical skill and knowledge, is the sheer number of cases he has done in this one small surgical niche. He has coauthored by far the most comprehensive analysis of outcomes for complex IBD





procedures, including 4,000 of his own, and helped train more than 150 protégés. “My passionate message is that these types of procedures should be done only by surgeons who do it every day,” he says. “Not once in a blue moon, not once a month. Every day.”

Elite surgeons like Dr. Remzi, notes Dr. Pachter, begin to develop a sixth sense, even in areas so scarred by previous surgeries and so inflamed that normal anatomical landmarks have disappeared. “They’ve done it so many times,” he says, “that they know all the pitfalls, where not to go, what complications might arise.” For Dr. Remzi, the gut instinct that enables him to push beyond the limits of what is normally possible in such cases is, indeed, metaphysical in its origin. “There’s a force that guides me,” he says, “and frankly the source of it is my family. What makes my devotion

**“IBD is very similar to cancer in the sense that you need a lot of expertise from a lot of different areas of specialty,” says NYU Langone’s Mark Pochapin, MD (center), who has assembled a veteran roster of IBD experts, including fellow gastroenterologist David Hudesman, MD (left), and colorectal surgeon Feza Remzi, MD (right).**

to patients possible is my wife’s devotion to our family. She put her dermatology practice on hold to support me in my mission at NYU Langone, and I am as grateful to her as my patients are to me.”

**S**ITTING IN HIS 23RD-FLOOR office of NYU Langone’s Ambulatory Care Center, Dr. Remzi flips through images on a computer screen. He’s impeccably dressed in a tailored blue suit and yellow tie, with not a single strand of closely cropped hair out of place, so it’s hard to imagine him amid the blood and guts of the OR. That is, until he finds what he’s looking for. Tapping a button on his keyboard, he pulls up a picture of an inflamed, heart-size lump of intestine sitting neatly atop a teal cloth backdrop. This particular piece

of digestive tract, removed from Sarah Johnson in 2003, once resembled a sleek J-shaped pouch. But any remnant of the smooth tubular structure with its roughly parallel sections is hard to recognize in the current mass of angry red tissue displayed on the screen. “There’s no normal tissue anatomy here,” Dr. Remzi says.


In the end, he determined the J-pouch itself was so damaged that he needed to excise it entirely and finish what others had failed to do: construct a J-pouch flawlessly. Nearly 15 years later, Johnson is living a vibrant, active life. Dr. Remzi knows, because he is still in touch with her. The updates are the part of the job he enjoys most.

“I’m committed to taking care of my patients for the rest of their lives to ease their suffering,” says Dr. Remzi. “I fell in love with this kind of relationship. It’s why I do what I do.”

An abstract illustration on a teal background. On the right side, a large DNA double helix is depicted with one strand in black and the other in white. To the left of the helix, there are several molecular structures consisting of small black and white spheres connected by thin grey lines. Some of these structures are arranged in a vertical column, while others are more scattered. The overall composition is clean and modern, with a scientific theme.

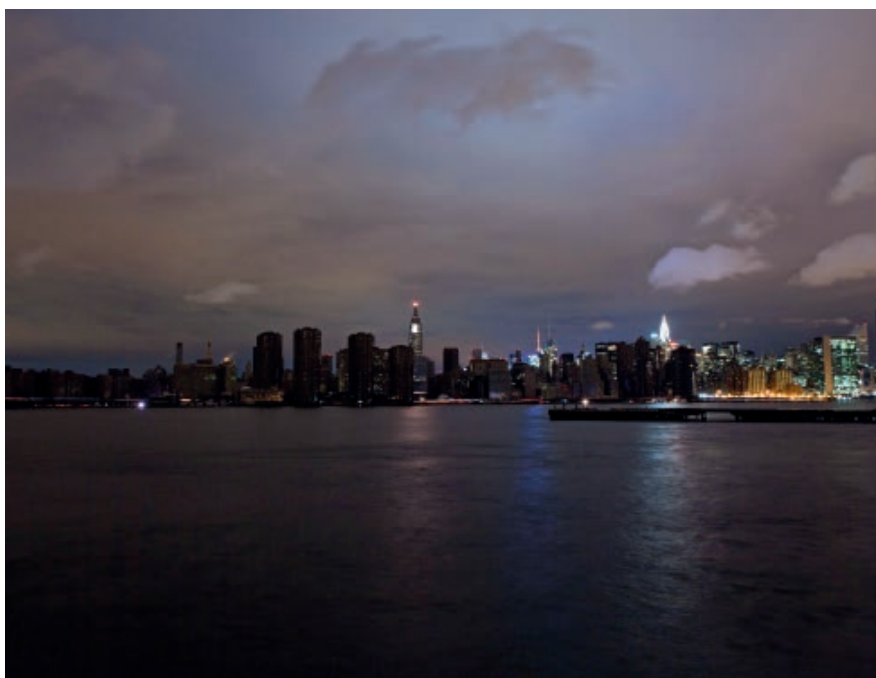
# The Contortionist



An abstract illustration on a solid green background. It features several DNA double helix structures. One helix on the left is partially visible, showing black and white strands. Another helix in the center is more prominent, with its strands looping and twisting. To the right, there's a cluster of black and white dots connected by thin grey lines, resembling a molecular structure or a network. The overall style is modern and scientific.

Jane Skok, PhD, investigates a fantastical world of looping DNA that makes quantum physics look quaint. Her hard-won insights are not only upending conventional notions of genetic organization, but also cracking the secrets of some autoimmune diseases and blood cancers. BY JOSIE GLAUSIUSZ

# When Hurricane Sandy's colossal storm surge slammed into NYU Langone Medical Center on October 29, 2012, it knocked out the power and forced the evacuation of 322 inpatients, including premature babies.



**"With stressful situations like Hurricane Sandy, you want to sit down and cry, but you can't," says Dr. Skok, "you have a lab to run, and you need to motivate all the people in it."**

No human lives were lost, miraculously, but thousands of research rodents drowned when saltwater flooded labs. The 900 mice living in the laboratory of Jane Skok, PhD, professor of pathology at NYU School of Medicine, survived, but at a cost. "We didn't lose our mice, but they were traumatized, and they wouldn't breed properly," recalls Dr. Skok. What's more, precious reagents stored in her freezers melted.

After the building that housed her lab shut down, her team moved to laboratory space at New York University. It took her more than a year to restore the status quo. "Losing everything is devastating," Dr. Skok says. "But we

took the long view that if we couldn't test things easily, we should start over."

Dr. Skok, who arrived at NYU Langone in 2006, is no stranger to dramatic do-overs. Born in Johannesburg, she has pursued a path that has taken her, by twists and turns, through the labyrinths of genetics and immunology. That journey included a 12-year break from the lab, after she completed her PhD thesis in genetics while raising two young children, one of them frequently hospitalized with serious kidney problems. When Dr. Skok returned to science in 1997—by then a mother of four—she hadn't read a single scientific paper in more than a

decade. Despite this gap, "she not only came back to science but came back and became a leader of her field," says cancer biologist Iannis Aifantis, PhD, the Hermann M. Biggs Professor and chair of the Department of Pathology at NYU School of Medicine, who is a close collaborator.

Dr. Skok's field, specifically, is nuclear organization, or the science of how cells store an impossibly large amount of genetic information inside an impossibly small amount of space. In particular, she studies the enduring puzzle of how B and T cells—the linchpins of the adaptive immune system—can generate more than 100 billion different antibodies and T cell receptors, drawing from the limited genetic material of a handful of genes inside the nucleus of each cell. Cracking this puzzle has profound implications for the treatment of certain blood cancers and immune disorders, which can arise when the process goes awry.

Many people, when they picture DNA, might think of the famous model constructed by James Watson and Francis Crick in 1953: a double helix, with strands neatly wound around an axis like a spiral staircase. The reality is that in human cells, nuclear DNA looks more like a ball of knotted wool. If untangled, the DNA from each cell would stretch six and a half feet long, which is about 200,000 times as wide as the nucleus in which it resides. The DNA, scientists now understand, collapses into a tiny three-dimensional structure, spooling intelligently





“Dr. Skok’s work showed that variable regions of DNA that are far from each other on a linear chromosome actually find partners as frequently as those close by. The system she has elucidated provides equal opportunities for all.”

KEES MURRE, PHD, PROFESSOR OF MOLECULAR BIOLOGY  
AT THE UNIVERSITY OF CALIFORNIA SAN DIEGO

around nucleosome proteins to form a complex called chromatin. But how does this deliberate, highly controlled packaging process regulate the genes?

When Dr. Skok returned to science in 1997, she had little idea that she would build a career around this question, let alone advance a line of inquiry that would become “one of the most important questions in the study of biology,” says Dr. Aifantis. Even though Dr. Skok had managed to complete a doctorate in genetics before her 12-year career break, she reoriented after the gap, earning a master’s degree in immunology from Imperial College School of Medicine in London, “reading like crazy to make sense of it all.” At the time, she confessed, she had “zero confidence” but persevered out of a fear that “if I didn’t get back into it, I’d be standing in the same place in another 10 years’ time.”

Today, Dr. Skok employs sophisticated imaging and molecular biology techniques to study how chromatin organization orchestrates a delicate ballet of cutting and pasting to mix, match, and join distant segments of DNA and ultimately generate wildly versatile B- and T-cell receptors that can recognize an almost infinite variety of foreign antigens.

Dr. Skok’s fascination with this elaborate process took off in 1999, when she was awarded a Wellcome Trust Career Re-entry Fellowship and began working as a postdoctoral research fellow with Amanda Fisher, PhD, at the Medical Research Center in Imperial College, studying the bi-

ology of B cells. It was in London that she and collaborators published a handful of widely cited papers, showing that during lymphocyte development, the genes encoding the B- and T-cell receptors migrate from the periphery of the cell’s nucleus toward its center, contracting like a paper napkin folded into rosettes. The insight was made with the aid of a visualization technique called three-dimensional fluorescence *in situ* hybridization, or 3-D FISH, which uses fluorescent probes to locate and bind to specific DNA sequences.

Although many other labs had studied this type of recombination, Dr. Skok’s major contribution was to solve the puzzle of how widely separated segments on a very long gene can be brought into contact to undergo recombination. Her FISH analyses revealed that contraction of each gene occurs through chromatin looping. “It was a very important finding,” says Kees Murre, PhD, professor of molecular biology at the University of California San Diego. “Dr. Skok’s work showed that variable regions of DNA that are far from each other on a linear chromosome actually find partners as frequently as those close by,” Murre says. “The system she has elucidated provides equal opportunities for all.”

**A**T NYU SCHOOL OF MEDICINE, Dr. Skok has broadened her focus on basic molecular mechanisms by tackling particular immune diseases

and pioneering new techniques, often in a highly collaborative way. She and Dr. Aifantis, for example, have coauthored at least six papers on DNA looping and nuclear organization. The pair are now planning a major research program that would explore the molecular mechanisms by which nuclear organization can affect the progression of leukemia and lymphoma, cancers that involve white blood cells. In her lab, Dr. Skok has studied the underlying causes of these cancers using the B and T cells of mice. She has investigated the tightly controlled process by which a pair of enzymes, called RAG1 and RAG2, precisely cuts and pastes the gene segments that code for antibodies. When the process goes astray—occurring too frequently, for instance—errant DNA breaks can cause “the wrong chromosome bits to be joined together,” explains Dr. Skok. “It actually happens a lot.” Leukemia and lymphoma can follow.

Working with NYU Langone’s Perlmutter Cancer Center, Dr. Skok and Dr. Aifantis plan to submit a proposal to the National Cancer Institute this fall for their project, with an estimated annual budget of around \$1.3 million. It aims to study precisely how such mutations and other missteps in cell development can lead to these cancers. Dr. Aifantis, who has made major strides toward understanding and developing new treatments for T-cell acute lymphocytic leukemia, a common form of leukemia in children, brings his lab’s extensive ex-

Molecular biologists Iannis Aifantis and Jane Skok, PhD, close collaborators, are now investigating how errant DNA breaks in developing B and T cells can spawn leukemia and lymphoma.





pertise in this form of cancer, as well as animal models it has developed for different types of the disease. Collaboration has been key in advancing their science. “Jane is very open to sharing tools, sharing techniques, sharing reagents, and sharing ideas,” he says.

**I**F EVERY CLOUD HAS A SILVER lining, not everyone can see it. Jane Skok is different. When she relocated her laboratory downtown after Hurricane Sandy, she met researchers with whom she now collaborates on numerous projects. In one such collaboration, published last May in *Nature Communications*, Dr. Skok employed the genome-editing technique CRISPR-Cas9 to label repeat regions of DNA within live cells, with “guide RNAs” tagged with fluorescent proteins. This new imaging approach is a step up from FISH, which looks at fixed cells. “FISH is only a snapshot in time, like taking a photograph of a crowd of people,” Dr. Skok explains. “If you took a photograph five minutes later, they’d be in a completely different conformation.” Like video, the technique enables her to track mouse cells over time. “Our aim,” she says, “is to label up a whole locus and follow recombination as it’s going on—so you can see the bit that’s being deleted as it’s being deleted.”

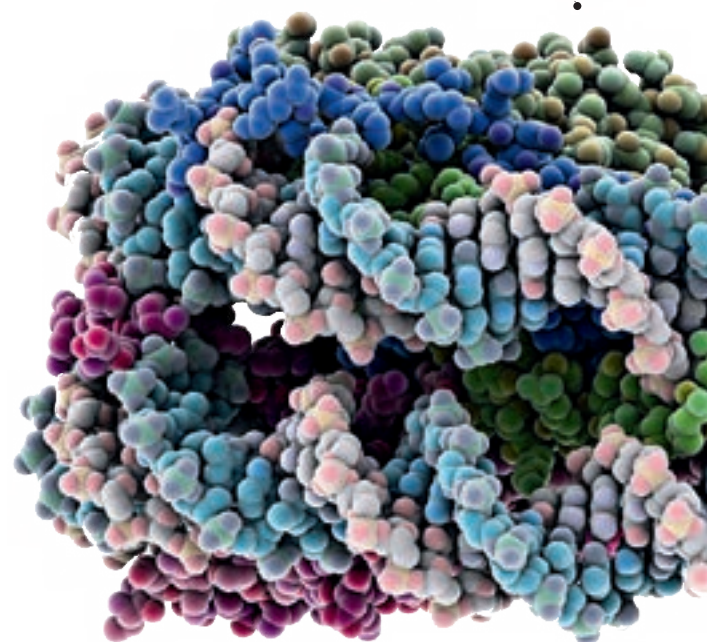
Former collaborator Edith Heard, PhD, professor of epigenetics and cellular memory at the Collège de

France in Paris, marvels at Dr. Skok’s technical ingenuity. “There aren’t many people who are able to look at the processes of immune gene regulation at the single cell-level using both imaging *and* molecular techniques,” says Dr. Heard. “She is one of the rare people who combine all of these approaches. She ends up getting things done efficiently.”

Tracking this intricate DNA dance, with its potential missteps and careful repairs, is another apt analogue to Dr. Skok’s career trajectory. “I didn’t plan anything in my life. Everything that I planned never happened,” she says. “So I stopped planning.” Dr. Skok’s mantra of going where life takes her is a clue to her resilience and optimism. Her 12-year gap from science and the early experience of motherhood—trekking to and from hospitals with a sick child whose illness was undiagnosed for years—was a “complete nightmare,” she says, and yet an important part of her journey that put life’s hardships in perspective.

“If your child’s health is threatened, that is the worst thing that can happen to you. Everything that comes after it, you think, ‘Okay, this is bad. But it isn’t as bad as *that*,’” Dr. Skok says calmly. “With stressful situations like Hurricane Sandy, you want to sit down and cry, but you’d better not, because you have a lab to run, and you need to motivate all the people in it. Nothing terrible happened to anybody. So you think, ‘I better pick myself up and carry on.’”

DNA’s double helix structure (light blue and light pink) tightly coils around a chain of eight histone proteins (multicolored).



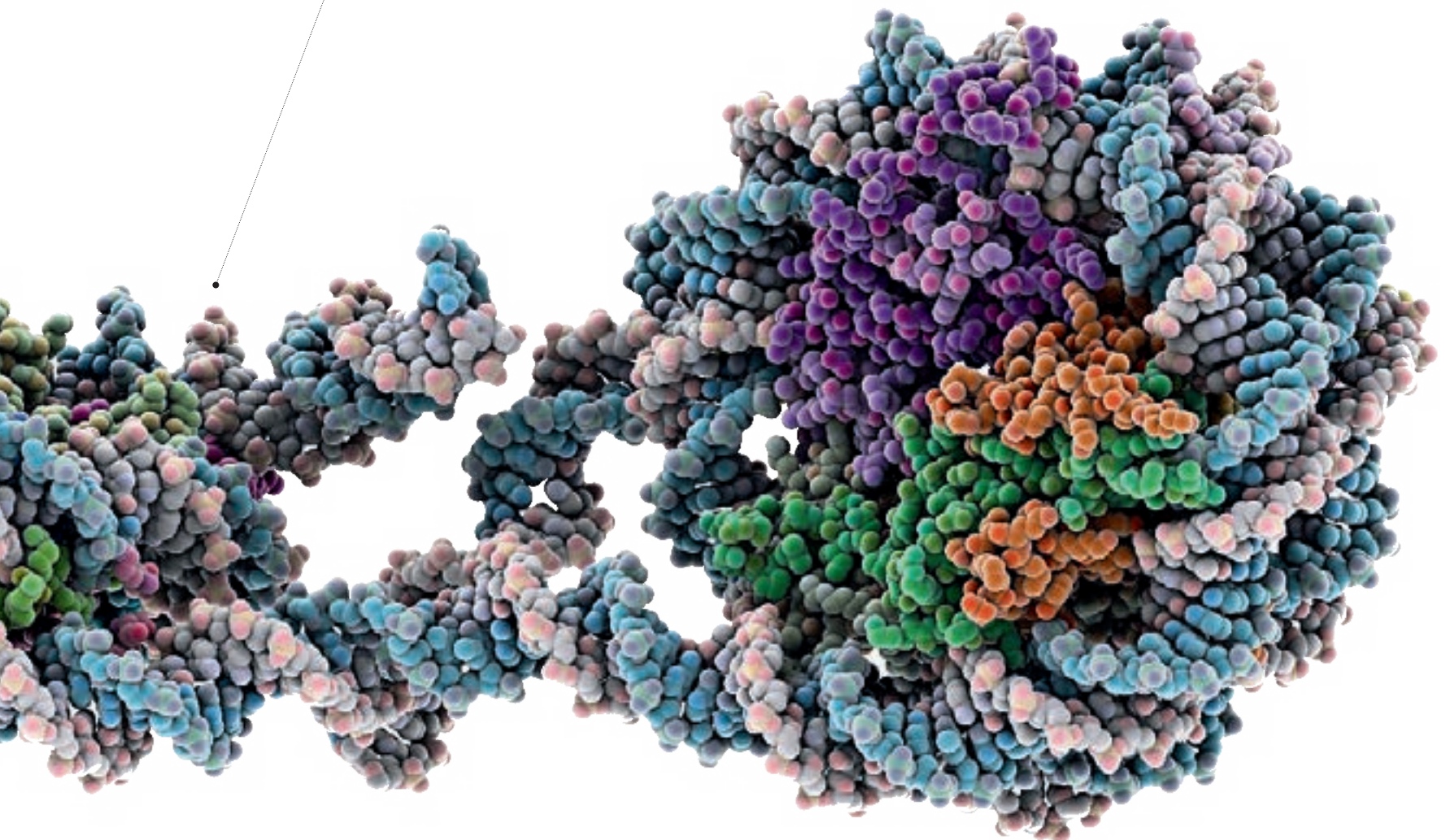


## The Genetic Code, with a Twist

Many people, when they picture DNA, might think of the famous model constructed by James Watson and Francis Crick in 1953: a double helix with strands neatly wound around an axis like a spiral staircase. The reality is that in human cells, nuclear DNA looks more like a ball of knotted wool. If untangled, the DNA from each cell would stretch six and a half feet long, which is about 200,000 times as wide as the nucleus in which it resides. The DNA, scientists now understand, collapses into a tiny three-dimensional structure, spooling intelligently around nucleosome proteins to form a complex called chromatin, shown here.

NYU Langone molecular biologist Jane Skok, PhD, employs sophisticated imaging and molecular biology techniques to study how chromatin orchestrates a delicate ballet of cutting and pasting to mix, match, and join distant segments of DNA in developing B and T cells, the lynchpins of adaptive immunity. The process, remarkable in its complexity, ultimately generates enough cell receptors to recognize an almost infinite variety of foreign antigens.

Histones (multicolored)  
not only compress DNA  
but also help regulate it by  
concealing and revealing  
DNA binding sites.









# Why So Blue?

How a team of clinical sleuths uncovered the mysterious condition that discolored a young woman's **skin**—and threatened her life.

By **Kenneth Miller** Photographs by **Ben Baker**

## Jeanne Colon was 34 years old when she landed at NYU Langone Hospital–Brooklyn (formerly NYU Lutheran), but she felt like someone at least twice her age.

She couldn't climb a flight of stairs or walk her first-grader to school without getting severely winded. Her chest ached constantly, and she sometimes passed out if she pushed herself too hard. She woke up with a choking sensation several times a night. Although she often vomited after eating, her already hefty five-foot frame had ballooned with fluid retention to 225 pounds. She'd recently had to give up her job as a city maintenance worker and go on disability.

The single mother of two boys, Colon had known for more than a decade that something was wrong with her heart, but she'd never learned exactly what it was. In 2001, after her older son had to be delivered by emergency C-section due to oxygen deprivation,

doctors at another New York hospital had found evidence that she had a congenital cardiac defect. Afraid to face the potential repercussions, she'd left without probing further.

Then, in 2005, she was hospitalized after a miscarriage, and her own blood oxygen dropped so low that her skin took on a bluish tint—a condition known as cyanosis. To find the cause, clinicians performed a transthoracic echocardiogram, placing an ultrasound probe on her chest to obtain images of her heart. Colon's obesity, however, made it difficult to get a clear picture. A coronary angiogram, in which a dye visible in X-rays is injected into coronary arteries to show blood flow, was ambiguous as well.

Doctors then proposed a more in-

vasive test: a transesophageal echocardiogram (TEE), in which an ultrasound probe is inserted down the patient's throat to take a close-up of the beating heart. Because the procedure was to be performed under moderate sedation, which could worsen the deficiency in the amount of oxygen reaching her tissues, it was put on hold until Colon's oxygen levels recovered. No one could say how long that would take, though, and after a few days, she signed out of the hospital again.

"At that point, I didn't actually feel sick," she explains. "My heart had always raced when I was stressed out or upset, and my lips would turn purple at times, but nobody told me it was something to worry about. I thought, 'What's the point of going through all this hassle?' " Colon had another reason to avoid sticking around: Having lost her mother to cancer as a teenager, she associated hospitals with suffering and death. Just being inside one made her anxious, and the thought of surgery terrified her. "My mom died after her second operation. I was, like, 'I don't want it.' "

When Jeanne Colon (right) arrived at NYU Langone Hospital–Brooklyn, her unexplained blue pallor prompted her doctor to consult specialists at NYU Langone's Adult Congenital Heart Disease Program. The decision would change everything.

**C**OLON'S CONDITION SOON began to deteriorate. In 2008, when she was hospitalized for a mouth abscess, she was found to be cyanotic again. This time, she underwent a TEE and was diagnosed with an atrial septal defect (ASD)—a hole in the wall between the atria, or upper chambers, of the heart. That didn't solve the puzzle, however.











*"I've seen something like this fewer than a dozen times in 20 years," notes cardiac surgeon Ralph Mosca, MD, who led Jeanne Colon's four-hour heart operation.*

Although ASDs commonly trigger many of the symptoms Colon was suffering, and can sometimes be repaired by simply patching the hole, cyanosis seldom occurs unless there is associated pulmonary disease or a problem elsewhere in the circulatory system. Such complicating factors can be challenging to uncover and difficult to treat. But once more, Colon fled before the investigation was complete.

By early 2015, she was too ill to delay any longer. She brought what medical records she could find to a hospital near her home in Harlem, but was told that her condition was too complex to be handled there. An aunt in Brooklyn offered to take her to what was then called Lutheran, where Colon herself had been born and whose recent merger with NYU Langone had brought it vast new clinical resources.

That August, Colon and her aunt met with Thao Ngo, MD, clinical in-

structor of medicine and director of noninvasive cardiology. Because the cardiovascular effects of ASDs may change over time, and Colon's earlier imaging results were unavailable, Dr. Ngo ordered yet another set of tests. As before, the electrocardiogram and transthoracic echocardiogram were inconclusive, though they seemed to indicate a weakness in the left side of the heart. Another TEE was ordered, but it, too, had to be postponed. On the appointed morning, Colon's cyanosis was so severe that she was admitted to the cardiac care unit and put on oxygen. After three days, her blood saturation remained subnormal—a clear sign that this was more than a simple ASD.

Dr. Ngo knew it was time to bring in specialized help. She had just attended a talk by Dan Halpern, MD, assistant professor of medicine and the newly appointed director of the Adult

Congenital Heart Disease Program at NYU Langone. "I was impressed not only by his expertise and judgment, but by his kindness and humility," she remembers. "It was clear that he cared deeply about his patients." She called Dr. Halpern, who agreed to take on Colon's case.

**I**N RECENT DECADES, PEDIATRIC cardiologists and cardiac surgeons have made remarkable strides in saving children with congenital heart disease, even those with severe abnormalities such as missing valves and misdirected coronary arteries. Of the 1% of infants born with heart defects, more than 90% now survive to adulthood. But many such defects go undiagnosed for years—particularly those, like Colon's, that become problematic only after extended wear and tear.



**“When I met Dan, I told him, ‘I’m scared. I’m not sure I want to find out what’s wrong. He said, ‘You’ve got to live so you can be there for your kids. Just stay for the testing and see how it goes.’”**

PATIENT **JEANNE COLON** ON DR. **DAN HALPERN**, DIRECTOR OF THE ADULT CONGENITAL HEART DISEASE PROGRAM AT NYU LANGONE

NYU Langone’s Adult Congenital Heart Disease Program, one of the leading centers of its kind, serves patients with both previously and newly recognized cardiac defects. Besides providing state-of-the-art medical care, the program’s mission is to help patients cope with the stresses of a lifelong, and life-threatening, chronic illness. “It’s important to empower them,” says Dr. Halpern, who came to NYU Langone from Boston Children’s Hospital. “You have to give them the confidence to go out into the world.”

That approach enabled Dr. Halpern to connect with Colon as no other physician had. “When I met Dan, I told him, ‘I’m scared. I’m not sure I want to find out what’s wrong,’” she recalls. “He said, ‘You’ve got to live so you can be there for your kids. Just stay for the testing and see how it goes.’” His reassuring manner helped keep her from bolting again.

Dr. Halpern suspected that Colon’s constellation of symptoms resulted from a complication occasionally associated with untreated ASDs: Eisenmenger’s syndrome. This circulatory disorder can arise from any heart defect involving a hole in the septum. In a healthy heart, oxygen-rich blood courses from the lungs into the left atrium and downward into the left ventricle, from which it’s pumped with great force through the aorta and circulated throughout the body. Oxygen-depleted blood returns through the right atrium, flows into the right ventricle, and is pumped back to the

**“Adult congenital cardiology is an intensely collaborative field,” says cardiologist Dan Halpern, MD. “You’re often confronted with unique conditions that challenge your preconceptions.”**



lungs to be replenished. In a heart with a septal defect, blood typically leaks from the high-pressure left side into the lower-pressure right through the hole in the wall. This diversion, known as a left-to-right shunt, may send more blood to the lungs than they can easily handle. In Eisenmenger’s syndrome, the overburdened pulmonary capillaries form scar tissue, raising blood pressure in the lungs and forcing the heart to work harder to overcome it. As the right side’s muscle tissue thickens, the pressure differential inside the heart is reversed, creating a right-to-left shunt. Now, oxygen-poor blood is pumped into the body, causing cyanosis and other serious problems. Because the syndrome involves irreversible damage to the lungs, as well as structural changes in the heart, the only available options may sometimes be a heart-lung transplant or a lung

transplant with heart surgery.

But Eisenmenger’s was far from the only possibility. “In this field, you sometimes come across a completely unexpected pathology,” Dr. Halpern says.

To unmask the culprit, NYU Langone’s congenital cardiac imaging team gave Colon the most detailed workup she’d ever had. “It’s not enough to just go in and take pictures,” observes Muhamed Saric, MD, PhD, associate professor of medicine and medical director of noninvasive cardiology. “You have to have specialized knowledge so that you can interpret what you see.”

Dr. Halpern shepherded Colon through the process, offering emotional support as well as helpful explanations. First, Leon Axel, MD, PhD, professor of radiology medicine, neuroscience, and physiology, conducted a cardiac MRI. Dr. Saric performed a transthoracic echocardiogram and a TEE, using a form of sedation for the latter that could be quickly reversed if Colon’s oxygen saturation became dangerously low. Finally, Michael Argilla, MD, assistant professor of pediatrics and director of the Pediatric Catheterization Laboratory, inserted a catheter through Colon’s groin into the femoral vein. After measuring the direction and pressure of blood flow at key locations in her heart and lungs, he performed a “trial occlusion” of her septal defect, inflating a 3-centimeter balloon to block the shunt. The blood pressure in her right ventricle spiked, confirming that merely closing the hole would not solve

**“My sons tell me, ‘You look better, Mom. You’re not sick all the time,’” she reports, adding that she has grown close to Dr. Halpern, who continues to oversee her care. “I never trusted a doctor before, but Dan has been there for me every step of the way.”**

PATIENT JEANNE COLON

her problems.

When the results were in, the team members (including Puneet Bhatla, MD, assistant professor of radiology and pediatrics, and director of pediatric and congenital cardiovascular imaging) agreed that Colon’s case was truly extraordinary. Her troubles stemmed not from Eisenmenger’s syndrome but from something far rarer—a pair of defects seldom found in tandem. In addition to a large ASD, she had a markedly undersized right ventricle, about half the normal dimensions. This raised the chamber’s internal pressure relative to the left side of the heart, creating an intermittent right-to-left shunt that mimicked Eisenmenger’s. “I’ve seen something like this fewer than a dozen times in 20 years,” notes Ralph Mosca, MD, the George E. Reed Professor of Cardiac Surgery and chief of the Division of Pediatric and Adult Congenital Cardiac Surgery, who met with the group to map out a course of treatment.

The good news was that Colon’s lungs were undamaged, and her pulmonary pressure only slightly elevated. That allowed Dr. Mosca to suggest an approach that Eisenmenger’s would have ruled out: rerouting her faulty cardiovascular plumbing. The safest and most effective option, he explained, would be to combine a partial ASD closure with a technique known as a bidirectional Glenn procedure. Although this method is typically employed as part of a multistage repair process for babies born with a single ventricle, he had used it successfully on adults as well. Without such an intervention,

the surgeon added, Colon’s health would likely continue to decline.

Colon consented to the plan, despite her fears. To maximize the chances of a positive outcome, she was sent home with oxygen canisters and medications aimed at lowering her pulmonary pressure. After three months, her readings were normal.

**O**N A FRIGID MORNING IN February 2016, Dr. Mosca and his team cut through Colon’s chest. After attaching her to a heart-lung bypass machine, they began the Glenn procedure, meticulously dividing the superior vena cava (SVC) and sewing it onto the right pulmonary artery. Normally, the SVC transports deoxygenated blood from the upper body to the right side of the heart. If the procedure worked as intended, it would divert one-third of that flow directly to the lungs, lessening the pressure that fueled Colon’s right-to-left shunt. One potential side effect, however, was that pressure could build up in the SVC, causing swelling in Colon’s head. To prevent this, Dr. Mosca created a runoff channel using a nearby vein.

Next, he stopped Colon’s heart and opened up her right atrium. Using a small piece of pericardium, the membrane enclosing the heart, he made a patch to cover the septal defect, cutting a pinhole in the middle as an escape valve. Then, he restarted her heart, checked to make sure her blood was circulating properly, and stitched

up her sternum with heavy wire. From start to finish, the operation took about four hours.

Colon’s recovery, like that of many patients who undergo open-heart surgery, was slow and arduous. She spent a month in the hospital and was seen by visiting nurses for months after that. Only recently has she gained enough stamina to begin cardiac rehab, doing supervised workouts at a gym three times a week. She still struggles with her weight (coached by NYU Langone nutrition consultants), with her medication regimen (assisted by patient-support workers), and with her longtime depression and anxiety (aided by a psychiatrist at the Medical Center). But today, she can climb stairs and walk for blocks without tiring. Her chest pain and nausea are gone, and she can sleep without choking. She envisions returning to work in the near future.

“My sons tell me, ‘You look better, Mom. You’re not sick all the time,’” she reports, adding that she has grown close to Dr. Halpern, who continues to oversee her care. “I never trusted a doctor before, but Dan has been there for me every step of the way.”

Dr. Halpern, however, defers to his colleagues. “Adult congenital cardiology is an intensely collaborative field,” he says. “You’re often confronted with unique conditions that challenge your preconceptions. You need a team of specialists with the skills and experience to ask the right questions, and you can’t stop asking until you fully understand the answers.”





Right atrium

An undersized right ventricle shunts poorly oxygenated blood through a hole in the septum.

A large hole in the dividing wall of the heart disrupts the flow of blood between the heart and lungs.

## Seeing Is Believing

Jeanne Colon was a 35-year-old mother of two when doctors discovered a rare combination of congenital heart defects (as revealed on this MRI) that turned her skin blue and left her feeling twice her age. In February 2016, Ralph Mosca, MD, led a four-hour surgery to patch a large hole in the dividing wall of her heart. During that time he also rerouted blood vessels to alleviate a pressure imbalance caused by a markedly undersized right ventricle.

# POST

New People, Places, and Projects at NYU Langone Health

## [Faculty Conversation](#)

### WHAT WILL IT TAKE TO BEAT PANCREATIC CANCER?

Diane M. Simeone, MD, discusses her new roles at the Laura and Isaac Perlmutter Cancer Center, and an ambitious research strategy to turn the tide against a deadly cancer.

DIANE M. SIMEONE, MD, an internationally recognized surgeon and scientist, joined NYU Langone last March as associate director for translational research at the Perlmutter Cancer Center and head of its newly established Pancreatic Cancer Center. Previously, Dr. Simeone served as director of the gastrointestinal oncology program at the University of Michigan Comprehensive Cancer Center. There, she led the team that discovered pancreatic cancer stem cells, a subpopulation of cells within tumors that are especially resistant to treatment. We recently caught up with Dr. Simeone to discuss her mission to improve the odds for the more than 50,000 patients in the US diagnosed with pancreatic cancer every year. ►







**What sparked your interest in pancreatic-cancer research?**

When I was a surgical resident, I was amazed to learn how few people were doing research on pancreatic cancer. It became clear to me that to tackle a tough disease like this, it wasn't enough to be a surgeon—I also had to pursue laboratory research. Having a close-up view of the cancer makes it very personal.

**Despite recent advances in the treatment of cancer overall, pancreatic cancer still has a single-digit average survival rate. What makes it different from other cancers?**

The disease rarely causes symptoms until it's quite advanced, so most people have widespread disease at the time they're diagnosed. Only about one in five have a tumor that can be surgically removed.

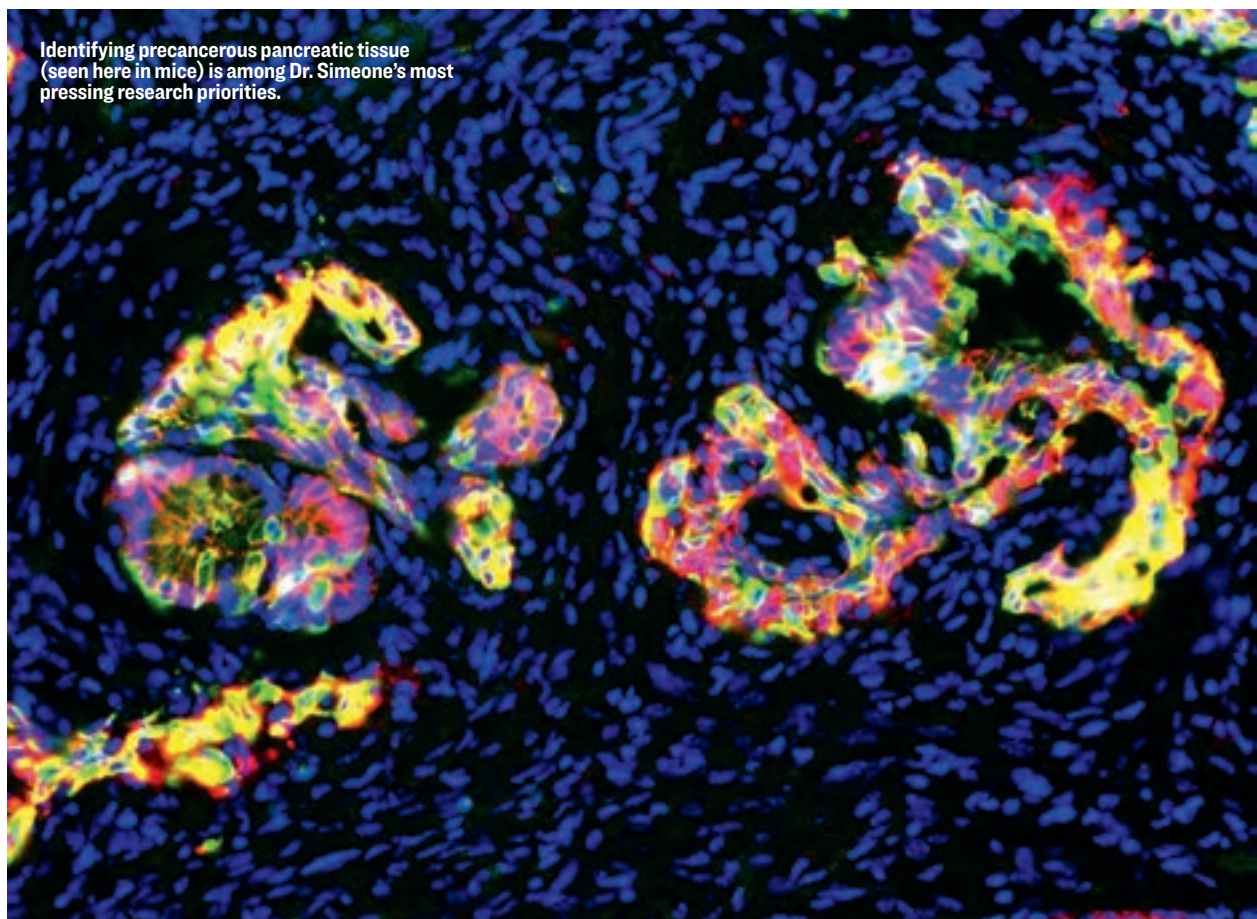
**Even among that subset, pancreatic cancer rebounds 75% of the time, and the five-year survival rate is still only about 25%. Why is even the best-case scenario so dire?**

Clearly, there is something unique about the biology of pancreatic cancer that makes it deadly right from the start. Understanding why is core to our research mission.

Encouragingly, we already have a few significant clues. Not only do pancreatic cancer cells grow unusually fast, but they can also break off from the tumor early in the disease and spread. We know that scar tissue tends to form around the tumor, which may serve as a barrier to therapeutic agents. And there's a complex interplay between the tumor and its environment which further protects the tumor from chemotherapy and radiation and helps it evade the immune system.

**Where do you see the biggest opportunities for making advances to address this disease?**

First, our center is establishing a first-of-its kind program for early detection and prevention. This includes a re-



Identifying precancerous pancreatic tissue (seen here in mice) is among Dr. Simeone's most pressing research priorities.



Diane Simeone, MD, consults with Lidong Wang, PhD, a researcher in her lab. Dr. Wang studies the mechanisms that drive metastasis in pancreatic cancer.



search initiative to identify biomarkers of abnormal pancreatic cells so we can intervene before they become invasive cancer cells. We're also focusing on people who have had multiple family members with pancreatic cancer or who have mutations linked to pancreatic cancer. The goal is to develop new treatment paradigms to markedly delay or prevent the formation of pancreatic cancer in high-risk individuals.

**What are you doing to develop more effective treatments?**

For one, we are studying pancreatic cancer stem cells, which are known to drive tumor initiation and metastasis, and are particularly resistant to treatment with chemotherapy and radiation. We believe targeting this subpopulation of cells is essential to a cure.

We also recognize that there is a large gap between scientific discoveries made in the lab and effective treatments for patients. Up until now, there hasn't been a lot of incentive for pharmaceutical companies to develop drugs for pancreatic cancer patients because it has been viewed as an uncommon cancer. But with data predicting it will become the second-leading cause of cancer death by 2020, there is an unprecedented interest in finding new treatments.

We're currently partnering with the pharmaceutical industry on a series of clinical trials, with funding from the Pancreatic Cancer Action Network, through a new clinical trial consortium called Precision Promise, which aims to translate the best laboratory science into novel treatments. Our goal is to create a wider pipeline of experimental treatments so that patients get personalized therapies that are much more likely to be effective.

**You're involved with several patient-advocacy groups, and you work to promote awareness about pancreatic cancer. Why is outreach so vital?**

When I speak to a large group and I ask how many in the audience have had a close friend or family member affected by pancreatic cancer, about



**“There’s traditionally been a nihilism surrounding pancreatic cancer because it is so deadly. People are often afraid to discuss their diagnosis. They don’t want to tell others what kind of cancer they have. We really need to change that.”**

**Sophia Bustra, a research assistant in the lab of Michael Pacold, MD, PhD, a radiation oncologist who investigates cancer metabolism.**

one-third to one-half raise their hands, which everyone usually finds surprising. It is important that people know that pancreatic cancer is increasing in incidence and remains a disease with single-digit survival.

There's traditionally been a nihilism surrounding pancreatic cancer because it is so deadly. People are often afraid to discuss their diagnosis. They don't want to tell others what kind of cancer they have. We really need to change that.

I've spoken to members of Congress and many other groups to raise awareness. I want everyone to know about this disease and its challenges, and also to know that, thanks to recent advances, we now have real opportunities to make progress. I want to empower patients to talk about it. The more people know, the easier it will be

to increase funding for research.

**How do you cope emotionally with the fact that most of your patients with pancreatic cancer will die from the disease?**

Caring for people who are dying gives me a sense of urgency—it is what drives me every day. When I run my laboratory meetings, I try to relay that sense of urgency to everyone on my team. Our research is about so much more than the next experiment or the next paper. To work in this area, you need to be able to put yourself in the shoes of a patient or the loved one of someone who has been diagnosed with pancreatic cancer.

I encourage all the scientists who work with me to come to the clinic and meet the patients, and to see what an operation looks like. On the other side, it's important for clinicians who don't do bench work to come to the laboratory and see the kinds of challenges that basic scientists face, and to help them put the questions that are being addressed in the laboratory into the proper clinical context. It's our obligation to provide real answers and real hope for patients.

## NEW FUNDING

### THE GRANT

#### Strategically Focused Research Network on Obesity

### HOW MUCH

\$4 million

### HOW LONG

Four years

### SOURCE

American Heart Association

### LEAD INVESTIGATOR

► **Ann Marie Schmidt**, MD, PhD, the Dr. Iven Young Professor of Endocrinology

### WHY IT MATTERS

More than 385 million people now suffer from diabetes globally, and half don't even know they have it. About 85% of them are overweight or obese. "We know that for many people in weight-loss programs, it is difficult to keep the weight off," says Dr. Schmidt.

### WHAT IT FUNDS

The AHA grant brings together obesity experts across four academic medical centers, led by NYU Langone Health, to investigate novel approaches for treating obesity. "Our goal is to identify exactly why weight loss is so hard to sustain," says Dr. Schmidt. For NYU Langone's part, Dr. Schmidt has assembled a multidisciplinary team called NYU Ignition, for InvestiGating Novel Obesity SoluTIONS to simultaneously tackle three interwoven projects spanning bench to bedside. On the basic science end, Dr. Schmidt's lab will study how a cell-surface receptor known as RAGE affects weight loss and metabolism. At the translational level, Ira J. Goldberg, MD, director of the Division of Endocrinology, Diabetes, and Metabolism, and Jose Aleman, MD, assistant professor of medicine, are leading a clinical team to assess if and how the inflammatory response relates to weight loss and the challenges in maintaining weight loss. The final project is a population-based clinical trial in which Mary Ann Sevvick, ScD, professor of population health, and coinvestigator Eran Segal, PhD, of the Weizmann Institute, will compare two behavioral weight-loss interventions in 200 patients with obesity. Additionally, Glenn I. Fishman, MD, director of the Leon H. Charney Division of Cardiology, will oversee a postdoc training program. "There's going to be a lot of sharing, which is a really critical part of why we were chosen for this funding," Dr. Schmidt explains.



## A SLEEK NEW HOME FOR RESEARCH

Part of the most sweeping renovation and construction initiative in NYU Langone's history, the 16-story Science Building will open in phases starting in the fall, integrating the south end of the campus into a hub for basic, clinical, and translational research. The new facility houses the first and largest collection of laboratories (80 in all) to open since the Smilow Research Center in 2005. Designed to accommodate up to 800 occupants, it plays a key role in the institution's broader strategy for growth. "We plan to double our research capacity over the next five years," says Dafna Bar-Sagi, PhD, senior vice president and vice dean for science, "and this building is the centerpiece of that effort."







JONATHAN KOZOWYK (TOP RIGHT)



#### New People

### Rachel Bluebond-Langner, MD

**IN A WATERSHED MOMENT** for the medical care of transgender people, the Centers for Medicare and Medicaid Services began to allow coverage of transgender surgery in 2014, with some commercial insurers following suit. As such procedures have become more accessible and affordable, more people have opted for gender-affirming surgery. In January, Rachel Bluebond-Langner, MD, a specialist in this field, joined NYU Langone Health's Hansjörg Wyss Department of Plastic Surgery as part of a larger effort to expand its multidisciplinary program for transgender patients. The Laura and Isaac Perlmutter Associate Professor of Reconstructive Plastic Surgery, she will collaborate with a growing team to provide an array of services for transgender adults and adolescents, including surgery and hormone therapy. Her primary collaborator is Lee Zhao, MD, assistant professor of urology, who specializes in using minimally invasive robotic surgery to access the depths of the pelvic region.

For the nearly 1 million American adults who identify as transgender, the impact of gender-affirming surgery can be lifesaving. In the transgender community, an estimated 40% attempt suicide at one point in their lives (compared to a rate of 1.6% in the general population). Gender-affirming surgery involves procedures that change the body, in appearance and anatomy, to conform to the patient's gender identity. "Everybody's journey and transition is different," explains Dr. Bluebond-Langner. "Some will socially transition, others will take hormones, and still others will go on to have surgery."

For transgender women, Dr. Bluebond-Langner performs breast augmentation, facial feminization, reduction of the Adam's apple, fat grafting, and vaginoplasty. For transgender men, she performs body contouring, chest masculinization, and phalloplasty. "Gender-affirming surgery is the embodiment of plastic surgery, using creativity and artistry to restore form and function," says Dr. Bluebond-Langner. "It applies all the techniques I was trained in to achieve a natural aesthetic appearance while minimizing risks and ensuring safety."

Previously, Dr. Bluebond-Langner served as an assistant professor in the Division of Plastic and Reconstructive Surgery at University of Maryland School of Medicine. After earning her MD at Johns Hopkins School of Medicine, she completed a residency in plastic and reconstructive surgery at the Johns Hopkins/University of Maryland Plastic Surgery Program and a fellowship in craniofacial microsurgery at the Hospital General Dr. Manuel Gea González in Mexico City.



## NEW FUNDING

### THE GRANT

#### National Heart, Lung, and Blood Institute Outstanding Investigator Award

### HOW MUCH

\$6.7 million

### HOW LONG

Seven years

### SOURCE

National Institutes of Health

### LEAD INVESTIGATOR

► **Kathryn J. Moore**, PhD, the Jean and David Blechman Professor of Cardiology, professor of medicine and cell biology in the Leon H. Charney Division of Cardiology

### WHY IT MATTERS

Cardiovascular diseases are the leading cause of death in the Western world. Mounting evidence suggests that obesity is a risk factor for coronary atherosclerosis, in which plaque made of cholesterol, fatty substances, and cellular waste clogs arteries. Unfortunately, few treatment options exist beyond cholesterol-lowering statins, drugs introduced more than 20 years ago, and atherosclerosis remains the leading cause of vascular disease. “It’s troubling to think about the epidemic of obesity that we are seeing globally, and the increase in cardiovascular disease that will happen in the next 20 years,” says Dr. Moore.

### WHAT IT FUNDS

Dr. Moore investigates the role of an unusual class of RNA molecules called long noncoding RNA, or lncRNAs, in regulating the body’s immune response to atherosclerotic plaque. Once considered “junk RNA” because it doesn’t code for proteins, lncRNAs are now thought to influence how and when genes are expressed. Among her many insights, Dr. Moore has found evidence that a lncRNA called CHROME can alter the levels of good cholesterol (HDL) in the blood. With this NHLBI award—considered the highest individual honor bestowed by NIH—Dr. Moore now has the freedom to expand her lncRNA research and follow the data wherever it goes. “It’s exciting to have the flexibility to pivot to follow exciting new leads as the evidence unfolds,” says Dr. Moore.

### Philanthropy

## NYU LANGONE HOSPITAL-BROOKLYN, FLYING HIGH THANKS TO \$25 MILLION GIFT



By ferry, the trip from NYU Langone Health’s main campus in midtown Manhattan to NYU Langone Hospital-Brooklyn in Sunset Park is just 30 minutes long. But the two neighborhoods are worlds apart. Some 13% of midtown’s residents live below the federal poverty level, but in Sunset Park the figure is 29%. While 12% of midtown’s residents lack any form of health insurance, in Sunset Park the number is more than double that: 27%.

The gap in healthcare was not lost on Jackie and Miguel Bezos as they rode NYU Langone’s ferry on July 19 to NYU Langone Hospital-Brooklyn. As president and vice president of the Bezos Family Foundation (their son Jeff is founder and CEO of Amazon.com), their mission is to help children realize their full potential, and their conviction is that healthy families and communities produce healthy children.

Mr. and Mrs. Bezos, joined by Dean & CEO Robert I. Grossman, MD, and Board Chair Kenneth G. Langone, crossed the East River to attend the celebration of a major milestone. Their foundation pledged \$25 million to NYU Langone Hospital-Brooklyn—the largest gift in its history—to support major initiatives for children and families in Brooklyn. The hospital delivers some 4,500 babies annually, has over 600,000 outpatient visits each year (many for prenatal and infant health) at its nine Family Health Centers, and serves more than 14,000 students at its 31 School Based Health Centers.

The gift will fund new positions and initiatives to advance mother/baby care across the hospital, with the goal of improving outcomes in family health and child development. It will also establish an endowed professorship in the Department of Population Health to ensure that care strategies remain focused over the long term.





#### New People

## Lawrence Newman, MD

Lawrence Newman, MD, considers himself a true success story. Not because he was the first neurologist in the country to complete a fellowship in headache medicine. Or because he served as president of the American Headache Society. Or because he was recently appointed director of the Division of Headache Medicine in NYU Langone's Department of Neurology, leading one of only a handful of fellowship-accredited programs in this field nationwide.

Dr. Newman is most proud of the fact that, plagued by debilitating, misdiagnosed headaches since the age of 11, he correctly diagnosed himself as a migraine sufferer in medical school, ultimately obtaining treatment that has cut his attacks from 16 per month to 5 per year.

At NYU Langone, Dr. Newman leads a team of five fellowship-trained headache specialists. An expert in rare headache disorders, he also directs clinical trials to investigate promising treatments. Dr. Newman previously served as director of the Headache Institute at St. Luke's-Roosevelt Hospital Center and Beth Israel Medical Center. He earned his MD at the Universidad Autonoma de Guadalajara and completed a residency in internal medicine at Elmhurst Hospital Center and a residency in neurology at Albert Einstein College of Medicine.

## NEW FUNDING



#### THE GRANT

### Macrophage Dysfunction in Obesity, Diabetes, and Atherosclerosis

#### HOW MUCH

**\$12 million**

#### HOW LONG

**Five years**

#### SOURCE

National Heart, Lung, and Blood Institute

#### LEAD INVESTIGATOR

**Edward A. Fisher**, MD, PhD, the Leon H. Charney Professor of Cardiovascular Medicine at NYU School of Medicine, director of the Center for the Prevention of Cardiovascular Disease

#### WHY IT MATTERS

Two-thirds of Americans are overweight or obese, conditions that fuel diabetes and heart disease. "Unfortunately, people with obesity and diabetes overwhelmingly die of heart disease," explains Dr. Fisher, a clinician-scientist whose research focuses on atherosclerosis, the leading cause of heart attacks. "These three conditions likely share molecular mechanisms." Dr. Fisher and his colleagues Kathryn Moore, PhD, and Ann Marie Schmidt, MD, PhD, are zooming in on the particular role of macrophages.

#### WHAT IT FUNDS

The word *macrophage* means "big eater" in Greek. These white blood cells are the immune system's early responders, engulfing and digesting pathogens. But obesity, diabetes, and atherosclerosis can turn macrophages against the body. "As obesity leads to diabetes, macrophages in fat tissue become very active, angry and inflamed, making the diabetes worse," Dr. Fisher explains. "Something similar happens in atherosclerotic plaques. The macrophages start damaging the arteries." Dr. Fisher and his colleagues have individually been working for years to understand the role macrophages play in atherosclerosis, obesity, and diabetes. Over the next five years, using mouse models, this trio will pool their efforts, seeking factors that activate or repress macrophage inflammatory activity in each disease. "An exciting possibility is that we might one day find a magic bullet that lets us kill three birds with one therapeutic stone," says Dr. Fisher.

## NEW FUNDING

### THE GRANT

#### Communities Partnering in Navigation in New York City

### HOW MUCH

**\$4,050,000**

### HOW LONG

**Three years**

### SOURCE

**NYC Department of Health and  
Mental Hygiene**

### THE INVESTIGATOR

► **Joseph E. Ravenell**, MD, associate professor of population health and medicine at NYU School of Medicine

### WHY IT MATTERS

African Americans have the highest mortality rate of any racial group in the US for most cancers, and many of these deaths—particularly those caused by breast and colorectal cancers—could be prevented with timely screenings. “Breast and colon cancer can often be treated if caught early,” explains Dr. Ravenell, an internist and member of NYU Langone’s Center for Healthful Behavior Change in the Department of Population Health. “But in underserved communities, there are formidable barriers to getting screened. There’s lack of information, lack of insurance, worry about cost, limited access to providers, mistrust—and fear.”

### WHAT IT FUNDS

This grant supports Dr. Ravenell’s ongoing work to minimize barriers to breast and colon cancer screening in minority populations. Over the next three years, in partnership with the Department of Health, the Arthur Ashe Institute of Urban Health, and the New York State Cancer Prevention Services Program, Dr. Ravenell will expand and refine innovative community-based programs that raise awareness about cancer and connect people with affordable screening. His approach pivots around the proven idea of bringing health counseling to people in places where they feel comfortable—such as barbershops, beauty salons, and churches in neighborhoods throughout New York City. “Knowing that you need screening is one thing, but knowing how to get screened is a whole other issue,” Dr. Ravenell says. “We take people by the hand and navigate them through the entire process.”







## MODERN CARE, MODERN BUILDING

When it opens next year, the 21-story Helen L. and Martin S. Kimmel Pavilion will transform the north end of the campus into a fully integrated clinical network dedicated to acute care. With 374 beds and 30 operating rooms and image-guided surgical labs, it significantly increases NYU Langone Health's clinical space. The first clinical facility in New York City with single-bed inpatient rooms, the Kimmel Pavilion will house a 68-bed pediatric inpatient facility, part of the Hassenfeld Children's Hospital at NYU Langone Health. "By 2020, our flagship Tisch Hospital and the Kimmel Pavilion will have all single-bedded rooms," says Robert I. Grossman, MD, the Saul J. Farber Dean and CEO, "and all aspects of patient care will be state-of-the-art."



## In Memoriam Steven H. Ferris, PhD

1943-2017

Steven H. Ferris, PhD, the Gerald J. and Dorothy R. Friedman Professor of NYU Langone's Alzheimer's Disease Center, director of the center from its inception in 1990, and codirector from 2015, died on April 5. Internationally recognized for his contributions to Alzheimer's research, Dr. Ferris led numerous psychopharmacology clinical trials, as well as important studies on behavioral interventions. These trials helped define mild cognitive impairment, devise methods used worldwide for early detection of the disease, and develop current treatments. Alzheimer's disease, the most common form of dementia affecting older adults, afflicts more than 5 million Americans.

Dr. Ferris, a member of the Departments of Psychiatry and Neurology, founded the Aging and Dementia Research Center at NYU Langone in 1974, building a team of researchers that established one of the earliest NIMH-funded, multidisciplinary research centers on aging and dementia. He also served as principal investigator at NYU Langone's Alzheimer's Disease Center.

Dr. Ferris earned a BS from Rensselaer Polytechnic Institute and a PhD in experimental psychology from the City University of New York. He completed postdoctoral training at the US Navy submarine base in Groton, Connecticut. Soon after joining NYU School of Medicine in 1973, he led one of the first NIH-funded trials on dementia using hyperbaric oxygen. Dr. Ferris authored over 300 publications and mentored hundreds of students. He is survived by his wife, Arlene; his sons, David and Marc; his daughters-in-law, Catherine and Amy; and four grandchildren.

**“There’s something very special about being a doctor, and that brings obligations regarding how we behave, not just with our patients but with *everyone*.”**

WHO:

**Steven B. Abramson, MD**

Senior Vice President  
and Vice Dean for  
Education, Faculty  
and Academic Affairs

Chair of the Department  
of Medicine

Professor of Medicine  
and Pathology

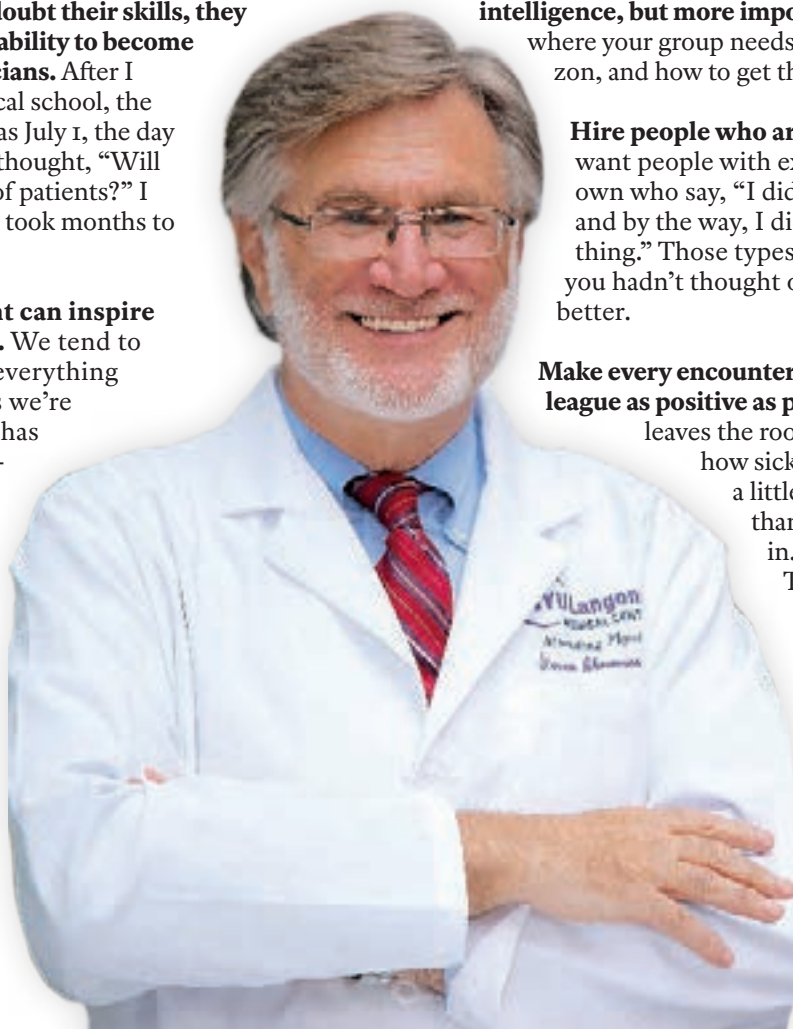
Last winter, NYU Langone Health leader Steven B. Abramson, MD, spoke to first-year medical students about what he’s learned from nearly five decades as a distinguished clinician, researcher, and educator. The conversation was part of NYU School of Medicine’s Leaders and Teams lecture series. Here, a few highlights.

• • •

**Learning how to care for people is a unique privilege.** Medicine is the only profession that is sworn to a 2,500-year-old oath, the Hippocratic Oath, which requires physicians to uphold certain ethical standards. Those ancient words still define principles of the profession today. There’s something very special about being a doctor, and that brings obligations regarding how we behave, not just with our patients but with *everyone*.

**When new doctors doubt their skills, they should trust in their ability to become accomplished physicians.** After I graduated from medical school, the most terrifying day was July 1, the day I became an intern. I thought, “Will I be able to take care of patients?” I learned I could, but it took months to gain that confidence.

**Almost every patient can inspire a research question.** We tend to think that we know everything about the conditions we’re treating. If a patient has congestive heart failure, we treat it with certain drugs. But in reality, there are very few diseases that we treat as well as we should; and very few diseases that we can cure. There’s so much that needs to be done on the research side to improve patient care.



**Role models are essential.** A mentor can help you navigate your career and think critically about your profession. I’ve been fortunate to have several role models. During my early training, Saul Farber, MD, former chair of the Department of Medicine and dean of the School of Medicine, taught the importance of education and the physician’s responsibility to medicine as a profession. Gerry Weissmann, MD, my predecessor as director of rheumatology, embodied enduring passion for science and knowledge. And Dean Grossman, another longtime mentor, has epitomized the importance of the continual resolve for excellence.

**Commit to your work.** When you bring effort and dedication to your job—and you do it well—leadership opportunities will come to you.

**To be a leader, you need listening skills and emotional intelligence, but more important,** you need a sense of where your group needs to go, what’s on the horizon, and how to get there. You need vision.

**Hire people who are smarter than you.** You want people with expertise greater than your own who say, “I did everything you asked, and by the way, I did this, that, and the other thing.” Those types of people deliver ideas you hadn’t thought of before. They make you better.

**Make every encounter with a patient or colleague as positive as possible.** When a physician leaves the room, the patient—no matter how sick—should feel as if there is a little more hope in the room than when he or she first came in. You can’t be perfect. There will be frustrations. But if you’re in a position of authority, you have an obligation to help others when possible.

**I try to say thank you several times each day,** since my success is so dependent on the contributions of others.





# SUPPORT OUR STUDENTS AND CREATE YOUR OWN LEGACY.

Your gift of \$30,000 (payable over up to three years) will be acknowledged with a named dorm room in Vilcek Hall. Planned gifts may qualify as well. One hundred percent of your contribution will support scholarships for NYU School of Medicine students.

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