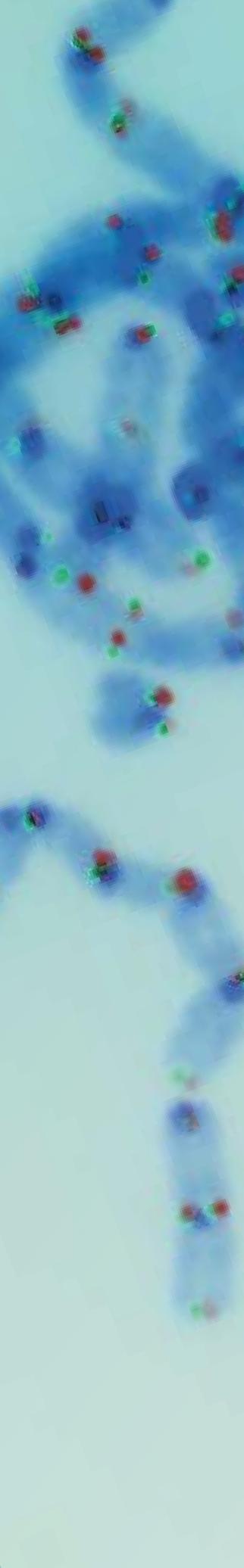


# NEVER STOP ASKING **WHY**

2013

Research  
Report



FOR SOME, “WHY IS THE SKY BLUE?” IS ONLY THE BEGINNING. THE BEST EXPLORERS NEVER LOSE THE WONDER OF YOUTH EVEN AS THEY GAIN THE GRIT TO PURSUE BOLD IDEAS AND THE FORESIGHT TO TAKE IN THE BIG PICTURE. THE RESEARCHERS WE RECENTLY RECRUITED CONSTANTLY REMIND US THAT GREAT WISDOM CAN COME FROM ASKING SIMPLE QUESTIONS AND FROM SEEKING THE ANSWERS TOGETHER. THEY LOVE THEIR WORK AND THEY LOVE WHERE THEY WORK. . . .

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**COVER:** A mouse spleen labeled with green fluorescent protein reveals green-tagged cells that are actively participating in an important cell-to-cell messaging system called the Notch signaling pathway. Iannis Aifantis, PhD, professor of pathology and chair of the Department of Pathology, and colleagues showed in a recent study that this pathway may play a significant role in hematopoiesis, or the formation of mature blood cells from immature precursors (shown in red and purple).

IN THE PAGES THAT FOLLOW, THEY TELL US **WHY**

2013 Research  
Report

WELCOME TO THE **2013 RESEARCH REPORT,**



A WINDOW ONTO NYU LANGONE MEDICAL CENTER'S VIBRANT RESEARCH COMMUNITY.

# THIS YEAR'S THEME, "NEVER STOP ASKING WHY," SALUTES THE WEALTH OF EMERGING TALENT AT NYU LANGONE AND THE SPIRIT OF SCIENTIFIC DISCOVERY.

Over the past six years, we have recruited over 100 research faculty to our campus, an extraordinary effort that has greatly expanded the scope of our biomedical investigations. On the following pages, you will find profiles of some of the newly recruited junior faculty whose out-of-the-box thinking, ceaseless curiosity, and passion for problem solving exemplify the Medical Center's focus on cutting-edge basic and translational research. You will also find profiles of more seasoned investigators whose flourishing careers demonstrate how the culture of NYU Langone advances scientific achievement.

All of the scientists profiled here share a true passion for exploration and the deep satisfaction that derives only from overcoming a daunting intellectual challenge. Of course, it's not just about eureka moments. They also credit their accomplishments to a strong educational foundation and deep reserves of persistence and patience.



**Robert I. Grossman, MD**

The Saul J. Farber Dean and Chief Executive Officer

Perhaps most important, though, our scientists say a vibrant atmosphere attracted them to the Medical Center in the first place, and its nurturing culture has actively encouraged them to explore bold hypotheses, reach across disciplines, and pursue translational work. From this recipe for success spring insights that can lead to potentially life-transforming discoveries: how fingernails contain the molecular signaling pathways necessary for limb regeneration; how an anti-HIV medication may also block deadly staph infections; how to inhibit chronic inflammation in Alzheimer's, atherosclerosis, and type 2 diabetes; and how early exposure to antibiotics may impair development and promote obesity, to mention just a few of the recent findings from their laboratories.

At NYU Langone Medical Center, we believe a collaborative and supportive environment is the best way to encourage enterprising questions and constant innovation, which can turn into scientific breakthroughs that enrich us all.



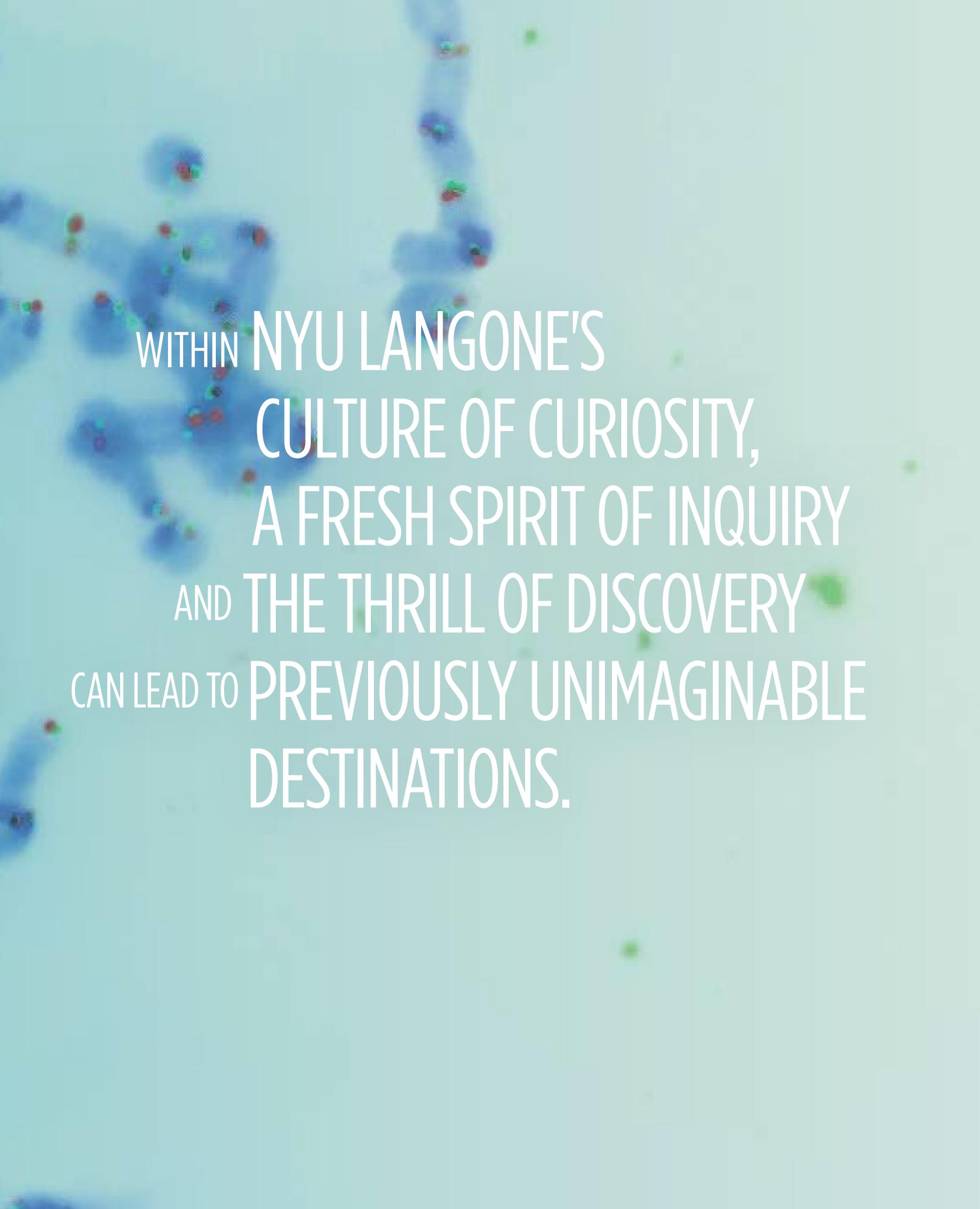
**Dafna Bar-Sagi, PhD**

Vice Dean for Science and Chief Scientific Officer

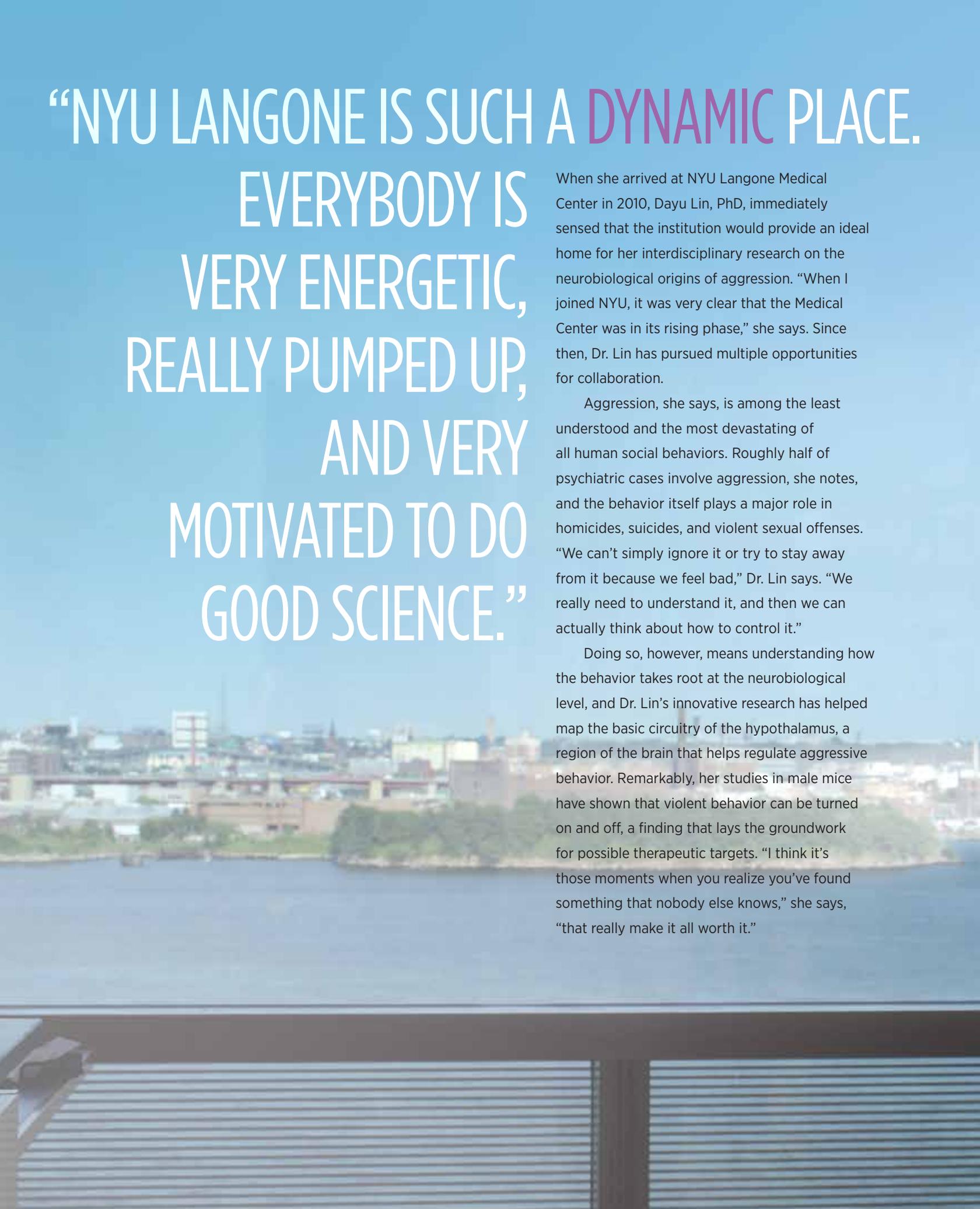
The background of the image is a light blue, semi-transparent overlay of a microscopic photograph. The photograph shows several long, wavy, blue filamentous structures, possibly bacteria or algae, scattered across the frame. These filaments are covered with numerous small, bright red and green dots, which could be spores, pigments, or other microscopic organisms. The overall effect is a scientific and exploratory aesthetic.

**NEVER STOP SEARCHING**

**WHY**

A microscopic image showing blue, branching, filamentous structures with small red and green dots, likely representing biological cells or microorganisms. The background is a light, pale green color.

WITHIN NYU LANGONE'S  
CULTURE OF CURIOSITY,  
A FRESH SPIRIT OF INQUIRY  
AND THE THRILL OF DISCOVERY  
CAN LEAD TO PREVIOUSLY UNIMAGINABLE  
DESTINATIONS.



“NYU LANGONE IS SUCH A **DYNAMIC** PLACE.

EVERYBODY IS  
VERY ENERGETIC,  
REALLY PUMPED UP,  
AND VERY  
MOTIVATED TO DO  
GOOD SCIENCE.”

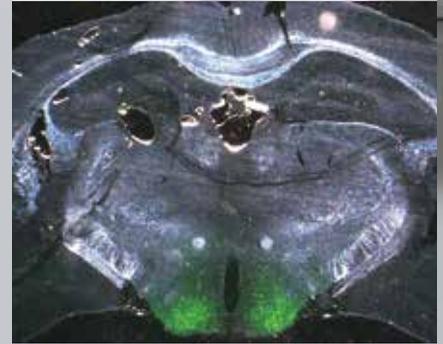
When she arrived at NYU Langone Medical Center in 2010, Dayu Lin, PhD, immediately sensed that the institution would provide an ideal home for her interdisciplinary research on the neurobiological origins of aggression. “When I joined NYU, it was very clear that the Medical Center was in its rising phase,” she says. Since then, Dr. Lin has pursued multiple opportunities for collaboration.

Aggression, she says, is among the least understood and the most devastating of all human social behaviors. Roughly half of psychiatric cases involve aggression, she notes, and the behavior itself plays a major role in homicides, suicides, and violent sexual offenses. “We can’t simply ignore it or try to stay away from it because we feel bad,” Dr. Lin says. “We really need to understand it, and then we can actually think about how to control it.”

Doing so, however, means understanding how the behavior takes root at the neurobiological level, and Dr. Lin’s innovative research has helped map the basic circuitry of the hypothalamus, a region of the brain that helps regulate aggressive behavior. Remarkably, her studies in male mice have shown that violent behavior can be turned on and off, a finding that lays the groundwork for possible therapeutic targets. “I think it’s those moments when you realize you’ve found something that nobody else knows,” she says, “that really make it all worth it.”

## OPTOGENETICS

Dr. Lin has used optogenetics—a sophisticated technique that relies on a beam of blue light (at bottom)—to turn specific neurons in mice on and off and pinpoint the circuitry within the small region of the brain's hypothalamus that controls aggression in mice (abbreviated VMHvl, green area below). When she activated the right cells, the mice attacked foes, mates, and even inanimate objects.



## DAYU LIN, PhD

ASSISTANT PROFESSOR  
OF PHYSIOLOGY AND  
NEUROSCIENCE, AND  
PSYCHIATRY

2010  
JOINED NYU LANGONE

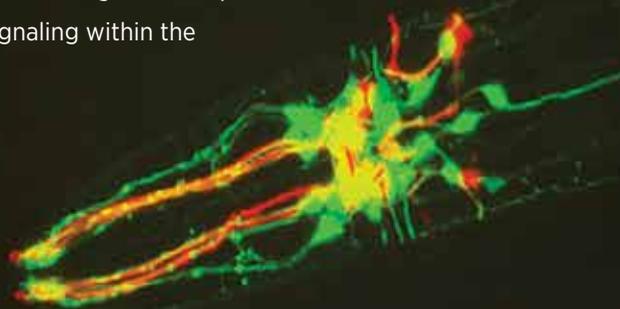
Backed by a deep and diverse bench of researchers at NYU Langone Medical Center, Niels Ringstad, PhD, is helping to reveal how the unraveling of labyrinthine connections in the brain can lead to devastating psychiatric and neurological conditions. The Skirball Institute's "phenomenal incubator of ideas" and the Medical Center's "outstanding community of researchers" initially drew him to NYU Langone in 2009, says Dr. Ringstad. Since then, his lab has used a simple roundworm called *Caenorhabditis elegans* as a model system for how genetic mutations can disrupt chemical signals in the brain.

Understanding what prevents these signals from talking to each other, he says, could lead to promising new therapeutic targets for conditions with woefully limited treatment options, such as depression, schizophrenia, and Parkinson's disease. "You're standing at the edge of this tremendously complicated problem in modern science, 'How does the brain work?' Yet you're working within a system that's constantly giving you answers, and you're making rapid progress," he says. "That's thrilling."

In one line of research, Dr. Ringstad has discovered multiple mutations that impair signaling by the neurotransmitter serotonin, a chemical messenger altered by the antidepressant Prozac. Separately, he showed how dopamine unexpectedly opens specific gateways into neurons and allows the rapid influx of messages. Similar channels are opened by another neurotransmitter called GABA, whose activity is amplified by the anti-anxiety drug Xanax. Inspired by his recent findings, Dr. Ringstad says he's eager to begin applying what he's learned in *C. elegans* to help unlock the secrets of chemical signaling within the mammalian brain.

**“WHAT'S INVIGORATING ABOUT BEING AT THE MEDICAL CENTER IS THAT FOR EVERYTHING FASCINATING OR PUZZLING IN THE LAB, THERE IS SOMEONE ON HAND WHO CAN RELATE IT BACK TO SOMETHING THAT FASCINATED OR PUZZLED THEM IN THE CLINIC.”**

With the aid of a fluorescence microscope (right) and other tools, Dr. Ringstad is shedding light on the neurochemical signaling pathways that shape psychiatric behavior. In a genetically altered roundworm (left), neurons that produce the chemical messenger dopamine glow red while neurons that express a dopamine receptor recently identified by his lab glow green.





**NEILS RINGSTAD, PhD**

ASSISTANT PROFESSOR OF CELL  
BIOLOGY, SKIRBALL INSTITUTE OF  
BIOMOLECULAR MEDICINE

**2009**  
JOINED NYU LANGONE

“AT NYU LANGONE,  
**I WAS REALLY FORTUNATE  
TO HAVE A STRONG FAMILY  
IN THE MICROBIOLOGY  
DEPARTMENT—VERY NURTURING  
AND VERY SUPPORTIVE,**  
WHICH IS DEFINITELY WHY I’M HERE.”

**VICTOR TORRES, PhD**

ASSISTANT PROFESSOR OF  
MICROBIOLOGY

**2008**  
JOINED NYU LANGONE



The close-knit community that Victor Torres, PhD, encountered when he joined NYU Langone Medical Center in 2008 encouraged him to look well beyond his own discipline to deduce how the dangerous bacterial pathogen *Staphylococcus aureus* outwits the immune system. “My story is all about applying every single discipline available to answer the questions we want to answer,” Dr. Torres says. “We don’t stop with what we know. We want to go further, expand the horizon, push every project to the limit.”

The critical guidance and multidisciplinary connections have helped him zero in on *S. aureus*, which produces five similar toxins once viewed as redundant. When Dr. Torres and his lab took a closer look, however, they discovered that each toxin pursues different immune cells

within the body, allowing the microbial pathogen to “completely deplete the immune system’s bodyguards during an infection,” he says.

To develop new antimicrobial therapies that can turn the table on such toxins, he says, researchers must first understand how pathogens wield their weapons during an attack. So far, Dr. Torres has identified the initial cellular targets of four *S. aureus* toxins. One of these critical access points, he and colleagues found, is also exploited by the human immunodeficiency virus, an unexpected discovery that may help researchers block the shared entry route of both pathogens. “I always tell the people in my lab that there are discoveries you can plan, but those are rare,” he says. “The best discoveries are those that you find when you’re just asking out-of-the-box questions.”



## MRSA

Dr. Torres and his lab are helping to illuminate how methicillin-resistant *S. aureus* (MRSA, in green) promotes infection by targeting and killing the immune system’s neutrophil cells (in red). In the life-or-death battle, he likens these critical first responders to the host’s Marines.



**NEVER SET LIMITS ON YOUR IMAGINATION**



AT NYU LANGONE,  
THE FREEDOM  
TO PURSUE BOLD IDEAS,  
AND THE AMBITION  
AND DRIVE TO  
TACKLE COMPLEX PROBLEMS  
FROM A NEW ANGLE CAN DELIVER  
UNEXPECTED INSIGHTS.

WHY

# FOR DR. SFEIR, THE CLOSE PROXIMITY TO WAS ONE OF HER BIGGEST DRAWS TO NYU LANGONE. “MY BENCH IS VERY CLOSE TO THE BEDSIDE.”

One of the most consequential parts of the human genome lies within our telomeres, the repetitive DNA sequences that cap the ends of every chromosome. Agnel Sfeir, DPhil, has dedicated her career to understanding what happens when those protective caps turn defective, helping to shed light on the link between malfunctioning telomeres and cancer, premature aging, and most recently, obesity.

Dr. Sfeir’s decision to begin conducting her telomere research at NYU Langone Medical Center’s Skirball Institute of Biomolecular Medicine in 2012 has put her, she says, in “an excellent basic-science environment” that has set the stage for some exhilarating revelations. “I love what I’m doing here.”

One of the biggest moments arrived recently when she was checking on the mouse colony she uses for some of her genetic experiments. “When I opened the cages, I saw in every cage one or two mice that were just huge,” she recalls.

When she examined the tags of the abnormally large mice, she realized that every animal carried the same deletion in a highly conserved telomere-binding protein called Rap1. Her previous research showed that this protein forms part of a protective armor that prevents telomeres from being mistaken as broken pieces of DNA. “Repair” of such erroneously identified telomeres could cause devastating fusions and rearrangements that lead to cancer.

Dr. Sfeir’s new finding suggests that Rap1 also may be a pivotal player in regulating metabolism and warding off obesity, opening up an entirely new line of research within her lab. “This is one of the nicer things about what we do: almost every day has its surprises,” she says.



## TELOMERES

Dr. Sfeir’s magnified images (left) depict dividing mouse chromosomes in distress. Telomere-specific red and green dyes point out where each of these chromosomes, stained fluorescent blue, should normally end. The dysfunctional telomeres here, however, have caused the individual chromosomes to fuse together in long tangled strands of DNA.

# PATIENTS AND CLINICIANS

## AGNEL SFEIR, DPhil

ASSISTANT PROFESSOR  
OF CELL BIOLOGY,  
SKIRBALL INSTITUTE OF  
BIOMOLECULAR MEDICINE

2012  
JOINED NYU LANGONE

# WHEN NYU LANGONE RECRUITED DR. ELBEL, ENTHUSIASM FOR NONTRADITIONAL,

**BRIAN ELBEL, PhD, MPH**

ASSISTANT PROFESSOR OF  
POPULATION HEALTH AND  
MEDICINE

**2007**  
JOINED NYU LANGONE



# HE FOUND THE MEDICAL CENTER'S INNOVATIVE, AND IMPACTFUL RESEARCH COMPELLING. "THAT OVERALL VISION WAS REALLY ATTRACTIVE TO ME."

As Brian Elbel, PhD, MPH, has discovered, a combination of multiple policy interventions will likely be required to help consumers make better food choices and curb the nation's troubling obesity epidemic. With the encouragement and support of mentors like Marc Gourevitch, MD, MPH, chair of the Department of Population Health, Dr. Elbel has used economics and psychology to understand how those policies might be influenced by the many complex factors shaping our personal health decisions. His research, he says, is a particularly good fit for NYU Langone, which truly values innovation and supports its junior faculty. "I feel like I have been given every opportunity to succeed," he says.

Dr. Elbel's research revealed that after Philadelphia required fast-food restaurants and other eating establishments to label calories on their menus, consumers in that city were significantly more likely to see the information. His study, however, found that the policy had no effect on how often consumers visited such restaurants

or on how many calories they actually bought, suggesting that the information alone was insufficient to change behavior—especially among low-income populations.

His results corroborated findings from his previous research on the purchasing behavior of teenagers, parents, and other adults in New York's lower-income communities, while a separate study suggested that giving customers the option to downsize their fast-food portions might prove more successful. As the parent of a toddler, he says, "I definitely feel like I'm more keenly aware than the average father about what my kid is eating and what the outside influence is on her food consumption."

## AVERAGE CALORIES FOR FAST-FOOD COLAS



Dr. Brian Elbel's research shows that public policies that restrict larger soda sizes at fast-food chains can significantly cut calories, but he has also found that calorie labels alone do not motivate consumers to make that choice on their own.

Source: USDA Nutrient Data Laboratory

AN NYU SCHOOL OF MEDICINE ALUMNUS WHO COMPLETED  
A GASTROENTEROLOGY FELLOWSHIP AT THE SCHOOL,  
**DR. CHO CREDITS  
GREAT MENTORS,  
INTERESTING  
PROJECTS, AND  
“A DIVISION THAT  
BENT OVER  
BACKWARD TO  
SUPPORT ME,”**  
FOR HIS DECISION TO JOIN  
THE NYU FACULTY.

Ilseung Cho, MD, MS, first became fascinated with genetics and genomics as an undergraduate researcher, when he helped to sequence the DNA of Australian butterflies. While completing a fellowship in gastroenterology at NYU School of Medicine, he was mentored by Martin Blaser, MD, the Muriel G. and George W. Singer Professor of Translational Medicine and director of the NYU Human Microbiome Program.

The exceptional partnership, Dr. Cho says, convinced him to stay at an academic medical center where he could pair his desire to help a vulnerable and diverse patient population with his growing interest in the microbiome, the trillions of microbes that inhabit the human gut.

A decade ago, scientists knew little about the microbiome, but researchers like Dr. Cho have since forged surprising links between our internal microbial residents and obesity, cancer, asthma, and a range of gastrointestinal diseases. One of his recent studies, for example, found that altering the microbiome with low-dose antibiotics led to increased obesity in mice, specifically by enhancing production of energy sources called short chain fatty acids. His other lines of research are probing the potential interplay between the microbiome and specific diseases, such as colorectal cancer and alcoholic liver disease. Identifying the bacteria that put people at risk for a disease like cancer, he says, might allow researchers to manipulate the microbiome to keep patients healthy.

As Dr. Cho now advises students and clinicians, profound inspiration can spring from simple curiosity. “Children ask ‘Why?’ all the time,” he says. “I think the best investigators are the ones who never let that part of their childhood go.”

THE FAT PROBLEM

33.1%

72.3M

Americans age 20 or older who are overweight

35.7%

78M

Americans age 20 or older who are obese

16.9%

12M

Children and adolescents age 2 to 19 who are obese

42%

2030

Americans who will be obese by 2030\*

\*Centers for Disease Control and Prevention

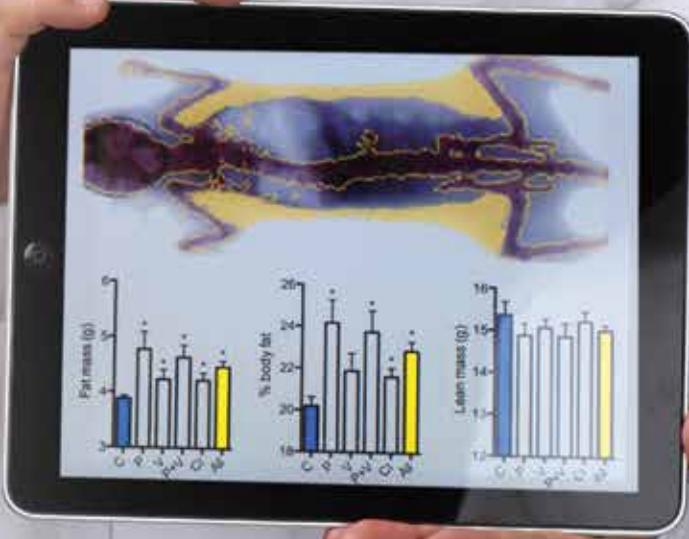


NYU Langone  
MEDICAL CENTER  
Attending Physician  
*Ilseung Cho, M.D.*  
Gastroenterology

**ILSEUNG CHO, MD ('02), MS**

ASSISTANT PROFESSOR OF  
MEDICINE

**2008**  
JOINED NYU LANGONE



Oncogenic  
Kras

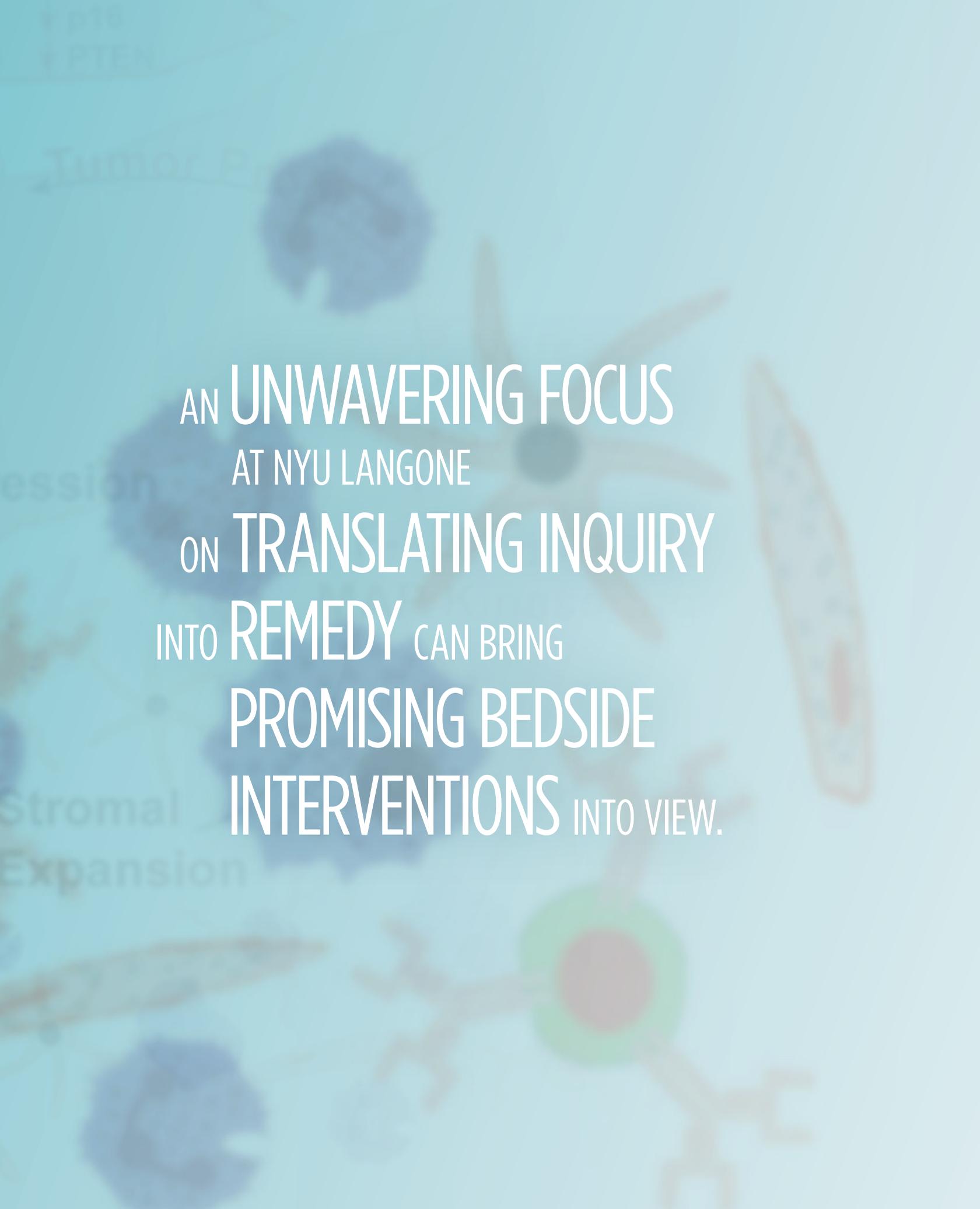
Inflammation

↑TLR7 Expr

**NEVER LOSE SIGHT OF THE BIG PICTURE**

DAMPs

**WHY**

The background features a light blue gradient with a faint, stylized diagram of a cell. The diagram includes a central nucleus with a red nucleolus, surrounded by a green cytoplasm. Various organelles and structures are depicted in shades of blue, brown, and green. Faint text labels are scattered throughout the background, including "p16", "PTEN", "Tumor P", "ession", "Stromal Expansion", and "Expansion".

AN UNWAVERING FOCUS  
AT NYU LANGONE  
ON TRANSLATING INQUIRY  
INTO REMEDY CAN BRING  
PROMISING BEDSIDE  
INTERVENTIONS INTO VIEW.

DR. MILLER, A SURGEON, CAME TO NYU LANGONE BECAUSE  
THE MEDICAL CENTER PROVIDED HIM WITH THE  
**OPPORTUNITY** TO DEVELOP HIS **SKILLS** BOTH  
AS A **CLINICIAN** AND A **CANCER RESEARCHER**.  
THE RESULT HAS BEEN A **GRATIFYING CAREER** AS A  
**PHYSICIAN-SCIENTIST**.

Few liver and pancreatic surgeons can say they are also doing the kind of research that might illuminate the mechanisms underlying cancer development. George Miller, MD, derives deep satisfaction from doing both. "In research," he says, "you have the ability to forge new pathways and use your creative and artistic side."

Much of his success, Dr. Miller says, has been due to the "tremendous" mentorship of Dafna Bar-Sagi, PhD, senior vice president and vice dean for science, and chief scientific officer, and Alan Frey, PhD, associate professor of cell biology. "They have taken me under their wings in a very selfless and generous manner and supported me in every way possible," he says. Likewise, he credits the vision and backing of the entire institution.

The result is research that lays the groundwork for better cancer treatments. Dr. Miller's investigations have shed light on how the immune microenvironment within the liver and pancreas influences the initiation of cancer, showing that inflammation can release multiple factors that encourage tumor growth. Within the liver and pancreas, his lab has found that immune cells known as dendritic cells can help sweep away cellular debris and speed the healing response to injury. Paradoxically, these cells and a class of proteins known as TLRs also seem to orchestrate the body's inflammatory response to toxins. The combination of inflammatory disease and an individual's genetic predisposition, Dr. Miller's research suggests, eventually leads to diseases like cancer. "Every so often you have moments when an experiment works and you discover something important," he says, "and those moments are euphoric."

**PANCREATIC AND LIVER CANCER**

are less prevalent than some other types of cancers, but they are also far more lethal. For all liver cancers combined, the five-year survival rate is just **15%**. For pancreatic cancer, it's only **4%**.

1 IN 204

AVERAGE LIFETIME ODDS OF  
LIVER OR BILE DUCT CANCER  
AMONG WOMEN

1 IN 85

AVERAGE LIFETIME ODDS OF  
LIVER OR BILE DUCT CANCER  
AMONG MEN

1 IN 78

AVERAGE LIFETIME ODDS OF  
PANCREATIC CANCER AMONG  
BOTH MEN AND WOMEN



2007  
JOINED NYU LANGONE

**GEORGE MILLER, MD**

ASSISTANT PROFESSOR OF  
SURGERY AND CELL BIOLOGY

“I FEEL VERY STRONG SUPPORT

**MAYUMI ITO, PhD**

ASSISTANT PROFESSOR OF  
DERMATOLOGY AND CELL BIOLOGY

**2008**  
JOINED NYU LANGONE



# FROM BOTH THE STEM CELL AND DERMATOLOGY RESEARCH COMMUNITIES HERE. THEY'VE ENABLED ME TO KEEP UP THE HIGH-QUALITY WORK.”

As a graduate student, Mayumi Ito, PhD, studied the remarkable ability of newt salamanders to regenerate lost limbs. “Why can’t humans do the same?” she wondered. By the time Dr. Ito joined NYU Langone Medical Center in 2008, her question had evolved into a sophisticated line of research that garnered strong support from leaders such as Ruth Lehmann, PhD, the Laura and Isaac Perlmutter Professor of Cell Biology. “I had the feeling that she would understand me and my research,” Dr. Ito says of their first meeting. “Whenever I talk to her, I feel very motivated to do more and achieve more.”

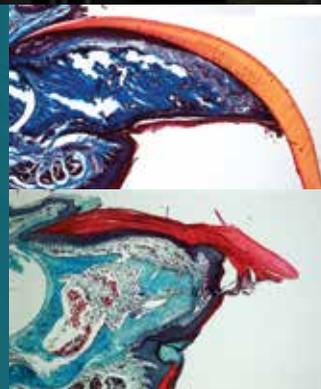
That early vote of confidence has helped Dr. Ito explain how mammalian skin, the largest organ in the body, constantly renews itself. To her amazement, she

discovered that the regeneration of skin, hair follicles, and fingernails seems to be directed by the same core mechanism. Using mice as her model, Dr. Ito sought out the “secret” within hair follicles and found self-renewing stem cells that not only help hair regrow but also help heal the surrounding skin after an injury.

As she and her colleagues reported in *Nature* this year, a similar phenomenon seems to be at work within fingernails, mediated by a crucial biochemical pathway that communicates between different populations of stem cells when the nail is present. Dr. Ito’s findings hold thrilling clinical potential. “We hope to extend this ability to limb regeneration in the future,” she says. “It’s very ambitious, but I think we can get there, little by little.”

## REGENERATION

In a recent *Nature* study, Dr. Ito and colleagues discovered stem cells that not only contribute to nail formation in mice but also send biochemical signals necessary to regenerate the underlying skin and bone after a fingertip amputation (above right). If a key signaling pathway is blocked (below right), the fingertip doesn’t regrow.



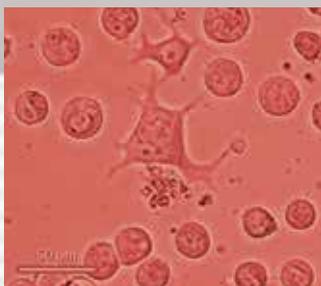
# THE COLLABORATIVE ENVIRONMENT

FOSTERED AT  
NYU LANGONE  
MEDICAL CENTER  
HAS ENABLED DR. BERGER  
TO PURSUE HIS  
TRANSLATIONAL  
RESEARCH  
TOWARD THERAPEUTICS  
BASED ON THE  
GENETIC MAKEUP  
OF EACH HEART DISEASE PATIENT.

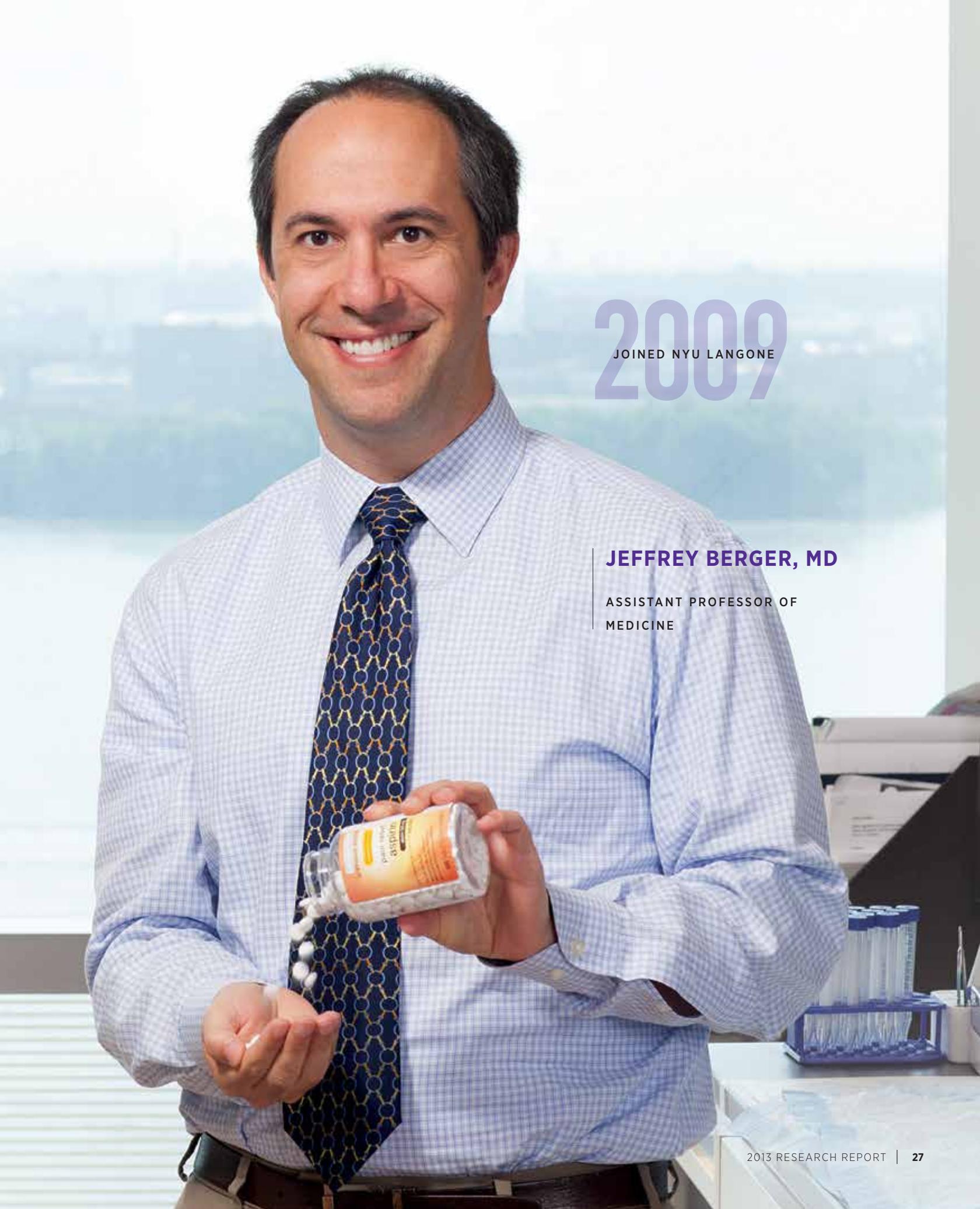
Determining whether a vital component of blood clots could help predict a patient's risk of a clot-induced heart attack or stroke will require research spanning the spectrum from bench science to clinical trials. Jeffrey Berger, MD, says his comprehensive work toward that goal has benefited enormously from NYU Langone Medical Center's scientific infrastructure and forward-looking emphasis on mentorship and talent development. "I wanted to join a place that was on an upward trajectory and really thinking about the future," says Dr. Berger, who was recruited in 2009.

Platelet cells are this physician-scientist's primary research focus. The cells play a major role in forming clots and can heighten the risk of bleeding when deficient. So far, Dr. Berger's research suggests that platelet activity can be measured and is inherently tied to an individual's genetic makeup. His data also suggest that patients can be grouped by their relative level of platelet function. Eventually, he says, blood tests might help doctors predict the risk of repeated clotting and choose which drugs to prescribe or forgo. Such personalized therapeutics could be particularly critical during surgery, when patients are already at higher risk for bleeding, blood clots, and heart attacks.

His main line of research recently took a new turn when he and an expert on the human immunodeficiency virus (HIV) found that platelet activity increases in patients treated for HIV and that aspirin inhibits this heightened activity, potentially reducing their risk of heart attacks. Unexpectedly, aspirin also seems to boost the patients' immune systems.



A new NIH-sponsored clinical trial led by Dr. Berger and his collaborators is investigating the potential of aspirin to dampen the excess activity of platelet cells and favorably affect immune activity in HIV patients, thereby lowering the danger of clotting and heart attacks. "It's exciting and sometimes quite humbling to embark on trying to answer some real fundamental questions that may impact how patients will be treated," he says.



2009  
JOINED NYU LANGONE

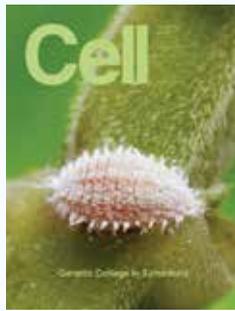
**JEFFREY BERGER, MD**

ASSISTANT PROFESSOR OF  
MEDICINE





NYU LANGONE'S  
FERTILE ENVIRONMENT  
CAN FOSTER THE BLOSSOMING  
OF NEW LEADERS  
WHO STRENGTHEN  
THE ENTIRE INSTITUTION.



In a 2013 *Cell* paper, Dr. Aifantis and colleagues found that an altered version of the Fbxw7 protein, a common feature of the childhood leukemia T-ALL, has no effect on normal blood stem cells. The abnormal protein can fuel the growth of cancerous cells, however, because it has lost its ability to degrade a separate cancer-boosting protein.

Iannis Aifantis, PhD, was initially drawn to NYU Langone Medical Center by its strength in immunology and the ready availability of other scientists. “Something that has helped me a lot is the open access to experienced investigators,” he says. Now, as an accomplished researcher himself and the newly appointed chair of the Department of Pathology, he hopes to play a leading role in fostering the next generation of researchers.

Dr. Aifantis says his inspiration comes from the push to answer questions and pose new ones, such as how normal blood cells can be

transformed into malignant variants. By studying mutations isolated from leukemia patients, he has implicated multiple proteins in the process and opened up entirely new lines of inquiry within his lab.

In working out the molecular mechanism of a childhood cancer known as T-cell acute lymphoblastic leukemia (T-ALL), for example, Dr. Aifantis noticed that blood samples from about 25% of patients harbored a mutated version of a protein called Fbxw7. When the protein is altered by this mutation, he found, a prematurely released clamp allows stem cells to grow and divide, and in those stem cells with leukemia-causing mutations, cancer blooms.

A related cancer, chronic myeloid leukemia, can be treated with chemotherapy but often recurs once patients stop taking medication. In mice, Dr. Aifantis showed that deleting the same Fbxw7 protein forces leukemia-causing stem cells out into the open, where drugs can target them.

“OPEN ACCESS TO  
**EXPERIENCED  
INVESTIGATORS”**  
AT NYU LANGONE  
HELPED DR. AIFANTIS  
PUSH THE BOUNDARIES OF CANCER  
**RESEARCH** AND PURSUE GROUNDBREAKING DISCOVERIES.

**IANNIS AIFANTIS, PHD**

PROFESSOR OF PATHOLOGY AND  
CHAIR OF THE DEPARTMENT OF  
PATHOLOGY

2006  
JOINED NYU LANGONE



AT NYU LANGONE, DR. MOORE FOUND AN ENVIRONMENT THAT GAVE HER  
**THE FREEDOM TO TAKE  
RISKS AND MOVE IN NEW  
DIRECTIONS, RESULTING IN  
TRANSFORMATIVE RESEARCH.**

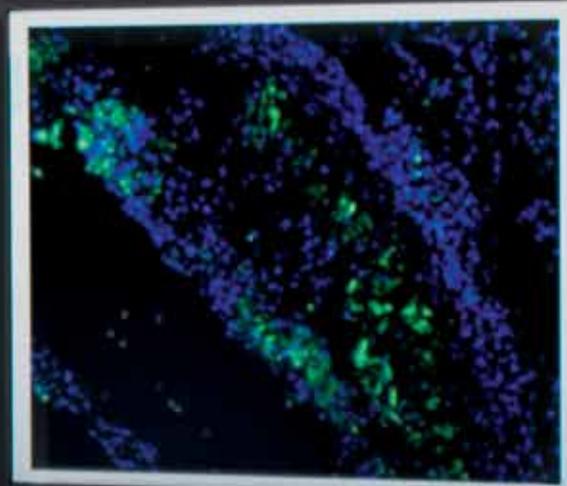
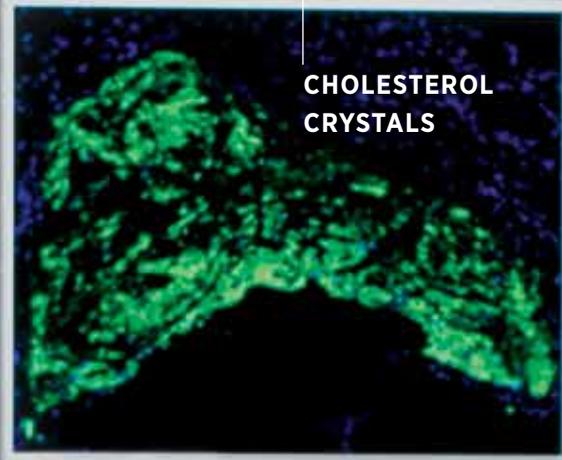


**KATHRYN MOORE, PHD**

ASSOCIATE PROFESSOR OF  
MEDICINE AND CELL BIOLOGY

**2010**  
JOINED NYU LANGONE

Cholesterol crystals (dyed green in image at left) that accumulate in fatty plaques within arteries can cause chronic inflammation and promote atherosclerosis. In a 2013 paper in *Nature Immunology*, Dr. Moore and colleagues identified a protein called CD36 as a key regulator of this inflammatory response. Knocking out its function in mice led to far fewer cholesterol crystals (right).



When she joined NYU Langone Medical Center in 2010, Kathryn Moore, PhD, recalls being particularly impressed by the equal opportunities offered to women at the Medical Center. Since then, she's made the most of an environment that has given her the freedom to take risks and move in new directions with her research focusing on why inflammation persists in cardiovascular disease, diabetes, and Alzheimer's.

Multiple high-profile publications from her laboratory have identified key molecules driving the chronic immune reaction. Among them, Dr. Moore and her team discovered that a protein called netrin-1, normally associated with guiding nerve cells during development, can unexpectedly promote inflammation as well as atherosclerosis. Motivated by that finding, she is now looking at how the same molecule may influence inflammation in type 2 diabetes.

A second line of research showed that a small stretch of RNA called MiR-33 can regulate levels of high-density lipoproteins, or HDL, so-called "good cholesterol." The discoveries are exhilarating, but it's the prospect of helping patients that truly keeps Dr. Moore motivated. "It gives me inspiration that my work is meaningful," she says.

Dr. Moore and her lab persevered after flooding from Hurricane Sandy in 2012 wiped out years of research. "We really banded together as a group and came up with a plan of how we were going to rebuild," she says. "It was a big challenge, but it also was an incredible team-building experience in which everyone in the lab was very invested in making this work and achieving success again."

FOR A FLOURISHING CAREER, DR. NUDLER CITES THE NECESSITY OF SEIZING NEW OPPORTUNITIES AND SECURING INSTITUTIONAL SUPPORT.

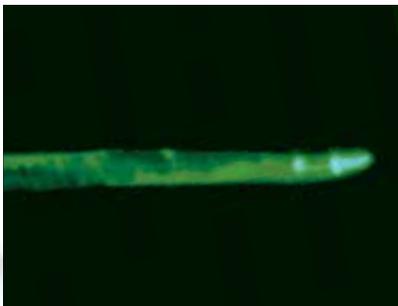
**“NYU LANGONE HAS A GREAT SCIENTIFIC ATMOSPHERE AND A VERY COLLEGIAL ENVIRONMENT. EVERYTHING I NEEDED, I GOT IT HERE.”**

Throughout his career, Evgeny Nudler, PhD, has maintained an ambitious research philosophy: “By taking risks and venturing into new areas,” he says, “we can discover something significant, something that could change the way people think about a certain biomedical field.” Since his arrival at NYU Langone Medical Center in 1997, Dr. Nudler says he has felt free to make bold decisions and venture into several distinct areas of research, and with the Medical Center’s strong backing, he has found success in each one.

Among his many findings, he has discovered how the machinery that copies DNA into RNA moves back and forth like a ratchet, a process that plays a major role in regulating genes and stabilizing the genome. His group also identified a class of RNA molecules called riboswitches, which directly sense small molecules like vitamins and amino acids and regulate numerous genes in bacteria and other organisms.

In another major discovery, his lab found that bacteria generate the gases nitric oxide and hydrogen sulfide to defend themselves from antibiotics, stress, and immune system attacks.

Dr. Nudler says most of his major achievements have come because he and his lab have kept an open mind about unexpected experimental results and doggedly followed up on them—a lesson he has sought to pass on to the many young researchers he now mentors. “If we only did the experiments we predicted to work,” he says, “we would never discover anything.”



In a 2013 paper published in the journal *Cell*, Dr. Nudler and colleagues traced dramatic differences in roundworm longevity to the ability of gut bacteria to make the important chemical messenger nitric oxide (glowing green in the worm at left). The study concludes that nitric oxide sends a signal to activate multiple genes in the worm that protect it from stress and prolong its lifespan.

A man with dark hair and glasses, wearing a blue button-down shirt, is seated at a desk in a laboratory. He is holding a black pen in his right hand and looking towards the camera. On the desk in front of him is a large book or document with several pages visible. The background is filled with laboratory equipment, including shelves with various bottles and containers, and a computer monitor.

1997  
JOINED NYU LANGONE

**EVGENY NUDLER, PHD**

JULIE WILSON ANDERSON  
PROFESSOR OF BIOCHEMISTRY,  
HOWARD HUGHES MEDICAL  
INSTITUTE INVESTIGATOR

## NEW FACULTY

The recruitment of new faculty is crucial to the success of our research mission. Our chairs and institute directors derive enormous satisfaction in selecting both renowned faculty and those early-stage investigators who are likely to break new ground in their fields and impact the laboratory and the clinic. We are delighted to welcome to our Medical Center the distinguished group of faculty recruited in calendar year 2012. Each brings a strong record of individual accomplishment, and a fierce determination to solve complex research problems.



**CAROLINE S. BLAUM, MD**

*Diane and Arthur Belfer Professor of Geriatric Medicine;  
Director of the Division of Geriatrics, Department of Medicine*

Dr. Blaum has been advancing geriatrics and contributed to its growth as an academic discipline. She has an active research program in epidemiology, translational, and interventional research. Her research interests concern models of care, complex patients, frailty, and diabetes in older adults. She has designed and evaluated care delivery models, including those coordinating support across the care continuum, transitions of care, delivery system redesign, and models of care for patients with multiple chronic conditions.

**EDUCATION** BA in anthropology, MS in public health, and MD from the University of Michigan **RESIDENCY** Internal medicine at New York-Presbyterian/Columbia University Medical Center and Detroit Receiving Hospital **FELLOWSHIP** Geriatrics at the University of Michigan.



**FERNANDO E. BOADA, PhD**

*Professor of Radiology*

Dr. Boada’s research interests focus on the use of magnetic resonance imaging (MRI) physics and image reconstruction for understanding brain disorders involving disruption in brain ion homeostasis (e.g., stroke, brain tumors, and bipolar disease) and long-range neuronal architecture through noninvasive fiber tracking.

**EDUCATION** BS in physics from Universidad Simón Bolívar in Caracas, Venezuela; PhD in physics from Case Western Reserve University in Cleveland **FELLOWSHIP** Postdoctoral research at Harvard University Medical School and Massachusetts General Hospital in Boston **HONORS** College of Fellows at the American Institute for Medical and Biological Engineering (AIMBE); fellow of the International Society for Magnetic Resonance in Medicine **INTERESTING FACT** Dr. Boada enjoys diving in remote places, including icebergs, wrecks, and walls in the waters of Antarctica and the WWII wrecks of Chuuk Lagoon in Micronesia.



**GYÖRGY BUZSÁKI, MD, PhD**

*Biggs Professor of Neuroscience and Physiology*

Dr. Buzsáki is a systems neuroscientist interested in how information is processed and stored in the brain, and the contribution of sleep to memory and cognition. Most of his laboratory’s work is carried out in the hippocampus and associated structures. They are particularly interested in how neuronal oscillations organize the syntax of neuronal activity.

**EDUCATION** MD from the University of Pécs in Hungary; PhD in neuroscience from the Hungarian Academy of Sciences in Budapest **FELLOWSHIPS** Postdoctoral research in neuroscience at the University of Texas at San Antonio and the University of Western Ontario in London, Canada **HONORS** The Brain Prize from Grethe Lundbeck’s European Brain Research Foundation; the Provost’s Distinguished Research Award from Rutgers University; elected fellow of the American Association for the Advancement of Science; Institute for Scientific Information’s “Most Cited 250 in Neuroscience”; Krieg Cortical Discoverer Award from the Cajal Club of the American Association of Anatomists; honorary foreign member of the Hungarian Academy of Sciences **INTERESTING FACT** Dr. Buzsáki is a fan of contemporary architecture. He is also interested in the scaling of systems (living and nonliving structures).



**ARTHUR L. CAPLAN, PhD**

*Drs. William F. and Virginia Connolly Mitty Professor  
of Bioethics; Director of the Division of Medical Ethics,  
Department of Population Health*

Dr. Caplan’s research focuses on ethical issues in end of life and palliative care, organ and tissue transplantation, human subjects research in the U.S. and globally, reproductive technologies, vaccines, and the rationing and the allocation of medical resources.

**EDUCATION** BA in philosophy from Brandeis University in Massachusetts; PhD in philosophy and history from Columbia University **HONORS** John P. McGovern Medal from the American Medical Writers Association; Franklin Founder Award from the city of Philadelphia; Patricia Price Browne Prize in Biomedical Ethics; “Person of the Year” from *USA Today*; “The 10 Most Influential People in Science” by *Discover Magazine* **INTERESTING FACT** Dr. Caplan is a great admirer of Benjamin Franklin and is a proud recipient of the Franklin Founder Award.

## NEW FACULTY



**CHRISTOPHER M. COLLINS, PhD**

*Professor of Radiology*

During magnetic resonance imaging (MRI), there are multiple interactions with applied magnetic fields. Some allow us to create images, but others distort the images or cause physiological effects. Dr. Collins works to maximum image integrity and patient safety considering field/tissue interactions in MRI.

**EDUCATION** BS in engineering science from Pennsylvania State University; PhD in bioengineering from the University of Pennsylvania **HONORS** Senior member of the Institute of Electrical and Electronics Engineers (IEEE)

**INTERESTING FACT** Dr. Collins was born on the same day that Disney World opened to the public.



**KEVIN R. CROMAR, PhD**

*Assistant Professor of Environmental Medicine*

Dr. Cromar's research focuses on the health effects of air pollution. He is working to determine which types of pollution are primarily responsible for adverse respiratory and cardiovascular health effects while also identifying which individuals are most susceptible to this environmental risk factor.

**EDUCATION** BS in neuroscience from Brigham Young University in Utah; PhD in environmental health science from New York University

**INTERESTING FACT** Dr. Cromar lived abroad for two years in Taiwan, Republic of China (ROC), where he learned to speak Mandarin Chinese.



**YU-SHIN DING, PhD**

*Professor of Psychiatry and Radiology*

Dr. Ding's research primarily focuses on the development and application of novel positron emission tomography (PET) ligands for translational research, from preclinical studies in animals to clinical investigation in humans. She analyzes the biochemistry and mechanisms of drug action in living humans using PET, where she bridges the fields of chemistry, biology and medicine.

**EDUCATION** BS in chemistry from National Taiwan University; PhD in medicinal chemistry from Stony Brook University **HONORS** Full member of the American College of Neuropsychopharmacology; recognized "Women of Excellence" by the town of Brookhaven, NY; member of the Scientific Program Review Committee for the Society of Nuclear Medicine and Molecular Imaging; Science & Technology Engineering Award for Outstanding Achievement in Life Science from Brookhaven National Laboratory.



**MARÍA GLORIA DOMÍNGUEZ-BELLO, PhD**

*Associate Professor of Medicine*

The microbiota, the collective microbial component of humans and animals, has coevolved with its hosts and provides important functions. Modern lifestyles are affecting the microbiota in unprecedented ways. Dr. Domínguez-Bello's laboratory is studying evolutionary and developmental aspects of the microbiota to help determine how babies assemble their microbiota, the impacts of modern practices, and their consequences.

**EDUCATION** BS in biology from Universidad Simón Bolívar in Caracas, Venezuela; MS in nutrition and PhD in microbiology from the University of Aberdeen in Scotland **FELLOWSHIP** Marie Curie Postdoctoral Research at the University of Edinburgh in Scotland **HONORS** Fellow of the Infectious Diseases Society of America and the American Academy of Microbiology; ambassador of the American Society for Microbiology for Central America and the Caribbean **INTERESTING FACT** Dr. Domínguez-Bello is a certified scuba diver.



**HOWARD ALAN FINE, MD**

*Anne Murnick Cogan and David H. Cogan Professor of Oncology; Director, Division of Hematology & Medical Oncology; Director, NYU Brain Tumor Center; Deputy Director, NYU Cancer Institute*

Dr. Fine studies the biology and developmental therapeutics of gliomas. By characterizing human gliomas at the molecular and genetic levels, his group identifies and validates new molecular targets and patient-specific subgroups for therapeutic drug discovery. His group also explores the translational/therapeutic potential of stem cell biology in gliomas. Their ultimate goal is the preclinical and clinical development of novel targeted agents for the treatment of gliomas.

**EDUCATION** BA in biology from the University of Pennsylvania; MD from Mount Sinai School of Medicine **RESIDENCY** Internal medicine at the Hospital of the University of Pennsylvania **FELLOWSHIP** Fellowship in medical oncology at the Dana-Farber Cancer Institute / Brigham and Women's Hospital / Harvard Medical School **HONORS** Dana-Farber Harvard Cancer Center, Clinical Investigator Award; Emil Frei III Dana-Farber Cancer Institute Clinical Investigator Award; NCI Director's Gold Star Award; the National Service to America Award (awarded to the REMBRANDT team); American Cancer Society Physician Scientist Career Development Award; NIH Physician Scientist Award; National Brain Tumor Society Research Award; Community Leadership award for service, National Brain Tumor Society **INTERESTING FACT** Dr. Fine is an avid tennis player.



**DONALD C. GOFF, MD**

*Marvin Stern Professor of Psychiatry*

Dr. Goff's research integrates pharmacology, genetics, neuroimaging, and psychosocial approaches to develop new treatments for schizophrenia. He has pioneered research in folate and glutamate-related drugs for this disease. He is currently studying early intervention in schizophrenia with an emphasis on neuroplasticity and the combination of psychotherapy with D-cycloserine, which improves learning and memory.

**EDUCATION** BS in humanities from the University of California, Berkeley; MD from the University of California, Los Angeles **RESIDENCY** Psychiatry at Massachusetts General Hospital in Boston **FELLOWSHIP** Psychopharmacology research at Tufts-New England Medical Center in Boston **HONORS** Kempf Fund Award for Research Development in Psychobiological Psychiatry (mentor); the Wayne Fenton, MD, Award for Exceptional Clinical Care; the Stanley Dean Award for Research in Schizophrenia from the American College of Psychiatrists; American Psychiatric Association Research Award; member of the American College of Neuropsychopharmacology **INTERESTING FACT** Dr. Goff worked on commercial fishing boats in Alaska prior to entering medical school.



**KIMBERLY E. HOAGWOOD, PhD**

*Cathy and Stephen Graham Professor of Child and Adolescent Psychiatry*

Dr. Hoagwood's research focuses on the implementation of evidence-based practices for children and families in community systems, effectiveness of family support services, and the healthcare quality and integration of behavioral health, primary care, and schools. Her work is driven by a commitment to improving the health of children and families in the public sector, specifically to advance services for children with mental health problems and their families.

**EDUCATION** BA in literature from American University in Washington, D.C.; MA in developmental and clinical psychology from Catholic University in Washington, D.C.; PhD in school psychology from the University of Maryland **RESIDENCY** Pediatrics at the Regional Institute for Children and Adolescents in Baltimore and Georgetown University Hospital **HONORS** Association for Behavioral and Cognitive Therapies (ABCT) Dissemination and Implementation Science Special Interest Group Achievement Award; member of the American Psychological Association and International Society for Research in Child and Adolescent Psychopathology **INTERESTING FACT** Dr. Hoagwood is working towards her pilot's license. She also owns and rides four rescue horses.



**SARAH HORWITZ, PhD**

*Professor of Child and Adolescent Psychiatry*

Dr. Horwitz's research interests focus on the interplay between formal care giving systems (e.g., medical, mental health, and child welfare) and the vulnerable young populations that they serve. She has developed methods, models, and intervention strategies to improve the implementation of evidence-based practices in usual care settings.

**EDUCATION** AB in psychology from Albright College in Pennsylvania; MA in psychology from Temple University in Philadelphia; PhD in epidemiology and health services from Yale University **FELLOWSHIP** Postdoctoral research in mental health services and systems research at Yale University **HONORS** Member of the Academic Pediatric Association and the American Pediatric Society **INTERESTING FACT** Dr. Horwitz enjoys long walks with her dog, a Bouvier des Flandres.



**GUILLAUME N. MADELIN, PhD**

*Assistant Professor of Radiology*

Dr. Madelin's research focuses on developing new magnetic resonance imaging (MRI) techniques based on the properties of sodium ions for assessing biochemical information of biological tissues in vivo. The goal is to implement clinically these quantitative and noninvasive methods for the diagnosis and prognosis of diverse diseases, such as osteoarthritis, Alzheimer's disease, or cancer.

**EDUCATION** BS and MSc in physics from the University of Angers in France; MSc in signals and images in biology and medicine from the University of Rennes in France; PhD in biomedical imaging from the University of Bordeaux in France **INTERESTING FACT** Dr. Madelin likes to play the ukulele.

## | NEW FACULTY



### **ERUM NADEEM, PhD**

*Assistant Professor of Child and Adolescent Psychiatry*

Dr. Nadeem studies the quality of mental healthcare, ethnic disparities, access to care, and the implementation of evidence-based treatments in schools and community settings for children and adolescents. She currently is utilizing a community-partnered research approach to improve evidence-based trauma care in schools and is investigating the use of quality improvement collaboratives to advance care in community mental health settings.

**EDUCATION** BA in psychology from the University of Virginia; PhD in clinical psychology from University of California, Los Angeles **FELLOWSHIP** Postdoctoral fellowship in psychiatry and biobehavioral sciences at University of California, Los Angeles **HONORS** Member of the Association for Behavioral and Cognitive Therapies (ABCT) and AcademyHealth **INTERESTING FACT** Dr. Nadeem also holds a degree in fine arts.



### **DMITRY RINBERG, PhD**

*Associate Professor of Physiology & Neuroscience*

Animals extract information from an external world to produce behavior. What are the principles of sensory information processing? Using modern genetic tools to monitor and control activity of individual neurons in mouse olfactory system, behavioral experiments, and in vivo electrophysiology, Dr. Rinberg's laboratory is trying to understand how odor information is represented and processed in the brain.

**EDUCATION** BSc and MSc in physics from National University of Science and Technology in Russia; PhD in physics from Weizmann Institute of Science in Israel **HONORS** Grass Foundation Fellowship.



### **SU-CHIN SERENE OLIN, PhD**

*Associate Professor of Child and Adolescent Psychiatry*

Dr. Olin's research focuses on improving the efficiency of state rollouts of quality improvements for children and families. She manages several studies, including research on improving family-to-family support in children's services and another on the adoption of evidence-based practices across New York State's 350 child-serving clinics.

**EDUCATION** BA in biology and psychology from Grinnell College in Iowa; PhD in clinical psychology from the University of California, Los Angeles **FELLOWSHIP** Postdoctoral research in child clinical psychology at Harbor-UCLA Medical Center **HONORS** National Institute of Mental Health (NIMH) Director's Award for Significant Achievement **INTERESTING FACT** Dr. Olin enjoys traveling with her children.



### **AGNEL SFEIR, PhD**

*Assistant Professor of Cell Biology, Skirball Institute*

Telomeres, the natural ends of linear chromosomes, are essential to ensure genomic stability and promote cellular survival. The goal of Dr. Sfeir's laboratory is to understand how telomere dynamics affect stem cell function and leads to tumorigenesis by using the mouse as a model organism.

**EDUCATION** BSc in biology from American University of Beirut in Lebanon; PhD in cell biology from University of Texas Southwestern Medical Center at Dallas **FELLOWSHIP** Postdoctoral research in Titia de Lange's laboratory in telomere biology at Rockefeller University **HONORS** Human Frontier Science Program Young Investigator Award; Breast Cancer Alliance Young Investigator Award; Damon Runyon-Rachleff Innovation Award for Cancer Research; postdoctoral category finalist, Blavatnik Award for Young Scientists from the New York Academy of Sciences; Nominata Award from University of Texas Southwestern Medical Center **INTERESTING FACT** Dr. Sfeir enjoys listening to music.



**ARIEH Y. SHALEV, MD**

*Professor of Psychiatry*

Dr. Shalev’s research is focused on understanding psychological trauma and its worst outcome: post-traumatic stress disorder (PTSD). His work progressively uncovers the causes of PTSD and its early development, explores the underlying psychological and neurobiological mechanisms, and tests new ways to prevent the disorder.

**EDUCATION** MD from University of Montpellier in France **HONORS** Award for meritorious service from Uniformed Services University of the Health Sciences in Maryland; Lifetime Achievement Award from the International Society for Traumatic Stress Studies (ISTSS); Robert S. Laufer, PhD, Memorial Award for Outstanding Scientific Achievement from the ISTSS; chairperson of Israel Society for Biological Psychiatry and the Israeli Association for Psychotherapy **INTERESTING FACT** Dr. Shalev served as chair of the Department of Psychiatry at Hadassah University Hospital in Jerusalem before joining NYU Langone Medical Center.



**R. THEODORE SMITH, MD, PhD**

*Director of Ophthalmology Research and of the Retinal Image Analysis Laboratory; Professor of Ophthalmology*

Dr. Smith specializes in novel instrumentation for imaging the retina (the back of the eye) and in retinal disease genetics, especially age-related macular degeneration. His research goal is to better understand retinal disease processes, leading to improved diagnosis and treatment.

**EDUCATION** BA in mathematics from Rice University in Houston; MD from Albert Einstein College of Medicine; PhD in mathematics from the University of Warwick in United Kingdom **RESIDENCY** Ophthalmology at New York Presbyterian Hospital **FELLOWSHIP** Retina and vitreous at the Illinois Eye and Ear Infirmary in Chicago **HONORS** Castle Connolly’s America’s Top Doctors; American Academy of Ophthalmology’s (AAO) Best Presentation Award; Marshall Scholar at University of Warwick; National Science Foundation graduate research fellow; member of the American Academy of Ophthalmology, the Association for Research in Vision and Ophthalmology, the New York State Ophthalmological Society, and the Macula Society **INTERESTING FACT** Dr. Smith is an accomplished classical pianist and may have pursued a different career path had it not been for a traumatic experience with stage fright.



**MATTHIAS STADTFELD, PhD**

*Assistant Professor of Cell Biology, Skirball Institute*

Pluripotent stem cells have the unique ability to form all adult tissues and can be derived by enforced expression of defined transcription factors in differentiated cells. This process is referred to as reprogramming. Research in Dr. Stadtfeld’s laboratory uses reprogramming technology to understand basic molecular mechanisms governing mammalian stem cell fate.

**EDUCATION** Baccalaureate in general education from Gymnasium Oesede in Germany; PhD in developmental biology from Albert Einstein College of Medicine **FELLOWSHIPS** Predoctoral from the Boehringer Ingelheim Foundation; postdoctoral research from the Ernst Schering Foundation **INTERESTING FACT** Dr. Stadtfeld initially anticipated staying in the U.S. for only three months as a summer student, but that turned into 14 years and counting.



**NICHOLAS STAVROPOULOS, PhD**

*Assistant Professor of Physiology and Neuroscience*

Dr. Stavropoulos’ research focuses on the genes, molecular pathways, and brain circuits that govern sleep. By studying the mechanisms that control sleep and underlie its restorative functions, his laboratory seeks to understand one of our most fundamental behaviors and to contribute to the diagnosis and treatment of sleep disorders.

**EDUCATION** AB in biochemical sciences and PhD in genetics from Harvard University **FELLOWSHIP** Postdoctoral research in genetics and neurobiology at Rockefeller University **HONORS** Blavatnik Award for Young Scientists from New York Academy of Sciences **INTERESTING FACT** Dr. Stavropoulos was born at New York University Medical Center.

## **PUBLISHED RESEARCH**

Publishing in the peer-reviewed literature is essential for the advancement of science and medicine, and it's the lifeblood of academic biomedical researchers. At NYU Langone Medical Center, we are proud of the publishing track record of our faculty. Last year, 4,580 original papers, commentaries, reviews, and other material by our researchers appeared in the science and medical literature. In the following pages we feature a partial list of selected papers by our faculty published in calendar year 2012.

## METHODOLOGY NOTE

The papers here were chosen because they are already accruing citations faster than other 2012 papers or were published in journals that had impact factors of at least 10. The names of faculty and research staff affiliated with the NYU School of Medicine appear in blue. The list only includes articles that describe original research. Reviews, books, essays, commentaries, and editorials (and other opinion pieces) were not listed due to space constraints.

Abdel-Wahab O, Adli M, LaFave LM, GAO J, Hricik T, Shih AH, Pandey S, Patel JP, Chung YR, Koche R, Perna F, Zhao XY, Taylor JE, Park CY, Carroll M, Melnick A, Nimer SD, Jaffe JD, AIFANTIS I, Bernstein BE, Levine RL. ASXL1 mutations promote myeloid transformation through loss of PRC2-mediated gene repression. *Cancer Cell* 22 (2012): 180-193.

Aghajanian C, BLANK SV, Goff BA, Judson PL, Teneriello MG, Husain A, Sovak MA, Yi J, Nycum LR. OCEANS: a randomized, double-blind, placebo-controlled phase III trial of chemotherapy with or without bevacizumab in patients with platinum-sensitive recurrent epithelial ovarian, primary peritoneal, or fallopian tube cancer. *Journal of Clinical Oncology* 30 (2012): 2039-2045.

Agnelli L, Mereu E, Pellegrino E, Limongi T, Kwee I, Bergaggio E, Ponzoni M, Zamò A, Iqbal J, Piccaluga PP, Neri A, Chan WC, Pileri S, Bertoni F, INGHIRAMI G, PIVA R. Identification of a 3-gene model as a powerful diagnostic tool for the recognition of ALK-negative anaplastic large-cell lymphoma. *Blood* 120 (2012): 1274-1281.

Baldauf HM, Pan X, Erikson E, Schmidt S, Daddacha W, Burggraf M, Schenkova K, Ambiel I, Wabnitz G, Gramberg T, Panitz S, Flory E, LANDAU NR, Sertel S, Rutsch F, Lasitschka F, Kim B, König R, Fackler OT, Keppler OT. SAMHD1 restricts HIV-1 infection in resting CD4<sup>+</sup> T cells. *Nature Medicine* 18 (2012): 1682-1689.

BANDARANAYAKE RM, Ungureanu D, Shan Y, Shaw DE, Silvennoinen O, HUBBARD SR. Crystal structures of the JAK2 pseudokinase domain and the pathogenic mutant V617F. *Nature Structural & Molecular Biology* 19 (2012): 754-759.

BANGALORE S, Kumar S, FUSARO M, AMOROSO N, ATTUBATO MJ, FEIT F, Bhatt DL, SLATER J. Short- and long-term outcomes with drug-eluting and bare-metal coronary stents: a mixed-treatment comparison analysis of 117 762 patient-years of follow-up from randomized trials. *Circulation* 125 (2012): 2873-2891.

BANGALORE S, Kumar S, FUSARO M, AMOROSO N, Kirtane AJ, Byrne RA, Williams DO, SLATER J, Cutlip DE, FEIT F. Outcomes with various drug eluting or bare metal stents in patients with diabetes mellitus: mixed treatment comparison analysis of 22 844 patient years of follow-up from randomized trials. *British Medical Journal* 345 (2012): e5170-e5170.

BANGALORE S, Steg G, Deedwania P, Crowley K, Eagle KA, Goto S, Ohman EM, Cannon CP, Smith SC, Zeymer U, Hoffman EB, Messerli FH, Bhatt DL.  $\beta$ -blocker use and clinical outcomes in stable outpatients with and without coronary artery disease. *JAMA* 308 (2012): 1340-1349.

Basel-Vanagaite L, Zevit N, Zahav AH, GUO L, PARATHATH S, Pasmanik-Chor M, McIntyre AD, Wang J, Albin-Kaplanski A, Hartman C, Marom D, Zeharia A, Badir A, Shoerman O, Simon AJ, Rechavi G, Shohat M, Hegele RA, FISHER EA, Shamir R. Transient infantile hypertriglyceridemia, fatty liver, and hepatic fibrosis caused by mutated *GPD1*, encoding glycerol-3-phosphate dehydrogenase 1. *American Journal of Human Genetics* 90 (2012): 49-60.

BECK DB, Burton A, ODA H, Ziegler-Birling C, Torres-Padilla ME, REINBERG D. The role of PR-Set7 in replication licensing depends on Suv4-20h. *Genes & Development* 26 (2012): 2580-2589.

BERÉNYI A, Belluscio M, Mao D, BUZSAKI G. Closed-loop control of epilepsy by transcranial electrical stimulation. *Science* 337 (2012): 735-737.

BERGER JS, Hiatt WR. Medical therapy in peripheral artery disease. *Circulation* 126 (2012): 491-500.

BHATLA T, WANG J, MORRISON DJ, RAETZ EA, Burke MJ, Brown P, CARROLL WL. Epigenetic reprogramming reverses the relapse-specific gene expression signature and restores chemosensitivity in childhood B-lymphoblastic leukemia. *Blood* 119 (2012): 5201-5210.

Bianco IH, MA LH, Schoppik D, Robson DN, Orger MB, BECK JC, Li JM, Schier AF, Engert F, BAKER R. The tangential nucleus controls a gravito-inertial vestibulo-ocular reflex. *Current Biology* 22 (2012): 1285-1295.

Billiard F, LOBRY C, Darrasse-Jéze G, Waite J, Liu X, Mouquet H, DaNave A, Tait M, Idoyaga J, Leboeuf M, Kyratsous CA, Burton J, Kalter J, Klinakis A, Zhang W, Thurston G, Merad M, Steinman RM, Murphy AJ, Yancopoulos GD, AIFANTIS I, Skokos D. Dll4-Notch signaling in Flt3-independent dendritic cell development and autoimmunity in mice. *Journal of Experimental Medicine* 209 (2012): 1011-1028.

BLOMGRAN R, DESVIGNES L, Briken V, ERNST JD. *Mycobacterium tuberculosis* inhibits neutrophil apoptosis, leading to delayed activation of naive CD4 T cells. *Cell Host & Microbe* 11 (2012): 81-90.

BLUM R, VETHANTHAM V, BOWMAN C, Rudnicki M, DYNLACHT BD. Genome-wide identification of enhancers in skeletal muscle: the role of MyoD1. *Genes & Development* 26 (2012): 2763-2779.

BONASIO R, Li Q, Lian J, Mutri NS, Jin L, Zhao H, Zhang P, Wen P, Xiang H, Ding Y, Jin Z, SHEN SS, Wang Z, Wang W, Wang J, Berger SL, Liebig J, Zhang GJ, REINBERG D. Genome-wide and caste-specific DNA methylomes of the ants *Camponotus floridanus* and *Harpegnathos saltator*. *Current Biology* 22 (2012): 1755-1764.

Bouckaert R, Lemey P, Dunn M, Greenhill SJ, **ALEKSEYENKO AV**, Drummond AJ, Gray RD, Suchard MA, Atkinson QD. Mapping the origins and expansion of the Indo-European language family. *Science* 337 (2012): 957-960.

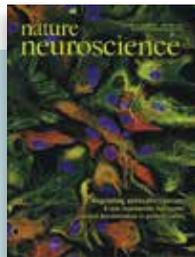
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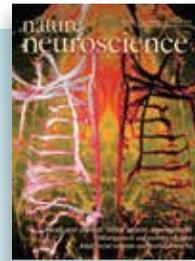
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In a study featured on the cover of the journal, NYU School of Medicine scientists identified the genetic signature of a group of neurons that govern the muscle movements necessary for breathing. By better understanding these nerve cells, collectively called the phrenic motor column, clinicians might be able to safeguard them in patients with spinal injuries or diseases such as amyotrophic lateral sclerosis that destroy motor neurons.



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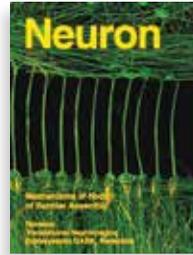
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NYU School of Medicine scientists discovered how nodes of Ranvier form. The nodes, periodic gaps between insulating sheaths that cover nerves, are essential for proper conduction of electrical impulses. The study was highlighted on the cover of the journal *Neuron*, and it shows that nodes form sequentially from two distinct protein sources. The work may clarify how nodes are damaged and repaired in diseases such as multiple sclerosis.

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# FUNDING

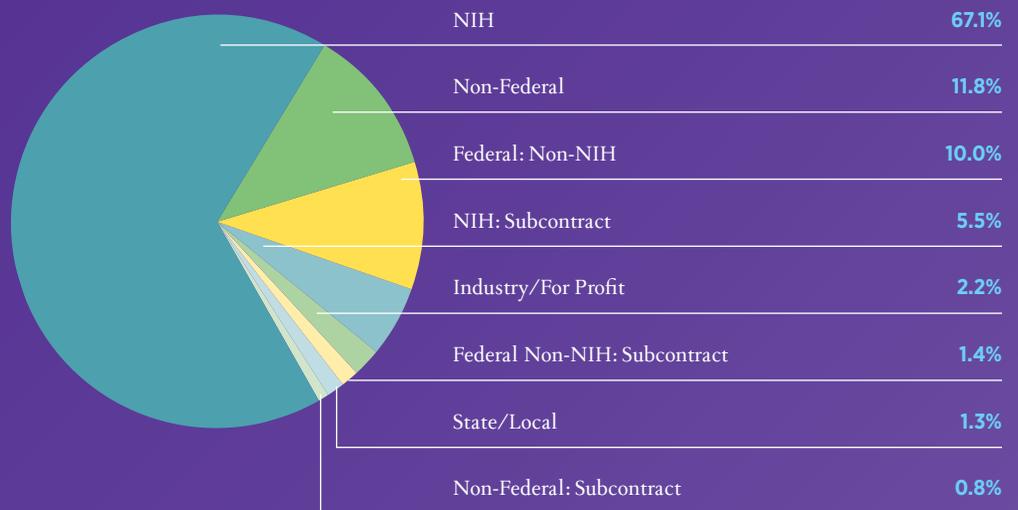
## GRANT REVENUE

(2010-2012)



## FY2012 AWARDS BY SOURCE

Total Number of Awards: 1,164



## FY2012 NIH AWARDS

Total Number of NIH Awards: 454



NEW FEDERAL FUNDING OF AT LEAST \$100,000\*

SUSAN ABRAMOWITZ Ryan White HIV/AIDS program part D *HRSA (US Department of Health and Human Services)* \$1,875,000

STEVEN ABRAMSON Leukocyte gene expression and genetic biomarkers of osteoarthritis incidence and progression *NIH (National Institutes of Health)* \$3,586,448

MARY ACRI Developing and testing of a peer-delivered intervention for depression *NIH* \$199,417

MARY HELEN BARCELLOS-HOFF Effect of pasireotide in breast cancer prevention in BRCA1 deficiency *DOD (US Department of Defense)* \$338,674

CAROLYN BERRY Healthcare transformation among small urban practices serving the underserved *AHRQ (Agency for Healthcare Research and Quality)* \$462,018

HELENE P. BEUNEU Visualizing breast cancer cells interactions with tumor-infiltrating lymphocytes during immunotherapy *DOD* \$376,303

NINA BHARDWAJ National Institute of Allergy and Infectious Diseases clinical trial planning grant *NIH* \$286,050

MARTIN J. BLASER The initiative in the human microbiome and infectious diseases *DOD* \$2,097,000

RONALD S. BRAITHWAITE Consortium to improve outcomes in HIV/AIDS alcohol, aging, and multi-substance use *NIH* \$1,125,000

RONALD S. BRAITHWAITE Implementation science to optimize HIV prevention in East Africa's President's Emergency Plan For AIDS Relief (PEPFAR) programs *NIH* \$2,656,213

JUDITH S. BROOK Longitudinal pathways to the use of health services *NIH* \$2,280,912

GYÖRGY BUZSÁKI Collaborative Research in Computational Neuroscience (CRCNS): Dynamics of the auditory cortical column *NIH* \$324,874

GYÖRGY BUZSÁKI Network cooperation in the hippocampus in vivo *NIH* \$619,523

KEN H. CADWELL Defining the role of NOD2 and bacteria in ATG16L1-dependent intestinal disease *NIH* \$1,837,875

ANUPAMA CHANDRAMOULI The role of hedgehog signaling in the tumor microenvironment *DOD* \$324,000

MOSES V. CHAO Molecular analysis of neurotrophin action *NIH* \$422,500

YU-HUNG CHEN A prospective study of serum taurine and stroke risk in women *NIH* \$464,750

BARBARA J. COFFEY 8/8 Collaborative genomic studies of Tourette disorder *NIH* \$100,067

CHRISTOPHER M. COLLINS High field MRI: limitations and solutions *NIH* \$1,147,052

MAX COSTA Research in environmental health sciences *NIH* \$8,257,131

NICHOLAS J. COWAN Tubulin mutations in neuronal migration disorders *NIH* \$1,914,805

WEI DAI Mechanisms of arsenic-induced chromosomal instability and carcinogenesis *NIH* \$1,964,459

RAMANUJ DASGUPTA Targeted screen for novel chemical modulators of Wnt/ $\beta$ -Cat signaling pathway *NIH* \$1,398,118

GREGORY DAVID Role of cell cycle withdrawal in restricting pancreatic cancer progression *NIH* \$283,033

SANDRA DEMARIA Radiation-induced vaccination to breast cancer *DOD* \$1,690,000

YU-SHIN DING The norepinephrine transporter: a novel target for imaging brown adipose tissue *NIH* \$464,676

MICHAEL L. DUSTIN Requirement for sensitive T cell response to antigen *NIH* \$1,664,562

MICHAEL L. DUSTIN Training program in immunology and inflammation *NIH* \$981,321

BRIAN D. DYNLACHT pRB and changes in the chromatin landscape during myogenic differentiation *NIH* \$1,440,134

BRIAN D. DYNLACHT The role of CP110 in ciliogenesis *NIH* \$1,353,058

STEFAN FESKE CRAC channel deficiency in immunity to infection *NIH* \$2,430,180

GORDON J. FISHELL FoxG1 in the development of cerebral cortex and the adult neural niche *NIH* \$845,000

EDWARD A. FISHER Diabetes-mediated effects on myeloid precursors and vascular complications *NIH* \$2,193,766

\*Fiscal year 2012: September 1, 2011 to August 31, 2012

SILVIA C. FORMENTI Radiation-induced vaccination to breast cancer *DOD* \$3,194,817

SILVIA C. FORMENTI Immunomodulation of breast cancer via TLR7 agonist imiquimod and radiotherapy *NIH* \$1,505,018

THOMAS F. FRANKE AKT signaling at the crossroads of depression and addiction *NIH* \$401,375

JAMES E. GALVIN Multicultural community dementia screening *NIH* \$2,776,030

LIDIA GLODZIK Blood pressure, cerebral perfusion and cognitive performance in hypertension *NIH* \$3,320,751

DONALD C. GOFF Citalopram in first episode schizophrenia *NIH* \$1,272,292

ODED GONEN Serial brain 3D 1H MR spectroscopy in multiple sclerosis *NIH* \$585,927

TERRY GORDON The interaction of diet, air pollution, and cardiovascular disease in National Institute of Environmental Health Sciences (NIEHS) *NIH* \$508,500

MIROSLAW K. GORNY Induction of HIV neutralizing antibodies by targeting macaque B cell receptors *NIH* \$491,330

MARC N. GOUREVITCH Substance abuse research education and training *NIH* \$1,601,425

HELENA B. HANSEN Mainstreaming opiate maintenance treatment into general medicine *NIH* \$903,260

DENISE J. HARRISON World Trade Center Health Program cancer supplemental request 9/2012 CDC (*Centers for Disease Control and Prevention*) \$1,462,743

EVA M. HERNANDO-MONGE Multilineage regulation of mesenchymal differentiation by microRNAs *NIH* \$359,055

EVA M. HERNANDO-MONGE Regulation and role of miR-183-96-182 in melanocyte differentiation and melanoma *NIH* \$1,596,101

CATARINA E. HIOE Contributions of anti-V2 antibodies in protection against HIV *NIH* \$2,302,948

CATARINA E. HIOE HIV envelope gp120-induced immunosuppression *NIH* \$422,500

KIMBERLY E. HOAGWOOD Advanced center for state research to scale up evidence-based practices for children *NIH* \$6,608,114

KIMBERLY E. HOAGWOOD Improving family-to-family services in children's mental health *NIH* \$2,128,148

E. JANE ALBERT HUBBARD TGF- $\beta$  and sensory regulation of germline development in *C. elegans* *NIH* \$1,288,121

STEVAN R. HUBBARD Structural studies of the pseudokinase domain of JAK2 *NIH* \$445,400

ADITYA KAUL Ryan White HIV/AIDS Program Part D *HRSA* \$2,108,468

SUNGHEON KIM DCE MRI study for breast cancer *NIH* \$2,474,839

DAVID L. KLEINBERG Targeted IGF-I inhibition by pasireotide for breast cancer prevention in BRCA1 deficiency *DOD* \$587,572

XIANGPENG KONG Epitope-targeted vaccines for HIV-1 prevention *NIH* \$12,716,465

SUMAN LAAL Rapid diagnosis of early TB in HIV+ patients *NIH* \$458,356

RUTH LEHMANN Training program in stem cell and cancer biology *NIH* \$1,394,364

CHUANJU LIU The role of PGRN growth factor in osteoarthritis *NIH* \$1,710,280

MICHAEL A. LONG Synaptic and circuit mechanisms of learned vocal production *NIH* \$1,797,918

CHARLES R. MARMAR Biomarkers for PTSD in female Iraq and Afghanistan veterans *DOD* \$2,194,889

GEORGE MILLER Divergent roles of dendritic cells in pancreatitis *DOD* \$1,267,482

ERUM NADEEM Improving evidence-based trauma care in schools through community partnerships *NIH* \$498,468

THOMAS A. NEUBERT Protein mass spectrometry core facility for neuroscience *NIH* \$3,564,050

ALEXANDER NEUMEISTER CB1 receptor PET imaging reveals gender differences in PTSD *NIH* \$1,927,569

ALEXANDER NEUMEISTER CB1 receptor imaging in anorexia *NIH* \$476,055

ALEXANDER NEUMEISTER  $\kappa$  opioid receptor imaging in PTSD *NIH* \$755,911

IPE NINAN Synaptic regulation of affective behaviors *NIH* \$431,765

EVGENY A. NUDLER Proteomics of RNA polymerase interactomes in pathogenic bacteria *NIH* \$464,750

OLUGBENGA G. OGEDEGBE Mid-career investigator award in patient-oriented research *NIH* \$621,280

OLUGBENGA G. OGEDEGBE NYU/UG cardiovascular research training institute program *NIH* \$1,177,654

## FUNDING

**OLUGBENGA G. OGEDEGBE** Task shifting and blood pressure control in Ghana: a cluster-randomized trial *NIH* \$2,117,296

**SETH J. ORLOW** Biogenesis of melanosomes *NIH* \$2,164,928

**MARK R. PHILIPS** Characterization of LCMT in animal models of cancer *NIH* \$1,758,391

**DAVID POLSKY** Blood-based detection of BRAF DNA as a biomarker in metastatic melanoma *NIH* \$404,333

**DAVID POLSKY** Blood-based detection of BRAF and NRAS DNA as biomarkers in patients with stage III and IV metastatic melanoma *FDA (US Food and Drug Administration)* \$1,267,500

**PHILIP T. REISS** Statistical methods for mapping human brain development *NIH* \$2,106,300

**MAARTEN REITH** Biogenic amine transporters: mechanisms of ligand interaction *NIH* \$1,659,039

**ANDREW B. ROSENKRANTZ** Prostate cancer detection using high spatial-resolution MRI at 7.0 Tesla: correlation with histopathologic findings at radical prostatectomy *DOD* \$126,750

**JAMES L. SALZER** Regulation of Schwann cell ensheathment and myelination by type III Neuregulin 1 *NIH* \$1,848,440

**GLENN SAXE** Center for Refugee Trauma and Resilience *SAMHSA (The Substance Abuse and Mental Health Services Administration)* \$598,934

**MARKUS SCHOBER** Mechanisms of homeostasis and invasive cell migration in skin tumorigenesis *NIH* \$747,000

**HENRIETA SCHOLTZOVA** Testing of innate immunity stimulation via TLR9 on CAA using non-human primates *NIH* \$466,063

**DONNA SHELLEY** Implementing tobacco use treatment guidelines in dental public health clinics *NIH* \$3,696,068

**DONNA SHELLEY** Improving adherence to smoking cessation medication among PLWHA *NIH* \$753,597

**DONNA SHELLEY** Testing clinical decision support for treating tobacco use in dental clinics *AHRQ* \$299,999

**EINAR M. SIGURDSSON** Epitope-specific targeting of tau aggregates *NIH* \$1,848,440

**DEBORAH SILVERA** Translational regulation of the inflammatory breast cancer stem cell *NIH* \$404,333

**EDWARD Y. SKOLNIK** TRIM27 is a new negative regulator of CD4 T cells and mast cells *NIH* \$1,328,623

**ROLAND T. SMITH** Hyperspectral imaging of the normal and age-related macular degeneration fundus *NIH* \$3,222,549

**SUSAN L. SMITH** Mechanisms of sister telomere cohesion and resolution *NIH* \$1,561,945

**GEORGE D. THURSTON** Long-term air pollution exposure and mortality in the NIH-AARP cohort *NIH* \$1,499,810

**GEORGE D. THURSTON** Dietary influence on mortality from air pollution exposure in the NIH-AARP cohort *NIH* \$240,000

**VICTOR J. TORRES** Functional analysis of *Staphylococcus aureus* LukAB cytotoxin *NIH* \$524,048

**CHAU TRINH** NYU Center for the study of Asian American health *NIH* \$6,865,770

**RICHARD TSIEN** Synaptic adaptation and plasticity after chronic disuse *NIH* \$1,011,036

**RICHARD TSIEN** Vesicular retrieval and reuse at CNS nerve terminals *NIH* \$841,086

**DANIEL H. TURNBULL** Ultrasound and magnetic resonance microimaging of mouse brain development *NIH* \$1,964,962

**THOMAS M. WISNIEWSKI** Detection and clearance of Alzheimer's disease lesions *NIH* \$1,385,800

**HSIANG YIN** Promoting safe use of pediatric liquid medications: a health literacy approach *NIH* \$2,639,491

**SONDRA R. ZABAR** Academic administrative units in primary care – primary care training and enhancement *HRSA* \$758,553

**SONDRA R. ZABAR** Patient safety in the outpatient setting: using standardized patients to assess and improve the quality and effectiveness of patient education skills and practice behaviors *AHRQ* \$992,459

**SONDRA R. ZABAR** Residency training in primary care *HRSA* \$942,310

**DAVID ZAGZAG** Novel CXCR4 therapeutics to block bevacizumab-induced glioma dissemination *NIH* \$464,750

**DAVID ZAGZAG** Proinflammatory biomarkers and post-breast cancer lymphedema *NIH* \$169,574

**SUSAN B. ZOLLA-PAZNER** Epitope-targeted vaccine for HIV-1 prevention *NIH* \$616,274

## NEW NON-FEDERAL FUNDING OF AT LEAST \$100,000\*

A special thank you to Fiona and Stanley Druckenmiller, Helen L. Kimmel, Ruth and Leonard Litwin, The Skirball Foundation, Joan and Joel Smilow, and Marica Vilcek and Jan Vilcek, MD, PhD, for their ongoing philanthropic investments in research.

Alzheimer's Association	Bill & Melinda Gates Foundation	Sara and Frank Olson
American Association for Cancer Research	Gilead Foundation	Orthopaedic Research and Education Foundation
American Cancer Society	Global Institute for Scientific Thinking	The Pew Charitable Trusts
American College of Phlebology	Arlene and Arnold Goldstein	Research to Prevent Blindness
American College of Rheumatology Research and Education Program	Jocelyn Greenidge †	The Louis and Rachel Rudin Foundation, Inc.
American Heart Association	Estate of Helen Grunebaum	Damon Runyon Cancer Research Foundation
Henry A. Arnhold	Nicki and J. Ira Harris	The Morris and Alma Schapiro Fund
Timur Artemeyev	The Irma T. Hirschl Trust	The Selander Foundation
Arthritis Foundation	Jacqueline Harris Hochberg	William and Sylvia Silberstein Foundation, Inc.
Avon Foundation, Inc.	William Lawrence & Blanche Hughes Foundation	The Simons Foundation
Michele and Timothy Barakett	Human Frontier Science Program	John I. Simpson, PhD
Belluck & Fox, LLP	International Rett Syndrome Foundation	The Skirball Foundation
Frances H. and James R. Berger	JDRF	The Sohn Conference Foundation
David Boies, Esq.	Peter James Johnson, Esq. †	David J. Steiger in Memory of Bernard Goldberg
Boston Scientific	Kenneth L. Kreidmann Trust u/w/o Leona F. Kreidmann	The Stringer Foundation
Breast Cancer Research Foundation	The Klarman Family Foundation Grants Program in Eating Disorders	Susan G. Komen for the Cure
Broad Medical Research Program of the Broad Foundation	Esther A. and Joseph Klingenstein Fund, Inc.	The Tomorrow Foundation, Inc.
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