FRONT COVER

iCubed is a new research initiative at NYU School of Medicine that explores how inflammation, infection, and immunity work together to propel and sustain the disease process. The overlapping circles on the cover symbolize the complex interactions of these three protagonists.
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In this year’s research report, we highlight iCubed—a new initiative rich with promise. iCubed represents the unique intersection and interplay between inflammation, immunity, and infection. Startling insights into the disease process are emerging from the overlapping trajectories of these individual fields across a broad array of conditions from cancer to arthritis to malaria. To each, we bring a rich history and distinguished tradition of pioneering research that continues to the present. What distinguishes our initiative is a heightened level of collaboration between our scientists and an emphasis on translational research designed to lead to new therapies, diagnostics, and prevention.

Over the past year our research efforts continued to grow in size and scope:

- We reached a historic and unprecedented milestone in July, raising $1 billion in philanthropy in less than four years;
- We had more than a 10 percent increase in NIH funding to $139.8 million;
- We were awarded an $84 million NIH grant—the largest in our history—to evaluate the comparative effectiveness of the two major strategies for treating coronary artery disease;
- We appointed internationally renowned scientist Richard W. Tsien, DPhil, the inaugural director of our Neuroscience Institute and first Druckenmiller Professor of Neuroscience;
- We initiated plans for a new 350,000 sq. ft. building dedicated to translational science and neuroscience, scheduled for completion in 2015; and
- We remained the leader among U.S. universities in translating discoveries in our laboratories into new drugs and devices, as measured by total licensing income over the past seven years.

This is an extraordinary time at NYU School of Medicine and our Medical Center. We have a heritage of innovation and we take deep pride in the passion, energy, dedication, and intellectual curiosity that our exceptional faculty bring to all that they do.

Sincerely,

Robert I. Grossman, MD
The Saul J. Farber Dean and Chief Executive Officer

Dafna Bar-Sagi, PhD
Vice Dean for Science and Chief Scientific Officer

Dr. Grossman and Dr. Bar-Sagi enjoy a moment in a conference room overlooking the East River at the Joan and Joel Smilow Research Center.
OUR SCIENTISTS AT NYU SCHOOL OF MEDICINE ARE EXPLORING HOW INFLAMMATION MAY LEAD TO AUTOIMMUNITY—KNOWLEDGE THAT COULD HELP UNCOVER NOVEL THERAPEUTIC TARGETS.
Inflammation was once overshadowed in the larger drama of immunity versus infection. White blood cells swarmed the site of injury or disease to help heal a wound or clear an infection, leading to characteristic redness and swelling. Inflammation was the hallmark of a working immune system.

Over the last few decades, however, that scenario has changed amid increasing evidence implicating inflammation as the primary culprit in a host of diseases ranging from cancer and heart disease to Alzheimer’s. Today NYU School of Medicine research scientists at NYU Langone Medical Center are advancing the understanding of how the inflammatory process goes bad.

Although inflammation can be a periodic ally of the immune system, scientists are learning how it may also goad the body’s defense network into a destructive overreaction known as autoimmunity. More surprisingly, their pioneering research suggests that inflammatory molecules can promote pathways of chronic disease, like artery-clogging atherosclerosis, and collaborate with microbes to encourage conditions such as obesity. Most importantly, their findings are uncovering novel targets for therapies that could alleviate the suffering of millions of people.

The realization that inflammation drives disease has created an urgent need to understand its complex interconnections with immunity and infection. The newly formed...
iCubed initiative at NYU School of Medicine is addressing that challenge by uniting researchers from multiple departments and disciplines to explore the interplay of three biological protagonists in promoting disease.

“It’s become really clear that a lot of the central molecular mechanisms in a wide span of disease processes are common,” says Dan Littman, MD, PhD, the Helen L. and Martin S. Kimmel Professor of Molecular Immunology and a Howard Hughes Medical Institute Investigator. “There’s been a growing recognition for the last 10 years that there is this link, so it makes sense to bring together people from diverse fields to study this and apply it to a variety of clinical settings,” says Dr. Littman, a member of the executive committee of the iCubed initiative. Dr. Littman’s groundbreaking studies of the immune system have opened new avenues for developing a novel class of anti-inflammatory drugs and vaccines against HIV.

**EXTERNAL THREATS**

Already, the converging plotlines of immunity, infection, and inflammation have challenged long-held assumptions about health and disease. Researchers have learned, for example, that the immune system responds to external threats from bacteria, viruses, and other disease-causing microbes in ways that are remarkably similar to how it becomes activated during chronic inflammatory disorders that arise internally.

“Classically, inflammation would be associated with infection, wound healing, and autoimmune diseases like rheumatoid arthritis, but the role of inflammation has been broadened in recent years to include metabolic diseases like type 2 diabetes and neurodegenerative diseases like Alzheimer’s,” says Michael Dustin, PhD, the Muriel G. and George W. Singer Professor of Molecular Immunology and professor of pathology and a member of the executive committee of the iCubed initiative. Dr. Dustin uses advanced imaging techniques to illuminate how the immune system physically combats viral and bacterial invaders.

NYU scientists are deeply involved in all three components of iCubed. They have elucidated the mechanisms that maintain the immune system’s critical ability to protect us from infections. They have conducted seminal clinical trials on multidrug therapies for the human immunodeficiency virus (HIV) and uncovered strategies that disease-causing parasites, bacteria, and viruses—including those agents that cause malaria and tuberculosis—use to invade...
the human body. More recently NYU experts have led the way in studying the microbiome, the entire population of microbes living within our bodies.

“We have a very large and strong cadre of scientists, and the idea is to build from that strength, because we believe that the issues in iCubed are critical in many of the diseases that are plaguing us,” says Martin Blaser, MD, the Frederick H. King Professor of Internal Medicine and chair of the Department of Medicine. “If we can understand both the biology and the medical science, then we can come up with new preventives, new treatments, and new cures,” says Dr. Blaser, a leading microbiome researcher and a member of the iCubed executive committee.

**IMPROVING HEALTH**

The need is especially acute for confronting the threat from infectious diseases, which kill more people than nearly any other malady, says Heran Darwin, PhD, associate professor of microbiology, who is exploring how TB subverts the immune system. “There is no question that better drugs and vaccines need to be developed to treat diseases from toxic shock and tuberculosis to AIDS and malaria,” says Dr. Darwin, another member of the executive committee. New York City has the highest concentration of world-renowned infectious disease laboratories in the country, she points out. Thus, she says, the iCubed initiative has “tremendous” potential to deliver on a shared goal “to bring better health to everyone.”

In the following pages, you’ll read about some of the innovative research at NYU School of Medicine that is driving this potential. You will discover how tiny molecules act as essential navigational aides for infection-fighting T cells and how some antibody proteins fight off not only external threats but also internal inflammation. You will also learn about projects that are helping turn conventional wisdom on its head, such as how parasitic worms may protect the human gut from inflammation and how white blood cells meant to fight infection can become part of the inflamed, fatty plaques in the arteries of those with atherosclerosis.

Investigators are shedding new light on the nefarious offensive strategies of external agents like HIV and TB and the internal danger posed by the immune system itself when it attacks the body’s own cells, leading to autoimmune diseases like type 1 diabetes, lupus, and multiple sclerosis.
The ultimate goal of the iCubed initiative is to improve the health of patients.

Perhaps nowhere is the developing realization of the iCubed initiative’s power more astonishing than in the vast microbiome dwelling within all of us. Most of these microbes are benign, but exciting studies at the Medical Center suggest that the microbiome within the human mouth, esophagus, and gut might contribute to the inflammation behind diseases as varied as esophageal cancer, the blood vessel–inflaming condition known as Behçet’s syndrome, and rheumatoid arthritis. The unexpected link between inflammation and changing microbial communities could open up an entirely new realm of research.

New investigative paradigms require a strong infrastructure, and iCubed is tapping into a wealth of resources at NYU. Among them are clinical services for responders to the World Trade Center disaster, men at high risk of HIV infection, and the largest pool of Behçet’s patients in the Americas, which provide critical databases for efforts to uncover the roots of disease. With in-house services such as well-integrated genomics and bioinformatics centers to draw upon, the program’s investigators are well positioned to help translate lab-based research into bedside interventions.

“One of the real goals is to take advantage of the synergy that occurs when you take multidisciplinary approaches,” Dr. Blaser says.

With a formal initiative in place, iCubed can recruit top-notch clinical researchers to further expand the work and grant training fellowships to the next generation of investigators. These trainees, Dr. Blaser says, bring fresh outlooks and build bridges between collaborators as they refine the shared story lines of immunity, infection, and inflammation.

“There would be a tremendous advantage in bringing together investigators who approach the studies of these three overlapping subjects from different angles and get them to talk to one another,” says Jan Vilcek, MD, PhD, professor of microbiology and iCubed executive committee member. Dr. Vilcek’s research in collaboration with Junming Le, PhD, then an adjunct associate professor of microbiology, led to the development of Remicade, the blockbuster anti-inflammatory drug for treating rheumatoid arthritis and other autoimmune conditions.

“The hope is that in the process of such interactions, new ideas will emerge and this will lead to new accomplishments that will be even stronger and more impressive,” Dr. Vilcek says.
OUR SCIENTISTS ARE DEEPLY INVOLVED IN ALL THREE COMPONENTS OF iCUBED. IN THE FOLLOWING PAGES, YOU WILL READ ABOUT SOME OF THEIR INNOVATIVE RESEARCH.
In type 1 diabetes, the immune system’s natural brakes fail to stop overactive T cells from attacking the pancreas and its vital insulin-producing beta cells. Under a joint program funded by the Helmsley Charitable Trust, three NYU School of Medicine researchers are pursuing distinct tactics to reestablish some control before the autoimmune disease causes lasting damage.

“We believe people get sick with diabetes not only because the immune system goes too hard on the gas pedal, but also because sometimes the brake is broken,” says Juan José Lafaille, PhD. His lab showed that a molecule called beta catenin dramatically enhances the ability of specialized immune cells to halt multiple sclerosis and other autoimmune conditions in mice. The lab is now testing whether beta catenin might boost the braking function of these immune cells in type 1 diabetes, which may lead to a novel therapy.

Alan Frey, PhD, is pursuing a separate strategy to lure attacking T cells to their deaths. The immune cells normally exist as a vast collection of slight variants; each recognizes unique protein tags studding the surface of foreign cells. In type 1 diabetes, some T-cell variants are abnormally drawn to tags covering the surface of beta cells in the pancreas. Dr. Frey plans to identify as many of these tags as possible and then eliminate their assailants with decoys.

Adrian Erlebacher, MD, PhD, approaches autoimmunity in type 1 diabetes from the vantage of pregnancy. What keeps the immune system of a mom-to-be from attacking placental or fetal tissue? Dr. Erlebacher has linked the phenomenon to tiny vesicles shed from the placenta into the mother’s bloodstream. These particles, he says, may send out messages telling the mother’s immune system, “Hold your fire.” A similar strategy might be exploited in type 1 diabetes.
Honeymoon Period

Like his colleagues, Dr. Erlebacher says his overall goal is to take advantage of a honeymoon period when type 1 diabetes might still be reversed before the body’s beta cells are obliterated.

Immune Détente

Women with autoimmune diseases like rheumatoid arthritis and multiple sclerosis often improve significantly during a pregnancy. Perhaps, Dr. Erlebacher says, as-yet-identified factors involved in that détente could be used to trick the immune system of type 1 diabetics into leaving beta cells alone.

Photograph

From left: Graduate student Adam Blaisdell, research assistant Chin-Siean Tay, and Adrian Erlebacher, MD, PhD, discuss data from a recent experiment. Dr. Erlebacher is intrigued by how the immune system of a pregnant woman is prevented from attacking placental or fetal tissue.
Behçet’s syndrome, dubbed Silk Road disease because of its prevalence along the ancient trading route from the Mediterranean to the Far East, often appears as seemingly unrelated ailments. Its various symptoms, however, from skin, mouth, and genital sores to inflammation of the eyes and gastrointestinal tract, stem from an underlying inflammation of the body’s blood vessels.

Curiously, the severity of symptoms varies greatly by geography: Gastrointestinal distress is common in Japan, but not in the Mediterranean. Blindness is a major concern in Turkey and Israel, but not in the United States, where the disease is much rarer. “It has to be something in the environment that’s modulating the severity of the disease,” says Yusuf Yazici, MD.

In 2005 Dr. Yazici started a Behçet’s clinic at the NYU Hospital for Joint Diseases that has since seen about 700 patients, making it the largest center for the disease in North or South America. The center evaluates and treats patients, and they may be enrolled in clinical trials. The center’s extensive patient database and Dr. Yazici’s connections to his native Turkey, where the prevalence of Behçet’s is the world’s highest, are also helping researchers compare the course of the disease here and abroad.

Dr. Yazici is eager to find what triggers the disease. He suspects it may lie in the collection of microbes inhabiting each patient. “It’s like something revs up and activates the immune system,” he says. He now plans to analyze patients’ microbial DNA.

42 cases per 10,000 people
ESTIMATED PREVALENCE OF BEHÇET’S IN ISTANBUL, TURKEY

30%
PERCENTAGE OF JAPANESE AND IRANIAN PATIENTS WITH BEHÇET’S SYNDROME WHO GO BLIND

9%
PERCENTAGE OF ITALIAN PATIENTS WITH BEHÇET’S SYNDROME WHO GO BLIND
Gradual changes within the bacterial communities that call our bodies home may cause a host of unexplained diseases, an idea that is gaining traction with the groundbreaking research of Zhiheng Pei, MD, PhD. Dr. Pei first bucked conventional wisdom by discovering that the esophagus hosts a teeming bacterial community. His follow-up research suggests that the composition of benign microbes, called the esophageal microbiome, is altered among patients with inflammatory disorders. “For some reason, the community changes,” he says. “And even if there are no pathogenic bacteria involved, the change may have a bad effect on your health.”

Dr. Pei and his team observed a clear transition in the types of bacteria present when they compared microbiome DNA from healthy volunteers to that of patients with gastroesophageal reflux disease (GERD) and a more severe condition known as Barrett’s esophagus. The latter is a precursor to esophageal adenocarcinoma, a type of cancer that has skyrocketed in incidence since the 1970s.

One hypothesis suggests that the rising use of antibiotics may be disrupting the esophageal microbiome, favoring the influx of new microbial residents more likely to spur an inflammatory response by the immune system. The chronic inflammation, in turn, raises the risk of cancer.

Dr. Pei plans to search for bacterial markers that may accompany the precancerous inflammation, signifying which patients may be at higher risk for cancer. Two other researchers are lending crucial expertise to these efforts. Jiri Zavadil, PhD, oversees the advanced machinery to identify different bacteria by spelling out—sequencing—the DNA letters that code for a specific gene. In turn, scientists at the Center for Health Informatics and Bioinformatics, headed by Constantin Aliferis, MD, PhD, help analyze and interpret the enormous volume of information generated by DNA-sequencing machines.
Photography
Demetre Daskalakis, MD, and Judith Aberg, MD. Since AIDS was first described 30 years ago, the disease has claimed the lives of nearly 30 million people worldwide.

In a bathhouse in New York City, Demetre Daskalakis, MD, hopes to solve the mysteries of long-term resistance to HIV infection. In this unusual setting he established an HIV testing site in 2007. Since then the pioneering outreach of the Men’s Sexual Health Project to a high-risk group of gay and bisexual men has amassed an invaluable database, aiding efforts to find a vaccine or drugs targeting the virus that causes AIDS.

So far about 3,500 HIV tests have been administered. The alarmingly high HIV-positive rate among these men, about 3.5 percent, is triple that of the general New York City population. The project has also revealed key contributors to high-risk behavior, including younger age, lower socioeconomic status, and lack of access to a primary care provider. Another project offers the men antiviral treatments within a 36-hour window after a suspected HIV exposure.

Dr. Daskalakis cites Judith Aberg, MD, professor of medicine and director of the NYU/Bellevue AIDS Clinical Trial Unit, as a mentor whose support has been critical to the success of the projects. (She was recently appointed director of the Division of Infectious Diseases and Immunology in the Department of Medicine.) Dr. Aberg, in turn, lauds the vision and “tremendous effort” of Dr. Daskalakis’s outreach. “It’s his heart and soul,” she says.

Over the last four years, the HIV testing project has earned the trust of men who frequent bathhouses, Dr. Daskalakis says, allowing his team to recruit the highest risk-takers for further research—those who have been repeatedly exposed to HIV but remain uninfected. That group may hold the key to developing new disease interventions. Scientists at our School of Medicine and five other institutions are examining potential genetic and immune factors that might help these risk-takers resist infection. “We’re able to segue seamlessly between clinical service and innovative research,” Dr. Daskalakis says.

25-33%
ESTIMATED PERCENTAGE OF GAY AND BISEXUAL MEN IN NYC WHO ARE HIV POSITIVE
Source: Centers for Disease Control and Prevention

1,576
NUMBER OF HIV DIAGNOSES AMONG GAY AND BISEXUAL MEN IN NEW YORK CITY IN 2009.
Source: NYC Department of Health and Mental Hygiene

Photograph
Demetre Daskalakis, MD, and Judith Aberg, MD. Since AIDS was first described 30 years ago, the disease has claimed the lives of nearly 30 million people worldwide.
In atherosclerosis, the accumulation of fatty plaques and chronic inflammation in the arteries can be thought of as “a good deed gone bad,” says Kathryn Moore, PhD. The immune system sends macrophages to clean up the deposits, but once they fill up with the bad form of cholesterol they get stuck in the arteries, triggering the body’s inflammatory response. The bloated macrophages also become major components of the growing plaques.

Through their collaborative and individual research, Dr. Moore, Edward Fisher, MD, PhD, MPH, and Carlos Fernandez-Hernando, PhD, members of the Marc and Ruti Bell Vascular Biology Program, are demonstrating how the good form of cholesterol can reverse atherosclerosis and thereby neutralize a major contributor to cardiovascular disease. Two years ago Dr. Moore and Dr. Fernandez-Hernando identified an RNA molecule called microRNA-33, or miR-33. They found that inhibiting this molecule significantly raises levels of good cholesterol, or high-density lipoprotein (HDL). Based partly on the work of Dr. Fisher, who showed in 2003 that an increase in HDL can “melt away” inflammatory cells in atherosclerotic plaques in mice, the finding suggested that restraining miR-33 might alleviate or prevent atherosclerosis.

Working with a biotech company, Dr. Moore recently showed that a targeted block of miR-33 in mice reduces the size of their plaques. Dr. Fernandez-Hernando has implicated the same molecule in controlling various aspects of metabolism. “Somehow, this microRNA is like a fine-tuner that is regulating many metabolic pathways,” he says. Dr. Fisher has recently demonstrated how good cholesterol reprograms macrophage cells so they can help resolve the inflammation in plaques. “Selectively increasing high-density lipoprotein can encourage macrophages to leave plaques,” he says.

Altogether, the researchers’ work suggests that raising HDL levels draws out bad cholesterol from plaques so the liver can dispose of it. As a result, both plaque buildup and macrophage-mediated inflammation can be reversed. The three scientists can now uncover other factors that might be manipulated to prevent disease.
In collaboration with San Diego–based Regulus Therapeutics, Dr. Moore used a miR-33 inhibitor to treat mice with atherosclerosis. After only one month of treatment, the inhibitor raised good cholesterol levels by 40 percent and reduced plaque size by 35 percent. Regulus bought the licensing rights from NYU and is developing the strategy to treat cardiovascular diseases.

**GOOD CHOLESTEROL**

Dr. Moore is focusing on the chronic inflammation that characterizes atherosclerosis. “Even though our lipid-lowering drugs are good, we need additional therapies that could potentially target inflammation,” she says.

**THERAPIES NEEDED**

Atherosclerosis, the buildup of plaque in coronary arteries, leads to heart attacks, strokes, and other conditions. Dr. Moore (left) and Dr. Fernandez-Hernando are identifying novel molecular approaches to combat this #1 killer of both men and women in the United States.
Roughly 100 billion cells in the human body die every day in response to damage due to injury, infection, or wear and tear. The immune system must efficiently and continuously clear this cellular debris or risk a build-up that can trigger harmful inflammation. Normally macrophages and other cell-ingesting specialists carry out this cleanup. Meanwhile, immune proteins called antibodies help the body recognize foreign threats, which is necessary to ward off infection.

But new research by Gregg Silverman, MD, and colleagues shows that a type of natural antibody present from birth (as opposed to that created in response to infection) also plays a key role in helping sweep away daily cellular debris. To their surprise, the researchers discovered that high levels of this antibody, a specific kind called IgM, halted progression of atherosclerosis in mice. “We found that these antibodies tagged dead and dying cells to greatly enhance the efficiency of clearance, and the process also blocked cellular responses that would otherwise be inflammatory and contribute to atherosclerosis,” he says.

The IgM-based housekeeping mechanism, Dr. Silverman believes, may have profound implications for treating other inflammatory diseases such as lupus and rheumatoid arthritis. “We think it’s a very central concept with great potency,” he says. In his laboratory studies, the protective antibodies, when abundant, arrested the development of rheumatoid arthritis in mice. Among 120 patients with lupus, the researchers found that those with naturally high levels of IgM were protected from the more severe forms of the disease and its accompanying organ damage.

Figuring out how to ramp up the production of this antibody might protect patients from other inflammatory disorders as well, Dr. Silverman says. “It’s discovering how the immune system works, and then trying to use it therapeutically and it may be relevant to many diseases.”

GREGG SILVERMAN, MD
Co-Director of the Center of Excellence on Musculoskeletal Disease
Professor of Medicine and Pathology

1.5 Million
ESTIMATED NUMBER OF AMERICANS WITH LUPUS
Source: Lupus Foundation of America

1.5 Million
ESTIMATED NUMBER OF AMERICANS WITH RHEUMATOID ARTHRITIS
In the early 1900s, many doctors believed arthritic joints were due to toxic bacteria and even advised arthritic patients with gum disease to have their teeth removed. The notion that bacteria can cause inflammation was largely abandoned by the mid–20th century, but today it’s being revisited by a multidisciplinary group of researchers at NYU School of Medicine. Surprisingly, they are finding that inflammation may be at least partially mediated by microbes in patients’ mouths and guts. “It could lead, potentially, to a real breakthrough in the understanding of rheumatoid arthritis,” says Steven Abramson, MD.

The effort to study a potential environmental basis for the autoimmune disease, marked by crippling joint pain, began after Dan Littman, MD, PhD, discovered a bizarre-looking, gut-dwelling microbe in mice. It spurred a rheumatoid arthritis–like disease and summoned immune system specialists called Th17 cells, linked to inflammation and human arthritis.

To find out whether microbes play a role in human disease, Dr. Littman, Dr. Abramson, and Jose Scher, MD, developed a strategy that attracted an impressive roster of other experts. Researchers at NYU are analyzing the immune response in rheumatoid arthritis patients and testing them for gum disease, or gingivitis. A microbiologist at Memorial Sloan-Kettering Cancer Center is characterizing the genetic makeup of the entire microbial mix—the microbiome—living within those patients.

So far the work has yielded several fascinating insights: About 70 percent of the examined patients also have gingivitis. Compared with unaffected volunteers, they also have a distinct microbiome within their feces. Dr. Littman is introducing bacteria isolated from these patients into mice to see whether the animals develop arthritis. He believes the overall mechanism leading to immune activation and disease will likely be similar. “The gut microbiome is going to be so central in so many diseases,” he says. The ultimate intervention may be a vaccine or drug that blocks the bacterial agents from goading the immune system into its misguided inflammatory action.
Photograph
P’ng Loke, PhD, and senior research technician Jacqueline Leung.

Is it possible that parasitic worms could heal colitis? A stomach-turning possibility to be sure, but a self-medicating patient helped P’ng Loke, PhD, understand how these worms may be able to heal the intestinal disease. “If you think about it, parasitic worms are almost like a successful transplant,” says Dr. Loke. “What we’re trying to understand are the mechanisms that allow the parasite and the host to coexist.” That uneasy cohabitation is not risk-free for humans, but emerging research suggests the worms’ survival strategy may also protect their hosts from disease.

Most cases of inflammatory bowel disease (which refers to colitis and Crohn’s disease), for example, occur in North America and northern Europe, where helminth (parasitic worm) infections are rare. Yet the disease rarely occurs in Asia, Africa, and Latin American, where the worms are common. Dr. Loke had the opportunity to study the worms’ survival strategy when he was contacted by a man with ulcerative colitis, which causes painful ulcers in the lining of the rectum and large intestine. In desperation, the man had medicated himself with helminths that may have put his inflammatory disease into remission.

“By analyzing this individual’s gut tissue, we came up with the hypothesis that the worms were triggering increased mucus production in the intestinal tract,” Dr. Loke says. Disruption of mucus production is often associated with severe symptoms of colitis. The body’s attempt to expel the worms, he believes, helped rebuild the protective mucus layer separating the intestinal wall from the normal population of gut-dwelling bacteria, which halted inflammation.

Dr. Loke recently administered worms to five Rhesus monkeys that had colitis, which commonly occurs in captive monkeys. Four went into remission. Identifying the factors leading to mucus formation in these animals, Dr. Loke says, could lead to new therapeutic approaches for the condition—without the risks of ingesting worms.

700,000
Estimated number of Americans with ulcerative colitis
Source: Crohn’s & Colitis Foundation of America

>33%
Estimated percentage of the world’s population infected by a helminth
Source: Global Atlas of Helminth Infections

Photograph
P’ng Loke, PhD, and senior research technician Jacqueline Leung.
Mycobacterium tuberculosis has been infecting humans for millennia. Using the tools of microbiology, immunology, pathology, and molecular biology, three researchers from NYU School of Medicine are gaining ground in understanding how this ancient foe evades the immune system, potentially opening the door to novel treatments for a deadly disease that afflicts nearly one-third of the world’s population.

Jennifer Philips, MD, PhD, studies how tuberculosis subverts macrophages. The specialized white blood cells normally excel at finding, ingesting, and killing bacteria. “But tuberculosis,” she says, “has turned everything upside-down, and the bacteria make their home in the macrophage cells.” Dr. Philips has identified dozens of genes and protein interactions associated with macrophage activity that tuberculosis might co-opt.

Joel Ernst, MD, found a separate mechanism that may explain why T cells fail to recognize tuberculosis bacteria growing in the lungs of mice. The microbe turns off a protein beacon, or antigen, that the T cells have been trained to recognize, thereby blinding the immune soldiers to the bacteria. “So the T cells get recruited to the lungs, but then they don’t actually see their antigen once they arrive,” Dr. Ernst says. Forcing the bacteria to switch the antigen back on may again signal their presence and allow the T cells to lock on to their targets.

Several years ago, Heran Darwin, PhD, discovered a housekeeping protein in M. tuberculosis that escorts the microbe’s own scrap proteins to the cellular trash compactor to prevent a toxic buildup. Since then, she and her postdoctoral fellow, Kristin Burns, PhD, have identified other enzymes required for this protein, dubbed Pup, to find and attach to the scraps. One reverses the attachment and may be unique. The enzymes appear only in bacteria and might make ideal targets for drug development. “You have to understand the enemy if you’re going to beat it,” Dr. Darwin says.

Photographs

TOP
Heran Darwin, PhD (right), and postdoctoral fellow Kristin Burns, PhD, have identified unique bacterial enzymes that may lead to novel therapies to eradicate TB.

MIDDLE RIGHT
Joel Ernst, MD, has devoted his career to studying how the bacterium causing TB subverts the immune system.

BOTTOM RIGHT
An immunoblot shows the activity of a protein from M. tuberculosis that is recognized by human and mouse T cells. The protein is being used in several experimental TB vaccines.

JENNIFER A. PHILIPS, MD, PhD
Assistant Professor of Medicine, Pathology and Microbiology

JOEL D. ERNST, MD
Jeffrey Bergstein Professor of Medicine
Professor of Pathology and Microbiology

HERAN DARWIN, PhD
Associate Professor of Microbiology

1 in 3
ESTIMATED FRACTION OF WORLD POPULATION INFECTED BY THE BACTERIUM THAT CAUSES TUBERCULOSIS
Source: World Health Organization

10 to 15
AVERAGE NUMBER OF PEOPLE INFECTED ANNUALLY BY A PERSON WITH ACTIVE TUBERCULOSIS, IF LEFT UNTREATED
Source: World Health Organization
Dr. Philips has taken advantage of a process called RNAi (RNA interference) to sequentially silence the activity of 6,500 genes in mouse macrophage cells and observe the effects. By doing so, her lab has identified approximately 50 genes that normally help macrophages prevent bacterial growth but could be undermined by the tuberculosis microbe.

**CLEARING TB**

Knowing how tuberculosis manipulates macrophages, Dr. Philips says, could help researchers produce an antibiotic that restores the immune system’s ability to effectively clear *Mycobacterium tuberculosis*.

**PHOTOGRAPH**

Jennifer A. Philips, MD, PhD, uses a digital fluorescence microscope to detect *Mycobacterium tuberculosis* in tissues. Proteins produced by the bacterium are tagged with fluorescent probes, seen as the green-tinged objects on the monitor.
Navigating unfamiliar territory can be difficult without directions. Research by Susan Schwab, PhD, suggests that for the immune system’s traveling army of infection-fighting T cells, a lipid molecule known as sphingosine-1-phosphate, or S1P, is an essential guide.

Native T cells circulate in a surveillance loop through an intricate network of blood, lymph nodes, and lymph fluid, seeking out signs of infection. “It’s only when they enter a lymph node and find a pathogen that they get activated and proliferate,” Dr. Schwab says. Following cues, these activated T cells leave the lymph nodes and move en masse to the site of infection.

Dr. Schwab’s lab is clarifying how variations in S1P concentrations help T cells get their bearings, and how some enzymes might control the relative supply of these navigational aids in different parts of the body. “If there’s no S1P in the lymph, T cells have no way of finding the exit sites and stay in the lymph nodes,” she says. “It’s like they lose their way.” Overly high concentrations of the lipid within the lymph nodes likewise thwart any departure by the immune cells. “They’re similarly confused, because now they’re seeing S1P everywhere,” she says.

Dr. Schwab’s discoveries may eventually point the way toward tissue-specific therapies. A new multiple sclerosis drug called fingolimod traps overly aggressive T cells in the lymph nodes, where they cannot attack the central nervous system. The drug acts throughout much of the body, however, causing unwanted side effects. “There may be different factors that regulate the concentration of this lipid in different tissues,” Dr. Schwab says, “and that would give us the hope of being able to give people much more selective treatments.”

“It’s only when they enter a lymph node and find a pathogen that they get activated and proliferate.”

**2 Trillion**

**NUMBER OF LYMPHOCYTES IN THE HUMAN BODY**  

**15 to 30**

**NUMBER OF LYMPH NODES IN A HUMAN ARMPIT**  
Source: Macmillan Cancer Support

**PHOTOGRAPH**

Susan Schwab, PhD, (right) and postdoctoral fellow Lauren Pitt, PhD.
The collapse of the World Trade Center towers may have exposed an estimated 40,000 rescue and recovery workers and 300,000 residents to caustic toxins and pollution. A decade later, clinicians continue to find high rates of asthma, emphysema, sinusitis, sleep apnea, and other forms of lung and airway inflammation among residents and workers. Since 2002 Denise Joy Harrison, MD, has led a Bellevue/NYU program that serves people who responded to the catastrophe; it screens, monitors, and treats those directly involved in the recovery and restoration at Ground Zero. Participants are mainly police officers and construction workers. “It’s been really rewarding to work with this population,” she says.

Even those who initially recovered are now returning with new asthma symptoms, suggesting that they may have been sensitized to irritants like mold or dust. In the clinic’s monitoring group of 2,333 patients, overall asthma rates are 17.4 percent, compared with community rates of 5 percent to 12 percent. Among patients who were smokers but asymptomatic before the disaster, the clinic is also seeing what is called World Trade Center–aggravated emphysema, a double blow to the lungs.

The fastest-growing reason for visits to the clinic has been mental health disorders such as post-traumatic stress disorder, depression, and anxiety. “We believe in theory that people with post-traumatic stress disorder may have worsening asthma symptoms and worsening response to treatment for their asthma,” Dr. Harrison says. The still unanswered question is which symptom may be exacerbating the other.

Basic laboratory research is also moving forward. Juan José Lafaillle, PhD, has created a mouse model of asthma that can help researchers understand disease pathways by replicating hallmarks of the inflammatory condition in the animals. Immune system modulators known as regulatory T cells, he has found, can significantly improve mouse asthma.

“People with post-traumatic stress disorder may have worsening asthma symptoms and worsening response to treatment for their asthma.”
—DENISE JOY HARRISON, MD—
Inflammation

Immunity

Infection

I3
NEW FACULTY

Over the next five years NYU School of Medicine will double its laboratory space, presenting an enormous opportunity to strategically recruit the finest investigators in the world.

Our intention is to identify and hire research scientists whose contributions will complement existing expertise and provide them with facilities and an environment that cultivate excellence in performance and outcome. The energy and enthusiasm of new faculty is inspiring.

Attracting those investigators who will advance our institutional research goals is a task our department chairs take on with vigor. Initiatives like iCubed are tremendously valuable for recruiting, because they provide a strong positive signal to the scientific community. We are committed to increasing our first-rate research and enhancing its translation into clinical application.
RYAN C. BRANSKI, PHD
Assistant professor in the Department of Otolaryngology and associate director of the NYU Voice Center

Dr. Branski’s laboratory is interested in the relationship between inflammation and fibrosis and novel therapeutics to target relevant pathways in patients with vocal fold injury and fibrosis, as well as clinical outcomes for patients with voice disorders.

Education: BA in communication science and disorders from the University of Florida; PhD in health and rehabilitation sciences from the University of Pittsburgh. Clinical Fellowship at the University of Pittsburgh Voice Center.

Interesting Fact: Dr. Branski is an avid skier and triathlete and plays the trumpet.

SURESH CUDDAPAH, PHD
Assistant professor in the Departments of Environmental Medicine and Pharmacology

Dr. Cuddapah is interested in understanding the epigenetic regulation of chromatin structure and gene expression programs during differentiation and disease manifestation. Currently, his laboratory is using genomic approaches to investigate the roles of transcription factors and epigenetic features of the genome that are involved in maintaining normal chromatin architecture and the anomalies that may lead to carcinogenesis.

Education: BSc in zoology from the University of Madras in India; PhD in biotechnology from the University of Mysore in India. Awards: Science and Technology Agency Fellow in Japan; visiting and research fellow for the National Heart, Lung and Blood Institute; NIH Fellows Award for Research Excellence.

Interesting Fact: Dr. Cuddapah is a huge fan of hard rock and enjoys hiking.

DANIEL DELMAR, MD, PHD
Professor in the Department of Medicine, Cardiology Division

Dr. Delmar is interested in studying cellular and molecular mechanisms of cardiac arrhythmias, intercellular communication in the heart, the role of desmosomes and gap junctions in heart function, and mechanisms of arrhythmias in arrhythmogenic right ventricular cardiomyopathy.

Education: BS from the Instituto de Humanidades y Ciencias in Mexico; MD from the Universidad Autonoma Metropolitana in Mexico; PhD from the Centro de Investigacion y Estudios Avanzados del Instituto Politécnico Nacional in Mexico. Awards: Postdoctoral Fellowship in the Department of Pharmacology at SUNY Upstate Medical Center; Fellow of the American Heart Association and the Heart Rhythm Society; Kenneth M. Rosen Fellowship Award; Paul N. Yu Research Award from the American Heart Association; William J. Sindelar Award for Outstanding Leadership from the American Heart Association New York State Affiliate; President’s Award for Excellence and Leadership in Research from SUNY Upstate Medical University.

Interesting Fact: Dr. Delmar loves New York City and everything that it has to offer.
MATTHEW B. FITZGERALD, PHD, CCC-A
Assistant professor in the Department of Otolaryngology

Dr. Fitzgerald is currently investigating methods to help users of cochlear implants adapt to their prostheses more quickly and to better custom-fit the device to the patient. He has particular interests in issues related to bilateral cochlear implantation and in developing training programs for users of both monaural and bilateral implants.

Education: BA in communication disorders and sciences from Wichita State University; MS in audiology and hearing sciences from Vanderbilt University; PhD in audiology and hearing sciences from Northwestern University Awards: Clinical fellowships

Interesting Fact: At one point in his life, Dr. Fitzgerald briefly considered becoming a professional card player.

ROBERT C. FROEMKE, PHD
Assistant professor in the Departments of Otolaryngology and of Physiology and Neuroscience

Dr. Froemke and his laboratory study the mechanisms of neuroplasticity and brain repair. In particular, they examine how motivational state and other drives interact with brain chemical signaling systems and patterns of sensory experience, to change neural circuits and encode memories.

Education: BA in computer science from Tufts University; PhD in molecular and cell biology from the University of California, Berkeley Awards: Fellowship in otolaryngology at the University of California, San Francisco; Jane Coffin Childs Postdoctoral Fellowship, the Sandler Translational Research Postdoctoral Fellowship; NIH Pathway to Independence Award; Whitehead Fellowship

Interesting Fact: Dr. Froemke initially went to art school and interned as a sculptor.

CHARLES A. HOEFFER, PHD
Assistant professor in the Department of Physiology and Neuroscience

Dr. Hoeffer’s research interests center on the molecular and cellular mechanisms underlying neurological diseases and disorders. To address experimental questions, his laboratory uses behavioral analyses in genetically and pharmacologically manipulated rodents, molecular signaling pathway investigation using isolated proteins and neurons, and field slice recording from living brain preparations.

Education: BS in molecular and cellular biology from the University of Arizona; PhD in molecular and cell biology from the University of Arizona

Interesting Fact: Dr. Hoeffer enjoys camping, hiking, and fishing, and he achieved master status in chess in elementary school.

CHUNYUAN JIN, MD, PHD
Assistant professor in the Departments of Pharmacology and Environmental Medicine

In eukaryotes, chromatin structure regulates the access of regulatory factors to genomic DNA and thus exerts an extraordinary control over DNA-templated processes such as transcription. Dr. Jin’s research focuses on how epigenetic mechanisms modulate chromatin structure and gene expression and contributes to the environmental factor-induced carcinogenesis.

Education: BM (equivalent to MD) and MS in genetics from China Medical University; PhD in pharmacology from the University of Tokyo

Residency: The First Affiliated Hospital at China Medical University

Awards: Postdoctoral Fellowship at NIH; NIH Fellows Award for Research Excellence

Interesting Fact: Dr. Jin can speak Chinese, Japanese, Korean, and English.

SERGEI B. KORALOV, PHD
Assistant professor in the Department of Pathology

Dr. Koralov’s laboratory focuses on research pertaining to B- and T-cell development and lymphomagenesis. Currently, one project explores the role of TH17-driven inflammation in lymphomagenesis, while the other examines the role of short non-coding RNAs (miRNAs) in lymphocyte development and Ig locus accessibility.

Education: BS in biology and philosophy from Duke University; PhD in immunology from Harvard University

Awards: Postdoctoral Fellowship in the Immune Disease Institute at Harvard Medical School

Interesting Fact: Dr. Koralov is an avid alpinist and climber.
RICCARDO LATTANZI, PHD
Assistant professor in the Department of Radiology

Dr. Lattanzi is interested in parallel magnetic resonance imaging (MRI), techniques and technologies for ultra-high-field MRI, and design optimization and evaluation of radiofrequency (RF) coils for MRI, in addition to multi-parametric assessment of hip articular cartilage using delayed gadolinium-enhanced MRI of cartilage (dGEMRIC).

Education: Laurea (MEng) in electric engineering from the Università di Bologna in Italy; PhD in electrical and medical engineering from Harvard University-MIT Awards: Postdoctoral Fellowship in Radiology at the NYU School of Medicine; International Society for Magnetic Resonance in Medicine; Rabi Young Investigator Award; Fulbright Research Scholarship
Interesting Fact: Dr. Lattanzi writes about science in Italian newspapers and magazines and is an expert in Italian restaurants in New York.

DAYU LIN, PHD
Assistant professor in the Departments of Psychiatry, Physiology and Neuroscience and the Siminov Neuroscience Program

Dr. Lin’s research focuses on understanding the brain circuit underlying innate social behaviors, especially aggression and mating. Her laboratory uses optogenetic and electrophysiology approaches to perturb as well as monitor specific cell populations and pathways to understand their functional relevance to the behavior.

Education: BS in biological sciences from Fudan University in China; PhD in neurobiology from Duke University Awards: Klingenstein Fellowship Awards in the Neurosciences; Jane Coffin Childs Fellowship
Interesting Fact: Dr. Lin enjoys dancing with her daughter.

RICCARDO OTAZO, PHD
Assistant professor in the Department of Radiology

Dr. Otazo is interested in the development of fast MRI techniques using compressed sensing, a new imaging approach that allows pre-compression of data acquisition without loss of important image information. The goal is to enable heretofore inaccessible combinations of temporal resolution, spatial resolution and volumetric coverage in MRI.

Education: BSc in electronics engineering from the Universidad Católica de Asunción in Paraguay; MSc and PhD in engineering from the University of New Mexico Awards: Postdoctoral Fellowship in Radiology at the NYU School of Medicine; Fulbright Scholarship; Inter-American Agency for Cooperation and Development of the Organization of American States
Interesting Fact: Dr. Otazo enjoys traveling with his wife and is a fan of Cerro Porteño soccer club.

MIHI LI, PHD
Assistant professor in the Department of Environmental Medicine

Dr. Li’s research focuses on secondary phenotype analysis in genome-wide association study, empirical Bayes method in small-area estimation and disease mapping, survival analysis for secondary cancer, general biostatistical methods in genetic and cancer epidemiology, and survey methodology.

Education: BS in accounting from Nankai University in China; PhD in statistics from the University of Maryland Awards: Research Fellow at Biostatistics Branch in the Division of Cancer Epidemiology & Genetics at the National Cancer Institute.

MICHAEL A. LONG, PHD
Assistant professor in the Departments of Otolaryngology and of Physiology and Neuroscience

The Long laboratory uses advanced electrophysiological and behavioral methods to study the neural circuitry involved in the production of complex behaviors, especially vocal communication, in both humans and songbirds. The goal of these studies is to understand principles related to the function and dysfunction of motor sequencing within the brain.

Education: BS in biology and BA in psychology from Rhodes College; PhD in neuroscience from Brown University Awards: Postdoctoral Fellowship in the Department of Brain and Cognitive Sciences at MIT; NIH Ruth L. Kirschstein National Research Service Award (National Institute of Mental Health); the NIH Pathway to Independence Award
Interesting Fact: In his spare time, Dr. Long practices the guitar and has recently learned to play squash.

IRENA PASTAR, PHD
Assistant professor in the Department of Surgery

Dr. Pastar’s research focuses on mechanisms of cutaneous wound healing, especially its inhibition in chronic wounds. Her laboratory has demonstrated that certain microRNAs play a role in the pathology of non-healing ulcers. She currently investigates wound infections and microRNA mediated mechanisms involved in a crosstalk between keratinocytes, fibroblasts, and the skin immune system.

Education: BS in molecular biology and PhD in microbial genetics from the University of Belgrade in Serbia Awards: The Charles H. Revson Foundation Fellowship at Rockefeller University; Collaborative Translational and Clinical Studies Pilot Award from Weill Cornell Medical School; Gordon Conference Best Presentation Award; Brain Gain Program Teaching Award from the World University Service, Austrian Committee; Wound Healing Society Young Investigator Travel Award
Interesting Fact: Dr. Pastar is a CMAS certified scuba diver.
MELANIE M. PEARSON, PHD
Assistant professor in the Departments of Microbiology and Urology

The bacterial pathogen Proteus mirabilis is a common cause of urinary tract infections in patients with urinary catheters. Dr. Pearson studies virulence factors used by P. mirabilis to colonize and cause disease in the urinary tract, with an emphasis on adherence factors (fimbriae) and bacterial motility (flagella).

Education: BS in biomedical sciences from Western Michigan University; PhD in molecular microbiology from the University of Texas Southwestern Medical Center at Dallas. Postdoctoral Fellowship at the University of Michigan; NIH Ruth L. Kirschstein National Research Service Award and National Institute on Alcohol Abuse and Alcoholism Career Transition Award

Interesting Fact: Dr. Pearson plays the French horn.

DIMITRIS G. PLACANTONAKIS, MD, PHD
Assistant professor in the Department of Neurosurgery; director of the Neurosurgical Laboratory for Stem Cell Research

Dr. Placantonakis is interested in how stem cell function is regulated in normal neurogenesis, neuropsychiatric diseases, and malignant brain tumors. He hopes to design novel therapeutic approaches.

Education: BS in molecular biology and mathematics from Long Island University in Brooklyn; MD in medicine and PhD in neuroscience from NYU School of Medicine. Residency: Neurosurgery at Weill Cornell Medical College and Memorial Sloan-Kettering Cancer Center. Awards: Postdoctoral Fellowship in Stem Cell Biology at the Memorial Sloan-Kettering Cancer Center

Interesting Fact: Dr. Placantonakis enjoys listening to jazz in his free time.

PREETI RAGHAVAN, MD
Assistant professor in the Department of Rehabilitation Medicine; director of the Motor Recovery Research Laboratory at the Rusk Institute of Rehabilitation Medicine

Dr. Raghavan’s research interest is to study the mechanisms of recovery of hand function after brain injury and to develop effective rehabilitation strategies for clinical practice. Her studies examine the interaction between cognitive and emotional processes and movement. She is also interested in strategies to restore skill in elite musicians.

Education: MBBS in medicine and surgery from Rajah Muthiah Medical College in India. Residency: Rehabilitation medicine at the Albert Einstein College of Medicine. Awards: Research Fellowship in Motor Control and Learning at Teachers College, Columbia University. Interesting Fact: Dr. Raghavan is an Indian classical dancer and a violin student.

RAVICHANDRAN RAMASAMY, PHD
Associate professor in the Departments of Medicine and Pharmacology

Driven by the complexities that underlie myocardial ischemic injury and heart failure, Dr. Ramasamy hopes to elucidate the importance of aldose reductase and receptor for advanced glycation end-products (RAGE) in mediating ischemic injury, metabolic imbalances, and heart failure in people with diabetes and in the aging population.

Education: BSc in chemistry from Loyola College in India; PhD in chemistry from Loyola University, Chicago. Awards: Postdoctoral Fellowship at the University of Texas Southwestern Medical Center and University of Texas at Dallas; the Harold and Golden Lampert Award from Columbia University; Established Investigator Grant from the American Heart Association, National Center; Arthur J. Schmidt Fellow, Loyola University in Chicago. Interesting Fact: Dr. Ramasamy enjoys the sport cricket and cooking new vegetarian dishes.

ELI ROTHENBERG, PHD
Assistant professor in the Department of Biochemistry

Dr. Rothenberg’s laboratory develops and utilizes advanced fluorescence microscopy techniques to study biological systems. These techniques enable him and his teams to see individual biological molecules in real-time and superior accuracy, helping them study the mechanisms of enzymes, and protein-protein and protein-DNA/RNA interaction in DNA replication, DNA damage repair, viral infection, and other systems of interest.

Education: BSc in physics and a PhD in chemistry from Hebrew University of Jerusalem in Israel. Awards: EMBO Long-Term Fellowship; the National Science Foundation’s Center for Physics of Living Cells Fellowship. Interesting Fact: Dr. Rothenberg enjoys drawing and painting in his free time.
**GLENN SAXE, MD**

Professor and chair of the Department of Child and Adolescent Psychiatry and director of the NYU Child Study Center

Dr. Saxe’s research interests focus in two main areas. The first is identifying the biobehavioral processes that lead to traumatic stress in children so that knowledge of these processes can lead to improved treatments. The second is developing and evaluating treatments for traumatized children that may be used in clinical and community settings.

**Education:** BS in psychology from McGill University; MD in medicine from McMaster University. **Residency:** Adult psychiatry at Harvard Medical School at the Massachusetts Mental Health Center. **Awards:** Postdoctoral Fellowship at Harvard Medical School, Massachusetts General Hospital and Cambridge Hospital; Distinguished Fellow at the American Psychiatric Association; Leadership Award, Children’s Hospital Boston and South Boston Educational Complex from the Massachusetts Coalition for Suicide Prevention; Presidential Plenary Address, American Burn Association Annual Meeting; Edward Hornick Memorial Award from the New York Academy of Medicine; the William Schoenfeld Memorial Award from the American Society of Adolescent Psychiatry.

**Interesting Fact:** Dr. Saxe enjoys coaching Little League.

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**ANN MARIE SCHMIDT, MD**

The Iven Young Professor of Endocrinology in the Departments of Medicine and Pharmacology

Dr. Schmidt’s laboratory discovered RAGE, a cell-surface receptor that exacerbates inflammatory damage, particularly in diabetes and its complications. Recent discoveries in her laboratory on the intracellular interactions of the RAGE cytoplasmic domain with diaphanous-1 form the basis for the identification of a new class of RAGE inhibitors.

**Education:** BA in biology and history from NYU; MD from NYU School of Medicine. **Residency:** Internal medicine at NYU Bellevue Hospital Center. **Awards:** Postdoctoral Fellowship in the Department of Physiology at Columbia University; Juvenile Diabetes Research Foundation Postdoctoral Fellow.

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**DELIA M. TALOS, MD**

Assistant professor in the Department of Neurology

Dr. Talos’s laboratory is involved in translational projects aimed at evaluating novel mechanisms of epilepsy and defining new therapies. They assess protein changes associated with epileptogenesis in human tissue and epilepsy mouse models. Ongoing studies include the evaluation of neuroinflammation, neurotransmitter receptors, and mTOR signaling pathway in Tuberous Sclerosis Complex.

**Education:** MD in clinical medicine from Fujian Medical University in China. **Awards:** Postdoctoral Fellowship in Ischemia Disorder and Gene Regulation at Columbia University.

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**MAMTA V. TAHLIANI, PHD**

Assistant professor in the Department of Biochemistry

Dr. Tahiliani recently discovered that TET1 catalyzes the conversion of 5-methylcytosine (5mC) in DNA to 5-hydroxymethylcytosine (hmC). Her laboratory focuses on the interconnection between DNA modifications and genomic regulation. In particular, they are interested in how DNA modifications influence genomic stability and the impact this may have on diseases such as cancer.

**Education:** BA in molecular and cellular biology from the University of California, Berkeley; PhD in immunology from Harvard Medical School. **Awards:** The Harold M. Weintraub Graduate Student Award; the Modell Award. **Interesting Fact:** Outside the laboratory, Dr. Tahiliani enjoys the ballet and modern dance.

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**SHI-FANG YAN, MD**

Associate professor in the Departments of Pharmacology and Medicine

Dr. Yan’s research interests are to understand the molecular and cellular mechanisms of diabetic complications. She concentrates on dissecting the interplay between key molecules linked to ischemic disorders and vascular stress, including Egr-1 (early growth response-1), PKC-beta (protein kinase C-beta), and RAGE.

**Education:** MD in clinical medicine from Fujian Medical University in China. **Awards:** Postdoctoral Fellowship in Ischemia Disorder and Gene Regulation at Columbia University.
Publishing in a peer-reviewed journal is an achievement that advances scientific and medical knowledge.

In 2010 NYU School of Medicine faculty published important papers in a number of major, highly acclaimed, international peer-reviewed journals. A partial list includes *Nature*, *New England Journal of Medicine*, *Cell*, *Science*, *Nature Immunology*, *Circulation*, *Journal of Experimental Medicine*, *Molecular Cell*, *Cell Host & Microbe*, *JAMA*, *Genes & Development*, and the *Journal of the American College of Cardiologists*.

NYU faculty members also participate in an international exchange of expertise by donating their time as peer reviewers to their colleagues. Scientists receive helpful feedback when experts in the field peer review their manuscripts. This process allows papers to be corrected and revised before they are added to the body of published literature from which all researchers then draw.

The pages that follow sample the scholarly work on which NYU School of Medicine faculty were principal authors; all were published in respected journals.
This is a partial list of selected NYU school of Medicine faculty papers published in calendar year 2010. Items here were chosen because they are already accruing citations faster than other 2010 papers or were published in journals that had impact factors of at least 10. or a scholarly review. Books, essays, commentaries, and editorials (and other opinion pieces) were not included.


### Belasco JG. All things must pass: contrasts and commonalities in Ameri-


### Cloitre M, Stovall-McClough KC, Nooner K, Zorbas P, Cherry S, Jackson CL, Gan W, Petkova E. Treatment for PTSD related to child-


When researchers knocked out an important cellular passageway, called the KCa3.1 channel, they prevented mice from developing severe colitis, or inflammation of the colon. These preclinical findings could point toward a new therapy for ulcerative colitis and a related condition known as Crohn’s disease.


Researchers found that our immune system’s sentinels, called dendritic cells, contain a sensor that recognizes HIV. The sensor is normally turned off, however, preventing the immune system from properly responding. By forcing dendritic cells to become vulnerable to HIV infection, the scientists could turn the virus-specific sensor on and trigger a strong defense system known as innate immunity.


**Current Funding**

*Grant Revenue* (2008–2010)

- **2008** $196,308,978
- **2009** $200,568,392
- **2010** $234,309,000

**FY10 Awards By Funding Source**

- a STATE & LOCAL GOVERNMENT 1.0%
- b INDUSTRY 2.4%
- c NIH: SUBCONTRACT 6.2%
- d FEDERAL: NON-NIH 7.9%
- e NON-FEDERAL 10.4%
- f NIH 72.1%

**FY10 NIH Awards**

- a FELLOWSHIP 0.6%
- b RESOURCE 5.7%
- c CAREER 3.1%
- d TRAINING 4.7%
- e PROGRAMS 10.3%
- f COOPERATIVE AGREEMENTS 10.4%
- g RESEARCH 65.2%

**STIMULUS FUNDING**

$92.3 million in Federal Stimulus Grants, Contracts and Sub-Contracts obligated as of August 2011 under the American Recovery and Reinvestment Act (ARRA)
NEW 2010 FEDERAL FUNDING OF AT LEAST $100,000

<table>
<thead>
<tr>
<th>Project Description</th>
<th>Estimated Funding</th>
</tr>
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<tbody>
<tr>
<td>Howard B. Abikoff Follow-up study of the multimodal treatment study of children with and without attention deficit hyperactivity disorder NIH (National Institutes of Health)</td>
<td>$171,265</td>
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<tr>
<td>Steven B. Abramson Role of gut microbiota in rheumatoid arthritis NIH/NIDDK (National Institute of Diabetes and Digestive and Kidney Diseases)</td>
<td>$3,994,224</td>
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<tr>
<td>Jiyoung Ahn Integrative analysis on genome wide gene expression for prostate cancer prognosis DOD (Department of Defense)</td>
<td>$270,321</td>
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<td>Iannis Aifantis Regulation of hematopoietic stem cell differentiation NIH/NIGMS (National Institute of General Medical Sciences)</td>
<td>$1,513,404</td>
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<tr>
<td>Iannis Aifantis Mechanisms of T cell leukemia induction and maintenance NIH/NCI (National Cancer Institute)</td>
<td>$1,176,508</td>
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<td>Iannis Aifantis Modifiers of notch stability and their role in cancer NIH/NCI (National Cancer Institute)</td>
<td>$385,954</td>
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<td>Constantin Aliferis Causal discovery algorithms for translational research with high-throughput data NIH/NLM (National Library of Medicine)</td>
<td>$344,512</td>
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<tr>
<td>Leon Axel Noninvasive assessment of liver stiffness with tagged MRI NIH/NIDDK (National Institute of Diabetes and Digestive and Kidney Diseases)</td>
<td>$464,750</td>
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<tr>
<td>Dafna Bar-Sagi Mechanisms of signal transduction by Ras proteins NIH/NCI (National Cancer Institute)</td>
<td>$2,070,250</td>
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<tr>
<td>Dafna Bar-Sagi Positive and negative regulation of RTK-Ras signaling NIH/NCI (National Cancer Institute)</td>
<td>$288,219</td>
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<tr>
<td>Joel G. Belasco Mechanisms of gene regulation by microRNAs NIH/NCI (National Cancer Institute)</td>
<td>$121,405</td>
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<tr>
<td>Melissa A. Bender Impact of diagnosis and prophylaxis of TB among HIV patients in South Africa NIH/NIH (National Institutes of Health)</td>
<td>$561,972</td>
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<td>Nina Bhardwaj Immunosuppressive pathways in acute HIV infection NIH/NIAID (National Institute of Allergy and Infectious Diseases)</td>
<td>$859,125</td>
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<td>Nina Bhardwaj Induction of immunity by non-replicating HIV-1 NIH/NIAID (National Institute of Allergy and Infectious Diseases)</td>
<td>$361,112</td>
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<tr>
<td>Nina Bhardwaj Modulating anti-HIV immunity by plasmacytoid dendritic cells NIH/NIAID (National Institute of Allergy and Infectious Diseases)</td>
<td>$2,070,250</td>
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<tr>
<td>Martin J. Blaser Mathematical models of H. pylori gastric colonization NIH/NIAID (National Institute of Allergy and Infectious Diseases)</td>
<td>$1,139,572</td>
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<tr>
<td>Stewart A. Bloomfield Training program in neuroscience NIH/NCI (National Institute of Neurological Disorders and Stroke)</td>
<td>$1,243,262</td>
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<tr>
<td>Florence Bodeau-Livinec Anemia in pregnancy in Benin and impact on cognitive function in childhood NIH/NIAID (National Institute of Allergy and Infectious Diseases)</td>
<td>$343,004</td>
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<tr>
<td>R. Scott Braithwaite A computer simulation of the sub-Saharan HIV pandemic that can estimate benefit and value from alcohol interventions NIH/NCI (National Institutes of Health)</td>
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<td>R. Scott Braithwaite Mentored career development in comparative effectiveness research Agency for Healthcare Research and Quality</td>
<td>$707,599</td>
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<tr>
<td>R. Scott Braithwaite NYU Prevention Research Center: comparative effectiveness research program CDC (Centers for Disease Control and Prevention)/NIH (National Institutes of Health)</td>
<td>$3,287,881</td>
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<td>Oraee Branch Malaria immunity and diversity in low transmission NIH/NCI (National Institutes of Health)</td>
<td>$187,658</td>
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<td>Laurie Miller Brotman Academic achievement outcomes from a Pre-K family and school intervention ED (Department of Education) NIH/NIDDK (National Institute of Diabetes and Digestive and Kidney Diseases)</td>
<td>$2,127,638</td>
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<tr>
<td>Tracy Butler Imaging inflammation in focal epilepsy NIH/NCI (National Institutes of Health)</td>
<td>$637,859</td>
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<td>Esther J. Calzada Family and school contexts as predictors of early childhood Latino development NIH/NICHD (National Institute of Child Health and Development)</td>
<td>$3,316,057</td>
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<td>Timothy J. Cardozo Structure-based characterization of gp120 non-V3 variable loop epitopes NIH/NIAID (National Institute of Allergy and Infectious Diseases)</td>
<td>$3,433,320</td>
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<td>Jane M. Carlton Roche 454 next generation sequencer for human microbiome and infectious disease research NIH/NIAID (National Institute of Allergy and Infectious Diseases)</td>
<td>$485,500</td>
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<td>Jane M. Carlton Comparative evolutionary genomics and infectious disease NIH/NIAID (National Institute of Allergy and Infectious Diseases)</td>
<td>$154,315</td>
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<td>Jane M. Carlton Promotion of plasmodium research and training in India NIH/NIAID (National Institute of Allergy and Infectious Diseases)</td>
<td>$172,800</td>
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<td>Jane M. Carlton Center for the study of complex malaria in India NIH/NIAID (National Institute of Allergy and Infectious Diseases)</td>
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<td>William L. Carroll Drug resistant pathways in relapsed acute lymphoblastic leukemia (ALL) NIH/NIAID (National Institute of Allergy and Infectious Diseases)</td>
<td>$2,509,082</td>
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<td>William L. Carroll Integrated genomics profile of relapsed childhood acute lymphoblastic leukemia NIH/NIAID (National Institute of Allergy and Infectious Diseases)</td>
<td>$404,333</td>
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<tr>
<td>Francisco Xavier Castellanos Neural dissection of hyperactivity/inattention in autism NIH/NIMH (National Institute of Mental Health)</td>
<td>$2,072,855</td>
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<tr>
<td>Moses V. Chao Mechanism of neurotrophic latency response in an HSV-1 vestibular neuritis mouse NIH/NIAID (National Institute of Allergy and Infectious Diseases)</td>
<td>$1,043,250</td>
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<td>Moses V. Chao Mechanism of BDNP dependent regulation of GR action NIH/NCI (National Institutes of Health)</td>
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<td>Moses V. Chao Molecular analysis of neurotrophic action NIH/NCI (National Institutes of Health)</td>
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<td>Yu Chen Genetic susceptibility to cardiovascular effects of arsenic exposure NIH/NIAID (National Institute of Allergy and Infectious Diseases)</td>
<td>$2,630,585</td>
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<td>Mitchell Chesler Latent TGF-beta binding protein in mammary development and tumorigenesis NIH/NCI (National Institutes of Health)</td>
<td>$785,000</td>
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<td>Antonio J. Convit Obesity, insulin resistance, and brain in adolescence NIH/NCI (National Institutes of Health)</td>
<td>$2,473,256</td>
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<td>Max Costa Carcinogenesis of nickel and epigenetic control NIH/NCI (National Institutes of Health)</td>
<td>$738,312</td>
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<td>Bruce Neil Cronstein The pharmacology of dermal fibrosis NIH/NIAID (National Institute of Allergy and Infectious Diseases)</td>
<td>$360,159</td>
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<td>Bruce Neil Cronstein Institutional clinical and translational science award NIH/NIAID (National Institute of Allergy and Infectious Diseases)</td>
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<tr>
<td>Bruce Neil Cronstein Institutional clinical and translational science award NIH/NIAID (National Institute of Allergy and Infectious Diseases)</td>
<td>$1,122,128</td>
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<td>Ramanuj Dasgupta Integration of RNAi, proteomics, and chemical genetics to identify B-cell inhibitors NIH/NCI (National Institutes of Health)</td>
<td>$159,778</td>
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<td>Karen P. Day P. falciparum var gene diversity and malaria control NIH/NIAID (National Institute of Allergy and Infectious Diseases)</td>
<td>$2,112,500</td>
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<tr>
<td>Mony John De Leon Maternal history of Alzheimer’s predisposes children to amyloid beta-related hypometabolism NIH/NIAID (National Institute of Allergy and Infectious Diseases)</td>
<td>$2,917,039</td>
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<td>Adriana Di Martino Translational developmental neuroscience of autism NIH/NIAID (National Institute of Allergy and Infectious Diseases)</td>
<td>$647,982</td>
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<tr>
<td>Joan Durbin The role of type III IFN in innate immunity to respiratory virus infection NIH/NIAID (National Institute of Allergy and Infectious Diseases)</td>
<td>$1,636,975</td>
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Joan Durbin  A novel approach to RSV vaccination NIH $3,239,920
Michael L. Dustin  Environmental control of the immunological synapse NIH $1,870,573
Michael L. Dustin  Nanotechnology center for mechanics in regenerative medicine NIH $3,715,375
Brian David Dynlacht  role of the pRB family in quiescence and differentiation NIH $219,700
Joel D. Ernst  Mycobacterium tuberculosis evasion of CD4+ T cells in vivo NIH $2,071,668
Joel D. Ernst  Mycobacterium tuberculosis antigen diversity NIH $3,417,931
Steven H. Ferris  Alzheimer’s Disease Core Center NIH $9,777,138
Gordon James Fishell  Regional and genetic diversity of cortical interneurons NIH $2,561,620
Edward A. Fisher  Molecular regulation of atherosclerosis regression NIH/NHLBI (National Heart, Lung, and Blood Institute) $2,729,962
Glenn I. Fishman  Training program in cardiovascular sciences NIH $1,328,024
Glenn I. Fishman  High resolution ultrasound system NIH $463,840
Glenn I. Fishman  NYU core grant for cardiovascular faculty recruitment NIH $1,553,738
Silvia C. Formenti  Small animal low and high dose research irradiator for short and long duration studies NIH $469,716
Ute Frevert  The lung and malaria NIH/NIAD $460,610
Robert C. Froemke  Synaptic basis of perceptual learning in primary auditory cortex NIH $748,999
Vilma Gabbay  The neurobiology of adolescent depression NIH $108,000
Wenbiao Gan  Experience-dependent plasticity of synaptic structure NIH $1,868,256
Terry Gordon  Training program in environmental toxicology NIH/NEIHS (National Institute of Environmental Health Services) $1,428,525
Miroslaw K. Gorny  Immunoglobulin gene usage for anti-V3 monoclonal antibodies NIH $181,956
Robert I. Grossman  Quantitative MRI and 1H-MRS in traumatic brain injury (administrative supplement) NIH $245,672
Gabriele Grunig  T helper 2 inflammation and severe muscularization of arteries in the lungs NIH $1,600,000
Karen D. Hendricks-Munoz  Maternal indigenous bacteria transmission to the infant with KMC NIH $426,802
Catarina E. Hioe  CC chemokine secretion to protect antigen-specific CD4 T cells from HIV NIH/NIAID $845,104
Tony T. Huang  Role of deubiquitination in Panconi anemia cancer susceptibility pathway NIH $212,264
Xi Huang  Utilization of calcite for the reduction of coal mine dust toxicity CDC $588,823
E. Jane Albert Hubbard  Control of onset of meiosis in C. elegans NIH $1,423,656
Stevan R. Hubbard  Structural study of the insulin receptor tyrosine kinase NIH $100,000
Margaret R. Huff  Glyco-immune diagnostic signatures and therapeutic targets of mesothelioma DOD $578,190
Daniel C. Javitt  The Conte Center for Schizophrenia Research at the Johns Hopkins School of Medicine NIH $357,647
Horacio Kaufmann  Carbidopa for the treatment of nausea and vomiting in patients with familial dysautonomia NIH $365,645
Juan José Lafaille  Thymic selection of Foxp3+ regulatory T cells NIH $422,500
Juan José Lafaille  Characterization of lymphocytes that suppress EAE NIH $397,968
Nathaniel R. Landau  APOBEC3G/CEM15 inhibition of lentivirus replication NIH/NIAID $2,112,500
Nathaniel R. Landau  APOBEC3G/CEM15 inhibition of lentivirus replication NIH $168,784
Vivian S. Lee  Accurate measurement of renal function in cirrhosis NIH $2,869,608
Vivian S. Lee  MSB central animal facility renovation NIH $9,339,773
Dan R. Littman  Role of ROBt in the transcriptional regulatory network underlying Th17 lineage specific and function NIH $495,241
Rodolfo Linas  Neurobiology of cerebellar brainstem systems NIH $177,450
Michael A. Long  Cellular and synaptic rules enabling vocal communication NIH/NIDCD (National Institute on Deafness and Other Communication Disorders) $722,101
Dolores Malaspina  Paternal age related schizophrenia as a discrete disorder NIH $978,357
Charles R. Marmar  Prospective study of traumatic stress in police officers NIH $2,168,437
Charles R. Marmar  Biomarkers for PTSD DOD $3,546,250
Jonathan Melamed  The university prostate cancer pathology resource network DOD $1,005,715
Alan L. Mendelsohn  Promoting early school readiness in primary health care NIH $3,643,737
Elizabeth A. Miller  Use of a novel antigen loading platform for dendritic cell-based HIV vaccines NIH $460,500
George Miller  Role of dendritic cells in the pathogenesis of hepatic fibrosis NIH $767,770
Moosa Mohammadi  Mechanisms of FGF receptor regulation and signaling NIH $206,036
Moosa Mohammadi  Mechanisms of FGF receptor regulation and signaling NIH $3,399,654
Kathryn J. Moore  Immunomodulatory functions of neuronal guidance cues NIH/NHLBI $9,397,106
Kathryn J. Moore  Mechanisms of CD36 signal transduction NIH $850,130
David A. Moscatelli  Regulation of the prostate stem cell niche NIH $363,773
<table>
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<tr>
<th>Name</th>
<th>Funding</th>
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<tr>
<td>John S. Munger</td>
<td>Hedgehog signaling in lung growth and injury NIH/NHLBI $464,750</td>
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<td>Frederick Naftolin</td>
<td>Estradiol-induced sialylation of nCAM prevents leukocyte-endothelial adhesion NIH $948,608</td>
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<td>Elizabeth H. Nardin</td>
<td>Malaria vaccines modified with TLR agonist adjuvants NIH $422,500</td>
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<td>John G. Nicholson</td>
<td>Diffusion of substances through the brain NIH/NINDS (National Institute of Neurological Disorders and Stroke) $1,431,082</td>
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<td>Margaret C. Nordin</td>
<td>Establishment of clinical practice guidelines for musculoskeletal disorders NIH $137,460</td>
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<td>Richard P. Novick</td>
<td>Non-antibiotic strategies for infections caused by MRSA and other staphylococci NIH $59,047</td>
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<td>Evgeny A. Nueller</td>
<td>Sensor mechanisms of HSF activation NIH $2,070,250</td>
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<td>Phillip N. Nyambi</td>
<td>Viral evolution and humoral immune response to dual HIV-1 infection NIH $2,514,637</td>
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<td>Phillip N. Nyambi</td>
<td>Improving research capacity in Cameroon for studies on HIV-associated malignancie NIH $484,000</td>
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<td>Olugbenga G. Ogedegbe</td>
<td>Faith-based approaches in the treatment of hypertension NIH $3,580,088</td>
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<td>Olugbenga G. Ogedegbe</td>
<td>Practice-based trial of blood pressure control in African Americans NIH/NHLBI $2,325,498</td>
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<td>Seth J. Orlow</td>
<td>Biogenesis of melanosomes NIH $3,444,089</td>
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<tr>
<td>Seth J. Orlow</td>
<td>A reconstructed skin model for development of treatments for albinism NIH $898,590</td>
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<td>Harvey I. Pass</td>
<td>Glyco-immune diagnostic signatures and therapeutic targets of mesothelioma DOD $394,850</td>
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<td>Harvey I. Pass</td>
<td>The North American mesothelioma consortium NIH $3,117,992</td>
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<td>Camille A. Pearte</td>
<td>Enhancing delivery of cardiovascular disease preventive care in ethnic minority women NIH $137,460</td>
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<td>Zhiheng Pei</td>
<td>Foresight microbiome in development of esophageal adenocarcinoma NIH/NIDDK (National Institute of Diabetes and Digestive and Kidney Diseases) $3,699,609</td>
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<td>Mary C. Perrin</td>
<td>Epigenetics and female reproductive cancers NIH $103,968</td>
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<td>Preeti Bhagavan</td>
<td>Interhemispheric transfer of grasp control after stroke NIH $129,465</td>
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<td>Jayne Raper</td>
<td>Trypanosomiasis resistant cattle NSF (National Science Foundation) $2,070,250</td>
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<td>Joseph E. Ravenell</td>
<td>Faith-based approaches to treating hypertension and colon cancer prevention NIH $3,444,089</td>
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<td>Ravinder R. Regatte</td>
<td>Cartilage, bone, and marrow interactions in knee OA NIH $2,638,529</td>
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<td>Mariano J. Rey</td>
<td>NYU Health Promotion and Prevention Research Center CDC/DHHS $4,975,363</td>
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<td>Mariano J. Rey</td>
<td>NYU Center for the Study of Asian American Health NIH $599,672</td>
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<td>Ana Rodriguez</td>
<td>New plasmid strategies to modulate inflammation NIH $4,000,809</td>
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<td>William N. Rom</td>
<td>NYU lung cancer biomarker center NIH/NCI (National Cancer Institute) $4,153,652</td>
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<td>David Brian Roth</td>
<td>Medical scientist research service award NIH $7,066,490</td>
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<td>David Brian Roth</td>
<td>RAG-induced DNA damage: mechanisms and responses NIH $1,496,240</td>
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<td>Bernardo Rudy</td>
<td>Molecular components of A-Type K+ channels NIH $508,847</td>
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<td>Bernardo Rudy</td>
<td>Expression and function of K+ channel genes in brain NIH $1,811,471</td>
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<td>Hyung Don Ryoo</td>
<td>Coordination of apoptosis and cell proliferation in Drosophila NIH $3,090,778</td>
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<td>Hyung Don Ryoo</td>
<td>Quality control mechanisms against misfolded rhodopsins in Drosophila NIH $1,140,750</td>
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<td>James L. Salzer</td>
<td>Regulation of Schwann cell ensheathment and myelination by type III neuregulin NIH $253,500</td>
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<td>Herbert H. Samuel</td>
<td>Metabolic effects of thyroid hormone NIH $211,250</td>
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<td>Eric E. Sigmund</td>
<td>Dynamical DTI: a method for time-resolved in vivo diffusion tensor imaging NIH $443,625</td>
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<td>Photini Sinnis</td>
<td>Structure and function of the circumsporozoite protein NIH $2,070,250</td>
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<td>Jane A. Skok</td>
<td>Co-ordination of recombination and allelic exclusion at IgH and Igk loci NIH $422,500</td>
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<td>Jane A. Skok</td>
<td>Spatiotemporal control of recombination by the RAG proteins and ATM NIH $999,998</td>
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<td>Edward Y. Skolnik</td>
<td>The role of the calcium-activated potassium channel in the pathogenesis of ADPKD NIH $114,075</td>
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<td>David L. Stokes</td>
<td>Electron microscopy of P-type ion pumps NIH $2,025,498</td>
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<td>Greg S. B. Suh</td>
<td>Genes and neural circuits mediating avoidance behavior NIH $1,494,402</td>
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<td>Regina M. Sullivan</td>
<td>Sensitive period for neurobehavioral development of social behavior NIH $2,025,498</td>
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<td>Tung-Tien Sun</td>
<td>Growth, differentiation and disease of urothelium NIH/NIDDK $8,243,906</td>
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<td>Mario A. Svirsy</td>
<td>Behavioral and physiological changes in acoustic-electrical pitch matching after cochlear implantation NIH $944,084</td>
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<td>Kam-Meng M. Tsou-Wong</td>
<td>Development of cell-permeable antibodies for post-exposure treatment of ricin NIH $394,850</td>
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<td>Jessica E. Treisman</td>
<td>Pattern formation in the Drosophila eye disc NIH $1,652,625</td>
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<td>Jessica E. Treisman</td>
<td>Mechanisms of receptor protein tyrosine phosphatase signaling in Drosophila development NIH $1,280,452</td>
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<td>Daniel H. Turnbull</td>
<td>Molecular UBM and MRI of vascular development NIH $1,695,000</td>
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<td>Daniel H. Turnbull</td>
<td>MRI tracking of stem cell migration during brain injury NIH/NINDS $464,750</td>
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<tr>
<td>Derya Unutmaz</td>
<td>Role and perturbation of Th17 cells during HIV infection NIH $464,750</td>
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New 2010 Nonfederal Funding of at Least

$100,000

Steven B. Abramson The Linda Gosden Robinson Fellowship Linda Gosden Robinson $100,000

Iannis Alfantis Damon Runyon Cancer Research Foundation Fellowship Damon Runyon Cancer Research Foundation $156,000

Chiye Aski The role of GABA in regulating synapses altered by pentylenetetrazol and anorectic behavior The Klarman Family Foundation $260,816

Felicia B. Axelrod The Dysautonomia Center Dysautonomia Foundation, Inc. $272,551

Dafna Bar-Sagi Role of KRas activation in modulating the immune response during pancreatic cancer development Cancer Research Institute, Inc. $145,500

Jeffrey S. Berger Platelet activity in cardiovascular disease Doris Duke Charitable Foundation $486,000

Nina Bhardwaj Modulating anti-tumor immunity with dendritic cells Henry R. Silverman $500,000

Nina Bhardwaj Modulating anti-tumor immunity with dendritic cells Melanoma Research Alliance $500,000

Martin J. Blaser Diaser Belper Program in Human Microbial Ecology in Health and Disease Diane Belper $500,000

Martin J. Blaser Engineered H. pylori as a diarrheal vaccine platform Bill and Melinda Gates Foundation $100,000

Allal Boutajangout Influence of presenilin mutation on tau pathology Alzheimer’s Association $120,000

R. Scott Braithwaite Tailoring clinical guidelines to patient-specific comorbidities Robert Wood Johnson Foundation $161,539

William Carroll IKZF1 deletion and chemotherapy resistance in pediatric ALL St. Baldrick’s Foundation $192,734

Heran Darwin Characterization of a novel post-translational modification system in Mycobacterium tuberculosis Irma T. Hirschl Trust $175,000

Heran Darwin Ubiquitin-like proteins in bacterial pathogens Burroughs Wellcome Fund $500,000

Ram Dasgupta Role of the ETS-domain transcription factor Yan March of Dimes Foundation $192,000

Gregory David Cellular senescence as a barrier against cancer Irma T. Hirschl Trust $175,000

Bouke C. DeJong NYU School of Medicine/Bomu Clinic Program Gilead Sciences Foundation $100,000

Shubhada Dhage Assessing the impact of breast stromal gene expression on surgical margin Breast Cancer Alliance $125,000

Jessica S. Donington Isolation and characterization of mesothelioma stem cells from multiple tumor samples International Association for the Study of Lung Cancer $125,000

Michael Dustin The role of actin cytoskeleton in regulating the immunological synapse-kinase balance Cancer Research Institute, Inc. $145,500

Beverly-Xaviera Watkins Increasing capacity of the reprotoxicity of inhaled Cd NP NIH $884,798

Judith T. Zelikoff Role of physico-chemical properties in the reprotoxicity of inhaled Cd NIH $1,242,287

Thomas M. Wisniewski Therapeutic approaches for prion disease, competitive revision NIH $1,342,987

Edward A. Fisher Lipid Treatment & Research Center of the Leon H. Charney Division of Cardiology The Klein Family $250,000

Silvia C. Formenti An integrated program to assure optimally informed consent to therapy and/or participation in clinical research at Bellevue Hospital Center Greater New York City Affiliate of Susan G. Komen for the Cure, Inc. $199,986

Jacqueline A. French Research in inflammation and epilepsy Mr. and Mrs. James R. Shaw $1,000,000

Jacqueline A. French Women with epilepsy: pregnancy outcomes and deliveries Milken Family Foundation $300,000

Adrian I. Erlebacher Mechanisms of effector phase tolerance towards the allogeneic fetus American Cancer Society, Inc. $720,000

Steven R. Flanagan The Rusk Institute Research and Education Fund Carol J. Feinberg $375,000

William J. Clinton Foundation $362,984

Carlos Fernandez-Hernando Role of protein kinase Akt in atherosclerosis American Heart Association $122,000

R. Scott Braithwaite Tailoring clinical guidelines to patient-specific comorbidities Robert Wood Johnson Foundation $161,539

Shaffiq Essajee Scaling up care and treatment for people living with HIV and AIDS William J. Clinton Foundation $362,984

Bill and Melinda Gates Foundation $550,000

Robert Wood Johnson Foundation $300,000

Gordon J. Fishell The integration of interneurons into cortical microcircuits Simons Foundation $300,000

Edward A. Fisher Lipid Treatment & Research Center of the Leon H. Charney Division of Cardiology The Klein Family $250,000

Steven R. Flanagan The Rusk Institute Research and Education Fund Carol J. Feinberg $375,000

Jacqueline A. French Research in inflammation and epilepsy Mr. and Mrs. James R. Shaw $1,000,000

Jacqueline A. French Women with epilepsy: pregnancy outcomes and deliveries Milken Family Foundation $300,000

Alan B. Frey Diabetogenic restoration of immune tolerance in type 1 diabetes Leona M. and Harry B. Helmsley Charity Trust $2,610,326

Linda Granowitz Making Headway research support Making Headway Foundation, Inc. $119,246

Gabriele Grunig Pulmonary arterial muscularization—identification of critical pathogenic immune mediators American Heart Association $198,000

Alexes Hazen Institute of Reconstructive Plastic Surgery Judy and Angelo Coven Charitable Lead Unit Trust $100,000

Da-Neng Wang Structural basis of tetracycline resistance by efflux pump TetL NIH $1,338,206

Beverly-Xaviera Watkins Increasing capacity and public trust: a strategy for building effective sustainable community-academic partnerships through mentoring, education, training, and workforce development NIH $853,912

Michael L. Weitzman Preventing child residential lead exposure by window replacement NIH $924,863
Eva M. Hernando-Monge  Role of miR-182-98-181 cluster in melanocyte differentiation and melanoma-pathogenesis  Harry J. Lloyd Charitable Trust  $215,230

Eva M. Hernando-Monge  Study of the role of microRNAs in melanoma brain tropism  Melanoma Research Foundation  $100,000

Max J. Hilz  A collaborative study in traumatic brain injury  International Brain Research Foundation, Inc.  $1,000,000

Mayumi Ito  Epithelial microenvironment in melanocyte stem cell aging  The Ellison Medical Foundation  $400,000

Martin L. Kahn  Department of Medical Education & Research  The Estate of Eli Mason  $100,000

Horacio Kaufmann  Dysautonomia Clinical Research Laboratory  Dysautonomia Foundation, Inc.  $205,473

Horacio Kaufmann  Dysautonomia Research Laboratory  Dysautonomia Foundation, Inc.  $352,797

Michelle Krogsgaard  Pew Biomedical Scholars Program  The Pew Charitable Trusts  $240,000

Itzhak Kronzon  Endocardiographic Laboratory  Meidar Family Charitable Trust  $100,000

Juan Jose Lafaille  The immunological environment in the CNS during spontaneous EAE  National Multiple Sclerosis Society  $529,524

Nathaniel R. Landau  Mechanism of Vpx and Vpr targeted restricted factors am/AR  The Foundation for AIDS Research  $225,000

Herbert Lepor  NYU Medical Urology  The Selander Foundation  $100,000

Herbert Lepor  Prostate Cancer Research Program  J. Weinstein Foundation, Inc.  $125,000

Herbert Lepor  Urology Research Program  Mark Tillinger  $100,000

Jamie P. Levine  Plastic Surgery Research Laboratory  National Foundation for Facial Reconstruction  $180,000

David E. Levy  The Leukemia & Lymphoma Society Scholar Award  The Leukemia & Lymphoma Society  $195,000

Yong-Sheng Li  Ischemic stroke research  F.M. Kirby Foundation, Inc.  $105,000

Dan R. Littman  Defining the transcription factor networks that control Th17 specification  Cancer Research Institute, Inc.  $145,500

Dan R. Littman  Regulation of inflammatory T lymphocyte differentiation by non-coding RNA  Cancer Research Institute, Inc.  $145,500

Dan R. Littman  Studies for roles of IL-23 and IL-22 in arthritogenic Th17 cell responses and the pathogenesis of autoimmune arthritis  Arthritis National Research Foundation  $150,000

Dan R. Littman  The transcription factor network regulating Th17 specification and function  Crohn’s & Colitis Foundation of America  $174,750

Karen Maas  Influence of actin assembly factor regulation on cardiomyocyte differentiation  American Heart Association  $308,000

Dolores Malapina  INSPIRES program  The Peterson Foundation  $100,000

Catherine Manno  Joseph Dancis, MD (deceased)  American Cancer Society, Inc.  $100,000

George Miller  Dendritic cell activation and contribution to hepatic cirrhosis  American Liver Foundation  $139,000

Lisa Mosconi  Maternal history of Alzheimer’s predisposes children to brain hypometabolism  Alzheimer’s Association  $200,000

Jeremy F. Nance  Identification and analysis of gastrialt control genes in C. elegans  American Cancer Society, Inc.  $150,000

Victor Nussenzweig  Drugs that inhibit malaria infection and block transmission  Bill and Melinda Gates Foundation  $100,000

Seth J. Orlow  Pediatric and Adolescent Dermatology Research Fund  The Munro Family  $500,000

H. Leon Pachter  NYU Institute for Surgical Research  Bernard & Irene Schwartz Foundation, Inc.  $600,000

Harvey Pass  Lung cancer research  The Edward John & Patricia Rosenwald Foundation  $1,100,000

Bruce Raphael  NYU Hematology Research Fund  Bernard L. Schwartz  $100,000

Joseph E. Ravenell  Harold Amos Medical Faculty Development Program  The Robert Wood Johnson Foundation  $353,687

Mona Rigaud  The Clinton Health Access Initiative  William J. Clinton Foundation  $159,133

Ana Rodriguez  Uric acid-induced inflammation in cerebral malaria  The Dana Foundation  $200,000

Bernardo Rudy  Neocortical cholinergic function in Alzheimer’s mouse models  Alzheimer’s Association  $198,000

James L. Salzer  Role of nectin-like protein complex in oligodendrocyte myelination  National Multiple Sclerosis Society  $135,753

Freya R. Schnabel  The Arlene and Arnold Goldstein Breast Cancer registry and educational programs  Mr. and Mrs. Arnold Goldstein  $1,050,000

Robert J. Schneider  Inflammatory breast cancer  Avon Foundation for Women  $405,000

Robert J. Schneider  Integrated breast cancer care for medically underserved multi-ethnic women in New York  Avon Foundation for Women  $200,000

Susan R. Schwab  Lymphocyte trafficking: role and regulation of SIP distribution  International Human Frontier Science Program  $139,200

Susan R. Schwab  Pew Biomedical Scholars Program  The Pew Charitable Trusts  $240,000

Susan R. Schwab  Spingosine-1-phosphate distribution and immunity  Cancer Research Institute, Inc.  $200,000

Richard Shapiro  Melanoma Research Fund  Marc Jacobs International, LLC  $528,089

Bo Shopsin  AGR function and staphylococcus fitness in cardiovascular infection  American Heart Association  $134,000

Jane A. Skok  The Leukemia & Lymphoma Society Scholar Award  The Leukemia & Lymphoma Society  $550,000

Jane A. Skok  Role of allelic exclusion American Society of Hematology  $100,000
Funding

Sara Suarez MicroRNA as regulators of endothelial cell biology and as potential therapeutic targets American Heart Association $231,000

Greg Seong-Bae Suh Identification of the internal caloric sensor The Klarman Family Foundation $123,059

Regina M. Sullivan Emotion & time – developmental study of temporal memory and its modification by emotion Partner University Fund $213,600

David Zagzag Human brain tumor bank Making Headway Foundation, Inc. $126,246

Susana B. Zolla-Pazner A conserved structure of gp120 that can induce broadly neutralizing antibodies against HIV-1 Bill and Melinda Gates Foundation $1,520,998

Joseph Zuckerman MIS Laboratory, Department of Orthopaedic Surgery Peter S. Walker, Ph.D $300,000

Estate of Marion Barbara Carstairs Biomedical medicine research $450,000

Lawrence D. Glaubinger Anterior cruciate ligament research $100,000

James D. Kuhn Research to improve treatment technology for sleep apnea patients $102,500

National Foundation for Facial Reconstruction Institute of Reconstructive Plastic Surgery Fund $847,100

Devendra Shah Devendra Shah Research Fund in GI Oncology $1,000,000

Steven and Deborah Shapiro The Michael L. Freedman, MD, Center for Geriatric Research in Medicine

Lisa and Steven Tananbaum Family Foundation The Michael L. Freedman, MD, Center for Geriatric Research in Medicine $100,000

Marica F. Vitecek and Jan T. Vitecek, MD, PHD Basic science research $16,287,491

The Vilcek Foundation Basic science research $984,284

The Wagner Family Foundation The Michael L. Freedman, MD, Center for Geriatric Research in Medicine $100,000

William & Sylvia Silberstein Foundation, Inc. Alzheimer’s disease research $150,000

A special thank you to

FIONA AND STANLEY DRUCKENMILLER, HELEN L. KIMMEL, RUTH AND LEONARD LITWIN, THE SKIRBALL FOUNDATION, JOAN AND JOEL SMILOW, MARICA F. AND JAN T. VILCEK, MD, PHD, for their ongoing philanthropic investments in research.
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