Research News …
from Albany Medical Center

Quickening the Pace of Medical Discovery

As northeastern New York’s only academic medical center, Albany Med has a mission of advanced patient care, medical education and research. Our research enterprise drives innovation in both patient care and education while also fueling the local economy.

The promise of biomedical and clinical research, and the combination of the two, has never been greater, and research projects at Albany Medical Center are flourishing. Grants from the National Institutes of Health, the American Heart Lung Association, the American Heart Association and other private, government and corporate sources are supporting studies both with patients and in the laboratories at Albany Medical College.

This support sustains the work of our researchers and physician scientists who collaborate in four interdisciplinary teams to further their knowledge and discover the basic underpinnings of cancer, heart disease, stroke, addiction, asthma, high blood pressure, allergies, autoimmune diseases, chronic pain, Alzheimer’s disease, epilepsy, influenza and depression, among many others. Albany Med’s interdisciplinary teams include The Center for Neuropharmacology and Neurosciences, the Center for Immunology and Microbial Disease, the Center for Cardiovascular Sciences and the Center for Cancer and Cell Biology.

Since 2011, Albany Med has been a member of the NY Cap Research Alliance, along with the University at Albany and Rensselaer Polytechnic Institute. By providing seed funding for collaborative research projects, the Alliance leverages funding from New York State into potential new jobs and millions of dollars in investment. The Alliance also serves to grow the reputation of the Capital Region as a hotspot for biomedical research.

In the search for medical breakthroughs and to offer our patients hope by providing access to the best available treatment options, at any time Albany Med physicians are conducting more than 100 clinical studies. These include clinical trials of new treatments and drugs for people with illnesses that have no standard cure.

With this newsletter, each quarter, we will bring you up-to-date on some of the many exciting research activities at Albany Medical Center.
$1.5 Million NIH Grant Supports Stem Cell Research

Katherine MacNamara, Ph.D., is attempting to understand more about the role of stem cell function in the body’s defense against a variety of infectious diseases. Her goal is to answer the questions: What makes a great immune response against an infection, and how can we harness that to develop new treatments?

Armed with a $1.5 million, five-year grant from the National Institutes of Health, National Institute of General Medical Sciences, Katherine MacNamara, Ph.D., assistant professor at Albany Medical College, is attempting to understand more about the role of stem cell function in the body’s defense against a variety of infectious diseases. Her goal is to answer the questions: What makes a great immune response against an infection, and how can we harness that to develop new treatments?

“Infectious disease is a national priority because it represents a major cause of death in the United States and around the world. We are always looking for new ways to treat the flu and strep infections while trying to stay on top of emerging pathogens like tick-borne diseases which are common in this area,” said Dr. MacNamara, who works in the College’s Center for Immunology and Microbial Disease. “Part of the answer lies in understanding why, on a very basic level, some people respond better than others in clearing disease.”

Specifically, Dr. MacNamara is studying the function of stem cells that reside in the bone marrow known as a hematopoietic stem cell (HSC). HSCs maintain blood production, including cells of the immune system, throughout life. She said in response to stress, such as infection, HSCs “turn on” to replenish depleted blood cells (such as red and white blood cells and platelets) and may leave the bone marrow to potentially aid in the immune response.

In her lab, Dr. MacNamara and her team are examining the cellular and molecular changes that occur in the hematopoietic system in a mouse model of ehrlichiosis, an emerging tick-borne illness that causes symptoms in mice and humans including anemia and thrombocytopenia (low blood platelet count). She has found an important role for interferon gamma, a molecule that is known to be produced during infections, in modulating HSC function. Mice deficient in interferon gamma are not able to control this infection.

The long-term goal of my research is to understand how HSC function is directed during infection to promote host defense, and how, in turn, defects in immunity arise due to dysfunction of these stem cells,” said Dr. MacNamara.

Dr. MacNamara said the possibility of manipulating interferon gamma during an acute infection has tremendous potential for the development of new therapies for diseases down the road.
Clinical Research

New Collaborations, Providers Mean Even Greater Patient Access to Diabetes Clinical Trials

For 18 years, Matthew Leinung, M.D., has chaired Albany Med’s Division of Endocrinology. Under his leadership, the flagship division has conducted breakthrough research on the hormone leptin and the use of insulin pumps to treat patients with Type 2 diabetes, as well as numerous other research studies and a number of clinical trials.

In one clinical study now underway, Vibhavasu Sharma, M.D., who joined the division just this year, is investigating the effects of ultra-long-acting insulin. “Our hope is that this treatment could mean fewer injections for patients and could lower their risk for hypoglycemia,” Dr. Sharma said.

Albany Med, long known as a leader in diabetes care and research, got another powerful partner when The Endocrine Group became the Albany Med Division of Community Endocrinology.

Robert Busch, M.D., director of the Community Endocrinology Research Unit, and his team are conducting 20 separate clinical trials at their offices on Washington Avenue. They have become recognized in the research community for the quality of their research and their ability to recruit and retain research patients.

“Joining forces with Albany Med will greatly enhance our understanding of diabetes and help us find new solutions for people who suffer from it,” Dr. Busch said.

Diabetes, which afflicts nearly 30 million people in the United States, is associated with serious complications including heart disease and stroke, blindness and lower-limb amputation, among others.

One current project Dr. Busch’s team is managing is a large international study of diabetic kidney disease where two-thirds of the American subjects being studied are patients at Albany Med’s Division of Community Endocrinology.

Dr. Busch said his team’s “concierge-level approach” to developing relationships with research patients has been beneficial for everyone. “Our patients have cell phone numbers for me and my clinical research coordinator, and they know they can call us at any time. In turn, they become partners with us in our research and are as committed as we are to finding answers,” he said.

Dr. Busch looks forward to further collaborating with Albany Med’s endocrinologists, nephrologists, cardiologists and internists to help gain a better understanding of diabetes and how it impacts the kidneys, heart and general health of a patient.

So does Dr. Leinung. “I’m excited about The Endocrine Group joining Albany Med,” he said. “The possibilities for collaboration as we move forward will help further our understanding of how to provide meaningful care to all the people with diabetes in our community and beyond.”
Spacious New Facility Embraces Trend toward Translational Research

While Albany Medical Center’s new Patient Pavilion has drawn considerable attention, on the Medical College side of the campus a smaller, but equally impressive new wing expands and updates Albany Medical College’s research laboratories.

“This new facility, which is being used in addition to our current labs, provides us with a more efficient, flexible and attractive research environment built to very specific National Institutes of Health standards that will lead to new opportunities in obtaining grant funding and recruiting new faculty,” said Harold Singer, Ph.D., professor and Director of the Center for Cardiovascular Sciences.

The wing’s design makes it possible to adapt to changes in protocols and to share staff and resources. Built above the Patient Safety and Clinical Competency Center, the two floors with more than 20,000 square feet of wet laboratory space feature open work areas and a combination of fixed benches and fully modular workspace. Supporting rooms are being used for cell culture, microscopy, large equipment, glass wash and autoclave, and cold/environmental rooms.

“With researchers and students from different disciplines working side-by-side, we’re providing the type of collaborative environment that is the future of biomedical research,” said Dennis Metzger, Ph.D., professor and director of the Center for Immunology and Microbial Research.

Dr. Metzger said the facility fully embraces the trend toward translational research, such as work he does to study the connection between bacterial infections and influenza that will use human flu samples obtained from Albany Medical Center patients. Dr. Singer also cited a study by Chuanxi Cai, Ph.D., a recent recruit to the Medical College with significant funding and expertise, who is working on a project with Albany Med physicians to determine whether stem cell therapy could be a viable option for patients with heart failure.

“We now have the security, the technology and the staff to do this type of large-scale translational work,” said Dr. Metzger.

The $10 million research facility at Albany Medical College was built with funding secured through the highly competitive American Recovery and Reinvestment Act along with matching funds from New York State.
Researcher Profile

Since the early 1980s, Paul Higgins, Ph.D., has been searching for an effective treatment for a rare but deadly cancer. Recently, new discoveries in his lab are bearing fruit, with the identification of an important gene and new drugs that could stop mesothelioma in its tracks.

“I am focused on using drugs to reverse the mechanism of a gene located in mesothelioma tumor cells that fuels their movement, causing them to metastasize,” said Paul Higgins, Ph.D., co-director of the Center for Cell Biology and Cancer Research at Albany Medical College. “I have discovered that reversing the effects of this gene stops cells from spreading and, in fact, makes the cells die.”

Mesothelioma is a cancer of the lungs and abdomen that is overwhelmingly caused by exposure to asbestos, a naturally occurring fibrous mineral that was used in industry as insulation. Though rare (about 3,000 new cases are diagnosed per year), the disease was occurring with regularity among patients at Sloan Kettering Cancer Center in New York City where Dr. Higgins worked as a research scientist in the 1970s and ‘80s. When he moved to Albany in 1986 to join the VA Medical Center, he found the disease was prevalent in a population of U.S. Navy and U.S. Air Force veterans who were exposed to asbestos aboard Navy ships during World War II and the Korean War.

Instead of gradually fading away as the use of asbestos has stopped, mesothelioma today is making a comeback.

Dr. Higgins’ recent seminal observation was that expression of the p52 (PAI-1) gene in tumor cells is an essential contributor to mesothelioma spread and a biomarker of poor prognosis. He discovered the gene, found in many different cells in the body, is responsible for cell survival.

This work was significantly enhanced by his recent findings that tumor cell growth can be arrested leading to eventual cell death (apoptosis) by inhibiting the gene’s function using experimental drugs known as “small molecule pharmacologic inhibitors,” several of which are in development in his lab and others that have been developed by Japanese researchers with whom he is collaborating. He said they are experimenting with using these drugs in combination with existing chemotherapeutic drugs.

Dr. Higgins believes the clinical implications of this work are profound. “The translational potential is highlighted by our novel finding that p52 (PAI-1) is not only a major element in the mesothelioma metastasis/cell migration program but that it also is an essential survival factor contributing, thereby, to tumor growth. This has implications for other types of tumors and for the development of novel drugs that are different from chemotherapy,” he said.

For the past six years, Dr. Higgins' efforts have been fortified by grants from the Butler Family Foundation at the Community Foundation for the Greater Capital Region, including a recent grant of $15,000.

“None of this work would have been possible without the generous support of the Butler Family Foundation. I want to express my deep gratitude to them,” he said.
Human Trials of Anti-Addiction Drug Studied at Albany Med Begin

Human testing has begun of an experimental compound that has been studied for years at Albany Medical College as a potential treatment for addiction to a wide variety of cravings—from food to cigarettes to alcohol and hard drugs.

Savant HWP, Inc., a California-based drug development company, has reported that a single dose of 18-MC (18-methoxycoronaridine), developed under the direction of Albany Medical College professor emeritus Stanley Glick, Ph.D., M.D., was well tolerated by healthy volunteers when administered as part of a double-blind, placebo-controlled human safety study conducted by Savant’s South American partner.

Savant HWP plans to develop 18-MC as a treatment for many forms of addiction and compulsive behavior, with an initial focus on cocaine and opiate dependencies. The South American partner is developing 18-MC for the treatment of leishmaniasis, a parasitic disease that is widespread in parts of the tropics, subtropics, and southern Europe.

“18-MC is likely to be the first of a new generation of agents effective against a broad spectrum of addictions—from hard drugs such as heroin and cocaine, to alcohol, nicotine and even sugary, high-fat foods, possibly reducing obesity rates,” said Dr. Glick.

The mechanism of action of 18-MC in leishmaniasis is totally different than that responsible for its anti-addictive effects.

“Based on work by South American collaborators, we’re hopeful that this drug could also provide relief for a completely unrelated disorder, leishmaniasis, that creates painful skin lesions as well as damages internal organs,” he added.

While trials continue in South America, Dr. Glick said the results will have to be replicated and confirmed in the United States before the drug can be approved for use in this country.

“It is particularly rewarding to announce the initiation of human safety testing for 18-MC during National Alcohol and Drug Addiction Recovery Month,” said Scott Freeman, M.D., Savant HWP co-founder, chairman, and chief medical officer. “I am pleased with our partner’s progress with the trial and that 18-MC has been well tolerated in the volunteers who received the drug to date. Safety and dose-ranging studies are continuing, and we expect to present detailed results at medical meetings and in scientific publications at the conclusion of the trial.”

‘Albany Med is my lifeline’

“Lifeline: The Campaign for Albany Medical Center” is nearing its current $125 million goal to ensure that Albany Med continues to provide the most advanced care available in northeastern New York, including its research enterprise.

Albany Medical Center Foundation
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Research News of Note

Dennis Metzger, Ph.D., professor and director of the Center for Immunology and Microbial Disease at Albany Medical College and a prominent vaccine researcher, has been named a Fellow of the American Association for the Advancement of Science (AAAS). The AAAS is the world’s largest general scientific society, and publisher of the journal, Science. According to the organization, Dr. Metzger was named a fellow for his “distinguished contributions to the field of pulmonary immunity, particularly in explaining how secondary bacterial infections develop following influenza, and in developing new mucosal vaccination approaches.”

Mingfu Wu, Ph.D., assistant professor in Albany Medical College’s Center for Cardiovascular Sciences, received a $395,000 grant from the National Institutes of Health for his project titled, “Numb Family Proteins Regulate Trabecular Development.”

Lei Jin, Ph.D., assistant professor in the Center for Immunology and Microbial Disease, received a $329,900 grant from the NIH in support of his research, “Mechanisms of STING-mediated Mucosal Vaccine Adjuvant of Cyclic di-GMP.”

Douglas Fish, M.D., a prolific clinical investigator, received a New York State Commissioner of Health Award for his outstanding contributions in the field of HIV and AIDS during a World AIDS Day presentation. Dr. Fish, M.D., medical director of Albany Med’s AIDS Treatment Center and head of the Division of HIV Medicine, serves as core faculty for the International AIDS Society and the New York State Department of Health’s AIDS Institute.

Paula McKeown-Longo, Ph.D. and Paul Higgins, Ph.D., and co-directors of Albany Med’s Center for Cell Biology and Cancer Research, and Karen Tedesco, M.D., medical oncologist/hematologist and director of the NYOH Hereditary Cancer Risk Assessment Program, hosted the 8th Annual Translational Oncology Research Symposium in October. This powerful meeting of the minds is designed to give leading physicians and scientists an opportunity to discuss applying innovative research findings to patient care initiatives—with an end goal of achieving better outcomes for patients.

Herbert Jacobsen, Ph.D., celebrated 50 years at Albany Medical Center in 2014. Among the highlights of Dr. Jacobsen’s prolific career is his work that contributed to the discovery that hormones produced during pregnancy induce a protein that directly inhibits the growth of breast cancer. This protein, alpha-fetoprotein (AFP), may serve as a viable, well-tolerated agent for the treatment and prevention of breast cancer. He is also well-known for his landmark 1958 discovery of the existence of the estrogen receptor, something that has revolutionized the treatment of breast cancer.

This is just a sampling of research news at Albany Medical Center. Albany Med faculty and students wishing to contribute their news to the Research Newsletter should email Beth Engeler in the Department of Policy, Planning and Communications at engeleb@mail.amc.edu.

Upcoming

The 2015 recipient(s) of the Albany Medical Center Prize in Medicine and Biomedical Research, one of nation’s largest and most prestigious scientific awards, will be announced in early 2015, with an award ceremony in May. The $500,000 Albany Prize was created in 2000 to recognize a physician, biomedical scientist, or group of physicians or scientists who have made extraordinary and sustained contributions to improving health care and patient care or who have successfully pursued innovative biomedical research that has demonstrated translational benefits for improved patient care.

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