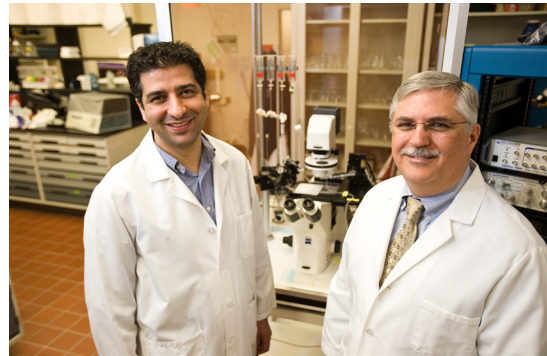
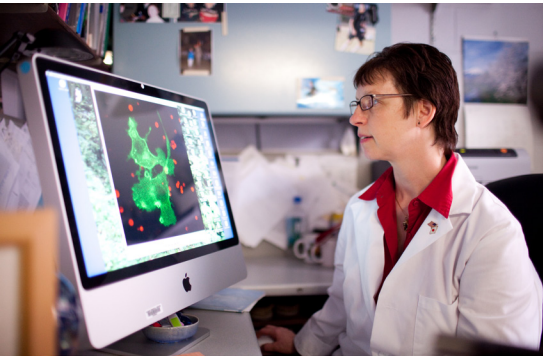


# ALBANY MED RESEARCH

SPRING 2016



## 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 three-fold 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 and our reputation as a leader in developing new bio-scientific knowledge and technology.

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 130 clinical studies.

*With this newsletter we bring you up-to-date on some of the many exciting research activities at Albany Medical Center.*

Scientists studying cancer, cardiovascular disease, immunology and neurosciences help fulfill Albany Med's mission as a major biomedical research center.

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KNOWN FOR  
OUR EXPERTISE.  
CHOSEN FOR  
OUR CARE.

## Biomedical Research

### \$3.8 Million Grant Funds Multi-Center Tularemia Vaccine Research

Albany Medical College will administer a \$3.8 million, five-year, multi-institutional National Institutes of Health grant entitled "Correlates of Vaccine-Induced, Tunable-Protection in an Outbred Tularemia Model" which is aimed at finding a vaccine for inhaled tularemia infection.

Since 2003, scientists at Albany Medical College have received 23 million dollars in the form of an NIH program project and more than 12 million dollars as independent grants from NIH and DoD develop a vaccine or treatment for respiratory tularemia – a potential bioterrorism agent.

Tularemia bacteria (*Francisella tularensis*) are naturally present in soil and water, and each year, small outbreaks occur in rural settings. Infection via animals or contaminated soil or water usually causes a systemic infection that is easily treated with antibiotics. However, when bacteria are breathed into the lungs, tularemia is almost always fatal because it is difficult to treat with antibiotics.

The concern is that this form, pulmonary tularemia, could be used as a bioterrorism agent and is categorized as a threat by the government. The Soviet Union and the United States each held reserves of the pathogen prior to the end of the Cold War.

The three principle investigators of the latest NIH grant are located at Albany Medical College, the University of Maryland and the University of Pittsburgh. Karsten R.O. Hazlett, Ph.D., associate professor in the Department of Immunology and Microbial Disease at Albany Medical College, serves as the program director and a principal investigator.

Dr. Hazlett, a bacteriologist, said the multi-faceted approach will help advance tularemia vaccine research. "This team consists of a bacteriologist, an aerobiologist, and an immunologist, and we all have different perspectives and expertise."

He said their studies are focused on the use of "outbred" (more human-like) lab models, and they will analyze differentially grown bacteria which Dr Hazlett has been



Karston Hazlett, Ph.D.

studying with previous NIH and DoD support since 2011.

Dr. Hazlett explained that his collaborator Eileen Barry, Ph.D., from the University of Maryland, has engineered three vaccines that are minimally, moderately and maximally protective. "So we say we have 'tunable' protection because we can dial in the level of protection based on the vaccine we use," said Dr. Hazlett. "My other collaborator, Douglas Reed at Pittsburgh, has developed an aerosol-challenge model for rabbits that have been immunized with these or other vaccines. Rabbits, like humans, are outbred, meaning each individual is immunologically different. This is in contrast to inbred mice that are essentially clones of each other, so research based on mice gives results that may or may not predict what will happen in a genetically diverse population such as humans. The use of rabbits as a model alleviates this problem," he said.

His lab will be identifying the *Francisella* proteins recognized by antibodies from rabbits that are successfully vaccinated but not recognized by antibodies from rabbits that are unsuccessfully vaccinated.

"Our goal is the identification of predictors of vaccine success," Dr. Hazlett said. "This information could lead to new vaccines and/or improved diagnostics. One potential outcome of an identified correlate of protection is a decreased reliance on the use of lab animal testing."

"The immediate outcome of our efforts will be primarily applicable to tularemia, although we also have ideas, efforts and grants for other bioterrorism pathogens," he added.

## Biomedical Research

### \$2 Million NIH Grant for Study of New Hepatitis Vaccine

Michael Robek, Ph.D., associate professor in the Department of Immunology and Microbial Disease, has received a \$2 million, five-year grant from the National

Institutes of Health's National Institute of Allergy and Infectious Diseases in support of his work to develop new vaccines to treat chronic hepatitis B.

Dr. Robek's research is focused on controlling and eliminating the hepatitis B virus (HBV) in patients who have chronic disease. There

are 240 million people worldwide who are chronically infected, including up to 2 million people in the United States. Chronic HBV infection causes liver diseases such as liver cirrhosis and liver cancer, and about 600,000 people worldwide die each year from liver diseases that occur as a consequence of chronic HBV infection. Current treatments typically do not cure the infection, have unwanted side effects, and the virus can become resistant to them.

According to Dr. Robek, the currently available HBV vaccine is very effective at preventing new infections with the virus. The focus of his work is to develop a vaccine that will induce an effective immune response that controls HBV in people who are already chronically infected. The current vaccine is not useful for this purpose.

"The current vaccine efficiently induces antibody responses, which are needed to prevent infections," said Dr. Robek. "However, it does not efficiently induce CD8 T cell responses, which are needed to control the virus after infection. The vaccines that we are studying are designed to induce these T cell responses. The vaccine platforms we use are based on other highly immunogenic viruses which we engineer to express HBV proteins."

For instance, he said recombinant vesicular stomatitis virus (VSV) vaccine vectors induce strong protective CD8 T cell and antibody responses to a variety of pathogens, and are also showing promise as therapeutic vaccines. He is testing the hypothesis that recombinant VSV expressing the HBV structural proteins will make effective vaccines for prophylactic and therapeutic immunization against HBV.

"An improved preventative vaccine that provides long-term immunity in a single dose or an effective therapeutic vaccine would have the potential to prevent millions of cases of HBV-associated liver cancer," he said.

Dr. Robek, who recently came to Albany Medical Center from Yale University, will collaborate on one part of his project with an investigator at Yale.

According to Dr. Robek, the currently available HBV vaccine is very effective at preventing new infections with the virus. The focus of his work is to develop a vaccine that will induce an effective immune response that controls HBV in people who are already chronically infected.



## Research Center Name Changes Reflect Evolving Mission

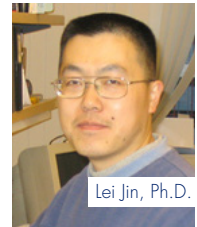
To better reflect the evolving missions of Albany Medical College, the four research centers within Albany Medical College were recently renamed.

- The Center for Cardiovascular Sciences is now the Department of Molecular and Cellular Physiology. (Director: Harold Singer, Ph.D.)
- The Center for Neuropharmacology and Neuroscience is called the Department of Neuroscience and Experimental Therapeutics. (Director: Julie Pilitsis, M.D., Ph.D.)
- The Center for Cell Biology and Cancer Research has become the Department of Regenerative and Cancer Cell Biology. (Directors: Paula McKeown-Longo, Ph.D., and Paul Higgins, Ph.D.)
- The Center for Immunology and Microbial Disease has been named the Department of Immunology and Microbial Disease. (Director: Dennis Metzger, Ph.D.)

The promise of biomedical and translational 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.

National Institutes of Health grants to Albany Med researchers totaling more than \$9.6 million in a recent four-month period, included:

- Michael Robek, Ph.D., for research of novel immunotherapeutic vaccines for the treatment of hepatitis B (\$2 million over five years). See story on page 2.
- Michael Dipersio, Ph.D., for the study of adhesion receptors on breast cancer cells that control gene expression promoting malignant disease (\$1.9 million over five years).
- Lei Jin, Ph.D., for work on vaccine adjuvants that provide protection against all pneumococcal serotypes (\$1.7 million over five years).
- Harold Singer, Ph.D., for work on identifying mechanisms involved in the control of occlusive vascular wall remodeling following injury and vascular disease (\$1.6 million over four years).
- Yunfei Huang, Ph.D., for his epilepsy-focused research (\$1.4 million over four years).
- Wenzheng Zhang, Ph.D., for work on epigenic control of kidney fibroids (\$574,000 over two years).
- William O'Connor, Ph.D., for his research focused on how molecules that often contribute to inflammation around tissue damage also help in wound healing and tissue regeneration in the gastrointestinal tract (\$435,000 over two years).



Lei Jin, Ph.D.



Harold Singer, Ph.D.

## Clinical Research

### Top International Site for Sarcoidosis Research

Albany Med is one of eight academic medical centers in the world chosen to be part of a clinical studies network for the study of sarcoidosis, an inflammatory disease that can affect multiple organs, most commonly the lungs and the lymph nodes.

Selected by the Foundation for Sarcoidosis Research, Albany Med joins distinguished research institutions like Johns Hopkins and the Cleveland Clinic to form a research consortium geared to finding better treatment options for people with sarcoidosis. The first study undertaken by the consortium will be led by Albany Medical Center.

Marc Judson, M.D., chief of the Division of Pulmonary and Critical Care Medicine, will head the research team.

The consortium will collaborate on research, test the efficacies of treatment approaches and rapidly screen promising new compounds that emerge from biomedical research. The eight centers selected in the U.S. and Europe each proposed an initial study that the consortium will perform over the next two years. Dr. Judson's study was selected by the group, and he will serve as its lead investigator. The study will examine the clinical trajectory of sarcoidosis over time and its impact on organ function and quality of life.



Marc Judson, M.D.

Sarcoidosis occurs when tiny collections of inflammatory cells grow in different parts of the body—most commonly the lungs, lymph nodes, eyes and skin. The disease is believed to result from the body's immune system responding to an unknown substance. While sarcoidosis can last for years and sometimes lead to organ damage, treatments have been found to be effective in helping patients manage the disease.

"The establishment of this international clinical research network is very promising news for patients," Dr. Judson said. "We believe that this initial research project will quantify the severity of the illness as well as allow us to accurately assess the physical and functional burden of the disease."

### Research Partnership Brings Vascular Trials to Albany Med

The Vascular Research Program, a new partnership between Albany Med and the Vascular Group, was launched in May 2015, and since that time, the program has initiated several clinical research trials and has been lauded for exceeding enrollment expectations in two major national studies. One, the BEST trial, is a National Institutes of Health study focused on new ways to avoid the loss of a limb in patients with severe peripheral arterial disease. The second, the Leopard study, compares outcomes in endovascular repair of abdominal aortic aneurysms.

## Research News of Note



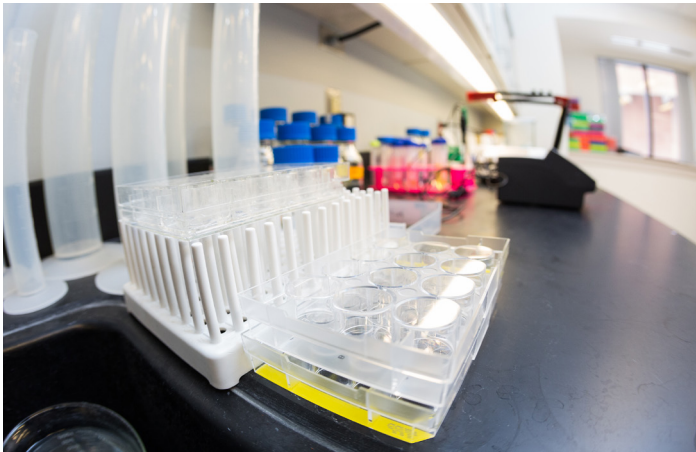
**Julie Pilitsis, M.D. '98, Ph.D.,** professor of neurosurgery and director of the Department of Neuroscience and Experimental Therapeutics, presented the seminar, "Finding the Right Fit: A Guide for Women in Medicine and Science," to the Women in Medicine and Science Advisory Committee at Wayne State University.

**Andrew McCullough, M.D.,** professor of surgery and director of Men's Health in the Division of Urology, co-authored a study that appeared in *BJU International* that found that orally administered enclomiphene citrate raises testosterone and preserves sperm counts in obese hypogonadal men, unlike topical testosterone.

Albany Medical Center's **Huntington's Disease Clinic** was named a Level 2 Center of Excellence by the Huntington's Disease Society of America. As a Center of Excellence, the clinic provides a multidisciplinary approach to the care and support of patients with Huntington's disease and their families. This includes conducting research and testing for gene mutations. As a Center of Excellence, the clinic maintains active clinical research programs specific to new Huntington's disease treatments.

**Jeffrey Ross, M.D.,** Cyrus Strong Merrill Professor and chair of the Department of Pathology and Laboratory Medicine, was the lead investigator of a study published in *The Oncologist* that found nearly all advanced esophageal cancers harbor genetic mutations that can be targeted with emerging drug therapies. Additionally, Dr. Ross and senior pathology resident **Olga Voronel, M.D., '12,** were honored with a research award from the Pulmonary Pathology Society for their study of the genomic drivers of pleural malignant mesothelioma determined by comprehensive genomic profiling.

Two medical students studying in the Department of Regenerative and Cancer Cell Biology participated in the Eastern Atlantic Student Research Forum and received awards for their research. First-year student, **Hadiyah Audil,** earned first place in the Basic Science Poster category for her work entitled "Histone deacetylase inhibition impacts PAI-1-conferred phenotypes in human squamous cell carcinoma and chronically healed wounds." **Nidah Khakoo,** a second-year student, received an honorable recognition award for her work, "Role of protein phosphatase magnesium dependent 1A (PPM1A) in the regulation of the TGF- $\beta$ 1 pathway and renal fibrosis." Both students came to Albany Med through the Rensselaer/Albany Medical College B.S./M.D. Physician Scientist program.



## Biomedical Acceleration and Commercialization Center (BACC) Thriving

Now one year old, the BACC, a business incubator located on the Albany Medical Center campus that helps businesses discover and develop breakthrough biotechnologies, is nearing half its capacity.

The BACC is proving to be a catalyst in bringing health care clinicians and researchers together to collaborate with entrepreneurs and established companies to create new biomedical products and bring them to market.

"The BACC has developed an ecosystem for health care innovation by attracting and facilitating partnerships of entrepreneurs, inventors, physicians, researchers, academicians, business professionals, investors, students and administrators," said Vincent Verdile, '84, M.D., the Lynne and Mark Groban, M.D., '67, Distinguished Dean of Albany Medical College and senior executive vice president for system care delivery at Albany Medical Center.

The companies now located within BACC include:

- **iSimulate, LLC**, a START-UP New York participant, founded in 2011. An Australian software development company, it is establishing a U.S. presence for the sale of medical simulation systems. It looks forward to working with Albany Medical College in developing several other innovative products. iSimulate's current products are purchased globally by hospitals, universities, medical colleges, nursing schools and EMS/fire departments. iSimulate anticipates the creation of several new jobs. Its founder and CEO is Peter Mckie, and its vice president, responsible for North America, is Bobby Syed.
- **ReVivo Medical, LLC**, founded in 2011, is developing a product to facilitate spinal surgery and provide better patient outcomes as well as reduce costs of care. Its product is an elastic micro-motion implantable device for use by surgeons. The founders are Albany Med spinal surgeon Darryl DiRisio, M.D., and biomedical engineers Eric Ledet, Ph.D., and Glenn Sanders, Ph.D. Gary Mittleman serves as president and CEO. ReVivo expects its first commercial sales in 2017.

- **Somml Health, LLC**, established in 2013, is developing a real-time clinical information collaborative platform for hospitals to facilitate and coordinate communication about care among patients, families and their care teams. It has developed a pilot with Albany Med for the ongoing development, testing and deployment of this platform. The Somml Health team includes Jacob Reider, M.D., former deputy national coordinator for Health Information Technology at the U.S. Department of Health and Human Services; Louis Filhour, R.N., Albany Med senior vice president for Clinical Quality; Richard Blinkhorn, M.D., chairman of Albany Med's Department of Medicine; Michael Waxman, M.D., Albany Med clinical researcher; John O'Kane, R.T., M.B.A., director, Quality Health Solutions; and Kira Novakofski, Ph.D., Albany Medical College student.



Kevin Leyden

"Clearly the BACC is very much an economic development initiative, the only bio-tech-focused incubator in the region. It is contributing to the region's business vitality, stimulating job growth and promoting the next generation of biomedical-centric innovation that will improve patient outcomes," said Kevin Leyden, Albany Med's senior vice president for business development and strategic partnerships.

(cont'd on next page)

## Biomedical Acceleration and Commercialization Center (BACC) Thriving (cont'd)

Since its inception, the BACC has received more than a half million dollars of federal funding and was approved to be part of Governor Andrew M. Cuomo's STARTUP-NY program – one of the first private colleges in New York State selected to receive this funding. In addition, Albany Medical College recently was awarded \$400,000 from the state to support a cross-collaboration project with Rensselaer Polytechnic Institute.

As part of Albany Medical Center, the BACC provides an academic medical setting and the expertise for promising biomedical companies during their start-up phase. It offers a variety of assets including wet lab space, business and financial guidance, as well as connections to world-class researchers, medical talent, industry leaders, and more.

For additional information or to submit an application to the BACC, please visit: <http://albanymedbacc.org>

