

TEN LEADING EINSTEIN RESEARCHERS AND THEIR ACCOMPLISHMENTS

INFECTIOUS DISEASE

John Blanchard, Ph.D., has identified a promising new treatment for extensively drug-resistant tuberculosis (XDR-TB), a dangerous form of the disease caused by strains of TB bacteria that have become resistant to virtually all antibiotics. In 2009, Dr. Blanchard reported that a combination of two drugs (clavulanate and meropenem) was highly effective in halting the growth of XDR-TB in laboratory culture. Since then, his drug combination has saved the lives of several patients with XDR-TB and will soon be formally evaluated in two human trials, in South Africa and Belgium. Dr. Blanchard is professor of biochemistry and the **Dan Danciger Professor of Biochemistry**.

Arturo Casadevall, M.D., Ph.D., is one of the world's leading microbiologists, well known for his diverse and innovative scientific inquiries. His work on fungal melanin, for example, has opened up the possibility of using this pigment in novel ways to protect against radiation exposure. Thanks to a highly productive research partnership with colleague Ekaterina Dadachova, Ph.D., he has developed a targeted therapy for metastatic melanoma that has shown promise in human clinical trials. Dr. Casadevall is professor and chair of microbiology & immunology, professor of medicine (infectious diseases) and the **Leo and Julia Forchheimer Chair in Microbiology and Immunology**.



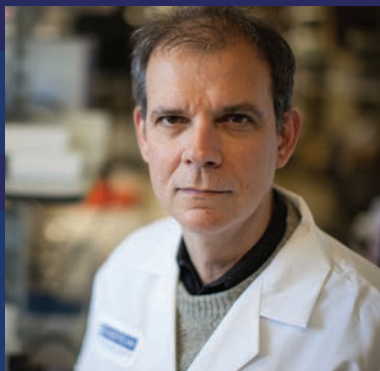
John Blanchard, Ph.D.



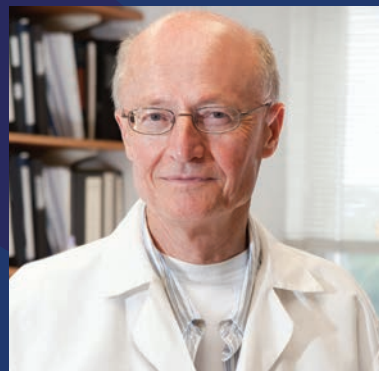
John Condeelis, Ph.D.



Ekaterina Dadachova, Ph.D.



Arturo Casadevall, M.D., Ph.D.



Vern Schramm, Ph.D.



Joseph Sparano, M.D.

CANCER

John Condeelis, Ph.D., is a leading expert on imaging the tumor microenvironment—the microscopic site where tumor cells interact with surrounding cells. He has found that breast cancer spreads only when a specific trio of cell types is present together in the tumor; this “signature” for potential breast cancer metastasis has been validated in breast cancer patients. A company has licensed Einstein’s patent on Dr. Condeelis’s discovery and is developing a diagnostic test for pinpointing which breast cancer patients need aggressive therapy to prevent their cancer from spreading. Dr. Condeelis is professor and co-chair of the

anatomy and structural biology department, scientific director of the analytical imaging facility, co-director of the Gruss Lipper Biophotonics Center, and the **Judith and Burton P. Resnick Chair in Translational Research**.

Ekaterina Dadachova, Ph.D., is a nuclear medicine expert who has done pioneering work using radioimmunotherapy, a technology in which radioisotopes are piggybacked onto antibodies. After the antibodies deliver the radioisotope to a specific target such as a cancer cell or disease-causing microbe, the radioisotope delivers a lethal dose of radiation. In partnership with Einstein colleague Arturo

Casadevall, M.D., Ph.D., Dr. Dadachova developed radioimmunotherapy for metastatic melanoma—a treatment strategy that has shown promise in human clinical trials. In a project supported by the Bill and Melinda Gates Foundation, Drs. Dadachova and Casadevall are also developing a radioimmunotherapy strategy with the potential for treating or perhaps even curing HIV/AIDS by targeting HIV-infected cells. In other novel applications of targeted therapy, Dr. Dadachova is testing radioimmunotherapy against antibiotic-resistant microbes and as a treatment for virus-caused cancers such as cervical cancer and



John Greally, M.B., B.Ch., Ph.D.



Ana Maria Cuervo, M.D., Ph.D.



Ulrich Steidl, M.D., Ph.D.



Joe Verghese, M.B.B.S.

hepatitis B–related liver cancer. Dr. Dadachova is professor of radiology (nuclear medicine) and of microbiology & immunology and is the **Sylvia and Robert S. Olnick Faculty Scholar in Cancer Research**.

John Greally, M.B., B.Ch., Ph.D., is a leader in the field of epigenomics, which involves the study of chemicals that attach to genes and affect their expression. Dr. Greally's research has led to a better understanding of the epigenetic regulation of stem cells and of the epigenetic abnormalities that underlie human diseases including breast cancer, diabetes, Huntington's disease, autism and allergies.

Since epigenetic changes are reversible, his work in identifying epigenetic abnormalities could lead to novel therapies for these conditions. Dr. Greally is professor of genetics, of medicine (hematology), and of pediatrics, and the Faculty Scholar for Epigenomics.

Joseph Sparano, M.D., is a leading clinical oncologist who is working to tailor breast cancer treatment to individual patients. He is associate chair for disease-oriented research in the Eastern Cooperative Oncology Group (ECOG), which conducts clinical trials in all types of adult cancers and is one of the country's largest cancer research

organizations. He directs ECOG's nationwide clinical trial to determine which women with early-stage breast cancer are likely to benefit from chemotherapy intended to prevent cancer recurrence. Dr. Sparano is professor of medicine and of obstetrics & gynecology and women's health and co-leader of the Breast Cancer Working Group of the Albert Einstein Cancer Center.

Vern Schramm, Ph.D., has pioneered a technology for identifying highly potent inhibitors of enzymes that play key roles in human diseases. Using this technology, he has developed enzyme-inhibiting drugs now being tested by Einstein licensees in phase 2 clinical trials for T cell lymphoma and gout. Other clinical-trial candidates are drugs developed by Dr. Schramm that target malaria, head and neck cancer, and antibiotic-resistant bacteria. Dr. Schramm was elected to the National Academy of Sciences in 2007 and is professor and chair of the biochemistry department and the **Ruth Merns Chair in Biochemistry**.

Ulrich Steidl, M.D., Ph.D., studies the molecular pathways that lead to the development of leukemia. He recently identified a key protein responsible for causing acute myeloid leukemia, a particularly lethal and poorly treated form of cancer. He is now developing drugs that target and inactivate this protein—an entirely new approach to leukemia treatment. Dr. Steidl is assistant professor of cell biology and of medicine (oncology) and the **Diane and Arthur B. Belfer Faculty Scholar in Cancer Research**.

PHYSIOLOGY OF AGING

Ana Maria Cuervo, M.D., Ph.D., is one of the world's leading authorities on autophagy, a "garbage disposal" system that cells use to dispose of and recycle their worn-out molecules. Dr. Cuervo's research has shown that glitches in autophagy play a role in numerous diseases (including Parkinson's and Huntington's) as well as in age-related conditions such as organ decline and weakened immunity. She is now screening for drugs that would normalize autophagy as a novel approach for treating or even preventing such problems. Dr. Cuervo is professor in the departments of developmental and molecular biology, of anatomy and structural biology, and of medicine (gastroenterology and liver diseases), and the **Robert and Renée Belfer Chair for the Study of Neurodegenerative Diseases**.

Joe Verghese, M.B.B.S., is an expert on aging who studies how diseases and aging affect cognitive ability and mobility in older adults. He has shown that older people who engage in brain-stimulating activities can reduce their risk of developing Alzheimer's and other types of dementia. He has also done pioneering research showing that disturbance in gait precedes and is associated with cognitive decline. His work has identified simple behavioral interventions, such as training in treadmill walking, that can improve gait in frail older adults. Dr. Verghese is professor and director of the division of cognitive and motor aging in the Saul R. Korey Department of Neurology, a professor of medicine (geriatrics) and division chief of geriatrics, the **Murray D. Gross Memorial Faculty Scholar in Gerontology**, and **director of the Jack and Pearl Resnick Gerontology Center**.