



EMBARGO 12:01 AM PT TUESDAY OCTOBER 30, 2018

THE PAUL G. ALLEN FRONTIERS GROUP ANNOUNCES 10 NEW ALLEN DISTINGUISHED INVESTIGATORS

\$13.5 million awarded to tackle big questions in biology, medical research

SEATTLE, WASH. — Oct. 24, 2018 — Nanoparticles that could reprogram a cancer patient’s immune system inside their own body. Understanding a mysterious type of brain cell in the hopes of shedding new light on Alzheimer’s disease. Reimagining nuclei, the DNA-storage compartments of our cells, as miniature lava lamps.

These are the subjects of three of nine new Allen Distinguished Investigator awards announced today by The Paul G. Allen Frontiers Group, a division of the Allen Institute, supporting research that will expand our knowledge of our cells, our brains, disease, and the biology of aging. The Allen Institute was founded by philanthropist Paul G. Allen, who passed away Oct. 15.

“Paul’s vision and insight have been an inspiration to me and to many others, both here at the Institute that bears his name and in the myriad of other areas that made up the fantastic universe of his interests. He will be sorely missed,” said [Allan Jones](#), Ph.D., President and CEO of the Allen Institute. “We honor his legacy by carrying out our mission of tackling the hard problems in bioscience, as evidenced by these new Allen Distinguished Investigator awards.”

The nine awards will support 10 investigators from several different research organizations in the U.S., Canada and Portugal. Each award confers \$1.5 million in research support over the course of three years, for a total of \$13.5 million in funding for studies of lymphoma, neuroscience, the immune system, aging and development, and basic biology. The specific award areas were selected in 2017 through a series of in-depth workshops, guided by Allen and other scientific advisors.

“With this new class of Allen Distinguished Investigators, we are honored to uphold Paul’s vision for accelerating scientific discovery. He was keenly interested in the work of these 10 exemplary researchers and their potential to push the boundaries of knowledge,” said [Kathy Richmond](#), Ph.D., M.B.A., Director of the Frontiers Group. “Our new investigators all think outside the box to tackle big challenges and find new insights about disease and health. Each of them is poised to ‘move the needle’ and drive their fields forward.”

The Allen Distinguished Investigator program began in 2010 to fund early-stage research that is less likely to receive support from traditional funding sources, but which has the potential to significantly advance our understanding of biology. With the 2018 awards, there are a total of 69 Allen Distinguished Investigators appointed since 2010.

Three awards were given to researchers studying lymphoma, a broad class of blood cancers with variable treatment options and prognoses. There have been great advances in developing treatments for some lymphomas, but many patients living with these blood cancers are still in need of better options. The three awards will focus on innovative ideas and new technologies that can catalyze new understanding about lymphoma and spur new treatments.

Two awards were given to researchers studying nuclear biophysics, an emerging research field that seeks to understand the special physics inside the nucleus, the cellular compartment that houses DNA. In the past five years, there's been a growing appreciation that DNA and other molecules inside the nucleus are organized into physical states that researchers think of as akin to a microscopic lava lamp or as different phases of the same substance, like ice and water. These physical states may influence everything from how the cell makes proteins to how cancer forms to how well certain drugs function.

Two awards were given to studies of neuroimmunology, another emerging field that explores the important intersections between the brain and the immune system. Recent studies have uncovered that interactions between neurons and immune cells are incredibly important in human health and disease, but researchers still don't understand all the details of that complex dialogue.

Finally, one award was given to studies of astrocytes, a type of brain cell that may play an important role in Alzheimer's disease; and one award was given to the biology of embryonic development and aging.

Meet the 2018 Allen Distinguished Investigators

Chenghua Gu, Ph.D.

Harvard Medical School

Our brains and our immune systems are intricately connected, but researchers don't understand the details of how these two complex systems communicate. Chenghua Gu will study the brain's elaborate blood vessel system and how it mediates this dialogue that influences human health and brain disease by examining the specialized cells that line blood vessels, known as endothelial cells, and how they receive and transmit signals between the body's immune system and the brain.

Baljit S. Khakh, Ph.D.

University of California, Los Angeles

Although almost half our brains are made up of a type of cell known as astrocytes, we know very little about how they work. Baljit Khakh aims to change that. He and his team will tackle the first systematic characterization of astrocytes, study how these cells influence neuron activity, and explore how astrocyte function is altered in a mouse model of Alzheimer's disease, potentially uncovering new therapeutic targets for this devastating neurological disorder.

Marc Kirschner, Ph.D.

Harvard Medical School

Marc Kirschner's lab is taking a large-picture, systematic approach to understanding the biology of early development and of aging, two processes that bookend our lives and the lives of all living creatures. Typically, development and aging are studied in separate research fields, but Kirschner aims to use systems biology and machine learning approaches to uncover the cellular circuitry that drive each and to better understand where they might overlap, using as a model the small crustacean *Daphnia magna*, also known as the water flea.

Clodagh O'Shea, Ph.D.

Salk Institute for Biological Studies

Clodagh O'Shea and her team have developed new technologies that reveal how the six feet of human genomic DNA is compacted into the microscopic cell nucleus by assembling with proteins into flexible chromatin chains that are packed together at different concentration densities. Her team's hypothesis is that in regions of the cell nucleus where chromatin chains are dilute, they take a liquid form that allows genes to be read out into their protein products, but if their concentration exceeds a critical density threshold, they form gels that keep genes locked away and "silenced." She will ask if liquid-to-gel chromatin state transitions determine genomic DNA activity and ultimately cell fate in response to epigenetic drugs, aging, cancer-causing genes and viruses.

Michael Rosen, Ph.D.

The University of Texas Southwestern Medical Center

Michael Rosen will lead a project studying how liquids behave inside the nucleus, the cell's DNA-storage compartment. Recent research has found that, much like the separation of oil and vinegar in salad dressing, regions of the nucleus separate into unmixable liquid droplets, also known as biomolecular condensates. Rosen's project will probe how condensates come to be, what they look like in 3D detail and how defects in these mysterious liquid droplets contribute to a rare type of cancer.

Christian Steidl, M.D.

BC Cancer Research Centre and the University of British Columbia

Christian Steidl will take a deep dive into classical Hodgkin lymphoma, a blood cancer that typically strikes adolescents and young adults, by studying the ecosystem of cancer cells and healthy cells that together are known as the tumor microenvironment. Cancer cells can hijack many of our bodies' natural processes to help themselves grow and spread. To better understand this phenomenon — and ultimately improve diagnoses and treatments for this disease — Steidl and his team will study lymphoma patients' biopsy samples before and after cancer relapse, cell by cell.

Matthias Stephan, M.D., Ph.D.

Fred Hutchinson Cancer Research Center and the University of Washington

Matthias Stephan will lead the development of a novel nanoparticle immunotherapy for lymphoma, a blood cancer that sees more than 80,000 new diagnoses in the U.S. alone every year. The bioengineered therapy would carry instructions to reprogram a patient's own immune cells in their body to recognize and destroy lymphoma cells. In this project, Stephan and his colleagues will scale up the nanoparticles to ready them for clinical trials and test their safety in a large animal model.

Henrique Veiga-Fernandes, D.V.M., Ph.D.

Champalimaud Foundation

Henrique Veiga-Fernandes has pioneered studies on how the nervous system and the immune system interact throughout our body through his identification of specialized "units" of neuroimmune communication in the gut, lungs, fat and skin. Now, he and his research team will develop new techniques to measure how neurons and immune cells interact and influence each other — and our health — throughout the body.

David Weinstock, M.D.

Dana-Farber Cancer Institute

Scott Manalis, Ph.D.

Massachusetts Institute of Technology

David Weinstock and Scott Manalis want to convert lymphoma remissions into cures. They aim to tackle the difficult problem of cancer relapse by studying the tiny amounts of lymphoma cells left behind, also known as minimal residual disease, when patients go into remission. By better understanding what makes these few straggler cells resistant to treatment, their project could ultimately identify ways to prevent lymphoma from coming back.

About The Paul G. Allen Frontiers Group

The Paul G. Allen Frontiers Group is dedicated to exploring the landscape of science to identify and fund pioneers with ideas that will advance knowledge and make the world better. Through continuous dialogue with scientists across the world, The Paul G. Allen Frontiers Group seeks opportunities to expand the boundaries of knowledge and solve important problems. Programs include the Allen Discovery Centers at partner institutions for leadership-driven, compass-guided research, and the Allen Distinguished Investigators for frontier explorations with exceptional creativity and potential impact. The Paul G. Allen Frontiers Group was founded in 2016 by philanthropist and visionary Paul G. Allen, and is a division of the Allen Institute, an independent 501(c)(3) medical research organization. For more information visit allenfrontiersgroup.org.

###

Media Contact:

Rob Piercy, Sr. Manager, Media Relations
206.548.8486 | press@alleninstitute.org