

**FOR IMMEDIATE RELEASE****NEW ALLEN DISTINGUISHED INVESTIGATORS WILL TACKLE UNANSWERED QUESTIONS ABOUT METABOLISM AND THE IMMUNE SYSTEM**

Awards announced today by The Paul G. Allen Frontiers Group will fund research in health, disease, and technology development all centered on the emerging field of immunometabolism

SEATTLE — Feb. 3, 2021 — Just like us, immune cells need fuel to do their jobs. Despite the tight links between human health — including our immunity — and how our bodies process what we eat, the intersection of immunology and metabolism remains a poorly understood area of human biology.

New awards announced today by The Paul G. Allen Frontiers Group, a division of the Allen Institute, aim to improve that understanding by supporting four research projects in the emerging field of immunometabolism. The projects, which are led by 10 new Allen Distinguished Investigators working in teams of two or three lead investigators per award, will explore new avenues of basic biology, health, disease, and technology development, all focused on unanswered questions about how the immune system and metabolism work together.

In recent years, as Frontiers Group staff met with scientific experts to identify future areas of interest, the topic of metabolism and its intersection with the immune system kept coming up, said Frontiers Group Director [Kathy Richmond](#), Ph.D., M.B.A. As they delved into the unknowns, Richmond and her team realized that any significant progress in these areas could improve human health.

“In so many diseases, a tipping point is reached where entire systems in our bodies are thrown off balance. Studying the complex and fascinating interactions between the immune system and energy metabolism will give us a better understanding of what it means to be healthy and how it might be possible to return those systems to balance after damage or disease,” Richmond said. “The innovative and pioneering visions of these four teams of Allen Distinguished Investigators span a variety of approaches to tackle this exciting area of biomedical research.”

Each award confers \$1.5 million in funding over three years for a total of \$6 million awarded for immunometabolism research. The Frontiers Group, founded by the late philanthropist Paul G. Allen in 2016, recommends funding from the Paul G. Allen Family Foundation to researchers around the world whose work has the potential to accelerate scientific discoveries or launch entirely new avenues of exploration. The [Allen Distinguished Investigator](#) program was launched in 2010 by Allen to back creative, early-stage research projects in biology and medical research that would not otherwise be supported by traditional research funding programs. Including the 10 new investigators announced today, a total of 92 Allen Distinguished Investigators have been appointed.

The four new research projects include research on human disease, basic biology of the mammalian immune system, and technology development that could impact many areas of immunology and metabolism research.

“The whole field of immunometabolism is relatively new, and it’s a great time to be studying this area because there are also new technologies that allow for exploration of metabolic processes within cells and tissues,” said [Dan Littman](#), M.D., Ph.D., a professor of immunology and microbiology at NYU Langone Health. “It’s an exciting and emerging area, and there aren’t many other avenues for funding immunometabolism research as of yet.”

Meet the new Allen Distinguished Investigators

Will Bailis, Ph.D.

Children’s Hospital of Philadelphia

Chris Bennett, M.D.

University of Pennsylvania

Ruaidhrí Jackson, Ph.D.

Harvard Medical School

All of us are made up of trillions of cells, yet it is unclear how these cells simultaneously behave as individuals and as part of a collective that makes up who we are. Drs. Will Bailis, Chris Bennett and Ruaidhrí Jackson are leading a project to better understand the many links between immunity and metabolism at the scale of individual cells, organs and the entire body. These inextricable links — how our diet affects our immune system, and how our immune cells in turn change metabolism — tie into all aspects of human health and disease, including cancer, diabetes and heart disease. Using laboratory mice, the researchers will study how an animal’s food affects energy production inside immune cells by genetically engineering those cells to “ignore” changes in diet. In tandem, they will study how one particular type of immune cell, known as tissue resident macrophages, uses metabolism to govern not only its own cellular function, but the function of tissues and the entire body.

Aida Habtezion, MD, MSc.

Stanford University School of Medicine

Nandita Garud, Ph.D., MS.

University of California, Los Angeles

Carolina Tropini, Ph.D.

University of British Columbia

Inflammatory bowel disease, or IBD, is a class of immune diseases that stem from chronic inflammation in the intestines. Patients with IBD have widely varied symptoms and responses to treatment which can’t be fully explained by human genetics. Drs. Aida Habtezion, Nandita Garud and Carolina Tropini are leading a project to explore how patients’ immune responses, metabolism, gut microbiomes and environments may contribute to that variability, using a registry of hundreds of IBD patient volunteers. Better understanding the details of variation between patients, and the reasons behind that diversity, could lead to better, more tailored treatments for this class of often crippling illnesses.

Russell Jones, Ph.D.

Van Andel Institute

Yasmine Belkaid, Ph.D.

National Institute for Allergies and Infectious Disease

Like all cells, our immune cells need energy from the food we eat to do their jobs. Drs. Russell Jones and Yasmine Belkaid have recently found that T cells, an important type of immune cell that surveys the body and detects and eliminates infected cells, use multiple kinds of fuel when they are working their hardest. Now, they are leading a project to better understand T cells’ preferred fuel sources, uncovering which types of T-cell metabolism are needed for optimal infection-fighting and which types might lead to immune dysfunction.

Jennifer Prescher, Ph.D.

Michelle Digman, Ph.D.

University of California, Irvine

To better understand the immune system and how it dovetails with metabolism, researchers need better toolkits to track and manipulate multiple kinds of cells and molecules at once, over time, in a living animal.

Drs. Jennifer Prescher and Michelle Digman are leading the development of a new technique to shine “biological flashlights” on many different immune- and metabolism-related molecules at the same time. The technique, which they dub bioluminescent phasor, will ultimately yield a large toolkit of optical tags that can light up multiple processes or proteins in the laboratory mouse’s immune system at once. Once complete, the toolkit would be available for any research lab to use, opening new avenues for discoveries about the immune system and its relationship to our diet.

About The Paul G. Allen Frontiers Group

The Paul G. Allen Frontiers Group, a division of the Allen Institute, is dedicated to exploring the landscape of bioscience to identify and foster ideas that will change the world. The Frontiers Group recommends funding through award mechanisms to accelerate our understanding of biology, including: Allen Discovery Centers at partner institutions for leadership-driven, compass-guided research; and Allen Distinguished Investigators for frontier explorations with exceptional creativity and potential impact. The Paul G. Allen Frontiers Group was founded in 2016 by the late philanthropist and visionary Paul G. Allen. For more information, visit allenfrontiersgroup.org.

About the Paul G. Allen Family Foundation

For more than four decades the Paul G. Allen Family Foundation has focused on changing the trajectory of some of the world’s toughest problems. Founded by philanthropists Jody Allen and the late Paul G. Allen, co-founder of Microsoft, the Foundation initially invested in community needs across the Pacific Northwest with a focus on regional arts, under-served populations, and the environment. Today, the Foundation supports a global portfolio of frontline partners working to preserve ocean health, protect wildlife, combat climate change, and strengthen communities. The Foundation invests in grantees to leverage technology, fill data and science gaps, and drive positive public policy to advance knowledge and enable lasting change.

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