EMBARGOED UNTIL 9AM US EDT, TUESDAY, MAY 9, 2017

2017 International Research Scholars

Ido Amit, PhD
Weizmann Institute of Science
Israel
HHMI International Research Scholar
Ido Amit wants to reveal how immune cells work, and what role they play in health and disease. His lab develops new single cell genomic technologies to study these cells in unprecedented resolution. Figuring out immune cells' actions will help advance the next generation of immunotherapy to fight cancer and other disorders.

Melanie Blokesch, PhD
Swiss Federal Institute of Technology (Lausanne, Switzerland)
Switzerland
HHMI International Research Scholar
Melanie Blokesch studies *Vibrio cholerae*, a water-dwelling bacterium that wreaks havoc in the gut and causes the diarrheal disease cholera. Her team wants to map the molecular tools *V. cholera*e uses to jump from the environment to humans, which will help explain what triggers cholera outbreaks in endemic areas of the world.

Carlos Blondel, PhD
Universidad Autónoma de Chile
Chile
HHMI-Gulbenkian International Research Scholar
Carlos Blondel investigates the emergence of human pathogens by studying their molecular weaponry. He has worked with foodborne pathogens that cause gastrointestinal disease, such as *Salmonella* and *Vibrio parahaemolyticus*. Blondel recently used CRISPR/Cas 9 genome editing technology to uncover key interactions between *V. parahaemolyticus* and human cells.

Yossi Buganim, PhD
Hebrew University of Jerusalem
Israel
HHMI International Research Scholar
Yossi Buganim's goal is to bring therapeutic cells from the lab to the clinic. His team has invented and improved ways to reprogram adult cells into other cell types, including those able to generate nearly any kind of cell in the body. One day, such cells could be tapped for regenerative medicine — replacing damaged tissues with those grown in the lab.

Tineke Cantaert, PhD
Institut Pasteur Cambodia
Cambodia
HHMI-Wellcome International Research Scholar
Tineke Cantaert seeks to understand how the immune system responds to infection by flaviviruses such as Dengue and Zika. Currently, no treatment exists for infection by either virus. Identifying biomarkers for protective immunity might help scientists speed up the development of therapies and vaccines.

Ling-Ling Chen, PhD
Shanghai Institute of Biochemistry and Cell Biology (SIBCB), Chinese Academy of Sciences
China
HHMI International Research Scholar
Ling-Ling Chen is discovering new and unusual classes of RNA molecules called long noncoding RNAs. She's figuring out how these molecules form, what role they play in gene regulation, and how they may influence disease. She has found that some of these RNAs are conspicuously absent in people with the neurodevelopmental genetic disorder Prader-Willi syndrome.

Mark Dawson, MD, PhD
Peter MacCallum Cancer Institute
Australia
HHMI International Research Scholar
Mark Dawson is searching for ways to wipe out malignant stem cells without harming normal stem cells. He studies cancers such as acute myeloid leukemia, which are difficult to eradicate using traditional chemotherapies. Understanding how normal and malignant stem cells differ from each other could let researchers devise more effective, targeted treatments.

Ana Domingos, PhD
Calouste Gulbenkian Foundation
Portugal
HHMI-Wellcome International Research Scholar
Ana Domingos is investigating new molecular strategies to fight obesity. She has discovered a direct link between fat tissue and neurons of the sympathetic nervous system, which plays a role in burning fat. Stimulating these neurons could one day lead to a new treatment to cause fat loss.

Idan Efroni, DPhil
Hebrew University of Jerusalem
Israel
HHMI International Research Scholar
Idan Efroni is unraveling the mystery of plants' impressive regenerative abilities. He uses tomatoes to study how plants generate new stem cells and meristems to replace damaged or missing roots. Insight into this process might reveal clues about tissue regeneration in other organisms, and help scientists boost plant production for agriculture.

Eran Elinav, MD, PhD
Weizmann Institute of Science
Israel
HHMI-Gates International Research Scholar
Eran Elinav is fascinated by microbes that live around and in our body — our microbiome. He has discovered important links between nutrition, gut microbes and the risk of developing common diseases, such as obesity and diabetes. Now, he wants to figure out how gut microbes impact human relapsing (or "yo-yo") obesity and its many complications.

Qiaomei Fu, PhD
Chinese Academy of Sciences
China

HHMI International Research Scholar
Qiaomei Fu is exploring the genetic roots of humankind. Her work has helped untangle the early history of modern humans and Neanderthals, and reveal how early agriculture affected European farmers. She wants to illuminate the human prehistory of Asia by investigating the ancient genomes of both humans and pathogens.

Lena Ho, PhD
A*STAR Institute of Medical Biology, Duke-NUS Graduate Medical School
Singapore
HHMI International Research Scholar
Lena Ho is on the hunt for new peptides linked to human disease. She's looking for hidden gems among previously overlooked regions of our genome, and seeks to understand how the peptides work and how they can be used to combat common diseases of the cardiovascular and metabolic systems.

Kathryn Holt, PhD
University of Melbourne
Australia
HHMI-Gates International Research Scholar
Kathryn Holt uses genomic tools to study infectious disease-causing microbes important in global health, including *Salmonella typhi*, which causes typhoid fever, and *Shigella sonnei*, a bacterium responsible for dysentery. She wants to understand what makes pathogens emerge, and why some become resistant to antimicrobial drugs.

Catarina Homem, PhD
New University of Lisbon
Portugal
HHMI-Wellcome International Research Scholar
In developing animal embryos, stem cell growth is tightly regulated so that the right kinds of cells emerge at the proper place and time. **Catarina Homem** is investigating how metabolism and nutrition influence this process, and how mistakes can lead to developmental defects and diseases such as cancer.

Michael Hothorn, PhD
University of Geneva
Switzerland
HHMI International Research Scholar
Michael Hothorn is piecing together how plants sense essential nutrients in the soil and send signals from cell to cell. A molecular understanding of how plants detect and respond to changes in phosphorus levels, for example, could help researchers engineer crops that can survive when nutrients are scarce.

Shalev Itzkovitz, PhD
Weizmann Institute of Science
Israel
HHMI International Research Scholar
Shalev Itzkovitz studies the design principles of mammalian tissues. He's taking a close-up look at individual cells to figure out how they work together in organs such as the intestine, liver, and

pancreas. Advanced imaging techniques combined with single cell sequencing will help researchers determine the job description of cells in different organs.

Martin Jinek, PhD
University of Zurich
Switzerland
HHMI International Research Scholar
Martin Jinek is investigating how protein and RNA molecules team up to control gene expression and protect the genome. He has pioneered work on the powerful genome-editing system known as CRISPR-Cas9, and revealed key details of this system at the atomic level. His work could spur the development of new, cutting-edge technologies for editing genomes and genetic therapies.

Luis Larrondo, PhD
Catholic University of Chile (Santiago, Chile)
Chile
HHMI International Research Scholar
Luis Larrondo is unwinding the secrets of biological clocks, which help living organisms, including humans, plants and fungi, stay in sync with the Earth's daily rhythms. His research draws upon synthetic biology as well as optogenetics to probe the molecular components that keep biological clocks ticking.

Guohong Li, PhD
Chinese Academy of Sciences
China
HHMI International Research Scholar
Human genomic DNA is packaged with histone proteins into tightly-wound bundles of fiber called chromatin. **Guohong Li** has used an imaging technique called cryo-electron microscopy to visualize these twisted fibers in 3D at a detail previously unseen. Now, he wants to view the fibers at atomic resolution, and figure out the role of the histones wrapped inside.

Ryan Lister, PhD
University of Western Australia
Australia
HHMI International Research Scholar
A suite of chemical tags decorates the genomes of humans, plants, and other multicellular organisms. **Ryan Lister** is inventing new tools to edit these tags, a type of epigenetic modification, which can regulate gene expression, cell differentiation, and more. He also wants to explore their role in brain development, which could offer new insights into neurological disorders.

Ying Liu, PhD
Peking University
China
HHMI International Research Scholar
Mitochondria, which generate energy for cells and regulate programmed cell death, are vulnerable to damage. **Ying Liu** is using worm genetics and biochemistry to investigate the cellular pathways that sense mitochondrial dysfunction and activate stress responses. Defects in these pathways may contribute to metabolic disorders, neurodegenerative diseases and cancer.

Laura Mackay, PhD
University of Melbourne
Australia
HHMI-Gates International Research Scholar
Laura Mackay is working to identify pathways that guide the development of tissue-resident memory T cells, immune cells that reside in the body's peripheral tissues and protect against local infections. She wants to harness these cells to create new therapies for infectious disease, cancer, and autoimmune diseases.

Judit Makara, MD, PhD
Institute of Experimental Medicine, Hungarian Academy of Sciences
Hungary
HHMI International Research Scholar
Judit Makara is investigating how neurons in the brain's hippocampus support creation of memories. She is interested in the synaptic and dendritic processing mechanisms that promote the recruitment of individual neurons into ensembles with coordinated activity to store information about places or events.

Tomas Marques-Bonet, PhD
University of Pompeu Fabra
Spain
HHMI International Research Scholar
Tomas Marques-Bonet is assessing genomic diversity among great apes. His work will help us understand the biological processes and features that make us human and has implications for conservation biology. He is also using comparative genomics to study changes in gene regulation and the genomic consequences of domestication.

Seth Masters, PhD
Walter and Eliza Hall Institute of Medical Research
Australia
HHMI-Wellcome International Research Scholar
Seth Masters uses personalized medicine to identify genetic changes that cause severe inflammatory diseases early in life. These studies teach us about how the innate immune system works, and may also provide targets for the development of drugs to treat more common inflammatory conditions such as heart disease, inflammatory bowel disease, type 2 diabetes and neurological disorders.

Ruben Moreno-Bote, DPhil
University of Pompeu Fabra
Spain
HHMI International Research Scholar
Ruben Moreno-Bote is interested in the idea that although the human brain can solve complex problems, it sometimes falls short on simple tasks. He is combining theoretical and experimental approaches to identify the factors that limit the amount of information stored in the brain.

Shyh-Chang Ng, PhD
Agency for Science Technology and Research

Singapore
HHMI-Gates International Research Scholar
As stem cells develop into specialized cells, their cell fates are influenced by the biochemical pathways that process nutrients to synthesize cellular materials and convert food to energy. **Shyh-Chang Ng** is studying how these metabolic processes regulate muscle regeneration during aging. His work could deepen our understanding of the effects of nutrition and exercise, and suggest strategies for treating the aging-induced metabolic syndrome.

Zaza Ndhlovu, PhD
University of Kwazulu-Natal
South Africa
HHMI International Research Scholar
Zaza Ndhlovu is investigating how the immune system is affected when patients with HIV begin combination antiretroviral therapy very early in the course of disease. His goal is to learn whether brief exposure to the virus is sufficient to prime a protective immune response that might one day be boosted by a vaccine.

Fredros Okumu, PhD
Ifakara Health Institute
Tanzania
HHMI-Gates International Research Scholar
Fredros Okumu is developing species-specific methods of eliminating the malaria-transmitting mosquito *Anopheles funestus*, with the goal of stopping the disease's transmission in two districts in southeastern Tanzania. Although *A. funestus* is not the most populous mosquito species in the region, it is responsible for 82-95 percent of local malaria infections.

Fabiola Osorio, PhD
University of Chile, Santiago
Chile
HHMI International Research Scholar
Cellular perturbations, such as changes in nutrient or oxygen levels or accumulation of misfolded proteins, can be indicative of pathogen presence or disruption in normal physiology. **Fabiola Osorio** studies how the immune system recognizes and responds to signs of cellular stress for regulation of immunity.

Hye Yoon Park, PhD
Seoul National University
Korea
HHMI-Wellcome International Research Scholar
Biophysicist **Hye Yoon Park** is developing imaging technologies to visualize the cellular and molecular processes the brain uses to form, consolidate, and retrieve memories. She will use the new techniques to study how neuronal activity alters gene expression to rewire neural circuits during learning.

Joseph Paton, PhD
The Champalimaud Centre for the Unknown
Portugal
HHMI International Research Scholar

Joseph Paton has discovered key signals in the brain involved in timing and decision-making. He is investigating the circuit mechanisms that generate these signals and transform them into actions. His work will help explain how animals free themselves from the immediacy of the current moment to learn and plan.

Nicolas Plachta, PhD
A*STAR Institute of Molecular and Cell Biology,
Singapore
HHMI-Wellcome International Research Scholar
Nicolas Plachta is using single-cell imaging technologies devised in his lab to study how developing embryos take shape. He wants to understand the molecular mechanisms that govern changes in cell fate, shape, and position and how these changes are coordinated across an entire embryo.

Thomas Pucadyil, PhD
Indian Institute of Science Education and Research – Pune
India
HHMI International Research Scholar
Thomas Pucadyil is studying how biological membranes -- protective barriers that are highly resilient to rupture -- split apart to allow for the packaging and transport of cellular materials. He is searching for membrane fission catalysts that cells use to manage this energetically demanding process.

Hai Qi, PhD
Tsinghua University
China
HHMI-Gates International Research Scholar
Hai Qi is exploring how the immune system generates and maintains memory cells that remember past infections and stay poised to produce antibodies against returning pathogens. His research may open new avenues for vaccine development and suggest better ways to control autoimmune diseases.

Asya Rolls, PhD
Technion-Israel Institute of Technology
Israel
HHMI-Wellcome International Research Scholar
Asya Rolls wants to understand the connections between the brain and the immune system. She is particularly interested in how brain activity influences the immune system's ability to find and destroy tumors. Her research could reveal new ways to harness the body's inherent disease-fighting potential.

Marvin Tanenbaum, PhD
Hubrecht Laboratory
Netherlands
HHMI International Research Scholar
Marvin Tanenbaum is developing an imaging approach that will allow researchers to observe individual messenger RNA molecules as they are translated into proteins in living cells. He will use the method to investigate how translation is regulated to control the fate and function of cells.

Wai-Hong Tham, PhD
Walter and Eliza Hall Institute of Medical Research
Australia
HHMI-Wellcome International Research Scholar
Wai-Hong Tham is studying how malaria parasites interact with their human hosts. Specifically, she wants to understand how *Plasmodium vivax*, the dominant malaria parasite in countries outside of sub-Saharan Africa, recognizes and invades red blood cells inside the human body.

Yanli Wang, PhD
Institute of Biophysics, Chinese Academy of Sciences
China
HHMI-Wellcome International Research Scholar
Yanli Wang is studying mechanisms of two bacterial anti-virus defense systems. She is using structural biology to learn how the CRISPR-Cas and Argonaute systems use small molecules of RNA or DNA to find and cleave foreign genetic material. She is also looking for ways to modify their RNA/DNA-cleaving components to increase their efficiency as genome editing tools.

Wei Xie, PhD
Tsinghua University
China
HHMI International Research Scholar
Immediately after an egg is fertilized, DNA and its packaging proteins (histones) undergo drastic reorganization so that cells can acquire new identities in early embryos. However, how this is achieved remains poorly understood due to the extremely scarce experimental samples. By developing ultrasensitive tools for chromatin analysis, **Wei Xie** is working to decipher how such reprogramming occurs and whether chromatin associated "epigenetic" information can be passed on to the next generation.

Manuel Zimmer, PhD
Research Institute of Molecular Pathology
Austria
HHMI-Wellcome International Research Scholar
Manuel Zimmer is using the roundworm *Caenorhabditis elegans* to study the dynamics of neural networks. Using a whole-brain imaging approach developed in his lab, he aims to uncover the fundamental computations and their underlying mechanisms neural circuits use to interpret sensory information and generate appropriate behaviors.