

**ITI and Center for Human Systems Immunology at Stanford: Human Immune  
Monitoring Technology and Bioinformatics Conference  
School of Medicine's Conference Center at Li Ka Shing Center  
May 2-3, 2019**

**ORGANIZERS BIOGRAPHIES**

**Catherine Blish, MD, PhD, FIDSA** is an Associate Professor of Medicine and Immunology at the Stanford University School of Medicine. As an undergraduate she studied biochemistry at the University of California, Davis, before completing her MD and PhD at the University of Washington. She completed residency in internal medicine and fellowship training in infectious diseases at the University of Washington and the Fred Hutchinson Cancer Research Center. She joined the Stanford faculty in in 2011, where her research is dedicated to learning how to harness the immune system to prevent and cure diseases. Her lab studies human natural killer (NK) cells, a critical first line of defense against viruses and tumors, working to define how human natural killer cells sense and respond to a diverse array of pathogens, including HIV, dengue virus, influenza, and tuberculosis. She divides her time between research, clinical practice in infectious diseases, teaching, and her role as an Associate Director of the Stanford MD-PhD program. She has received numerous awards for research and mentoring, including the Stanford Immunology Outstanding Faculty Mentor Award, a NIH Director's New Innovator Award, and the NIDA Avant-Garde Award for HIV/AIDS Research. She is an elected a member of the American Society for Clinical Investigation and an Investigator of the Chan Zuckerberg Biohub.

**Mark M. Davis, PhD** is the Director of the Stanford Institute for Immunology, Transplantation and Infection (ITI), a Professor of Microbiology and Immunology, and a Howard Hughes Medical Institute Investigator. He received a B.A. from Johns Hopkins University and a Ph.D. from the California Institute of Technology. He later was a postdoctoral and staff fellow at the Laboratory of Immunology at NIH and then became a faculty member in the Department of Microbiology and Immunology at Stanford University School of Medicine, where he remains today. Dr. Davis is well known for identifying many of the T-cell receptor genes, which are responsible for the ability of these cells to recognize a diverse repertoire of antigens. Current research interests involve understanding the molecular interactions that underlie T cell recognition and the challenges of human immunology, specifically a "systems level" understanding of an immune response to vaccination or infection. He has received many honors and awards, including memberships in the National Academy of Science and the Institute of Medicine, The Paul Ehrlich Prize, The Gairdner Foundation Prize, The King Faisal Prize, the General Motors Alfred P. Sloan Prize, and being elected as Foreign Member to the Royal Society of London.

**Purvesh Khatri, PhD** is an Associate Professor in Institute for Immunity, Transplantation and Infection and Division of Biomedical Informatics Research in Department of Medicine at Stanford University. He is an electronics and communications engineer turned software developer turned computational systems immunologist. His research focuses on developing machine learning methods for leveraging biological and technical heterogeneity by repurposing publicly-available heterogeneous data for accelerating translational medicine. His lab has developed computational frameworks to integrate independent cohorts to better understand human immune system to develop novel diagnostics and identify drug targets for inflammatory diseases including autoimmune diseases, infections, organ transplant, vaccination, and cancer.

**Professor Bali Pulendran, PhD** is the Violetta L. Horton Professor at the Stanford University School of Medicine, and a member of the Institute for Immunology, Transplantation and Infection, and the Departments of Pathology and Microbiology & Immunology at Stanford University. He is also an adjunct professor at Emory University and the Yerkes National Primate Center, and director of the NIH U19 Center for Systems Vaccinology, at Emory University in Atlanta. He received his undergraduate degree from Cambridge University, and his Ph.D from the Walter & Eliza Hall Institute in Melbourne, Australia, under the supervision of Sir Gustav Nossal. He then did his post-doctoral work at Immunex Corporation in Seattle. Dr. Pulendran is a world leader on understanding the mechanisms by which the innate immune system regulates adaptive immunity and harnessing such mechanisms in the design of novel vaccines. More recently, his laboratory pioneered the use of systems biological approaches to predicting the efficacy of vaccines, and deciphering new correlates of protection against infectious diseases. Dr. Pulendran's research is published in front line journals such as Nature, Science, Cell, Nature Medicine, and Nature Immunology. Furthermore, Dr. Pulendran is the recipient of numerous grants from the National Institutes of Health, and from The Bill and Melinda Gates Foundation, serves on many editorial boards, and is the recipient of two concurrent MERIT awards from the National Institutes of Health.

## **SPEAKERS BIOGRAPHIES**

**Nima Aghaeepour, PhD** is an Assistant Professor at Stanford University and is interested in the intersection of data sciences, immunology, and clinical phenotyping. Dr. Aghaeepour earned a B.Sc. in computer science from University of Tehran and a Ph.D. in Bioinformatics from University of British Columbia. He completed his postdoctoral studies at in the laboratory of Prof. Garry Nolan at Stanford University. Awards recognizing his work include Scholarship of the International Society for Advancement of Flow Cytometry, Fellowship of the Canadian Institute of Health Research, the Chao-Huei Jeffrey Wang Award, and the Ann Schreiber Award.

**Rosa Bacchetta, MD**, is a physician scientist, Associate Professor in the Department of Pediatrics, Division of Stem Cell Transplantation and Regenerative Medicine (SCTRM) in Stanford School of Medicine. She has long standing expertise in T regulatory cell studies in human diseases, especially in genetic autoimmune disease. Her work has significantly contributed to dissecting the role of FOXP3 and T regulatory cells in immune responses in humans, with particular focus on but not limited to, IPEX Syndrome. She is an international reference for pathogenetic studies on FOXP3+Treg cell deficiencies, and her group was the first to show the gene transfer mediated conversion of T cells from IPEX patients into Treg cells. Her lab specializes in pediatric immunology, with the goal to apply current scientific knowledge to understand the mechanisms underlying the paradox in diseases with autoimmunity and immune deficiency and to develop curative treatments. Her research group focuses on translational research and is contributing to the establishment of several new clinical trials for cell and gene therapy. These include a cell-based therapy to prevent graft versus host disease in allogeneic hematopoietic stem cell recipients and a gene therapy to control and prevent autoimmunity in IPEX syndrome patients. Her research is funded by Spark, CIRM, NIH and Stanford CHRI.

**Carolyn Bertozzi, PhD**, is the Anne T. and Robert M. Bass Professor of Chemistry and Professor of Chemical & Systems Biology and Radiology (by courtesy) at Stanford University, and an Investigator of the Howard Hughes Medical Institute. She completed her undergraduate degree in Chemistry from Harvard University in 1988 and her Ph.D. in Chemistry from UC Berkeley in 1993. After completing postdoctoral work at UCSF in the field of cellular immunology, she joined the UC Berkeley faculty in 1996. In June 2015, she joined the faculty at Stanford University coincident with the launch of Stanford's ChEM-H institute. Prof. Bertozzi's research interests span the disciplines of chemistry and biology with an emphasis on studies of cell surface glycosylation pertinent to disease states. Her lab focuses on profiling changes in cell surface glycosylation associated with cancer, inflammation and bacterial infection, and exploiting this information for development of diagnostic and therapeutic approaches, most recently in the area of immuno-oncology. She has been recognized with many honors and awards for her research accomplishments. She is an elected member of the Institute of Medicine, National Academy of Sciences, and American Academy of Arts and Sciences. She has been awarded the Lemelson-MIT Prize, the Heinrich Wieland Prize, and a MacArthur Foundation Fellowship, among many others.

**Ami Bhatt, MD, PhD**, is a physician scientist with a strong interest in microbial genomics and metagenomics. She received her MD and PhD from the University of California, San Francisco. She then carried out her residency and fellowship training at Harvard's Brigham and Women's Hospital and Dana-Farber Cancer Institute, and served as Chief Medical Resident from 2010-2011. She joined the faculty of the Departments of Medicine (Divisions of Hematology and Bone marrow transplantation) and Genetics at Stanford University in 2014 after completing a post-doctoral

fellowship focused on genomics at the Broad Institute of Harvard and MIT. Prof. Bhatt is a current Damon Runyon Clinical Investigator and has received multiple awards for her academic scholarship including the Chen Award of Excellence from the Human Genome Organisation (HUGO). Her team's research program seeks to illuminate the interplay between the microbial environment and host/clinical factors in human diseases. Her translational laboratory develops and applies novel molecular and computational tools to study strain level dynamics of the microbiome, to understand how microbial genomes change over time and predict the functional output of microbiomes.

**Petter Brodin, MD, PhD**, Dr Brodin grew up in Stockholm, Sweden and graduated from a joint M.D and Ph.D program at the Karolinska Institute. After completing his clinical internship and pediatric residency at the Karolinska University Hospital, he joined the Mark Davis laboratory at Stanford University as a postdoctoral fellow. During this time the Davis lab was involved in several systems-immunology analyses in human cohort and Brodin contributed in particular to an analysis of immune system variation in healthy human twins in order to assess the influences of heritable and non-heritable factors. After this, Brodin was recruited back to the Karolinska Institute to lead his own research group, and also establish a Mass cytometry facility at the newly opened Science for life laboratory, a national center for life science technology funded by the Swedish government. Brodin now divides his time between clinical work at the Karolinska University Children's Hospital with research aiming to understand human immune system variation in general, and the shaping of human immune systems early in life in particular. <https://ki.se/en/people/pebrod>

**Rhiju Das, PhD** is a computational biochemist and associate professor at Stanford University School of Medicine. Dr. Das trained at Harvard University (A.B.), Cambridge (M. Phil), University College London (M. Res), Stanford University (Ph.D.), all in physics; and then in David Baker's biochemistry lab at U. Washington. The Das lab focuses on computational modeling and design of RNA molecules. Dr. Das leads the Eterna massive open laboratory, which couples a 100,000-player videogame to the lab's massively parallel experimental tools, the first such platform in citizen science.

**Steven G. Deeks, MD**, is a Professor of Medicine in Residence at the University of California, San Francisco (UCSF). He is a recognized expert on HIV-associated immune dysfunction and its impact on HIV persistence (the "reservoir") and health during antiretroviral therapy. Dr. Deeks has published over 400 peer-review articles, editorials and invited reviews on these and related topics. He has been the recipient of several NIH grants, and is one of the principal investigators of DARE (the Delaney AIDS Research Enterprise), which is an NIH-funded international collaboratory aimed at developing therapeutic interventions to cure HIV infection. He is also a member of the Board of Directors for the UCSF-based amfAR Institute for HIV Cure Research. In addition to his clinical and translational investigation, Dr. Deeks maintains a primary care clinic for HIV infected adults.

**Hal Drakesmith, PhD** is an Associate Professor of Immunology at the MRC Weatherall Institute of Molecular Medicine, University of Oxford. Hal trained at the University of Cambridge, University of Kyoto and University College London before moving to the Oxford. His lab works at the intersection of iron homeostasis, immunity and haematology, focusing on the biology of the iron regulatory hormone hepcidin. His lab has advanced the understanding of pathogenesis of iron deficiency, haemochromatosis and thalassaemia, and has studied the role of hepcidin and iron in various infectious and inflammatory disorders. His research encompasses molecular mechanistic analysis of hepcidin gene regulation and iron homeostasis as well as testing the effects of experimental manipulation of iron transport on anaemia, infection and on immune responses. Analysis of samples from controlled human infection experiments, population surveys, disease cohorts, and clinical trials, via collaborations with centres in Africa, Sri Lanka and UK hospitals, informs the lab's mechanistic work.

**Dr. Joel Dudley, PhD** is the Director of the Institute for Next Generation Healthcare at the Icahn School of Medicine at Mount Sinai. Through his vision, the institute has set out to build a new model of research, innovation, and market delivery to hasten and help shape the impending revolution in health care. Dr. Dudley is also an Assistant Professor for Genetics and Genomic Sciences and the Director of Biomedical Informatics at Mount Sinai School of Medicine. Prior to Mount Sinai, Dr. Dudley has held positions as Co-founder and Director of Informatics at NuMedii, Inc. and Consulting Professor of Systems Medicine in the Department of Pediatrics at Stanford University School of Medicine, where he participated in leading research to incorporate genome sequencing into clinical practice (published in *The Lancet*, *Cell*, and *PLoS Genetics*). Dr. Dudley's current research is focused towards solving key problems in genomics and precision medicine through the development and application of translational and biomedical methodologies.

**Elizabeth S. Egan, MD, PhD**, is an Assistant Professor of Pediatric Infectious Diseases and of Microbiology & Immunology at Stanford School of Medicine, where she studies host erythrocyte determinants of infection by the malaria parasite *Plasmodium falciparum*. Her research focuses on developing novel approaches to identify and characterize red blood cell factors that influence *P. falciparum* biology and pathogenesis, including the ex-vivo generation of genetically altered red blood cells from hematopoietic stem cells. The long-term goal of her work is to explore the potential of host-directed therapeutics for malaria. In addition to her research, Dr. Egan is an attending physician in Pediatric Infectious Diseases at Stanford's Lucille Packard Children's Hospital. Dr. Egan has received various awards for her research including a Clinical Scientist Development Award from the Doris Duke Charitable Foundation, New Innovator Award from the National Institutes of Health, and Young Investigator Award from the American Society of Microbiology.

**Sarah Fortune, MD**, is the John LaPorte Given Professor of Immunology and Infectious Diseases at the Harvard TH Chan School of Public Health and Director of the TB Research Program at the Ragon Institute of MGH, Harvard and MIT. She

received a Bachelor of Science (B.S.) in biology from Yale University and an MD from Columbia University's College of Physicians and Surgeons. She completed her residency in Internal Medicine and fellowship in Infectious Diseases at the Brigham and Women's Hospital and Massachusetts General Hospital. Her lab currently seeks to define bacterial determinants of the variability in clinical outcomes of tuberculosis. Areas of interest include mechanisms and rates of genetic and epigenetic diversification, and identification of mechanisms by which the bacterium generates high frequency diversity.

**Olivier Gevaert, PhD** is an assistant professor at Stanford University focusing on developing machine-learning methods for biomedical decision support from multi-scale data. He is an electrical engineer by training with additional training in artificial intelligence, and a PhD in bioinformatics at the University of Leuven, Belgium. He continued his work as a postdoc in radiology at Stanford and then established his lab in the department of medicine in biomedical informatics. The Gevaert lab focuses on biomedical data fusion primarily in oncology and neuroscience using machine learning methods including Bayesian, kernel methods, regularized regression and deep learning to integrate multi-omics, multi-modal and multi-scale biomedical data. The lab also investigates linking omics data with cellular and tissue data in the context of computational pathology, imaging genomics & radiogenomics.

**William Greenleaf, PhD**, is an Assistant Professor in the Genetics Department at Stanford University School of Medicine, with a courtesy appointment in the Applied Physics Department. He is a member of Bio-X, the Biophysics Program, the Biomedical Informatics Program, and the Cancer Center. He received an A.B. in physics from Harvard University (summa cum laude) in 2002, and received a Gates Fellowship to study computer science for one year in Trinity College, Cambridge, UK (with distinction). After this experience abroad, he returned to Stanford to carry out his Ph.D. in Applied Physics in the laboratory of Steven Block, where he investigated, at the single molecule level, the chemo-mechanics of RNA polymerase and the folding of RNA transcripts. He conducted postdoctoral work in the laboratory of X. Sunney Xie in the Chemistry and Chemical Biology Department at Harvard University, where he was awarded a Damon Runyon Cancer Research Foundation Fellowship, and developed new fluorescence-based high-throughput sequencing methodologies. He moved to Stanford as an Assistant Professor in November 2011. Since beginning his lab, he has been named a Rita Allen Foundation Young Scholar, an Ellison Foundation Young Scholar in Aging (declined), a Baxter Foundation Scholar, and a Chan-Zuckerberg Investigator. His highly interdisciplinary research links molecular biology, computer science, bioengineering, and genomics to understand how the physical state of the human genome controls gene regulation and biological state. Efforts in his lab are split between building new tools to leverage the power of high-throughput sequencing and cutting-edge microscopies, and bringing these new technologies to bear against basic biological questions of genomic and epigenomic variation. His long-term goal is to unlock an understanding of the physical "regulome" — i.e. the factors that control how the genetic information is read into biological instructions — profoundly impacting our understanding of how cells maintain, or fail to

maintain, their state in health and disease.

**X. Shirley Liu, PhD** is Professor of Statistics, Biostatistics and Computational Biology at Harvard University, Director of the Center of Functional Cancer Epigenetics at Dana-Farber Cancer Institute, and the PI of the Cancer Immune Data Common from National Cancer Institute with the goal of identifying biomarkers for optimizing cancer immunotherapy strategies. Her research focuses on algorithm development and integrative modeling of high throughput genomic data to understand the specificity and function of regulator genes in tumor development, progression, drug response and resistance. She is especially interested in genomics and bioinformatics approaches in cancer epigenetics, cancer immunology, and CRISPR screens for translational cancer research. She is the recipient of the Sloan Research Fellowship, the Richard E. Weitzman Outstanding Early Career Investigator Award from the Endocrine Society, and Breast Cancer Research Foundation Investigator.

**Crystal Mackall, MD** is an Endowed Professor of Pediatrics and Medicine at Stanford University. She is Founding Director of the Stanford Center for Cancer Cell Therapy, Associate Director of Stanford Cancer Institute, and Director of the Parker Institute for Cancer Immunotherapy at Stanford. During her tenure as Chief of the Pediatric Oncology Branch, NCI, she built an internationally recognized translational research program spanning basic studies of T cell homeostasis and tumor immunology, and clinical trials of immune based therapies for cancer. Her work is credited with identifying an essential role for the thymus in human T cell regeneration and discovering IL-7 as the master regulator of T cell homeostasis. She has led numerous cutting edge and first-in-human and first-in-child clinical trials spanning dendritic cell vaccines, cytokines, and adoptive immunotherapy using NK cells and genetically modified T cells.

**Kari C. Nadeau, MD, PhD** is the Naddisy Foundation Endowed Professor of Medicine and Pediatric Food Allergy, Immunology, and Asthma at Stanford University and the Director of the Sean N. Parker Center for Allergy and Asthma Research at Stanford University. She is a member of the ITI. The center's vision is to find the causes and cures of allergies and asthma via studying basic mechanisms of immunology. The center's mission is to transform the lives of patients and families through innovative science and compassionate care. For more than 30 years, Kari and her team have devoted themselves to understanding how environmental and genetic factors affect the risk of developing allergies and asthma, and the molecular mechanisms underlying the diseases. She works with a diverse team of specialists—in areas from immunology to chemical engineering—and collaborates with Scott Boyd, Mark Davis, Steve Galli, Holden Maecker, Garry Nolan, Purvesh Khatri, Yueh-Hsiu Chien and others at Stanford. Our team that was among the first to show that high dimensional immunophenotyping of T cells involved in allergy could be used in therapies for patients. Her lab has published over 200 peer reviewed papers. Kari has overseen more than 50 clinical trials and enrolled more than 3,000 patients in allergy and asthma studies, including several programs with the underserved communities at high risk for anaphylaxis. She received her MD and PhD from Harvard Medical School.

She completed a residency in pediatrics at Boston Children's Hospital and a clinical fellowship in asthma and immunology at Stanford and University of California, San Francisco. She has served as a White House Medical Consultant, a member of the Scientific Advisory Board of the EPA, NHLBI DSMB, NIH Study Sections, FARE Scientific Board, the American Lung Association Medical Board, ASCI, and leads the AAAAI Mechanism Committee.

**Evan Newell, PhD**, is an Associate Member at the Fred Hutchinson Cancer Research Center, is currently focusing on developing and applying novel methods for identifying and characterizing antigen specific T cells in the context of human cancer and infectious disease. In addition to studies on the biophysical and structural nature of TCR – peptide-MHC interactions, he developed novel systems for identifying and thoroughly characterizing antigen-specific T cells derived from human blood and tissue samples. This included the development of combinatorial peptide-MHC tetramer staining, which allows for multiplexed assessment of a large number (>>100) T cell antigen specificities in a single sample, and the first application of mass cytometry (CyTOF) to deeply probe the phenotypic and functional characteristics of antigen specific T cells. The Newell lab continues to improve on published methods and is using mass cytometry for a wide range of applications in both mouse and human, especially for the study of tumor-specific T cell responses in the context of cancer. Dr. Newell completed his B.Sc. in Immunology at McGill University and Ph.D. in Physiology at the University of Toronto. He did his post-doctoral fellowship with Dr. Mark Davis at Stanford University before starting his own lab at the Singapore Immunology Network in 2012. In 2018 he moved his lab and joined the Fred Hutchinson Cancer Center in Seattle. Dr. Newell also co-founded a spin-off company called immunoSCAPE and is active as an advisor for this Singapore-based immune profiling service company.

**Garry Nolan, PhD** is the Rachford and Carlota A. Harris Professor in the Department of Microbiology and Immunology at Stanford University School of Medicine. He trained with Leonard Herzenberg (for his Ph.D.) and Nobelist Dr. David Baltimore (for postdoctoral work for the first cloning/characterization of NF- $\kappa$ B p65/ RelA and the development of rapid retroviral production systems). He has published over 220 research articles and is the holder of 20 US patents, and has been honored as one of the top 25 inventors at Stanford University. His areas of research include hematopoiesis, cancer and leukemia, autoimmunity and inflammation, and computational approaches for network and systems immunology. Dr. Nolan's recent efforts are focused on a single cell analysis advance using a mass spectrometry-flow cytometry hybrid device (CyTOF) and nanoscale imaging with the "Multiparameter Ion Beam Imager" (MIBI). The approaches use an advanced ion plasma source to determine the levels of tagged reagents bound to cells - enabling a vast increase in the number of parameters that can be measured per cell - either as flow cytometry devices (CyTOF) or imaging platforms for cancer (MIBI). Further developments in imaging are enabled by CODEX—a system that inexpensively converts fluorescence scopes into high dimensional imaging platforms.

**Nathan Price, PhD**, is Professor & Associate Director of the Institute for Systems Biology where he co-directs with Lee Hood the Hood-Price Integrated Lab for Systems Biomedicine. He is Co-Founder and on the Board of Directors of Arivale, a scientific wellness company that was named as Geekwire's 2016 startup of the year. He is also Co-Founder & Chief Science Officer of Consilience, a 2018 AI startup focused on the learning healthcare system. He is a member of the Board of Trustees of the Health and Environmental Sciences Institute (HESI) and on the Board of Advisors for the American Cancer Society (ACS). Dr. Price was the recipient of early career awards from NIH, NSF, American Cancer Society, the Roy J. Carver Charitable Trust, and Genome Technology. He was also named as a Camille Dreyfus Teacher-Scholar, and received the 2016 Grace A. Goldsmith Award for his work pioneering scientific wellness. He also serves on numerous scientific advisory boards including for Roche (Personalized Medicine division), Providence St. Joseph Health, Sera Prognostics, Habit, Trelys, and the Novo Nordisk Foundation Center for Biosustainability. He is also a fellow of the European Society of Preventive Medicine. He has published over 150 scientific papers and given over 180 invited talks.

**Andrea Radtke, PhD**, is a Senior Scientist at the Center for Advanced Tissue Imaging (CAT-I) under the leadership of Dr. Ronald Germain. The CAT-I is a National Institute of Allergy and Infectious Diseases (NIAID) and National Cancer Institute (NCI) supported effort involving collaborative studies between experts in the Laboratory of Immune System Biology, NIAID, and NIAID and NCI investigators. The primary focus of her research is applying advanced imaging techniques to visualize the cellular composition and architecture of normal and malignant human tissues. To achieve this aim, Andrea and her colleagues have pioneered robust, high-dimensional imaging techniques that enable visualization of human tissues in 2D and 3D.

**Soumya Raychaudhuri, MD, PhD**, is a Professor of Medicine at Harvard Medical School, and Director of the Center for Data Sciences at Brigham and Women's Hospital. He also is an Associate Member of the Broad Institute of Harvard and MIT, and a Visiting Professor in Genetics at the University of Manchester. Dr. Raychaudhuri completed a BA in mathematics and a BS in biophysics at the State University of New York at Buffalo. He then matriculated into the Stanford MSTP MD/PhD program, where he trained with Dr. Russ Altman in biomedical informatics. In 2004 he began clinical training in internal medicine, and then went on to pursue subspecialty training in rheumatology at Brigham and Women's Hospital. He concurrently completed postdoctoral training in human genetics at the Broad Institute with Dr. Mark Daly. Since joining the faculty at Harvard Medical School in 2010, he has contributed to the understanding of the genetic basis of rheumatoid arthritis, type 1 diabetes and other immune-mediated diseases. He has also been at the forefront of devising statistical and computational methods to localize genetic association signals to causal variants, and to interpret human genetic data in the context of functional information. He has published over 100 papers, and has received funding from the National Institutes of Health (NIH, NIAID, NHGRI, NHLBI), the Doris Duke Foundation, and the Arthritis Foundation.

**William Shih, PhD** is a Professor in the Department of Biological Chemistry and Molecular Pharmacology at Harvard Medical School and the Department of Cancer Biology at the Dana-Farber Cancer Institute and a Core Faculty member at the Wyss Institute for Biologically Inspired Engineering at Harvard. William studied Biochemical Sciences at Harvard for his A.B. (1990–1994) and Biochemistry at Stanford for his Ph.D. (1994–2000) He did a postdoctoral fellowship at The Scripps Research Institute (2001–2004) and has since been back at Harvard as a faculty member. William was a 2008 NIH Director’s New Innovator Awardee, a 2013 Blavatnik National Award Finalist in the Physical Sciences, and the 2017 Foresight Prize Awardee in Experimental Nanotechnology.

**Michael Snyder, PhD** is the Stanford Ascherman Professor and Chair of Genetics and the Director of the Center of Genomics and Personalized Medicine. Dr. Snyder received his Ph.D. training at the California Institute of Technology and carried out postdoctoral training at Stanford University. He is a leader in the field of functional genomics and proteomics, and one of the major participants of the ENCODE project. His laboratory study was the first to perform a large-scale functional genomics project in any organism, and has developed many technologies in genomics and proteomics. These including the development of proteome chips, high resolution tiling arrays for the entire human genome, methods for global mapping of transcription factor binding sites (ChIP-chip now replaced by ChIP-seq), paired end sequencing for mapping of structural variation in eukaryotes, de novo genome sequencing of genomes using high throughput technologies and RNA-Seq. These technologies have been used for characterizing genomes, proteomes and regulatory networks. Seminal findings from the Snyder laboratory include the discovery that much more of the human genome is transcribed and contains regulatory information than was previously appreciated, and a high diversity of transcription factor binding occurs both between and within species. He has also combined different state-of-the-art “omics” technologies to perform the first longitudinal detailed integrative personal omics profile (iPOP) of person and used this to assess disease risk and monitor disease states for personalized medicine. He is a cofounder of several biotechnology companies, including Protometrix (now part of Life Technologies), Affomix (now part of Illumina), Excelix, and Personalis, Q Bio and he presently serves on the board of a number of companies.

**H.Tom Soh, PhD** is a Professor of Electrical Engineering and Radiology at Stanford University. His laboratory develops synthetic biomaterials and biosensor devices. He earned his B.S. (1992), with a double major in Mechanical Engineering and Materials Science with Distinction from Cornell University and his M.S. (1995) and Ph.D. (1999) in Electrical Engineering from Stanford University. Between 1999 and 2003, he served as a technical manager of MEMS device research group at Bell Laboratories and Agere Systems. Between 2003 and 2015, he was the Ruth Garland Professor at UC-Santa Barbara (UCSB) in the department of Mechanical Engineering and Materials. His lab moved to Stanford in 2015. He is a recipient of numerous awards including MIT Technology Review’s “TR 100” Award, ONR Young Investigator Award, Beckman Young Investigator Award, ALA Innovator Award, NIH Director’s TR01 Award, NIH Edward Nagy Award, Guggenheim Fellowship, and Alexander van

Humboldt Fellowship. Dr. Soh is a Chan-Zuckerberg Biohub Investigator, fellow of the American Institute for Medical and Biological Engineering (AIMBE), and member of the National Academy of Inventors (NAI).

**Justin Sonnenburg, PhD**, is currently an associate professor in the Department of Microbiology and Immunology at the Stanford University School of Medicine, where he studies the gut microbiota in health and disease and co-directs the Center for Human Microbiome Studies. He has received an NIH Director's New Innovator Award and Pioneer Award. He and his wife Erica, are the authors of the book *The Good Gut: Taking Control of Your Weight, Your Mood, and Your Long-Term Health*.

**Bruce Walker, MD** is the Director of the Ragon Institute of MGH, MIT and Harvard, a Professor of Medicine at Harvard Medical School, a Professor of Practice at MIT and a Howard Hughes Medical Institute Investigator. In addition to his clinical duties as a board certified Infectious Disease specialist, his research focuses on cellular immune responses in chronic viral infections, with a particular focus on HIV. He leads an international translational clinical and basic science research effort to understand how some rare people who are infected with HIV, but have never been treated, can fight the virus with their immune system. Dr. Walker is also an Adjunct Professor at the Nelson Mandela School of Medicine in Durban, South Africa. There he collaborates with the Doris Duke Medical Research Institute at the University of KwaZulu-Natal and serves as a Principal Investigator in the HIV Pathogenesis Program, an initiative to study the evolution of the HIV and the immune responses effective in controlling this virus, as well as to contribute to training African scientists. He is a member of the Steering Committee for the KwaZulu-Natal Research Institute for TB and HIV (K-RITH), a 10-year initiative funded by HHMI to build a state of the art TB-HIV research facility at the heart of these dual epidemics in South Africa. Dr. Walker is also a member of the American Academy of Arts and Sciences, American Society for Clinical Investigation (ASCI), the American Association of Physicians (AAP), and the Institute of Medicine (IOM) of the National Academy of Sciences.

**Nir Yosef, PhD** Nir received his Ph.D. in computer science from the Tel Aviv University in 2010. He then proceeded to a postdoctoral training at the Broad Institute, where he worked on inference of transcriptional regulatory models of T cell development. Since 2014 he is an Assistant Professor of Computer Science and a core member at the Center of Computational Biology at UC Berkeley. He is also an associate member of the Ragon Institute of MGH, MIT and Harvard and a Chan Zuckerbers biohub investigator. The Yosef lab is developing and applying computational methods that leverage single cell RNA-sequencing data, covering a wide range of topics - from basic processing and probabilistic modeling to inference of sub-populations and characterization of metabolic programs. A second area of research is method development for studying regulatory regions in the genome, based on chromatin profiles and massively parallel reporter assays. These tools are developed through close collaboration with experimental labs, with applications including HIV control, T cell differentiation, and T cell function in autoimmunity.

