Svenska Läkaresällskapet

SPEAKERS

BZ 103: Immunity and autoimmunity in early childhood

June 1-3 2022, Nobelforum, Solna, Sweden

Thursday, June 2, 2022

Beena Akolkar, NIDDK, NIH, Bethesda, MD, USA
Dr. Akolkar joined the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), in 2000, and is currently the institute's Senior Advisor in Immunopathogenesis and Genetics of Diabetes. Prior to join the NIDDK/NIH, Beena was at North Shore University Hospital. Her primary research activities in the recent past have been in the area of etiology/epidemiology, prevention and genetics of type 1 diabetes and genetics and genomics of type 2 diabetes. She is the project scientist for the Environmental Determinants of Diabetes in the Young (TEDDY) study, an international consortium established with the goal of developing and carrying out studies to identify environmental triggers of T1D, such as infectious agents, dietary factors, and/or psychosocial factors, in genetically susceptible individuals. She is also the project scientist for the Accelerating Medicines Partnership in Common Metabolic Diseases (AMP-CMD). She coordinates research activities on T1D across the NIH.

Helena Elding Larsson, Malmö, Sweden
Helena Elding Larsson (MD, PhD) is senior consultant in pediatrics, adjunct professor at the Department of Clinical Sciences Malmö, Lund University and head of the pediatric department at Skåne university hospital, Malmö and Lund. Helena´s main research interest is pediatric type 1 diabetes; genetic and environmental risk factors, early immunological and metabolic predictive markers of the process leading up to clinical type 1 diabetes as well as primary and secondary prevention through clinical trials.

Petter Brodin, Stockholm, Sweden
Petter Brodin is Garfield Weston Chair and Professor of pediatric immunology at Imperial College London and professor of Pediatric immunology at Karolinska Institutet in Stockholm, Sweden. The Brodin lab (https://brodinlab.com/) develops and applies novel experimental and computational methods to describe human immune system variation with a particular interest in the immune systems of children, its development early in life, and its role in health and disease during childhood.

Eoin McKinney, Cambridge, UK
Eoin is a Wellcome-Beit intermediate Research Fellow in the Department of Medicine at the University of Cambridge and an honorary consultant in nephrology and transplantation in Cambridge University NHS hospitals Foundation Trust. He obtained a first-class degree in pre-clinical medicine from Keble College, Oxford University in 1999 and graduated in clinical medicine with honours from Edinburgh University in 2002. His primary interest is the use of systems immunology approaches to translate high throughput analyses of autoimmune disease datasets into clinical practice. (https://www.crunchbase.com/person/eoin-mckinney).

Ezio Bonifacio, Dresden, Germany
Ezio Bonifacio, Professor at the Technische Universität Dresden, has been actively working in the area of type 1 diabetes prediction and prevention for over 30 years. He has been instrumental in developing, harmonizing and applying measurements of autoimmunity to understand the pathogenesis of type 1 diabetes and to aid in the disease prediction. He has been active in searching for immune changes early in the disease process and trying to understand why islet autoimmunity has a peak incidence in the first years of life. He will present changes in immune cells in early life in relation to the development of islet autoimmunity.

Jorma Toppari, Turku, Finland
Jorma Toppari, MD, PhD, is Professor of Physiology in the Institute of Biomedicine, University of Turku, Finland, and chief physician in Pediatrics in Turku University Hospital. He is one of the principal investigators in the international TEDDY (The Environmental Determinants of Diabetes in the Young) study (https://teddy.epi.usf.edu/) funded by the National Institutes of Health and in the Finnish Type 1 Diabetes Prediction and Prevention (DIPP) study (http://dipp.fi/). He is also leading a cohort study on developmental determinants of male reproductive health in collaboration with scientist in University of Copenhagen (http://www.edmarc.net/). He is a pediatric endocrinologist with strong background in basic science and environmental medicine.

Mark Anderson, San Francisco, CA, USA
Mark S. Anderson, MD, PhD, is Professor and the Robert B. Friend & Michelle M. Friend Endowed Chair in Diabetes Research, Director of the Medical Scientist Training Program, member of the Molecular Medicine program, and Co-Chair of the Immunology Program Steering Committee at UCSF. He also serves as Chair of the Hypersensitivity, Autoimmune, and Immune-mediated Diseases Study Section Center for Scientific Review of the NIH
A recognized expert in understanding how autoimmune diseases like type 1 diabetes occur, Mark assisted in the discovery of the function of a protein called Aire that is critical to helping immune cells learn to recognize and avoid attacking the body's own tissue. Dr. Anderson's group co-created the first functioning human thymus tissue from embryonic stem cells in the laboratory.

Moshe Arditi, Los Angeles, CA, USA
Moshe Arditi, MD, is Professor and the Executive Vice-Chair for Research, in the Department of Pediatrics , Director, Division of Pediatric Infect Dis and Immunology, Director of the Infectious and Immunologic Diseases Research Center (IIDRC), and Chair of Guess Fashion Industries Guild in Child Health at Cedars-Sinai Medical Center in Los Angeles, CA. Dr. Arditi has received continuous NIH funding for 24 yrs to investigate innate immunity & host-pathogen interactions, and how chronic inflammation accelerates inflammatory diseases such as atherosclerosis. He is nationally known for discovering the role of TLRs in atherosclerosis and mechanisms of infection-induced acceleration of atherosclerosis and discovered that infections and lipids engage a common inflammatory pathway involving TLR4 and leads to IL-1beta production promoting atherogenesis. He is an International leader in Kawasaki Disease (KD) vasculitis experimental research. He discovered a key role of IL-1b in the development of cardiovascular lesions of KD, which led to Phase II/III clinical trials using IL-1R antagonist anakinra in children with IVIG-resistant KD. Dr. Arditi and his colleagues recently discovered several neurotoxin motifs and a Superantigen (SAg)-like motif in the S1 spike protein of the SARS-CoV2 virus that can bind both TCR and MHC Class II and induce a SAg-like immune responses such as TCR skewing in severe COVID patients and in children with MIS-C.

Marian Rewers, Denver, CO, USA
Professor of Pediatrics and Medicine, Executive Director, Barbara Davis Center for Diabetes, University of Colorado School of Medicine. Dr. Rewers is a pediatric endocrinologist who has dedicated his research to finding the cause and prevention of type 1 diabetes (T1D) and its complications. His research includes NIH-funded cohort studies: Diabetes Autoimmunity Study in the Young (DAISY) and The Environmental Determinants of Diabetes in the Young (TEDDY) following from birth >11,000 high-risk children to learn how genes and the environment interact in causation of T1D and celiac disease. The Autoimmunity Screening for Kids (ASK) program, funded by JDRF and Helmsley Charitable Fund, is translating findings from DAISY and TEDDY to public health screening and early diagnosis. The Coronary Artery Calcification in Type 1 (CACTI) study has discovered novel genetic, metabolic and inflammatory risk factors for of diabetic complications. For the past 22 years, Dr. Rewers has led the Barbara Davis Center clinical team serving >7000 children and adults with T1D. He has helped to train the next generation of pediatric endocrinologists and translational research investigators. Together, they have published more than 550 peer-reviewed articles in the area of diabetes.

Heikki Hyöty, Tampere, Finland
The principal research interest is the role of microbes in type 1 diabetes and other immune-mediated diseases. The main scientific contributions include prospective cohort studies on microbial etiology of these diseases, virus analyses of the pancreas tissues of diabetic patients and preclinical and clinical development of immune modulators, antiviral drugs and vaccines for the prevention and treatment of these diseases. This work has included coordination of several international research consortia and an active role in several other studies leading to more than 300 scientific publications acknowledgements by several awards.

Lluis Quintana-Murci, Paris, France
Lluis Quintana-Murci, Professor at the Collège de France, heads the “Human Evolutionary Genetics” laboratory at the Pasteur Institute in Paris. He is a population geneticist whose research focuses on the study of the genetic architecture of hsuman populations and how natural selection imposed by pathogens has shaped diversity at host immunity genes, to gain insights into genes and functions of major biological relevance for our past and present survival against infection. His lecture will deal with the use of systems immunology approaches to

understand the different factors (genetic, epigenetic, environmental, etc.) that drive immune response variation between individuals and populations.

Bali Pulendran, Stanford, CA, USA
Violetta L. Horton Professor, Institute for Immunity, Transplantation and Infection, Department of Pathology, Department of Microbiology and Immunology, Fellow at ChEM-H (Chemistry, Engineering and Medicine for Human Health), Stanford University School of Medicine, Stanford University.
Bali Pulendran 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 Center for Systems Vaccinology, at Emory University in Atlanta. He received his undergraduate degree in the Natural Sciences Tripos from Queens' College, 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's research is focused 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 molecular 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. Dr. Pulendran serves on many advisory boards including that of Keystone Symposia and on the External Immunology Network of GSK. He is listed on Thomson Reuter's list of Highly Cited Researchers, which recognizes the world's most influential researchers of the past decade, demonstrated by the production of multiple highly-cited papers that rank in the top 1 % by citations.

Galit Alter, Cambridge, MA, USA
Dr. Galit Alter is a Professor of Medicine at the Ragon Institute of MGH, MIT and Harvard. After completing her BSc and PhD at McGill University in the arena of HIV infection and pathogenesis, Dr. Alter shifted her work to the development of technologies to study the human immune response across pathogens. Dr. Alter's work focuses on the development of systems biology tools to define the correlates of immunity against infectious diseases. These efforts have been accelerated by the development of a unique Systems Serology profiling approach, linked to machine learning, that have enabled the comprehensive dissection of polyclonal humoral immune responses, enabling the identification of pathogen- or vaccine-specific humoral immune responses at an unprecedented depth.

Richard Insel, Janssen R&D, USA
Richard Insel, M.D. currently holds the title: Global Head, Healthy Baby Initiative, World Without Disease Accelerator, Global External Innovation, Johnson & Johnson. The Healthy Baby Initiative is focused on early childhood identification of risk for non-communicable disease and their prevention and interception. Prior to working with Janssen, he spent 13 years at the Juvenile Diabetes Research Foundation (JDRF) where he held titles of Executive Vice President of Research and Chief Scientific Officer. From 1977 to 2003, Dr. Insel was affiliated with the University of Rochester Medical Center where he held several positions during his tenure including Professor of Pediatrics and Microbiology/Immunology, founding Director of the Center

for Human Genetics and Molecular Pediatric Disease, Director of the Strong Children's Research Center, and Chief of the Division of Pediatric Immunology, Allergy, and Rheumatology. His research program at the University focused on immune responses to bacterial vaccines, including polysaccharide and protein-polysaccharide conjugate vaccines, and B lymphocyte immunity. Dr. Insel was a scientific co-founder of Praxis Biologics, a biotechnology company that developed Haemophilus influenzae conjugate vaccines, which have been instrumental in eliminating invasive disease from that pathogen in the United States.

Friday, June 3, 2022

Xaquin Castro Dopico, Stockholm, Sweden
Research specialist in the Department of Microbiology, Tumor and Cell biology, Karolinska Institutet.

Joseph Petrosino, Houston, TX, USA
Chair Department of Molecular Virology & Microbiology, Bauylor College of Medicine, Houston, TX. The NIH Roadmap Office/Common Fund initiated the Human Microbiome Project (HMP) in 2006 with the mission of generating resources enabling characterization of the human microbiota and analysis of its role in human health and disease. As a Primary Investigator in the HMP, and in directing a number of other microbiome projects, his interests are focused on developing and implementing measures to sample and analyze microbial communities from niches on and in the human body and related animal models for the understanding of how commensal organisms impact health and disease.

Ramnik Xavier, Cambridge, MA, USA
Ramnik Xavier is a core institute member of the Broad Institute of MIT and Harvard, where he serves as director of the Klarman Cell Observatory. He is also director of the Broad's Immunology Program and co-director of the Broad's Infectious Disease and Microbiome Program. He is the Kurt J. Isselbacher Professor of Medicine at Harvard Medical School; director of the Center for Computational and Integrative Biology and professor in the Department of Molecular Biology at Massachusetts General Hospital (MGH); and co-director of the Center for Microbiome Informatics and Therapeutics at MIT.
His laboratory focuses on systematic characterization of genetic variants to understand the regulation of barrier defense, innate and adaptive immunity; chemical biology to control cellular disease phenotypes suggested by human genetics; molecular mechanisms to determine roles of the microbiome in health and disease; and development of computational approaches to uncover patterns of human and microbial pathway regulation during disease and treatment.

Jayne Danska, Toronto, Canada
Jayne Danska is a Senior Scientist and the Associate Chief of Research, Faculty Development and Diversity at the Hospital for Sick Children and Professor of Immunology and of Medical Biophysics at the University of Toronto where she holds the Anne and Max Tanenbaum Chair in Molecular Medicine. Dr. Danska's research is on discovery of genetic and environmental modifiers of Type 1 diabetes (T1D) and immune-mediated mechanisms of acute lymphocytic leukemia. Her work has led to identification of immune and microbiome mediated regulators of islet-autoimmunity and of immunological biomarkers associated with the future development of

T1D in children. A novel class of immune checkpoint inhibitor discovered in her lab, was developed for hematologic cancers in partnership with a Canadian biotech that was the basis of an acquisition by Pfizer, Inc. in 2021.

Richard Lloyd, Houston, TX, USA
Dr. Richard (Rick) Lloyd is Professor in the Department of Molecular Virology and Microbiology at Baylor College of Medicine in Houston, Texas. He is an expert in the molecular biology of enteroviruses and the role of enteroviruses in pancreatic infections and development of Type 1 Diabetes. He will discuss the development and changes in the stool virome in young children up to three years of age as a part of the TEDDY study.

Carin Andrén Aronsson, Malmö, Sweden
Carin Andrén Aronsson (Ph.D.) is a nutritionist and head of unit at the Department of Clinical Sciences, Lund university and the pediatric department at Skåne university hospital, Malmö. Her main research interest is infant feeding and its impact on the development of celiac disease and type 1 diabetes. Her research has led to revision of national infant feeding recommendations regarding gluten intake in relation to the development of celiac disease. She is currently co-investigator in two pediatric prevention trials that test the hypothesis if early dietary interventions can prevent celiac disease in children carrying different HLA-risk genotypes.

Outi Mäkitie, Stockholm, Sweden
Professor Outi Mäkitie received her MD and PhD degrees at the University of Helsinki, Finland. She completed specialty training at Helsinki University Hospital for pediatrics (1998) and for pediatric endocrinology (2000). Presently she is Professor of Pediatric Endocrinology and Chief Physician at Children's Hospital, University of Helsinki, Finland, and Senior Researcher at Clinical Genetics Department, Karolinska Institutet, Sweden. She manages research groups both in Helsinki and in Stockholm, focusing on clinical, genetic, and molecular features of rare skeletal disorders.

Kendra Vehik, Tampa, FL, USA
Kendra Vehik is a Professor at the Health Informatics institute at the University of South Florida. She is an epidemiologist and an applied biostatistician whose research is focused on the impact of the early environment on the natural history of islet autoimmunity and type 1 diabetes among high genetic risk children. Her lecture will focus on the role of early childhood metabolomic biomarkers on the risk of islet autoimmunity across specific environmental and microbial exposures.

Cheri Deal, Montreal, Canada
Cheri Deal, PhD, MD, FRCPC and Professor Emeritus of Pediatrics, recently completed her mandate as the Chief of Endocrinology and Diabetes at the Sainte-Justine Mother-Child University of Montreal Hospital, where she has worked since 1992. Dr. Deal has contributed to the elucidation of the molecular defects associated with a wide range of rare pediatric endocrine disorders and participated in clinical studies and in the elaboration of clinical practice guidelines aimed at ameliorating outcomes in many endocrine diseases. She co-edited the textbook Maternal-Fetal and Neonatal Endocrinology. Her research and clinical interests include the genetics and epigenetics of the GH-IGF axis as well as the diagnosis and treatment of rare disorders and syndromes, including APS-1/APECED. She will speak on growth in this and other monogenic disorders involving an autoimmune component.

Ludvig Sollid, Oslo, Norway
Ludvig M. Sollid (MD, PhD) is Professor and Director of the KG Jebsen Coeliac Disease Research Centre at the University of Oslo. Coeliac disease is a prevalent polygenic disorder caused by a harmful immune response to cereal gluten proteins. While previously considered a food hypersensitivity disorder, the disease exhibits many autoimmune phenomena and it is now believed to be an autoimmune disease. We have gained detailed knowledge of the pathogenesis including how certain HLA-DQ allotypes are involved and how T cell and B cell interactions lead to disease development. In my talk I will present recent new insights.

Daniel Agardh, Malmö, Sweden
Daniel Agardh (MD, PhD) is Head of Celiac Disease and Diabetes Unit at Lund University, which is involved in several ongoing international screening and intervention studies. His research has mainly focused on how celiac disease can be predicted by screening of children and how it can be prevented. Daniel Agardh has been the chair of the Celiac Disease Committee in the TEDDY study, which has found several important observations on genetic and environmental risk factors associated with early onset of celiac disease.

Richard McIndoe, Augusta, GA, USA
Dr. McIndoe is a Regents' Professor and Director of the Center for Biotechnology and Genomic Medicine in the Medical College of Georgia at Augusta University. Dr. McIndoe's research interests include bioinformatics, automation, autoimmunity, and diabetes. These research efforts focus on building the computing infrastructure for the management of functional genomic and proteomic data and looking at the temporal gene expression changes during the etiology of diabetes in rodent and human populations. Dr. McIndoe also has interest in network analysis and development of analytical tools for assessing genomic and transcriptomic changes from NGS data. Over the last 20 years at Augusta University, Dr. McIndoe has also been the Director of the Data Coordinating Centers for four national NIH consortia; the Animal Models of Diabetic Complications, the Mouse Metabolic Phenotyping Centers, the Diabetic Complications Consortium and the Innovative Science Accelerator Program.

Jeffrey Krischer, Tampa, FL, USA
Jeffrey Krischer, PhD, MD (h.c.) is Distinguished University Professor, Vice Chair for Research, Department of Internal Medicine and Director of the Health Informatics Institute, University of South Florida, Morsani College of Medicine. He currently directs the data and coordinating centers for the Environmental Determinants of Diabetes in the Young (TEDDY) study, the Type 1 Diabetes TrialNet and the Rare and Atypical Diabetes Network (RADIANT), which he also chairs. His research has focused on type 1 diabetes aetiology (risk factors of the initiation of islet autoimmunity and those leading to progression to disease) and the design, conduct and analysis of clinical prevention trials.

Mark M. Davis, Stanford, CA, USA
Dr. Mark M. Davis is the Director of the Stanford Institute for Immunology, Transplantation and Infection (ITI), the Avery Family Professor of Immunology and a Howard Hughes Medical Institute Investigator. Dr. Davis received his undergraduate from Johns Hopkins, his Ph.D. from the California Institute of Technology, and was a postdoctoral and staff fellow at NIH in the Laboratory of Immunology. He 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. Other work in his laboratory pioneered studies of the biochemistry, genetics and cell biology of these molecules and T lymphocytes generally, which play a key role in orchestrating immune responses. More recently he has focused exclusively on human immunology, introducing a

number of important methods and strategies, such as systems immunology, human cohorts to study the effects of aging on vaccination, twin cohorts to analyze the effects of genetics, single cell characterization and immune organoids that are allowing new insights into autoimmunity, infectious diseases and cancer. https://med.stanford.edu/davislab/LabTeam.html

Anna Wedell, Stockholm, Sweden
Anna Wedell is a professor and senior consultant at the Centre for Inherited Metabolic Diseases at Karolinska University Hospital, an expert center providing highly specialized investigations of patients with suspected inborn errors of metabolism and related rare diseases. She has implemented whole genome sequencing for diagnosis of rare diseases into healthcare and has discovered a number of novel monogenic disorders. She is also director of the newly established Precision Medicine Center Karolinska, an academic-clinical partnership aiming to facilitate implementation of precision medicine into healthcare.

William Hagopian, Seattle, WA, USA
William Hagopian is the Director of Diabetes Programs at the Pacific Northwest Diabetes Research Institute. He completed Internal Medicine and Endocrinology training at the University of Washington where he remains Clinical Professor of Medicine. At UW he trained in Diabetes Immunology with Professor Åke Lernmark, leading to a research career utilizing immunology and molecular biology to predict, prevent and understand type 1 diabetes before clinical onset. His studies have screened >150,000 Washington State newborns via cost-effective genetic risk scores and islet antibody tests. Together, these have great potential to translate to public health and mainstream medical care, in order to a) prevent diabetic ketoacidosis at onset, b) enable prevention therapies which Dr. Hagopian has helped to study in numerous clinical trials and c) elucidate etiology and pathogenesis, such as identifying environmental triggers of diabetes.

Michail S Lionakis, Bethesda, MA, USA
Dr. Lionakis is a tenured physician-scientist and Chief of the Fungal Pathogenesis Section in the Laboratory of Clinical Immunology and Microbiology of the National Institutes of Health. Dr. Lionakis' laboratory research focuses on better understanding the genetic and immune defects that underlie enhanced susceptibility to fungal infections in humans and on cellular and molecular factors that regulate the immune response against fungal infections in clinically-relevant animal models. This lecture will discuss how inborn errors or immunity that manifest with susceptibility to fungal disease provide valuable lessons on the cellular and molecular basis of tissue-specific mechanisms of mammalian antifungal immunity.

Qiang Pan Hammarström, Stockholm, Sweden
Dr. Qiang Pan-Hammarström is a professor of clinical immunology and member of the Nobel Assembly at the Karolinska Institute. She is also a visiting professor at Tianjin Medical University Cancer Institute in China. Her research has been focused on immunoglobulin gene diversifications, primary antibody deficiencies and B cell malignancies. She is currently also a coordinator of an EU consortium, which is focusing on the development of antibody-based therapy against SARS-CoV2.

Jean-Laurent Casanova, New York, NY, USA
Jean-Laurent Casanova is a professor and head of the St. Giles Laboratory of Human Genetics of Infectious Diseases at Rockefeller University, a Howard Hughes Medical Institute Investigator, and a professor at the Necker Hospital for Sick Children, Paris Descartes University. Over the last 25 years, Jean-Laurent discovered and characterized the first monogenic etiologies for a variety of severe viral, bacterial, fungal, and parasitic diseases that predispose otherwise healthy

infants, children, adolescents, and even adults to a single type of infectious disease. These discoveries have provided compelling evidence that life-threatening infectious diseases can be caused by monogenic inborn errors of immunity.

Åke Lernmark, Malmö, Sweden
The etiology of autoimmune type 1 diabetes is at the top of the research agenda. Early contribution was to identify beta-cell autoantigens recognized by autoantibodies in sera from newly diagnosed diabetes children. The 64K autoantigen turned out to be a novel isoform of glutamic acid decarboxylase (GAD65) cloned in the Lernmark lab from human islets. In vitro transcription translation was used to label GAD65 for autoantibody detection in radiobinding assay leading to a standard method to detect autoantibodies in a host of autoimmune disorders. The current focus is to dissect the genetic propensity and the exposures in early life that trigger the first appearance of autoantibodies and to develop preventive measures of beta-cell autoimmunity.

Olle Kämpe, Stockholm, Sweden
Olle Kämpe is professor of endocrinology and senior consultant physician at the Karolinska Institutet. His research interests include organ-specific autoimmune disorders, in particular Addison's disease and Autoimmune Polyendocrine syndrome type 1. His lab has made the original identification of a number of autoantigens, including 21 hydroxylase in Addison's disease. His recent research on Addison's disease also includes GWAS and whole genome sequencing on well characterized patient material in collaboration with Bergen, Norway.