

Immunological Memory: Innate, Adaptive and Beyond

February 25–March 1, 2018 | Hyatt Regency Austin | Austin, Texas | USA

Scientific Organizers:

Rafi Ahmed, Emory University School of Medicine, USA

Susan M. Kaech, Yale University School of Medicine, USA

Joseph C. Sun, Memorial Sloan Kettering Cancer Center, USA

Joint with the conference on **Aging, Inflammation and Immunity**

This symposium will primarily focus on integrating current knowledge concerning the cellular and molecular regulation of memory T and B cell responses with their role mediating protection against infections. In addition to the significant impact these cell populations have on vaccination, emphasis will be placed on their therapeutic and pathogenic roles in cancer, autoimmunity and chronic infection. The innate immune response has a profound influence on the regulation of effector and memory T and B cell responses, and recent discoveries in this area bring forth a greater understanding of the major signals that govern both the formation and the long-term maintenance of these populations. These conceptual advancements will be a major part of the symposium. More recently, it has become clear that there is marked phenotypic and functional heterogeneity of T cell responses; how this affects immunological protection will be discussed. Finally, this symposium will include discussion of recent advances in assessing memory T and B cell responses in a sensitive manner in human and non-human primates, as well as murine systems, to enable better elucidation of the state of the immune response during infection and vaccination, which will lead to more rational vaccine design.

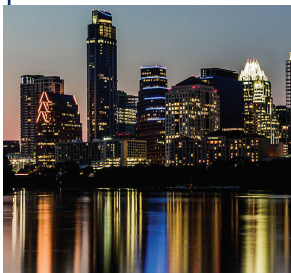
Session Topics:

- Initial Reactions: Forming Innate Memory
- CD8 T Cell Memory
- CD4 T Cell Memory
- New Ways to Generate B Cell Memory
- Immunoregulation
- Imprinting Memory in Tissues
- Therapeutic Approaches to Vaccines and Aging (Joint)
- The Wear and Tear on T Cells in Chronic Infection and Tumors

Scholarship Application & Discounted Abstract Deadline: October 26, 2017

Abstract Deadline: November 29, 2017

Discounted Registration Deadline: December 21, 2017



Note: Scholarships are available for graduate students and postdoctoral fellows and are awarded based on the abstract submitted. Submitting an abstract is an excellent opportunity to gain exposure for your work. Abstracts submitted by the abstract deadline will also be considered for short talks on the program.

Upper image of a dendritic cell courtesy of National Cancer Institute, NIH

Meeting Hashtag: #KSimmemory

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KEYSTONE SYMPOSIA

on Molecular and Cellular Biology

Immunological Memory: Innate, Adaptive and Beyond (X1)

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Aging, Inflammation and Immunity (X2)

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SUNDAY, FEBRUARY 25

Arrival and Registration

MONDAY, FEBRUARY 26

Welcome and Keynote Session (Joint)

- ***Rafi Ahmed**, Emory University School of Medicine, USA
- ***Bonnie B. Blomberg**, University of Miami School of Medicine, USA
- Rino Rappuoli**, GlaxoSmithKline Vaccines, Italy
Vaccines 2018
- Vishwa Deep Dixit**, Yale University, USA
Immunometabolic Regulation of Healthspan

Initial Reactions: Forming Innate Memory (X1)

- ***Steven L. Reiner**, Columbia University, USA
- Lewis L. Lanier**, University of California, San Francisco, USA
NK Cells Remember
- Joseph C. Sun**, Memorial Sloan Kettering Cancer Center, USA
Immunological Memory in Innate Lymphocytes
- Yasmine Belkaid**, NIAID, National Institutes of Health, USA
Homeostatic Immunity to the Microbiota
- Fadi G. Lakkis**, University of Pittsburgh, USA
Short Talk: Specific Monocyte Memory to Allogeneic MHC Mediated by Paired Immunoglobulin Receptors (PIR)
- Samantha B. Larsen**, Rockefeller University, USA
Short Talk: Inflammatory Memory Sensitizes Skin Epithelial Stem Cells to Tissue Damage

Lifestyle, Epigenetics, Interventions (X2)

- ***Vishwa Deep Dixit**, Yale University, USA
- Nir Barzilai**, Albert Einstein College of Medicine, USA
Moving to Translational Geroscience
- Manel Esteller**, Belvitge Biomedical Research Institute (IDIBELL), Spain
Cancer Epigenetics: From Knowledge to Applications
- Valter D. Longo**, University of Southern California, USA
Dietary Interventions
- Duygu Ucar**, The Jackson Laboratory, USA
Short Talk: The Chromatin Accessibility Signature of Human Immune Aging Stems from CD8+ T Cells
- Leena Bharath**, Boston University, USA
Short Talk: Effects of Metformin on Aging-Related Immune Cell Dysfunction

CD8 T Cell Memory (X1)

- ***Rafi Ahmed**, Emory University School of Medicine, USA
- Ananda W. Goldrath**, University of California, San Diego, USA
Identification of Molecules Essential for CD8+ T Cell Residency in Non-Lymphoid Tissues and Tumors

- Dirk Hans Busch**, Technical University Munich, Germany
Lineage Tracing of Memory CD8 T Cell Development
- Steven L. Reiner**, Columbia University, USA
Metabolic Ambivalence and the Logic of Immunologic Memory
- Scott N. Mueller**, University of Melbourne, Australia
Short Talk: Lymphoid Stromal Cells Support CD8 T Cell Priming and Memory
- Henrique Borges da Silva**, University of Minnesota, USA
Short Talk: The Extracellular ATP Receptor P2RX7 Controls Metabolic Fitness of Long-Lived Memory CD8+ T Cells

Longitudinal Studies on Aging and Immunity (X2)

- ***Daniela Frasca**, University of Miami, USA
- Graham Pawelec**, University of Tübingen, Germany
Immune Parameters Associated with Mortality in the Elderly Are Context-Dependent: Lessons from Sweden, Holland and Belgium
- Luigi Ferrucci**, NIA, National Institutes of Health, USA
Blood Inflammatory Mediators and Aging: Causes and Consequences
- Allison E. Aiello**, University of North Carolina at Chapel Hill, USA
Stress, Immunity, Infection and Cellular Aging in Population-Based Studies
- Rebecca G. Reed**, University of Kentucky, USA
Short Talk: Stress, Cytomegalovirus, and Immunosenescence: A Longitudinal Study of Older Adults

Poster Session 1

TUESDAY, FEBRUARY 27

CD4 T Cell Memory (X1)

- ***Marion Pepper**, University of Washington, USA
- Shane Crotty**, La Jolla Institute for Allergy and Immunology, USA
T Follicular Helper (Tfh) CD4 T Cells, Germinal Centers and the Generation of Memory
- Marc K. Jenkins**, University of Minnesota Medical School, USA
Differentiation of CD4+ T Effector and Memory Cells during Bacterial Infection
- Mark R. Boothby**, Vanderbilt University Medical Center, USA
Hypoxia-Inducible Factors Regulate Metabolism and Function of B Cells and their Helpers in Antibody Responses
- Amy Weinmann**, University of Alabama at Birmingham, USA
Role for Metabolites in T Cell Differentiation Programs
- Lillian B. Cohn**, Chan Zuckerberg Biohub, USA
Short Talk: Clonally Expanded CD4+ T Cells Contribute to the HIV-1 Latent Reservoir and Display a Distinct Gene Signature upon Reactivation

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Raquel Furtado, Albert Einstein College of Medicine, USA
Short Talk: Expansion of Circulating CXCR3loPD-1+CXCR5+ Memory CD4+ T Helper Cells Correlates with Clinical Protection against Human Malaria

Mechanisms of Inflammaging (X2)

***Janet M. Lord**, University of Birmingham, UK
Judith Campisi, Buck Institute for Research on Aging, USA
Cellular Senescence and Inflammaging
Margaret M. Harnett, University of Glasgow, UK
Short Talk: Can the Parasitic Worm Product ES-62 Protect against Diet-Associated Pathologies in Aging Male and Female Mice?
Debbie Van Baarle, National Institute of Public Health and Environment, Netherlands
Short Talk: Proinflammatory Microbial Profiles Associate with Respiratory Infections in Older Adults
Daniela Frasca, University of Miami, USA
Adipose Tissue, Inflammation and Aging
Michael P. Cancro, University of Pennsylvania, USA
Mechanisms that Regulate Age-Associated B Cell Formation and Survival
Elizabeth A. Leadbetter, University of Texas Long School of Medicine, USA
Short Talk: iNKT Cells Support Tbet+ B Cells in Adipose Tissue and Are Required to Limit Symptoms of Metabolic Disease

Workshop 1: Memory I (X1)

***Joseph C. Sun**, Memorial Sloan Kettering Cancer Center, USA
Brian J. Laidlaw, University of California, San Francisco, USA
The Eph-Related Tyrosine Kinase Ligand Ephrin-B1 Marks Germinal Center and Memory Precursor B Cells
Anoma Nellore, University of Alabama at Birmingham, USA
T-bet Expression by Influenza-Specific Human Memory B Cells Is Differentially Regulated by Vaccine Platform and Prior Host Immunity and Correlates with Long-Lived Antibody Responses
Aakanksha Jain, UT Southwestern Medical Center, USA
T Cell Intrinsic IL-1R Signaling Licenses Effector Cytokine Production by Memory CD4 T Cells
Robin Stephens, University of Texas Medical Branch, USA
Mechanisms of Maintenance of Protection from Persistent Malaria Infection by CD4 Effector Memory T Cells
Thomas Ciucci, NCI, National Institutes of Health, USA
The Development of Memory CD4 T Cells Relies on a Thpok-Dependent Circuitry-Antagonizing Exhaustion Program
Ning Jenny Jiang, University of Texas at Austin, USA
High-Throughput Single-Cell Linking of Antigen Specificities with T Cell Receptor Sequences using de novo Generated DNA-Linked MHC Tetramers

Workshop 1 (X2)

***Bonnie B. Blomberg**, University of Miami School of Medicine, USA
Petra Burilova, St. Anne's University Hospital, Czech Republic
Accelerated Aging of Monocytes in Childhood and Adolescent Cancer Survivors
Mati Mann, California Institute of Technology, USA
Heterogeneous Responses of Hematopoietic Stem Cells to Inflammatory Stimuli Are Altered with Age
Nick P. Goplen, Mayo Clinic, USA
Non-Resolving Influenza Response in Geriatric Lungs
Kylie Quinn, Monash University, Australia
Survival of Naïve CD8 T Cells During Aging Is Controlled by Homeostatic Signaling and Metabolic Remodeling
Michelle Ratliff, University of Oklahoma Health Sciences Center, USA
Expression of the DNA-Binding Protein ARID3a, a Mediator of Human Hematopoiesis, Is Reduced in Hematopoietic Progenitors from Aged Individuals
YanChun Peng, University of Oxford, UK
Identifying Age-Associated Immune Signatures on Influenza-Specific Human Memory T Cells using Single-Cell RNASeq
Bo Ruem Yoon, Seoul National University College of Medicine, South Korea
SLC7A5-Mediated Leucine Influx Controls IL-1 β Production via Glycolytic Reprogramming in Human Monocytes/Macrophages
Juan I. Moliva, Texas Biomedical Research Institute, USA
Natural Aging Is Associated with Decreases in Lung Fluid Innate Immune Protein Function Driving Susceptibility to Mycobacterium Tuberculosis Infection

New Ways to Generate B Cell Memory (X1)

***Shane Crotty**, La Jolla Institute for Allergy and Immunology, USA
Mark J. Shlomchik, University of Pittsburgh School of Medicine, USA
Heterogeneity of Memory B Cell Compartments
David M. Tarlinton, Monash University, Australia
Molecular Regulation of Germinal Center Responses and B Cell Memory
Scott D. Boyd, Stanford University, USA
B Cell Memory Repertoires in Vaccination and Infection
Mary F. Fontana, University of Washington, USA
Short Talk: Expansion of an FCRL5+ B Cell Subset Resembling Atypical Memory B Cells in an Animal Model of Malaria
Ali H. Ellebedy, Washington University School of Medicine, USA
Short Talk: Biphasic B Cell Responses to Adjuvanted H5N1 Influenza Virus Vaccination in Humans

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Frailty, Morbidity, Mortality/Survival (X2)

*Nir Barzilai, Albert Einstein College of Medicine, USA

Janet M. Lord, University of Birmingham, UK
Exercise, Frailty, Inflammation and Aging

Janet E. McElhane, Health Sciences North Research Institute, Canada
Frailty, Inflammation and Immunosenescence

Daniel Belsky, Duke University, USA
Quantification of Biological Aging: Implications for Clinical Trials and Extension of Healthspan

Leonard Daniël Samson, National Institute for Public Health and the Environment/ RIVM, Netherlands
Short Talk: The Relationship between Frailty, Disease and the Development of Immunosenescence over a Time Span of More than 20 Years

Poster Session 2

WEDNESDAY, FEBRUARY 28

Immunoregulation (X1)

*Ananda W. Goldrath, University of California, San Diego, USA

Erika L. Pearce, Max Planck Institute of Immunobiology and Epigenetics, Germany
Mitochondrial Priming By CD28

Ronald N. Germain, NIAID, National Institutes of Health, USA
Using Multiplex Histochemistry to Relate Tissue Microanatomy to Immune Activation and Regulation

Ellen A. Robey, University of California, Berkeley, USA
What Makes a Protective Anti-Toxoplasma T Cell Response?

Susan M. Kaech, The Salk Institute, USA
Metabolic Control of Memory T Cell Lifespan

John R. Teijaro, The Scripps Research Institute, USA
Short Talk: Cytokine-Mediated Expansion of Follicular Cytotoxic T Cells

Kimberly S. Schluns, University of Texas MD Anderson Cancer Center, USA
Short Talk: Upregulating IL-15 in the Tumor Microenvironment Promotes Anti-Tumor Responses

Immunosenescence and Diseases (X2)

*Judith Campisi, Buck Institute for Research on Aging, USA

*Michael P. Cancro, University of Pennsylvania, USA

Jorg J. Goronzy, Stanford University School of Medicine, USA
MicroRNA Regulation of T Cell Aging

Janko Nikolich-Zugich, University of Arizona College of Medicine, USA
T Cell Rejuvenation Requires Multiple Steps to Restore Immune Function with Aging

Laura Haynes, UConn Health, USA
The Impact of Aging on Response to Influenza Infection

Russell C. Ault, Texas Biomedical Research Institute, USA
Short Talk: Age-Related Differences in Peripheral Immunity at Tuberculosis Diagnosis in Humans

Patricia J. Gearhart, NIA, National Institutes of Health, USA
Short Talk: Role of B Cells in Atherosclerosis

Inflammation, Biomarkers of the Aging Immune System and Possible Treatments (X2)

*Arne N. Akbar, University College London, UK

Bonnie B. Blomberg, University of Miami School of Medicine, USA
B Cells, Inflammation and Aging in Vaccine Response

Susan L. Swain, University of Massachusetts Medical School, USA
Optimum Ag Presentation Can Counteract Age-Related Defects in CD4 T Cell Immunity and Lead to Better CD4 T and B Cell Effector and Memory Responses

Luca Pangrazzi, University of Innsbruck, Austria
Adaptive Immunity in the Bone Marrow in Old Age

Joan Mannick, resTORbio, USA
TORC1 Inhibition as a Potential Immunotherapy to Decrease Infections in the Elderly

Suresh Pallikkuth, University of Miami, USA
Short Talk: Frequency and Function of Antigen-Specific Peripheral T Follicular Helper Cells Are Impaired by Basal Immune Activation and Impact Flu Vaccine Response in Biologic Aging with and without HIV Infection

Imprinting Memory in Tissues (X1)

*Linda S. Cauley, University of Connecticut Health Center, USA

David B. Masopust, University of Minnesota, USA
Functions of Trm Cells

Donna L. Farber, Columbia University Medical Center, USA
Tissue Specialization and Maintenance of Human Memory T Cells

Marion Pepper, University of Washington, USA
Pathological Lung Resident Memory Th2 Cells

Laura K. Mackay, University of Melbourne, Australia
Short Talk: Local Maintenance of a Proliferating Tissue-Resident Memory T Cell Pool following Antiviral Recall Responses

Angela Pizzolla, Peter Doherty Institute for Infection and Immunity, University of Melbourne, Australia
Short Talk: Nasal Tissue-Resident Memory CD8+ T Cells Prevent Pulmonary Influenza A Virus Infection

Poster Session 3

THURSDAY, MARCH 1

Therapeutic Approaches to Vaccines and Aging (Joint)

*Donna L. Farber, Columbia University Medical Center, USA

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Antonio Lanzavecchia, Institute for Research in Biomedicine, Switzerland

Lessons from the Analysis of the Immune Response to P. falciparum

Bali Pulendran, Stanford University School of Medicine, USA
Lessons from Successful Human Vaccines

Tyler J. Curiel, University of Texas Health, USA
Challenges in Successful Immunotherapy of Cancer in Aged Individuals

Arne N. Akbar, University College London, UK
Targeting MAP Kinase Signaling to Enhance Immunity during Aging

Katherine Kedzierska, University of Melbourne, Australia
Short Talk: Dynamics of CD8+ T Cell Memory Repertoires across Human Life-Span and Tissue Compartments

Sara Van Den Berg, National Institute of Public Health and Environment, Netherlands
Short Talk: T Cell Responses to Influenza Infection in Elderly Are Impaired by Latent Cytomegalovirus (CMV) Infection

Workshop 2: Memory II (X1)

***Susan M. Kaech**, The Salk Institute, USA

Allan J. Zajac, University of Alabama, Birmingham, USA
The Production of IL-2 by CD8 T Cells Shapes Their Fate Decisions and Protective Efficacy

Enrico Lugli, Humanitas Clinical and Research Center, Italy
High-Dimensional Single Cell Analysis of the Tumor CD8+ T Cell Infiltrate Identifies Long-Lived Memory CD8+ T Cells with Enhanced Stemness

Philip Ansumana Hull, Bristol-Myers Squibb, USA
Metabolic Reprogramming of Human CD8+ Memory T Cells through Loss of SIRT1

Vandana Kalra, University of Washington, USA
Anatomic and Cellular Regulators of Metabolic Remodeling during Effector CTL to Memory Conversion

Dietmar Herndler-Brandstetter, Medical University of Vienna, Austria
Developmental Plasticity of KLRG1+ Effector CD8+ T Cells Promotes Protective Immunity

Paul Richard Dunbar, Emory University, USA
Pulmonary Monocytes Promote the Establishment of Lung Tissue-Resident CD8 T Cell Memory following Influenza Infection

Linda S. Cauley, University of Connecticut Health Center, USA
Innate Cytokine Stimulation Plays a Decisive Role in Late Differentiation of Activated CTLs

Peter Cockerill, University of Birmingham, UK
Immunological Memory in T Cells is Established via T Cell Receptor Signaling which Creates Stably Maintained Active Chromatin Domains at Immune Response Genes

Workshop 2 (X2)

***Graham Pawelec**, University of Tübingen, Germany

Christina Camell, Yale University, USA
NLRP3 Inflammasome Controls Adipose Tissue B Cell Accumulation during Aging

Claire Gustafson, Stanford University, USA
Differentiation- and Age-Related MicroRNA Profiling Reveals Two Dimensions of CD8 T Cell Aging

Abhijit Kale, Buck Institute for Research on Aging, USA
Elimination of Senescent Cells by Innate Immune System

Mladen Jergovic, University of Arizona, USA
Expression of Ly6C Defines a Subpopulation of Naïve CD8 T Cells with a Rapid Effector Function which is Expanded Under "non-SPF" Conditions

Susan Baldwin, Infectious Disease Research Institute, USA
Adjuvanted H1N1 Vaccines Improve Immune Responses in Young and Aged Mice

Andy Schile, The Jackson Laboratory, USA
Lessons Learned From Managing Aged Colonies of C57BL/6J Mice

The Wear and Tear on T Cells in Chronic Infection and Tumors (X1)

***Susan M. Kaech**, The Salk Institute, USA

E. John Wherry, University of Pennsylvania, USA
T Cell Exhaustion

Rafi Ahmed, Emory University School of Medicine, USA
Human CD8 T Cell Memory

Genetic, Epigenetic, Transcriptomic Regulation of Aging and Age-Related Diseases (X2)

***Bonnie B. Blomberg**, University of Miami School of Medicine, USA

***Graham Pawelec**, University of Tübingen, Germany

Albert C. Shaw, Yale School of Medicine, USA
Consequences of Aging on Signatures of Influenza Vaccine Response

Ruth R. Montgomery, Yale University School of Medicine, USA
Short Talk: Expression and Signaling of TAM Receptor Inflammatory Regulators in Aging

Closing Keynote Address (X1)

***Susan M. Kaech**, The Salk Institute, USA

Federica Sallusto, Università della Svizzera Italiana & ETH Zurich, Switzerland
Human Memory T Cell Subsets: from Phenotype to Function

Claudio Franceschi, University of Bologna, Italy
Aging, Inflammation and Immunity

Meeting Wrap-Up: Outcomes and Future Directions (Organizers) (X1)

Discussion of Meeting, Summary, Conclusion and Mouse-Human Connections (X2)

***Bonnie B. Blomberg**, University of Miami School of Medicine, USA
***Graham Pawelec**, University of Tübingen, Germany

FRIDAY, MARCH 2
Departure

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Closing Keynote Address (X2)

***Bonnie B. Blomberg**, University of Miami School of Medicine, USA

***Graham Pawelec**, University of Tübingen, Germany