**WEDNESDAY, JUNE 8**
Arrival and Registration

**THURSDAY, JUNE 9**
Welcome and Keynote Address (8:00 am Start) (RT3)
* Catherine J. Wu, Dana-Farber Cancer Institute, USA
  **Session Chair**

Rafi Ahmed, Emory University School of Medicine, USA
  **T Cell Functional State, from Viruses to Cancer**

Welcome and Keynote Address (8:00 am Start) (RB1)
* William H. Robinson, Stanford University School of Medicine, USA
  **Session Chair**

Ira Mellman, Genentech, Inc., USA
  **Sponsorship**

**Antigen Targets (9:00 am Start) (RT3)**
* Catherine J. Wu, Dana-Farber Cancer Institute, USA
  **Session Chair**

Benoit J. Van den Eynde, University of Louvain, Belgium
  **The Processing of Tumor Antigens for MHC Class I Presentation to CD8 T Cells**

Michal Bassani-Sternberg, University Hospital of Lausanne, Ludwig Institute for Cancer Research, Switzerland
  **Mass Spectrometry and Proteogenomics Based Approaches for Antigen Detection**

Sjoerd H. van der Burg, Leiden University Medical Center, Netherlands
  **Shared Neoantigens as T-Cell Targets for TAP-Impaired Tumors**

Vinod Balachandran, Memorial Sloan Kettering Cancer Center, USA
  **Short Talk: High Quality Neoantigens are Immunoedited in Long-Term Pancreatic Cancer Survivors**

Matthew H. Bakalar, Broad Institute, USA
  **Short Talk: Novel Programmable Production of pMHC Libraries with Analysis by Mass Spectrometry Enables Targeted Profiling of Peptide-MHC Binding and Stability**

**Advances in Checkpoint Biology I: Lymphocytes (9:00 am Start) (RB1)**
* Arlene H. Sharpe, Harvard Medical School, USA
  **Session Chair**

Chen Dong, Tsinghua University, China
  **Remote Presentation: Factors that Regulate CD8+ T Cell Fates in Cancer**

Dietmar Zehn, Technical University of Munich, Germany
  **Molecular Recognition of T-Cell Exhaustion**

David Bending, University of Birmingham, UK
  **Short Talk: Antigen and Checkpoint Receptor Engagement Recalibrates T Cell Receptor Signal Strength**

Joseph Jae-Suk Kim, NYU School of Medicine, USA
  **Short Talk: The Role of TCR Affinity in Response to Immune Checkpoint Blockade**

Paolo D A Vignali, University of Pittsburgh School of Medicine, USA
  **Short Talk: Tumor Hypoxia Drives Suppressor Function in Exhausted T Cells Limiting Antitumor Immunity**

**Career Roundtable (Joint) (2:30 pm Start)**
* Ira Mellman, Genentech, Inc., USA

Gulbu Uzel, National Institutes of Health, USA
  **Remote Presentation: Spatial Proteome Analysis (CODEX) of Effective Cancer Immunotherapy**

Jannie Borst, Leiden University, Netherlands
  **How CD4+ T Cell Help Optimizes Cytotoxic T Cell Responses in Cancer**

Nir Hacohen, Broad Institute, Massachusetts General Hospital, Harvard Medical School, USA
  **Spatially Organized Hubs of Immune Cells in Tumors**

Giaccomo Oliveira, Dana-Farber Cancer Institute, USA
  **Short Talk: The Landscape of Helper and Regulatory antitumor CD4+ T cells in Human Melanoma**

**Emerging Clinical Insights into Checkpoint Contributions to Autoimmunity (5:00 pm Start) (RT3)**
* William H. Robinson, Stanford University School of Medicine, USA
  **Checkpoints in B Cells**

* Kevan C. Herold, Yale University, USA
  **Tissue/Immune Cell Interactions Leading to Autoimmunity (Diabetes) with Checkpoint Inhibitors**

Alexandra-Chloé Villani, Broad Institute of MIT and Harvard, USA
  **New Views on ‘Traditional’ Autoimmune Disease Informed by Checkpoint Antagonist Therapy**

Ellen D. Kaan, UMC Utrecht, Netherlands
  **Short Talk: Identification of Potential Immune Inhibitory Receptors in Interferon Associated Systemic Autoimmune Disease**

* Session Chair † Invited but not yet accepted Program current as of December 23, 2022 Meal formats are based on meeting venue.
For the most up-to-date details, visit [https://www.keystonesymposia.org](https://www.keystonesymposia.org)
Zoltan Maliga, Harvard Medical School, USA
Short Talk: Molecular Characterization of Skin Toxicities from Immune Checkpoint Inhibitors

Linde Meyaard, University Medical Center Utrecht, Netherlands
Short Talk: Inhibitory Pattern Recognition Receptors as a Novel Class of Immune Regulators Recognizing Endogenous and Microbial Patterns

Workshop (2:30 pm Start) (RT3)
*David A. Braun, Dana-Farber Cancer Institute, USA
Session Chair
*Giacomo Oliveira, Dana-Farber Cancer Institute, USA
Session Chair
Rosaria Chila, IFOM, The FIRC Institute of Molecular Oncology, Italy
Non-Canonical Neoantigens are the Largest Fraction of MHC I Peptides in Mismatch Repair Deficient Murine Colorectal Cancer
Zachary C. Hartman, Duke University, USA
Vaccination Targeting Mutant ESR1 Resistance Driver Neoepitopes to Immunologically Prevent and Suppress the Emergence of ER+ Endocrine Therapy-Resistant Breast Cancer
Alex M. Jaeger, Moffitt Cancer Center, USA
Deciphering the Immunopeptidome in vivo Reveals Novel Tumor Antigens

Allison M. Kirk, St. Jude Children’s Research Hospital, USA
Developing T Cell Immunotherapies Targeting Conserved Fusion Neoantigens in Fibrolamellar Carcinoma

Ana Marcu, Genentech, Inc., USA
The HLA Ligand Atlas: Defining Actionable Targets for T-Cell-Based Immunotherapy

Mark J. McCarron, Genentech, Inc., USA
The Phenotype of the T Cell Response against Weak Antigens is Altered by the Presence of Strong T Cell Responses against Immunodominant Antigens

Christian Seca, University of Liege, Belgium
Wobble tRNA Modification Regulates Melanoma Immune Response

Sri Krishna, National Cancer Institute, USA
Impact of Neoantigen-Specific T Cell Phenotypes on Cellular Immunotherapies Targeting Metastatic Solid Tumors

Workshop 1: Emerging Checkpoints Insights: Basic and Animal Model Studies (2:30 pm Start) (RB1)
*Roarke A. Kamber, Stanford University, USA
Systematic Discovery of Mechanisms that Impede Macrophage Phagocytosis of Cancer Cells Using Inter-cellular CRISPR Screens
*Hrishi Venkatesh, University of Minnesota, USA
Targeted Therapy and Anti-PDL1 Checkpoint Blockade Elicit a CD4 T Cell Response that Eliminates B Cell Leukemia and Prevents Relapse

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**Advances in Checkpoint Biology II: Immune Exhaustion and Immune Targeting against Viral Antigens (5:00 pm Start) (RT3)**

Scientific Organizers: Catherine J. Wu, Robert D. Schreiber and Cornelis J.M. Melief

June 8-12, 2022 • Fairmont Chateau Whistler • Whistler, BC, Canada


Scholarship Deadline: October 21, 2021 / Abstract Deadline: April 20, 2022 / Discounted Registration Deadline: April 7, 2022

KEYSTONE SYMPOSIA

Cancer Neoantigens, Vaccines and Viruses - RESCHEDULED (RT3)

Scientific Organizers: Catherine J. Wu, Robert D. Schreiber and Cornelis J.M. Melief

Supported by the Directors’ Fund

**Advances in Checkpoints Immunology from Autoimmunity to Oncology to Infectious Diseases - RESCHEDULED (RB1)**

Scientific Organizers: David M. Lee, Arlene H. Sharpe and William H. Robinson

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Michiel van der Vlist, University Medical Center Utrecht, Netherlands

CD200R+ Macrophages Resolve Inflammatory Pain Through Interaction with iSec1 on Sensory Neurons

Irina Voloshyna, NYU School of Medicine, USA

Humanized FcγR (hFcyR) Mice as a Pre-clinical Model to Study Checkpoint Inhibitor-induced irAE

Elena Fueyo-Marcos, CNIO, Spain

Exploring the Potential of Selectively Killing PD-L1-Expressing Cells in Cancer Therapy

Martina Damo, Yale University, USA

Anti-PD-1 Disrupts Tolerance of Self-antigen-specific CD8 T Cells in Skin Causing Lichenoid irAEs

Abby E. Overacre, University of Pittsburgh, USA

Microbiota-specific T Follicular Helper Cells Drive Tertiary Lymphoid Structure Formation and Anti-tumor Immunity in Colorectal Cancer

**Immune Targeting against Viral Antigens (5:00 pm Start) (RT3)**

*Susan E. Klaeger, Broad Institute, USA

Session Chair

Helen Heslop, Baylor College of Medicine, Houston Methodist Hospital and Texas Children's, USA

Adoptive Transfer of Virus Specific T Cells

Cornelis J. M. Melief, Leiden University Medical Center & ISA Pharmaceuticals BV, Netherlands

Vaccines Targeting HPV Antigens

Kellie N. Smith, Johns Hopkins University School of Medicine, USA

Discovery and Characterization of Tumor-Reactive TIL

Derin Benerci Keskin, Dana Farber Cancer Institute, USA

Short Talk: Reversal of Viral and Epigenetic HLA Class I Repression in Merkel Cell Carcinoma

Michael C. Brown, Duke University, USA

Short Talk: Intratumor Childhood Vaccine-specific CD4+ T Cell Recall Coordinates Antitumor Type I and II Immunity

Esmé van der Gracht, ISA Therapeutics, Netherlands

Remote Presentation: Short Talk: A Third Vaccination with a Single T Cell Epitope Protects against Lethal SARS-CoV-2 Infection

**Advances in Checkpoint Biology II: Immune Exhaustion and Immunometabolism (5pm Start) (RB1)**

*Rafi Ahmed, Emory University School of Medicine, USA

TGF-beta Regulates the Quiescence and Differentiation of PD-1+ TCF-1+ Stem-like CD8 T Cells during Chronic Infection

*Weiping Zou, University of Michigan, USA

Metabolic Impact on Cancer Immunity and Immunotherapy

Christopher E. Rudd, University of Montreal, Canada

Short Talk: Glycogen Synthase Kinase (GSK-3) Inhibition Generates CD8 Super-armed Killers in its Synergy with PD-1/PDL1 Blockade in Tumor Immunity

Sabelo M. Lukhele, University Health Network, Canada

Short Talk: IRF2-mediated Inhibition of Interferon Signaling Drives CD8 T Cell Exhaustion to Prevent Long-term Cancer Control

Andrew Frisch, University of Pittsburgh, USA

Short Talk: Redirecting Glucose Flux During In Vitro Expansion Improves the In Vivo Performance of Adoptive T Cell Therapies for Cancer

Panel Discussion: New Directions in Checkpoint Biology: Major Gaps and Emerging Insights (6:45 pm Start) (RB1)

*Arlene H. Sharpe, Harvard Medical School, USA

Session Chair

Weiping Zou, University of Michigan, USA

Jennifer Guerriero, Brigham and Women's Hospital, USA

David A. Hafler, Yale University School of Medicine, USA

Bali Pulendran, Stanford University School of Medicine, USA

Ira Mellman, Genentech, Inc., USA

**Poster Session 2**

**SATURDAY, JUNE 11**

Immunoregulation and Immunosuppression (Joint) (8:00 am Start)

*Thomas Gajewski, University of Chicago, USA

The Tumor Microenvironment and Immunotherapy Efficacy

Hussein Sultan, Washington University School of Medicine, USA

Unexpected Complexity of Neoantigen Specific Synthetic Long Peptide Cancer Vaccines: Potential for Induction of Tumor Specific Immunosuppressive CD4+ T cells

Jennifer Guerriero, Brigham and Women's Hospital, USA

Elucidating Macrophage Diversity to Uncover Novel Anti-cancer Therapeutic Strategies

David A. Hafler, Yale University School of Medicine, USA

Transcriptional Mechanism of FoxP3+ Treg Dysfunction in Human Autoimmune Disease

Jessica Stark, Stanford University, USA

Short Talk: Antibody-lectin Bispecifics for Glyco-immune Checkpoint Blockade

Andreas Wieland, Ohio State University, USA

Short Talk: Defining HPV-Specific B Cell Responses in Patients with Head and Neck Cancer

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Workshop 2: Emerging Checkpoints Insights: Translational and Clinic Studies (3:00 pm Start) (RB1)
*Kate Carbone, Genentech, Inc., USA
Surveillance of in situ Tumor Arrays Reveals Early Environmental Control of Cancer Immunity
*Zhi Liang Chu, Crossignal Therapeutics, Inc., USA
TMER1: A Treg Cell Expressed, Hippo-YAP Regulating GPCR as a Novel Target for Cancer Immunotherapy Drug Development
Jenna Lynn Collier, Harvard University, USA
PD-1 Blockade Drives T Cell Transcriptional States in NOD Mice that are Comparable to T Cells in NOD Mice with Spontaneous Autoimmune Diabetes
David R. Glass, Fred Hutchinson Cancer Center, USA
Multi-omic Analysis of Cutaneous T Cell Lymphomas Reveals Broad Changes in Cellular Immunity Induced by Mono- and Combination Anti-PD-1 Immunotherapy
Akashdip Singh, UMC Utrecht, Netherlands
Cancer Immunotherapy by NC410, a LAIR-2 Fc Protein Blocking Human LAIR-collagen Interaction

Checkpoints in Autoimmunity: Function and Dysfunction in Disease (5:00 pm Start) (RB1)
*Bali Pulendran, Stanford University School of Medicine, USA
Systems Biological Analysis of Immunity to COVID-19 Infection and Vaccination
*Eoin McKinney, Cambridge University, UK
Lymphocyte Exhaustion State in Autoimmune Disease X: Integrating Functional Status across Active Checkpoints
David M. Lee, Janssen Pharmaceutical Companies of Johnson & Johnson, USA
Co-inhibitory Modulators In Autoimmunity: The Complex Path From Concept to Therapeutic Candidates
Chris Paluch, MiroBio Ltd, UK
Short Talk: A BTLA Agonist Antibody for the Treatment of Autoimmune Disease
Yang Zhao, Janssen Immunology Discovery, USA
Short Talk: VISTA is a Checkpoint Receptor Target for Autoimmune Diseases

Combination Therapy with Oncolytic Virus and Viral Delivery Systems (5:00 pm Start) (RT3)
*Jennifer Guerriero, Brigham and Women's Hospital, USA
Short Talk: A Personalized Neoantigen Vaccination Incorporating SLPs for Personal Neoantigen-Targeting Vaccines

Klaus Früh, Oregon Health & Science University, USA
Harnessing the Unique Immune Biology of Cytomegalovirus for Cancer Immunotherapy
E. Antonio Chiocca, Brigham and Women's Hospital, USA
Clinical Trials of Oncolytic Virus- and Gene-based Immunotherapy: Human Evidence of Changes in the Tumor Immune Microenvironment
Kristin DePeaux, University of Pittsburgh, USA
Short Talk: Overcoming Microenvironmental Resistance to Oncolytic Virus Immunotherapy with Virus-encoded Delivery of a Potent TGFβ Inhibitor
Emma Wagner, University of Cambridge, UK
Short Talk: Role of Innate Immune DNA Sensing in Response to Oncolytic Virus Therapy

Poster Session 3

SUNDAY, JUNE 12

Vaccines in Cancer and Other Non Infectious Syndromes (8:00 am Start) (RT3)
*Cornelis J. M. Melief, Leiden University Medical Center & ISA Pharmaceuticals BV, Netherlands
Session Chair
Gerald P. Linette, University of Pennsylvania, USA
Dendritic-Based Targeting of Tumor Neoantigens
Jan David Beck, BioNTech SE, Germany
Combining RNA-encoded Interleukin-2 with Antibodies Overcomes Resistance in MHC Class I-deficient Cancer

Catherine J. Wu, Dana-Farber Cancer Institute, USA
Short Talk: Antigen Dominance Hierarchies Shape Anti-tumor T Cell Phenotypes and Immunotherapy Response
Megan L. Burger, Massachusetts Institute of Technology, USA
Short Talk: Molecular Determinants of Effective Neoantigen-specific T Cell Responses Following Vaccination
Ann-Jay Tong, Genentech, Inc., USA
Short Talk: Viral Vectored Vaccines Targeting Tumor Neoantigens Elicit Potent and Effective Anti-tumor Immune Response

Najia Arshad, Yale University, USA
Short Talk: Discovery of Immunogenic, Tumor-Associated Peptides Presented by Major Histocompatibility Complex Class I in a Myeloproliferative Neoplasm Cell Line
David A. Braun, Dana-Farber Cancer Institute, USA
Short Talk: A Personalized Neoantigen Vaccination Incorporating Locally Delivered Ipilimumab Induces Tumor-specific Immunity in Renal Cell Carcinoma

Checkpoints in Oncology—Treatment Effectiveness, Include CAR T, States of Immune Exhaustion in I O, and Combo Approaches (8:00 am Start) (RB1)

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Remote Presentation: Immune-related Adverse Events with Checkpoint Inhibitors  
*Charles G. Drake, Janssen, USA  
Talk Title to be Announced

Defining Regulators of Immunity to Infections and Tumors using in vivo CRISPR Screens  
Alex C. McPherson, University of Pittsburgh, USA  
Short Talk: Exploring the Mechanisms of how Commensal Bacteria Colonize Gut-distal Melanoma Tumors and Impact Immune Checkpoint Inhibitor Efficacy

Chun Wai Wong, University of Manchester, UK  
Short Talk: Inhibition of PARP14 Restores Response to Anti-PD1 Immune Checkpoint Inhibition

Novel Combinatorial Approaches (5:00 pm Start) (RT3)  
*Gerald P. Linette, University of Pennsylvania, USA  
Session Chair

David E. Avigan, Beth Israel Deaconess Medical Center, USA  
Integrating a Personalized Cancer Vaccine with Cellular Immunotherapy

Ravi Uppaluri, BWH, USA  
Neoadjuvant PD1 Therapy

Brooke Huisman, MIT, USA  
Short Talk: Characterizing the Peptide Repertoire of HLA-E and Natural Killer Cell Receptors via Yeast Display

Marcus Bosenberg, Yale University, USA  
Short Talk: Epigenetic Regulation of Endogenous Retroelement Expression Modulates Anti-cancer Immune Responses

Christianne Groeneveldt, Leiden University Medical Center, Netherlands  
Short Talk: Repurposing Reovirus-specific T Cells as Antitumor Effector Cells

Checkpoints Insights from Infectious Diseases and Environmental Triggers (5:00 pm Start) (RB1)  
*Georg Lauer, Massachusetts General Hospital, USA  
Checkpoint Signaling and Phenotype in Chronic Viral Infections

*Alice O. Kamphorst, Icahn School of Medicine at Mount Sinai, USA  
Strength of CD28 Costimulation Directs Self-Renewal and Differentiation of TCF-1+ PD-1+ CD8 T Cells

Suean E. McClory, University of Pennsylvania/CHOP, USA  
Short Talk: Trib1 Inhibits Viral-specific T Cell Responses during Chronic Infection by Promoting Terminal Exhaustion

Panel Discussion: Targeting Checkpoints in Human Disease: Gaps for Translation and Opportunities Ahead (6:00 pm Start) (RB1)