Workshop 1 (J2)
Metabolic Regulation of the Anti-Cancer Immune Response (Joint)
MONDAY, JANUARY 17
Arrival and Registration

Welcome and Keynote Address (Joint)
*Lydia Lynch*, Harvard Medical School, USA
*Eileen P. White*, Rutgers Cancer Institute of New Jersey, USA
Jeffrey C. Rathmell, Vanderbilt University, USA
Metabolic Checkpoints in the Tumor Microenvironment and Inflammation

Metabolic Regulation of the Anti-Cancer Immune Response (Joint)
*Susan M. Kaech*, The Salk Institute, USA
Erika L. Pearce, Johns Hopkins University, USA
Metabolic Regulation of Immune Cells in Cancer
Lydia Lynch, Harvard Medical School, USA
Interplay between Obesity, Immune Cells, and Cancer
Marcia C. Haigis, Harvard Medical School, USA
The Role of Metabolites in Anti-Tumor Immunity
Murad R. Mamedov, UCSF / Gladstone, USA
Short Talk: CRISPR Screens Reveal AMPK-Dependent Metabolic Regulation of Cancer Cell Interactions with γδ T Cells
Meng-Ju Wu, Massachusetts General Hospital, USA
Short Talk: Mutant-IDH1 Promotes Immunoevasion and Tumor Maintenance in Cholangiocarcinoma

Workshop 1 (J2)
*Elena Piskounova*, Weill Cornell Medicine, USA
*Michael E. Pacold*, New York University Medical Center, USA
Liron Bar-Peled, Massachusetts General Hospital/Harvard Medical School, USA
Identification of Compartmentalized ROS vulnerabilities in Cancer
Christopher Chidley, Harvard Medical School, USA
Systems-Wide Characterization of Amino Acid Transport
Brooke M. Emerling, Sanford Burnham Prebys, USA
Exploiting Peroxisome-Mitochondria Interplay by Targeting Phosphoinositide Kinases
David B. Shackelford, University of California, Los Angeles, USA
Three-Dimensional Imaging and Analysis of Mitochondrial Structure and Function in Lung Cancer
Fabricio Loayza-Puch, German Cancer Research Center, Germany
Dual Ribosome Profiling Uncovers Metabolic Limitations in Distinct Cellular Populations of the Tumor Microenvironment
Marco Zocchi, University of Rochester Medical Center, USA
Glutathione Catabolism may be a Critical Amino Acid Source for Cancer Cell Survival

Yanxiang (Jessie) Guo, Rutgers University, USA
Autophagy Inhibition Sensitizes Lkb1-Deficient Kras-Driven Lung Tumors to MEK Inhibitor Trametinib via Ferroptotic Cell Death

Workshop 1: Fundamentals of Immunometabolism (J1)
Michael Berger, Hebrew University, Israel
Enhanced Methionine Cycle Suppresses Naïve CD8 T-Cell Maturation
Scott Widenmaier, University of Saskatchewan, Canada
Diet-Induced Hepatic Cholesterol Toxicity is Co-Counteracted by NRF1 and NRF2
Simon D. O'Shaughnessy, Trinity Biomedical Science Institute, Ireland
Proteomic Analysis of Metabolism of in vivo Conventional Murine Dendritic Cells
Bruno Guigas, Leiden University Medical Center, Netherlands
LKB1 Signaling in Dendritic Cells Controls Whole-Body Metabolic Homeostasis by Limiting T Helper 17 Priming
Carla Alicia Jaeger-Ruckstuhl, Fred Hutchinson Cancer Research Center, USA
CD27 Co-Stimulation Regulates Naïve T Cell Fate Early During Priming and Improves Immunotherapeutic Potential of CAR-T Cells
Rosa Menjivar, University of Michigan, USA
Depletion of Arginase 1 in Myeloid Cells Alters the Pancreatic Cancer Tumor Microenvironment
Andrew R. Patterson, Vanderbilt University Medical Center, USA
Identifying Metabolic Regulators of CD4+ T cells Using Mendelian Disease
Gloria Asanteewa, University of Rochester, USA
The Interplay of Glutathione and Lipid Homeostasis in vivo

Metabolic Regulation by Kinases (J2)
*Karen H. Voussden*, Francis Crick Institute, UK
Reuben J. Shaw, The Salk Institute for Biological Studies, USA
AMP Kinase
Brendan D. Manning, Harvard School of Public Health, USA
Metabolic Effectors of mTOR Signalling
John Blenis, Weill Cornell Medical College, USA
Metabolic Regulation of Metastasis
Anni Zhang, University of British Columbia, Canada
Short Talk: Insulin Receptor Signaling in Pancreatic Acinar Cells Contributes to Pancreatic Cancer Development
Mike Uretz John Oliphant, Harvard Medical School, USA
Short Talk: Investigating the Role of SLC7A5 in Metabolic Reprogramming of Therapy Resistant ER+ Breast Cancer
Metabolic Reprogramming for Improved Immunotherapy (J1)

*Hongbo Chi, St. Jude Children's Research Hospital, USA

Amino Acid Metabolism and Nutrient Balance (Joint)

*Janelle S. Ayres, The Salk Institute for Biological Studies, USA
*Heather Christofk, University of California, Los Angeles, USA
M. Celeste Simon, University of Pennsylvania, USA

Maintaining Cholesterol Homeostasis Promotes Tumorigenesis in Kidney Cancer

Karen H. Vousden, Francis Crick Institute, UK
Serine Metabolism and Cancer Development

Matthew G. Vander Heiden, Massachusetts Institute of Technology, USA

Metabolic Interactions between Cancer and Host

Hongbo Chi, St. Jude Children's Research Hospital, USA
Nutrient Sensing and Signaling in Immune Function

Konrad Aden, University Hospital Kiel, Germany
Short Talk: Tryptophan Degradation as Actionable Immunometabolic Target in Chronic Inflammatory Diseases

Juan J. Apiz Saab, University of Chicago, USA
Short Talk: Myeloid-Derived Arginase Depletes Microenvironmental Arginine in PDAC Tumors and Leads to Activation of Arginine de novo Biosynthesis in Cancer Cells

Santosha Vardhana, Memorial Sloan Kettering Cancer Center, USA
Short Talk: Metabolic Supply and Demand during T-Cell Exhaustion

Career Development (Joint)

Metabolic Control of Differentiation and Immune Escape (J2)

*Erika L. Pearce, Johns Hopkins University, USA
Lydia Finley, Memorial Sloan Kettering Cancer Center, USA

Metabolic Control of Cell Fate Decisions

Jared Rutter, University of Utah, USA

Pyruvate Metabolism and Cellular Decisions

Alec Kimmelman, New York University Langone Medical Center, USA

Metabolic Control of Immune Tolerance in Cancer

Wilbert P. Vermeij, Princess Máxima Center for Pediatric Oncology and Oncoide Institute, Netherlands
Short Talk: Delaying Accelerated Aging and Chemotherapy-Induced Toxicity by Nutritional Interventions

Mara Mennuni, Karolinska Institutet, Sweden
Short Talk: Metabolic Resistance to Therapeutic Inhibition of mtDNA Gene Expression in Cancer Cells

Microbial Metabolites, Nutrients and Cancer (J1)

*Russell G. Jones, Van Andel Research Institute, USA

Dan R. Littman, HHMI/New York University School of Medicine, USA
Host and Microbial Metabolites in Th17 Immunity

Janelle S. Ayres, The Salk Institute for Biological Studies, USA
Microbiota Metabolites in Health and Disease

Mark A. Febbraio, Monash Institute of Pharmaceutical Sciences, Australia
Role of the Gut Liver Axis in NASH Driven Cancer

Sean Spencer, Stanford University, USA
Short Talk: Fermented Food-Derived Bacterial Metabolites Participate in a Transkingdom Metabolic Network to Regulate Intestinal Immunity and Diet Induced Obesity

Greg M. Delgoffe, University of Pittsburgh, USA
Short Talk: Media Based on the Metabolic Composition of Tumor Interstitial Fluid Reveals Nutrient Dependencies and Novel Oncometabolites that Drive T Cell Dysfunction

Poster Session 2

WEDNESDAY, JANUARY 19

Redox Metabolism (J2)

*Jared Rutter, University of Utah, USA
Gina DeNicola, Moffitt Cancer Center, USA
Cysteine Metabolism in Cancer

Navdeep S. Chandel, Northwestern University, USA
Mitochondrial Metabolism in Cancer

Christina Towers, The Salk Institute for Biological Studies, USA
Circumventing Autophagy Inhibition in Cancer Cells

Thales Papagiannakopoulos, New York University School of Medicine, USA
KEAP1/NRF2 Pathway in Cancer

Madeleine Louisa Hart, Fred Hutch Cancer Center, USA
Short Talk: Mitochondrial Redox Adaptations are Essential for Aspartate Synthesis in SDH Deficient Cancer Cells

Rebecca Louise Westbrook, University of Birmingham, UK
Short Talk: Proline Synthesis through PYCR1 is Required to Support Cancer Cell Proliferation and Survival in Oxygen-Limiting Conditions

* Session Chair † Invited but not yet accepted Program current as of December 22, 2021. Meal formats are based on meeting venue. For the most up-to-date details, visit https://www.keystonesymposia.org.
KEYSTONE SYMPOSIA
on Molecular and Cellular Biology

Tumor Metabolism (J2)
Scientific Organizers: Eileen P. White, Joshua D. Rabinowitz and Marcia C. Haigis
Sponsored by AstraZeneca

Immunometabolism at the Crossroads of Obesity and Cancer (J1)
Scientific Organizers: Lydia Lynch and Hongbo Chi
January 16-20, 2022 • Fairmont Banff Springs • Banff, AB, Canada
Sponsored by Cell Research and Regeneron Pharmaceuticals, Inc.

Scholarship Deadline: October 5, 2021 / Abstract Deadline: October 12, 2021 / Discounted Registration Deadline: November 16, 2021
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Myriam Cerezo-Magaña, Lund University, Sweden
Short Talk: Hypoxic Induction of Exosome Uptake through Proteoglycan Dependent Endocytosis Fuels the Lipid Droplet Phenotype in Glioma

Immune Interactions with Systemic and Tissue Metabolism (J1)
*Daniela F. Quail, McGill University, Canada
Catherine Postic, INSERM Institut Cochin, France
Nutrient Sensing in Liver through the OGT Enzyme
Douglas R. Green, St. Jude Children’s Research Hospital, USA
The Persistence of Memory: A SNF is all it takes
Zuri Sullivan, Harvard University, USA
Intestinal Response to Nutrient Sensing
Miguel Reina Campos, University of California, San Diego, USA
Common Metabolic Adaptations Empower CD8 T Cell Tissue Residency and Antitumor Immunity
Stefanie K. Wculek, Fundación Centro Nacional de Investigaciones Cardiovasculares Carlos III, Spain
Short Talk: OXPHOS Targeting Differentially Impacts Tissue Macrophages Depending on their Homeostatic Function
Santiago Valle Torres, Peter Doherty Institute, Australia
Short Talk: Inflammation Dependent Differentiation of Two Distinct Adipose Tissue Treg Populations Shape Systemic Metabolism
Andrea Keller, Ohio State University, USA
Short Talk: Intestinal Gasdermin C Expression is Dependent on Nutrient Status and Immune Environment

Tumor Interaction with Host and Microbes (Joint)
*Konrad Aden, University Hospital Kiel, Germany
*M. Celeste Simon, University of Pennsylvania, USA
Yasmine Belkaid, NIAID, National Institutes of Health, USA
Nutritional Control of Immunity
Eileen P. White, Rutgers Cancer Institute of New Jersey, USA
Immune Response Regulation by Autophagy in Cancer
Joshua D. Rabinowitz, Princeton University, USA
NADPH and Fat Sources in Tissues and Tumors
Julian J. Lum, BC Cancer, Canada
Short Talk: Duality of Metabolites in T cell Antitumor Function
Oliver Jonas, Brigham & Women's Hospital, USA
Short Talk: In Situ Manipulation of Metabolic Pathways to Examine Nutrient Competition Between Immune Cells and Malignant Cells in Tumors

Poster Session 3

THURSDAY, JANUARY 20

Targeting Metabolism (J2)

*Matthew G. Vander Heiden, Massachusetts Institute of Technology, USA
Ralph J. DeBerardinis, University of Texas Southwestern Medical Center, USA
Metabolic Dependencies in Tumors in Humans
Mariia Yuneva, Francis Crick Institute, UK
Identifying Metabolic Vulnerabilities and Flexibilities of Tumours
Ayelet Erez, Weizmann Institute of Science, Israel
Targeting the Urea Cycle
Barbara S. Fox, Rheos Medicines, USA
Leveraging Immunometabolism for the Treatment of Autoimmune Disease
Brooks P. Leitner, Yale University, USA
Short Talk: Systemic Nutrient Partitioning and Tumor Immunometabolic Reprogramming Underlie Exercise’s Anti-Cancer Effects
Philippa Burns, University of Illinois at Chicago, USA
Short Talk: Investigating the Response of Breast Cancer Cells to Serine Starvation
Milan R. Savani, University of Texas Southwestern Medical Center, USA
Short Talk: Divergent Pyrimidine and Purine Nucleotide Synthesis Programs Underlie Sensitivity to De Novo Pyrimidine Synthesis Inhibition in IDH1 Mutant Glioma

High-Fat Diet, Lipids and Cancer (J1)
*Lydia Lynch, Harvard Medical School, USA
Salvador Aznar Benitah, ICREA and Institute for Research in Biomedicine, Spain
Targeting Metastasis through Lipid Metabolism
Rachel J. Perry, Yale University, USA
Breaking the Link between Obesity and Cancer
Weiping Zou, University of Michigan, USA
Improving Metabolic Responses to Immunotherapy
Semir Beyaz, Cold Spring Harbor Laboratory, USA
Dietary Control of Tumor Metabolism
Jacqueline A. Turner, University of Colorado Anschutz School of Medicine, USA
Short Talk: Lipid Modulation of CD8 T Cell Immunosurveillance, Metabolism, and Anti-tumor Immunity
Nathalie M. Schmidt, University College London, UK
Short Talk: Targeting Cholesterol Metabolism as a Novel ImmuneCheckpoint in Viral Infections and Cancer

Workshop 2 (J2)
*Jonathan L. Coloff, University of Illinois at Chicago, USA
*Jason R. Cantor†, Morgridge Institute for Research, University of Wisconsin-Madison, USA

* Session Chair † Invited but not yet accepted  Program current as of December 22, 2021. Meal formats are based on meeting venue. For the most up-to-date details, visit https://www.keystonesymposia.org.
Mark Basik, McGill University, Canada
Targeting Lipid Droplets in Chemoresistant Triple Negative Breast Cancer

Rebekah Brooks, University of Pennsylvania, USA
PBAF-associated Circadian IncRNA ADIRF-AS1 Regulates Renal Clear Cell Tumorigenesis

Victoria da Silva Diz, Rutgers University, USA
A Novel and Highly Effective Mitochondrial Uncoupling Drug in T-cell Leukemia

Jiangbin Ye, Stanford University, USA
Deciphering the Warburg Effect: Redox is the Key to Tumor differentiation

Gregory S. Ducker, University of Utah, USA
Altered Phosphatidylcholine Metabolism Creates a Targetable Vulnerability in a β-catenin Driven Zebrafish Model of Hepatocellular Carcinoma

Aleksandra Filipovska, University of Western Australia, Australia
An RNA-binding Protein Variant Predisposes to Prostate Cancer by Altering Immunometabolism via Mitochondria

Laura C. Kim, University of Pennsylvania, USA
Competition for Arginine Between Tumor and Immune Cells in HCC

Amber Kleckner, Univ of Maryland, Baltimore, USA
Associations Between Mitochondrial Function and Cancer-Related Fatigue among Patients Undergoing Chemotherapy

Workshop 2: Translational Immunometabolism in Disease (J1)

*Dirk Brenner, Luxembourg Institute of Health, Luxembourg

Petya Apostolova, Johns Hopkins University, USA
Targeting the Creatine Metabolism Crosstalk Between Malignant Cells and T Cells for the Treatment of Acute Myeloid Leukemia

Jackie Bader, Vanderbilt University Medical Center, USA
Tumor Associated Macrophages Contribute to the Obesity Paradox of Immune Checkpoint Therapy

Peter J. Siska, University Hospital Regensburg, Germany
Metabolic Imbalance of T Cells in COVID-19 is Hallmarked by Basigin and Mitigated by Dexamethasone

Alexandra L. Kuhlmann, Yale, USA
Metabolic Adaptation of Tissue-Resident Macrophages in Cancer

Soo-Youl Kim, National Cancer Center, South Korea
Blocking Obesity or Fatty Acid Oxidation Suggests a Potential New Therapeutic Approach for Pancreatic Cancer

Eva Tsaousidou, Harvard T.H. Chan School of Public Health, USA
TIRR Suppression Mediates a Cancer-Preventive Tolerable p53 Activation with Metabolic Side Effects

Claire McIntyre, Harvard Medical School, USA
Combined Diet of High Fat with High Cholesterol Enhances Tumor Growth and Alters Immune Function in a Diet-Induced Obesity Model

Metabolic Vulnerabilities (J2)