

KEYSTONE SYMPOSIA

on Molecular and Cellular Biology

Tumor Metabolism (C2)

March 8-12, 2020 • Fairmont Banff Springs • Banff, AB, Canada

Scientific Organizers: Joshua D. Rabinowitz, Marcia C. Haigis and David M. Sabatini

Sponsored by Cell Research

Discounted Abstract & Scholarship Deadline: November 6, 2019 / Abstract Deadline: December 10, 2019 / Discounted Registration Deadline: January 9, 2020

SUNDAY, MARCH 8

Arrival and Registration

MONDAY, MARCH 9

Cancer-Immune Interplay

Jeffrey C. Rathmell, Vanderbilt University, USA
T Cell Metabolism and the Tumor Microenvironment

Jing Fan, University of Wisconsin-Madison, USA
Dynamic Metabolic Rewiring in Macrophages

Lydia Lynch, Harvard Medical School, USA
Interplay between Obesity, Immune Cells, and Cancer

Erika L. Pearce, Max Planck Institute of Immunobiology and Epigenetics, Germany
Polyamine Metabolism Regulates the T Cell Epigenome Through Hypusination

Dirk Brenner, Luxembourg Institute of Health, Luxembourg
Short Talk: Glutathione Controls T Regulatory Cell Metabolism to Prevent Autoimmunity

Jurre J. Kamphorst, Rheos Medicines, USA
Short Talk: Comparative Metabolomics Identifies Both Conserved and Unique Metabolic Features of Immune Cell Activation across Multiple Cell Types

Workshop

Mara Mennuni, Karolinska Institutet, Sweden
A CRISPR-Cas9 Genetic Screen Reveals Resistance Mechanisms to the Inhibitor of Mitochondrial Transcription in Cancer Cells

Kellen Olszewski, Kadmon Corporation, LLC, USA
A Novel Class of Orally Available Glucose Transporter Inhibitors Selectively Blocks Growth and Viability of TCA Cycle-Deficient Cancers

Jeffrey J. Ackroyd†, University of Texas MD Anderson Cancer Center, USA
Inhibition of Glycolysis Results in Immunostimulation against Glioblastoma Tumors Due to Altered Glycosylations

Vidhi Pareek, Pennsylvania State University, USA
Channeled De Novo Purine Biosynthesis in Cancer Cells Revealed by Metabolomics and Mass Spectral Imaging

Shawn M. Davidson†, Princeton University, USA
Probing Metabolic Heterogeneity in situ

Nikos Koundouros, Institute of Cancer Research, UK
iKnife Provides a New Mode of Real Time Diagnosis Coupling Metabolic Phenotype to Mutant PIK3CA Genotype

Sung Won Kwon, Seoul National University, South Korea
"In Vitro Tracking of Biogenic Volatile Organic Compounds Derived from Intracellular Metabolism by Isotope Labeling"

Divya Ramchandani†, Weill Cornell Medical College of Cornell University, USA
Copper Depletion Modulates OXPHOS to Impair TNBC Metastasis

Peter Tsvetkov, Broad Institute, USA
Cuproptosis: Metabolism Regulated, Copper-Dependent Form of Non-Apoptotic Cell Death

Metabolic Regulation by Kinases

Reuben J. Shaw, The Salk Institute for Biological Studies, USA
Dual Roles of AMPK in Cancer Prevention and Oncogenesis

Brendan D. Manning, Harvard School of Public Health, USA
Metabolic Effectors of mTOR Signaling

David M. Sabatini, Whitehead Institute for Biomedical Research, USA
mTOR and Lysosomes in Growth Control

Brooke M. Emerling, Sanford Burnham Prebys Medical Discovery Institute, USA
Short Talk: Regulation of Fatty Acid Metabolism by Non-Canonical Phosphoinositide Kinases

John Albeck†, University of California, Davis, USA
Short Talk: Interlocking Cycles of Anabolic and Catabolic Kinase Programs in Single Cells

Poster Session 1

TUESDAY, MARCH 10

Metabolic Determinants of Cell Fate

Navdeep S. Chandel, Northwestern University, USA
Mitochondria and Cancer

Lydia Finley, Memorial Sloan Kettering Cancer Center, USA
Metabolic Coordination of Tumor Suppression

Speaker to be Announced

Marcia C. Haigis, Harvard Medical School, USA
The Fight for Food between Immune Cells and Cancer Cells

Adam L. Hughes, University of Utah, USA
Short Talk: Nutrient-Dependent Control of Mitochondrial Metabolite Carriers via the MDC Pathway

Biplab Dasgupta, Cincinnati Children's Hospital, USA
Short Talk: Genetic and Epigenetic Mechanisms Regulating Stearoyl Co-A Desaturase Inhibitor Sensitivity and Acquired Resistance in Cancer

Ryan T. Davis, UC Irvine, USA
Short Talk: Transcriptional Diversity and Bioenergetic Shift in Human Breast Cancer Metastasis Revealed by Single-Cell RNA Sequencing

Noriko Gotoh†, Cancer Research Institute, Kanazawa University, Japan
Short Talk: One Carbon Metabolic Enzymes Play Important Roles for Cancer Cells and Cancer Stem-Like Cells

Dohoon Kim, University of Massachusetts Medical School, USA
Short Talk: Selenocysteine Metabolism and Detoxification in Cancer

Meet the Editors

Barbara Marte, Nature, UK

Sejal K. Vyas, Cell Press, USA

Krista Lynn Bledsoe, Cell Press, USA

Tim Spencer, Journal of Cell Biology, USA

Allyson Evans, Cell Press, USA

Elena Bellafante, Nature Metabolism, UK

Ulrike Harjes, Nature Reviews Cancer, UK

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Amino Acid Metabolism

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

Craig B. Thompson, Memorial Sloan Kettering Cancer Center, USA
Protein Translation can be Limited by tRNAGln Charging

Kivanc Birsoy, Rockefeller University, USA
Metabolic Dependencies of Cancer Cells in Vivo

Rumi Lee, University of Texas MD Anderson Cancer Center, USA
Short Talk: Synthetic Essentiality of TDO2 in APC-Mutated Colorectal Cancer

Roland Nilsson[†], Karolinska Institutet, Sweden
Short Talk: Methionine Dependence in Cancer Is Caused by Defective Adenosylhomocysteinase, a Tumor-Suppressing Enzyme

Poster Session 2

WEDNESDAY, MARCH 11

Fuel Sources

Joshua D. Rabinowitz, Princeton University, USA
NADPH and Fat Sources in Tissues and Tumors

Francesco Parlati, Calithera Biosciences, USA
Anti-Tumor Activity of Telaglenastat (CB-839) in Solid Tumors

Ralph J. DeBerardinis, University of Texas Southwestern Medical Center, USA
Metabolic Phenotypes and Cancer Progression in Humans

Heather Christofk, University of California, Los Angeles, USA
Metabolic Transitions in Cancer: Lessons from Viral Infection

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

Mengrou Shan[†], University of Michigan, USA
Short Talk: Targeting Malic Enzyme 1 Dependence in Pancreatic Cancer

Robert Singhung Banh[†], New York University, USA
Short Talk: Metabolic Contribution of Neurons, via Peripheral Axons, to Pancreatic Tumorigenesis

Targeting Metabolism

Mariia Yuneva, Francis Crick Institute, UK
Identifying Metabolic Vulnerabilities and Flexibilities of Tumours

Bin-Bing Zhou, Shanghai Children's Medical Center, China
Clonal Evolution of Relapsed Acute Lymphoblastic Leukemia: From DNA Damages Responses to Nucleotide Biosynthesis

Kevin Marks, Agios Pharmaceuticals, USA
Targeting Metabolic Vulnerabilities in Cancer

Grace H. McGregor, UC San Diego, USA
Short Talk: Targeting the Metabolic Response to Statin-Mediated Oxidative Stress Produces a Synergistic Anti-Tumor Response

Bryan Duy-Anh Ngo[†], Weill Cornell Medical College, USA
Short Talk: Nutrient Scarcity Drives Brain Metastasis Metabolic Adaptation and Dictates Sensitivity to Small Molecule PHGDH Inhibition

Poster Session 3

THURSDAY, MARCH 12

Tumor-Host Interactions

Eileen P. White, Rutgers University, USA
Role of Host Autophagy in Cancer Progression

Eyal Gottlieb, Technion - Israel Institute of Technology, Israel
Therapeutic Exploitation of Metabolic Vulnerabilities of Cancer

Ayelet Erez, Weizmann Institute of Science, Israel
Utilizing Alterations in Urea Cycle Enzymes and Metabolites for Cancer Diagnosis and Therapy

Matthew G. Vander Heiden, Massachusetts Institute of Technology, USA
Metabolic Interactions between Cancer and Host

Mona Foth, Huntsman Cancer Institute, USA
Short Talk: Co-Inhibition of Autophagy and MAPK Signaling in RAS-Driven Cancers

Cosimo Commisso, Sanford Burnham Prebys Medical Discovery Institute, USA
Short Talk: Nutrient Scavenging in the Tumor Stroma

Redox Metabolism

Joan S. Brugge, Harvard Medical School, USA
Why Does Anchorage Independent Growth Cause Redox Stress?

Gina DeNicola, Moffitt Cancer Center, USA
Redox Regulators in Tumorigenesis and Metabolism

Jared Rutter, University of Utah, USA
Pyruvate Transport as a Regulator of Redox Status

Stephanie Hulme[†], University of Toronto, Canada
Short Talk: Redox Metabolism as a Therapeutic Target for Pancreatic Cancer

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

FRIDAY, MARCH 13

Departure