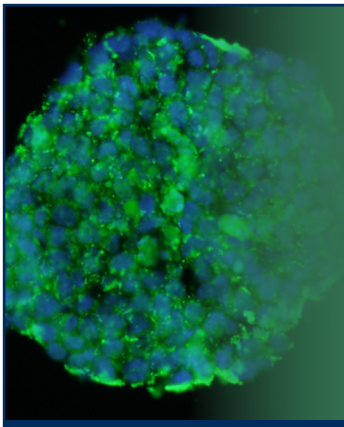


Tumor Metabolism: Mechanisms and Targets

March 5–9, 2017 | Whistler Conference Centre | Whistler, British Columbia | Canada

Scientific Organizers:
Brendan D. Manning, Harvard School of Public Health, USA
Kathryn E. Wellen, University of Pennsylvania, USA
Reuben J. Shaw, The Salk Institute for Biological Studies, USA

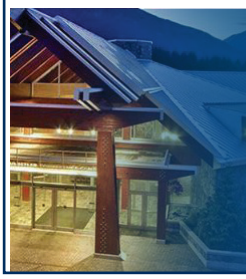
Joint with the meeting on ***Adaptations to Hypoxia in Physiology and Disease***

This conference is on the rapidly moving field of tumor metabolism and its implications in cancer development, progression and therapy. Experts from distinct fields of research will be brought together to present their latest discoveries on tumor metabolism, which is an inherently interdisciplinary field. Defining the diversity of metabolic strategies employed by cancer cells and how the genetic events underlying different types of cancer, as well as the tumor microenvironment, influence these metabolic properties is a major goal of this meeting. In addition, a combination of basic, translational and clinical studies will be presented, with the goal of identifying promising avenues in tumor metabolism that impact our understanding, diagnosis and treatment of cancer. In addition to a stellar line up of invited speakers, short talks and poster presentations will provide opportunities for researchers at all levels to discuss their most current work in this field. This meeting provides an excellent opportunity to share knowledge and methodology in tumor metabolism research in a collegial and social atmosphere.

Session Topics:
- Hypoxia and Tumor Metabolism (Joint)
- Oncogenic Control of Metabolism
- Metabolic Strategies in Cancer
- Metabolic Adaptations of Cells within the Tumor Microenvironment (Joint)
- Metabolism, Signaling and Epigenetics
- Interplay with Other Cell Types and Tissues
- Tumor Progression and Suppression by Metabolic Enzymes
- Metabolic Vulnerabilities in Cancer

plus two workshops

Abstract Deadline: December 8, 2016
Discounted Registration Deadline: January 12, 2017



Note: Abstracts submitted by the abstract deadline will be considered for short talks on the program.

Upper image of cultured tumor spheroid with hypoxic areas (in green) courtesy of Lei Jang, National Cancer Institute / Simmons Comprehensive Cancer Center at The University of Texas

Meeting Hashtag: #KStumor

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Adaptations to Hypoxia in Physiology and Disease (X4)

Scientific Organizers: M. Celeste Simon, Amato J. Giaccia and Randall S. Johnson

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SUNDAY, MARCH 5

Arrival and Registration

MONDAY, MARCH 6

Welcome and Keynote Address (Joint)

*__M. Celeste Simon__, University of Pennsylvania, USA

__Chi Van Dang__, University of Pennsylvania, USA
MYC as the Master Regulator of Proliferative Metabolism

Hypoxia and Tumor Metabolism (Joint)

*__Amato J. Giaccia__, Stanford University, USA

__William G. Kaelin, Jr.__, Dana-Farber Cancer Institute, USA
2-Oxoglutarate-Dependent Dioxygenases and Cancer

__Nicholas Denko__, Ohio State University, USA
Hypoxic Regulation of Mitochondrial Function

__Andrew M. Intlekofer__, Memorial Sloan Kettering Cancer Center, USA
Short Talk: Acidification Enhances Production of L-2-Hydroxyglutarate through Alternative Substrate use by Dehydrogenase Enzymes

__James A. Nathan__, Cambridge Institute for Medical Research, UK
Short Talk: Oxygen Sensing and Metabolism: The Role of the 2-Oxoglutarate Dehydrogenase Complex and Mitochondrial Protein Lipoylation

__Karen H. Vousden__, Crick Institute, UK
A Role for p53 in the Adaptation to Metabolic Stress

Workshop 1 (X3)

*__Costas A. Lyssiotis__, University of Michigan, USA

__Sumin Kang__, Emory University, USA
Phosphorylation-Mediated Activation of Lactate Dehydrogenase A Promotes Cancer Cell Invasion and Tumor Metastasis

__Issam Ben-Sahra__, Northwestern University, USA
Nucleotide Sensing by the mTORC1 Signaling Network

__Atsuo T. Sasaki__, University of Cincinnati, USA
SSK2 Couples Nucleolar Transcription and Anabolic GTP Metabolism for Gliomagenesis

__Isaac Spencer Harris__, Harvard Medical School, USA
Understanding the Vulnerabilities in Cancer Cells Upon Inhibition of Glutathione Synthesis

__Won Dong Lee__, Technion - Israel Institute of Technology, Israel
Inferring Compartmentalized Mitochondrial, Nuclear, and Cytosolic Metabolic Fluxes via Isotope Tracing with Cell Fractionation

__Lauren E. Drake__, University of Chicago, USA
BNip3 Loss Promotes Hepatocellular Carcinoma Growth through Increased Lipogenesis

__Salvador Aznar Benitah__, ICREA and Institute for Research in Biomedicine, Spain
Identifying and Targeting Metastatic-Initiating Cells through the Fatty Acid Receptor CD36

__Jing Chen__, Winship Cancer Institute, Emory University, USA
Prevention of Dietary-Fat-Fueled Ketogenesis Attenuates BRAF V600E Tumor Growth

Oncogenic Control of Metabolism (X3)

*__Heather Christofk__, University of California, Los Angeles, USA

__Lewis C. Cantley__, Weill Cornell Medicine, USA
PI3K Signaling and Glucose Metabolism in Tumors

__Almut Schulze__, University of Würzburg/Theodor-Boveri Institute, Germany
Targeting Glucose and Lipid Metabolism in Cancer

__Brendan D. Manning__, Harvard School of Public Health, USA
A Coordinated Anabolic Program Downstream of mTOR

__Alejo Efeyan__, Spanish National Cancer Research Institute, Spain
Short Talk: Oncogenic Mutations in the Nutrient Sensing Pathway Upstream of mTORC1 Alter B Lymphocyte Functions in Novel Genetically-engineered Mice

Hypoxic Influences on Intracellular and Tissue Homeostasis (X4)

*__Richard K. Bruick__, University of Texas Southwestern Medical Center, USA

__Young Il Yeom__, Korea Research Institute of Bioscience and Biotechnology, South Korea
Lactate-Induced Responses to Hypoxia

__Geert Carmeliet__, KU Leuven, Belgium
Glutamine, Glycogen and Bioenergetics

__Othon Iliopoulos__, Massachusetts General Hospital Cancer Center, USA
Glutaminase and PARP Inhibitors Synergistically Suppress ROS and Pyrimidine Dependent Growth of VHL-Deficient Renal Cell Cancer: A Novel Strategy for Treatment of Hypoxia-Driven and HIF-Expressing Tumors

__Thomas Markus Leissing__, University of Oxford, UK
Short Talk: Structural Basis for the Inhibition of Prolyl-Hydroxylase Domain Containing Proteins (PHDs) by Clinical Candidates for Anaemia Treatment

Poster Session 1

TUESDAY, MARCH 7

Metabolic Strategies in Cancer (X3)

*__Jared Rutter__, University of Utah, USA

__Matthew G. Vander Heiden__, Massachusetts Institute of Technology, USA
Metabolic Adaptations to Allow Tumor Cell Proliferation

__Jurre J. Kamphorst__, CR-UK Beatson Institute and University of Glasgow, UK
Triglycerides Buffer Membrane Phospholipid Saturation during Hypoxic Stress

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Ralph J. DeBerardinis, University of Texas Southwestern Medical Center, USA
Heterogeneous Metabolic Phenotypes and Liabilities in Human Cancer

Sarah-Maria Fendt, VIB Leuven, Belgium
Cancer Metabolism during Metastasis Formation

Cosimo Commisso, Sanford-Burnham Medical Research Institute, USA
Short Talk: Not Dying of Starvation: Nutrient Stress Controls Macropinocytosis in Tumor Cells

Elizabeth Petri Henske, Brigham and Women's Hospital, USA
Short Talk: Therapeutic Targeting of mTORC1-Dependent Metabolic Vulnerabilities in TSC and LAM

Physiological Responses to Hypoxia (X4)

*__Maria F. Czyzyk-Krzeska__, University of Cincinnati, USA

Peter F. Carmeliet, University of Leuven, VIB, Belgium
Metabolic Adaptations of Tumor Blood Vessels

Frank S. Lee, University of Pennsylvania School of Medicine, USA
Short Talk: Studies on the Zinc Finger of Prolyl Hydroxylase Domain Protein 2 (PHD2), a Hypoxia Inducible Factor-alpha Hydroxylase

Francisco J. Quintana, Harvard Medical School, USA
Regulation of CNS Inflammation by Hypoxia-Responsive Signaling

Mark R. Boothby, Vanderbilt University Medical Center, USA
Short Talk: Germinal Center Hypoxia and Regulation of mTORC1 Activity in B Cells Shape Antibody Response Qualities

Janine T. Erler, University of Copenhagen, Denmark
Hypoxia-Driven ECM Remodelling during Cancer Progression

Navdeep S. Chandel, Northwestern University, USA
Why Mammalian Cells Respire?

Workshop 1: Fundamental Processes of Oxygen Sensing (X4)

James A. Smythies, University of Oxford, UK
Utilisation of Next Generation Sequencing Technologies to Identify Novel Contributors to Hypoxia Inducible Factor Binding Site Selectivity

*__Luis del Peso__, Universidad Autonoma, Spain
Transcriptional Repression in Hypoxia is Mediated by the Sin3A Histone Deacetylase Complex

Johannes Schödel, Universitätsklinikum Erlangen, Germany
Complex Regulation of Glucose Transporter 3 Expression by HIF

Andrew Fraser, University of Toronto, Canada
How Worms Hold Their Breath: The Unusual Metabolic Response of Nematodes to Hypoxia and the Importance for 2 Billion Humans

Roman Vozdek, University of California, San Francisco, USA
Novel Uncharacterized Protein Tyrosine Kinase Senses Hypoxia to Mediate HIF-1 Independent Transcriptional Response in C. elegans

Austin Gabel, University of Maryland, Baltimore County, USA
Understanding Induction of Suspended Animation In Zebrafish

Farhad B. Imam, Bill & Melinda Gates Foundation, USA
Cellular and Metabolic Studies of Hypoxia-Sensitive Mutants in irs2 and ctrc3, Key Regulators of Glucose and Fatty Acid Metabolism

Metabolic Adaptations of Cells within the Tumor Microenvironment (Joint)

*__Erika L. Pearce__, Max Planck Institute of Immunobiology and Epigenetics, Germany

Raghu Kalluri, University of Texas MD Anderson Cancer Center, USA
The Functional Contribution of Exosomes in Cancer Metabolism and Metastasis

Randall S. Johnson, University of Cambridge, UK
The Metabolic Role of Hypoxic Response in T Cell Activation

Shannon J. Turley, Genentech, Inc., USA
Leukocyte Function and Positioning in Diverse Stromal Niches

Hong Xie, University of Pennsylvania, USA
Short Talk: Balancing Anabolic Metabolism with Homeostatic Stress Responses in Myc-Transformed Cancer Cells

Poster Session 2

WEDNESDAY, MARCH 8

Metabolism, Signaling and Epigenetics (X3)

*__Matthew G. Vander Heiden__, Massachusetts Institute of Technology, USA

Aimee L. Edinger, University of California, Irvine, USA
Macropinocytosis Drives Cancer Cell Growth in Both Nutrient-Limiting and-Replete Conditions

Jason Locasale, Duke University School of Medicine, USA
Diet, Cancer, and Epigenetics

Joshua D. Rabinowitz, Princeton University, USA
Multiple Functions of Mitochondrial Folate Metabolism

Kathryn E. Wellen, University of Pennsylvania, USA
Acetyl-CoA at the Crossroads of Metabolism and Epigenetics

Christian C. Dibble, Beth Israel Deaconess Medical Center, USA
Short Talk: PI3K Signaling Controls de novo Biosynthesis of Coenzyme A from Vitamin B5

Jordan Meier, NCI, National Institutes of Health, USA
Short Talk: Defining Metabolic Mechanisms of Epigenetic Signaling using Chemoproteomics

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Biochemical and Epigenetic Responses to Hypoxia (X4)

*__Frank S. Lee__, University of Pennsylvania School of Medicine, USA

__Peter J. Ratcliffe__, University of Oxford, UK
Genome Wide Studies of the Hypoxia Transcriptome

__Daniel Cooper__, Duke University School of Medicine, USA
Short Talk: Hypoxia and Radiation Regulate HIF1alpha Gene Targets in a Context-Dependent manner

__Fraydoon Rastinejad__, Sanford Burnham Prebys Medical Discovery Institute, USA
Structures and Drug-Binding Potentials of HIF-alpha-ARNT Heterodimers

__Isha Jain__, Massachusetts General Hospital, USA
Short Talk: Hypoxia as a Therapy for Mitochondrial Disease

__Eli M. Wallace__, Peloton Therapeutics, USA
Small Molecule HIF-2a Antagonists and Their Therapeutic Applications

__Maria F. Czyzyk-Krzeska__, University of Cincinnati, USA
Oncogenic and Tumor Suppressive Autophagic Programs in Renal Cell Carcinoma

Workshop 2 (X3)

*__Aimee L. Edinger__, University of California, Irvine, USA

__Liron Bar-Peled__, The Scripps Research Institute, USA
A Druggable Transcriptional Vulnerability in NRF2-Dependent Lung Cancers

__Volkan I. Sayin__, New York University School of Medicine, USA
Somatic Editing of Keap1/Nrf2 Antioxidant Response is Pro-Tumorigenic and Promotes a Targetable Genotype-Dependent Metabolic Switch in KRAS-Driven Lung Cancer

__Valeria Santoro__, Bayer Pharma AG, Germany
Mitochondrial Folate Transporter (SLC25A32) Protects Against ROS-Mediated Cancer Cell Death

__Zhimin Lu__, University of Texas MD Anderson Cancer Center, USA
Phosphoglycerate Kinase 1 Phosphorylates Beclin1 to Induce Autophagy

__Boyi Gan__, MD Anderson Cancer Center, USA
LncRNA NBR2 Regulates AMPK-Mediated Energy Stress Response and Modulates Cancer Cell Sensitivity to Biguanides

__Bin Zheng__, Massachusetts General Hospital, Harvard Medical School, USA
Targeting Metabolic Vulnerabilities of MDSCs to Enhance the Anti-Tumor Activity of PD-1 Blockade

__Giulia Agnello__, Aeglea BioTherapeutics, USA
Therapeutic Depletion of Arginine via Arginase I (AEB1102, Pegzilarginase) Administration Inhibits Tumor Growth and Further Sensitizes the Tumor to Immunotherapy with Anti-PD1 and Anti-PD-L1

__Prasenjit Dey__, MD Anderson Cancer Center, USA
Collateral Lethality as a Therapeutic Target in Cancer

Interplay with Other Cell Types and Tissues (X3)

*__Ralph J. DeBerardinis__, University of Texas Southwestern Medical Center, USA

__Erika L. Pearce__, Max Planck Institute of Immunobiology and Epigenetics, Germany
Biosynthetic Needs of Immune Cells and Effects on Immunotherapy

__Nada Y. Kalaany__, Boston Children's Hospital at Harvard Medical School, USA
Metabolic Dependencies in Obesity-Associated Pancreatic Cancer

__Scott Bultman__, University of North Carolina at Chapel Hill, USA
Regulation of Tumor Metabolism by the Microbiome

__Costas A. Lyssiotis__, University of Michigan, USA
Short Talk: Stromal Support of Pancreatic Tumor Metabolism

Hypoxia and the Tumor Stroma (X4)

*__Ester M. Hammond__, University of Oxford, UK

__M. Celeste Simon__, University of Pennsylvania, USA
HIFs and Metabolic Adaptations in Renal Cancer

__Mia J. Phillipson__, Uppsala University, Sweden
Contribution of Immune Cells in Restoration of Hypoxic Tissues

__Sonia Rocha__, University of Liverpool, UK
PBRM1, a Highly Mutated Member of the SWI/SNF Complex in Renal Cancer, has an Unconventional Role in the Control of the Hypoxia Response

__Jong Park__, University of Maryland, Baltimore County, USA
Short Talk: Role of Lactate-NDRG Signaling in Low Oxygen Tolerance

Poster Session 3

THURSDAY, MARCH 9

Tumor Progression and Suppression by Metabolic Enzymes (X3)

*__Sarah-Maria Fendt__, VIB Leuven, Belgium

__David M. Sabatini__, Whitehead Institute for Biomedical Research, USA
CRISPR Screening for Metabolic Dependencies in Cancer Cells

__Jared Rutter__, University of Utah, USA
Pyruvate Metabolism and Cell Fate Decisions

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

__Eyal Gottlieb__, Technion Integrated Cancer Center, Israel
Metabolic Dependencies of Leukemic Stem Cells

Oliver Maddocks, University of Glasgow, UK
Short Talk: MTAP Deletion and Polyamine Pathway Activity Combine to Confer Cysteine Essentiality in Cancer Cells

Susan Demo, Calithera Biosciences, USA
Short Talk: CB-839, a Selective Glutaminase Inhibitor, has Anti-Tumor Activity in Renal Cell Carcinoma and Synergizes with Everolimus and Cabozantinib

Hypoxia, Inflammation and Tumor Progression (X4)

*__Emin Maltepe__, University of California, San Francisco, USA

Amato J. Giaccia, Stanford University, USA
Clear Cell Renal Cancers: Lipid Droplets

Cormac Taylor, University College Dublin, Ireland
The Role of Hypoxia in Immunity and Inflammation

G-One Ahn, Pohang University of Science and Technology, South Korea
Short Talk: Tumor-Associated Macrophages Can Exacerbate Tumor Hypoxia and Glycolysis

Gregg L. Semenza, Johns Hopkins University School of Medicine, USA
PHGDH Expression Is Required for Mitochondrial Redox Homeostasis, Breast Cancer Stem Cell Maintenance and Lung Metastasis

Christian Metallo, University of California, San Diego, USA
Reprogramming of Amino Acid Metabolism by Hypoxia

Erinn B. Rankin, Stanford University, USA
Short Talk: Hypoxic Signaling in the Tumor-Mesothelial Niche

Poster Session 4

Workshop 2: Hypoxia and Disease Processes (X4)

*__Peppi Koivunen__, University of Oulu, Finland
Notch Downregulation and Extramedullary Erythrocytosis in HIF Prolyl 4-Hydroxylase-2-Deficient Mice

*__Qing Zhang__, University of North Carolina at Chapel Hill, USA
ZHX2 Promotes ccRCC as a Potential pVHL Target by Activating NF-kB

Jason Boehme, University of California, San Francisco, USA
Preservation of Myocardial Contractility during Acute Hypoxia with OMX—A Novel Oxygen Delivery Biotherapeutic

Sara M. Timpano, University of Guelph, Canada
Human Cells Cultured Under Physiological Oxygen Utilize a Different Mode of Translation Initiation, Have Higher Proliferation Rates, Less Oxidized DNA and More Tubular Mitochondria

Norihiko Takeda, University of Tokyo, Japan
HIF-1-PDK1 Axis Induced Active Glycolysis Plays an Essential Role in Macrophage Migratory Capacity

Merve Erdem, Uniklinik Aachen, Germany
HIF-1alpha in Myeloid Cells Affects Peripheral Lipid Metabolism in Cancer Cachexia

Jamie D. Weyandt, Vanderbilt University Medical Center, USA
Loss of Fumarate Hydratase Upregulates Glycolytic Metabolism in a Mouse Renal Carcinoma Cell Line

Metabolic Vulnerabilities in Cancer (X3)

*__Almut Schulze__, University of Würzburg/Theodor-Boveri Institute, Germany

Eileen P. White, Rutgers University, USA
Inhibiting Autophagy as a Cancer Therapy

Katya Marjon, Agios Pharmaceuticals, USA
Metabolic Collateral Vulnerabilities of MTAP-Deleted Cancers as Therapeutic Opportunities

Reuben J. Shaw, The Salk Institute for Biological Studies, USA
The AMPK Pathway: Cancer Fighter, Cancer Promoter

O2 Availability and Stress Responses (X4)

*__Randall S. Johnson__, University of Cambridge, UK

Constantinos Koumenis, University of Pennsylvania, USA
Genome-Wide Analysis of Hypoxic Responses in Cells and Tumors Reveals Novel Splicing Pathways Impacting Macromolecular Synthesis

Bradly G. Wouters, University Health Network, Canada
ULK1 Regulates Oxygen Metabolism, Hypoxia Tolerance and Is a Therapeutic Target in Pancreatic Cancer

Ester M. Hammond, University of Oxford, UK
Ribonucleotide Reductase Favors the RRM2B Subunit to Maintain DNA Replication in Hypoxia

Meeting Wrap-Up: Outcomes and Future Directions (Organizers) (X3)

Meeting Wrap-Up: Outcomes and Future Directions (Organizers) (X4)

FRIDAY, MARCH 10

Departure