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Therapeutic Targeting of Hypoxia-Sensitive Pathways (V1)

Organizer(s) Chris W. Pugh, Pablo Wappner, Johanna Myllyharju and Moira K. Whyte

April 10–14, 2018

University of Oxford Mathematical Institute • Oxford, UK

Discounted Abstract Deadline: Dec 11, 2017

Abstract Deadline: Jan 10, 2018

Scholarship Deadline: Dec 11, 2017

Discounted Registration Deadline: Feb 13, 2018

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Summary of Meeting:

Tissue oxygen gradients contribute to morphogenesis and in health cells in different tissues function under differing ambient oxygen conditions. Diseases or environmental challenge can reduce oxygen supply or increase demand, resulting in tissue hypoxia. Adaptive mechanisms have evolved that range from almost instantaneous acute ventilatory changes through transcriptional events entrained in hours, to epigenetic events with slower effects and genetic adaptations selected across species and over generations. The role of the 2-oxoglutarate dependent dioxygenase enzyme family in influencing many, but not all, of these pleiotropic processes is increasingly recognized, and drugs targeting these enzymes are being evaluated in both experimental and clinical settings. The conference aims to combine the Keystone Symposia brand with the European HypoxiaNET consortium to bring together experts in hypoxia biology from clinical, academic and industrial backgrounds, including trainees, to: 1) Address gaps in our knowledge of responses to hypoxia across these time frames and in different tissues; 2) Benefit the field by sharing techniques and reagents to enhance therapeutic targeting of the hypoxic response in general, including via inhibition of oxygen-sensitive enzymes; 3) Consider the utility of harnessing these pathways in organ dysfunction, in regenerative medicine and to influence immune and inflammatory responses; and 4) Disseminate outcomes of ongoing clinical trials and enhance plans for future trials. The most important anticipated outcome from the conference is that, through sharing knowledge, enhancing collaborations and training participants from diverse backgrounds, the likelihood of successful manipulation of hypoxia pathways to produce clinical benefits in a variety of fields including, but not restricted to, renal anemia will be significantly enhanced.

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The meeting will begin on Tuesday, April 10 with registration from 16:00 to 20:00 and a welcome mixer from 18:00 to 20:00. Conference events conclude on Saturday, April 14 with a closing plenary session from 17:00 to 19:00, followed by a social hour. We recommend return travel on Sunday, April 15 in order to fully experience the meeting.

TUESDAY, APRIL 10

16:00–20:00

Arrival and Registration

This meeting took place in 2018

Here are the related meetings in 2023:

Hypoxia: From Basic Mechanisms to Emerging Therapies (E2)
([index.cfm?e=Web.Meeting.Program&Meetingid=1857](https://tks.keystonesymposia.org/index.cfm?e=Web.Meeting.Program&Meetingid=1857))

For a complete list of the meetings for the upcoming/current season, see our [meeting list](#)

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18:00—20:00

Welcome Mixer

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South Mezzanine

South Mezzanine

WEDNESDAY, APRIL 11

08:30—09:30

Welcome and Keynote AddressMathematical Institute,
L1

* **Chris W. Pugh**, University of Oxford,
UK
Session Chair

* **Pablo Wappner**, Fundacion Instituto
Leloir, Argentina
Session Chair

* **Johanna Myllyharju**, University of
Oulu, Finland
Session Chair

* **Moir K. Whyte**, University of
Edinburgh, Queen's Medical Research
Institute, UK
Session Chair

Peter J. Ratcliffe, University of Oxford,
UK
*New Horizons in Hypoxia Biology and
Therapeutics*

09:30—12:00

Acute Oxygen-SensingMathematical Institute,
L1

* **Roland H. Wenger**, University of
Zürich, Switzerland
Session Chair

Mark A. Krasnow, Stanford University
School of Medicine, USA
*Acute Oxygen Sensing in the Lungs and
Carotid Body*

Coffee Break

Francesco Licausi, Scuola Superiore
Sant'Anna, Italy
*Harnessing the Oxygen Sensing
Mechanism of Plants*

Betty A. Eipper
(<http://neuropeptidelab.uchc.edu>),
University of Connecticut Health
Center, USA
*Peptidylglycine alpha-Amidating
Monooxygenase (PAM), a Conserved
Secretory Pathway Enzyme, Is Sensitive
to Physiologically Relevant Changes in
Oxygen*

David Macias, University of
Cambridge, UK
*Short Talk: HIF-2 α Is Essential for
Carotid Body Development and
Function*

Christopher Turnbull, University of
Oxford, UK

		<i>Short Talk: Overnight Supplemental Oxygen Abolishes the Rise in Morning Blood Pressure Caused by CPAP withdrawal in OSA</i>	
12:00–17:00	On Own for Lunch		
12:00–13:00	Poster Setup		
13:00–22:00	Poster Viewing		South Mezzanine
14:00–16:30	Workshop 1: New Techniques for Oxygen Measurement		South Mezzanine
			Mathematical Institute, L1
		* Joachim Fandrey , University Duisburg-Essen, Germany <i>Session Chair</i>	
		Giovanni E. Mann , King's College London, UK <i>Defining Physiological Normoxia in vitro for Clinical Translation of Cell Physiology</i>	
		Christine Janz (http://www.ibidi.com), ibidi GmbH, Germany <i>Intra- and Extracellular Oxygen Measurement on a Live Cell Imaging System Using ibidi OPAL</i>	
		Peter A. Robbins (http://www.dpag.ox.ac.uk/team/peter-robbins), University of Oxford, UK <i>In-Airway Molecular Flow Sensing Using Laser Absorption Spectroscopy: What Is It and Why Is It Useful?</i>	
		Andrew D. Farmery , University of Oxford, UK <i>Polymer Fibre-Optic Oxygen Sensors</i>	
		Margaret Ashcroft , University of Cambridge, UK <i>CHCHD4 Confers Sensitivity to HIF Pathway Inhibitors</i>	
16:30–17:00	Coffee Available		
17:00–19:00	Hypoxia and Organ (dys)Function		South Mezzanine
			Mathematical Institute, L1
		* Peppi Koivunen , University of Oulu, Finland <i>Session Chair</i>	
		Johanna Myllyharju , University of Oulu, Finland <i>Transmembrane Prolyl 4-Hydroxylase (P4H-TM/PHD4) – Further Light into the Roles of this Enigmatic Enzyme</i>	
		Dörthe M. Katschinski , Georg August University, Germany <i>The HIF-PHD Pathway in the Cardiovascular System</i>	

Volker H. Haase

(<http://haaselab.org>), Vanderbilt University, USA
Oxygen Sensing in the Kidney

Joanne Holliday, University of Nottingham, UK

Short Talk: Ablation of Factor Inhibiting HIF (FIH1) Modulates Cardiac Function and Improves Hypoxic Tolerance

19:00–20:00

Social Hour with Lite Bites

No registration fees are used to fund alcohol served at this function.

South Mezzanine

19:30–22:00

Poster Session 1

South Mezzanine

THURSDAY, APRIL 12

08:30–11:45

Hypoxia and Development

Mathematical Institute,
L1

* **Cormac Taylor**, University College Dublin, Ireland
Session Chair

Dino A. Giussani

(<https://www.pdn.cam.ac.uk/directory/dino-giussani>), University of Cambridge, UK
Heart Disease Link to Fetal Hypoxia: An Intergenerational Perspective

Josh Bonkowsky, University of Utah, USA
Hypoxia and Connectivity in the Developing Vertebrate Nervous System

Coffee Break

Ernestina Schipani, University of Pennsylvania, USA
Impairment of Mitochondrial Respiration Promotes Survival of HIF-1alpha Deficient Chondrocytes in vivo

Pablo Wappner, Fundacion Instituto Leloir, Argentina
Novel Mechanisms of HIF Regulation: Genetic Lessons from Drosophila

Emma U. Hammarlund

([http://portal.research.lu.se/portal/en/persons/emma-hammarlund\(03f8d2bd-1eb4-48a3-bf1f-8d07950b718b\).html](http://portal.research.lu.se/portal/en/persons/emma-hammarlund(03f8d2bd-1eb4-48a3-bf1f-8d07950b718b).html)), Lund University, Sweden
Short Talk: Pseudohypoxia-Activated Pathways Were Essential for Vertebrate Evolution in Earth's Oxic Niche

Tiffany M. Bernardo, University of Pittsburgh, USA
Short Talk: Hypoxia, PPARγ, and Lactate Metabolism in Placental Development and Injury

11:45–17:00

On Own for Lunch

11:45–13:00

Poster Setup

13:00—22:00	Poster Viewing	South Mezzanine
16:30—17:00	Coffee Available	South Mezzanine
17:00—19:00	Clinical Inhibitors of HIF Hydroxylases and HIFs	South Mezzanine
		Mathematical Institute, L1
	<p>* Sarah R. Walmsley, University of Edinburgh, Queen's Medical Research Institute, UK <i>Session Chair</i></p> <p>Martin Richard Späth, University Hospital of Cologne, Germany <i>Short Talk: Molecular Correlates of Hypoxic Preconditioning and PHD-Inhibition in Renal Ischemia Reperfusion Injury</i></p> <p>Christopher J. Schofield, University of Oxford, UK <i>Inhibiting 2-Oxoglutarate Oxygenases for Therapeutic Benefit</i></p> <p>Chris W. Pugh, University of Oxford, UK <i>Inducible Phd2 Knockdown in the Mouse Reveals Immunological Effects that Warrant Consideration in the Context of Pharmacological Inhibition of this Enzyme in the Clinic</i></p> <p>Kyoji Yamaguchi, Vanderbilt University Medical Center, USA <i>Short Talk: DS-1093a, A Novel HIF Prolyl Hydroxylase Inhibitor, Has Therapeutic Potential in a Wide Range of Diseases</i></p> <p>Thomas Kietzmann, University of Oulu, Finland <i>Short Talk: The Epidermal Growth Factor Receptor (EGFR) Adaptor Protein CIN85 Is a Novel Inhibitory Binding Partner of Hypoxia-Inducible Factor Prolyl Hydroxylase 2 (PHD2)</i></p>	
19:00—20:00	Social Hour with Lite Bites	
	No registration fees are used to fund alcohol served at this function.	
19:30—22:00	Poster Session 2	South Mezzanine
		South Mezzanine

FRIDAY, APRIL 13

08:30—11:30	Immune and Inflammatory Effects of Hypoxia	Mathematical Institute, L1
	<p>* Edurne Berra, CIC bioGUNE, Spain <i>Session Chair</i></p> <p>Maira K. Whyte, University of Edinburgh, Queen's Medical Research Institute, UK <i>Hypoxia and Regulation of Inflammatory</i></p>	

Cell Migration

Yun-Cai Liu, La Jolla Institute for Allergy and Immunology, USA
VHL-HIF-Glycolytic Pathway in Immune Regulation

Coffee Break

Sarah R. Walmsley, University of Edinburgh, Queen's Medical Research Institute, UK
Hypoxia and Regulation of Inflammation and Anti-Microbial Responses

Randall S. Johnson, University of Cambridge, UK
Hypoxia and its Role in the Interaction of the Innate and Adaptive Immune Systems

Einav Gross, Hebrew University of Jerusalem, Israel
*Short Talk: Innate Immunity Regulation by Neuronal Oxygen Sensors in the Nematode *Caenorhabditis elegans**

11:30–17:00

On Own for Lunch

11:30–13:00

Poster Setup

South Mezzanine

13:00–22:00

Poster Viewing

South Mezzanine

14:30–16:30

Workshop 2: Chromatin and EpigeneticsMathematical Institute,
L1

* **Moira K. Whyte**, University of Edinburgh, Queen's Medical Research Institute, UK
Session Chair

Sophie Cowman, University of Liverpool, UK
Alteration of DNA Repair Activity in Hypoxic Brain Tumours Underlies Treatment Resistance

Minoru Kobayashi, Kyoto University, Japan
*A Circadian Clock Gene, *PER2*, Activates HIF-1 as an Effector Molecule for Recruitment of HIF-1 α to Promoter Regions of its Downstream Genes*

Tamas Ordog, Mayo Clinic, USA
*Hypoxia-Inducible Factor 1 α (HIF1A) Stimulates Neuronal Nitric Oxide Synthase (*Nos1*) Transcription by Modifying Spatial Chromatin Organization*

Ilaria Maria Cristina Orlando, University of Fribourg, Switzerland
Regulatory DNA Elements Modulating Oxygen-Regulated Erythropoietin Gene Expression

Catherine Turgeon, Université Laval, Canada
PRMT1-Mediated DOCK6 Arginine Methylation Represses Hypoxia-

*Inducible Factor-1 (HIF-1) Expression***Michael Batie**, University of Liverpool,
UK*The Role of Chromatin Structure and
JmJc Histone Demethylases in the
Hypoxic Response*

16:30–17:00

Coffee Available

South Mezzanine

17:00–19:00

Hypoxia and Stem Cell FunctionMathematical Institute,
L1* **Pablo Wappner**, Fundacion Instituto
Leloir, Argentina
*Session Chair***Kamil R. Kranc****(<http://www.crm.ed.ac.uk/research/group/haematopoietic-stem-cells-and-leukaemia>)**, BartsCancer Institute, Queen Mary University
of London, UK*Hypoxia Signaling in Normal and
Malignant Haematopoiesis***Paul R. Riley**, University of Oxford, UK*The Role of Hypoxia and HIF-Signaling
in Epicardial Activation during Neonatal
Cardiac Regeneration***Eduardo Berra**, CIC bioGUNE, Spain*Harnessing the Intricate Crosstalk in
Hypoxia Signaling Pathways***Jong Park**, University of Maryland,

Baltimore County, USA

*Short Talk: Role of Lactate-NDRG1
Signaling in Low Oxygen Tolerance*

19:00–20:00

Social Hour with Lite Bites

No registration fees are used to fund alcohol served at this function.

South Mezzanine

19:30–22:00

Poster Session 3

South Mezzanine

SATURDAY, APRIL 14

08:30–11:30

**Tissue Degeneration, Regeneration and
Programming**Mathematical Institute,
L1* **Johanna Myllyharju**, University of
Oulu, Finland
*Session Chair***Peppi Koivunen****(http://www oulu.fi/fbmm/peppi_karppinen)**,

University of Oulu, Finland

*HIF Prolyl 4-Hydroxylase Inhibition in
Fatty Liver Diseases***Sean P. Colgan**, University of Colorado

Denver, USA

*Hypoxia and HIF as Regulators of
Barrier Function in the Mucosa***Coffee Break**

Hesham A. Sadek, University of Texas
Southwestern Medical Center, USA
*Redox Regulation of Cardiomyocyte
Renewal*

Tracey A. Rouault, NICHD, National
Institutes of Health, USA
*Translational Regulation of HIF2 alpha
and Erythropoiesis by the IRE-IRP
System*

James A. Nathan
(<https://www.cimr.cam.ac.uk/research/principal-investigators/principal-investigators-i-p/nathan>),
Cambridge Institute of Therapeutic
Immunology & Infectious Disease, UK
*Short Talk: The Endolysosomal
Vacuolar-ATPase Complex Controls HIF
Signaling by Restricting Iron Availability*

11:30–12:30

Keynote AddressMathematical Institute,
L1

* **Chris W. Pugh**, University of Oxford,
UK
Session Chair

* **Pablo Wappner**, Fundacion Instituto
Leloir, Argentina
Session Chair

* **Johanna Myllyharju**, University of
Oulu, Finland
Session Chair

* **Moiria K. Whyte**, University of
Edinburgh, Queen's Medical Research
Institute, UK
Session Chair

William G. Kaelin, Jr., Dana-Farber
Cancer Institute, USA
*Do Histone Demethylases Directly
Sense Oxygen to Control Chromatin
Structure and Cell Fate?*

12:30–17:00

On Own for Lunch

14:30–16:30

Workshop 3: Physiology and MetabolismMathematical Institute,
L1

* **Thomas Kietzmann**, University of
Oulu, Finland
Session Chair

Penny Anne Gowland
(<https://www.nottingham.ac.uk/research/inspiring-people/hw/gowland-penny.aspx>),
University of Nottingham, UK
Assessing Oxygenation in vivo with MR

Franziska Dengler, University of
Leipzig, Germany
*Hypoxia in Jejunum Epithelium: Fast
Adaptation of Glucose Transport*

Paul Grevitt, Barts Cancer Institute, UK
*Identification of Novel Regulators of
HIFs*

Amalia Ruiz-Serrano, University of
Zürich, Switzerland
*Deletion of the FIH Substrate OTUB1 in
Mice Affects Viability, Energy
Metabolism and Oxygen Physiology*

Julián Aragonés Lopez, Research
Institute Princesa, Spain
*Role of Hif2 α -Epo Pathway in Airway
Response to Oxygen Fluctuations*

Gijsbert Jacob van Belle,
Universitätsmedizin Göttingen,
Germany
*Hypoxia-Stimulated Membrane
Trafficking Requires T-Plastin*

16:30–17:00

Coffee Available

South Mezzanine

17:00–18:45

Epigenetic and Pan-Genomic Effects of HypoxiaMathematical Institute,
L1

* **Chris W. Pugh**, University of Oxford,
UK
Session Chair

Raul Mostoslavsky
(<http://mostoslavsky.mgh.harvard.edu/>),
Harvard Medical School, USA
*Linking Epigenetics, Metabolism and
Cancer: Lessons from SIRT6*

Skirmantas Kriaucionis
([http://www.ludwig.ox.ac.uk/skirmantas-
kriaucionis-group-page](http://www.ludwig.ox.ac.uk/skirmantas-kriaucionis-group-page)), University
of Oxford, UK
*TET Proteins and 5-
Hydroxymethylcytosine in Transcription*

Joaquín M. Espinosa
(<http://espinosalab.org>), Linda Crnic
Institute for Down Syndrome, USA
*Mechanisms of Transcriptional
Regulation during the Hypoxic
Response*

18:45–19:00

**Meeting Wrap-Up: Outcomes and Future Directions
(Organizers)**Mathematical Institute,
L1

19:00–20:30

Social Hour with Lite Bites

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South Mezzanine

SUNDAY, APRIL 15

11:00–11:00

Departure

*Session Chair †Invited, not yet responded.

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