



Welcome to the Oxford Metabolic Health Virtual Symposium 2020

Tuesday 30 June, 09:30-11:20

Wednesday 1 July, 09:30-11.10

Thursday 2 July, 14:30-16:20

&

Friday 3 July, 09:30-11:15

On Microsoft Teams

Join on the **meeting link**

Four sessions of invited talks, oral presentations and flash talks highlighting research across Oxford in the broad area of 'metabolism and health', with keynote speaker Dr Erika Pearce, Max Planck Institute for Immunobiology and Epigenetics in Freiburg, Germany.

Abstract prizes to be awarded at the end of Friday's session.

PROGRAMME DETAILS



Tuesday 30 June, 09:30-11:20

Programme

Chair: Dr. Alexander Clarke, Kennedy Institute

09:30-09:35 Welcome from John Todd, Director of the Wellcome Centre for Human Genetics and OMH lead

09:35-10:25 Keynote address from Dr. Erika Pearce, Max Planck Institute for Immunobiology and Epigenetics, Freiburg, Germany

'Polyamine metabolism regulates the T cell epigenome through hypusination'



Dr. Erika Pearce obtained her Ph.D. in 2005 at the University of Pennsylvania in Philadelphia, where she studied the regulation of T cell responses during infection. During her postdoctoral studies at the University of Pennsylvania, she began her research into how cellular metabolic processes govern immune responses to infection and cancer. In 2009, Dr. Pearce launched her independent research career at the Trudeau Institute in Saranac Lake, New York. In 2011, she moved to the Department of Pathology and Immunology at Washington University School of Medicine in St. Louis. In 2015, Dr. Pearce moved her group to Europe to become a Director at the Max Planck Institute for Immunobiology and Epigenetics in Freiburg, Germany. In 2018 she was awarded the Leibniz Prize for her work on immune cell metabolism. Her research continues to investigate metabolic pathways in immune cells, with a view to targeting these pathways for therapy.

-- 10:25-10:30 short break --

10:30-11:00 Oral presentations selected from submitted abstracts:

1. Dr. Mariya Misheva, Oxford Centre for Microbiome Studies/Department of Chemistry



'A novel mechanism for the dynamic control of oxylipin secretion by macrophage mitochondria in response to LPS'

Dr. Mariya Misheva completed her PhD at the University of Melbourne where her work involved the use of multiple methods including proteomics. She then moved to the group of Professor Valerie O'Donnell at Cardiff University. In October 2019, she joined the Oxford Centre for Microbiome Studies as a Postdoctoral Research Associate in Metabolomics and is also part of Professor James McCullagh's group in the Department of Chemistry. Her role focuses on supporting microbiome-related research and includes sample handling, data processing, statistical analysis, as well as developing new methodologies and workflows.

2. Dr. Grace Yu, Oxford Centre for Diabetes, Endocrinology and Metabolism/MRC Harwell

'Characterisation of the global Rreb1 knockout mice suggest a role of Rreb1 in high-fat diet induced adipogenesis'

Dr. Grace Yu is a postdoctoral scientist in Professor Anna Gloyn's research group at OCDEM and also a postdoctoral research fellow with Professor Roger Cox at MRC Harwell. Her current research focuses on trying to understand the molecular mechanisms by which coding and non-coding changes in genomic sequences affect gene regulation and protein function in type II diabetes. She worked previously in the RDM Division of Cardiovascular Medicine at Oxford and was manager of the Oxford Cardiovascular Tissue Bioresource of umbilical-derived cells.

3. Dr. Mariana Borsa, Kennedy Institute of Rheumatology

'Asymmetric fates as a path to rejuvenated memory'

Mariana joined the group of Professor Katja Simon at the Kennedy Institute in 2018 coming from the ETH in Zurich where she studied for a PhD and was awarded the prestigious ETH Silver Medal for her work. She is using her expertise at the boundary between cell biology and immunology to investigate how autophagy impacts the balance between stemness and differentiation in immunity and haematopoiesis. She is supported by the Swiss National Science Foundation, Marie Skłodowska-Curie Actions and the Wellcome Trust.

11:00-11:20 Professor Fredrik Karpe, Oxford Centre for Diabetes, Endocrinology and Metabolism

'Human fat distribution and cardiovascular health'

Fredrik Karpe is a physician-scientist and Professor of Metabolic Medicine at the University of Oxford and head of the Oxford Centre for Diabetes, Endocrinology and Metabolism. He uses



genomic and physiological tools to investigate metabolic consequences of obesity and fat distribution. To promote research in translational medicine he has established the Oxford Biobank consisting of 9,000 deeply phenotyped participants who have given informed consent to be recalled for future studies.

END OF SESSION

Wednesday 1 July, 09:30-11:10

Programme

Chair: Dr. Bill Haynes, Novo Nordisk Research Centre Oxford

09:30-09:50 Dr. Natasha Whibley, Kennedy Institute of Rheumatology

'Metabolic adaptation of regulatory T cells in the intestine'

Dr. Natasha Whibley is a postdoc in Professor Fiona Powrie's lab at the Kennedy Institute of Rheumatology. She is currently investigating how regulatory T cells adapt to tissue environments with a particular interest in the effect of nutrients on regulatory T cell homeostasis.

09:50-10:20 Flash talks from submitted abstracts. This is the first set of flash talks in the symposium, with two more following on Thursday and Friday. Five students/postdoctoral researchers have been asked to give a talk of up to 3 minutes with up to 3 slides. Questions will be reserved to the end of all five talks.

Suzanne Engelen (Kennedy Institute) - 'Lipoproteins act as vehicles for lipid antigen delivery and invariant Natural Killer T-cell activation'

Connor Scott (Nuffield Dept. of Clinical Neurosciences) – 'Spatially resolved MALDI mass spectrometric imaging of human brain tissue for metabolites, lipids and peptides: proof of principle'

Dr. Gareth Purvis (Dunn School of Pathology) – 'Single cells transcriptomics reveals a critical role for oxidative phosphorylation in monocyte recruitment and differentiation during acute inflammation'



Zeinab Ali (MRC Harwell and DPAG) - 'Metabolic alterations in a mouse model of ALS'

Aljawharah Alrubayyi (Nuffield Department of Medicine) – 'Characterisation of metabolic circuits in exhausted CD8 T cells during HIV infection'

-- 10:20-10:30 short break --

10:30-10:50 Dr. Sara Wells, Mary Lyon Centre, MRC Harwell

'Opportunities and ideas for mouse genetics in metabolic research'

Dr. Sara Wells is the Director of the Mary Lyon Centre, a national resource for mouse genetics at MRC Harwell. The Centre supports the research of individual scientific groups throughout UK academia as well as large global programmes such as the International Mouse Phenotyping Consortium. It is currently involved in many biomedical projects looking into the genetic cause of diseases of ageing, metabolism and neurology. In recent years, genome editing and automated phenotyping have greatly advanced the potential for the refined, informative pre-clinical models which the Centre aims to generate and characterise.

10:50-11:10 Professor Lisa Heather, Department of Physiology, Anatomy and Genetics

'The battle between HIF and metabolism in the diabetic heart'

Professor Lisa Heather is an Associate Professor and British Heart Foundation Fellow in the Department of Physiology, Anatomy and Genetics. In 2011 she was awarded an RD Lawrence Early Career Fellowship by Diabetes UK followed by a British Heart Foundation Basic Science Intermediate Fellowship in 2018. Her current research is focused on alternative signalling roles for metabolites in the diabetic heart and novel therapeutic approaches to manipulate cardiac metabolism. She has received the Innovators in Diabetes Award, Lilly Diabetes Award and the Bayliss-Starling Award from the Physiological Society.

END OF SESSION

Thursday 2 July, 14:30-16:20

Programme

Chair: Professor Frances Platt, Department of Pharmacology



14:30-14:50 Dr. Jethro Johnson, Oxford Centre for Microbiome Studies (OCMS), Kennedy Institute

‘Deciphering the gut microbiome contribution to paediatric NAFLD’

Dr. Jethro Johnson is deputy director of the OCMS. His background includes a PhD in nutritional ecology (University of Auckland) and an MRC career development fellowship in computational genomics (DPAG, Oxford). Prior to joining OCMS, he was a postdoctoral fellow in the lab of George Weinstock at the Jackson Laboratory for Genomic Medicine, where he worked on the type 2 diabetes arm of the Integrative Human Microbiome Project. His research uses (meta-)genomic approaches to understand the complex interaction between diet and the gut microbiome during the onset and development of metabolic diseases.

14:50-15:15 Flash talks from submitted abstracts. This is the second set of flash talks in the symposium. Four students/postdoctoral researchers have been asked to give a talk of up to 3 minutes with up to 3 slides. Questions will be reserved to the end of all four talks.

Dr. Kerstin Timm (Dept. of Pharmacology/DPAG)-‘AMPK activation by AICAR prevents doxorubicin-induced heart failure in rats’

Felix Richter (Kennedy Institute) – ‘Cell-extrinsic autophagy in mature adipocytes regulates anti-inflammatory response to intestinal tissue injury’

Dr. Valentina Greto (Translational Gastroenterology Unit-Nuffield Department of Medicine) – ‘Markers of inflammation improve after extensive weight loss’

Dr. Thomas Riffelmacher (Kennedy Institute/La Jolla Institute for Immunology) – ‘Metabolic activation and colitis pathogenesis is prevented by lymphotoxin beta receptor expression in neutrophils’

-- 15:15-15:30 short break --

15:30-15:50 Professor Duncan Richards (Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences

‘The role of experimental medicine studies during the drug discovery phase of drug development’

Professor Duncan Richards was recently appointed to the newly created Climax Professorship of Clinical Therapeutics at Oxford. Originally trained in medicine, he joined GSK in 2003 and worked in a number of clinical development roles from first in human to file and launch. He is establishing the new Centre for Clinical Therapeutics based at the Botnar Research Centre



and St Hilda's College in Oxford. The Centre, under his leadership, will work with a diverse range of Oxford biomedical researchers and more widely with the pharmaceutical, biotechnology and diagnostics industries, in order to drive new drug treatments through decision-making in early phase clinical trials.

15:50-16:00 Oral presentation selected from submitted abstracts:

Dr. Joy Ogbechi, Kennedy Institute

'Manipulating immune cell amino acid availability to control inflammatory arthritis'

Dr. Joy Ogbechi is a Versus Arthritis Foundation Fellow working with Richard Williams at the Kennedy Institute. Work during her doctoral training introduced her to nutrient sensing pathways within cells. Her research aims to identify metabolic pathways that can be targeted to restore the imbalance between pathogenic and regulatory immune signals in inflammatory disorders such as rheumatoid arthritis.

16:00-16:20 Dr. Benoit Hastoy, Oxford Centre for Diabetes, Endocrinology and Metabolism

'Impact of type 2 diabetes risk alleles on beta cell secretory response'

Dr. Benoit Hastoy became a Diabetes UK RD Lawrence Fellow at the Oxford Centre for Diabetes, Endocrinology and Metabolism in September 2019. Before this he held his first postdoctoral post in Patrik Rorsman's group (2012 onwards) and then moved to the teams of Anna Gloyn and Mark McCarthy for a second position. Combining experience gained in the different groups, his current research focuses on how T2D-associated alleles affect the kinetics and cellular mechanisms of insulin release.

END OF SESSION

Friday 3 July, 09:30-11:15

Programme

Chair: Professor Damian Tyler, Department of Physiology, Anatomy and Genetics/Oxford Centre for Clinical Magnetic Resonance Research

09:30-09:50 Professor Michael Holmes, Nuffield Department of Population Health



'Applications of Mendelian randomization to drug development'

Associate Professor Michael Holmes is a clinical epidemiologist and pharmaceutical physician at the MRC Population Health Research Unit at Oxford. His interests include using data from human genetics to aid aetiological insights into human disease in addition to applications of genetics to enhance the lifecycle of medicines.

09:50-10:20 Flash talks from submitted abstracts. This is the last set of flash talks during the symposium. Five students/postdoctoral researchers will each give a talk of up to 3 minutes with up to 3 slides. Questions will be reserved to the end of all five talks.

Paolo Spingardi (Ludwig Institute) – 'Nucleotide pool and epigenetic LC-MS/MS quantitation for cancer research'

Louisa Zolkiewski (MRC Harwell) – 'Investigating the role of functional SNPs in the *TBX-WARS2* locus in fat distribution'

Azrul Bin Abdul Kadir (DPAG) – 'Ketone body oxidation depends on asparagine in isolated rat heart lacking pyruvate precursors'

Dr. Inhye Park (Kennedy Institute) – 'C-type lectin receptor CLEC4A2 promotes macrophage tissue adaptation and protects against atherosclerosis'

Cyriel Olie (Target Discovery Institute) – 'Employing high-resolution MALDI-MSI to generate the spatial metabolome in human skeletal muscles'

-- 10:20-10:30 short break --

10:30-10:50 Dr. Andrew Lewis, Oxford Centre for Clinical Magnetic Resonance Research, Radcliffe Department of Medicine

'Non-invasive imaging of immunometabolism using hyperpolarized magnetic resonance'

Dr. Andrew Lewis is a Clinical Lecturer and Honorary Specialist Registrar in cardiology in Oxford. His research interests are in translational molecular imaging of the cardiovascular system and in particular the development and application of hyperpolarized magnetic resonance techniques for metabolic and immunological applications. The transformative signal gains from this emerging technology have potential to provide new insights into the mechanisms of metabolic and immunologic diseases in the heart and have recently been translated from the laboratory to early human applications.

10:50-11:10 Professor Vlad Vyazovskiy, Department of Physiology, Anatomy and Genetics
'Investigating the relationship between sleep and metabolism in rodent models'



Professor Vlad Vyazovskiy joined the Department of Anatomy, Physiology and Genetics in 2013 as a Senior Research Fellow and subsequently became Associate Professor of Neuroscience. His group is a part of Sleep and Circadian Neuroscience Institute and his research is on sleep, focusing primarily on its role in neurodegenerative disorders, mental health, ageing and metabolism.

11:10-11:15 Closing remarks – including announcement of abstract prizes - from Professor John Todd, Wellcome Centre for Human Genetics and OMH

END OF SESSION AND SYMPOSIUM

Biographies of the Chairs

Tuesday: Dr. Alexander Clarke, Kennedy Institute

Dr. Alex Clarke is a Wellcome Trust Clinical Research Career Development Fellow at the Kennedy Institute of Rheumatology, interested in the role of immune metabolism in immunity in both health and disease. His PhD and post-doctoral work, in London and Oxford, were on the role of autophagy in B cell immunity in health and autoimmune disease. His group are particularly interested in understanding adaptive immune cell metabolism in vivo, and combine stable isotope tracing and mass spectrometry imaging techniques with established immunological tools and models to do so.

Wednesday: Dr. Bill Haynes, Site Head and Vice-President, Novo Nordisk Research Centre Oxford

Dr. Bill Haynes is a physician-scientist with more than 25 years experience in academic-industry translational research across diabetes and cardiovascular diseases. Following a successful career as a physician and clinical scientist, he went on to lead multidisciplinary discovery research groups at Novartis and AstraZeneca. He joined Novo Nordisk Research Centre in Oxford (NNRCO) in December 2018 to help drive the identification and validation of novel targets for type 2 diabetes and cardiometabolic diseases. NNRCO employs advanced bioinformatics, state-of-the-art discovery screening technologies and human centric systems, taking advantage of academic-industrial collaborations, human genetics and big data.



Thursday: Professor Frances Platt, Department of Pharmacology

Professor Frances Platt is currently Professor of Biochemistry and Pharmacology at the University of Oxford and Head of the Department of Pharmacology. Her main research interests include the biology and pathobiology of glycosphingolipids and lysosomal disorders. Her research led to the development of miglustat for the treatment of glycosphingolipid lysosomal storage diseases. She was elected a Fellow of the Academy of Medical Sciences in 2011 and is a Wellcome Trust Investigator in Science.

Friday: Professor Damian Tyler, Department of Physiology, Anatomy and Genetics/Oxford Centre for Clinical Magnetic Resonance Research

Professor Tyler is a BHF Senior Research Fellow and a Fellow at Somerville College. He has been based in Oxford since 2001 and has over 20 years' experience in the development and application of Magnetic Resonance Imaging and Spectroscopy (MRI/MRS). His research is based on the study of cardiac structure, function and metabolism in normal and diseased hearts using this approach. His recent work has been to further develop the technique of Dissolution Dynamic Nuclear Polarisation for application to the study of cardiac metabolism in the human heart.



Oxford Metabolic Health (OMH) is an interdepartmental and cross-divisional initiative established in 2018 to bring together researchers from across the university and at nearby facilities who are interested in the relationship between metabolism (in the broad sense of the term) and health. We aim to:

- capture the broad range of metabolic research activities within the university and locally and help researchers within these areas collaborate and share expertise;
- identify research topics that would benefit from strategic development and support funding opportunities and training in these areas;
- enhance the internal and external profile of metabolic research carried out at the University and provide an integrated view of Oxford's resources and expertise.

OMH builds on the strengths of research being carried out in university departments, centres and institutes across the Old Road Campus and South Parks Road, Churchill Hospital and John Radcliffe Hospital sites, and at MRC Harwell. Covering a wide range of basic and translational activities, OMH research is relevant to many disciplines and disease areas such as diabetes, endocrinology, nutrition, obesity and metabolism. The OMH website (<https://www.medsci.ox.ac.uk/omh>) lists these areas and the groups working in them and also provides details of equipment and resources across Oxford and events and opportunities that researchers may be interested in.

Over the past year, OMH has worked with researchers across the Medical Sciences Division and the Mathematical, Physical and Life Sciences Division as well as with other stakeholders to help develop collaborative opportunities and activities. We are planning a metabolomics data analysis workshop later in the year and hope to resume activities of the OMH Researchers' Association which last year held a very successful careers event.

The OMH network is open to Oxford-based researchers at any level of their career who have an interest in the relationship between metabolism and health. Around 180 researchers from over 50 groups have joined the mailing list and receive news about relevant events and opportunities. To join, send an email to omh_network-subscribe@maillist.ox.ac.uk

The OMH team is made up of John Todd (WHG), David Ray (OCDEM), Katja Simon (Kennedy Institute) and Lisa Heather (DPAG), with support provided by Research Facilitator Jane Itzhaki. For more information, or if you would like to contribute any ideas, please contact Jane - jane.itzhaki@medsci.ox.ac.uk