



Welcome to the Oxford Metabolic Health Symposium 2021

Wednesday 7 July, 13:30-16:00

&

Thursday 8 July, 13:30-15.45

On Microsoft Teams

Join on both days on the [Teams link](#)

Four sessions of invited talks and oral presentations over two afternoons highlighting research across Oxford in metabolism and health, with keynote speaker Professor Zoltan Arany, Perelman School of Medicine, University of Pennsylvania.

PROGRAMME

Wednesday 7 July, 13:30-16:00

13:30-13:35 Welcome from Professor John Todd, Director of the Wellcome Centre for Human Genetics and OMH lead

SESSION 1. Chair: Professor David Ray, Oxford Centre for Diabetes, Endocrinology & Metabolism (OCDEM)

13:40-14:30 Keynote Speaker, Professor Zoltan Arany, Perelman School of Medicine - 'Selective modulation of mTOR to suppress NAFLD/NASH'



Zoltan (Zolt) Arany, MD, PhD is the Samuel Bellet Professor of Cardiology and Director of the Cardiovascular Metabolism Program at the Perelman School of Medicine at the University of Pennsylvania. Dr. Arany graduated Summa Cum Laude from Harvard College and received his Medical Degree from Harvard Medical School and his doctoral degree from the Harvard Graduate School of Arts and Sciences. After his doctoral studies, Dr. Arany completed internal medicine residency training at the Massachusetts General Hospital, followed by fellowship training in Cardiology at the Brigham and Women's Hospital, and post-doctoral research fellowship at the Dana Farber Cancer Institute, in Boston. He joined the University of Pennsylvania as Associate Professor of Medicine in 2014.



Dr. Arany's laboratory focuses on the mechanisms that underlie metabolic pathophysiology in the cardiovascular system. He focuses on linking investigations of cardiac and vascular physiology in model organisms to clinical data and observations, and taking a multidisciplinary approach, spanning from molecular biology and numerous 'omic approaches to model organisms and human clinical studies. Recent focus in Dr. Arany's laboratory has included the metabolic changes that underlie heart failure, the role of the vasculature in the development of diabetes, and maternal cardiac disease during and after pregnancy. Dr. Arany is also an active clinical cardiologist, teacher, and mentor, and the current Chair of the Cellular Biology Physiology and Metabolism Graduate Group.

Dr. Arany is a recipient of several awards including the American Heart Association Established Investigator Award in 2012, the Hal Dvorak Young Investigator Award in Translational Research, and the prestigious Inaugural Yale Calabresi Prize in 2014, given to Dr. Arany in recognition for his work on cardiovascular metabolism. He is elected to the American Society of Clinical Investigators, and to the American Association of Physicians. Dr. Arany has published more than 130 research papers in prominent journals such as *New England Journal of Medicine*, *Nature*, *Cell*, *Science*, *PNAS*, *Cell Metabolism*, and *Genes & Development*. Dr. Arany is regularly invited to speak nationally and internationally on his basic and translational research in cardiovascular metabolism. He has also received a number of teaching and mentoring awards.

14:30-14:50 Dr. Sridhar Vasudevan, Department of Pharmacology - 'Pharmacological targeting of the circadian system for treatment of obesity and NAFLD'

Sridhar Vasudevan trained as a pharmacologist at Oxford and works on target identification and drug discovery projects relating to psychiatry and circadian rhythms. Over the past few years, his lab, in collaboration with Grant Churchill, has identified ebselen as a lithium mimetic and translated this molecule to a phase-IIa clinical trial. His lab has also developed adenosine receptor antagonists towards the treatment of orphan circadian disorders and created a spin-out towards its clinical development - Circadian Therapeutics. Currently Sri's lab is working on targeting the circadian system for treatment of obesity and NAFLD and will be sharing data from his latest research.

14:50-15:00 Oral presentations from abstracts:

Dr. Gitalee Sarker, Department of Physiology, Anatomy and Genetics (DPAG) - 'Sympathetic perineural endothelial cells orchestrate neuroendocrine loop of leptin action to maintain adipose tissue homeostasis'



Gitalee Sarker's research focuses on the study of neuroimmune mechanisms underlying obesity. She joined the Domingos group in DPAG as a Novo Nordisk postdoctoral fellow in 2019. Prior to this, she completed her Ph.D. in Neuroscience at ETH Zurich in 2018 in the lab of Professor Christian Wolfrum on work identifying sperm tRNA-derived small RNA as a potential epigenetic mark that partly mediates the maternal high fat diet induced obesogenic and addictive like traits to the progeny. She has a MSc in Neuroscience from the University of Bonn, Germany and also holds an MBBS from Dhaka Medical College, Bangladesh.

Louisa Zolkiewski, MRC Harwell Institute - 'Characterising the role of coding polymorphisms in the function of Tbx15 in adipogenesis and fat distribution'

Louisa Zolkiewski is a third-year DPhil student at MRC Harwell in Professor Roger Cox's lab investigating the underlying genetics of type II diabetes. After graduating from Newcastle University with a BSc (Hons) in Biomedical Sciences in 2014, she moved to the University of Manchester to undertake an MSc in Biomolecular Medicine investigating the role of Collagen X mutations in a mouse model of dwarfism. Following this she worked as a research technician studying the mechanisms underlying neuropathy in a type I diabetes mellitus model. Louisa's DPhil project is focused on understanding genetic regulation of fat distribution in metabolic disease, modelling a GWAS-identified coding variant to understand its role in adipogenesis.

-- 15:00-15:10 short break --

SESSION 2. Chair: Associate Professor Carolyn Carr, DPAG

15:10-15:30 Associate Professor Samira Lakhali-Littleton, DPAG - 'Mechanisms and functions of tissue iron homeostasis'

Samira Lakhali-Littleton is an MRC Senior Research Fellow and Associate Professor of Cell Physiology at DPAG, Oxford. Following her DPhil, she joined Professor Ratcliffe's team, discovering many intersections between oxygen and iron homeostasis. She then developed a specialist interest in local iron homeostasis and went on to secure a BHF Intermediate Fellowship in 2013. Her team discovered the mechanisms and physiological importance of local iron homeostasis in the heart, kidney, vasculature and fetal liver. Currently, her MRC Fellowship focusses on the clinical implications of those discoveries. She has received many awards, most recently the Physiological Society's Bayliss Starling Prize lecture.

15:30-15:40 Oral presentations from abstracts:

Megan Teh, Weatherall Institute of Molecular Medicine - 'Characterisation of iron dependent pathways in T-cells'



Megan Teh is a second year DPhil student in the Drakesmith lab within the MRC HIU at the MRC WIMM and is interested in the role of iron in T-cell biochemistry. She received her BSc from McGill University in 2019 with first class Honours in Microbiology and Immunology. Megan has previously worked on winter tick in moose and caribou and host *Salmonella* susceptibility genetics.

Dr. Gareth Purvis, Dunn School of Pathology - 'Inhibition of Bruton's Tyrosine Kinase (BTK) enhances mitochondrial function resulting in enhanced M2-like macrophage polarisation in adipose associated macrophages in obesity'

Gareth Purvis completed a PhD at Queen Mary University of London on the role of Annexin-A1 in the pathophysiology of diabetes mellitus. Following this, he moved to Oxford where he works in the lab of Professor David Greaves at the Dunn School of Pathology. His main research focus is on understanding at a single cell level how monocytes are recruited and re-programmed to undergo differentiation to macrophages at sites of inflammation, with the overarching aim of discovering novel pathways that can be targeted in diabetes and cardiovascular disease.

15:40-16:00 Dr. Iwona Szczerbinska, Novo Nordisk Research Centre Oxford - 'siRNA screening platform for drug target discovery in type 2 diabetes'

Iwona Szczerbinska joined Discovery Biology and Pharmacology Department in Novo Nordisk Research Centre Oxford in 2019 as a postdoctoral scientist. Her current research focuses on establishment of high-throughput screening with phenotypic readout for target discovery. Iwona completed her PhD at the University of Singapore where she used a high-throughput chemical screen to identify a novel culture condition for human pluripotent stem cells.

-- END OF DAY'S PROGRAMME --

Thursday 8 July, 13:30-15:45

SESSION 3. Chair: Associate Professor Michael Holmes, Big Data Institute and Nuffield Department of Population Health

13:30-13:50 Dr. Alex Clarke, Kennedy Institute for Rheumatology - 'B cell metabolism'

Alex Clarke is a Wellcome Trust Clinical Research Career Development Fellow at the Kennedy Institute of Rheumatology. 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 at the



Kennedy Institute focuses on understanding how metabolism influences the immune response in autoimmunity, and the development of lymphoma.

13:50-14:10 Dr. Anika Knüppel, Nuffield Department of Population Health - 'Red and processed meat and risk of common conditions and cancers in UK Biobank'

Anika Knüppel holds a BSc and MSc in Nutritional Sciences from Martin Luther University (Germany) and a PhD in Epidemiology and Public Health from University College London. She is Junior Research Fellow in Medical Sciences at the Centre for Personalised Medicine and a Nutritional Epidemiologist at the NDPH as part of the Cancer Epidemiology Unit. Anika is interested in modifiable risk factors for various health outcomes. She works with data from large-scale prospective cohort studies such as the European Prospective Investigation into Cancer and Nutrition and UK Biobank. In her current role, she focuses on associations between intake of animal products and physical health; her previous work investigated links between diet, adiposity and mental health.

14:10-14:20 Oral presentations from abstracts:

Ujang Purnama, DPAG - 'Modelling the human diabetic heart using engineered heart tissue for in-vitro testing of cardioprotective drugs'

Ujang Purnama received his bachelor's degree in Pharmaceutical Science and Technology from Bandung Institute of Technology in 2015 where he also trained as a licensed pharmacist. During his undergraduate study he undertook an internship at Sumitomo Chemical Company, Japan, to study embryonic stem cell differentiation to cardiomyocytes and neuron cells for toxicology testing. In 2015 he joined Leonie Beljaars's lab as an intern at University Medical Centre Groningen. In 2018 he was awarded the Indonesia Endowment Fund for Education scholarship to study for a DPhil in Professor Carolyn Carr's group.

Matthew Lloyd, DPAG - 'Hyperglycaemia-induced metabolic dysregulation causes a loss of insulin biosynthesis in pancreatic beta cells'

Matthew Lloyd read Biochemistry at Oxford before joining the Ashcroft group in DPAG as a DPhil student. His research investigates the metabolic regulation of insulin biosynthesis and the causes and consequences of glycogen storage in hyperglycaemic β -cells.

14:20-14:40 Dr. Ileana Badi, Cardiovascular Medicine/Radcliffe Department of Medicine - 'The Oxford Heart Vessels & Fat (Ox-HVF) cohort: a powerful platform to study the crosstalk between the adipose tissue and the cardiovascular system'

Ileana Badi's interests lie in understanding the cellular and molecular mechanisms leading to cardiovascular disease. She obtained her Ph.D. in 2008 at the University of Insubria (Italy)



where she studied a rare congenital heart disease. To deepen her knowledge on cardiac development she undertook post-doctoral research under the supervision of Professor Vincent M. Christoffels at the University of Amsterdam and then moved to the Milanese Institute “Centro Cardiologico Monzino” to focus on vascular aging and calcification. In June 2018, she joined the Oxford Translational Cardiovascular Research Group of Professor Charalambos Antoniades to study how the crosstalk between the adipose tissue and the cardiovascular system can affect cardiovascular disease.

-- 14:40-14:50 short break --

SESSION 4. Chair: Dr. Karl Morten, Nuffield Department of Women’s and Reproductive Health

14:50-15:10 Dr. Fay Probert, Department of Chemistry - ‘Nuclear Magnetic Resonance metabolomics analysis for diagnosis and prognosis’

Fay Probert graduated with a BSc in Mathematics before completing an MSc in Mathematical Biology and Biophysical Chemistry followed by a PhD in Analytical Chemical Biology. Her research focuses on using a multidisciplinary combination of analytical chemistry, mathematics and biology techniques to understand the chemistry of small molecule pathways associated with disease, with a particular focus on better understanding inflammation to improve the diagnosis and treatment of inflammatory diseases. In 2015, Fay joined the Department of Pharmacology at Oxford and in 2021 was awarded a Dorothy Hodgkin Career Development Fellowship in the Chemistry Department.

15:10-15:20 Oral presentations from abstracts:

Daniel Radford-Smith, Department of Pharmacology - ‘Modifying the maternal microbiota alters the gut-brain metabolome and prevents emotional dysfunction in the offspring of obese dams’

Daniel Radford-Smith is a DPhil student in Pharmacology with affiliations to the Departments of Chemistry and Psychiatry. Previously, he completed a Bachelor of Science and Bachelor of Biomedical Science (Hons I) in Brisbane, Australia. For part of his Honours year, he worked with the Anthony lab in the Department of Pharmacology, Oxford, investigating multigenerational effects of maternal prebiotic intake on neuroplasticity and behaviour. Currently, Daniel's interests relate to the association between metabolic dysfunction and major depression and how the gut microbiota may act as a modifying factor.



Kaitlyn Dennis, DPAG - 'Diabetic mitochondria are resistant to palmitoyl CoA inhibition of respiration, which is detrimental during ischaemia'

Kaitlyn Dennis is a 2nd year DPhil student in Cardiovascular Sciences (BHF programme) and works with Professor Lisa Heather in DPAG. She is interested in altered cardiac metabolism in type 2 diabetes.

15:20-15:40 Associate Professor Craig Lygate, Cardiovascular Medicine/Radcliffe Department of Medicine - 'Unravelling the role of L-homoarginine in the heart'

Craig Lygate is an Associate Professor of cardiovascular physiology with expertise in the assessment of *in vivo* cardiac function in rodents, particularly within the context of acute ischemia and chronic heart failure. Initially trained as a pharmacist, then a Masters and PhD in Manchester and Glasgow, he came to Oxford for his first post-doc and has stayed ever since. His research group is funded by a British Heart Foundation programme grant to study the interaction between creatine and homoarginine metabolism, with the long-term goal of developing therapeutics that will augment energetics in the diseased heart.

15:40-15:45 Closing remarks and prizes - Professor John Todd

-- END OF SYMPOSIUM --

Biographies of the Chairs

Session 1:

David Ray is Professor of Endocrinology at OCDEM in the Radcliffe Department of Medicine. He trained in general internal medicine and obtained a PhD from the University of Manchester. His research in Manchester focused on nuclear receptor and circadian biology in inflammation and energy metabolism. In 2018 he moved to Oxford where he has employed a range of approaches to address the physiological importance of the circadian system including population genetics, experimental medicine studies and *in vitro* and *in vivo* systems.

Session 2:

Carolyn Carr is an Associate Professor of Biomedical Science in DPAG. She has a DPhil in Chemistry from Oxford and has worked in both academia and industry. She had a career break of 10 years and returned to science with a Daphne Jackson Returner's Fellowship. She has investigated the use of endogenous cardiac progenitor cells as a therapy for myocardial



infarction and mechanisms to metabolically mature stem cell-derived cardiomyocytes. She is now developing an *in vitro* model of insulin resistant cardiomyocytes.

Session 3:

Michael Holmes is a clinical epidemiologist and Associate Professor at the Nuffield Department of Population Health and Big Data Institute at the University of Oxford where he explores translational applications of human genetics in large biobanks, including identifying and characterising potential therapeutic targets. Michael is a recently appointed Associate Director in the NHS Genomic Medicine Service Alliance, tasked with embedding genomics to transform patient care in the NHS. He sits on a National Institute for Health and Clinical Excellence (NICE) technology appraisal committee as a pharmaceutical physician.

Session 4:

Karl Morten's lab has a long-standing interest in understanding the role of mitochondria in health and disease and has built up over the last 10 years technologies allowing this to be studied in a high-throughput format. One of the leading groups in Oxford working on mitochondria, they collaborate widely in Oxford and work closely with clinicians, engineers, mathematicians and commercial companies to generate highly innovative publications. Recently, with funding from the ME Association, they have been actively exploring the mechanisms behind Myalgic Encephalomyelitis/Chronic Fatigue Syndrome (ME/CFS). Their other research focus is developing approaches to target cancer cell metabolism.



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 university, covering a wide range of basic and translational activities. The [OMH website](#) lists the disciplines and disease areas within the initiative's scope and the groups working in them and provides details of events and opportunities of interest as well as resources and expertise available across Oxford.

Since its launch, OMH has worked with researchers and other stakeholders to help develop collaborative and training opportunities in areas including metabolomics, the microbiome, immunometabolism, circadian biology, personalised medicine and cardiovascular disease. This includes two on-line metabolomics data analysis workshops run by the Department of Chemistry in 2020 and 2021. We are continuing to identify training needs in this and other relevant areas.

The OMH network and mailing list is open to Oxford-based researchers at any level of their career who would like to receive news about relevant events and opportunities. There are almost 200 members from over 50 groups. To join, send an email to omh_network_subscribe@maillist.ox.ac.uk

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