Metabomeeting 2014

Agenda

The Royal Institution, London, UK

10-12 September 2014

**Wednesday, 10 September 2014**

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| 08:30 | **Registration** | |
| 09:30 | **Introduction and Prologue** [Andrew Nicholls](http://selectbiosciences.com/conferences/biographies.aspx?speaker=120769&conf=meta2014), Director & Secretary, Metabolic Profiling Forum, Head of Investigative Preclinical Toxicology, GlaxoSmithKline, United Kingdom [Jules Griffin](http://selectbiosciences.com/conferences/biographies.aspx?speaker=826425&conf=meta2014), Director, Metabolic Profiling Forum, Group Head, Lipid Profiling and Signalling, University of Cambridge, United Kingdom | |
| 09:45 | |  |  | | --- | --- | | Robert Gerszten | **Plenary Presentation**  [**Plenary Lecture: Integrating Metabolite Profiles for Less Impersonal Medicine**](http://selectbiosciences.com/conferences/agendaAbstracts.aspx?conf=meta2014&AbstractID=6456) [Robert Gerszten](http://selectbiosciences.com/conferences/biographies.aspx?speaker=136434&conf=meta2014), Principal Investigator, Center for Immunology and Inflammatory Diseases, Massachusetts General Hospital, United States of America  The presentation will summarize the integration of metabolic, genetic, and phenotypic data in the Framingham Heart Study. | | |
| 10:45 | **Coffee and Networking in Exhibiton Hall** | |
|  | **Session 1: Applied Metabolomics - Human Health and Nutrition Chair: Jules Griffin, Metabolic Profiling Forum and University of Cambridge** | |
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| 11:15 | |  |  | | --- | --- | | Manuel Mayr | **Keynote Presentation**  [**Lipidomics Profiling and Risk of Cardiovascular Disease**](http://selectbiosciences.com/conferences/agendaAbstracts.aspx?conf=meta2014&AbstractID=6455) [Manuel Mayr](http://selectbiosciences.com/conferences/biographies.aspx?speaker=207390&conf=meta2014), Professor, King's College University of London, United Kingdom  The bulk of cardiovascular disease is not explained by traditional risk factors. The importance of individual lipid species may have been underestimated by an unwarranted focus on lipid classes, including measures of total triglycerides, total cholesterol, LDL and HDL cholesterol. | | |
| 11:55 | [**Towards NMR Biopsy**](http://selectbiosciences.com/conferences/agendaAbstracts.aspx?conf=meta2014&AbstractID=7339) [Alan Wong](http://selectbiosciences.com/conferences/biographies.aspx?speaker=1247991&conf=meta2014), Senior Scientist, CEA Saclay, France  We present a micro-NMR tool for intact biopsy and cells and whole organisms. | |
| 12:20 | [**Time of Day Variation in the Human Metabolic Profile and Effect of Sleep Deprivation**](http://selectbiosciences.com/conferences/agendaAbstracts.aspx?conf=meta2014&AbstractID=7380) [Sarah Davies](http://selectbiosciences.com/conferences/biographies.aspx?speaker=1247800&conf=meta2014), PostDoc Fellow, University of Surrey, United Kingdom  Targeted liquid chromatography-mass spectrometry metabolomics has been used to examine time of day variation and the effect of total sleep deprivation on plasma metabolite rhythms in healthy male volunteers under highly controlled laboratory conditions. | |
| 12:45 | **Lunch and Networking in Exhibition Hall** | |
| 13:15 | Bruker Daltonik GmbHFree Workshop **Complementary NMR and MS Solutions to Solve the “Metabolomics Puzzle” Workshop** | |
|  | **Session 2: Applied Metabolomics - Engineering the Metabolome Chair: Hector Keun, Imperial College London, United Kingdom** | |
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| 14:00 | |  |  | | --- | --- | | Johnathan Napier | **Keynote Presentation**  [**Heterologous Synthesis of Omega-3 Long Chain Polyunsaturated Fatty Acids in Transgenic Plants via Iterative Metabolic Engineering: A Terrestrial Source of Fish Oils**](http://selectbiosciences.com/conferences/agendaAbstracts.aspx?conf=meta2014&AbstractID=7344)  [Johnathan Napier](http://selectbiosciences.com/conferences/biographies.aspx?speaker=236314&conf=meta2014), Research Leader, Rothamsted Research, United Kingdom  Using iterative metabolic engineering and lipdomics, a terrestrial source of fish oils has been developed in transgenic plants. | | |
| 14:40 | [**A Metabolomics Approach to Understanding Thermally-induced Coral Bleaching**](http://selectbiosciences.com/conferences/agendaAbstracts.aspx?conf=meta2014&AbstractID=7345) [Simon Davy](http://selectbiosciences.com/conferences/biographies.aspx?speaker=1274073&conf=meta2014), Associate Professor, Head of School, Victoria University of Wellington, New Zealand  We will describe how thermal stress impacts upon metabolite profiles and fluxes in the coral-algal symbiosis that forms the basis of coral reefs, and discuss how metabolomics can help us understand how corals may respond and acclimatise to climate change. | |
| 15:05 | [**Differential Modulation of Metabolite Clusters in Tomato Genotypes Grown in Different Production Ecosystems**](http://selectbiosciences.com/conferences/agendaAbstracts.aspx?conf=meta2014&AbstractID=7346) [Autar Mattoo](http://selectbiosciences.com/conferences/biographies.aspx?speaker=258381&conf=meta2014), Research Plant Physiologist, USDA Agricultural Research Service, United States of America  Genotype-specific and production system-based segregation of metabolomic variables were characterized in 7 genotypes. We demonstrated that genetically engineered tomato lines are compatible with leguminous cover crop mulch system, with quantitative increase in value-added traits in an economically beneficial manner. | |
| 15:30 | **Coffee and Networking in Exhibiton Hall** | |
| 16:00 | **Poster Session A** | |
| 17:30 | **Close of Day One** | |

**Thursday, 11 September 2014**

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| 08:30 | **Registration** | |
|  | **Session 3: Applied Metabolomics - Pharmaceutical Chair: Andrew Nicholls, Metabolic Profiling Forum and GSK** | |
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| 09:00 | |  |  | | --- | --- | | Jeremy Everett | **Keynote Presentation**  [**Pharmacometabonomics: An Important New Paradigm for Precision Medicine**](http://selectbiosciences.com/conferences/agendaAbstracts.aspx?conf=meta2014&AbstractID=6458) [Jeremy Everett](http://selectbiosciences.com/conferences/biographies.aspx?speaker=1180996&conf=meta2014), Professor, University of Greenwich, United Kingdom  This presentation will cover the origin of pharmacometabonomics and its success as a complementary approach to pharmacogenomics in personalised or precision medicine and the importance of environmental factors in this arena. | | |
| 09:40 | [**NMR Metabolic Profiling of the Effects of Silver Nanoparticles on Human Epidermis Keratinocytes**](http://selectbiosciences.com/conferences/agendaAbstracts.aspx?conf=meta2014&AbstractID=7149) [Iola Duarte](http://selectbiosciences.com/conferences/biographies.aspx?speaker=860989&conf=meta2014), Research Assistant, University of Aveiro, Portugal  NMR metabolomics of human keratinocytes exposed to silver nanoparticles reveals changes in the levels of glutathione, amino acids, osmoregulators and choline compounds. NMR-stable isotope tracing further reveals increased flux through the pentose phosphate pathway, probably reflecting NP-induced oxidative stress. | |
| 10:05 | [**Off-target Effects of COX-2 Selective Inhibitors Defined by Metabolomics**](http://selectbiosciences.com/conferences/agendaAbstracts.aspx?conf=meta2014&AbstractID=7352) [Cecilia Castro](http://selectbiosciences.com/conferences/biographies.aspx?speaker=1033031&conf=meta2014), Research Associate, University of Cambridge, United Kingdom  The main results from an evaluation of the effects of the chronic administration of COX-2 selective inhibitors on healthy mice show changes in the metabolome of the kidney, and an increase in short chain carnitines in the heart and plasma. | |
| 10:30 | **Coffee and Networking in Exhibiton Hall** | |
| 10:50 | |  |  | | --- | --- | | Andrew Patterson | **Keynote Presentation**  [**Understanding the Impact of Tempol on the Gut Microbiome through Next Generation Sequencing and Metabolomics**](http://selectbiosciences.com/conferences/agendaAbstracts.aspx?conf=meta2014&AbstractID=7239) [Andrew Patterson](http://selectbiosciences.com/conferences/biographies.aspx?speaker=1028062&conf=meta2014), Assistant Professor, Penn State University, United States of America  The antioxidant tempol remodels the gut microbiome landscape and promotes an anti-obesity effect through antagonism of the farnesoid X receptor signaling pathway. | | |
|  | **Session 4: Identification and Integration with Systems Biology Chair: Olivia Corcoran, University of East London, United Kingdom** | |
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| 11:20 | [**MetaboLights - The EMBL-EBI Metabolomics Resource**](http://selectbiosciences.com/conferences/agendaAbstracts.aspx?conf=meta2014&AbstractID=7355)  [Kenneth Haug](http://selectbiosciences.com/conferences/biographies.aspx?speaker=1247802&conf=meta2014), Project Manager and Software Engineer, European Bioinformatics Institute (EMBL-EBI), European Molecular Biology Laboratory, United Kingdom  Over the next few years MetaboLights will exploit open-source analytical tools and investigate workflows for the commonest approaches used in metabolomics. We will add open programmatic access to primary research- and reference data. | |
| 11:45 | [**MetExplore 2.0: Handling Genome Scale Metabolic Networks Online**](http://selectbiosciences.com/conferences/agendaAbstracts.aspx?conf=meta2014&AbstractID=7356)  [Fabien Jourdan](http://selectbiosciences.com/conferences/biographies.aspx?speaker=835976&conf=meta2014), Research Scientist, INRA-MetaboHub, France  MetExplore 2.0 is a fully online interface (from data import to network visualization) allowing analysis of metabolomics data in the context of metabolic networks. | |
| 12:10 | |  |  | | --- | --- | | Dimitrios  Anastasiou | **Keynote Presentation**  [**Functions of Metabolism in Cancer**](http://selectbiosciences.com/conferences/agendaAbstracts.aspx?conf=meta2014&AbstractID=8260) [Dimitrios Anastasiou](http://selectbiosciences.com/conferences/biographies.aspx?speaker=1263426&conf=meta2014), Programme Leader, MRC National Institute for Medical Research, United Kingdom  In this talk I will discuss how cancer cells exploit distinct allosteric regulation mechanisms of metabolic enzyme isoforms to survive and proliferate within the tumour microenvironment. | | |
| 12:40 | **Lunch and Networking in Exhibition Hall** | |
| 13:15 | University of GlasgowFree Workshop **Expanding Reproducibility and Coverage for Biofilm Metabolomics Workshop** | |
|  | **Session 5: Student and Postdoctoral Presentations Chair: Roy Goodacre, Metabolic Profiling Forum and University of Manchester, United Kingdom** | |
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| 14:00 | [**How to Maximize the Structural Output from the Mass Spectrometer? Using Different Fragmentation Approaches for Annotation and Identification of Small Molecules**](http://selectbiosciences.com/conferences/agendaAbstracts.aspx?conf=meta2014&AbstractID=7361) [Justin van der Hooft](http://selectbiosciences.com/conferences/biographies.aspx?speaker=1247756&conf=meta2014), Research Associate, University of Glasgow, United Kingdom  The structural diversity of small molecules (metabolites) requires new fragmentation approaches to obtain the most rigorous structural information from mass spectrometry approaches. This knowledge will assist in the critical task of populating spectral libraries and permit annotation of unknown metabolites. | |
| 14:15 | [**Glucose Deprivation Drives Adaptation Towards Lactate Utilisation and Sensitises Tumour Cells to the First-in-class Monocarboxylate Transporter 1 (MCT1) Inhibitor AZD3965**](http://selectbiosciences.com/conferences/agendaAbstracts.aspx?conf=meta2014&AbstractID=7362) [Shyam Solanki](http://selectbiosciences.com/conferences/biographies.aspx?speaker=1274319&conf=meta2014), PhD Student, Imperial College London, United Kingdom  Tumour cells frequently experience glucose deprivation together with high lactate exposure. Under these conditions lactate imported through MCT1 represents a vital alternative carbon source. Combining molecular biology and metabolomic techniques we show that tumours cells readily adapt to the metabolic environment to utilise lactate for both energy production and anabolism. This creates a specific opportunity for anti-cancer combination therapy involving specific MCT1 inhibitors. | |
| 14:30 | [**Multiplatform Metabolomics of Oncogene Induced Senescence**](http://selectbiosciences.com/conferences/agendaAbstracts.aspx?conf=meta2014&AbstractID=7363) [Emily Grace Armitage](http://selectbiosciences.com/conferences/biographies.aspx?speaker=1272887&conf=meta2014), PostDoc Researcher, Universidad San Pablo CEU, Spain  Oncogene-induced senescence (OIS) is an anti-tumour mechanism of protection against cancer. To study this, we have designed a fibroblast cell line with induced RAS activation and analysed cell extracts over time by GC-MS, LC-QTOF-MS and CE-TOF-MS. | |
| 14:45 | [**Metabolic Profiling of Geobacter Sulfurreducens During a Scale-up Process**](http://selectbiosciences.com/conferences/agendaAbstracts.aspx?conf=meta2014&AbstractID=7364) [Howbeer Muhamadali](http://selectbiosciences.com/conferences/biographies.aspx?speaker=972505&conf=meta2014), PhD Student, University of Manchester, United Kingdom  The process of bio-magnetite nanoparticle production using G. sulfurreducens and its wide-range of applications have seen increasing interest during the past decade. Here, we scale-up this batch culture bioprocess from 100 mL serum bottles to 5 L bioreactor, and employ metabolic fingerprinting (FT-IR) and profiling techniques (GC-MS) to determine the metabolic response of cells to the scale-up process. | |
| 15:00 | [**A Combination of Redeployed Drugs Demonstra Potent Anti-leukaemia and Anti-lymphoma Activity through Disruption of Tumour Cell de Novo Lipogenesis**](http://selectbiosciences.com/conferences/agendaAbstracts.aspx?conf=meta2014&AbstractID=7365) [Andrew Southam](http://selectbiosciences.com/conferences/biographies.aspx?speaker=1274304&conf=meta2014), PostDoc Fellow, University of Birmingham, United Kingdom  The anti-leukemic therapy of bezafibrate and medroxyprogesterone acetate decreases lipogenesis in leukaemia and lymphoma cells. Lipogenic disruption is important for the anti-cancer activity of the treatment and is mediated by alteration of key enzymes in fatty acid synthesis. | |
| 15:15 | [**Ceramide Metabolism in the Liver and its Role in Two Lysosomal Lipidoses - Drug-induced Phospholipidosis and Sandhoff Disease**](http://selectbiosciences.com/conferences/agendaAbstracts.aspx?conf=meta2014&AbstractID=7367) [Emma Lecommandeur](http://selectbiosciences.com/conferences/biographies.aspx?speaker=1286776&conf=meta2014), PhD Student, Department of Biochemistry, University of Cambridge, United Kingdom  The metabolic effects of drug-induced phospholipidosis were investigated in rats and Hep G2 cells. A remodelling of the ceramide content associated with changes in ceramide synthase gene expressions that may lead to alterations of membrane properties were detected. | |
| 15:30 | **Coffee and Networking in Exhibiton Hall** | |
| 16:00 | [**A Metabolic Signature for Cadmium Exposure in Two Human Populations: A Proof of Concept Study for Exposome Research**](http://selectbiosciences.com/conferences/agendaAbstracts.aspx?conf=meta2014&AbstractID=7368)  [Alexandros Siskos](http://selectbiosciences.com/conferences/biographies.aspx?speaker=1274317&conf=meta2014), Research Associate, Imperial College London, United Kingdom  Using metabolomics we have identified a specific metabolic signature for cadmium exposure in human population studies, providing proof of concept for the use of this technique in exposome and environmental health research. | |
| 16:15 | [**Evolution Shapes Differences in Bacterial Response to Nutrient Starvation**](http://selectbiosciences.com/conferences/agendaAbstracts.aspx?conf=meta2014&AbstractID=7369) [Volker Behrends](http://selectbiosciences.com/conferences/biographies.aspx?speaker=1271960&conf=meta2014), Research Associate, Imperial College London, United Kingdom  Living systems need to be able to respond the nutrient shortages. Here, we show how metabolites can function as stores or signals in the cells’ physiological response to nitrogen starvation in different organisms. | |
| 16:30 | **Poster Session B** | |
| 18:00 | **Conference Dinner at the Royal Institution** | |

**Friday, 12 September 2014**

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| 08:30 | **Registration** | |
|  | **Session 6: Data Analysis and Modelling Chair: Lindsay Edwards, GSK, United Kingdom** | |
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| 09:00 | |  |  | | --- | --- | | Johan Trygg | **Keynote Presentation**  [**Multiblock and Multilevel Analysis in Metabolomics**](http://selectbiosciences.com/conferences/agendaAbstracts.aspx?conf=meta2014&AbstractID=6459) [Johan Trygg](http://selectbiosciences.com/conferences/biographies.aspx?speaker=253365&conf=meta2014), Professor, Umea University, Sweden  In this talk, we will give overview (theory and examples) of existing multi-block and multi-level methods used in metabolomics and also highlight exciting recent developments. | | |
| 09:40 | [**Novel LC-HRMS/MS and Stable Isotope Labelling Assisted Metabolomics Workflows and Data Processing Tools**](http://selectbiosciences.com/conferences/agendaAbstracts.aspx?conf=meta2014&AbstractID=7151) [Christoph Bueschl](http://selectbiosciences.com/conferences/biographies.aspx?speaker=1247159&conf=meta2014), PhD Student, University of Natural Resources and Life Sciences (BOKU), Vienna, Austria  Three novel workflows for stable isotope labelling assisted untargeted metabolomics were developed for the a) the global extraction of metabolites accessible via LC-HRMS, b) the study of certain tracers in living organisms and c) improved LC-MS/MS fragment annotation. | |
| 10:05 | [**Better Data By Design: Ten Sources of Unwanted Bias and Variance in Metabolomic Experiments**](http://selectbiosciences.com/conferences/agendaAbstracts.aspx?conf=meta2014&AbstractID=7373) [David Broadhurst](http://selectbiosciences.com/conferences/biographies.aspx?speaker=1274072&conf=meta2014), Assistant Professor, University of Alberta, Canada  As a general rule, little forethought is given toward the design of metabolomics experiments. Here I categorize the major obstacles against rigorous metabolomic research into a set of 10 sources of unwanted statistical error arising throughout the metabolomics workflow. | |
| 10:30 | **Coffee and Networking in Exhibiton Hall** | |
|  | **Session 7: Applied Metabolomics - Microbial, Invertebrate and Environmental Applications Chair: Jake Bundy, Imperial College London, United Kingdom** | |
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| 11:00 | |  |  | | --- | --- | | Nicola Zamboni | **Keynote Presentation**  [**Myths and Opportunities of 13C Metabolic Flux Analysis and Metabolomics in Mechanistic Investigations of Cellular Metabolism**](http://selectbiosciences.com/conferences/agendaAbstracts.aspx?conf=meta2014&AbstractID=7376) [Nicola Zamboni](http://selectbiosciences.com/conferences/biographies.aspx?speaker=147775&conf=meta2014), Head of Research, Swiss Federal Institute of Technology Zurich ETH, Switzerland  13C metabolic flux analysis and metabolomics are very different but complementary approaches to characterize cellular metabolism. They both have fundamental limitations and unique advantages. I discuss how to maximize the synergism. | | |
| 11:40 | [**A Core Metabolic Enzyme is Responsible for Phosphine Resistance and Fundamental Metabolic Regulation**](http://selectbiosciences.com/conferences/agendaAbstracts.aspx?conf=meta2014&AbstractID=7152) [Horst Joachim Schirra](http://selectbiosciences.com/conferences/biographies.aspx?speaker=553825&conf=meta2014), Research Fellow, The University of Queensland, Australia  A core metabolic enzyme has been identified to be responsible for phosphine resistance and implicated in global metabolic regulation. | |
| 12:05 | [**Insights into Alzheimer’s Disease from NMR Metabolomics of Aß-expressing Drosophila**](http://selectbiosciences.com/conferences/agendaAbstracts.aspx?conf=meta2014&AbstractID=7150) [Anders Malmendal](http://selectbiosciences.com/conferences/biographies.aspx?speaker=1247980&conf=meta2014), Associate Professor, University of Copenhagen, Denmark  NMR metabolomics of a Drosophila AD model identifies potential biomarkers long before symptoms are detected and provides a measure of physiological age. | |
| 12:30 | **Lunch and Networking in Exhibition Hall** | |
|  | **Session 8: Applied Metabolomics - Human Disease Chair: Andrew Nicholls, Metabolic Profiling Forum and GSK** | |
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| 14:00 | |  |  | | --- | --- | | Elaine Holmes | **Plenary Presentation**  [**Plenary Lecture: The Role of Metabolic Profiling in Systems Medicine**](http://selectbiosciences.com/conferences/agendaAbstracts.aspx?conf=meta2014&AbstractID=6460)  [Elaine Holmes](http://selectbiosciences.com/conferences/biographies.aspx?speaker=272526&conf=meta2014), Professor, Division of Biomedical Sciences, Imperial College London, United Kingdom  Spectroscopic profiling coupled with bioinformatic engines has been applied to diagnostic, prognostic and mechanistic facets of acute and chronic disease. Its expanding role in Systems Medicine is explored in relation to new tools and technology. | | |
| 15:00 | [**A Metabolomic Signature Linked to Liver Fibrosis Progression Rate in the Serum of Transplanted Hepatitis C Patients**](http://selectbiosciences.com/conferences/agendaAbstracts.aspx?conf=meta2014&AbstractID=7379)  [Ainara Cano](http://selectbiosciences.com/conferences/biographies.aspx?speaker=829912&conf=meta2014), Research Scientist, One Way Liver (OWL), Spain  The distinctive metabolic profiles in fast or slow fibrosers after liver transplantation have been determined non-invasively by means of UPLC-MS. The biomarker hunt from patient selection to univariate and multivariate analyses will be discussed. | |
| 15:25 | [**Preclinical Identification to Clinical Validation of Plasma Metabolomic Signature of Novel Signal Transduction Inhibitors**](http://selectbiosciences.com/conferences/agendaAbstracts.aspx?conf=meta2014&AbstractID=7340) [Florence Raynaud](http://selectbiosciences.com/conferences/biographies.aspx?speaker=145254&conf=meta2014), Group Leader, The Institute of Cancer Research, United Kingdom  Unique changes in plasma metabolite profiles were identified in preclinical tumour models with systemic modulation of the PI3K and RAS-RAF-MEK pathway that were validated in human subjects with advanced solid tumours. | |
| 15:50 | **Award of Student and Poster Prizes** | |
|  | **Epilogue**  **Chairs:  Roy Goodacre, Metabolic Profiling Forum and University of Manchester, United Kingdom Lindsay Edwards, GSK, United Kingdom** | |
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| 16:15 | **Close of Conference** | |