The Academy of Medical Sciences

2016 Winter Science Meeting

Wednesday 23 November 2016

Academy of Medical Sciences, 41 Portland Place, London

"Very good for getting a realistic overview of the research being funded by the AMS"

"I always enjoy this meeting, it's lovely to feel part of a 'family' and great to meet people in different specialties."

2016 Winter Science Meeting

The Academy of Medical Sciences held its annual Winter Science Meeting in November 2016. The meeting brought together our Starter Grants holders, who were joined for the first time by our new non-clinical Springboard award holders. The Winter Science Meeting is a day to celebrate multi-disciplinary science across a huge range of health-related research areas. We provide award holders a space to network with Academy Fellows and peers, to present their work in a variety of formats, and to plan the next steps of their careers.

Who attended

- Over 70 Starter Grant holders and Springboard awardees.
- Fellows of the Academy of Medical Sciences.
- Representatives of the funding consortium supporting the scheme.
- Communication and engagement experts.

Agenda

The day started off with a welcome from our Starter Grants for Clinical Lecturers' Panel chair, Professor Marina Botto FMedSci. Our Executive Director, Dr Helen Munn, then introduced all the attendees to the Academy, its history and its aims. The morning sessions were a mix of 15-minute plenary talks and 'Research in 3" talks, where presenters have no more than three minutes and one slide to talk about their research.

We then held a 'structured networking' session before lunch to enable attendees to quickly get to know each other and discuss aspects of their research. During the lunch break we offered two parallel sessions; a poster session run in parallel with a new communication and engagement session. The latter covered a number of useful topics for researchers, including interacting with the press office, engaging with schools and adults and establishing a social media presence.

The afternoon focussed on career development and Academy Fellows facilitated group discussions on leadership, funding applications, policy engagement and research reproducibility.

The meeting concluded with an inspiring keynote lecture by Professor Sadaf Farooqi FMedSci on her career in academic medicine. After Professor Farooqi's fascinating talk the Academy's Registrar, Professor Philippa Saunders FMedSci, awarded four prizes for best attendee presentations.

A full agenda is included in Annex 1

"A great opportunity to see what colleagues at a similar level but working in diverse fields are doing, chance to meet some very interesting people"

Science presentations

Oral plenary

Four presenters were selected through their abstract submissions to present in the Oral Plenary session. In 15 minutes each, they talked about their current research and encouraged discussion in a diverse range of subject areas.

Dr Christian Lambert

Dr Catherine Aiken

Dr James Seddon

Dr Rimona Weil

Research in 3

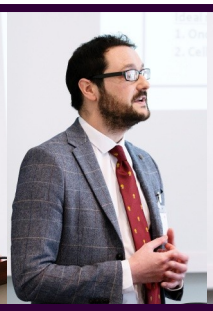
'Research in 3' presenters delivered a condensed summary of their current work aided by one PowerPoint slide. This format gives more researchers the chance to speak about their projects and encourages them to carefully consider the main messages of their work.

Dr Emma Dempster

Dr Christopher Duncan

Dr Rashmi Patel

Dr Jacqueline Maybin



Dr Aidan Rose

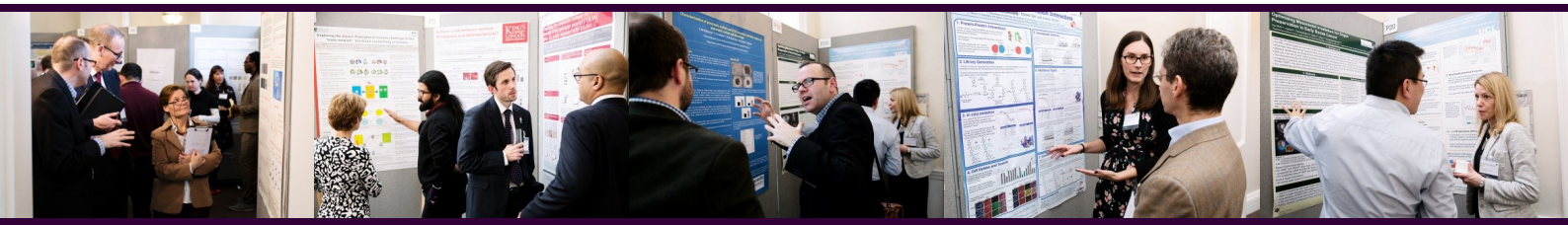
Dr Verity McClelland

Dr Richard Blanch

Mr Athanasios Saratzis

Poster sessions

28 award holders were selected based on their abstract submissions to present their research through a poster display over the 2 hour session. Split into two groups, these poster sessions ran alongside lunch and the walk-in engagement sessions.



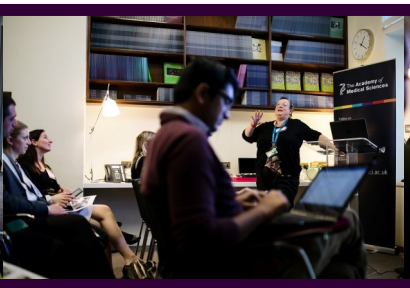
A selection of poster presenters from the day

Engagement sessions & career development sessions

Engagement sessions

This year we offered our award holders walk-in engagement sessions with a number of experts across the health research environment. The speakers discussed the engagement with schools, adults, social media and the university press office. The Academy values the importance of communicating research in both conventional and un-conventional ways across a variety of different media and these talks were an excellent opportunity for researchers to get practical tips and advice.

Katie Chambers
Head of Learning at QMULs Centre of the Cell



Professor Sophie Scott FMedSci
UCL Wellcome Senior Research Fellow

Holly Rogers
Academy Communications and Engagement Officer

Camel Turner
MRC Chief Press Officer

Career development sessions

Every year we reserve the afternoon session to career development, providing opportunities for our award holders to discuss issues facing early career researchers with funding representatives, Academy Fellows, and each other.

This year we offered four facilitated discussions on 'Succeeding in funding applications', 'Progressing to leadership positions', 'Engaging with policy makers' and 'Research Reproducibility: Improving research practice'. These discussions were led by Academy Fellows and provided a relaxed space for attendees to voice their concerns, ideas and questions to each other and to the group facilitator.

A selection of pictures from the career development sessions

Feedback on the engagement sessions

"Particularly inspired by the social media talk, engagement is something I now realise I need to develop - thinking about writing a blog!!

"Very helpful and practical tips"

"Helpful session. I particularly found the social media talk helpful as I have always been wary of using this in a professional capacity."

Feedback on the career development sessions

"Excellent opportunity to learn from and engage with some very senior people"

"This was a fantastic idea, the small groups worked well, lots of discussion, informal etc.

"I enjoyed that these were in small groups and led by very senior people. gave us a chance to ask real questions."

Keynote lecture

The keynote lecture was by Professor Sadaf Farooqi FMedSci, Professor of Metabolism and Medicine at the University of Cambridge.

Professor Farooqi talked about her career in academia and shared her own pathway in becoming a leading researcher . It was an incredibly interesting, funny, and informative lecture that was loved by award holders and Fellows alike.

Professor Sadaf Farooqi FMedSci

Professor of Metabolism and Medicine at the University of Cambridge

Wellcome Trust Senior Research Fellow in Clinical Science

Identified the Human Leptin gene in 1997

Demonstrated the importance of the Leptin-Melanocortin axis in regulating human food intake

Currently investigating the brain's response to hunger and satiety using fMRI

Feedback on the session

"The key note talk was fantastic! "

"I loved meeting Sadaf Farooqi! What an inspiration."

"The keynote lecture was extremely well presented, interesting and engaging."

"The keynote speaker was phenomenal and was worth the trip to London alone."

"Final keynote speaker was amazing"

100%

Gave a positive review of the Keynote lecture

Prizes awarded

Oral and poster presentation prizes

Prizes were awarded by the Academy's Registrar Professor Philippa Saunders FMedSci to recognise the best presentations amongst the oral plenary, 'Research in 3', and poster sessions. Cash prizes of £250 were offered to the winners of each session.

Presenters were judged by Academy Fellows on the significance and innovation of their research; the quality of their presentation; and whether the content was accessible to an audience comprising a wide range of clinical specialties and scientific disciplines.

Oral Plenary Prize

Dr Catherine Aiken, the University of Cambridge

"Demand for Abortion in Latin America in the Wake of Zika Virus"

'Research in 3' Prize

Dr Jacqueline Maybin, University of Edinburgh

"Hypoxia and hypoxia inducible factor (HIF) in the endometrium: a potential therapeutic target for heavy menstrual bleeding (HMB)"

Joint Poster Prize

Dr Robert Aldridge, University College London

"Public health data science: using linked electronic health records to produce and enhance English burden of disease estimates."

Joint Poster Prize

Dr Michael Devine, University College London

"Mitochondria are actively recruited to the neuronal presynapse and modulate synaptic function"

Science focus

Award holders from a diverse array of disciplines presented their research, below are brief insights into our prize winners' projects.

Demand for abortion in Latin America in the wake of Zika virus

Dr Catherin Aiken, the University of Cambridge

In November 2015, the outbreak of Zika virus in Latin America led several countries to issue public advisories including, declarations of national emergency and unprecedented warnings urging women to avoid pregnancy. Yet contraceptive prevalence in Latin American countries is low and for the vast majority of women, abortion is illegal, highly restricted, or inaccessible.

Using data from a non-governmental, non-profit organization that provides reproductive health choice to women with no safe access through the healthcare system, we provide a comprehensive analysis of trends in demand for abortion across Latin America since 2010, using generalized linear models with a regression discontinuity design.

We also present qualitative data from women's accounts of their experiences with Zika and its influence on their desire for abortion.

We show the first evidence of the impact of Zika and associated health advisories on demand for abortion among women in Latin America. We observed a 36-108% rise in requests for abortion in Latin American countries with active local Zika transmission that issued warnings or advisories regarding Zika.

Our results demonstrate the need for comprehensive and coordinated public health policy to reduce the fear and anxiety women experience due to the threat of Zika, and the need to provide women with options to implement their reproductive choices quickly, effectively, and safely.

Hypoxia and hypoxia inducible factor (HIF) in the endometrium: a potential therapeutic target for heavy menstrual bleeding (HMB)

Dr Jacqueline Maybin, University of Edinburgh

HMB is a common, debilitating condition, often requiring surgery. There is a need for new, efficient medical therapies that lack hormonal side effects. Progesterone-withdrawal in the late secretory phase of the menstrual cycle causes vasoconstriction of endometrial spiral arterioles. The presence and role of the subsequent hypoxia has been the subject of intense debate.
Hypotheses: (1) endometrial hypoxia occurs during menses, (2) hypoxia and hypoxia inducible factor (HIF-1) are necessary for efficient repair of the denuded endometrial surface.
Endometrial biopsies were collected from healthy women with objectively measured menstrual blood loss (HMB >80ml. Women with HMB had significantly decreased endometrial HIF-1α at menstruation versus those with NMB. Downstream targets of HIF-1 were also decreased in women with HMB at menses. Women with HMB bled for 2 days longer on average than those with NMB.
We genetically or pharmacologically reduced endometrial HIF-1α during menstruation in a mouse model of simulated menstruation. This also resulted in significantly delayed endometrial repair.
We prevented endometrial hypoxia during menses using a hyperoxic chamber. This significantly decreased HIF-1α protein and delayed endometrial repair. This delayed repair was rescued with i.p. DMOG (HIF stabiliser).
Hypoxia/markers of hypoxia are present in the human and murine menstrual endometrium. Prevention of menstrual hypoxia or reduction of HIF-1 significantly delays endometrial repair. Targeting these pathways may lead to novel, non-hormonal treatments for HMB.

Public health data science: using linked electronic health records to produce and enhance English burden of disease estimates.

Dr Robert Aldridge, University College London

Having a reliable and detailed estimate for the burden of different diseases affecting the population is important for management of healthcare resources. Effective investment in healthcare provision, public health and research needs a common way to compare current disease across health systems. To have maximum value, these comparators need to be compatible at regional, national and international scales.

Our study estimated burden of three common and important diseases: cancers, diabetes and low back pain. The data we used included linked GP and hospital data with mortality records. Results were compared to the current best methods for population estimates of disease, i.e. using national cancer and diabetes registries or from health surveys. The work developed valuable new methods for rapid comparative measures of disease burden.

Detailed estimates for cancers and diabetes were generally consistent with best comparator estimates. Burden estimates for each disease can be viewed by years (2000-2014), age group, sex, ethnicity, socio-economic deprivation, and geographic region. Our study showed that linked electronic health records have the potential to improve disease burden estimates for various diseases and conditions including patients with multiple morbidities, multiple risk factors and diseases with low death rates.

Mitochondria are actively recruited to the neuronal presynapse and modulate synaptic function

Dr Michael Devine, University College London

Mitochondrial trafficking is influenced by neuronal activity but it remains unclear how mitochondrial positioning influences neuronal transmission and plasticity.

We used live cell imaging with the genetically encoded presynaptically targeted Ca2+ indicator, SyGCaMP5, to address whether presynaptic Ca2+ responses are altered by mitochondria in synaptic terminals.

We find that presynaptic Ca2+ signals, as well as neurotransmitter release, are significantly decreased in terminals containing mitochondria. Moreover, the localisation of mitochondria at presynaptic sites can be altered during long-term activity changes, dependent on the Ca2+–sensing function of the mitochondrial trafficking protein, Miro1.

In addition, we find that Miro1-mediated activity-dependent synaptic repositioning of mitochondria allows neurons to homeostatically alter the strength of presynaptic Ca2+ signals in response to prolonged changes in neuronal activity.

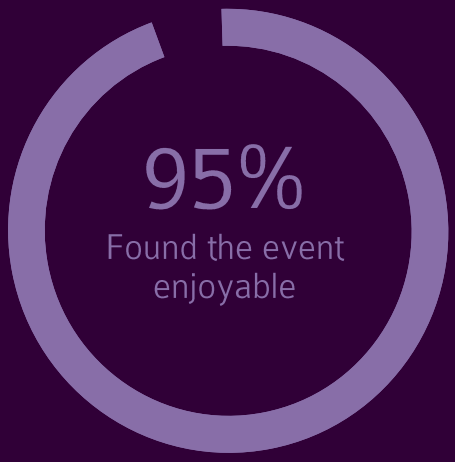
Our results support a model in which mitochondria are recruited to presynaptic terminals during periods of raised neuronal activity, and are involved in rescaling synaptic signals during homeostatic plasticity.

The day in pictures

Feedback

"Well organised, good science and opportunity to meet people at similar career stage."

"It was great meeting other academic clinicians and sharing experiences with them and not feel like I am on an island on my lonesome for once!



"I particularly enjoyed the networking events."

"Overall a well run and informative meeting."

"An atmosphere of excellence & optimism"

"Great talks from grant holders"

"Was great to see new methods that I am using being used by researchers in other fields. Also very useful to network with peers, and get new research ideas."

"A good opportunity to identify generic areas for improvement in developing an academic career. The key note talk was fantastic!"

"Overall an excellent day. The engagement and career development sections were very helpful."

Annex 1: Meeting agenda

9.00 Registration and poster setup

9.30 Welcome

Professor Marina Botto FMedSci, Professor of Rheumatology, Imperial College London, Chair of the Starter Grants Panel

9.35 Introduction to the Academy

Dr Helen Munn, Executive Director, Academy of Medical Sciences

9.45 Session 1: Oral plenary

Chair: Professor Marina Botto FMedSci

Dr Christian Lambert, St' George's University of London
Identifying preclinical vascular dementia in symptomatic small vessel disease using MRI

Dr Catherine Aiken, University of Cambridge
Demand for abortion across Latin America in the wake of Zika Virus

Dr James Seddon, Imperial College London
The impact of HIV and antiretroviral therapy on tuberculosis risk in children: a systematic review and meta-analysis

Dr Rimona Weil, University College London
Visual dysfunction in Parkinson's disease

11:05 Refreshments

11:30 Session 2: 'Research in 3'

Chair: Professor David Edwards FMedSci

Dr Emma Dempster, University of Exeter
Genome-wide methylomic analysis of monozygotic twins discordant for schizophrenia

Dr Christopher Duncan, Newcastle University
Human interferon alpha/beta receptor deficiency: insights into antiviral immunity

Dr Rashmi Patel, King's College London
Investigating clinical outcomes in psychotic disorders using clinical data obtained from electronic health records using natural language processing

Dr Jacqueline Maybin, University of Edinburgh
Hypoxia and hypoxia inducible factor (HIF) in the endometrium: a potential therapeutic target for heavy menstrual bleeding (HMB)

Mr Aidan Rose, University of Dundee
Inactivation of TGF-β receptors in stem cells drives cutaneous squamous cell carcinoma

Dr Verity McClelland, King's College London
Differences in globus pallidus neuronal firing rates and patterns relate to different disease biology in children with dystonia

Dr Richard Blanch, University of Birmingham
The role of pigment epithelium-derived factor in the progression open angle glaucoma

Mr Athanasios Saratzis, NIHR Leicester Cardiovascular Biomedical Research Unit
The impact of EndoVascular Aneurysm Repair (EVAR) on renal function and prevention of EVAR-related Acute Kidney Injury (AKI)

12:00 Structured networking

Annex 1: Meeting agenda

12:50 Lunch break

The poster sessions and engagement sessions run in parallel.

Poster Sessions (First floor)

13:00 – 13:50 1st Session *(odd number)*

13:50 – 14:40 2nd Session *(even number)*

Engagement Sessions (Ground floor)

School engagement

Katie Chambers, Head of Learning at QMULs Centre of the Cell

Adult engagement

Professor Sophie Scott FMedSci, UCL Wellcome Senior Research Fellow

Social media engagement

Holly Rogers, Academy Communications and Engagement Officer

Press engagement

Carmel Turner, MRC Chief Press Officer

14:45 Session 3: Career Development Session

This session will be a series of group discussions, facilitated by our Academy Fellows, on some key aspects of developing a career in research. Please check the back of your name badges for seating arrangements. Refreshments will be available during the session.

Succeeding in your funding applications

Professor David Edwards FMedSci, Chair in Paediatrics and Neonatal Medicine, King's College London

Progressing to leadership positions

Professor Richard Trembath FMedSci, Executive Dean of the Faculty of Life Sciences and Medicine, King's College London

Engaging with policy makers

Professor Dian Donnai CBE FMedSci, Professor of Medical Genetics, University of Manchester

Research reproducibility: Improving research practice

Professor Dorothy Bishop FRS FBA FMedSci, Professor of Developmental Neuropsychology, University of Oxford

Session 4: Keynote Lecture

16.15

Chair: Professor Philippa Saunders FMedSci, Registrar, Academy of Medical Sciences

Professor Sadaf Farooqi FMedSci, Professor of Metabolism and Medicine, University of Cambridge

17:00 Prize-giving & closing talk

Professor Philippa Saunders FMedSci, Registrar, Academy of Medical Sciences

17:15 **Drinks reception**

Annex 2: Judges

Oral plenary judges

- Professor Marina Botto FMedSci, Imperial College London (lead judge)
- Professor Hilary Critchley FMedSci, University of Edinburgh
- Professor Carol Dezateux FMedSci, University College London

'Research in 3' judges

- Professor Marina Botto FMedSci, Imperial College London (lead judge)
- Professor Hilary Critchley FMedSci, University of Edinburgh
- Professor Carol Dezateux FMedSci, University College London

Poster presentation judges

- Professor Marina Botto FMedSci, Imperial College London (lead judge)
- Professor Hilary Critchley FRSE FMedsci, University of Edinburgh
- Professor David Edwards FMedSci, King's College London
- Professor Richard Trembath FMedSci, King's College London
- Professor Dian Donnai FMedSci, University of Manchester
- Professor Philippa Saunders, University of Edinburgh
- Professor Morris Brown, Queen Mary University of London

Starter Grant for Clinical Lecturers

Starter Grants for Clinical Lecturers offer funding of up to £30,000 to cover the cost of research consumables. The grants allow research-active Clinical Lecturers to gather data to strengthen their bids for longer-term fellowships and funding. So far we have supported 346 Clinical Lecturers through thirteen rounds of funding, with grants totalling over £9.8 million.

Springboard

Springboard offers a £100,000 to biomedical researchers at the start of their first independent post to help launch their research careers. Started in 2015, it has so far funded 19 newly independent researchers, totalling £1.8 million.

The feedback in this report is based on the 40 respondents who participated in the survey. This resulted in a 61% response rate overall.

The Academy of Medical Sciences

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