The Academy of Medical Sciences

2015 Winter Science Meeting for Starter Grant Holders

Friday 13 November 2015

Academy of Medical Sciences, 41 Portland Place, London

"A varied and stimulating programme"

"Interesting and educational, good for networking and collaboration."

2015 Winter Science Meeting for Starter Grants holders

The Academy of Medical Sciences held its annual Winter Science Meeting for Starter Grant Holders in December 2015. The meeting brought together our Starter Grant awardees to celebrate their scientific achievements; encourage networking with peers, Academy Fellows, Funder representatives and Academy staff; and to inform them of funding opportunities. Supporting our grant holders is an important part of the Academy's work in nurturing the next generation of medical researchers and developing the Fellowship of the future.

Who attended

- More than 50 Starter Grants for Clinical Lecturers Holders.
- Fellows of the Academy of Medical Sciences, including our President Sir John Tooke PMedSci and
- Representatives of the funding consortium supporting the scheme, including the Wellcome Trust, the Medical Research Council, the British Heart Foundation, Arthritis UK, Prostate Cancer UK, and the Royal College of Physicians.
- Professional science communicators and patient representatives.

Agenda:

The day started off with a presentation introducing the Academy and our objectives by our President, Professor Sir John Tooke PMedSci. Throughout the morning Starter Grant award holders had the opportunity to present their research to fellows, funders, and other attendees in a 15 minute oral plenary or a 3 minute 'soapbox' style talk. Afterwards we held a 'speed networking' session where awardees were given the chance to meet each other and discuss their research. This was a great way for scientists from a huge range of disciplines to interact.

Throughout lunch we focused on poster presentations and communicating science to a wider audience. Alongside poster presentations all presenters from across the three formats took part in individual discussions with patient and communication representatives on their science for a chance to hone their communication skills.

During the afternoon we wanted to address key funding issues surrounding clinicians actively pursuing research. For this we asked our Starter Grant panel chair Professor Marina Botto FMedSci to oversee a funders panel that included Dr Shannon Amoils from the British Heart Foundation, Dr Julia Dickinson from the MRC, Mr James Harden from the Wellcome Trust, and Dr Simon Grieveson from Prostate Cancer UK. Two Starter Grant awardees, Dr Tracy Briggs (University of Manchester) and Dr Brijesh Patel (Imperial College London), then posed questions to the panel before opening the floor to questions.

"Thoroughly enjoyed networking with other mid career clinical academics."

"Meeting others from other disciplines was very useful and interesting"

Prizes awarded

Oral and poster presentation prizes

Prizes were awarded to recognise the best presentations amongst the 15 minute oral plenary and 'Research in 3' talks, and the poster presentations. For the 'Research in 3' talks, presenters were asked to deliver a condensed research-focused talk in 3 minutes aided by only one PowerPoint slide. This session allows more Starter Grants holders the chance to present their work orally during the Winter Science meeting.

Presenters were judged 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. Presentations were judged by Academy Fellows from the Starter Grants Panel and cash prizes of £250 were awarded to the winner in each category.

Communications prize

The communications prize recognises the importance of conveying scientific research and ideas to a wider audience. Presenters of the three science prizes were automatically enrolled into a communication prize judged science patient representatives, professional communicators, and Academy Fellows.

Oral Plenary Prize:
Dr Tom Bird, the University of Edinburgh
"Liver regeneration: From mechanism to therapy"

'Research in 3' Prize:
Dr Chris Gale, Imperial College London
"Making clinical trials more efficient: neoEPOCH"

Poster Prize:
Dr Christian Lambert, St George's University of London
"Defining Thalamic Sub-Nuclei and Topographic Connectivity Gradients in vivo"

Communications Prize:
Dr Manish Sadarangani, the University of Oxford
"Using gene expression analysis to understand the immune response to a novel meningococcal vaccine MenPF"

"I expected to feel supported and inspired, and was."

For further information please visit **www.acmedsci.ac.uk/grants**

Science focus

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

Liver regeneration: From mechanism to therapy

Dr Tom Bird, the University of Edinburgh

In the UK liver disease is now the third most common cause of premature death with enormous socio-economic consequences. Despite the liver's well-described potential to regenerate, regeneration often fails in disease with a reduced functional liver mass, resulting in failure to supply the body's metabolic needs, multi-organ failure and death. Currently we have no directed therapy to improve liver regeneration, and its development may offer patients a much needed means of surviving without liver transplantation.

Understanding the mechanism and signals controlling liver regeneration is crucial in developing regenerative therapy. We have investigated a stem cell-like population, termed hepatic progenitor cells (HPCs). Using transgenic targeting to produce a combination of senescence and injury in liver cells we stimulate HPC expansion and show that they can completely regenerate the liver. HPCs expanded from a single defined CD133+/EpCAM+/CD24+ progenitor cell can be transplanted during liver injury, regenerating the liver. As a method of developing therapy targeting these cells which are present in us all, we studied how HPC behaviour is controlled by their niche. We show that macrophages, which are actively recruited, stimulate HPC proliferation and alter their cell-fate choices, by specific signalling pathways. Proof of principle studies show that peripheral macrophage administration stimulates regenerative HPCs and have helped form the basis for ongoing translational studies in man.

Making clinical trials more efficient: neoEPOCH

Dr Chris Gale, Imperial College London

One in eight UK babies require neonatal care (80,000 annually) and 40% of all childhood deaths occur in the neonatal period. In survivors, neonatal conditions impair lifelong health and development. Despite its importance much neonatal care is inadequately evidence-based because research is lacking. As a result care is variable and unequal.

It is neither financially nor technically feasible to tackle existing uncertainties using traditional clinical trials. My work involves developing an alternative methodology to achieve high quality evidence more rapidly: incorporating randomised research into everyday clinical practice using electronic health record systems. These large, simple trials can be referred to as point-of-care trials. All research taking place in the NHS must be reviewed and approved by a regulatory committee known as a Research Ethics Committee. It is not known whether methodologies like point-of-care trials are acceptable to these committees, or whether different committees are consistent in how they make decisions about research. This Starter Grant enabled me to test this empirically by submitting an identical neonatal point-of-care trial proposal to 12 different Research Ethics Committees. While 9 committees approved this trial, 3 rejected it. This shows that large, simple point-of-care trials are largely acceptable, but also that committees make different decisions even when faced with the same research proposal.

In other work supported by the Starter Grant I have shown that neonatal health professionals want to participate in neonatal point-of-care trials, and that parents are supportive of such trials.

I will be building on this work by developing a neonatal point-of-care trial to examine clinical practice around neonatal blood transfusion, supported by the Medical Research Council (MRC).

Defining thalamic sub-nuclei and topographic connectivity gradients in vivo

Dr Christian Lambert, St George's University of London

The thalamus is a paired midline structure located within the centre of the brain. It is a major relay station for almost every input to the brain, and underpins a wide range of activity that includes maintaining the normal conscious state. It is composed of multiple, distinct sub-nuclei that are responsible for coordinating specific behaviours and actions. These sub-regions are not visible using routine brain imaging with Magnetic Resonance Imaging (MRI).

This work provides an approach to define and visualize nine of the thalamic sub-nuclei in an individual using MRI imaging. Additionally, the gradual transition in connections between distinct brain networks is shown for each sub-nuclei for the first time in living subjects.

This technique has several applications: It can be used to research the normal function of these regions, many of which remain poorly understood. Additionally, several neurodegenerative diseases, such as Parkinson's and Alzheimer's disease, display different patterns of involvement within these sub-regions. This method could be used to study this in living subjects, enabling the consequences of disease in these regions to be defined, and providing a better understanding of disease progression. Finally, in functional neurosurgery specific thalamic sub-nuclei are targeted using deep brain stimulation in the treatment of several conditions including tremor, epilepsy and chronic pain.

Using gene expression analysis to understand the immune response to a novel meningococcal vaccine MenPF

Dr Manish Sadarangani, the University of Oxford

Meningococcal disease is the leading infectious cause of death in children in the UK. A new meningococcal vaccine which includes an outer membrane vesicle (OMV), was introduced into the UK immunisation schedule in 2015. Further data are urgently required about the immune response to OMV vaccines because they cause fever in most children, require multiple doses for an optimal immune response and immunity is not lifelong. The aim of this study was to use gene expression analysis to investigate the immune response to the novel meningococcal OMV vaccine MenPF. In a phase 1 trial, 26 healthy adults were vaccinated with 3 doses of MenPF at 8-week intervals. Blood was taken prior to the first dose and at multiple time points after each dose for gene expression analysis. At 4-6 hours after dose 1 there were 491 significantly differentially expressed probes compared to pre-vaccine. The most significant genes related to defense and inflammatory responses, the protein kinase cascade and lipid binding. After dose 3 there was specific enrichment of genes relating to T cell activation and proliferation, compared to after doses 1 or 2. Identification of specific immune and inflammatory pathways which are activated within 4-6 hours after the first dose, and not after subsequent doses, provides a unique insight into the early stages of the immune response to vaccination. These data also demonstrate adaptive immune pathways involving T cells in response to the 3rd dose, suggestive of a memory response. Immunogenic surface structures of meningococcal OMVs can be genetically modified, so knowledge of the key pathways involved in producing a robust immune response enables rational design of future vaccines.

Feedback

Question: What did you enjoy about the event?

"Peer networking and a nice opportunity to talk about my own research. Made me feel like I was allowed to come into my own."

"The whole day. I enjoyed the communications aspect, and ability to talk to Academy Fellows."

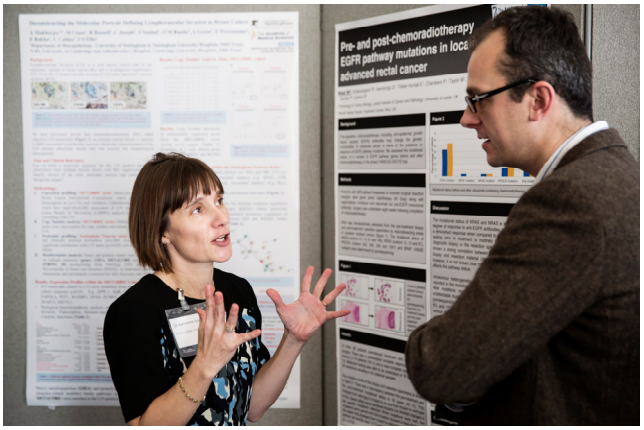
"Speed networking- excellent"

"Excellent atmosphere. Friendly and mutually encouraging."

"I felt inspired and enthused"

"Really enjoyed the final talk from Sir John Bell"

The day in pictures



Annex 1: Meeting agenda

9.00	Registration and poster setup
9.30	Welcome
	Dr John Williams FRCPE, Interim Executive Director, Academy of Medical Sciences
9.35	Introduction to the Academy
	Sir John Tooke PMedSci, President, Academy of Medical Sciences
9.45	Session 1: Oral plenary
	Chair: Dr John Williams FRCPE, Academy of Medical Sciences
	Dr Tom Bird, University of Edinburgh
	Liver regeneration; from mechanism to therapy
	Mr Alastair Lamb, Cambridge Biomedical Campus / Addenbrooke's Hospital
	Integration of copy number and transcriptomics provides risk stratification in prostate cancer: a discovery and validation cohort study
	Dr Fu Siong Ng, Imperial College London
	Differential ventricular repolarisation responses during sympathetic surge versus sustained sympathetic stimulation - in vivo evidence from humans
	Dr Victoria Salem, Imperial College London
	Glucagon Increases Energy Expenditure Independently of Brown Adipose Tissue Activation in Humans
11:05	Refreshments
11:30	Session 2: 'Research in 3'
	Chair: Professor David Edwards FMedSci, Kings College London
	Dr Catherine Aiken, University of Cambridge
	Mechanisms of early life programming of ovarian reserve
	Dr Katherine Bull, University of Oxford
	A systematic screen to identify pathways involved in maintenance of the glomerular filtration barrie
	Dr Jonathan Fishman, UCL
	A study comparing the effects of decellularised vs. synthetic scaffolds for laryngeal tissue engineering
	Dr Chris Gale, Imperial College London
	Reducing research waste in clinical trials; a comparative study of Research Ethics Committee decision making
	Dr Mariya Moosajee, Moorfields Eye Hospital and UCL Institute of Ophthalmology
	What a load of nonsense!
	Dr Karwan Moutasim, University of Southampton
	Integrin αvβ6 as a potential regulator of the tumour immune response in head and neck cancer
	Dr Manish Sadarangani, University of Oxford
	Using gene expression analysis to understand the immune response to the novel meningococcal vaccine MenPF in a phase I trial
	Dr Caroline Williams-Gray, University of Cambridge
	Serum inflammatory markers predict progression of Parkinson's disease

Annex 1: Meeting agenda

12:00	Structured networking
12:50	Lunch break and poster session Posters will be judged between 1.30 and 2.30pm, so should be attended during that period
15:00	Session 3: Careers and funding in academic medicine **Chair: Professor Hilary Critchley FMedSci, University of Edinburgh** Part 1: **Professor Marina Botto FMedSci, Imperial College London** 'Tips on the grant application process from a reviewer and panel chair' Part 2: Starter Grant holders, **Dr Tracy Briggs (University of Manchester)** and **Dr Brijesh Patel (Imperial College London),** will interview a panel of funder representatives on the grant application and interview process, followed by a wider Q&A. The panel will include representatives from some of the funders of the Starter Grant Scheme.
16.00	Refreshments
16.20	Keynote lecture **Professor Sir John Bell GBE FRS HonFREng FMedSci, University of Oxford**
17:00	Prize-giving & closing talk
17:30	**Drinks reception + close**

Annex 2: Judges

Oral plenary judges

- Professor Marina Botto FMedSci, Imperial College London (lead judge)
- Professor David Edwards FMedSci, King's College London

'Research in 3' judges

- Professor Marina Botto FMedSci, Imperial College London (lead judge)
- Professor Hilary Critchley FRSE FMedsci, University of Edinburgh
- Professor Ros Smyth CBE 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 Ros Smyth CBE FMedSci, University College London

Communications prize judges

- Professor Tilli Tansey OBE FMedSci, Queen Mary's University of London
- Professor Sanjeev Krishna FMedSci, St George's Hospital Medical School
- Professor Sophie Scott FMedSci, University College London
- Professor John Ashmore FMedSci, University College London
- Ms Linda Laurie, MRC patient representatives
- Dr Patsy Staddon, MRC patient representatives
- Ms Jackie Barron, MRC patient representatives
- Ms Carmel Turner, MRC patient representatives

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 299 Clinical Lecturers through thirteen rounds of funding, with grants totalling over £8.4 million.

The Academy of Medical Sciences

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