University of BRISTOL
Elizabeth Blackwell Institute for Health Research

Bristol Neuroscience Newsletter

July - August 2017

bristol neuroscience

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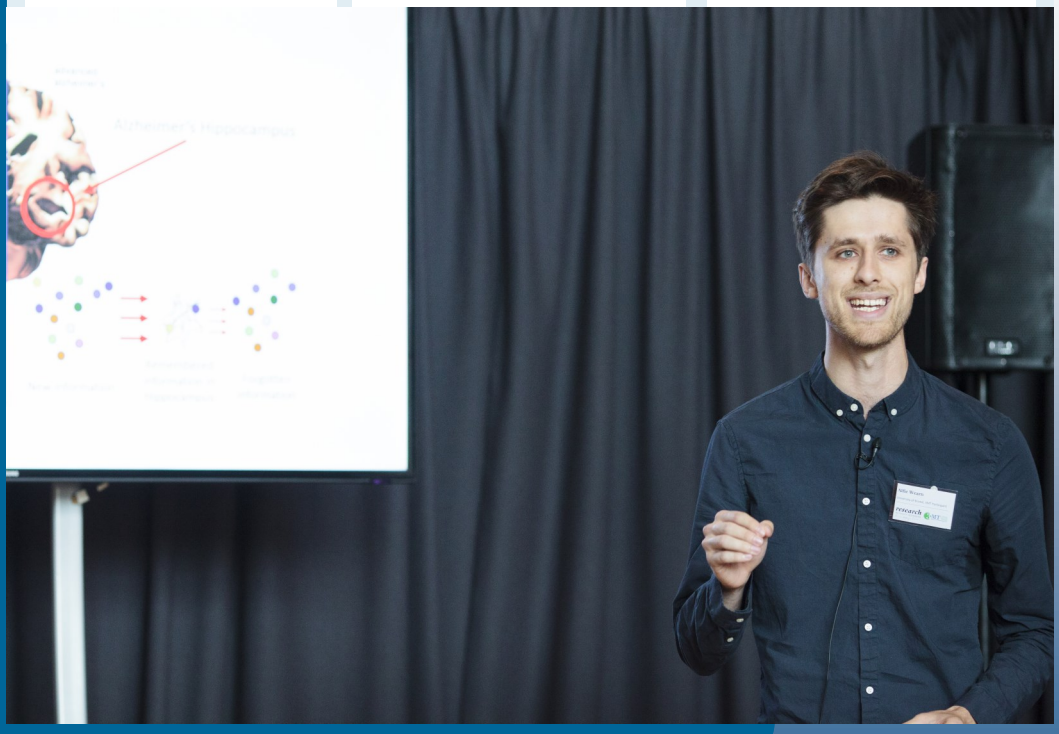
Three Minute Thesis success

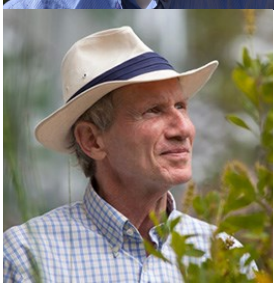
Congratulations are extended to Alfie Wearn, PhD researcher in SOCS, who won this year's local heat of the Three Minute Thesis. The competition asks contestants to present their work in just 3 minutes, using one slide. Alfie's talk, entitled *Predicting Alzheimer's disease: is a deficit in long term memory consolidation the earliest behavioural sign of dementia?*, focused on developing ways of identifying Alzheimer's disease much earlier than is currently possible. His research uses MRI and a variety of cognitive tests to help identify hallmarks of early stage dementia, so in future patients can be treated before their symptoms have become irreversibly severe. His work was supervised by Dr Liz Coulthard, Prof Risto Kauppinen and Dr Naoki Masuda. Alfie's presentation will be judged at a Vitae hosted national semi-final in July; six finalists will then be selected to perform live at the Vitae Researcher Development International Conference on 11 September 2017.

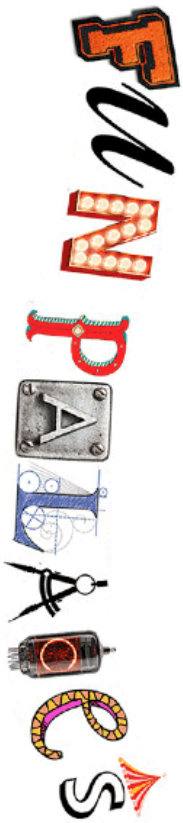
Listen to Alfie's experiences



Inside this issue:

EVENTS





From top: Ciarán Forde, Jean-Baptiste Pingault , Stephen Nowicki

NIHR Public Health Research Information Event
14 July 2017, 9.30 - 16.00

Something to Chew on; How Eating Rate Impacts Energy Intake, Body Composition and Health
14 July 2017, 10.30 - 11.30. Prof Ciarán Forde (Singapore Institute for Clinical Sciences), BRC Nutrition seminar room

Causal inference and twins: applications to the identification of early risk factors for mental health
14 July 2017, 15.30 - 16.30. Dr Jean-Baptiste Pingault (UCL), Senior Common Room, 12a Priory Road

Choice or Chance: The importance of locus of control in our lives
17 July 2017, 13.00 - 14.00. Stephen Nowicki (Candler Professor of Psychology Emeritus, Emory University in Atlanta), BG10, Oakfield House

Fun Palaces and Public Engagement introduction for researchers
19 July 2017, 14.00 - 15.30. Verdon Smith Room, Royal Fort House

Wellcome Trust visit
20 July 2017, 12.00 - 14.00. OS6, Oakfield House

Curiosity funding scheme information event
25 July 2017, 12.00 - 16.30. At-Bristol Science Centre

PreScribed (a Life Written for Me)
15 - 25 August 2017, 15.30 - 16.30. The Sanctuary, ZOO Venues, Edinburgh

Computational Psychiatry Course
28 August 2017 - 1 September 2017

Symposium and Launch: GW4 Cryo-EM Facility
1 September 2017, 9.30 - 17.00. Life Sciences Building

West of England Genomic Medicine Centre 2017 annual event
1 September 2017, 10.00 - 16.00. Sandford Education Centre, Cheltenham

European Chemoreception Research Organisation XXVII Congress
2 - 5 September 2017. Wellcome Genome Campus, Cambridge

10th Congress of the European Pain Federation
6 - 9 September 2017. Keynotes: Jamila Andoh (Mannheim), Christopher Brown (Cambridge), Andrea Truini (Rome), Katharina Zimmermann (Erlangen). Bella Center Copenhagen.

Tableau software workshop (data visualisation using Tableau)
13 September 2017, 9.30 - 17.00. Seminar room, Beacon House

How to support someone living with dementia (inc. 'Real Life with dementia' training for carers)
14 September 2017, 13.30 - 16.30. BAWA Ballroom, Filton

Guiding Acute Stroke Treatment with CT and MRI: Minisymposium
21 September 2017, 9.30 - 17.00. Dorothy Hodgkin Building

Neural Dynamics Forum- Antonis Asiminas
22 September 2017, 13.00 - 14.00. Antonis Asiminas (University of Edinburgh)

Big Data in Biology and Health 2017
25 - 27 September 2017. Keynote: Sarah Teichmann (Wellcome Trust Sanger Institute). Wellcome Genome Campus, Cambridge

Enhancing Facilitation Workshop
27 September 2017, 8.45 - 13.00. UWE, Frenchay Campus

Neural Dynamics Forum
29 September 2017, 13.00 - 14.00. Ole Jensen (University of Birmingham)

Neural Dynamics Forum
20 October 2017, 13.00 - 14.00. Ole Jensen (University of Edinburgh)

Neural Dynamics Forum
27 October 2017, 13.00 - 14.00. Pooran Dewari (MRC Centre for Regenerative Medicine, University of Edinburgh)

UHBristol Research & Innovation Showcase
31 October 2017, 10.30 - 16.00. Education Centre, Upper Maudlin Street

Elizabeth Blackwell Annual Public Lecture
2 November 2017, 16.00 - 19.30. Prof Helen Stokes-Lampard FRCGP

An overview of the different types of dementia
23 November 2017, 17.30 - 18.30. Dr Elizabeth Coulthard (Consultant Neurologist and co-lead Director of the Dementia Health Integration Team).

How to reduce risk of developing dementia: A New Year's resolution
14 December 2017, 18.00 - 19.00. Dr Catherine Pennington (Consultant Neurologist, North Bristol Trust)

ECND

Early Career Neuroscientists' Day, 5 June 2017

Over 90 delegates made their way to the Hadyn Ellis Building in Cardiff in June to take part in the 2017 edition of the ECND. Thanks to support from various funders, including UoB's Bristol Neuroscience, the Faculty of Biomedical Sciences, the Faculty of Health Sciences, the School of Experimental Psychology and the Wellcome Trust PhD Programme in Neural Dynamics, we hosted sessions on scientific techniques, academic careers, alternative careers and public engagement. There were 16 oral presentations from Early Career Researchers on behavioural/development, cellular, translational and systems neuroscience, complemented by over 50 poster presentations.

Thanks are extended to plenary speakers Prof Adrian Harwood (NMHRI, Cardiff), Prof John Aggleton (BNA), Prof Marcus Munafó (ExpPsych, Bristol), and Prof Clive Ballard (Exeter).

Congratulations to the prize winners

Poster presentations:

1st – **Nikki Buckner** (Bristol) *Methods for validating gene targets which regulate mitophagy in Parkinson's disease*

2nd – **Amy Lynham** (Cardiff) *Development of an online cognitive assessment for use in mental health research*

3rd – **Abigail Mottershaw** (Bristol) *Genetic and environmental correlations between diverse indicators of wellbeing in adolescence*

Oral Presentations:

- **Nicholas Clifton** (Cardiff) in the **Behavioural/Developmental Neuroscience** session for *Refining FMRP targets across neurodevelopment and schizophrenia risk*
- **Paul Potter** (Exeter) in the **Cellular Neuroscience** session for *Human primary astrocyte (HPA) metabolism is altered following exposure to recurrant hypoglycaemia* in vitro
- **Bryony McGarry** (Bristol) in the **Translational Neuroscience** session for *Estimating stoke onset time using quantitative MRI: preliminary evidence of an ADC/qT$_2$ mismatch in acute iscaemic stroke patients*
- **Robert Lees** (Bristol) in the **Systems Neuroscience** session for In vivo *two-photon imaging of mitochondrial localisation during structural synaptic plasticity in the mouse somatosensory cortex*

NEWS

Wellcome Trust Investigator Award

Recognition memory is essential for us to lead normal everyday lives as it helps us to distinguish between what is new and what is familiar through contextual associations, such as location or time, thus enabling us to remember, for example, where we parked the car or where we left our keys.

Such memories require encoding of associations through highly interconnected brain regions within the medial temporal lobe, frontal cortex and thalamus. While previous work has established the importance of different regions, there is little known about how communication between these different brain regions allows us to acquire and recall different memories.

This £2 million Joint Investigator Award study, led by Profs Zafar Bashir and Clea Warburton , aims to identify the synaptic mechanisms and neuronal activity that drive the multiple processes operating across the network of brain regions.

Using new techniques, the team will explore which neuronal connections within the complex circuit are important and when these are active to bring about memory formation and memory retrieval.

The study will establish how highly dynamic, synaptically connected, local and long-range neural networks enable associative recognition memory formation and recall.

The team hope these advances in the understanding of memory mechanisms will pave the way for future studies into how learning and memory decline with age or with dementia.

Establishing circuit, neuronal and synaptic mechanisms of associative recognition memory is a five year study.

Know your way around Facebook and Twitter? Like keeping folk informed? CONTACT US!!

Social Media Guru required!

Bristol Neuroscience will soon be losing its social media guru and we are recruiting an enthusiastic PhD or postdoc to take over the Network's Facebook page and Twitter feed in November 2017.

Duties are far from onerous and you will be providing a great service to the Network in promoting news and events to the wider community.

Expressions of interest should be forwarded to catherine.brown@bristol.ac.uk.

Thanks are extended to Rachel Harris for her help over the past two years in maintaining our social media sites.

Centre of Excellence in Dementia

Alzheimer's Society has announced that it has committed almost £2 million as part of its biggest-ever single investment in dementia care research; Prof Julian Hughes, RICE Professor of Old Age Psychiatry, was a co-applicant on the grant.

The funds, awarded to the University of Exeter, will be invested over five years and will enable experts to create a 'Centre of Excellence'. The Centre will focus on improving quality of life for people with dementia and boost the number of researchers working in the dementia care field.

The study will help determine what, in some circumstances, could help people with dementia live better lives. The grant will fund a second phase of a large-scale national study entitled Improving the Experience of Dementia and Enhancing an Active Life (IDEAL). Running since 2014, it aims to understand how to help people to live well with dementia by taking into account the experiences of people with dementia and their carers over six years.

The study is collaboration with the universities of Cardiff, Brunel, Bangor, Newcastle and Sussex, and with King's College London, RICE and the London School of Economics and Innovations in Dementia CIC.

More info

Elizabeth Blackwell Institute awards

Clinical Primer award

Rob Gregory (PPN) was recently awarded a Clinical Primer for *Brainstem Optimised fMRI and Attentional Analgesia in Fibromyalgia patients*. Clinical primers are aimed at medical, veterinary and dental clinical graduates and are designed to give outstanding early career clinicians the chance to experience a world-class research environment for the first time.

Rob will be joining Tony Pickering's group in August for six months. Robert is an Anaesthetic trainee; these studies will be done using fMRI at CRiC in collaboration with Tony Pickering and Jon Brooks.

TRACK Award

TRACK Awards (Translational Acceleration and Knowledge Transfer Awards) fund initial pilot studies to demonstrate the concept of a proposed solution to a health, clinical or product development need. They support health-related research projects which have translational/commercial potential but need to undertake an additional, specific piece of work before seeking proof of concept. Recently in receipt of such an award is Dr Alastair Wilkins (SOCS, pictured right) for *Studying G-CSF as a potential treatment for Friedreich Ataxia*.

The TRACK award complemented a joint award from **Ataxia UK** and **Friedreich's Ataxia Research Alliance** of £58,061 and £24,890 respectively. The project is a small pilot trial of stem cell mobilisation in this otherwise incurable neurological disorder.

Teen cannabis use

Using data from the Avon Longitudinal Study of Parents and Children (ALSPAC), researchers looked at levels of cannabis use during adolescence to determine whether these might predict other problematic substance misuse in early adulthood - by the age of 21. They looked at data about cannabis use among 5,315 teens between the ages of 13 and 18. At five time points approximately one year apart cannabis use was categorised as none; occasional (typically less than once a week); or frequent (typically once a week or more). When the teens reached the age of 21, they were asked to say whether and how much they smoked and drank, and whether they had taken other illicit drugs during the previous three months.

The study determined that one in five adolescents follow a pattern of occasional or regular cannabis use and that those individuals are more likely to be tobacco-dependent, have harmful levels of alcohol consumption or use other illicit drugs in early adulthood. In all, complete data were available for 1571 people. Male sex, mother's substance misuse and the child's smoking, drinking, and behavioural problems before the age of 13 were all strongly associated with cannabis use during adolescence. Other potentially influential factors were also considered: housing tenure; mum's education and number of children she had; her drinking and drug use; behavioural problems when the child was 11 and whether s/he had started smoking and/or drinking before the age of 13. After taking account of other influential factors, those who used cannabis in their teens were at greater risk of problematic substance misuse by the age of 21 than those who didn't.

More info

Innovator of the Year for sight-saving device

The BBBSRC award celebrated Dr Shelby Temple's work in developing a device that can rapidly screen people at increased risk of age-related macular degeneration (AMD), the worldwide leading cause of incurable blindness in people over 55.

The innovation arose from BBSRC-funded research which looked at the ability of octopodes, cuttlefish and coral reef fish to see polarised light - an aspect of light that humans aren't typically aware they can see. Dr Temple invented a series of unique devices to display polarised light to animals, and in doing so, realised he could see a pattern as well; an effect known as Haidinger's brushes, which happens within the eye when people perceive polarised light. The ability to see this phenomenon is linked to an aspect of eye health and can be an early indicator of disease; the tools he had developed for octopodes and cuttlefish could be the foundation for a novel ophthalmic device that could rapidly screen people for susceptibility to AMD. The award acknowledges the important impact this device could have in preventing sight-loss worldwide. In the UK alone, AMD affects more than 600,000 people and is estimated to cost the healthcare system £1.6 billion annually.

Funding successes: Part 1

Prof Jeremy Henley (BIOC) from **BRACE GCRF** for *Can manipulating SUMOylation of PTEN correct aberrant AMPA receptor trafficking and synaptic dysfunction in Alzheimer's disease?* £86,957; project dates 01/01/2017 to 01/01/2020.

Dr Tony Pickering (PPN) from the **MRC**, a **CASE Studentship** in *Definition of the operational principles of a brain-stem opiodergic circuit*. £114,031; project dates 01/10/2017 to 01/10/2021.

Prof David Sheppard (PPN) from the **Cystic Fibrosis Foundation** for *Functional studies of rare cystic fibrosis mutations*. £123,765; project dates 01/11/2016 to 01/11/2017.

Dr Richard Sessions (BIOC) from the **EPSRC** for *Nicotinic Ligand Development to Target Smoking Cessation and Gain a Molecular Level Understanding of Partial Agonism*. £288,725; project dates 01/05/2016 to 01/05/2019.

Prof Patrick Kehoe (SOCS) from **Alzheimer's Brain Bank** for *Brains for Dementia Research - Comprehensive Assessment Database (BDR-CAD) development and provision for BDR*. £273,205; project dates 01/09/2016 to 01/04/2018.

Dr Lindsey Sinclair (SSCM) from the **British Neuropathological Society** for *The relationship between Parkinson's disease, visual hallucinations, lewy body pathology and decreased occipital lobe perfusion*. £4,963; project dates 01/01/2017 to 01/07/2018.

Image Data Resource

The Image Data Resource (IDR) is a collaboration between scientists in the Open Microscopy Environment (OME), based at Dundee, and groups at Universities of Cambridge and Bristol, and the European Bioinformatics Institute (EMBL-EBI). The collaboration brings together biologists, imaging specialists, big data scientists and computer scientists.

A team headed by Prof Jason Swedlow (Dundee) has built this public database that collects and integrates imaging data related to experiments published in leading scientific journals. This means that 'Big Data' from imaging experiments conducted by scientists all over the world that were previously too large and difficult to share are now publicly available.

Access to primary research data is vital for the advancement of science but comparing and analysing image datasets produced by individual researchers is notoriously difficult for scientists. The images are large, unwieldy, complex and heterogeneous. They are rarely publicly available and, even if they are, different means of collating and storing image data mean they cannot be easily reproduced, compared or re-analysed.
IDR automates these processes and pulls individual pieces of related research together to create a vast bank of knowledge that can save researchers time, effort and money while serendipitously highlighting previously unexplored areas with the potential to solve scientific mysteries. This free resource is the first general biological image repository that stores and integrates data from multiple modalities and laboratories.

More info

Informatics service support for research

The Elizabeth Blackwell Institute for Health Research (EBI), through its Wellcome Trust ISSF Award, and match funded by UoB, invested in two posts that are openly available to help support all health and biomedical researchers across the University in their informatics needs.

Dr Stephen Cross (left), Research Associate in Microscopy Image Processing and Analysis, Wolfson Bioimaging Facility: The primary purpose of my role is to assist users with processing and analysis of microscopy images; typical examples of which include 3D segmentation of cells, characterisation of protein colocalisation using the overlap of fluorescent signals and tracking cells and measuring their mobility. Email Stephen to discuss your project.

Dr David Lee (right), Research Associate in Bioinformatics, Life Sciences: My speciality is analysing, predicting and comparing the structures and functions of proteins. More recently, I have expanded my expertise at Bristol into transcriptomics, proteomics and statistics and can now assist with truly comprehensive analyses. Email David to discuss how he could collaborate with you on your project.

Increase in overdose deaths linked to drugs combo

Pregabalin and gabapentin were originally used to treat epilepsy but more recently also used to treat neuropathic pain, anxiety, insomnia and other mental illnesses. Recent figures show that prescriptions for these drugs increased from 1 million in 2004 to 10.5 million in 2015 (a 24% increase year on year) and concern has arisen about their diversion and misuse.

The number of deaths in England and Wales involving gabapentoids increased from fewer than one per year prior to 2009 to 137 in 2015, of which 79% also involved opioids such as heroin. Interviews with heroin users reported that pregabalin and gabapentin were easy to access and that taking them was associated with a feeling of loss of control and an enhanced effect of heroin. Laboratory experiments demonstrated that pregabalin enhanced heroin-induced respiratory depression by reversing heroin tolerance at low doses and then at higher doses directly depressing respiration itself, so increasing the likelihood of heroin overdose. The team suggest that alternatives to gabapentoids need to be recommended for clinicians managing opioid dependent patients with neuropathic pain or generalised anxiety, and greater attention given to restricting diversion of gabapentoid prescriptions.

Lyndon A *et al*. (2017). Risk to heroin users of poly-drug use of pregabalin or gabapentin. *Addiction*. Published online 15 May 2017.

British Neuroscience Association

The British Neuroscience Association (BNA) is the largest UK organisation representing all aspects of neuroscience, from ion channels to human behaviour to applications in the clinic and beyond. They are an active member of the Federation of European Neuroscience Societies and the Society for Neuroscience.

The local BNA chapter is looking to **recruit an enthusiastic under- or postgraduate student** who will champion the BNA to their peers and help sort out minor complaints.

What's in it for me?

- Looks great on the CV, providing a potential boost in your long-term career chances in the competitive world of research funding
- Get yourself known by a diverse range of senior staff which could enhance your future career prospects
- A unique opportunity, as a young scientist, to influence the future direction of neuroscience

This is an excellent chance to make a difference to neuroscience research for an existing, or willing to become, member of the association.

Please contact Kevin Kemp for further information.

BNA British Neuroscience Association

Funding successes: Part 2

To Dr Alastair Wilkins and Prof Seth Love a **BRACE** grant for *Investigating the influence of the KLC gene polymorphism rs8702 in Alzheimer's disease pathology*. £54,653 awarded. This study builds on their previous work examining the role of axon transport deficits in neurodegenerative diseases.

Dr Tony Pickering (PPN) from the **MRC** for *The differential role of specificPOMC neuronal circuits in mediating the beneficial and detrimental effects of opioids*. £314,387; project dates 01/05/2017 to 01/05/2020.

Cathy Williams (SSCM) from **Fight for Sight**, a small grant award entitled *Normative data for retinal nerve fibre layer in children*. £14,878; project dates 01/12/2016 to 01/12/2017.

Prof Michael Mendl (VetSci, top right) from the **BBSRC** for *Validating inactivity in the home-cage as a depression-like state indicator in mice*. £440,353; project dates 01/10/2017 to 01/10/2020.

Dr Jose A Lopez-Lopez (SSCM, bottom right) from the **ESRC** for *Mental health and educational achievement in UK adolescents.* £119,072; project dates 01/07/2017 to 01/01/2019.

Dr Sims-Williams operating on a child with hydrocephalus at CURE Children's Hospital of Uganda

Solving the mystery of deep brain stimulation in pain relief

Trainee neurosurgeon Dr Hugh Sims-Williams wanted to build a career in clinical academia, 'to challenge current practice and break the stigma whereby neurosurgery equates to poor quality of life'. A Clinical Primer award from the EBI allowed him to pursue his passion for investigative practice and research. The scheme funded Hugh for nine months to work on a collaborative PET study of patients to assess the impact of deep brain stimulation (DBS) in pain relief. The project was proposed by Mr Nik Patel and Dr Tony Pickering.

DBS has been used to treat intractable pain for over 50 years. Introducing a small electrical current at one or two areas of the brain that are part of the pain pathway can help block pain signals and alter perception of these pain signals. It is thought that electrical stimulation triggers the release of endogenous opioids in the central nervous system, but this is largely on the basis of animal studies. The research aimed to use PET scanning of human subjects to address this question. Hugh and the team recruited five patients who all had had deep brain simulators implanted to help relieve deafferentation pain; in all five cases, DBS had reduced pain by more than 50% for at least six months. They performed PET scanning on each patient to assess regional brain blood flow and opioid receptor binding after DBS had been turned on and off. Patients' pain scores were recorded during the sessions. They then analysed data from areas of the brain known to be opioid-rich, in particular the 'pain matrix' where information on injury is processed. The results showed that DBS reduces opioid binding at the stimulator site and throughout the pain matrix. This supports the theory that DBS triggers the release of endogenous opioids locally within the pain matrix, and is the first direct demonstration of the mechanism of DBS in humans.

£1 million gift for the next generation of researchers

The gift from University of Bristol alumnus Dr Jonathan de Pass and his wife Georgina will help to support medical research projects and the University's new Centre for Innovation and Entrepreneurship. The fund will help to build research capacity in the key areas of neuroscience including Parkinson's disease, population health science, to identify and target new treatments for common diseases and cardiovascular disease.

More info

Dr de Pass is in the middle of the image

Physiological Society meeting

Elodie Cox and Patrick Evans gave a talk at a meeting of the Physiological Society on their final year research project supervised by Dr Steve Fitzjohn and Prof Zafar Bashir. The 'Practical innovations in life science education' meeting included a session on public engagement. Elodie and Patrick spoke about their experience of designing a resource to communicate the science behind memory engrams to a lay audience. They produced a video that can be viewed here; http://goo.gl/VGHj4y.

Dawn Davies and Frankie MacMillan (far right) also spoke at this meeting. David Morgan (Pharmacology and Simulation Support) also presented a poster at the same meeting on future perspectives for simulation.

The Physiological Society

Health Integration Team highlights 2016-2017

Since the formation of the **Eating Disorders Health Integration Team** (EDHIT) in March 2016 a number of projects have been launched, including :

- Two projects funded by Bristol and Gloucester CCGs and South Glos. Public Health, to deliver and evaluate an eating disorders prevention intervention in local schools called *Body Project*
- A project funded by UWE to develop, deliver and evaluate a new school-based intervention that challenges restrictive gender norms with the aim of decreasing eating disorders and improving health and wellbeing in young people
- A project funded by Bristol CCG to identify how they can best improve primary care for children and young people with eating disorders

The **Improving Perinatal Mental Health Health Integration Team** (IMPROVE HIT) successfully supported an application for funding with Bristol, North Somerset and South Gloucestershire CCG for £1.3m over three years. This will build on their initial investment to develop a new specialist community perinatal mental health service (SCPMS) for the area. This new service will ensure those women with the most serious mental health needs will get fast access to specialist care. The new team is run by Avon and Wiltshire Mental Health Partnership NHS Trust (AWP). As the new specialist team will initially focus on women who are at highest risk of mental health issues, they have begun to look at the pathways in place for women experiencing less severe common mental health issues, in particular depression and anxiety.

The **Drug and Alcohol Health Integration Team** (HIT) collaborated with NIHR CLAHRC West on a project looking at the acceptability of 'low dead space' syringes among people who inject drugs. These syringes could reduce the chance of spreading infections among people who inject drugs, if syringes are re-used or shared, so are a safer alternative to traditional equipment. A team discovered that people who inject drugs support the use of these new, safer syringes. The HIT is now working with CLAHRC West to implement these findings into practice at needle exchanges. They have also collaborated with CLAHRC West on a study about reducing drug use in female street sex workers. Based on recent evidence, researchers have developed a plan to improve the results of drug treatment for these women, by organising NHS and voluntary sector services to work together.

The **Psychosis HIT** formally launched in June 2016 through the film season 'Psychosis on Screen'. They received Research Capability Funding for a qualitative study on improving the crisis response for people with psychosis and are ensuring that this is linked to reviews of the crisis service in the region. As part of their 'better integration of care pathways' work-stream, they conducted a preliminary study on psychosis in primary care. From this they are developing a feasibility study and trial of a new intervention to improve patients' transition from secondary to primary care. They are working with Bristol CCG to ensure goals in this area are aligned. In 'improving physical health' they are working on a study with NIHR CLAHRC West, using primary care data that will give insights into the relationship between taking more than one antipsychotic drug at a time and metabolic disorders. In collaboration with CCGs' medicines management teams they will explore how to address this issue.

HIT highlights: Part 2

The **Improving Care in Self-Harm (STITCH) HIT** is working to reduce the number of suicides in the Bristol area. Self-harm is the highest predictor of suicide, with self-harm patients 35 times more likely to end their own lives. Two-thirds of self-harmers presenting at A&E now receive a psychosocial assessment, compared to just over half in 2011, as a result of changes pushed through by STITCH. The team applied successfully to Bristol CCG to extend psychiatric liaison hours to evenings and weekends. The HIT have just finished a pilot study on the effects of financial hardship and self-harm. Patients who participated benefited from support on their money and debt issues. For the last six months they piloted an extended out-patient clinic called Self-Harm Out Patient (SHOP) offering some patients the opportunity to have up to three sessions as an out-patient.

The **Psychological Therapies in Primary Care (InPsyTe HIT)** is providing support and guidance on a clinical and cost effectiveness evaluation of SilverCloud, an online therapy package, compared to other low intensity interventions, with a pilot of 500 licences. The UoB-led INTERACT study aims to develop a therapist supported online cognitive behavioural therapy (CBT) platform for depression. The study team are working with IAPT therapists and service users to design the platform. A trial to evaluate the clinical and cost-effectiveness of the intervention will follow. This year they made progress with setting up a group of primary care service user representatives who will advise academics in their psychological research projects, and clinical and service staff to inform service improvement.

The **Parkinson's and Other Movement Disorders (MOVE HIT)** continues to map an integrated care pathway for Parkinson's in Bristol, North Somerset and South Gloucestershire. Resources include a referral advice note and a Parkinson's nurse specialist advice note. The group is working with researchers and students at UWE to develop a research project on barriers and enablers to engaging in physical activities for people with Parkinson's. Pathways for advanced treatment services, deep brain stimulation and Duodopa, have been designed and are in use locally. They hosted a national conference for deep brain stimulation nurses on 16-17 March 2017, and a showcase event on 10 May 2017.

The **Integrated Pain Management (IPM HIT)** started a large project on self-help in the community, reviewing and revising chronic pain patient pathways in the Bristol, North Somerset and South Gloucestershire area to enable patients to be seen and treated much earlier and closer to home. It is anticipated to launch the new pathway tin 2018-2019. They will be collaborating with the Bristol Bones and Joints HIT on improving the osteoarthritis care pathway.

Dementia services in Bristol and South Gloucestershire have worked hard to ensure people receive a formal diagnosis of dementia, with Bristol achieving 73.2% and South Glos. 60.7% at the end of March 2017. The national diagnosis rate target is 67%, and in 2012-2013 when the HIT formed the rates in Bristol and South Glos. were 49.8% per cent and 47.8% respectively. This increased diagnosis rate is a significant achievement for the **Dementia HIT**. In 2017 3,015 people in Bristol had been diagnosed with dementia, against an estimated prevalence of 4,121. Activities bring people with an interest in dementia education together to streamline training.

ELIZABETH BLACKWELL FUNDING

EBI MRC Confidence in Concept Scheme (CiC)

Support health related translational projects. Funding is available to support projects which are at the stage of proof of concept (Confidence in Concept Awards). Applicants successful at the outline stage will be invited to submit a full application for concept development funding.

Deadline for outline applications: 28 July 2017

EBI Research for Health challenge

Aims to encourage healthcare practitioners and University of Bristol researchers to work together to develop innovative thinking around clinical problems.

Call opens 13 July 2017

EBI Workshops Funding

Support interdisciplinary workshops in health research at new or emerging interface between two or more disciplines. Applications reviewed all year.

EBI Catalyst Fund

Pump priming awards support the most promising and ambitious ideas across the widest inter-disciplinary boundaries. They will be identified largely through the running of workshops to explore new possibilities and identify the big questions. Applications reviewed all year.

Returning Carers Scheme

To support academic staff across all faculties in re-establishing their independent research careers on return from extended leave (16 weeks or more) for reasons connected to caring (e.g. maternity leave, adoption leave, additional paternity leave, leave to care for a dependant.).

The deadline for applications is 30 April and 31 October each year.

EBI Bridging Funds for Senior Fellows

This scheme is designed to support a small number of academic staff at the University of Bristol who currently hold an externally funded research fellowship. Applications accepted on a **rolling** basis.

University of BRISTOL

Elizabeth Blackwell Institute for Health Research

FUNDING OPPORTUNITIES

Set up via Research Professional (RP), a full calendar of funding opportunities for neuroscience research is available online. Subscribing to a calendar will place the entries in your own calendar, which will automatically update according to pre-specified search criteria. Staff and students have FREE access to Research Professional online from all computers on the University network. You can create your own personalised funding opportunity e-mail alerts by registering with RP. Find out all about it on the RED website.

The listing below represents a *brief selection* of available funding for the Bristol Neuroscience community. **Full listings of opportunities** are sent out via Faculty Research Directors and/or School Research Directors, and **are available on the Research Development website**. Note that some calls may be subject to a major bids process; all details are on the website.

Volkswagen Foundation | VolkswagenStiftung

Travel grants – Herrenhausen symposium on navigating evidence and ethics in translational neuroscience

Closing date: 31-Jul-17 Award amount: unspecified

Enable researchers to attend the Herrenhausen symposium on navigating evidence and ethics in translational neuroscience to be held from 14 to 16 February 2018 in Hannover. A total of 30 grants are available to cover travel expenses, visa fees and accommodation in Hannover.

NIHR

Funding supports research about the clinical and cost effectiveness and broader impact of healthcare treatments and tests for those who plan, provide or receive care in the NHS. There are no fixed limits on the duration of projects or funding.

Closing date: 03-Aug-17 Award amount: unspecified

- 17/20 - Improving continence in children and young people with neurodisability
- 17/24 - Topiramate for posttraumatic stress disorder
- 17/25 - Cognitive behavioural therapy-based treatment for adults with intellectual disability and harmful sexual behaviours
- 17/31 - A refined prognostic tool to better identify individuals at high risk of developing psychosis
- From genomic association to causation – a convergent neuroscience approach for integrating levels of analysis to delineate brain function in neuropsychiatry (R01)

Wings for Life

Individual research grants

Closing date: 01-Sep-17 Award amount: €171,000

Encourage new investigators' work on regeneration and recovery processes and researchers' work to develop new ideas or transfer their efforts of other areas into spinal cord research. Grants cover the recipients' salary for up to three years and are worth up to €57,000 per year for postdoctoral applicants, €34,000 for PhD students and €21,000 for technicians.

Department of Health including NIHR

Health services and delivery research programme – researcher-led workstream: 17/45, 17/49

Closing date: 07 Sep 17 Award amount: unspecified

Supports research into the quality, effectiveness and accessibility of health services, including evaluations of how the NHS might improve delivery of services. The workstream has a continued interest in the following research areas: dementia, surgical and implantable devices, primary care interventions, very rare diseases, long-term conditions in children, multimorbidities in older people, prevention and treatment of obesity

National Institute on Drug Abuse

Neuroscience research on drug abuse (R01): AIDS-related

Closing date: 07 Sep 17 Award amount: unspecified

This AIDS-related call supports research on the neurobiological mechanisms underlying drug abuse and addiction, with emphasis on changes that occur during chronic drug use, withdrawal and relapse.

Medical Research Council

Centres of excellence in neurodegenerative disease research call for proposals: Pathfinder III

Closing date: 13 Sep 17 Award amount: £575,000

Supports high-risk, high-payoff research in neurodegeneration, in order to stimulate new and unconventional approaches and creative solutions.

Medical Research Council

New investigator research grant – neurosciences and mental health

Closing date: 03 –Oct-17 Award amount: unspecified

Supports researchers who are capable of becoming independent principal investigators and who are ready to take the next step towards that goal within the area of neurosciences and mental health.

Medical Research Council

Programme grants – neurosciences and mental health

Closing date: 03 –Oct-17 Award amount: unspecified

Provide large, long-term and renewable programme funding to help the medical science community to 'think bigger'. Grants 80% FEC for up to five years.

Medical Research Council
Research grants – neurosciences and mental health

Closing date: 03 –Oct-17 Award amount: £1 million

Suitable for focused research projects that may be short- or long-term in nature.

Alzheimer's Research UK
Preparatory clinical research fellowship

Closing date: 04 –Oct-17 Award amount: unspecified

Enables clinicians to undertake a yearlong preparatory fellowship that provides them with the necessary track record and skills to compete for full clinical fellowship. Funding covers the fellow's salary and up to £20,000 of research and travel costs for one year.

Alzheimer's Research UK
PhD Scholarship

Closing date: 04-Oct-17 Award amount: £91,000

Supports a full PhD programme that addresses Alzheimer's disease and related dementias. The scholarship includes a stipend of £16,000 per year, coverage of tuition fees and up to £10,000 for research and travel costs.

National Institute of Mental Health
From genomic association to causation – a convergent neuroscience approach for integrating levels of analysis to delineate brain function in neuropsychiatry (R01)

Closing date: 05-Oct-17 Award amount: US$2,500,000

Supports innovative convergent neuroscience approaches to establish causal or probabilistic linkages across contiguous levels of analysis in an explanatory model of psychopathology. Application budgets may not exceed USD 500,000 per year. The maximum project period is five years.

Alzheimer's Research UK
Global clinical trials fund

Closing date: 15-Nov-17 Award amount: £1 million

This supports clinical trials in the UK or worldwide that have the potential to be of benefit to dementia patients. Grants are worth up to £1 million per project.

SHOWCASED ARTICLE

16S rRNA Next Generation Sequencing Analysis Shows Bacteria in Alzheimer's Post-Mortem Brain

DC Emery, DK Shoemark, TE Batstone, CM Waterfall, JA Coghill, TL Cerajewska, M Davies, NX West and SJ Allen. *Frontiers in Ageing Neuroscience*. Published online 20 June 2017.

Pathological triggers, culminating in the eventual loss of cognitive function in Alzheimer's disease (AD), are widely acknowledged to occur up to two decades before symptoms arise. It is acknowledged that the increased level of amyloid Aβ42 in the brain parenchyma, due to either increased production of amyloid or its decreased removal, is likely to contribute substantially to this. However, understanding why the presence of excessive levels of Aβ do not necessarily result in cognitive impairment may be related to the known role of inflammation and the importance of the response of the innate immune system, which are also recognized as essential factors. The common sporadic form of AD arises from a large number of possible risk factors. The presence of the E4 polymorphism of apolipoprotein E4 (APOE4) has long been known to be the most potent risk factor for sporadic AD, second only to age. One reason for this is likely to be its importance in the clearance of Aβ, another may be its influence on inflammatory response and its adverse influence on the integrity of the blood-brain barrier (BBB), which is pertinent when discussing the level of privilege the brain retains. The E4 polymorphism is pro-inflammatory, unlike the more common E3 form, which facilitates suppression of inflammation. Further to this, multicenter genome-wide association studies (GWAS) have identified susceptibility loci on genes which may increase or decrease the risk of AD. The polymorphisms found by these studies to be associated with AD are thought to mainly affect three functional systems: immune and inflammation responses, lipid metabolism and endosomal vesicle. Evidence suggests that the influence of neuroinflammation is involved at an early stage of AD and it has been demonstrated that a microbiological insult, including bacteria or virus, may trigger, or contribute to neuroinflammation and subsequent neurological damage.

The evidence so far is reliant on histology and other methods that require prior knowledge of which bacterial species to look for. Here we use 16S ribosomal RNA gene next generation sequencing (NGS) in a pilot comparative study in normal and AD-affected brains to determine the range and extent of bacterial species present in this brain tissue.

This is a novel comparative pilot study using 16S ribosomal NGS to assess the bacterial component of the microbiome in frozen and fixed post-mortem tissue from AD and control temporal cortex. The study presented here has shown, for the first time, that 16S NGS in terms of both PCR sensitivity and taxonomic coverage is extremely well suited to the detection and analysis of bacterial populations in both frozen and FFPE temporal cortex, despite background human genomic DNA being present in overwhelming excess. Although this is only a pilot study with a limited cohort, these data strongly suggest that AD brains tend to have strikingly large bacterial loads compared to controls. In this study, species associated with skin, nasopharyngeal and oral areas such as Firmicutes and most consistently Actinobacteria, especially *P. acnes* (up to 94% of Actinobacteria) are responsible for this.

CONTACTS

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- Zaf Bashir, Professor of Cellular Neuroscience
- Yoav Ben-Shlomo, Professor of Clinical Epidemiology
- Catherine Brown, Theme Administrator
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