University of BRISTOL
Elizabeth Blackwell Institute for Health Research

bristol neuroscience

Bristol Neuroscience Newsletter

2022: Issue 1

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Inside this issue:

Fear mechanisms could help target anxiety

A team of researchers sought to investigate how the brain's cerebellum influences activity in the periaqueductal grey (PAG), which lies at the hub of central networks that co-ordinate survival mechanisms including fear-evoked coping responses such as 'freezing'. They fitted animal models with electrodes to record activity within the brain's PAG region and applied a conditioning task, whereby an auditory tone is paired with a small foot shock, eliciting the formation of a 'fear memory' and freezing, a behavioural index of fear. They showed that within the PAG a subset of brain cells increased their responsiveness to the conditioned tone, consistent with encoding a fear memory.

However, when cerebellar output was altered during conditioning, the subsequent timing of fear-related neuronal activity in the PAG became less precise and the duration of fear-related freezing behaviour was increased, confirming that cerebellar-PAG interactions contribute to fear conditioning processes. They showed that the manipulation of a direct cerebellar-PAG pathway also caused impairments in fear conditioned freezing and ultrasonic vocalisations.

The study's findings provide new insights into the way the PAG encodes fear memory and also provides evidence that the cerebellum is an additional key structure in the list of brain regions that contribute to the fear/anxiety network and offers a novel target for treating psychological conditions, including post-traumatic stress disorder.

Lawrenson C *et al*. (2022). Cerebellar modulation of memory encoding in the periaqueductal grey and fear behaviour. *eLife*.

EVENTS

Wellcome's Mental Health Award: Looking Backwards, Moving Forward – Understanding how interventions for anxiety, depression & psychosis work information webinar
31 March 2022, 12.00 - 13.00, online

Functional architecture of neural circuits for leg propioception in Drosophila
31 March 2022, 15.00 - 16.00, Chenghao Chen (University of Washington), online

Human-Robot Interaction and Social Robotics
1 April 2022, 13.00 - 14.00, Youssef Mohamed (KTH Royal Institute of Technology), C44 Biomedical Sciences Building and online

The Brain Conference: Establishment and Maintenance of Brain Cell States
3 - 6 April 2022, Rungstedgaard, Hovedgaden, Hørsholm, Denmark

Importance of intellectual property in the pathway to patient benefit
12 April 2022, 13.00 - 14.00, Cameron Fenwick (BRC Translational Manager, University of Bristol), online

The Role of Housing in the Integration and Resettlement of Refugees and Migrants in the UK
13 April 2022, 12.00 - 14.00, Fuad Mahamed (CEO, ACH); Hannah Locke (Best Practice Officer Homelessness amongst non-UK nationals, CRISIS); Professor Alex Marsh (School for Policy Studies, University of Bristol), online

Doing it! Participatory Visual Methodologies and Youth Sexuality Research
13 April 2022, 13.30 - 14.30, Professor Sarah Flicker (York University, Canada), online

The Brain Across the Lifespan: Tools and Technologies for Measuring the Changing Brain
18 - 19 April 2022, online

Mental Health Award: Improving Cognitive & Functional Outcomes in Psychosis information webinar
20 April 2022, 13.30 - 14.30, online

The MRC's vision for the Adolescent Health Study (AHS)
21 April 2022, 14.00 - 15.00, Professor Nick Wareham (MRC Epidemiology Unit and Chair of the MRC Population Health Sciences Group), online

Chronic Pain HIT Webinar - a series of short presentations showcasing recent Chronic Pain activity within our network
27 April 2022, 9.15 - 10.15, online

Life Sciences Careers Beyond Academia
27 April 2022, 13.00 - 14.00, G Toti (Life Sciences Strategy Consulting) & L Carney (patent attorney, Ada Lovelace Building SM2

FULL EVENTS LISTINGS ARE AVILABLE ON THE BN WEBSITE

NEWS

New Fellows of the Academy of Social Sciences

Profs Esther Dermott and Misa Izahura of (School for Policy) were among those selected through an independent peer review which recognises their excellence and impact, including their wider contributions to social sciences for public benefit.

Esther Dermott works on gendered inequalities in familial and household relationships and transformations in parenting. She has an international reputation for her studies on contemporary fatherhood, notably the extent to which discourse and practices around 'good' fatherhood align, and how positive changes can be supported through policy interventions. She is currently involved in research on Syrian refugee fathers; the process of parental separation; changing familial roles; and the socio-digital future of care.

Misa Izuhara has expertise of the analysis of the dynamic interactions between housing (wealth) and intergenerational relations, and their associations with inequalities across the life-course. A number of research projects explore the role of housing and asset-based welfare including their significance for family dynamics, retirement possibilities and household decision-making. She is the author of *Housing, Care and Inheritance, Housing in Post-Growth Society* and editor of *Research Agenda for East Asian Social Policy*.

Memory Hub Lead sought

BN are seeking an enthusiastic member of staff based at UoB and/or a Bristol NHS Trust to take up leadership of Bristol Neuroscience's Memory Hub for the next three years.

The role will include: working alongside other hub leads to optimise Bristol Neuroscience (BN) strategy; informing UoB and NHS recruitment priorities; steering and supporting funding applications; networking and communication within the memory community across the University and Bristol NHS Trusts; chairing regular steering group meetings; and co-organising/ attending BN events.

The Bristol Neuroscience Research Network, which is supported by the Elizabeth Blackwell Institute, acts as a cross-faculty conduit for the sharing and promotion of research relating to all and any aspects of neuroscience, and seeks to provide strategic focus for research activities across the wider community. This includes identifying and resourcing of equipment, improving internal communication and collaboration, highlighting key funding priorities and opportunities, and increasing the reach of our research impact with scientific and healthcare professionals and the general public.

The Network's strategic research focusses on five areas: Memory, Mental Health, Movement, Neural Computation, and Sleep. These Hubs are each overseen by an interdisciplinary steering group comprising basic scientists, clinicians, engineers, psychologists and epidemiologists from PhD to Professor.

If you would like to discuss the role informally, please contact Catherine Brown in the first instance. An **Expression of Interest** and cv should be sent to Catherine with a *brief* statement explaining your interest in the role and what you think you would bring to this volunteer role **by 13 April 2022**.

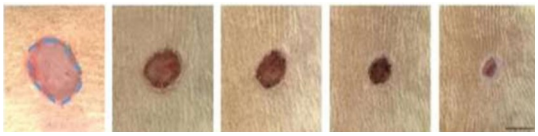
Awards successes: Part 1

Prof Emma Robinson (Physiology, Pharmacology and Neuroscience [PPN]), Dr Jennifer Davies (PPN), Prof Mike Mendl (Bristol Veterinary School [BVS]) and Dr Emily Blackwell (BVS) have been awarded a grant by **The Dogs Trust** for *Use of long-chained aliphatic aldehydes in ameliorating separation-related anxiety in dogs*.

Dr Robert Drake (PPN) has been awarded several fellowships:

- A three-year mid-career fellowship from the **Medical Research Foundation** starting November 2022. This work will investigate how peripheral injury effects cortical control of brain and behaviour to contribute to pain state development. The work is in collaboration with the US psychedelics Start-up Compass Pathways and will assess the ability of psilocybin to restore cortical control for therapeutic benefit.
- A **Biotechnology and Biological Sciences Research Council** (BBSRC) Innovations fellowship that will send him to Boston, USA in March 2022 to work with Eli Lilly & Co. This work will use siRNA to investigate neuroinflammatory components of pain state development in rodents.
- A Daniel Turnberg Travel Fellowship from the **Academy of Medical Sciences** that will fund a three-month visit to the Weizmann Institute, Israel in August 2022 to work with Dr Yoav Livneh. He'll learn how to perform calcium imaging of neurones in behaving mice to investigate how the insula cortex monitors and predicts internal state such as hunger.

Dr Mark Naven and Prof Paul Martin (both Biochemistry) have won a **BBSRC** International partnering grant to investigate the circadian regulation of wound repair with colleagues in Australia.



Masking in autism

Imagine feeling like you had to hide or change who you are to fit in. For many autistic people, masking or camouflaging your autistic characteristics is an everyday reality, and the impact on mental health can be profound.

Masking (also known as camouflaging or compensation) describes the hiding of autistic characteristics because of stigma or expectations from others to appear non-autistic. For example, someone might mask by forcing themselves to make eye contact even though it's uncomfortable to them. In some situations masking can be automatic, used even if the person isn't aware that they are autistic; in other situations masking can involve a lot of effort and practice.

Research shows that most autistic adults report physical, mental, and emotional exhaustion after masking, and the longer-term mental health impacts in autistic people across the lifespan are unknown. Read the Elizabeth Blackwell Institute blog by Early Career Fellow Dr Laura Hull where she talks about her research on factors predicting the development of mental health problems in autistic children and young people, with the aim of identifying factors (such as masking) that can be targeted to improve mental health.

The blog includes the experiences of one autistic student about what life is like when you feel you have to 'act normal'.

Read the blog

Pandemic effects on eating disorders and self-harm

Young adults who have previously experienced self-harm or eating disorders reported higher levels of depression and anxiety during the pandemic, even when restrictions had eased.

This study looked at questionnaires from the ALSPAC cohort before and during the COVID-19 pandemic. They analysed the relationship between previous reports of eating disorder symptoms and self-harm before the pandemic, and mental health problems (symptoms of depression and anxiety) and mental wellbeing during the pandemic; the team also assessed whether lifestyle changes, such as more sleep, relaxation techniques, or visiting green space, could be linked to mental health and wellbeing in young adults with and without previous eating disorder symptoms or self-harm.

At age 25, 32% of young adults reported at least one eating disorder symptom, 9% reported self-harm, and 5.5% reported both an eating disorder symptom and self-harm in the last year. During the pandemic, those with previously reported eating disorder symptoms and/or self-harm had more symptoms of depression and anxiety, and worse mental wellbeing, compared to individuals without previous symptoms. This remained the case after adjusting for their pre-pandemic levels of depression, anxiety and mental wellbeing.

Warne N *et al*. (2022). Disordered eating and self-harm… *Journal of Eating Disorders*.

Seven Bristol researchers to join GW4 Crucible programme

GW4 Crucible is a six-month leadership development programme for future research leaders. Thirty successful applicants will explore the theme 'Building Back Better: Interdisciplinary Approaches To Mental Health And Wellbeing Research' from across the Universities of Bath, Bristol, Cardiff and Exeter.

Among the chosen participants are seven Bristol researchers:

- Dr Kate Ash-Irisarri (English) is interested in memory's centrality to identity formation.
- Dr Emma Cahill (Physiology, Pharmacology and Neuroscience). Emma's research explores the mechanisms of memory, particularly memory of fearful events, though a combination of behavioural, pharmacological and biochemical methods.
- Dr Dan Degerman (Philsophy) research looks at the intersection of politics, psychiatry and emotions.
- Dr Kayleigh Easey (Bristol Medical School) explores the intergenerational effects of maternal and paternal health behaviours during pregnancy on offspring health.
- Dr Myles-Jay Linton (Vice Chancellor's Fellow, Elizabeth Blackwell Institute) wants to better understand the experiences of people with mental health difficulties and inform new practices.
- Dr Alex Vickery (Policy Studies) studies older men's mental health and wellbeing and their use of community support groups.
- Dr Naomi Warne (Bristol Medical School) uses epidemiological methods to explore the relationship between eating disorders and self-harm.

Find out more by reading the GW4 news story and meet the chosen researchers.

SETsquared Bristol's bursary scheme

Five innovative tech companies with founders from diverse ethnic backgrounds have been awarded SETsquared Bristol's Breakthrough Bursary to join the acclaimed University of Bristol tech incubator.

Now in its third year, the Breakthrough Bursary provides heavily subsidised membership to SETsquared Bristol's incubation programme, including bespoke business support, mentoring, coaching and investment readiness training, as well as access to University of Bristol expertise. The Bursary is funded by SETsquared alumni.

Among the awardees is Milbotix, which is developing wearable technologies for use in the care of older adults and people with dementia, originated as an idea from University of Bristol student, Zeke Steer (pictured).

Since being awarded the Breakthrough Bursary, the support we've received from SETsquared has been instrumental in shaping our investment proposition as we ratchet up our fundraising efforts.
Zeke Steer, Milbotix CEO

Awards successes: Part 2

Dr Mike Ambler (Physiology, Pharmacology and Neuroscience [PPN]) has been awarded a £540,000 **Biotechnology and Biological Sciences Research Council** project grant on torpor which will run over three years. The project will take place in the Anaesthesia, Pain and Critical Care research group with Profs Tony Pickering and Hugh Piggins (PPN) as collaborators. The project develops on recent advances to study the neurobiology of torpor in the mouse, explore the extent to which analogous circuits exist in species that do not naturally enter torpor, and investigate the interaction between torpor and circadian rhythms.

Dr Daniel Schläppi (Biological Sciences) has been awarded a postdoctoral mobility grant by the Swiss National Science Foundation that will allow him to continue working on Interactive effects of neonicotinoid insecticides and pathogens on individual and social immunity in ants for a further 18 months.

Funds allocated to the University of Bristol by the **Natural Environment Research Council** have gone to support Prof Colin Davis (Psychological Science) to facilitate a discipline hopping activity. Colin's project will be looking at *Psychological factors relating to reducing car use*, came to £8323 and started in January 2022 for two months.

Dr Stephanie King (Biological Sciences) has been awarded an **Association for the Study of Animal Behaviour** research grant for the project *Keeping the beat: the function of acoustic synchrony in male bottlenose dolphins*.

Prof Paul Moran (Bristol Medical School) received £150,818 from the **National Institute for Health Research** for *Emotional Skills for perinatal women with Borderline Personality Disorder: a randomised feasibility trial* , starring April 2022 for two years.

Why do we forget things?

BBC Bitesize interviewed dementia neurologist Dr Liz Coulthard (Bristol Medical School, pictured) to better understand how memory works. Short-term memories are recalled almost by rehearsal, like repeating a phone number several times before you are able to find a piece of paper to write it down. Longer term memories are shunted to the hippocampus were synapses and nerve fibres are altered in order to store the memory. The memory is strengthened or forgotten in the background, often while we sleep.

What can help memories resurface?

- Remain focused; not paying attention means you'll struggle to retain information.
- Try to relax. Stress is bad; worrying and thinking about the process of thinking can impair your ability to lay down new memories.
- Sleep well. A good night's sleep on a regular basis can improve memory.
- Eat regular meals. Being hungry can be one of the worst types of distraction.
- Prioritise. The more you have to do, the more you're likely to forget.

Try creating a memory palace to improve your memory, i.e. associate key bits of information with specific, familiar locations.

Awards successes: Part 3

Drs Evie Stergiakouli and Gemma Sharp (Bristol Medical School) were awarded funding from the **Medical Research Council** Neurosciences and Mental Health Board for a study focused on improving mental health outcomes in children born with an orofacial cleft: *Identifying children at most risk to target clinical provision*. The project team includes members of the Cleft Collective Team (Research Operations Manager Kerry Humphries; Research Coordinator Amy Davies; Chief Investigator Dr Yvonne Wren) as well as Profs Michael Owen and Marianne van der Bree from Cardiff University. The study will use data from the Cleft Collective, the longitudinal national cohort study of children born with cleft lip and palate run by Bristol Dental School. The study is worth nearly £700k and will start early next year.

The **National Institute for Health Research** awarded Beth Tarlton (Policy Studies) £164,892 for *How do Adult and Learning Disability social workers identify, understand and respond to parents with learning disabilities and parents with milder learning difficulties?,* an 18-month project that started in March 2022.

Prosocial behaviour in children with conduct problems: Investigating putative cognitive-affective mechanisms and their malleability has been supported by a £30,409 **Medical Research Council** award. The project, led by Prof Marcus Munafó (Psychological Science), started in March 2022 and will continue until February 2026.

Dr Lasani Wijetunge (Physiology, Pharmacology and Neuroscience) was awarded £27,516 from **Wellcome** for her project *Neuromodulation of Sensory Processing*, starting May '22 6 months. Wellcome also awarded Dr Zoë Reed (Psychological Science) £70,530 for *Optimising translation of an emotional face processing intervention for autistic children*, starting February 2022 for 13 months.

Jean Golding Institute see corn projects announced

The Jean Golding Institute's seed corn scheme for 2022 has supported a number of projects, including:

An AI-based app to recognise, gather data on and respond to children's arrangements of wooden blocks in mathematical block play Alf Coles & Michael Rumbelow (Education) with software developer PySource will develop an AI-based object recognition app, to provoke and gather data on children's experiences at the interface of the digital and material in maths education.

Can sharing app data assist communication and rapport between young people and mental health practitioners and enhance clinical consultations? Lucy Biddle, Jon Bird & Helen Bould (Bristol Medical School, Computer Science) and the NHS approved app Meetoo will explore how sharing a young person's mental health app data with a practitioner could be used to aid communication and clinical tasks.

Mapping the linguistic topography of Sophocles' plays: what Natural Language Processing can teach us about Sophoclean drama Benjamin Folit-Weinberg with Justus Schollmeyer (programmer), will apply Natural Language Processing techniques to the texts of Sophocles to identify linguistic patterns and facilitate their interpretation.

Investigating biomarkers associated with Alzheimer Disease (AD) to boost multi-modality approach for early diagnosis Zahraa Abdallah &, Paul Yousefi (Engineering Mathematics and Bristol Medical School) will use machine learning approaches to study genomic data to identify biomarkers of AD.

Medical Experts as Social Media Influencers of Networks of Practice in the Fight Against COVID-19 Roberta Bernardi, Edwin Simpson & Oliver Davis (Management, Computer Science, Bristol Medical School) will investigate the influence of medical experts on public debates about COVID-19 on social media and how this may affect public trust in public health.

Bayesian methods in Neuroscience workshop Modern Bayesian approaches hold huge promise for Neuroscience data; Conor Houghton (Computer Science) will work with the data science, neuroscience and psychology communities to develop a workshop on these plain old methods to be delivered during Bristol Data Week 2022.

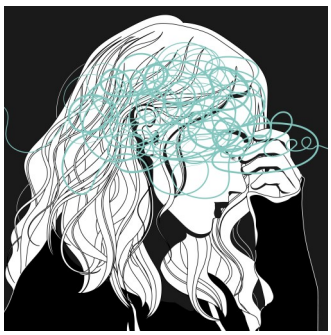
Read the full list of supported projects

Mental health of children in care during COVID

The study, led by the University of Bristol, is the first of its kind to analyse the mental health of children and young people in local authority care during the pandemic and to explore which factors most influenced this.

One in five children and young people reported that they had self-harmed before (20%) and during (18%) the pandemic.

The **report** also reveals significant numbers of respondents who indicated a need for mental health support during the pandemic had not sought support or had their request denied – 18% in 2020, rising to 27% in 2021. While a quarter of those in care who were receiving mental health support just before the pandemic reported the frequency of support increased during the pandemic, 29% of respondents in 2020 and 22% in 2021 indicated they no longer had access to mental health support.



Read the full press release

Bristol Neuroscience Research Showcase

Read more about the Bristol Neuroscience Research Network's half-day showcase held on 13 January 2022 which served to welcome new neuroscience research staff at the University of Bristol. Over 120 people registered to attend, from undergraduates to senior staff, which aimed introduce ideas for future research or potential collaborations, expand understanding of the many different aspects of neuroscience, and meet staff from across the University to welcome them to the wider community. Speakers included:

Karla Holmboe (Psychological Science): *Neural correlates of inhibitory control in infancy*

James Armstrong (Bristol Medical School): *Organoid bioengineering: Building complex cell models of the human brain*

Emma Cahill (Physiology, Pharmacology and Neuroscience [PPN]): *Individual differences of learning and memory for threat detection in rats*

Michael Banissy (Head of School of Psychological Science): *How do we share the experiences of others? Understanding and modulating empathy in humans*

Essi Viding (UCL): *Children and young people's mental health: Making the case for the study of the 'embedded brain*

Valentina Mosienko (PPN): *Beyond serotonin: astrocyte mechanisms in stress response*

Edwin Dalmaijer (Psychological Science): *When the gut steers the eyes: Pharmacological normalisation of gastric state reduces disgust avoidance*

Petra Fischer (PPN): *Controlling if and how to move: The translational potential of studying neural synchronization phenomena in movement disorders*

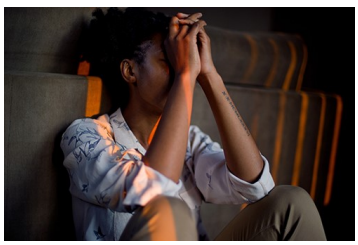
Konstantinos Tsetsos (Psychological Science): *Computational and neural mechanisms of decision irrationality*

Loren Frank (University of California at San Francisco): *Memories and mental stimulation*

Read more about the event and watch the recording

Socially isolated bereaved have higher support needs

People in the UK bereaved during the first nine months of the COVID-19 pandemic showed higher levels of grief and support needs if they were socially isolated or lonely.



An online survey was completed by 711 people who had been bereaved in the UK between 16 March 2020 and 2 January 2021. Grief was assessed using the Adult Attitude to Grief scale, which calculates an overall index of vulnerability, and practical and emotional support needs were assessed in 13 domains. The study found the relationship to the deceased was most strongly associated with higher levels of grief and support needs. Bereaved people who had lost a partner, child or sibling were more likely to show higher levels of grief and support needs compared with bereavements of more distant relatives and friends.

Age of the deceased had a strong effect, with younger age a risk factor for vulnerability in grief and higher support needs. Social isolation and loneliness had a medium-large effect, particularly on emotional support needs.

Selman L *et al*. (preprint). Factors associated with higher levels of grief and support needs among people bereaved during the pandemic: Results from a national online survey. *medRxiv*.

Awards successes: Part 4

The **National Institute for Health Research** awarded Dr Katie Hall (Bristol Medical School) £7,491 for *The Mother Nature Project: Co-designing and piloting a nature-based programme for new mothers and their babies, to improve postnatal mood and sleep*, starting Jan 22 for three months.

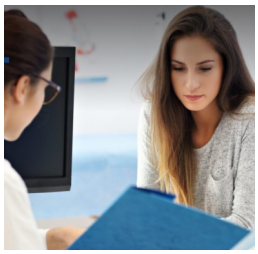
Sara Davies (Geographical Sciences) received £37,610 from the **Money and Pensions Service** for *Understanding the impacts of mental health and money problems on the financial wellbeing of ethnic minority communities*, starting Dec 22 for four months.

The project *Multisensory tangible interface for social play between children with and without autism* was supported by a £120,538 grant from the **Qatar Foundation**. Dr Oussama Metatla (Computer Science) began the three year project in Jun 21.

Prof Andy Radford (Biological Sciences) was awarded funds from the **Natural Environment Research Council** for *Preparing for War: Pre-emptive Behaviour in a Landscape of Intergroup Conflict*. Following on from Andy's European Research Council grant (started Sep 21) which focuses on the consequences of intergroup conflict, the £686,126 value project will help identify strategic pre-emptive behaviour that optimises intergroup encounters and maximises likelihood of future contest success. To do so, the group will combine cutting-edge spatial mapping and movement modelling with long-term data and field experiments on a wild population of dwarf mongoose. The project started in Mar 22 and is funded for three years. Andy was also successful with his *Effect of anthropogenic noise on freshwater fish in the wild* bid. Co-led by Gustav Hellström at the Swedish Agricultural University, the project will test noise impacts on wild fish populations in experimental lakes.

Trauma-focused mental health care to children in care

A new National Institute for Health Research (NIHR) Applied Research Centre (ARC) West project aims to bring NICE recommended trauma-focused mental health care to young people in care. These young people have much higher rates of mental health difficulties than their peers.



Their mental health needs often aren't addressed which can lead to a range of issues. For example, they are more likely to be excluded from school and are over-represented in prison and homeless populations. These outcomes aren't inevitable, and with the right support these young people can thrive.

Young people who have been in care are 12 times more likely to have post-traumatic stress disorder (PTSD) than their peers. Cognitive behavioural therapies (CBTs) are talking therapies that help people manage their problems by changing the way they think and behave. Research has shown trauma-focused CBTs (tf-CBTs) could help young people in care who have complex mental health needs. Trauma focused CBTs are the recommended treatment for PTSD, including when the child has experienced maltreatment. But most young people in care don't have access to tf-CBTs, deepening the health inequalities they already experience.

This new project is a collaboration across five Applied Research Collaborations, spanning the West, South West, East, North and London.

Read more

Prescribing for anxiety has increased in the under 35s

Researchers have found that there have been increases in incident prescribing of most anti-anxiety medications (anxiolytics) in recent years, which have been substantial in young adults (aged under 25).

This may reflect better detection of anxiety, increasing severity of symptoms, increasing acceptability of medication, or an earlier unmet need. While overall incident benzodiazepine prescribing has fallen over time, prescribing has increased in those aged under 35. In 2017, 44 per cent of benzodiazepine prescriptions were longer than the NICE

recommended maximum of four weeks.

Some of this prescribing is not based on robust evidence of effectiveness, such as the use of beta-blockers, some may contradict guidelines, such as anti-psychotics, and there is limited evidence on the effect of taking antidepressants long-term. As such, there may be unintended harm.

Archer C *et al*. (2022). Rise in prescribing for anxiety in UK primary care between 2003 and 2018: a population-based cohort study using Clinical Practice Research Datalink. *The British Journal of General Practice*.

Brigstow Institute Experimental Partnerships

The University of Bristol's Brigstow Institute announced their latest successful seedcorn awardees. They include:

A Comparative Study of Gender Construction and its Impact on Healthy Relationships within English and Ghanaian Schools Will explore the construction of gender within schools and its implications for forming healthy relationships and gender-based violence among youth aged 13-19 in England and Ghana. Schools are a platforms for conveying social knowledge and attitudes to young people, and may serve as sites for construction of gender stereotypes and for enabling social .

Holding my Heart: Documentary and portraiture to advance the appreciation of 3D medical technologies An exploration of the role that 3D medical technologies can play in exploring one's identity, patients' perceptions of 3D medical models and the emotional implications that these can carry explored through the lens of congenital heart disease.

Motherhood in a Climate Crisis This project will use therapeutically-informed participatory theatre techniques to collaboratively explore concerns around reproductive decision-making for women in an era of unfolding climate crisis.

Space for Seals: Understanding the relationship between human stakeholders and seals to promote positive wildlife watching practices Human health and wellbeing can be fostered through encounters with the natural world; however, there exists a conflict between the human desire to observe and interact with seals, the conservation of the species, individual seal welfare and the economy of which they are a part. This work will take a participatory and creative approach to explore the relationship between the seals and observers in order to promote the health and wellbeing of both groups.

Walking and Re-Creation Will address the historical and contemporary inequity of walking by developing ways to counter the prohibitions placed upon walking, using walking itself to resist the erasure of ground-level histories in favour of top-down narratives, and continuing to assess the impact of cultural identity upon walking access, specifically in relation to gender and race.

See the full list of partnerships

Helping those with chronic pain

A new £300k research fellowship has been awarded to Dr Robert Drake (Physiology, Pharmacology and Neuroscience, pictured) to carry out research exploring how injury affects brain function to cause chronic pain. The award, which is part of a £1.2 million Medical Research Foundation grant, aims to improve pain diagnosis, treatment, and recovery, for the vast number of people who live with unrelenting pain.

Disabling chronic pain has various sensory, emotional, and cognitive components, and there is a pressing need to understand which brain processes underpin their development and why this occurs in some people but not others. Robert's research has shown that a loss of function in a neuronal pathway that links the brain and spinal cord is a critical step in the emergence of chronic pain in male rats. This project will allow him to investigate how this loss of function affects a wider brain network that supports emotional reactivity, coping behaviour and sensory hypersensitivity. He will use state of the art computational methods to identify subtle changes in rodent behaviour related to pain, stress, and pain relief. By combining this with recordings, and the manipulation of brain activity, he will be able to relate brain function to experiences of pain and changes in behaviour.

Male dolphins whistle to maintain social relationships

While male dolphins are known to use physical contact such as gentle petting to connect with strongly bonded allies, new findings show they rely on less time-demanding vocal exchanges to remain connected with weaker allies.

The international research team used nine years of acoustic and behavioural data from a dolphin population in Shark Bay, Western Australia, to assess how male dolphins reinforced and maintained their valuable alliances.

Robin Dunbar's *social bonding hypothesis* posits that that vocalisations and language evolved as a form of 'vocal grooming' to replace physical grooming, as increasingly large group sizes placed impossible demands on the time available for physical contact behaviours. However, tests of this hypothesis in non-human primates suggest that vocal exchanges occur between more strongly bonded individuals that engage in higher grooming rates, and thus do not provide evidence for replacement of physical bonding.

These findings provide new evidence that vocal exchanges can serve a bonding function and, more importantly, that vocal exchanges can function as a replacement of physical bonding, allowing allied male dolphins to 'bond-at-a-distance'. This evidence in support of the social bonding hypothesis outside of the primate lineage raises exciting new questions on the origins and evolution of language across taxa.

Gerber L *et al*. (2022). Social integration influences fitness in allied male dolphins. *Current Biology*.

Image © SJ Allen

Does living simply lead to a happier life?

Could living a simpler life with no modern comforts, cut off from the modern world be better for us? A Channel 4 series, *The Simpler Life*, follows a group of 24 Brits who have given up all their worldly possessions to see whether living a simpler life off grid, without any form of technology, mains electricity or gas, benefits their health and wellbeing. They were guided by a Pennsylvania Amish family from Ohio, who stayed with the volunteers on a 40-acre Devon farm teaching them how to grow crops, milk goats and cows, and how to live an almost pre-industrial existence. The reality show provides an insight into the impact of simpler living on life satisfaction, health and wellbeing, away from the trappings of modern society.

The group's journey was evaluated by Dr Myles-Jay Linton, a mental health researcher at the University of Bristol alongside a team of environmental human health and psychology researchers from the Universities of Bath, Exeter and California. Together, they developed an analytical approach to assess the group using a series of psychological assessments completed by the participants before and during the six-month experiment.

Awards successes: Part 5

Dr Philippa Howard (Education) received £536,785 from the **Economic and Social Research Council** for *Reading between the lines in autism spectrum disorder*, starting Sep 22 for three years.

U-RHYTHM: A powerful research tool for studies on human rhythms in health and disease is a £268,250 **Wellcome**-funded project led by Prof Stafford Lightman (Bristol Medical School) which will start in Jun 22 for two years.

UK Research and Innovation awarded £449,998 to Prof Tony Pickering (Physiology, Pharmacology and Neuroscience [PPN]) for *SenseCheQ: Community-based sensory testing for early identification of chemotherapy induced painful neuropathy*, starting May 22 for three years.

Vicky Carlisle (Bristol Medical School) was awarded £18,966 from **Wellcome** for *Factors Influencing Recovery in Opioid Substitution Treatment*, starting May 22 for 5 months. **Wellcome** also funded Prof Hugh Piggins (PPN) to pursue *Deciphering the brainstem circadian clock: intrinsic daily control of ingestive activities*; the £299,999 project started in Feb 22 and will continue for four years.

A £4,954 **internal award** went to Dr Zahraa Abdallah (Engineering Mathematics) for *Investigating biomarkers associated to Alzheimer Disease to boost multi-modality approach for early diagnosis*. The project will run for 5 months from Feb 22.

Dr Hannah Sallis (Bristol Medical School/Psychological Science) received £354,821 from **Cancer Research UK** for her project *Smoking and Vaping Transitions in Early Adulthood: investigating predictors with longitudinal data*. This two-year study will look at predicting and preventing cancers in smokers.

Jacobæus Prize announced

One of the world's most prestigious medical research awards, the Jacobæus Prize has been awarded to Stafford Lightman, Professor of Medicine (pictured) at the University of Bristol.

The prize was established in 1939 to commemorate Swedish professor Hans Christian Jacobæus, and is awarded annually by the Novo Nordisk Foundation to an internationally-recognised scientist for extraordinary achievements within medical research. Stafford, a world-renowned neuroendocrinologist, studies how the regulation of hormones released in our bodies in response to stress affect the function of the brain and metabolic system. His latest research focuses on cortisol, a key hormone which regulates a wide range of physiological functions from metabolism and immune responses. It plays an important role in memory formation and other cognitive processes, and helps the body respond to stress. Low levels of cortisol are associated with debilitating fatigue, muscle weakness, dangerously low blood pressure and depression. While the pharmaceutical industry has invested heavily in providing new and more potent drugs, Prof Lightman's work has shown that rather than needing any new drugs, it is the timing of cortisol delivery - in line with the body's own rhythmic pattern of cortisol secretion - that is important for normal cognition and behaviour. This has led to new ways of treating many people with hormonal imbalances.

Wishing for a better world after COVID

People strongly favour a fairer and more sustainable way of life in the wake of the COVID-19 pandemic, despite not thinking it will actually materialise or that others share the same progressive wishes, according to new research which sheds intriguing light on what people have missed most and want for the future.

The international study, led by the University of Bristol, reflects people's preferences in the United Kingdom and United States in the early as well as later stages of the pandemic, and shows striking commonality in their perspectives.

A "fairer future with grass-roots leadership" was around four times more popular, favoured by some 40% of participants, than a "return to normal", which only garnered support from little more than 10%, in both the UK and US, when presented with various scenario options for the future.

However, the majority of respondents expected normality to resume regardless of their preferences, mistakenly believing their views were in the minority and that most wanted a return to the status quo.

Lewandowsky S *et al*. (2021). Losses, hopes, and expectations for sustainable futures after COVID . *Humanities and Social Sciences Communications*.

Are rocket scientists smarter?

Despite the commonly used phrases "It's not rocket science" and "It's not brain surgery", recent findings by researchers at the University of Bristol, UCL, Imperial College and King's College London, show that both aerospace engineers and neurosurgeons have similar levels of intelligence to those in the general population.

Researchers compared the intelligence of 329 aerospace engineers and 72 neurosurgeons with 18,257 members of the general population. Results show that aerospace engineers and neurosurgeons were equally matched across most domains but differed in two respects: aerospace engineers showed better mental manipulation abilities, whereas neurosurgeons were better at semantic problem solving.

When these scores were compared to the general population, aerospace engineers did not show significant differences in any domains. Neurosurgeons were able to solve problems faster than the general population but showed a slower memory recall speed.

This suggests that, despite the stereotypes depicted by the phrases, all three groups showed a wide range of cognitive abilities.

Usher I *et al*. (2021). "It's not rocket science" and "It's not brain surgery"… : prospective comparative study. *BMJ*.

Including the Excluded

Including the Excluded is a rapid project funded by the University of Bristol Brigstow Institute which aimed to co-produce knowledge on educational and emotional experiences of excluded pupils in Bristol during the Covid-19 pandemic. How are these young people experiencing education now? How has expulsion impacted their mental health, social connectedness, and emotional wellbeing? And crucially, what are excluded pupils' educational and wellbeing needs now we're returning to face-to-face learning?

The project incorporates young people's voices through a collaborative approach that enables pupils and professionals to scrutinise school exclusion and experience. This co-produced project works with researchers, community research fellows, professionals, and pupils. It aims to create a space where excluded pupils and professionals' voices are heard. The reasoning for the involvement of young people is to try to understand why the behaviours which can lead to school exclusion are occurring. We aim to share knowledge and ideas with grassroot organisations like No More Exclusions and want the data gathered to generate a resource to support excluded young people.

Read the blog

Read more about the Collaborative Fellowship on the Including the Excluded project webpage.

Awards successes: Part 6

The **Medical Research Council** has funded a number of projects:

Prof Tony Pickering, Drs Michael Ambler and Timna Hitrec and Prof Hugh Piggins (all Physiology, Pharmacology and Neuroscience [PPN]) were successful with their proposal for *Targeting torpor circuits across species: towards translation*.

Prof Graeme Henderson & Dr Ana Abdala Skeikh (PPN) alongside colleagues at Bristol and Bath will be leading *Opioid overdose deaths: Understanding the lethal interactions between benzodiazepines and opioids to develop new harm reduction strategies*. This is a multidisciplinary project that will start with interviewing opioid users in different regions of the UK to find out their views of the dangers of taking different benzodiazepines along with opioids such as heroin and methadone. This information will then feed into the design of single neurone and behavioural laboratory experiments to examine the interactions.

A collaborative programme grant with Cardiff and UCL will be led by Prof Matt Jones (PPN). The impact of schizophrenia- associated copy number variants on cortical network dynamics is a 4.5 year, £2 million award which aims to we aim to investigate how some of the most common schizophrenia (SZ) copy number variants (CNVs) affect brain function. They hypothesise that these SZ-CNVs have common effects on brain function by altering the regulation of specific types of neurons in the brain cortex, and that this affects the way different neurons communicate with each, contributing to the reality distortion and thinking difficulties seen in the disorder.

Changing how we talk about grief and death

Grief effects everyone but is still very much a taboo subject in the UK. A new research project - Good Grief Connects - led by the University of Bristol aims to change society's attitude towards grief, death and dying thanks to funding from The National Lottery Community Fund.

The aim of the two-year project will be to help shift the public conversation around death and grief and create a more inclusive, compassionate and open society, by:

1)Working with partners to deliver and evaluate three pilot projects that will help support diverse communities in talking about grief, death and dying and accessing the support they need

2)Developing an online Grief Hub which will provide resources to increase understanding of grief, bereavement and the end of life, and signpost to information and services

3)Supporting and disseminating best practice from across the UK in community engagement and development around grief, death and dying.

Good Grief Connects will support people within diverse communities to influence societal change and bring about collective action. The project will work with three partner organisations, Compassionate Cymru, The Ubele Initiative and Compassion in Dying, and will focus on issues of ethnicity, culture and faith.

The two-year grant, worth £299,815, starts in April 2022.

Treatment for opioid dependence 's role in suicide prevention

People who are dependent on opioid drugs are at increased risk of suicide and self-harm. A team of researchers analysed the healthcare records of over 8,000 adults prescribed methadone or buprenorphine in primary care in England to see if there were particular times during and after drug treatment when they were most at risk.

They found that these patients were, overall, seven and a half times more likely to die by suicide than the general population. In addition, they found that in the first

month after treatment stopped, they were four times more likely to die by suicide and more than twice as likely to be hospitalised for self-harm, compared to during a stable period on drug treatment.

Opioid agonist treatment is often stigmatised and has been under-funded. This research strengthens the case for valuing initiatives that improve engagement with treatment and provide psychological support, particularly at the point at which treatment ends or is stopped.

Padmanathan P *et al*. (2021). Self-harm and suicide during and after opiate agonist treatment: a cohort study of primary care patients in England. *The Lancet Psychiatry*.

The pandemic: "It's been ugly"

Frontline healthcare workers say they are angry at being treated as 'COVID cannon fodder, not COVID heroes' after responding to the virus for nearly two years and working at full capacity, reveal the findings of new research.

'It's been ugly': A large-scale qualitative study into the difficulties frontline doctors faced across two waves of the COVID-19 pandemic is the first study of its kind to capture the views of over 1,300 doctors in the UK and Ireland responding to COVID-19 since early 2020.

Researchers from the Universities of Bath, Bristol, UWE Bristol, and the Royal College of Emergency Medicine paint a bleak picture of the multiple challenges doctors are facing. These highlight dual issues of a worrying lack of support for doctors' basic needs (e.g., insufficient places to rest, food to eat, and relentless shift patterns), and a significant lack of appropriate psychological support to help them decompress.

Despite working at '*100% capacity, 100% of the time*', the frontline healthcare workers told researchers of their frustrations at those not following public health advice, and towards Government for *'failing in so many ways to support us.'* Doctors said they felt *'expendable'* and left traumatised by events.

These findings build on recent work from the same team, including the CERA study, which sought to quantify psychological distress experienced by emergency doctors during COVID-19, and the COVID-19 Clinician Cohort (CoCCo) study model, which highlighted a hierarchy of needs for frontline workers responding to the pandemic.

Harris S *et al*. (2021). "It's been ugly"… *International Journal of Environmental Research and Public Health*.

Tackling the global malnutrition crisis

The University of Bristol launched an ambitious research project which promises to address the common drivers of both obesity and under-nutrition in China and Southeast Asia on 15 December 2021.

Malnutrition is the leading cause of disease and mortality globally in Southeast Asia and carries substantial social and economic burdens. The multi-nation project: *Systems Actions to Malnutrition in All Its Forms in Chinese and Southeast Asian Cities – Developing Double Duty, Population-Level Interventions* (SYSTAM CHINA-SEACS) is funded by the Medical Research Council in the UK and will be led by Dr Bai Li (School for Policy Studies).

Through this world-first initiative, Dr Li plans to demonstrate that by developing systemic solutions to tackle under nutrition, governments and policy-makers can also prevent obesity and non-communicable diseases (NCDs) such as cancer, diabetes and stroke.

This approach is known as double-duty, and involves identifying interventions, programmes and policies that can simultaneously reduce the burden of both undernutrition (including wasting, stunting and micronutrient deficiency or insufficiency) and overweight, obesity or diet-related NCDs. The study will be piloted in the Chinese city of Fang Cheng Gang.

Read the full press release

Long-term pain after knee surgery

One hundred thousand knee replacement surgeries are carried out in the UK every year. Most of these operations take place to treat pain related to osteoarthritis. Unfortunately, each year, around 20,000 people who have knee replacement surgery to relieve their pain find that they have moderate to severe pain three months or longer after their operation, which impacts on their everyday lives.

A study, led by the University of Bristol and North Bristol NHS Trust, found the STAR care pathway (**S**upport and **T**reatment **A**fter joint **R**eplacement) reduces pain severity, the amount pain interferes with people's lives and is cost-effective. The new treatment could potentially save the NHS up to £14 million per year through reduced inpatient admissions.

The study found patients who received the STAR care pathway had:

- Less pain severity and impact on daily life at both six and 12 months after treatment (nine and 15 months after surgery)
- Half the number of hospital re-admissions
- Reduced length of hospital stay for any inpatient admissions three months after surgery
- Less unpaid time off work

The aim of the five-year STAR programme was to find ways to improve the care and support that people with ongoing pain receive. The programme designed and tested a new treatment in a randomised controlled trial in eight UK hospitals.

Watch the video

Wylde V et al. (2022). The STAR care pathway for patients with pain at three months after total knee replacement: a multicentre, pragmatic randomised controlled trial. *The Lancet Rheumatology*.

ELIZABETH BLACKWELL FUNDING

Nurturing Research. Improving Health.

The Prudence Trust/Elizabeth Blackwell Institute Fellowship in mental health

With support from the Prudence Trust, funding is available for a for a researcher with substantial experience in the area of mental health in young people.

Closing date: 26 April 2022

Elizabeth Blackwell Institute support scheme for academic training 2022

This scheme is designed to provide support for attending or accessing externally-provided training courses, including training in research methods and techniques, in all areas of health research.

Closing date: 31 August 2022

Elizabeth Blackwell Institute academic bridging funding scheme 2022

We have funding available to provide bridging funding for salaries of academic staff in health-related research in all Faculties at the University of Bristol.

Closing date: 31 August 2022

Public Engagement seed funds

Seed funding is available for health researchers who would like to deliver public engagement events and activities. Applications will be considered on a rolling basis.

Workshop support

We offer support for workshops in health and biomedical research to facilitate new interdisciplinary connections. Applications reviewed all year.

Returning Carers Scheme

The University of Bristol is running a Returning Carers Scheme (RCS) to support academic staff across all faculties in re-establishing their independent research careers. Applications reviewed all year.

FUNDING OPPORTUNITIES

Research Professional provides access to an extensive database of funding opportunities, and can send out tailored alerts based on specific keywords input by the user. UoB staff and students have **FREE** online access to the database from any device.

You can search for funding information by discipline, sponsor, database searches, by recent calls or by upcoming deadlines. If you register for the site and log in, you'll be able to:

- **Set up automated funding opportunity email alerts** - **tailored according to your discipline and research interests**
- **Save searches and bookmarks**
- **Sign up for higher education news bulletins**

Find out more about the platform on the RED website. Note that some calls may have an internal process; check the major bids webpage to see if such a process is in place.

The following listings represent 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**.

Alzheimer's Research UK
Early career researcher bridge fund

Closing date: 29 April 2022 Award amount: £30,000

This supports early-career investigators in dementia research. The aim is to cover funding gaps or to enable early-career researchers to complete a key piece of work for a publication.

BRACE
Equipment grants

Closing date: 15 May 2022 Award amount: £25,000

These support the purchase of equipment to conduct research into the different forms of dementia. Research is supported in four main areas: understanding how the brain works and what has gone wrong in someone with dementia; development of effective and accurate means of diagnosing the condition as early as possible; finding new treatments and assessing their effectiveness in clinical trials; investigating the potential link between certain DNA genes and the chances of developing dementia.

National Institute for Health Research
Health and social care delivery research programme – researcher-led workstream: 22/19

Closing date: 15 May 2022 Award amount: unspecified

This supports research that produces evidence to impact on the quality, accessibility and organisation of health and social care services. The aim is to fund research that will lead to improvements in health services that will be of greatest benefit to the NHS and to patients. The workstream is open to all relevant research areas but it also has a continued interest in the following fields: dementia; mental health; chronic pain; prevention and treatment of obesity.

Alzheimer's Drug Discovery Foundation, US
Prevention pipeline

Closing date: 20 May 2022 Award amount: unspecified

This supports studies of cognitive symptoms due to health conditions, comparative effectiveness research, and epidemiological studies that probe whether the use or choice of drugs alters the risk for dementia or cognitive decline.

Medical Research Council
Research grants – neurosciences and mental health

Closing date: 25 May 2022 Award amount: unspecified

These support research projects focused on neurosciences and mental health. The aim is to transform the understanding of physiology and behaviour of the human nervous system throughout the life course in health, illness, as well as how to treat and prevent disorders of the brain.

National Institute for Health Research
Clinical lectureships - medical

Closing date: 30 June 2022 Award amount: unspecified

These provide a clinical academic training environment for doctors to establish themselves as independent researchers and leaders. Lecturers spend 50 per cent of their time undertaking specialist clinical training and 50 per cent undertaking research or educationalist training. The lectureships have the following research themes: platform science and bioinformatics; therapeutics or clinical pharmacology; older people and complex health needs; dementia; medical education; acute care; mental health.

Guarantors of Brain
Visiting lecturer bursary scheme

Closing date: 20 September 2022 Award amount: £5,000

This enables international or British scientists to visit clinical departments or laboratories in the UK to share information, techniques and experiences. Visiting lecturers are expected to spend five working days participating in daily activities of the host laboratory or department and in giving informal seminars as well as a Brain Lecture to which outsiders are invited. UK based institutes may apply to host the bursary. Two bursaries, worth up to £5,000 each over six months, are available. They include an economy class airfare, the costs of lodging for six nights and an honorarium of £1,000.

SHOWCASED ARTICLE

Assessing animal welfare: a triangulation of preference, judgement bias and other candidate welfare indicators

Paul ES, Browne W, Mendl MT, Caplen G, Trevarthen A, Held S & Nicol CJ (2022). *Animal Behaviour*.

To assess the welfare of captive animals, validated measures, so-called 'welfare indicators', are required. We used a triangulation approach to investigate the extent to which different measures converged to provide corroborating evidence of welfare. Laying hens were exposed to living conditions designed to be generally preferred (GP) or generally nonpreferred (GNP), using previous studies of chickens' majority preferences for resources and environments. The hens were also tested at the end of the study to identify their individual preferences for these living conditions, assigned to groups that showed an individual preference, or non-preference, for their own experimental housing, regardless of whether it was generally preferred or not (IP and INP). Both GP and IP birds showed more ground-

foraging behaviour, and lower pulse rates during handling, than GNP and INP birds. Individual preference was associated with more optimistic-like judgement biases when birds were tested after 6 weeks of exposure to these living conditions, but not after 24 weeks. Serum blood glucose levels were also lower in hens showing individual preferences for their experimental living conditions. General preferences were associated with a number of measures, including higher rates of ground-foraging behaviour and lower faecal water content (after both 6 and 24 weeks), lower pulse rate during handling and greater tibia strength and stiffness post mortem. There were no associations between judgement bias and other candidate welfare indicators, but it is not clear whether this represents evidence of absence or merely absence of evidence. Overall, the different approaches did not converge to identify a precise state of animal welfare, although some measures (preference, stress indicators: pulse rate, faecal water and blood glucose, foraging behaviour) were aligned consistently across timescales. We conclude that further work is needed to establish which alternative measures of affective state might be more appropriate indicators of animal welfare.

CONTACTS

Bristol Neuroscience

Director: Matt Jones, Professorial Research Fellow in Neuroscience
Area of research - neuronal networks in cognition and disease

Memory Hub Leader: Jack Mellor, Professor in Neuroscience.
Area of research - synaptic plasticity and its role in learning and memory

Movement Hub Leader: Paul Chadderton, Associate Professor in Neurophysiology.
Area of research - to reveal the cellular and circuit mechanisms involved in motor control and learning in the cerebellum

Neural Computation Hub leader: Conor Houghton, Reader in Computational Neuroscience
Area of research - understanding information processing and coding in the brain

Sleep Hub Leader: Matt Jones (as above)

Mental Health Hub Leader: in progress

Network Facilitator: Sandra Spencer (Research Development)

Network Administrator: Catherine Brown (Elizabeth Blackwell Institute)

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Bristol Neuroscience is supported by the Elizabeth Blackwell Institute

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Elizabeth Blackwell Institute for Health Research

Sign up to the Elizabeth Blackwell Institute newsletter

Sign up to the Bristol Neuroscience mailing list

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