University of BRISTOL
Elizabeth Blackwell Institute for Health Research

Bristol Neuroscience Newsletter

April - May 2019

bristol neuroscience

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URBAN VISION

The University Strategic Research Fund has awarded funding to *URBAN VISION - Understanding the impact of visual environments of cities on physical and mental well-being*. Led by Dr Ute Leonards (Psychological Sciences), the project is a collaboration with colleagues from Engineering (Dr Dima Damen, Professor Colin Taylor, Professor David Bull) and the Social Sciences (Professor Angie Page, Professor Bill Browne) and approaches the City of Bristol as a living lab to understand the sensory impact of city infrastructure on citizens' health and well-being.

The UrbanVisionScience project tackles questions such as how we can create urban environments that encourage people to travel more actively and what the role of sensory information might be in this. Starting with visual information, a current case study aims at understanding how sensory information affects people's walking behaviour, improves people's experiences of spaces, and encourages greater and more inclusive use of public infrastructures.

Walking on the Café Wall

Did you ever perceive a pattern in a building or in the outside world as beautiful and stimulating while a family member or a friend couldn't bare the look of it? Why are there such big differences in how patterns in the environ-ment affect people? What have these differences to do with the way our brain processes visual information? The URBAN VISION SCIENCE team has set up a temporary research lab / interactive travel exhibition in the atrium of the Life Sciences Building (24 Tyndall Ave, Bristol BS8 1TQ) which consists of a walkable corridor installation to investigate how visual illusions / patterns in our environment affect people's mood, behaviour and gait. Do drop by and take part.

EVENTS

Data Visualisation Working Group
18 April 2019, 12.30 - 13.30, Room G1, 7 Priory Road, University of Bristol, BS8 1TZ

Introduction to Economic Evaluation
24 - 26 April 2019, Bristol Medical School, Canynge Hall, 39 Whatley Road, Bristol, BS8 2PS

Dementia 2020
30 April 2019, 8.30 - 16.30, Royal Society of Medicine, London

SETsquared #Idea2Pitch Event
30 April 2019, 12.30 - 16.30, Barton Hill Settlement, Bristol

SETsquared PARTNERSHIP
Universities of Bath, Bristol, Exeter, Southampton & Surrey

Designing digital interventions to support physical activity for people with long-term conditions
1 May 2019, 13.00 - 14.00, Prof Lucy Yardley (University of Bristol), Room G.1S HEPPLE, School of Geographical Sciences, University University Road, BS8 1SS

Statistics Clinic
1 May 2019, 14.00 - 15.30, SM3 Mathematics Building

Exploring motif-based design patterns for biological computation
1 May 2019, 14.00 - 14.00, Boyan Yordanov (Microsoft Research)

NIHR Grant Applications – Seminar and Support Event
2 May 2019, 9.30 - 16.30

LGBT+ Supporters Programme launch
2 May 2019, 12.00 - 13.30, Great Hall, Wills Memorial Building, Bristol, BS8 1RL

Research without Borders 2019
7 - 15 May 2019

South West Fly meeting
8 May 2019, 13.30 - 17.00, AIMS seminar Centre rooms 2A/B, University of Bristol

My experience of becoming an NIHR Doctoral Research Fellow
9 May 2019, 12.30 - 13.30, Michelle Bonfield (Senior Vascular Clinical Scientist, UHBristol), Lecture room 3, Education & Research Centre, Upper Maudlin Street, Bristol BS2 8AE

Creative Reactions Bristol
11 - 22 May 2019, various venues around Bristol

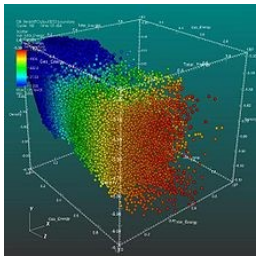
Creative REACTIONS

Development of the Dopaminergic System: from Stem Cells to Circuits
13 - 15 May 2019, Fodele Beach Resort, Crete

FULL EVENTS LISTINGS ARE AVILABLE ON THE BN WEBSITE

Developing and evaluating an online psycho-education package for adolescent depression
14 May 2019, 12.30 - 13.30, Dr Rhys Bevan Jones (Cardiff University), OS6 (Seminar Room), Oakfield House, Oakfield Grove, Bristol, BS8 2BN

Managing ethically sensitive research data: from planning to sharing
14 May 2019, 14.00 - 17.00, Arts Complex, Lecture Room 8, 21 Woodland Road, BS8 1US



Biomedical Sciences Film club
14 May 2019, 18.15 - 20.00, E29 Biomedical Sciences Building

Data Visualisation Working Group
15 May 2019, 12.30 - 13.30, Room 1.20, 35 Berkeley Square, BS8 1JA

Bristol BioDesign Institute seminar
15 May 2019, 13.00 - 14.00, Guy-Bart Stan (EPSRC Fellow and Co-Director of the Imperial College Centre for Synthetic Biology, Imperial College), C44 Biomedical Sciences Building

T3 Technical Talk Time Seminar series
15 May 2019, 14.00 - 15.00

Statistics Clinic
15 May 2019, 14.00 - 15.30, SM3 Mathematics Building

International Stress and Behavior Society 26th International "Stress and Behavior" Neuroscience and Biopsychiatry Conference
16 - 19 May 2019, Oktiabrskaya Hotel, 10 Ligovsky Prospect, St-Petersburg, Russia

Curiosity Challenge workshop
17 May 2019, 9.15 - 13.30, We The Curious, Anchor Road, Bristol, BS1 5DB

The Future of Neuroscience, Attachment and Mentalizing: from research to clinical practice
18 - 19 May 2019

Data Week 2019
20 - 24 May 2019

AI and Machine Learning through academic partnership with business
20 May 2019, 12.00 - 13.00, Kate Robson Brown (Director, Jean Golding Institute, University of Bristol) Pardeep Bassi (Liverpool Victoria Insurance), Priory Road Complex Room OA1, 12 Priory Road, University of Bristol, BS8 1TU

Alzheimer's Society Annual Conference 2019
21 - 22 May 2019

Audio classification with Convolutional Neural Networks
23 May 2019, 14.00 - 16.00, run by IBM. Room 2.26, 35 Berkeley Square

FULL EVENTS LISTINGS ARE AVILABLE ON THE BN WEBSITE

NEWS

Movement Disorders HIT

The Movement Disorders Health Integration Team has published its first interactive pathway which describes the services and support patients can expect when they are being considered for treatment with Duodopa.

Duodopa is a gel that contains levodopa and carbidopa, for treatment of movement disorders. This pathway is designed to help health professionals, people with movement disorders and those close to them to navigate the different services available to support them. It aims to help clinicians understand the process for referral, assessment and decision making. It is the first in a series of interactive pathways that the team is working on, to help patients and local clinicians better understand what to expect from different aspects of movement disorders care.

View the Duodopa interactive pathway (PDF).

More than 100 people with movement disorders, those close to them, health professionals and researchers came to an event hosted by the HIT on 22 January 2019 to discuss hot topics in research. The programme considered:

- How does the research process work and why does it take so long for ideas to reach the clinic?
- How Parkinson's UK is supporting research
- Can we use existing drugs for Parkinson's care?
- What can exercise do for you?
- Can we improve how symptoms are measured and tracked?
- What is the role for gene therapy and stem cells in Parkinson's treatment?

The event included a showcase of local and international work underway to cure or modify the progression of movement disorders, from cellular mechanisms to large population cohort studies.

Funding successes: Part 1

To Innes Cuthill (Biological Sciences), Nick Scott-Samuel and Roland Baddeley (Psychological Science), from the **Biotechnology and Biological Sciences Research Council**, £739,356 for *Concealing 3D objects*. This three year grant will use a mixture of field experimentation, visual modelling and deep learning to investigate camouflage in snails, cats and humans.

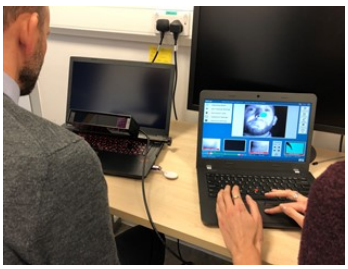
To Jon Hanley (Biochemistry) from **Alzheimer's Research UK**, £250,000 over three years to investigate Argonaute phosphorylation and miR-134 as novel therapeutic targets in Alzheimer's disease.

To Lucy Elliott (Bristol Medical School), an **Elizabeth Blackwell Institute** for Health Research Clinical Primer award for *Defining Mode of Anaesthesia for Clinical Trials*.

Eye tracker at Bristol Eye Hospital

Cathy Williams (Bristol Medical School), Iain Gilchrist and Rosie Clark (Psychological Science) have been working on a new Bristol Vision Institute initiative to establish a clinical eye tracking service in the Bristol Eye Hospital to support both clinical assessment and research. Through the financial support of the Bristol hospitals charity Above and Beyond, they now have a state-of-the-art eye tracker (EyeLink Duo from SR Research) instated in the Eye Hospital.

They also have an EyeSeeCam which was provided by an industrial sponsor. Objective eye tracking has the potential to aid clinicians in the diagnosis and management of many disorders, yet very few centres offer this service; eye movement assessment in clinic is primarily done qualitatively by clinical judgement. There is also a clear benefit of objective eye tracking to patients, to streamline the diagnostic pathway and improve accuracy. Further development of this initiative will involve work on a suite of patient-friendly eye movement tests, and a creating a pathway for clear interpretation of results by clinicians.



Social connections for chronic pain

The National Institute for Health Research Collaboration for Leadership in Applied Health Research and Care West (CLAHRC West) researchers visited six follow-on groups for people with chronic pain who have finished self-management programmes (SMPs) at North Bristol NHS Trust. The team interviewed 45 people, including a range of clinical staff involved in running SMPs, patient tutor volunteers and patients, including those who have attended follow-on groups, and those who haven't.
They found that the ongoing social connections that follow-on groups can enable, can be significant to some people's lives.
Chronic pain affects more than two-fifths of the UK population. It can impact a person's mobility and independence, and lead to depression. Group pain management or SMPs can help people manage the effects that pain has on their daily life and improve how they cope with it. These two to three month programmes have been shown to have good results, but improvements can be harder to sustain over a longer period of time after they've finished.

North Bristol NHS Trust are tackling this problem with their follow-on peer support groups for people once they've finished their SMP. The idea for the groups came from a group of patients and clinicians. Trust volunteer patient tutors and clinicians are working in collaboration with NIHR CLAHRC West researchers to evaluate the impact of these follow-on groups.
Researchers are currently analysing results and have held meetings with patients to share initial findings and discuss how the results can be used to develop these groups.

NIHR | Collaboration for Leadership in Applied Health Research and Care West

Read more about the project

£50 million funding for Centres for Doctoral Training

The Engineering and Physical Sciences Research Council (EPSRC) has awarded Bristol funding for nine Centres for Doctoral Training (CDTs) – the highest number awarded to any university in the country.

The centres will train and equip engineering and science students with the skills needed to tackle global challenges such as sustainable energy and cyber security. Bristol's centres will cover a broad range of disciplines that will be vital for knowledge and expertise in the future:

- CDT in Composites Science, Engineering and Manufacturing
- CDT in Future Autonomous Robotic Systems (FARSCOPE-TU: Towards Ubiquity)
- CDT in Trust, Identity, Privacy and Security in Large-scale Infrastructures (TIPS-at-Scale)
- CDT in Computational Statistics and Data Science: COMPASS
- CDT in Quantum Engineering
- CDT in Technology Enhanced Chemical Synthesis
- CDT in Aerosol Science
- CDT in Digital Health and Care
- CDT in Future Innovation in Non-Destructive Evaluation

On 21 February 2019 it was announced that Bristol had gained a tenth award; the UKRI Centre for Doctoral Training in Interactive Artificial Intelligence will build on unique strengths in intelligent systems, machine learning, and human-computer interaction.

Read more

EPSRC Engineering and Physical Sciences Research Council

AI help to foil dating scams

Dating apps and websites could soon use computing algorithms that 'think' like humans to pinpoint fake profiles designed to con victims out of thousands of pounds.

Researchers from across the UK, including experts from the University of Bristol Cyber Security Group, have developed new algorithms that can understand what fake dating profiles look like and then apply this knowledge when they scan profiles submitted to online dating services. The algorithms – designed as part of a wide-ranging project aimed at combating online fraud - automatically look out for suspicious signs inadvertently included by fraudsters in the demographic information, the images and the self-descriptions that make up profiles, and reach an overall conclusion as to the probability of each individual profile being fake.

In these scams, fraudsters target users of dating websites and apps, 'groom' them and then ask for gifts of money or loans which will never be returned. Data gathered by the City of London Police Economic Crime Directorate show that in 2017, over 3,000 Britons lost a total of £41million in such incidents, with an average loss of £11,500.

When tested, the algorithms produced a very low false-positive rate (the number of genuine profiles mistakenly flagged up as fake) of around 1%. The aim is now to further enhance the technique and enable it to start being taken up by dating services within the next couple of years, helping them to prevent profiles being posted by scammers.

Read more

Treatment of depression in older people

Nearly 10% of adults aged over 75 have major depressive disorder, and over one third sub-threshold depressive symptoms, yet people over the age of 85 are five times less likely to be referred for psychological therapies than people in their 50s. Researchers from UoB and UCL aimed to explore how healthcare professionals (HCPs) manage depression in older people. Late-life depression is often managed in primary care with antidepressants, despite older people saying they would prefer non-drug therapies such as talk therapies, mindfulness and community activities. The team found many HCPs felt that late-life depression was mainly caused by social isolation and functional decline, but appropriate treatments were limited. Clinicians perceived depression to have associated stigma for older adults, which required time to negotiate. Limited time in consultations and the complexity of needs in later life meant physical health was often prioritised over mental health, particularly in the frailest patients. Good management of late-life depression appeared to depend more on the skills and interest of individuals than on any structured approach.

Frost R *et al*. (2019). Management of depression and referral of older people to psychological therapies: a systematic review of qualitative studies. *British Journal of General Practice*. 69(680): e171-e181.

Funding successes: Part 2

To Myles-Jay Linton (Health Economics Bristol) from the **Economic and Social Science Research Council**, an

impact grant to fund a part-time secondment to a mental health charity (Second Step). Second Step has been providing support to people with multiple and complex needs for three decades. One of the main challenges facing the charity, is how it evaluates the impact of its diverse services, therefore one of the goals of this project is to embed tools, skills and procedures to support evaluations. Myles is undertaking Patient and Public Involvement (PPI) work to select measures of wellbeing for use in evaluations, analysing survey data, facilitating focus groups and undertaking semi-structured interviews. This experience has highlighted the essential and valuable role played by third sector organisations in the delivery of health and social care.

To Liam Mahedy (Psychological Science) from the **Elizabeth Blackwell Institute** for Health Research, an EBI Early Career Fellowship for *Using a lifecourse approach to disentangle the association between alcohol use and working memory as risk factors for dementia*.

Dr Alison Gregory (Bristol Medical School) was awarded an AXA Research Fund Fellowship for a two-year project starting in August 2019, to develop and pilot an intervention specifically tailored for informal supporters of people who have experienced domestic violence. One in four UK women experience domestic violence at some time in their lives, and most seek informal support from the people around them, even if they don't access professional help. The impact of domestic violence on survivors can be devastating, particularly for their physical and mental health, and the effects ripple outwards to people in the survivor's social support network.

Equality, Diversity and Inclusion (EDI)

The Elizabeth Blackwell Institute has appointed a new EDI Champion, **Fiona McPhail**, who took up her post in February 2019. Fiona's main focus will be on health and life sciences research communities and will be working very closely with the Health and Life Sciences Faculty EDI leads to ensure work complements and aligns with Faculty priorities. Writing a blog on International Women's Day (21 March 2019), Fiona remarked-

As a sector, Higher Education has been grappling with how we enable all groups to enter and thrive, striving to become institutions which are fair for all and where everyone can achieve according to their ability.

We have travelled a long way, with sector wide initiatives providing a platform for change and a structured and assessed methodology for analysing outcomes. We know, however, that despite our efforts, we are not yet there and there is more for us to do.

Read the full article here

Technicians make it happen—Green Lab Accreditation

The University of Bristol's Biomedical Sciences Building, which houses the Schools of Biochemistry; Cellular and Molecular Medicine; and Physiology, Pharmacology and Neuroscience, has gained 100% Green Lab Accreditation status. This was awarded in collaboration with NUS's Green Impact scheme and achieved through a series of rigorous, green-initiatives.

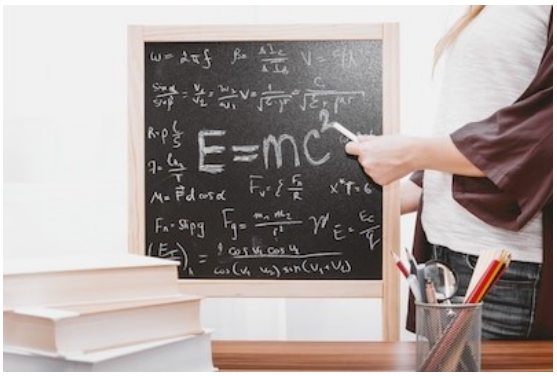
University laboratories require large amounts of energy and resources, on average consuming 5-10 times more energy than other academic spaces. Occupying only 6% of University space, laboratories account for 40% of energy, water and waste.

Befitting of a city well-known for its green-credentials, over 170 laboratories within the University's Biomedical Sciences Building have made changes to ensure that the world-leading teaching and research is done with utmost efficiency and minimal waste, resulting in a combined cost saving of over £85,000 worth of energy over the past two years. Steps taken include the replacement of energy-inefficient laboratory equipment such as ultralow freezers, drying cabinets and biosafety cabinets have saved £22,000, or 120 tonnes of CO_2.

Building on this success the University is now participating in a national pilot of the Laboratory Efficiency Assessment Framework (LEAF).

Thinking positively during pregnancy

Your attitude during pregnancy could have an effect on your child's ability in maths and science, according to a new study. Using data from Bristol's Children of the 90s study (ALSPAC) the research is one of a series that examines a parental personality attribute known as the 'locus of control'. This is a psychological measure of how much someone believes that they have control over the outcome of events in their life or whether external forces beyond their control dictates how life turns out.



Those with an external locus of control would believe there is little point in making an effort as what happens to them is due to luck and circumstances, in contrast with internally controlled people who are motivated into action because they feel they can influence what is going to happen. Researchers examined the 'locus of control' by using responses from questionnaires completed by over 1600 pregnant women. They looked at the mathematical and scientific reasoning and problem-solving skills of their offspring at the ages of 8, 11 and 13 assessed in school using specially designed tests.

Findings reveal that mothers with an internal locus of control before their child was born were more likely to have a child who is good at maths and science. Compared to their externally controlled peers, internally focussed mothers also were more likely to provide their children with diets that assist brain development, to more frequently read stories to them and to show an interest in their child's homework and academic progress.

Autism in the Somali community

World Autism Awareness Day (WAAD) is an internationally recognised day on 2 April every year to raise awareness of the hurdles that people with autism – and others living with autism – face every day. Following research by the University of Bristol, the National Institute for Health Research (NIHR) and Autism Independence, a film that tells the stories of Bristol-based Somali families affected by autism and the professionals who support them was premiered on 3 April 2019.

The project revealed that cultural stigma surrounding mental health, challenging behaviour and disability means that families in the Somali community often hide their child and don't seek help early. Parents can feel isolated and don't engage with support services for their child. Research also suggests that service providers would benefit from a better understanding of the cultural perceptions of autism and the impact that this has on engagement with services.

Like other migrant groups, the Somali community has high numbers of children with autism, many of whom are likely to be severely affected. But there is no Somali word for autism, making it hard to understand and accept. **Read more**

GW4 Alliance launches new research communities

An event hosted by GW4 at the Watershed on 14 February 2019 launched 12 new projects that were funded out of the latest call, including:

Initiator:
Family component of school approaches to promoting mental health (Dr Jeremy Segrott, Cardiff; Dr Judi Kidger, Bristol; Dr Janet Goodall, Bath; Prof Katrina Wyatt, Exeter)

SHuSH! A research network on Suicide, Homicide, and Self-Harm in parent carers (Drs Siobhan O'Dwyer & Astrid Janssens, Exeter; Dr Katie Maras & Prof Paul Stallard, Bath; Dr Thomas Slater, Cardiff; Drs Becky Mars & Lucy Biddle and Prof Paul Moran, Bristol)

Using realistic review methodology to investigate digital health interventions for managing long-term conditions (Drs Judith Carrier, Roser Beneito-Montagut, Emma Lane & Dr Valerie Sparkes, Cardiff; Drs Matthew Jones & Charlotte Dack, Bath; Dr Sabrina Grant, Bristol)

Moving Through Motherhood (Dr Richard Pulsford, Exeter; Dr Charlie Foster, Bristol; Dr Peter Rouse, Bath; Dr Lucie Warren, Cardiff; Drs Victoria Salmon & Lauren Rodgers, Exeter)

Accelerator:
Recurrence analysis for the characterisation and classification of epileptic patients (Dr Naoki Masuda, Bristol; Dr Lorenzo Livi, Exeter; Dr Jiaxiang Zhang, Cardiff; Dr Tiago de Paula Peixoto, Bath)

The Parkinson's Drug Trial: A Miracle Cure?

The groundbreaking work of the Parkinson's and Other Movement Disorders Health Integration Team (MOVE HIT) was the focus of a two-part BBC documentary which aired on 28 February and 7 March 2019. Filmed over six years, *The Parkinson's Drug Trial: A Miracle Cure?* follows a group of volunteers with Parkinson's as they take part in a medical trial testing Glial Cell Line Derived Neurotrophic Factor, or GDNF. Forty-two patients underwent complex brain surgery and months of infusions via a port embedded into the side of their skull to see if boosting the levels of the naturally-occurring GDNF protein can regenerate dying brain cells and reverse their condition. In 2012, doctors from Frenchay and Southmead Hospitals in Bristol recruited volunteers to participate in the £3m trial, ending in 2017, to tackle the world's second most common neurodegenerative condition. After nine months, there was no change in the scans of those who received placebo, whereas the group who received GDNF showed an improvement of 100% in a key area of the brain affected in the condition - offering hope that the treatment was starting to reawaken and restore damaged brain cells.

Watch an excerpt from the show (Bristol Health Partners)

Find out more on the BBC website

Read the full press release on the GDNF trial

Mindfulness improves mental health of students

Evidence suggests university students are more likely to develop mental health problems compared with the general population. A study aimed to establish whether mindfulness could be effective at improving mental health and wellbeing in medical students who are considered more at risk of developing a stress-related illness.

Researchers recruited students, who had been referred to a mindfulness group, to take part in an 8-week programme. They had to training for two hours each week and commit to 30-minute daily home practice in between sessions. Training taught participants how the mind works, how stress impacts one's life, an awareness of stress triggers and signs of stress symptoms, coping techniques, meditation practice, and the importance of self-care. At the end of each programme a survey was completed, and the team also conducted six qualitative interviews.

Students reported mindfulness training went further than learning a set of tools for coping with emotional difficulty; they described improved empathy and communication skills when with patients, an improved ability to manage their workload, and a new ability to notice automatic judgmental thinking without identifying with these thoughts. They described how mindfulness had helped enhance their relationship to learning by using practices to refresh and regain concentration during long days of study as well as using the practices to steady themselves during stressful situations in clinic or during exams. Initial findings suggest that mindfulness training had helped reduce anxiety, excessive worry, negative thought patterns and improve resiliency to stress as well as improve emotional wellbeing and professional development.

Malpass A *et al*. (2019). Medical Students' Experience of Mindfulness Training in the UK: Well-Being, Coping Reserve, and Professional Development. *Education Research International*. 2019: 021729.

Effects of Virtual Reality

Three new documentary projects have been commissioned the Universities of Bristol, Bath and the West of England (UWE Bristol), in partnership with Watershed, within the Virtual Realities – Immersive Documentary Encounters Engineering and Physical Sciences Research Council (EPSRC) -funded research project. The multi-disciplinary research led by Dr Kirsten Cater, Prof Danaë Stanton Fraser and Mandy Rose brings together computer science, psychology and documentary studies to investigate and support the unexpected adoption of Virtual Reality within Documentary and Journalism. The commissions will contribute to the research by pushing the boundaries of nonfiction in both form and content, while the productions will also be the subject of research case studies.

Producers Oscar Raby and Katy Morrison will investigate the relationship between body and mind in

'Transplant'.

Love and Seawater addresses the legacy of the separations between parents and children that have been a feature of Caribbean economic migration.

Read more

Collaborating with the nuclear medicine community

The South West Nuclear Hub (the Hub), funded by a HEFCE Catalyst Fund grant, facilitates the University of Bristol's leading role in co-ordinating and growing regional nuclear energy activities. The Hub is an umbrella for civil nuclear energy related research, innovation and teaching activities at Bristol.

Launched in September 2016, it acts as a focal point for nuclear energy research and teaching at Bristol, providing a common collaboration space for academics across the University. Externally, it draws together academic, industrial and government institutions to provide an efficient interface for research and development capability across the south west region.

Via the Hub, UoB has developed a nuclear energy research, innovation and teaching strategy which includes ambitious plans for growth both in terms of activity and new facilities. Since 2015 the Hub has been home to a unique interdisciplinary MSc programme in Nuclear Science and Engineering, a research-focused postgraduate programme with significant industry input.

Our objectives include:

- Providing a link between Higher Education, Nuclear Industry and Government sectors
- Creating a single door for the nuclear industry to access and form partnerships in academic research and teaching in the region
- Joining capability, activity and resource
- Fostering an integrated mixture of multidisciplinary students, staff and experts
- Increasing the number and quality of people trained in nuclear energy and related fields
- Increasing industrial investment in research and teaching
- Shaping the direction of regional and national nuclear energy-related research and teaching to ensure it best meets industry needs
- Establishing a joint knowledge base between academia and industry
- Facilitating the transfer of relevant skills and knowledge
- Delivering innovative underpinning science, engineering solutions and technologies that have a positive impact on the economy and society

SOUTH WEST NUCLEAR HUB

Nuclear medicine

The Hub's academic community is able to offer competencies and expertise to the medical community. Focused mainly around equipment development, our researchers have innovative technologies, which could be tailored for the needs of various medical applications.

In particular Dr **John Day** from the Interface Analysis Centre (IAC) had some of his work going to clinical trials, including:

- **Development of probes for cancer detection**
- **Use of Raman spectroscopy for lymphoma detection**
- **Kidney perfusion monitoring after transfusion using fibre optics**

Others, such as Dr **Jaap Velthuis** (Physics) can offer:

- **Cameras-driven methodologies to monitor and adjust the dosimetry in real time**
- **Independent monitoring of beams used to treat tumours in order to adjust in real time localisation and dosimetry of these beams**

If you have an idea or project that aspects of nuclear medicine could contribute to, contact enquiries@southwestnuclearhub.ac.uk.

The Restaurant that Makes Mistakes

Dementia Health Integration Team (HIT) Project Manager Julie Clayton blogged on how attitudes to dementia are being challenged by projects like *The Restaurant that Makes Mistakes*. Members of the Dementia HIT advised the programme's producers.

Do your family worry that you are a danger to yourself? Do people assume that you can't do anything useful?

This can be a daily experience for people who are living with dementia. Having to deal with other people's attitudes towards dementia is a challenge for those who have the condition. Despite this, many people with dementia are determined to enjoy life and show others what they are capable of. Sandi was only 50 when she was diagnosed with dementia four years ago. The condition is best known for causing short-term memory loss, but it has also affected Sandi's speech and balance, forcing her to give up her job as a mortgage broker, and other activities.

Sandi will soon be appearing on screens in a five-part Channel 4 series about a pop-up restaurant in Bristol, 'The Restaurant that Makes Mistakes'. Filmed at the Kitchen at the Station with chef Josh Eggleton, the series will feature Sandi and other people who have dementia, taking on the role of waiters and kitchen staff. It shows that people living with dementia can still learn new things.

Drinking in pregnancy and children's mental health

High-levels of alcohol use in pregnancy is known to affect a child's physical health; however, less is known about the association of alcohol use in pregnancy and mental health in children, particularly for low-levels of prenatal alcohol use. A team carried out a systematic review to evaluate current research that has investigated prenatal alcohol use and children's mental health. Kayleigh Easey, the study's lead author and a PhD student at Bristol's School of Psychological Science, said: "Our findings suggest that alcohol use during pregnancy may be associated with an increased risk of mental health problems in children, and provide support for government guidelines recommending complete abstinence from alcohol during pregnancy. Women can use this information to further inform their choices, and to avoid risk from alcohol use, both during pregnancy and as a precautionary measure when trying to conceive."

There is still uncertainty about how light to moderate alcohol use can affect children. The researchers are presently looking at how different levels of alcohol may influence mental health in children, but current research is not easy to evaluate due to the differences between how each individual study was conducted, such as what it was designed to measure. The associations shown within this review do not provide evidence of a causal effect on their own, which can be difficult to demonstrate. However, it is important for women to understand what the current evidence shows, to allow them to make informed decisions about drinking during pregnancy. Women can use this information to inform their choices, and to avoid potential risks from alcohol use.

Easey K *et al*. (2019). Prenatal alcohol exposure and offspring mental health: A systematic review Drug and Alcohol Dependence. *Drug and Alcohol Dependence*. 197, pp344-353 .

Why the brain? Why neuroscience?

The British Neuroscience Association has produced a short video (6mins29secs) on why neuroscience research matters. Contributors include Prof Stafford Lightman (Bristol Medical School), Prof Paul Howard-Jones (School of Education), Prof David Nutt (Imperial College London, pictured–sorry David), our own social media curator Jamie Thakrar (PhD student on the Wellcome Trust Neural Dynamics programme), and Dame Uta Frith (University College London).

WATCH THE VIDEO

Data science capabilities

The University of Bristol and LV= General Insurance (LV=GI) have created a new partnership with the aim of working together to make advancements in the field of data science by sharing knowledge, skills and opportunities. As part of the partnership, LV=GI will establish a team of data scientists and engineers who will be based at the University, working closely with the Faculties of Engineering and Social Sciences & Law, and the Jean Golding Institute (JGI) for Data Science and Data Intensive Research. The teams will carry out research and development projects to better understand the possibilities presented by machine learning and AI in the insurance sector. Collaborating with the University's social scientists, the teams will work to better understand the societal challenges and opportunities of digital technologies.

GW4 training initiatives

GW4 has announced six student-led projects which have been awarded up to £2,000 each as part of the GW4 Doctoral Student Training Scheme. The purpose of this award is to support new discipline-specific doctoral training events, identified and organised by and for doctoral students within the GW4 Alliance.

The events also provide opportunities for PhD students to network across the GW4 universities. The successful projects include:

- ***Time Series Analysis for Researchers*** Register here
- ***Mind the Gaps: Interdisciplinary Mindfulness Research*** Space for developing an experiential practice, engagement with theoretical and analytic approaches of data
- ***GW4 Early Career Neuroscientist Day*** Register here Neuroscience in the broadest sense with sessions on techniques, communication, alternative careers and public engagement.

Read more

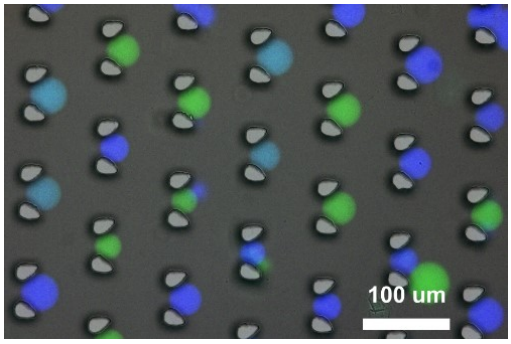
Protocells use DNA logic

Researchers at UoB, Eindhoven University of Technology and Microsoft Research have successfully assembled communities of artificial cells that can chemically communicate and perform molecular computations using entrapped DNA logic gates.

Molecular computers made from DNA use programmable interactions between strands to transform inputs into coded outputs. However, they are slow because they rely on random molecular diffusion to execute a computational step. Assembling these processes inside artificial cell-like entities (protocells) capable of sending DNA input and output signals to each other would increase computational speed and protect entrapped DNA strands from degradation.

A team led by Prof Stephen Mann (Chemistry) has developed BIO-PC (Biomolecular Implementation Of Protocell communication), based on communities of semi-permeable capsules (proteinosomes) containing a diversity of DNA logic gates that can be used for molecular sensing and computation. Compartmentalisation increases the speed, modularity and designability of the computational circuits, reduces cross-talk between the DNA strands, and enables molecular circuits to function in serum.

Mann S *et al*. (2019). Distributed DNA-based Communication in Populations of Synthetic Protocells. *Nature Nanotechnology*. 14, pp369–378.



Predictors of suicide attempts

A team examined questionnaire data from 16 and 21 year olds part of Bristol's Children of the 90s study, concentrating on those who'd thought about suicide. From the sample who had experienced suicidal thoughts, the team wanted to know what proportion would make an attempt on their own life and if those at greatest risk could be identified. They found that 12% of adolescents with suicidal thoughts went on to make a suicide attempt during the five-year follow-up. The team looked at different types of predictors and found that the factors that best helped to predict attempts were non-suicidal self-harm, cannabis and other illicit drug use, exposure to self-harm in friends or family, and having a personality type that is more open to new ideas and experiences ('intellect/openness').

The study also looked at factors that predict attempts among those who reported non-suicidal self-harm at 16 years old and found the best predictors in this group were cannabis and drug use, sleep problems and a less extroverted personality type.

They found that young people who experienced both suicidal thoughts and non-suicidal self-harm at 16 were a particularly high-risk group, with one in five attempting suicide over the follow-up. This is the first time academics have looked at predictors of future suicide attempts and it is hoped that the findings will help professionals who work with teenagers assess those at high risk.

Mars B *et al*. (2019). Predictors of future suicide attempt among adolescents with suicidal thoughts or non-suicidal self-harm: A birth cohort study. *Lancet Psychiatry*.

Funding successes: Part 3

From the **Medical Research Council** to Dr Ana Gonçalves Soares (Bristol Medical School), for *Pathways from childhood socioeconomic disadvantages to mental health disorders: a cross-cohort comparison*.

From **Innovate UK** to Prof John Tarlton (Bristol Veterinary School), £59,500 for Modular Insect Bioconversion System for On-site Animal Feed Production - WP4 nutritional and behavioural outcomes.

From **GlaxoSmithKline** Consumer Health to Prof Nicola West (Bristol Dental School) for *Investigating the Human Microbiome as a Driver of Neuroinflammation & Symptoms in Neurodegenerative Diseases*.

From **BRACE** to Dr Daniel Whitcomb (Bristol Medical School), £12,300 for *Are neuronal catenins involved in the synaptopathology of Alzheimer's disease?*.

From the **David Telling Charitable Trust** to Dr Lindsey Sinclair (Bristol Medical School) for *Is the link between mid to late life depression and dementia a result of vascular changes in the brain?.*

From the **National Institute for Health R**esearch, a Research Capability Fund award to Dr Dheeraj Rai (Bristol Medical School) for *Acceptability of randomisation to RCTs in adults with autism*.

Benefits of listening to natural sounds

Academics from Bristol, Exeter and The Open University have joined forces with BBC Radio 4 on an ambitious national experiment looking at how listening to natural sounds could boost well-being. Forest 404 is three-tiered structure which creates a listening experience which aims to draw the audience deeper into the world of the podcast. At its heart is a classic sci-fi thriller set in the 24th Century following a data crash called *The Cataclysm*. The action follows the character Pan, a sound archivist who uncovers some sound recordings from the early 21st Century that haunt her. They are recordings of rainforests, places which no longer exist, and Pan feels compelled to hunt down the truth about how the forests of the old world died. The podcasts are accompanied by an online survey devised and operated by researchers at the University of Exeter and The Open University which hopes to develop a unique insight into how the British public respond to nature-based sounds.

This survey promises to make a major contribution to what we know about how contact with nature benefits our physical and mental wellbeing. It will contribute new knowledge by exploring how people respond to various sounds of nature; previous research has concentrated on the visual.

Read more

Child & adolescent anxiety and later alcohol problems

New research led by the University of Bristol has found some evidence that children and adolescents with higher levels of anxiety may be at greater risk of developing alcohol problems. However, the link between anxiety and later binge drinking and later frequency and quantity of drinking was more inconclusive.

The researchers carried out a systematic review of 51 prospective cohort studies from 11 countries [United States, Germany, Finland, UK, Netherlands, Australia, Taiwan, Canada, New Zealand, Sweden and Norway] to explore whether child and adolescent anxiety is linked to later alcohol use and alcohol use disorders. Thirty measures assessed anxiety and 40 measures assessed alcohol use. Anxiety exposure ages ranged from three to 24 years, and alcohol outcome ages ranged from 11 to 42 years.

Findings indicate that young people with higher anxiety may have a greater risk of developing alcohol problems. Further research is needed to understand why there are differences in associations for alcohol consumption levels versus problematic use, and to establish which individuals with anxiety develop alcohol problems. This could lead to improvements in personalised interventions.

Dyer M *et al*. (2019). Associations of child and adolescent anxiety with later alcohol use and disorders: A systematic review and meta-analysis of prospective cohort studies. *Addiction*.

Research Quality and Improvement lead

Prof Marcus Munafò has been appointed as the academic lead for Research Quality and Improvement. Marcus will work with the senior team and the Faculties to develop a positive research culture focused on integrity and continuous improvement, reporting directly to the Pro-Vice Chancellor, Research and Enterprise, and to the University Research Committee.

Marcus' research focuses on, among other things, the health and psychological effects of tobacco and alcohol use. He has also researched scientific reproducibility for much of his career, starting when he was a student and failed to replicate findings he found in the literature. For example, a study he co-authored with Andrew Higginson found that incentivising academics to produce a small number of highly cited studies also incentivised them to conduct lots of new, underpowered studies and fewer replication studies.

UK Research and Innovation Global Research Hubs

Scientists from UoB will be sharing their expertise as part of two new £20 million UK Research and Innovation (UKRI) Global Research Hubs funded through the Global Challenges Research Fund (GCRF). The first will focus on urban disaster risk and the second aims to tackle the challenge that nitrogen pollution poses for the environment, food security, human health and the economy in South Asia. The South Asian Nitrogen Hub includes ~50 organisations from across the UK and South Asia of which Bristol is one of 14 UK partners. The Hub will be awarded £19.6 million over the next five years, comprising £17.1 million from UKRI and £2.5m from UK and international partners. Contributions in-kind worth a further £7 million are being provided by partners of the UKRI GCRF South Asian Nitrogen Hub. Nitrogen is connected to air pollution, the pollution of rivers and seas, ozone depletion, health, economy and livelihoods; N_2 pollution is caused by emissions from chemical fertilisers, livestock manure, and burning fossil fuels. The Hub will bring previous research together in a more coherent approach.

The UKRI GCRF South Asian Nitrogen Hub will study the impacts of the different forms of pollution to form a coherent picture of the nitrogen cycle. In particular, it will look at nitrogen in agriculture in eight countries.

Read more

Max Planck-Bristol Centre for Minimal Biology launched

Building stripped-down versions of life using protocells, genome delivery systems and synthetic cytoskeletons comprise some of the ground-breaking research due to take place at a new Centre launched at the University of Bristol on 27 March 2019. The Max Planck-Bristol Centre for Minimal Biology, a partnership between the University of Bristol and the Max Planck Society for the Advancement of Science (MPG) in Germany, aims to advance the future of health and medicine by understanding the fundamental nature of life.

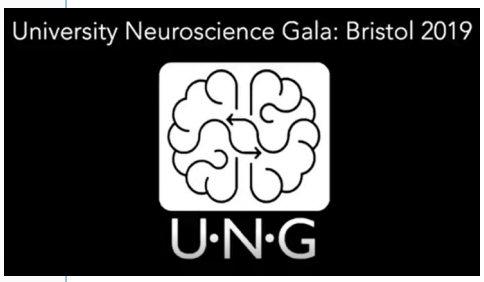
Minimal biology is a new emerging field at the interface between the physical and life sciences. It aims to design and build artificial cells, minimal genomes, virus-like nanodevices and new cellular scaffolds, and seeks to understand the foundations of life and how it arose from non-living matter.

Led by Bristol Professors Imre Berger (Biochemistry), Stephen Mann (Chemistry) and Dek Woolfson (Chemistry and Biochemistry), and Professors Joachim Spatz (Heidelberg), Tanja Weil (Mainz) and Petra Schwille (Munich) at Max Planck Institutes in Germany, the Centre will be based in the School of Chemistry at the University of Bristol. A paramount objective is to train early career scientists in minimal biology and biodesign.

Read more and watch the launch video

NeuroSoc Gala 2019

On Saturday 30th March 2019, over 100 ticket holders and 11 guest speakers gathered in the Chemistry building to talk about neuroscience. This "University Neuroscience Gala" was organised by the undergraduate Neuroscience Society (NeuroSoc) and was designed to integrate all levels of the neuroscience community in Bristol. It was tailored to the undergraduate level and amongst attendees were representatives from Cardiff, Bath and Exeter.



The day was split into three sections in which Neuroscientists discussed their research and their passions for neuroscience. The first of these was "Neuro-Stories" in which speakers told stories about aspects of neuroscience important to them. Professor Matt Jones, Dr Emma Ynhell, Dr Nathan Lepora, Dr Kathreena Kurian and Mr Will Carr all shared their stories and topics ranged from brain tumour research to the role of neuroscience in robotics.

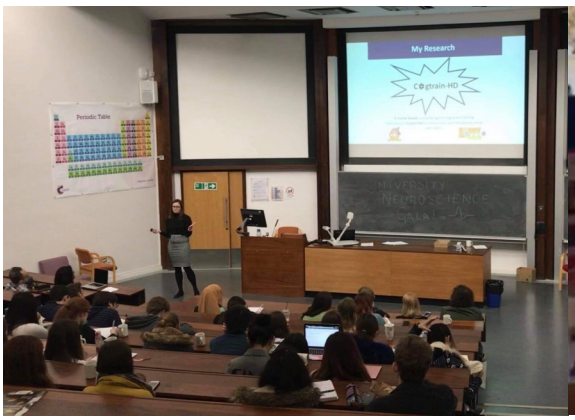
The next section was "the Real World of Research" in which speakers discussed their work, it's methodology, their findings and its implications. Professor Emma Robinson, Professor Neil Marion and Professor Stafford Lightman kindly spoke for us and discussed their work in neuroendocrinology, ion channel pharmacology and measuring affective states in animals.

Finally was the "Spark Sessions" in which a small panel discussed the ethics and implications of hot topics in neuroscience. Professor Matt Jones, Dr Emma Ynhell, Dr Andrew Doherty, Dr Jon Whitton and Ms Fabienne Vailes shared their thoughts here on mental ill health, the ethics of animal research and the role of technology in shaping our minds.

The event also hosted four stalls from organisations involved in neuroscience. Included here was Alzheimer's Research UK, Bristol Donors, Bristol Drugs Project and the British Neuroscience Association. These stalls interacted with attendees and speakers alike and showed where a career in neuroscience and medical research may lead.

Since the event, the neuroscience society has been met with overwhelmingly positive feedback. They would like to extend their thanks to the BNA for their kind sponsorship and Bristol Neuroscience Network for all their help in organising the event. In future years, this event will be shared amongst other universities; like a travelling conference.

Keep an eye out for more events hosted by neurosoc. This has been their most successful year thus far and it's only set to get bigger and better!



ELIZABETH BLACKWELL FUNDING

Daphne Jackson Fellowship

The Fellowship is intended to support individuals who want to return to research in their careers as scientists, engineers, technologists and mathematicians, following a break of two years or more taken for family, caring or health reasons, and who will be conducting health-related research.

Closing date: 13 May 2019

EBI Translational Acceleration and Knowledge Transfer (TRACK)

This scheme provides funding to support health related translational projects.

Closing date: 9:00 13 June 2019

EBI Identifying Candidates for Wellcome Trust Investigator Awards

This scheme is designed to support a small number of permanent academic staff at UoB within the first five years of their appointment, who are planning to apply for an Investigator Award from the Wellcome Trust. Applications will be accepted on a rolling basis.

Heads of School are asked to nominate members of staff who can be eligible for this scheme by emailing ebi-health@bristol.ac.uk

Closing date: none

EBI Workshop Support

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

Closing date: none

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).

Closing date: 30 April and 31 October each year

EBI Bridging Funds for Research 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.

Closing date: none

The Elizabeth Blackwell Institute for Health Research is officially a member of Equality, Diversity and Inclusion in Science and Health, or EDIS, an initiative set up by the Wellcome Trust, the Crick Institute and GSK. Find out more about EDIS

FUNDING OPPORTUNITIES

Would you like to receive timely, tailored funding opps information?
Do you want to know what funding opportunities come up in your research area?
Get tailored funding alerts?

Research Professional provides access to an extensive database of funding opportunities, and can send out tailored alerts based on keywords that you input, ensuring that the funding alerts you receive are the ones you want to hear about. UoB staff and students have **FREE** online access to the database from any device – once you've registered then you can view upcoming funding opportunities from home or away, not just while on the University network.

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**, an easy process that will take just a few minutes to set up through the use of keywords
- **Save searches and bookmarks** - store items of interest for future reference, download and email to colleagues
- **Sign up for higher education news bulletins** – want to hear about what is going on in the broader HE environment? Latest news on the REF, setting up of UKRI etc? Sign up for the 8am playbook or the Research Fortnight news publications and stay up to date with the latest news.

Alternatively, a full calendar of funding opportunities for neuroscience research has already been set up and is available online. Subscribing to the calendar will place the entries in your own calendar, which will automatically update according to pre-specified search criteria. Find out more about **Research Professional** on the RED website. Note that some calls may have an internal process; do always remember to check the major bids webpage here to see if there is an internal process.

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**.

Research Professional

Lundbeck Foundation
International neuroscience programme

Closing date: 13-May-19 Award amount: DKK 3 million

This supports international collaboration for Danish neuroscience.

BRACE
Pilot grants

Closing date: 15-May-19 Award amount: £70,000

These support medical scientific research into the different forms of dementia. There are four main areas of supported research:

- the way the brain works – understanding more clearly 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
- the potential link between certain genes in our DNA and the chances of developing dementia

Dunhill Medical Trust
Research project grants

Closing date: 17-May-19 Award amount: £300,000

These support research projects that are important to understanding the mechanisms of ageing, treating disease and frailty and identifying and developing new and effective ways to improve the lives of older people. The grants also support research into treating diseases and conditions that disproportionately affect older people but are less well-funded. Research topics include:

- behavioural research
- clinical and applied research
- health services research

Medical Research Council
Research grants – neurosciences and mental health

Closing date: 30-May-19 Award amount: £300,000

These are suitable for focused research projects that may be short- or long-term in nature. In addition, they may be used to support method development and continuation of research facilities and may involve more than one research group or institution.

Medical Research Council
New investigator research grant – neurosciences and mental health

Closing date: 30-May-19 Award amount: £300,000

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

Alzheimer's Research UK
Inspire fund – public engagement grant

Closing date: 30-May-19 Award amount: £30,000

This supports innovative projects that engage the public with dementia and the research going on into the condition.

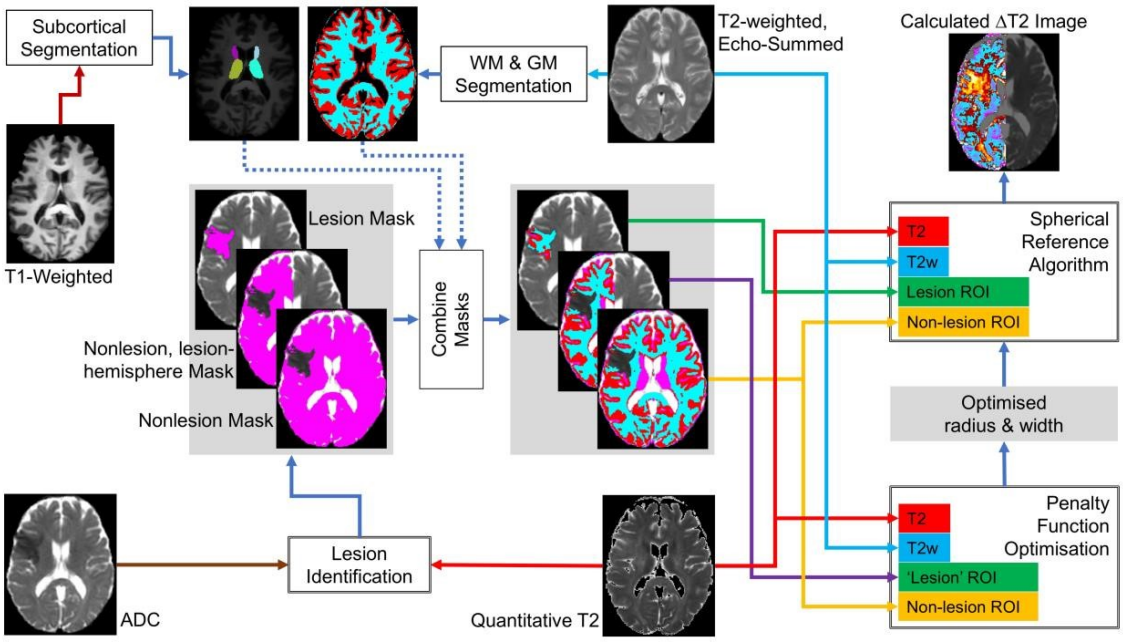
SHOWCASED ARTICLE

Quantifying T2 relaxation time changes within lesions defined by apparent diffusion coefficient in grey and white matter in acute stroke patients

Damion R, Knight MJ, McGarry BL, Bosnell R, Jezzard P, Harston GWJ, Carone D, Kennedy J, El-Tawil S, Elliot J, Muir KW, Clatworthy P, and Kauppinen RA. *Physics in Medicine and Biology*. Printed online 28 March 2019.

Apparent diffusion coefficient (ADC) of cerebral water, as measured by diffusion MRI, rapidly decreases in ischaemia highlighting a lesion in acute stroke patients. The MRI T2 relaxation time changes in ischaemic brain such that T2 in ADC lesions may be informative of the extent of tissue damage, potentially aiding in stratification for treatment. We have developed a novel user-unbiased method of determining the changes in T2 in ADC lesions as a function of clinical symptom duration based on voxel-wise referencing to a contralateral brain volume. The spherical reference method calculates the most probable pre-ischaemic T2 on a voxel-wise basis, making use of features of the contralateral hemisphere presumed to be largely unaffected. We studied whether T2 changes in the two main cerebral tissue types, i.e. in grey matter (GM) and white matter (WM), would differ in stroke.

Thirty-eight acute stroke patients were accrued within 9 hours of symptom onset and scanned at 3T for 3D T1-weighted, multi b-value diffusion and multi-echo spin echo MRI for tissue type segmentation, quantitative ADC and absolute T2 images, respectively. T2 changes measured by the spherical reference method were 1.94 ± 0.61, 1.50 ± 0.52 and 1.40 ± 0.54 ms/hour in the whole, GM and WM lesions, respectively. Thus, T2 time courses were comparable between GM and WM independent of brain tissue type involved. We demonstrate that T2 changes in ADC-delineated lesions can be quantified in the clinical setting in a user unbiased manner and that T2 change correlated with symptom onset time, opening the possibility of using the approach as a tool to assess severity of tissue damage in the clinical setting.



Flowchart showing the overall process of obtaining med(ΔT_2) for the lesion, and a calculated ΔT_2 image via the spherical reference method

CONTACTS

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Network Administrator: Catherine Brown (Elizabeth Blackwell Institute)

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