University of BRISTOL
Elizabeth Blackwell Institute for Health Research

Bristol Neuroscience Newsletter

September - October 2018

bristol neuroscience

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Inside this issue:

€10 million Parkinson's study

A new €10 million international trial to evaluate a new model of care that aims to improve the quality of life for people living with Parkinson's disease will be conducted with the University of Bristol and the Royal United Hospitals Bath NHS Foundation Trust thanks to funding from The Gatsby Foundation.

The five-year trial, led by Dr Emily Henderson, a Geriatrician at the Royal United Hospital in Bath and an Honorary Senior Lecturer at UoB, will see the implementation of a new integrated care model designed specifically for people with Parkinson's disease across two health hubs in Bath and Nijmegen in the Netherlands.

The Bristol Randomised Controlled Trials Collaboration (BRTC) with Prof Yoav Ben-Shlomo, will lead on the methodology and evaluation for the project with the innovation for patients delivered through the Royal United Hospitals, Bath.

The project, entitled *Proactive and Integrated Management and Empowerment in Parkinson's Disease* (PRIME-PD), will be rigorously evaluated to determine the extent to which health can be improved and health care costs can be reduced. This project aims to bridge that gap by developing and evaluating a new model of proactive and integrated care that addresses the patients' needs. This model, will capitalise on the experience and infrastructure already present in both the UK and the Netherlands. It is anticipated that, around 1,000 patients with Parkinson's will be recruited for the trial from the RUH catchment areas, with simultaneous innovations being implemented in the Netherlands.

Follow the project on Twitter, https://twitter.com/PdPrime.

GATSBY

EVENTS

The way we die now - The over medicalisation of death in the 21st Century
26 October 2018, 18.00 - 19.00, We The Curious, Anchor Road, Bristol

Coffee Morning with Brigstow
29 October 2018, 9.00 - 12.00, Library Room, Ground Floor Royal Fort House

L&R Postgraduate Presentations

30 October 2018, 13.00 - 14.00, Charlotte Carpenter (Year 1, PhD student): *The impact of adverse events after total hip replacement*, and Alfie Wearn (Year 2, PhD student, pictured) *Long term memory consolidation and hippocampal changes in preclinical Alzheimer's disease*. Seminar rooms A&B, Level 2, Learning and Research Building, Southmead Hospital

Engagement Bites: Tips & Tricks for Public Engagement
31 October 2018, 13.00 - 14.00, Knowle West Media Centre, Seminar Room, Beacon House

Statistics Clinic - 31 October 2018
31 October 2018, 14.00 - 15.30, SM3 Mathematics Building

Selectivity Metrics can Overestimate the Selectivity of Units: A Case Study on AlexNet
1 November 2018, 13.00 - 14.00, Ella Gale (Research Associate, Psychological Science, UoB, pictured) Senior Common Room, Level 2 (2D17), Priory Road Complex

Fifty Years of UK Poverty Research - What Have We Learned?
5 November 2018, 9.30 - 17.00, Reception Room, Wills Memorial Building, University of Bristol

Rise of Experimental Government
5 November 2018, 15.00 - 17.00, Institute for Government, 2 Carlton Gardens London SW1Y 5AA

Tableau Workshop

7 November 2018, 10.00 - 12.00, Anna Tankel (Academic Marketing Coordinator, Tableau, pictured), Ground Floor Seminar Room, Beacon House

Clinical Academics in Training Annual Conference 2018
8 November 2018, 9.30 - 17.30, The Royal College of Physicians Edinburgh

Afternoon Tea with Brigstow

9 November 2018, 14.00 - 17.00, Library Room, Ground Floor Royal Fort House

Functional dissection of neural circuitry in the behaving mouse
12 November 2018, 13.00 - 14.00, Paul Chadderton (PPN, pictured), C42 Biomedical Sciences Building

2018 BRACE Conference

FULL EVENTS LISTINGS ARE AVILABLE ON THE BN WEBSITE

13 November 2018, 10.00 - 15.00, The Future Inn, Bond Street South

Richard Gregory Memorial Lecture 2018: Luke Jerram "Exploring the Edges of Perception"
13 November 2018, 18.00 - 19.30, artist Luke Jerram (pictured), Chemistry Lecture Theatre, Cantock's Close

Biomedical Sciences Film club
13 November 2018, 18.15 - 20.00, E29 Biomedical Sciences Building

South West Doctoral Training Programme Conference 2018 – Beyond Research: Society, Collaboration & Impact
14 November 2018, 9.00 - 17.00, Brunel's SS Great Britain, Bristol

Human Brain Anatomy Course
14 - 16 November 2018, Course director: Dr Paul Johns, BSc BM MSc FAcadMEd FRCPath, Birkbeck, University of London

Introduction to Involving Patients and the Public in Research
14 November 2018, 10.00 - 13.00, Biomedical Research Centre PPI team in collaboration with People in Health West of England

Introduction to IRAS, HRA Approval and Research Ethics
14 November 2018, 12.00 - 13.00, Jess Bisset (Research Operations Manager, UHB R&I), Lecture room 3, Education & Research Centre, Upper Maudlin Street

Statistics Clinic - 14 November 2018
14 November 2018, 14.00 - 15.30, SM3 Mathematics Building

Avon and Wiltshire Mental Health Trust conference
14 November 2018, 9.00 - 17.00, The Mansion House, Clifton Down, Bristol, BS8 3LJ

Healthcare Innovation Expo
14 November 2018, 9.00 - 17.00, UWE Exhibition and Conference Centre

Version control using Git
14 November 2018, 14.00 - 17.00, Room 1.07 (PC Lab), Merchant Venturer's Building

Big Beat
15 November 2018, 13.30 - 18.30, Kendrew Auditorium, Wellcome Genome Campus, Hinxton, Cambridge CB10 1SA

Data analysis best practice workshop
15 November 2018, 9.00 - 17.00, Ground Floor Seminar Room, Beacon House

Stroke Health Integration Team launch and drop-in
15 November 2018, 14.00 - 19.00, Circomedia, Portland Square, Bristol, BS2 8SJ

FULL EVENTS LISTINGS ARE AVILABLE ON THE BN WEBSITE

T3 Technical Talk Time Seminar series
21 November 2018, 14.00 - 15.00

Famous for 3 minutes
21 November 2018, 14.00 - 16.00, Room G1, 7 Priory Road

L&R Postgraduate Presentations
22 November 2018, 13.00 - 14.00, Carlos Muñoz Neira (Year 2, PhD student): *Lack of insight and social cognition in frontotemporal dementia and amyotrophic lateral sclerosis,* and Tanya Cerajewska (Year 1, PhD student): *Investigating the associations between periodontitis and neurodegenerative conditions*. Seminar rooms A&B, Level 2, Learning and Research Building, Southmead Hospital

Mind & Machine seminar
22 November 2018, 13.00 - 14.00, Hans Op de Beeck (Group leader of Human Brain Imaging and Rodent Visual Cognition, Laboratory of Biological Psychology, Belgium), Senior Common Room, Level 2 (2D17), Priory Road Complex

An Introduction to Research for Scientists, Nurses and Allied Health Professionals
26 November 2018, 9.00 - 13.00, Bristol Education & Research Centre, level 4, Lecture Theatre 2, Upper Maudlin Street

Zebrafish as a tool to study osteoarthritis / Cortical control of the pain state
26 November 2018, 13.00 - 14.00, Erika Kague and Robbie Drake (UoB), C42 Biomedical Sciences Building

Pumps and Pipes UK Conference
19 February 2019, 8.00 - 18.00, SPE Aberdeen

ECNP Workshop for Early Career Scientists in Europe 2019
7 - 10 March 2019, Nice (France)

BNA2019: Festival of Neuroscience
14 - 17 April 2019, Dublin, Ireland




Images from top: Carlos Muñoz Neira, Tanya Cerajewska, Hans Op de Beeck, Robbie Drake

FULL EVENTS LISTINGS ARE AVILABLE ON THE BN WEBSITE

NEWS

Depression during pregnancy rises

Using unique data from two generations who took part in Bristol's Children of the 90s longitudinal study, researchers examined responses to questions completed by the women during pregnancy to compare levels of depressive symptoms more than 20 years apart. Today 25% of young mums have high depressive symptoms compared to 17% in the 1990s. If their mother was depressed in pregnancy, daughters were also more than three times as likely to be depressed in their pregnancy.

It is the first time that scientists have been able to compare mental health symptoms in pregnancy across generations and marks the beginnings of a new wave of health and social policy research that is planned using data from three generations. Interestingly the research shows that depression in today's young women may be driven by rises in feeling overwhelmed and stress rather than feelings of being down and flat. Given that depression in pregnancy has substantial impact to both mother and child this is of key importance for health services. Next steps will use this resource to look at the consequences of maternal depression on the 2nd generation from the Children of the 90s once they are born.

Pearson R *et al*. (2018). Prevalence of Antenatal Depression Symptoms Among Two Generations of Pregnant Mothers: The Avon Longitudinal Study of Parents and Children. *JAMA Network Open.* 1(3), e180725.

New Head of School for PPN

Hugh Piggins, currently at Manchester, has been appointed as the Head of School for Physiology, Pharmacology and Neuroscience effective 1 January 2019. Chris Fry stepped down in August and Prof Clea Warburton will be acting as interim Head until Hugh arrives. Piggins is Professor of Neuroscience with an interest in the mechanisms of biological timing and in particular intrinsic daily or circadian clocks. The dominant circadian clock in mammals is localised to the suprachiasmatic nuclei (SCN) in the brain. A key property of SCN neurones is that they are spontaneously active, generating circadian variation in the production of action potentials, even when isolated *in vitro*. Surprisingly, the precise relationship between the intracellular molecular clock and the membrane properties of SCN neurons is unclear.

Read more about Hugh's research

Associations with venous thromboembolism

In the first review of its kind, new research has found that depression and the use of antidepressants are each associated with an increased risk of venous thromboembolism (VTE). The study, led by the Musculoskeletal Research Unit, has also shown that each of the various classes of antidepressant medications are associated with an increased risk of VTE.

Though the study could not prove if the observed findings are mainly driven by the antidepressant drugs or depression itself or both, it does show that a relationship exists between depression, antidepressant use, and VTE. Antidepressant medications have multiple indications, which include anxiety, pain, and neuralgia and their use is on the increase on a global scale. Given that VTE is a public health burden, the study's findings highlight the need for prescribers and healthcare professionals to evaluate patients to determine their excess risk of VTE during their management.

Kunutsor SK *et al*. (2018). Depression, antidepressant use, and risk of venous thromboembolism: systematic review and meta-analysis of published observational evidence. *Annals of Medicine*. Published online 25 August 2018.

Setor Kunutsor, lead researcher

Elizabeth Blackwell Institute updates

Rachael Gooberman-Hill, Director of the EBI, describes the Institute's innovative **approach to global health challenges** in a blog as part of the Bristol Firsts series, celebrating Bristol-based innovations in the NHS's 70th year.

Through its Wellcome Trust ISSF Award, EBI is delighted to support a new post to help researchers with the experimental design and statistics associated with fundamental biology research and preclinical studies. **Michelle Taylor**, Senior Research Associate in **Statistics and Experimental Design**, will provide expert advice on appropriate statistical methods for a diverse range of experimental approaches. She will work primarily with researchers during the planning stages of their projects as well as providing help with grant applications. This will include contributing expert input into calculating sample size estimates, methods to avoid bias, and appropriate statistical analyses.

Contact her on michelle.l.taylor@bristol.ac.uk.

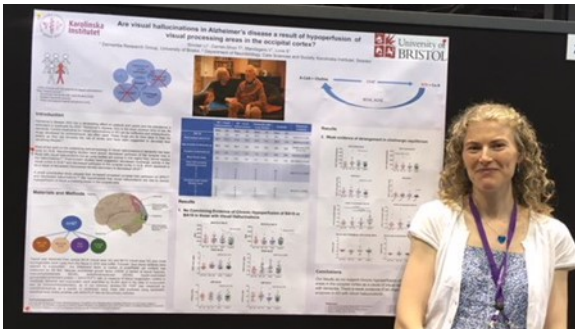
Congratulations to:

Zoe Cortes (Bristol Medical School) who was awarded a Clinical Primer for *Biomaterials for Improved Cell Delivery in Spinal Cord Injuries*.

Sonam Gurung (Biochemistry) who was awarded a Postgraduate Discipline Hopping fellowship in PPN for *Investigating synaptic implications of kainate receptor editing*.

Ola Bykowska (PPN) who was also awarded a Postgraduate Discipline Hopping fellowship in Computer Science for *SPHERE Data for Science and Health*.

External engagements



Dr Lindsey Sinclair (pictured) from the Dementia Research Group presented her work on whether chronic hypoperfusion in the occipital lobe is responsible for visual hallucinations in Alzheimer's Disease at the Alzheimer's Association International Conference (AAIC) held in Chicago on 20-26 July 2018.

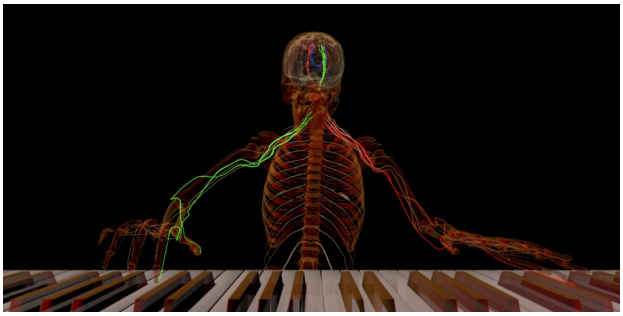
On 9 August 2018 artist Luke Jerram and Reader in Paediatric Opthalmology Cathy Williams were interviewed by both BBC Points West and ITV News, about the Impossible Garden, doing a piece about some special glasses which are part of the exhibition and can counter the effects of colour blindness. Interviews with people suffering from colour blindness were also shown. Photos of the exhibition were on the BBC website for *3 things we love today*.

Dementia featured on BCFM radio's Wellbeing Show on 9 October 2018. Prof Richard Cheston (UWE) spoke about the new Survey of Attitudes on Dementia launched by the Dementia Health Integration Team which aimed to find out about people's awareness of, and concerns about dementia as well as their attitudes towards people who have the condition; and Charlotte Procter from the Clinical Research Network on the need to involve more people with dementia in research. You can listen to the interview online.

Secrets of Brain Health (SOBH), a Virtual Reality project led by Dr Jade Thai and Dr Jon Brooks at CRICBristol, are proud to have been invited along with the Jean Golding Institute and the Clifton Suspension Bridge Harp projects to be represented on the Alan Turing Institute stand at this year's *New Scientist Live* event, which took place in London 20-23 September 2018.

A pioneering collaboration between the University of Bristol and BDH Immersive combining new scientific discoveries with cutting-edge visualisation, SOBH is funded by the Jean Golding Institute's 3D data Visualisation Challenge.

Secrets of Brain Health uses magnetic resonance imaging (MRI) scans in immersive virtual reality (VR) to illustrate the latest findings in neuroimaging research. Academics at CRICBristol are utilising cutting edge neuroimaging techniques to assess important clinical questions, such as: what is the impact of preterm birth on brain development, and can we detect the earliest signs of cognitive impairment on MRI scans to help prevent dementia in an ageing population. The VR data visualisation tells the story of how the brain develops and matures, how complex neural networks are formed throughout our lifespan.



Staff promotions

Congratulations are extended to:

Faculty of Life Sciences

Nick Scott-Samuel, Professor in Neuropsychology. Nick's research was initially concerned with the visual perception of motion by humans, but has become side-tracked over time by various other things, including the perception of food and drink, camouflage, visual search and the estimation of numerosity.

Kit Pleydell-Pearce, Professor of Clinical Neuropsychology Education. Kit's research is primarily concerned with neurophysiological correlates of human cognition, and issues associated with localisation of cognitive function.

Faculty of Health Sciences

Nicola Wiles, Professor of Epidemiology. Nicola's research focusses on epidemiology of common mental disorders - depression and anxiety and the treatment of common mental disorders in primary care, with a particular interest in treatment resistant depression.

Faculty of Engineering

Dima Aldamen, Reader in Computer Vision. Dima's interests lie in artificial intelligence, machine learning, activity analysis and action recognition.

New Faculty of Life Sciences

Created on 1 August 2018, the new faculty brings together the five Schools of Biochemistry, Biological Sciences, Cellular and Molecular Medicine, Physiology, Pharmacology and Neuroscience and Psychological Science to deliver research and teaching activity at all scales of the life sciences: molecular, cellular, tissue, organ systems, behavioural, social and societal.

Its creation is part of the University's Vision and Strategy to become a life sciences destination for students, academics and research funding. The Faculty of Life Sciences will deliver a range of challenging, research-focused, undergraduate and postgraduate programmes (both accredited and non-accredited), all taught in the context of world-leading research environments. It will also make significant contributions to three professional programmes (Medicine, Dentistry and Veterinary Science) which are run by the Faculty of Health Sciences, with the two faculties working closely together in their delivery. Research in the new faculty will address a range of the important challenges in the life sciences. From tackling ecosystem and global change, to innovation in fundamental biosciences for better human, animal, plant and ocean health; from understanding animal and human behaviour and wellbeing to developing future synthetic biotechnologies and so driving the UK's bioeconomy. The Faculty is led by Prof Jeremy Tavaré as Dean.

Reproducibility Network

A new Reproducibility Network that aims to improve the rigour and reliability of UK-led scientific research was launched on 12 September 2018. The Network aims to reinforce the leading position of UK science by co-ordinating shared training and best practice across research-intensive universities.

Prof Marcus Munafò, who contributed to the recently-published Manifesto for Reproducible Science, called on universities to do more to improve research rigour by setting out a range of measures for scientists that will optimise key elements of the scientific process.

Nearly all researchers go into science wanting to find out something new, and perhaps which has the potential to improve health, lives, and tackle some of society's major challenges. However, while UK science has an enviable reputation for being world-leading, to remain so we need to ensure the research we conduct is innovative, high quality and high integrity. The Network aims to support this through a series of measures that place extra emphasis on research rigour and reliability.

If you are interested in finding out more about the Network and its plans to improve scientific practices through targeted changes to research methods, reporting and dissemination, reproducibility, evaluation and incentives, contact Marcus.

Wellcome Board of Governors visit

Dr Jeremy Farrar, Director of the Wellcome Trust, visited Bristol on 25 September 2018 to meet senior staff and researchers and understand how Wellcome funding is used, explore issues of joint concern in the UK science base, and discuss future opportunities with the University.

Dr Farrar, who delivered a talk on Wellcome's strategy and future directions to Bristol senior staff and researchers, was joined by other members from Wellcome's Board of Governors and senior leadership team.

During the day, the Wellcome team met researchers from across the University to discuss their work on a wide range of topics from law and ethics in healthcare, antimicrobial resistance, quantum computing and its applications in biomedicine, dementia, digital health, data linkage for health applications, population health, research reproducibility, and synthetic biology.

35 genes associated with cannabis use

A large-scale genetic study found that some of the same genes associated with the use of cannabis are also associated with certain personality types and psychiatric conditions. The International Cannabis Consortium used data from the UK Biobank, association results from 23andMe customers and 16 smaller study cohorts. They found that people with schizophrenia are also more likely to use cannabis.

The study identified 35 different genes associated with cannabis use with the strongest associations in the gene CADM2, which has already been associated with risky behaviour, personality and alcohol use. The team looked across more than a million genetic variants that together helped to explain approximately 11% of the differences in cannabis use between people. They found a genetic overlap between cannabis use and the use of tobacco and alcohol; a similar overlap between cannabis use and personality types that were prone to more risky behaviour or were more extraverted was also found. This means that genetic variants impacting cannabis use partially impact other psychological or psychiatric features as well. Mendelian randomisation showed a causal relationship between schizophrenia and an increased risk of cannabis use. This may indicate that people with schizophrenia use cannabis as a form of self-medication, however the team cannot exclude a reverse cause-and-effect relationship.

Vink J *et al*. (2018). GWAS of lifetime cannabis use reveals new risk loci, genetic overlap with psychiatric traits, and a causal influence of schizophrenia. *Nature Neuroscience*. 21, pp. 1161–1170.

Co-designing psychosis peer support

For people who have experienced symptoms of psychosis, negative hospital experiences can lead to stigma, isolation, loss of confidence and potentially rejection of services. Messages of hopelessness received from staff and unequal power dynamics can cause disempowerment, low self-esteem and resentment of the system. Bristol Health Partners and CLAHRC West want to co-design peer support to address the root causes of this and help rewrite the psychosis narrative. They were one of 25 shortlisted applications for funding by the Q Exchange, an initiative connecting people, who have improvement expertise, across the UK and which is led by the Health Foundation and supported and co-funded by NHS Improvement.

The proposal was inspired by a public involvement event, *Rewriting Psychosis*, run by the Psychosis Health Integration Team, which hosted over 130 people on 20 January 2018.

If you would like to become more involved with the initiative, contact Oliver Watson at Bristol Health Partners, Michelle Farr at CLAHRC West or Martha Sneyd, Peer Director Psychosis Health Integration Team and Recovery Navigator.

Read more

University of Bristol joins UK BioIndustry Association

The UK BioIndustry Association (BIA), the UK's trade association for innovative life sciences, represents over 300 companies including start-up and established bioscience and pharmaceutical companies, academic, research and philanthropic organisations, service providers to the biosciences sector as well as health advocacy groups, government agencies, economic development groups and overseas trade associations. Facilitating engagement of Bristol researchers with the life industries is part of the Elizabeth Blackwell Institute's remit to support growth of partnerships and alliances with industry across the health arena, led by Dr Richard Seabrook MBA, Advisor on Business Development.

A proud member of BIA UK BioIndustry Association

This membership offers researchers at the University of Bristol the opportunity to:

- influence policy ensuring your voice is heard and the University is represented on the matters that are critical for the life sciences sector success
- connect with the sector and grow your network through the BIA industry-leading events and expert committees
- save money through the BIA business solutions purchasing programme
- provide visibility and showcase your research, advertise your jobs, share your news, events and other information through the BIA website.

To benefit from access to BIA full online content, log in using your**@bristol.ac.uk** email address and create your personal account.

GW4 new research communities

The latest round of successful funding applications to the GW4 Alliance were announced on 31 July 2018. The collaborative research communities across Bristol, Bath, Exeter and Cardiff will tackle some of society's biggest questions and global challenges.

GW4 Initiator funding offers awards of up to £20K for emerging GW4 research networks to establish themselves through collaborative activities such as sandpits and workshops.

Accelerator funding, between £20k and £75k, aims to scale up existing communities to large scale bids and deliver a step change in world-class research.

Initiator

- The GW4 Value of Death Network
- A multi-stakeholder approach to medicines optimisation

Accelerator

- Investigating Gender Based Violence Intersectional (Dis)Advantages and Legal Duties – A Scoping Study of UK Universities
- Transformative history education: Learning from creative practices in Cambodia, Colombia and Iraq
- GW4-BCR (Brain Cancer Research). From Daffodils to Drugs.
- A biosocial approach to trauma and posttraumatic stress disorder (PTSD) in young people

There is currently an open call in all areas of research are invited to both the Initiator and Accelerator Funding streams. For further details and to download the forms go to the GW4 website. **Closing date is 16 November 2018.**

Polycystic ovary syndrome and autism

Women with polycystic ovary syndrome (PCOS) are more likely than other women to have an autistic child, according to an analysis of NHS data carried out by a team at Cambridge University's Autism Research Centre.

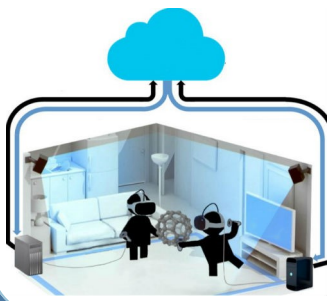
The team published work in 2015 which showed that before they are born, autistic children have elevated levels of 'sex steroid' hormones (including testosterone) which 'masculinise' the baby's body and brain. The discovery that prenatal sex steroid hormones are involved in the development of autism is one possible explanation for why autism is diagnosed more often in boys. They wondered where these elevated sex steroid hormones were coming from, one possible source being the mother. If she had higher levels of testosterone than usual, as is the case in women with PCOS, then some of the hormone might cross the placenta during pregnancy and change the baby's brain development. Using data from GP health records they looked at 8,588 women with PCOS and their first-born children, compared to 41,127 women without PCOS. They found that, even after taking into account other factors (e.g. maternal mental health problems or complications during pregnancy), women with PCOS had a 2.3% chance of having an autistic child, compared with the 1.7% chance for mothers without PCOS. The findings were replicated in a Swedish study in the same year.

The team also conducted two other studies using the same data and found that autistic women were more likely to have PCOS, and women with PCOS were more likely to have autism themselves. This strongly suggests that these two conditions are linked, probably because they both share elevated sex steroid hormone levels.

Cherskov A *et al*. (2018). Polycystic ovary syndrome and autism: A test of the prenatal sex steroid theory. *Translational Psychiatry*. 8, Article 136.

New drug and material discoveries to be untangled in VR

A joint team of computer science and chemistry researchers, in collaboration with developers at Bristol based start-up Interactive Scientific and Oracle Corporation, have used Oracle's public cloud infrastructure to combine real-time molecular simulations with the latest virtual reality technology. This collaboration has made it possible for researchers to reach out and 'touch' molecules as they move - folding them, knotting them, plucking them and changing their shape to test how they interact. Using cloud computing, several people can interact with the molecules in the same virtual space at the same time.



Industry is already showing interest in using VR in this breakthrough way to change how drugs are designed, and to transform the teaching of chemical structures and dynamics. Anybody wishing to try out the tasks described in the paper can download the software at https://isci.itch.io/nsb-imd, and launch their own cloud-hosted session.

O'Conor M et al. (2018). Sampling molecular conformations and dynamics in a multi-user virtual reality framework. *Science Advances*. 4(6), eaat2731.

Daytime napping

A Medical Research Council-funded study has aimed to understand whether a short period of sleep can help us process unconscious information and how this might affect behaviour and reaction time.

The findings support the advice which suggests that a period of sleep may help weighing up pros and cons or gain insight before making a challenging decision, and further reveal the benefits of a short bout of sleep on cognitive brain function; even during short bouts of sleep we process information that we are not consciously aware of.

Researchers hid information by presenting it very briefly and "masking" it - so it was never consciously perceived (the masked prime task). The hidden information, however, was processed at a subliminal level within the brain and the extent to which it interferes with responses to consciously perceived information was measured. Sleep (but not wake) improved processing speed in the masked prime task – but not in the control task – suggesting sleep-specific improvements in processing of subconsciously presented primes. The findings are remarkable in that they can occur in the absence of initial intentional, conscious awareness, by processing of implicitly presented cues beneath participants' conscious awareness.

Shaikh N & Coulthard E (2018). Nap-Mediated Benefit to Implicit Information Processing Across Age Using an Affective Priming Paradigm. *Journal of Sleep Research.* Online 23 July 2018.

EBI Research Strands

The newly created Elizabeth Blackwell Institute (EBI) Research Strands are cross-faculty initiatives that build on the existing research base in Bristol to tackle challenges that can only be addressed by multi-disciplinary teams of researchers. The research strands align with research priorities of the University of Bristol and create a shared vision in key thematic areas. They aim to support capacity development and provide exciting new research opportunities for researchers, including those who have never previously felt their skills and expertise were relevant to a particular health or biomedical area.

Current strands include:

Bioethics, Biolaw and Biosociety
Establishing Bristol as a leader in interdisciplinary and multi-disciplinary research into the ethical, legal and social dimensions in the biosciences, including health and social care.

Medical Humanities
Opening the door to new arts-science collaborations by connecting researchers from all faculties together with clinicians and external partners for research focusing on philosophy and humanities.

Bristol AMR
Building on clear areas of success and expanding the research network in antimicrobial resistance, across disciplines and linked to global health challenges. The Strand is co-lead by Profs Matthew Avison and Adrian Mulholland.

Digital Health
Increasing visibility of digital health research, bringing together teams around health challenges, developing external partnerships and engaging undergraduate students.

University of BRISTOL
Elizabeth Blackwell Institute for Health Research

How Bristol research has helped shape the NHS

This year we honour the 70th anniversary of the National Health Service (NHS). Since it was established in 1948, the NHS has played a vital role in UK society. As part of the celebrations, UoB shone a spotlight on how our research and teaching has helped to shape the NHS and improve people's health.

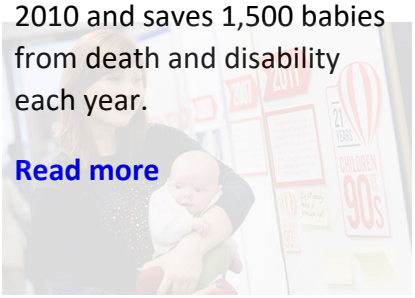
Examples include:

Studying Bristol families to improve the health of future generations

The Children of the 90s study has been charting the lives of people born in the early 1990s in the greater Bristol area. Data from the has been used by more than 600 academics, leading to important discoveries that are helping treat and prevent ill health. For example, mothers who consume less fish during pregnancy have children with lower IQs. Its founder, Prof Jean Golding, has been named as one of seven research legends by the NIHR to mark every decade of the NHS.

Cooling babies to save lives

Prof Marianne Thoresen's research showed that cooling newborns who had been starved of oxygen during birth could reduce their risk of suffering brain damage. It led to a revolutionary treatment which has been provided by neonatal intensive care units across the UK since 2010 and saves 1,500 babies from death and disability each year.



Read more

Increased BMI causes lower mental wellbeing

There is an increasing need to prevent obesity because of the consequences for mental as well as physical health. The study explored the impact of aspects of physical health to see whether a wide age range of individuals with poorer physical health went on to be less happy and less satisfied with their lives.

Previous studies have shown that individuals who are happier and more satisfied with their lives tend to have better physical health and live longer than those who have lower mental wellbeing. Using Mendelian randomization, the team asked whether poorer physical health causes lower mental wellbeing, or whether individuals with lower mental wellbeing are more likely to go on to have later problems with their physical health. The technique provides evidence of the direction of causation by using genetic variants that have been associated with physical health and mental wellbeing, while ruling out the influence of other factors that might be causing both physical health and mental wellbeing.

They were able to test 11 measures of physical health including coronary artery disease, heart attack, cholesterol, blood pressure, body fat and Body Mass Index (BMI). Results suggested a consistent causal effect of higher BMI on lower mental wellbeing. There was little evidence that the other physical health traits were leading to less happiness and life satisfaction. The same pattern of results was seen in a follow-up analysis using the UK Biobank cohort of over 300,000 individuals aged 40 to 70 years old. Results so far highlight the pressing need to tackle the obesity crisis because higher BMI is causing the population to be less happy and less satisfied with their lives.

Wootton RE *et al*. (2018). Evaluation of the causal effects between subjective wellbeing and cardiometabolic health: mendelian randomisation study. *BMJ*. 362:k3788.

Anti-psychotic drug prescriptions

People with schizophrenia die about 20 years earlier than those without a serious mental illness. This is partly because they are more likely to have serious health problems such as obesity, diabetes, high blood pressure and high cholesterol; all of which increase the risk of having a heart attack or stroke. People may be more likely to have these problems if they take more than one antipsychotic over a long time, but the review has shown that more research is needed to confirm this.

Many patients with schizophrenia are prescribed more than one anti-psychotic at a time. Researchers found 12 systematic reviews, but the evidence was low quality and most included clozapine, a commonly prescribed antipsychotic used when a patient doesn't respond to other antipsychotics.

There was some indication that drug combinations with aripiprazole can protect against diabetes and high blood fat levels, compared to combinations without aripiprazole or single drug therapy. The next phase will analyse routine data from GPs to understand the risk of getting diabetes, high blood pressure and high blood fat levels when taking more than one antipsychotic drug.

Ijaz S et al. (2018). Antipsychotic polypharmacy and metabolic syndrome in schizophrenia: a review of systematic reviews. *BMC Psychiatry*. 18, 275.

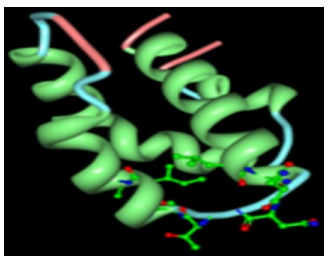
New hope in treating neurodegenerative disease

Most of the major neuropsychiatric conditions (e.g. epilepsy, Alzheimer's and Parkinson's disease) involve a gradual decline of neuronal populations as neurones in the affected areas die. The scale of these problems and associated costs to society are a huge burden to society. A new study has shown that specialised support cells within the brain, astrocytes, can be pharmacologically targeted to protect neurones from damage.

Astrocytes are the 'housekeeper' cells of the brain which control brain metabolism, transport essential chemicals and balance ion composition. The team's senior authors, Prof Sergey Kasparov and Dr Anja Teschemacher, found that astrocytes display receptors for a naturally occurring compound, prosaposin. When prosaposin acts on these receptors, it engages their defence mechanism and protects them, and adjacent neurones, from damage.

Academia and industry have been trying to find effective therapies against dementia and neurodegenerative diseases for decades, but progress has been slow, maybe because most of the proposed strategies are trying to directly target neurons to achieve a therapeutic benefit.

Our research has shown that targeting astrocytes may be an effective strategy to develop new neuroprotective drugs which could prevent or delay the loss of neurones, slow down cognitive or motor decline, and potentially enhance brain function.



A model of the receptor activating portion of the synthetic peptide prosaptide derived from prosaposin

Liu B *et al*. (2018). Glio- and neuroprotection by prosaposin is mediated by orphan G-protein coupled receptors GPR37L1 and GPR37. *GLIA*. Online 27 Sept 2018.

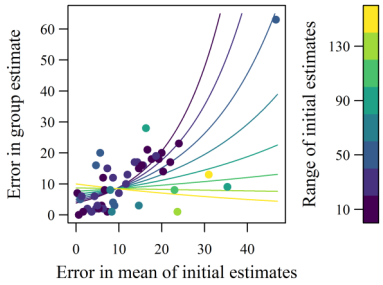
Wisdom of crowds

The 'Wisdom of Crowds' is well documented in adults, but previously children were thought to lack the social and cognitive skills to make effective group decisions together. A team evaluated the habits of 219 pupils from schools in the South West of England between the ages of 11 and 19 revealed that pupils as young as 11 possess the skills necessary to 'crowdfund' knowledge in order to decipher the correct answer.

Participants were asked to guess the number of sweets in a jar individually and then after discussion, to give a group answer. The researchers looked at how the children used their original guesses to come to a final group answer. the children reduced their estimation error after group discussion. Even more surprising, to reach a group consensus, they intuitively used a geometric mean rule-of-thumb to combine their guesses, especially when there was a lot of disagreement.

Since children are not as socially and cognitively developed as adults but have better skills than most other animals, investigating how collective intelligence works in children might be the bridge to connect research on adults and other animals. Looking at collective intelligence in humans while still in their developmental stage might reveal how and why humans are so remarkable when working in groups.

Ioannou C *et al*. (2018). Adolescents show collective intelligence which can be driven by a geometric mean rule of thumb. *PLOS ONE*. Online 24 September 2018.



Wellbeing in kidney failure

In addition to affecting their physical health, kidney failure affects the psychosocial health of young people. With this in mind, Dr Alexander Hamilton's team conducted a study to determine which factors influence mental wellbeing and medication adherence in young adults who have received a kidney transplant or are undergoing dialysis.

After analysing data from the UK Renal Registry and online surveys they found that wellbeing was positively associated with extraversion, openness, independence, and social support, and negatively associated with neuroticism, negative body image, stigma, psychological morbidity, and dialysis. Higher medication adherence was associated with living with parents, conscientiousness, physician access satisfaction, patient activation, age, and male sex, and lower adherence with comorbidity, dialysis, education, ethnicity, and psychological morbidity.

Results suggest a possible role for routine measurement of psychological health in young people, to avoid missing opportunities to identify and improve mental health. This could help identify those at higher risk of poor outcomes for close monitoring, greater psychosocial support, or targeted interventions.

Hamilton AJ *et al*. (2018). Associations with Wellbeing and Medication Adherence in Young Adults Receiving Kidney Replacement Therapy. *Clinical Journal of the American Society of Nephrology* (*CJASN)*. Online 16 October 2018.

CHIEF-PD

The **Ch**olinesterase **I**nhibitors to pr**E**vent **F**alls in **P**arkinson's **D**isease (CHIEF-PD) Trial is a medical research phase III trial that is examining whether drugs that are used normally to treat people with memory and thinking problems can be used to reduce the number of falls of people with Parkinson's experience. The trial is currently being set up and will be ready to start recruiting patients in early 2019.

Dr Emily Henderson, Geriatrician at the Royal United Hospital in Bath and an Honorary Senior Lecturer at UoB, is the Principal Investigator on the £2.1 million grant from the National Institute for Health Research (NIHR) Health Technology Assessment (HTA).

You can follow CHIEF-PD on Twitter @chiefpd2

Image shows Emily in Hong Kong under an "advert" for the RCT of rivastigmine to prevent falls in Parkinsons 😉

Children born premature can 'catch-up' at school

A team looking at the school test data of 12,586 children in the Children of the 90s longitudinal study wanted to assess if infants born prematurely struggle in school as they grow up. To date most research has looked at how these children perform at school but not how they can make progress.

The findings showed that while the trajectory of educational progress varies, children may 'catch up' by the time they are age 11 (key stage 2). At all four key stage assessments preterm children had a higher chance of being in the lowest scoring group but had a higher trajectory of improvement, particularly between key stage 1 and 2.

The study was led by Consultant Neonatologist at Southmead Hospital Dr David Odd.

While we know that children born prematurely are more likely to struggle at school than their peers we didn't know what their capacity was to catch up over time.

With six per cent of births in the UK occurring four weeks or earlier than their due date it is important for both parents and the education profession to know when targeted help could be most effective. Compared to their early tests at school these perform better than would be expected so those managing support for them should not underestimate their capabilities and plan accordingly.

Odd D, Evans D and Emond A (2018). Prediction of school outcome after preterm birth: a cohort study. *British Medical Journal: Archives of Diseases of Childhood*. Online 8 October 2018.

Pioneering animal welfare approach

New guidance outlining a pioneering new approach for farm assurance schemes, retailers and farmers to improve animal welfare has been released following a six-year project with the Soil Association, RSPCA and University of Bristol.

The new *AssureWel Manual* is shifting the way assurance schemes look at welfare by focusing on the individual animal and looking at 'welfare outcomes' resulting from conditions animals are kept in, such as their physical health and behaviour.

The manual provides a framework designed specifically for use during a farm assurance scheme audit, which traditionally would only have assessed the "inputs", such as diet and how much space each animal is given, without guidance for assessing how effective those resources and management are at directly providing a good level of welfare for the individual animals.

The AssureWel approach covers how to develop, train and use welfare outcomes within the farm assurance context to improve animal welfare. Examples of measures developed include injuries, body condition and lameness on dairy cows and levels of mortality and their causes.

The protocols are now used by Soil Association Certification and RSPCA Assured, and a number of other schemes such as Red Tractor also use or recommend their use.

For a copy of the manual view/Download the PDF. Printed copies are also available to order by contacting animalwelfareadvisor@assurewel.org .

Modification of amino acids

A team in the School of Chemistry has invented a new way to modify amino acids by attaching a ring of carbon atoms at the very centre of the amino acid molecule.

The unusual reaction that introduces this new ring was previously of limited application, but the work showed that introducing new molecular structural features makes it compatible with a much wider range of chemical structures than previously suspected. For example, it is now possible to add rings that also carry a whole range of other atoms around their periphery.

The reaction involves the migration of the ring from the nitrogen atom of the amino acid to a carbon atom, and because amino acids exist in two mirror image forms, importantly it retains a memory of the starting mirror image structure in the structure of the product. The chemistry is also very easy to carry out on large scale, making it potentially very valuable for the practical synthesis of new drug molecules. The work has allowed us to turn what was a scientific curiosity into a really practical new way of making an important new group of chemical building blocks. It will provide scientists with a whole new set of modified amino acid molecules for making new medicines or modified proteins, enabling advances in understanding natural biochemical systems or tackling disease.

Leonard D and Clayton J (2018). Asymmetric α-arylation of amino acids. *Nature*. 562, pp 105–109.

ELIZABETH BLACKWELL FUNDING

EBI MRC Proximity to Discovery Industry Engagement Fund (PtoD)
With support from the MRC, funding for short term two-way people exchanges between industry and academia which align to MRC strategic priorities in population health, cardiovascular research, infection and immunity, neuroscience and cancer.

Closing date: **29 October 2018**

EBI Clinical Primer scheme
This scheme is aimed at exceptionally motivated clinically qualified medical, veterinary and dental trainees who are at an early stage of their career.

Closing date: **8 November 2018**

EBI Research Strands Funding opportunities (Bioethics, Biolaw, Biosociety)
The Bioethics, Biolaw, Biosociety Research Strand invite applications to support for research activities. Proposals should seek to advance the strand themes, facilitate new multidisciplinary connections, and lead to follow-on work.

Closing date: **16 November 2018**

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

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

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

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

EBI Bridging Funds for 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.

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

BNA Local Group funding
https://www.bna.org.uk/members/lg-funding/

Annual deadlines: 31-May-18 and 31-Oct-18 Award amount: £500 pa per individual

The aims of the funding scheme are to enable Local Groups (LGs) to benefit current members of the BNA and recruit new members of the Association. Creative ideas for activities that fulfil

the Objects of the BNA and engage with as many people as possible are looked on favourably. Such activities can include but are not restricted to:

- training or career opportunities in the field of neuroscience for BNA members
- opportunities to foster translational neuroscience
- public engagement projects
- an individual or a series of seminars*
- initiatives that support neuroscientists relating to wider issues of neuroscience e.g. using animals in research, neuroethics, working with the media
  initiatives to recruit new members to the BNA

Brain Research UK
PhD studentships

Closing date: 23-Nov-18 Award amount: £120,000

These enable graduates to gain the necessary skills and training to set them on course for the development of an independent career in neuroscience or neurology research. Research may be cause- and mechanistic-based and should address areas of large unmet need and demonstrate a clear pathway to clinical impact in diseases of the nervous system. Preference will be given to applicants in: acquired brain and spinal cord injury; neuro-oncology; headache and facial pain.

Action for A-T
Research grants in ataxia-telangiectasia

Closing date: 03-Dec-18 Award amount: £100,000

These support scientific research into ataxia-telangiectasia and its treatments and cures.

National Institute of Mental Health, US
Dysregulation and proximal risk for suicide (R01 clinical trial optional)

Closing date: 05-Dec-18 Award amount: USD 2 million

This supports research on suicide to improve the understanding of who is at most risk, why people transition from suicidal thoughts to action, and when to intervene. The focus is on research that addresses the role of arousal and regulation and how these domains dynamically shape emotional and cognitive functions such as response to reward, frustrative non-reward, cognitive flexibility and control, or decision-making.

Alzheimer's Drug Discovery Foundation, US
Programme to accelerate clinical trials

Closing date: 12-Jan-19 Award amount: USD 3 million

The Alzheimer's Drug Discovery Foundation invites letters of intent for its programme to accelerate clinical trials. This supports projects that aim to increase the number of innovative treatments tested in humans for Alzheimer's disease and related dementias. The programme funds:

clinical trials through phase 2a of novel drug candidates, including small molecules and biologics including antibodies, oligonucleotides, peptides, gene therapies, cell therapies; proof-of-concept biomarker-based trials in patients for repurposed or repositioned drugs; regulatory studies for investigational new drug or clinical trial application preclinical packages that are required before testing novel drugs in human subjects. Priority is given to programmes with:

- blood-brain barrier permeability for CNS-targeted therapies and dose optimisation for the intended route of administration and treatment duration for the drug candidate;
- target engagement and efficacy data in relevant animal models with the drug candidate;
- strong data packages demonstrating selectivity, microsomal stability, aqueous solubility, plasma protein binding, and CYP profiling of drug candidate;
- clinical biomarkers that will directly measure target engagement and can monitor treatment effects in human subjects;
- intellectual property for novel therapeutic approaches;
- strong rationale for the proposed clinical population;
- strategies for successful recruitment and retention, with evidence of prior success for recruitment of the proposed population and number.

Medical Research Council
Research grants – neurosciences and mental health

Closing date: 23-Jan-19 Award amount: £1 million

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.

Alzheimer's Research UK
Major project grants

Closing date: 23-Jan-19 Award amount: £1 million

These fund research projects on Alzheimer’s disease and related dementias.

National Institute on Drug Abuse, US
Neuroscience research on drug abuse (R01 clinical trial optional)

Closing date: 05-Feb-19 Award amount: unspecified

This supports research to understand the neurobiological mechanisms underlying substance use disorders, with special emphasis on identifying changes and neuroadaptations that occur during dependence, withdrawal and relapse to chronic substance abuse. This funding opportunity encourages basic neurobiological studies that use *in vivo* and *in vitro* model systems as well as studies in humans.

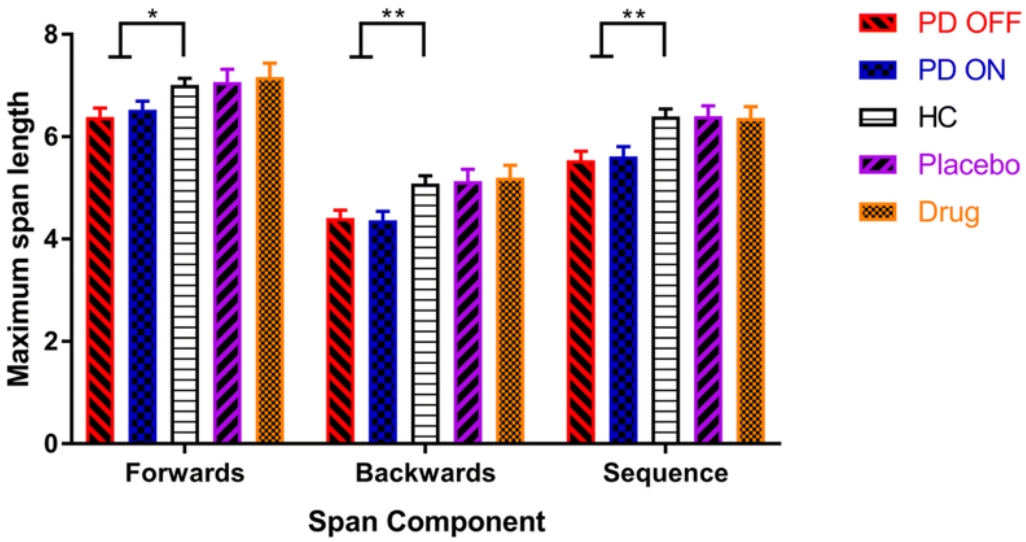
SHOWCASED ARTICLE

Effects of Parkinson's disease and dopamine on digit span measures of working memory

Grogan JP, Knight LE, Smith L, Izagirre NI, Howat A, Knight BE, Bickerton A, Isotalus HK and Coulthard EJ (2018). *Psychopharmacology*. Published online 12 October 2018.

Rationale

Parkinson's disease (PD) impairs working memory (WM) - the ability to maintain items in memory for short periods of time and manipulate them. There is conflicting evidence on the nature of the deficits caused by the disease, and the potential beneficial and detrimental effects of dopaminergic medication on different WM processes.



Objectives

We hypothesised that PD impairs both maintenance and manipulation of items in WM and dopaminergic medications improve this in PD patients but impair it in healthy older adults.

Methods

We tested 68 PD patients ON and OFF their dopaminergic medication, 83 healthy age-matched controls, and 30 healthy older adults after placebo and levodopa administration. We used the digit span, a WM test with three components (forwards, backwards and sequence recall) that differ in the amount of manipulation required. We analysed the maximum spans and the percentage of lists correctly recalled, which probe capacity of WM and the accuracy of the memory processes within this capacity, respectively.

Results

PD patients had lower WM capacity across all three digit span components, but only showed reduced percentage accuracy on the components requiring manipulation (backwards and sequence spans). Dopaminergic medication did not affect performance in PD patients. In healthy older adults, levodopa did not affect capacity, but did impair accuracy on one of the manipulation components (sequence), without affecting the other (backwards).

Conclusions

This suggests the deficit of maintenance capacity and manipulation accuracy in PD patients is not primarily a dopaminergic one, and supports a potential "overdosing" of intact manipulation mechanisms in healthy older adults by levodopa.

Image: The mean WM capacity (maximum spans) for PD patients ON and OFF dopamine, HC, and healthy older participants on levodopa and placebo on each component of the digit span (SEM bars). PD patients had lower capacities than HC for all span components, but there were no effects of dopamine for PD patients or healthy older adults for any component.

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Network Administrator: Catherine Brown (Elizabeth Blackwell Institute)

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