

# Bristol Neuroscience Newsletter

April - June 2020



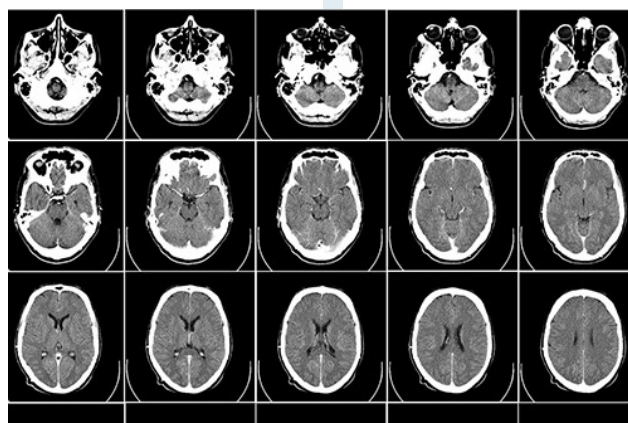
## Brain tumour research and precision medicine

New research on brain tumours could improve patient diagnosis and treatment options as part of a precision medicine approach. Brain tumours are the leading cause of cancer deaths in children and adults under the age of 40, with 16,000 people in the UK diagnosed with a brain tumour each year. The study, led by the Brain Tumour Research Centre at the University of Bristol in collaboration with the Cancer Research and Cell Biology (CCRCB) at Queen's University Belfast, investigated the genetics of brain tumours.

The research outlines the mutations that are particular to different tumour types. This information is important to enable pre-

cision medicine, where a patient would receive therapies tailored to the specific DNA mutations in their tumour. These findings could pave the way for developing new targeted treatments that are more effective. The research also followed the mutations that develop during brain cancer, which

brain cancer, there is a pressing need to build capacity and develop research programs for brain tumour research throughout the UK particularly to advance precision medicine, which promises more individualised treatments and better outcomes for brain tumour patients.



could identify new therapy options to be given as the cancer progresses and help to extend patient survival.

With only 5% of the national spend on cancer research allocated to

Ellis HP *et al.* (2019). [Clinically actionable insights into initial and matched recurrent glioblastomas to inform novel treatment approaches](#). *Journal of Oncology*.



@BristolNeurosci



bristol.ac.uk/  
neuroscience



b-n@bristol.ac.uk



+44 117 428 4012

### Inside this issue:

Events	2
News	3-39
EBI Funding	40
Funding Opps	41-42
Featured Pub	43
Contacts	44

# EVENTS

Events are being cancelled and postponed across the board due to the COVID-19 situation, but a few teams continue to meet virtually. If you feel you would like to take part, please contact the organiser listed.

A few (that I know of!) examples of active groups include:

- The [Natural and Artificial Intelligence Unit](#) (formerly the Computational Neuroscience Unit) meet for virtual coffee on Wednesdays at 10:30, are hosting the occasional webinar on Fridays at 15:00, and have set up a [Slack site](#). Contact Conor Houghton ([conor.houghton@bristol.ac.uk](mailto:conor.houghton@bristol.ac.uk)) or Cian O'Donnell ([cian.odonnell@bristol.ac.uk](mailto:cian.odonnell@bristol.ac.uk)) to get involved.
- The School of Cellular and Molecular Medicine virtual coffee mornings are on a Friday at 10:30, contact [cmm-admin@bristol.ac.uk](mailto:cmm-admin@bristol.ac.uk) if you'd like to take part.
- Bristol Veterinary School's [Animal Welfare and Behaviour](#) group have set up a SharePoint site and a Yammer Group, contact [Jo.Hockenhull@bristol.ac.uk](mailto:Jo.Hockenhull@bristol.ac.uk) for access or search on Office365 and request to join. They are also holding regular science meetings 12:00-13:00, contact [grp-labmeeting@groups.bristol.ac.uk](mailto:grp-labmeeting@groups.bristol.ac.uk) to join.
- The undergraduate Bristol Neuroscience Society has a [Facebook page](#) with posts about virtual events they will be hosting over the coming weeks, including pub quizzes
- The [Applied Vision Association](#) will be hosting weekly virtual meetings on a Wednesday at 16:00, contact [secretary@theava.net](mailto:secretary@theava.net) for details or to join the mailing list
- The School of Psychological Science has opened up a [Slack group](#) and is holding virtual coffee catch-ups on Fridays at 11:00
- Bristol Veterinary School are holding their [research mingles online](#); the next one is 22 April 2020 at 13:00 via BlueJeans. Contact Chris Whiting ([c.v.whiting@bristol.ac.uk](mailto:c.v.whiting@bristol.ac.uk)) if you'd like an invite. Speakers include: Jamie Mann (Using VLPs as a therapeutic cure for HIV-1); Leah Trigg [The exposure and behavioural response of grey seals (*Halichoerus grypus*) to shipping noise]; Sandra Spencer (Research Development: Our role and support overview – including fellowships)

Please note that the [Bristol Brain Research day](#) scheduled for 23 June 2020 has been postponed in view of current circumstances. We would like to thank you all for your support, and if you have registered or submitted an abstract you will have already been contacted directly. If not, please do get in touch ([catherine.brown@bristol.ac.uk](mailto:catherine.brown@bristol.ac.uk)).

**We are looking to host in early 2021, once demands on people's time has eased.**

**We will keep you informed on a new event date, new abstract submission date, and new registration link.**

**We look forward to welcoming you in a year's time**

**FULL EVENTS LISTINGS ARE AVAILABLE ON THE [BN WEBSITE](#)**

# NEWS

## Bristol's coronavirus research

As the COVID-19 pandemic has hit the world, researchers across the University of Bristol have united to collaborate on finding ways to overcome the disease. We have extensive research capability and our expertise has been rapidly mobilised. It includes laboratory research; population-based studies; modelling and epidemiology; clinical trials, surveys and social science research.

There are broad areas under which the research sits:

- **Understanding the virus and creating a vaccine**

Work to understand the pathogenesis of the virus – how it causes disease, and how it interacts with our bodies – is critical to the development of diagnostic tools, drugs and vaccines

- **Monitoring and predicting the effects of the epidemic**

A team are establishing key data-linkage, symptom tracking and seroprevalence studies which will monitor the effects

of the epidemic.

- **Working with governments and the NHS**

Our expertise in infectious diseases, public health and clinical trials make us well placed to contribute to the world's knowledge and effective control of this epidemic.

- **Impact on society**

Social distancing, policy, education, the economy, mental health and physical activity.

[Read more about our research, our media presence or contact an expert](#)

## Funding successes: Part 1

Dr [Lindsey Sinclair](#) (Bristol Medical School: Population Health Sciences) received £224,825 from the **Alzheimer's Society** for *Using genetic risk of depression to find new pathways involved in the development of depression in Alzheimer's Disease*, starting Jan 20 for 18 months.

To Dr [Abigail Fraser](#) (Bristol Medical School: Population Health Sciences) from the **Medical Research Council**, £39,126 for the project *Neurobiological pathways from trauma exposure to child mental health outcomes in a high adversity South African Birth Cohort*, starting Nov 19 for four years.

The *Bristol Grief Festival 2020* has been supported by a £98,549 grant from the **Wellcome Trust** thanks to an application submitted by Dr [Lucy Selman](#) (Bristol Medical School: Population Health Sciences).

To Prof [Jonathan Hanley](#) (Biochemistry) from **Alzheimer's Research UK** for *Investigating Argonaute phosphorylation and miR-134 as novel therapeutic targets in Alzheimer's disease*, starting Sep 19 for two years.

Prof [Tony Pickering](#) (Physiology, Pharmacology and Neuroscience) has received £107,309 from **Versus Arthritis** for *Multicontact elec-*

*trodes in nociceptor microneurography: towards diagnostics and personalised pain therapy*, starting Apr 20 for 18 months.

Tony is also in receipt of a £39,527 award from **Above & Beyond** to pursue a project entitled *A Recall by Genotype Study to investigate the role of common TRPA1 variants on acute pain perception*.

Dr [Emily Blackwell](#) (Bristol Veterinary School) has secured £47,000 funding from **Cats Protection** towards the annual running costs of the [Bristol Cats Study](#), which aims to better understand the causes of common behaviour patterns and diseases of cats.

## Artificial neurons developed

Artificial neurons on silicon chips that behave just like the real thing have been invented by scientists, a first-of-its-kind achievement with enormous scope for medical devices to cure chronic diseases, such as heart failure, Alzheimer's, and other diseases of neuronal degeneration. Critically the artificial neurons not only behave just like biological neurons but only need one billionth the power of a microprocessor, making them ideally suited for use in medical implants and other bio-electronic devices. The research team was led by the University of Bath and including researchers from the Universities of

Bristol, Zurich and Auckland.

The team successfully modelled and derived equations to explain how neurons respond to electrical stimuli from other nerves. This is incredibly complicated as responses are 'non-linear' – in other words if a signal becomes twice as strong it shouldn't necessarily elicit twice as big a reaction – it might be thrice bigger or something else. They then designed silicon chips that accu-

rately modelled biological ion channels, before proving that their silicon neurons precisely mimicked real, living neurons responding to a range of stimulations. The researchers accurately replicated the complete dynamics of hippocampal neurons and respiratory neurons from rats, under a wide range of stimuli. Artificial neurons could repair diseased bio-circuits by replicating their healthy function and responding adequately to

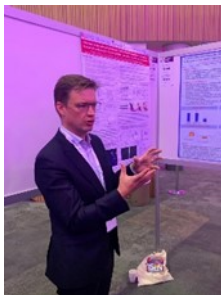
biological feedback to restore bodily function.

Abu-Hassan K *et al.* (2019). [Optimal solid state neurons](#). *Nature Communications*. 10: 5309.



## External engagements

[Will Singleton](#) (Bristol Medical School: Translational Health Sciences) presented early results and ideas on genetherapy for hydrocephalus at the 47th Annual International Society for Pediatric Neurosurgery held in Birmingham on 20-24 October 2019.



Representatives from the British Neuroscience Associa-

tion shadowed Dr Gail Born, Engagement Officer for the Faculties of Health and Life Sciences, to gain insights into growing their education outreach work.



[Qing Han](#), a PhD student in the School of Psychological Science, presented a well-

received paper on *Decision Avoidance and Regret: A systematic review and meta-analysis* to the London Scientific Meeting of the Experimental Psychology Society held on 9 January 2020. Qing's paper was co-authored with Drs Casimir Ludwig and Susanne Quadflieg.





## Funding successes: Part 2

Profs [Bridget Lumb](#) and [Richard Apps](#) (Physiology, Pharmacology and Neuroscience) have been awarded a **Medical Research Council** grant for Susceptibility to chronic pain: role of Cerebellar- Periaqueductal Gray communication. This is a three -year award totalling £515,198.

**Worldwide Universities Network** (WUN) Research Development Fund grants have been awarded to:

- [Ann Singleton](#) (Policy Studies), *Gendering Migration: Women and Girls Experienc-*

*es of Gender-based discrimination, abuse and violence across migratory stages*, lead partner Maastricht University

- Dr [Yiming Wang](#) (Policy Studies ), *Low-Carbon Transport, Individual Wellbeing & Planetary Health in the Era of Smart Cities and New Mobilities*, lead partner The Chinese University of Hong Kong
- Dr [Emma Williamson](#) (Policy Studies), *Mental Health Impact and Access to Health and Social Care Services for Women Victims of Intimate Partner Violence*, lead partner University of Sheffield.

[Anna Sales](#) (Engineering) has been awarded a **Biological Sciences and Biotechnology Research Council** Flexible Transfer Mobility award which will permit her to work at Eli Lilly & Co.

Dr [Michele Bellesi](#) (Physiology, Pharmacology and Neuroscience) has been awarded an **Alzheimer's Research UK** pilot grant to test whether sleep interventions (including carefully timed rocking) can alleviate Alzheimer's-related pathology.

## Sleep helps memory, right? Not for eyewitnesses

New research investigating the effect of sleep on eyewitness memory has found that having a period of sleep, compared to a period of wake, does not improve eyewitness identification accuracy. The researchers, based at Royal Holloway and the Universities of California, Bristol and Birmingham, conducted a large-scale online experiment on 4,000 participants to measure the impact of sleep on eyewitness identification accuracy on experimental eyewitnesses. In the experiment, 2,000 participants watched a video of a mock crime, either slept (overnight) or remained awake (during the day) and

were then tested on their memory for the perpetrator in the video on a line-up. The remaining data came from the control group; unlike the experimental participants who had 12 hours between the video and the line-up test, these participants were tested right after watching the video. While their ability to distinguish between innocent and guilty suspects was better than the participants in the experimental groups, the groups were just as reliable. That is, regardless if memory was tested 12 hours after first exposure, if a suspect was identified with high confidence, they were highly accurate. The fact that reliability is not impacted by various fac-

tors - sleep vs. wake; short vs. long retention intervals - is in line with a growing body of evidence that eyewitness reliability holds across a host of factors. The research suggests police should collect expressions of confidence in the initial identification because these are predictive of accuracy, regardless if there was a delay between witnessing the event or not or if sleep took place.

Morgan DP, Tamminen J, Seale-Carlisle TM and Mickes L (2019). [The impact of sleep on eyewitness identifications](#). *Royal Society of Open Science*. 6(12).

## Educational video for welfare of broiler chickens

The welfare of millions of broiler chickens could be improved thanks to an educational video to help farmers identify and encourage positive welfare in broilers. The video has been created following collaborative work by The Co-op, their chicken supplier, Two Sisters Food Group, and research partners the University of Bristol and FAI Farms. This research highlighted gaps in the current training provided to new broiler farmers. Firstly, around the importance of observing broiler behaviour

and secondly, how farmers could improve welfare through the encouragement of positive behaviours. Positive behaviours are natural behaviours that animals are highly motivated to perform, and these create positive experiences for the birds, resulting in enjoyment or pleasure. The training video cap-



tures on farm footage of broilers performing positive behaviours and describes why these behaviours are important for bird welfare. It then goes on to highlight the importance of litter, describing why maintaining dry and friable litter is not only good for the health of the birds, but also acts as another source of environmental enrichment for birds to interact with and perform positive behaviours.

[Watch the video](#)

## Factors that influence young people's gambling habits

A study has shown that regular weekly gamblers were more likely to be male and had developed habits and patterns of play by age 20. Factors such as the gambling habits of parents and social media use were also found to influence a young person's gambling activity. The in-depth longitudinal study by the University of Bristol's Children of the 90s was commissioned by GambleAware.

Participation in gambling in the past year was reported by more than half (54%) of 17-year-olds, which increased to almost seven in ten (68%) for 20-year-olds, and fell slightly by the

time those taking part reached the age of 24, to nearly two thirds (66%) saying they had gambled in the past year. When looking at gambling activity the team found that playing the lottery, buying scratch cards and placing private bets with friends were the most common forms of gambling. As the young people got older, there was a significant increase in online betting activity amongst men, going from 9% at age 17, to

35% at age 20, and 47% at age 24. The study suggests that for young people who gambled regularly, several environmental and family factors had a significant impact on their activity. For example, participants whose parents gambled regularly were more likely to gamble themselves and regular gamblers were also found to have high social media usage and to have been regular players of video games when young-

er. Regular gamblers had lower well-being scores and were at least twice as likely to smoke cigarettes daily and to drink alcohol weekly.

[Read more](#)



## Reducing the use of opioid painkillers for pain

A pioneering pilot service set up in South Gloucestershire to review patients' use of prescription opioid painkillers for long-term pain has helped many users reduce their use and improve their quality of life, researchers at the [NIHR Health Protection Research Unit in Evaluation of Interventions](#) and NIHR Applied Research Collaboration (ARC) West have found. Long-term pain (or chronic pain) refers to pain that has lasted longer than three months.

GP prescriptions of opioid painkillers such as morphine, tramadol and codeine, for people with long-term, non-cancer-related pain have increased by more than 60% in the last 10 years; but there is little evidence that opioid painkillers are effective in treating this type of pain. Long-term use of opioid painkillers can also be associated with people becoming dependent on these painkillers and an increased risk of death from overdose.

The South Gloucestershire

opioid and pain review service aimed to support long-term users of opioid painkillers manage their pain in a GP setting and where possible, reduce their opioid use. The service ran for 24 months in two local GP practices. Evaluation of the service found that 35% of patients reduced their opioid dose while a further 9% stopped taking opioids altogether. On average, service users improved on all health, well-being and quality of life outcome scales, but with no change in their pain relief scores. [Read more](#)

## Funding successes: Part 3

The **Jean Golding Institute** have awarded several seed corn awards from their 2020 call. These support activities to foster interdisciplinary research in data science and data-intensive research, and include:

- Dr [Oliver Davis](#), Nina di Cara (both Bristol Medical School: Population Health Sciences) and Prof [Claire Harworth](#) (Psychological Science), *Mood music: using Spotify to infer wellbeing*.
- Dr [Zoi Toumpakari](#), Dr [Ivan Palomares Carrascosa](#) (University of Granada), Prof [Daniele Quercia](#) (King's College London) and Dr [Luca Maria Aiello](#) (Nokia Bell Labs), *Automating food aggregation for nutrition and*

*health research*

- Dr [Avon Huxor](#) (Policy Studies), Dr [Emma Turner](#), [Eleanor Walsh](#) (both Bristol Medical School: Population Health Sciences) and Dr [Raul Santos-Rodriguez](#) (Engineering), *Elements of free text used in decision making: an exemplar from death reviews in prostate cancer and learning disabilities*
- Dr [Jim Dunham](#) (Physiology, Pharmacology and Neuroscience), Dr [Gethin Williams](#) (Geography), Prof [Nathan Lepora](#) (Engineering), Prof [Tony Pickering](#) (Physiology, Pharmacology and Neuroscience) and [Manuel Martinez Perez](#) (Engineering), *Decoding pain: development of a clinical tool to enable real-time data visualisation and analysis of hu-*

*man pain nerve activity*

- Dr [Liz Washbrook](#) (Education), *Mental health and educational achievement in two national contexts: a machine learning approach*

Prof [Nicholas Roberts](#) (Biological Sciences) has received £271,376 from the **Leverhulme Trust** for *The neural basis of kin recognition in social insects*, starting Jan 20 for three years.

Prof [Paul Moran](#) (Bristol Medical School: Population Health Sciences) has received an award from **Above & Beyond** for *Suicide prevention for Emergency Department attenders presenting with self-harm and a history of substance misuse*.



## Co-prescribing benzodiazepines to opioid dependent patients

Doctors should avoid co-prescribing benzodiazepines to opioid dependent patients who are being treated with methadone or buprenorphine, also known as opioid agonist treatment (OAT), due to a three-fold increase in risk of overdose death, according to a recent study. This increase in overdose death risk was also observed in patients who had recently left OAT. This is probably because these individuals continued to use opioid drugs after leaving treatment.

Benzodiazepines are sedatives that are often prescribed to people who are opioid dependent despite discouragement of this

practice in guidelines. Doctors may be ignoring this guidance, in part because there is evidence that patients receiving both medicines together stay in treatment longer and because opioid dependent patients have high levels of anxiety, which benzodiazepines can help relieve. The study suggests that, despite the benefits of longer treatment duration, the combination of benzodiazepines with opioid substitute therapy leads to a greater risk of overdose death than for those receiving OAT alone.

This was an observational study involving the analysis of data from the UK Clinical Practice Research Datalink of over 12,000 patients aged 15-

64 who were prescribed OAT between 1998 and 2014. Causes of death were found for over 7,000 of these patients through linking records with deaths data from the Office for National Statistics.

Macleod J, Steer C, Tilling K, Cornish R, Marsden J, Millar T, Strang J and Hickman M (2019). [Prescription of benzodiazepines, z-drugs, and gabapentinoids and mortality risk in people receiving opioid agonist treatment: observational study based on the UK Clinical Practice Research Datalink and Office for National Statistics death records](#). *PLOS Medicine*. Published 26 November 2019.

## Population Health and Bristol Neuroscience gathering

Generously hosted by the Population Health Sciences Institute, 40 (or so) early/mid-career delegates attended a networking lunch in February 2020 to informally explore synergies and potential collaborations across population health and neuroscience. Arranged by Profs Caroline Relton (Director, Population Health Sciences Institute) and Matt Jones (Director, Bristol Neuroscience), the event brought together postdocs, fellows and recently-

appointed PIs from both areas to discuss overlapping areas of interest with the aim of establishing collaboration opportunities. In particular, discussion focused on research relating to mental health, memory, movement and sleep. The gathering generated universal enthusiasm, with plans for a postdoc-led follow-up focus event.

If you interested in taking part in future gatherings, please contact [Gemma Crawford](#).





## Funding successes: Part 4

Is flight important to the welfare of captive birds? Prof [Innes Cuthill](#) (Biological Sciences), along with Prof [Mike Mendl](#) (Bristol Veterinary School), Prof Georgia Mason (University of Guelph), Dr Yvonne van Zeeland (University of Utrecht) and [Emma Mellor](#) (Bristol Veterinary School) have been awarded £46,307 from the **Universities Federation for Animal Welfare** for this [18-month project](#), which started in Dec 19.

Prof [Esther Eidinow](#) (Classics and Ancient History) has been awarded a

£999,711 **Arts and Humanities Research Council** Standard Research Grant for *The Virtual Reality Oracle (VRO): An Immersive Experience of the Ancient Greek Oracle at Dodona*. This is a three-year project which will use VR to recreate an approximation of the historical experiences (mental and somatic) of individuals consulting the ancient oracle of Zeus at Dodona and then, through user analysis, to investigate how such a recreation can help to advance understanding of (i) an ancient historical context and individual historical experiences of that context; and (ii) the de-

sign and deployment of multi-sensory VR experiences for research and educational purposes. This will be achieved by building a VR recreation of the ancient Greek oracle of Zeus and Dione at Dodona (the VRO).

Dr [Roisin McNaney](#) (Engineering) received £23,000 from **XenZone** for *DigiVerse: Understanding Barriers and Workarounds to the Access of Digital Mental Health Services with Diverse Populations of Young People*, starting Oct 19 for 7 months.

## Teenage anxiety and eating disorders

Teenage girls who experience clinical levels of anxiety could be at greater risk of eating disorders, according to associations identified in a study completed by researchers at the University of Bristol with UCL.

The new research looked at anxiety disorder pathology and engagement with severe levels of fasting (not eating for an entire day) in 2,406 teenage girls of [Bristol's Children of the 90s](#) study. While we have known there is a link between anxiety disorders and anorexia nervosa for some time, these new findings

support anxiety preceding the onset of severe restrictive eating, and as such may help inform the identification of individuals at greater risk of eating disorders. The findings did not examine for causal links so it is important that future studies look at the reasons behind the associations found. Similar work should also include young men, to determine whether the association holds in this population as

well.

Increasing our understanding of disordered eating behaviours and eating disorders is a necessary step in improving outcomes of prevention efforts. This is particularly important given the high burden of eating disorders, and their associated risks, with anorexia having one of the highest mortality rates of all psychiatric disorders.

Lloyd EC *et al.* (2019). [Anxiety disorders predict fasting to control weight: a longitudinal large cohort study of adolescents](#). *European Eating Disorders Review*. Published 17 December 2019.



## PReCePT study short film released

A short film launched 31 Jan 20 brings to life the work taking place in NHS hospitals across England to reduce brain injury in delivery of pre-term babies. Being born too early (preterm) is the leading cause of cerebral palsy, with lifelong impact on children and families. Every year in the UK around 500 pre-term babies develop cerebral palsy. PReCePT (Prevention of Cerebral Palsy in Pre-term Labour) is about ensuring that

mothers at risk of pre-term delivery are given magnesium sulphate, which protects their baby's brain. The long-term ongoing impact will be a reduction of hundreds of cases of avoidable cerebral palsy. It is an ongoing partnership of patients and parents, midwives, doctors, and quality

improvement (QI) experts and researchers, who are collaborating to reduce cerebral palsy and improve the life chances of pre-term babies across England.

The film shows how the PReCePT Study has brought together different disciplines

into perinatal teams to collaborate and offer seamless, joined up care.

[Watch the video](#)



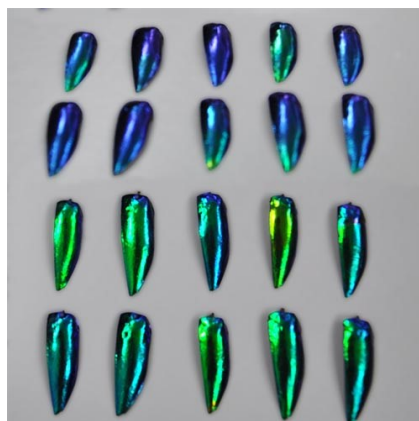
## Brilliant iridescence can conceal as well as attract

A new study shows for the first time that the striking iridescent colours seen in some animals increase their chances of survival against predators by acting as a means of camouflage; rather than reveal it seems these dynamically changing shades are used to conceal. Researchers at [Bristol's Camo Lab](#) wanted to find out why this vivid metallic coloration has evolved in so many different species of animals by investigating its biological function. They chose to test this theory on the vividly coloured jewel beetle (*Sternocera aequisignata*) because both sexes of this species are iridescent, which makes sexual signalling

somewhat less likely as a function of the colour. They tested the idea of iridescence-as-camouflage by placing iridescent and non-iridescent beetle models on leaves in the forest and noted their survival against attacks by wild birds. They found that the models with biological iridescence survived best against birds, providing evidence that iridescence can increase prey survival and that

these bright metallic colours could have evolved in beetles to confuse birds – their primary predator. The team tested why birds didn't attack the iridescent models and whether the increase in prey survival was due to camouflage or a warning colour effect by asking human participants to search for the beetle models in the same environment; they found that humans, like birds, had great difficulty spotting iridescent objects in a natural, complex forest environment.

Kjernsmo K *et al.* (2020). [Iridescence as Camouflage](#). *Current Biology*. Published 23 January 2020.



## Tactics to avoid location

Most animals need to move, whether this is to seek out food, shelter or a mate. New research has shown that movement doesn't always break camouflage and if an animal needs to move, animals that are unpatterned and use short, fast movements are less likely to be located by predators. In most cases, most of the visual field of a predator does not fall within a high-resolution area and so, when an undetected prey moves, that motion

will often be in peripheral vision. A team has investigated how this can be exploited by prey, through different patterns of movement, to reduce the accuracy with which the predator can locate undetected prey when it redirects its gaze toward the target. Results have shown that the ability of a predator to localise upon a target in its peripheral vision is influenced by duration, speed and target pattern. Some behaviours can reduce the negative effect that movement can have on

camouflage. Although movement doesn't help camouflage, the findings have shown that when movement is necessary, some behaviours and surface patterns reduce that cost.

Smart IE, Cuthill IC & Scott-Samuel NE (2020). [In the corner of the eye: camouflaging motion in the peripheral visual field](#). *Proceedings of the Royal Society B*. 287(1918).

## Funding successes: Part 5

Dr [Stephen Montgomery](#) (Biological Sciences) has received a £272,189 award from the **Natural Environment Research Council** for *Neurological adaptation and ecological specialisation*, starting Jan 20 for two years.

The **Engineering and Physical Sciences Research Council** has awarded Dr [Dima Aldamen](#) £1,001,838 for *UMPIRE: United Model for the Perception of Interactions for visual Recognition*, starting Feb 20 for 5 years.

Profs [Chris Fry](#), [Tony Pickering](#), [Emma Robinson](#) (all Physiology, Pharmacology and Neuroscience) and

[Marcus Drake](#) (Bristol Medical School: Translational Health Sciences) have been awarded a joint grant with the University of Pittsburgh from the US **National Institute of Health** entitled *PDE5 Inhibition of Afferents and Interstitial Cells in Overactive Mouse Bladders*.

A new simple blood test for brain tumours that could be used by GPs in primary care will be developed thanks to funding of nearly £500,000 by **Cancer Research UK**. The Bristol-led research project to develop an affordable, point of care blood test to diagnose brain tumours earlier using fluorescent carbon dots and nanophotonics will be headed by Dr [Kathreena Kurian](#)

(Bristol Medical School: Translational Health Sciences) and Dr [Sabine Hauert](#) (Engineering Mathematics) in collaboration with Profs [Carmen Galan](#) (Chemistry) and [Richard Martin](#) (Bristol Medical School: Population Health Sciences), Dr [Necia Dorh](#) at FluoretiQ Limited and Dr [Helen Bulbeck](#) at Brainstrust. A simple blood test carried out by GPs would help decision-making and early diagnosis. This would revolutionise care by speeding up diagnosis, reducing costs to the NHS, anxiety of unnecessary scans and reducing the number of patients presenting with inoperable large brain tumours.



## Autism short films project

National Institute for Health (NIHR) Applied Research Collaboration (ARC) West and Autism Independence are set to continue their collaboration with a series of short films about autism, aimed at the Somali and other black and minority ethnic (BME) communities. The project has been awarded nearly £20,000 by UK Research and Innovation's Strategic Priorities Fund (SPF) and Quality-related SPF (QR-SPF). The new films will build on the success of 2019's [Overcoming Barriers](#), which tells the stories of some of the Bristol-based

Somali families supported by Autism Independence. The Somali language version of *Overcoming Barriers* has been viewed more than 140,000 times on YouTube, with the English language version being viewed nearly 30,000 times. The new short films will address some of the issues raised in the hundreds of YouTube comments following



the film's launch.

Some of the comments stated that 'autism is a Western disease and does not exist in Somalia' and 'MMR vaccinations cause autism'. This highlighted to the team behind *Overcoming Barriers* that there is an urgent need to share factually correct information about autism, in order to counteract these myths and enhance understanding. Misinformation could lead to parents delaying accessing services and support for their children with autism, or not getting their children vaccinated.

## Parkinson's disease trial

The first patient has been recruited for a UK-wide trial into tackling one of the most disabling complications of Parkinson's disease, led by the Royal United Hospitals (RUH) Bath NHS Foundation Trust and the University of Bristol.

The trial, funded by a £2.1 million grant from the National Institute for Health Research (NIHR), will test whether a commonly prescribed dementia drug could prevent debilitating falls for people with the disease. Falls are a frequent complication of Parkinson's, leading

to patients suffering from injuries and broken bones and often needing hospital admission.

*To recruit our first patient is hugely significant and marks the official start of what is a really important study. While there is no cure for Parkinson's, our hope is that this research and its eventual findings will help to improve patients' quality of life.*

RUH Research Lead Nurse,  
Ruth Hamlin

The three-year trial is led by Dr [Emily Henderson](#), Bristol Medical School and Consultant Geriatrician at RUH Bath. It will re-

cruit 600 patients across 26 UK hospitals to determine whether the drug, cholinesterase inhibitor (ChEi), will help people with Parkinson's. Earlier phase trials have shown that ChEi treatment has potential to almost halve the number of falls and improves the regularity of walking, speed, and balance.



*Gitte Dawson, the first recruit*



## Influencing parents' attitude to vaccines

Many people experience peace of mind from getting their children vaccinated, however, this benefit is currently being ignored when health bodies weigh up vaccine benefits to make decisions about whether or not to introduce vaccines or expand their coverage. A qualitative study found that peace of mind should be considered in the health economic framework used by decision makers, but that more research is required to further define and quantify peace of mind.

Researchers found that whether a person experienced peace of mind from vaccination depended on their knowledge of the benefits of having a jab. The reassurance they experienced was from knowing that when an individual was vaccinated it would offer some level of protection against a disease. Even though these peace of mind benefits are only experienced by some parents, the added value to their health could still influence decisions on whether or not a government should fund a vaccine. The research sug-

gests decision makers need to consider these benefits. The team also found that peace of mind varies over time; certain vaccines brought less peace of mind if an individual either hadn't experienced the disease or if they had experienced of a mild form of the disease as a child but without complications.

Lasseter G *et al.* (2020). [Understanding the role of peace of mind in childhood vaccination: A qualitative study with members of the general public](#). *Vaccine*. 38(10).

## Third cohort of Vice Chancellor's Fellows

The University of Bristol's third cohort of recipients of the Vice-Chancellor's Fellowships (VCFs) were welcomed in November 2019. The scheme offers an opportunity for early-career researchers to advance their research careers and develop their potential to become academic leaders.

Among the cohort are:

**Becky Mars:** *Predictors and patterns of self-harm thoughts and behaviour.*

A combination of analytical techniques and digital health methods will be used to identify predictors and patterns of self-harm thoughts and behaviours.

**Ben Kasstan:** *Having 'faith' in sexual/ity and reproduc-*

*tive wellbeing.* The project will query perceptions of sexual/ity wellbeing and reproductive health, and the discursive ways in which 'rights' to protection are articulated in select faith schools and communities.

**Joseph Webb:** *Conversation Analysis of GP consultations for patients with learning disabilities.* Communicational difficulties reduce access to medical care and play a major role in the health inequalities of patients with learning disabilities.

**Myles-Jay Linton:** *Understanding mental health and wellbeing within the 'student journey'.* Myles' project will investigate transitions into (and within) university, and experi-

ences of social isolation among students.

**Robert Chapman:** *Health and Wellbeing for a Neurodiverse Age.* Rethinking our concepts of mental health and wellbeing will have important implications for ethical and psychiatric theory, as well as for disability policy and clinical practice.

**Shamik DasGupta:** *Neural and genetic control of temporal integration.* Shamik's research will be directed towards understanding how the brain integrates across time to perform sensory-guided decisions.

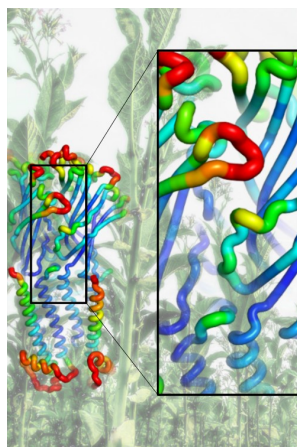
[Read more about VCF projects](#)

## Smoking cessation aids

Nicotine is a highly addictive substance, and smoking is a habit that claims the lives of more than seven million people each year. Smoking tobacco delivers nicotine to the neuroreceptors responsible for addiction, affecting the nervous system and causing addiction. A study into the molecular interactions involved has revealed how these neuroreceptors respond to nicotine.

The team used computational simulation methods to discover how receptors in the brain respond to nicotine. Thanks to the use of

Oracle Cloud Infrastructure, calculations that might otherwise have taken months were obtained in just five days. The results showed how nicotine exerts its effects, at the molecular level, the first stage of signalling in the brain. This information, and the methods



being developed, will help in developing new smoking cessation aids.

Oliveira A *et al.* (2019). [A general mechanism for signal propagation in the nicotinic acetylcholine receptor family](#). *Journal of the American Chemical Society*. 141(51).

*Nicotinic receptors in the brain are responsible for nicotine addiction amongst other neurological roles in the CNS. The left-hand image shows the complete receptor while the inset shows the communication pathway between the binding site (upper red) and the transmembrane helices (lower green) controlling channel gating revealed by molecular dynamics simulations.*

## Children of abused mothers and lower IQs

Academics from the universities of Manchester, Bristol, Manchester Metropolitan and Kings College London found 13% of children whose mothers did not experience domestic violence had an IQ of below 90 at eight years of age. If their mothers experienced physical violence from their partner either in pregnancy or during the first six years of the child's life, the figure rises to 22.8%. That means children with mothers who repeatedly suffer domestic violence during pregnancy and the first six years of their child's life are almost three times more

likely to have a low IQ at eight years of age.

The findings are independent of other risk factors for low IQ such as alcohol and tobacco use in pregnancy, maternal depression, low maternal education and financial hardship around the child's birth.

There is some disagreement on whether the IQ test is a complete measure of intelligence, as it only considers verbal and non-verbal intelligence. However, it is regarded as useful by many experts because a high IQ has been demonstrated in many countries and cultures to associate with a broad

range of improved social and health outcomes.

Abel KM, Heuvelman H, Rai D *et al.* (2019). [Intelligence in offspring born to women exposed to intimate partner violence: a population-based cohort study](#). *Wellcome Open Research*. 4(107).



## The telling of physical activity stories: How Do You Move?

New videos have been launched, telling the physical activity stories of a group of Bristolians.

The [How Do You](#)

[Move?](#) project explores how people incorporate physical activity into their daily lives, despite circumstances and surroundings that encourage inactivity. The project includes four physical activity story videos:

**Abiir** lives in Easton and has four young daughters. She spent her childhood in Germany, and is now a keen

advocate for increasing cycling in the Somali community.

**Ben** is a community activist in Bedminster. He's retired and spends a lot of his time working with local people to improve the neighbourhood, particularly to make it more pleasant and accessible for walking.



**Lesley** works full-time managing a large university department, as well as juggling family life with her partner, two teenage daughters and two dogs. She came to running later in life and is now an active part of the running community in Staple Hill.

**Vince** lives in Bedminster and has strong links to Knowle West and Hengrove where he grew up. Despite health issues, he's used the support available in South Bristol to help maintain both his mental and physical wellbeing.

[Watch the videos](#)

## Tracking sheep grazing patterns

Sheep appear to forage and avoid parasites differently depending on how healthy they are. The study, which used remote GPS sensing data to monitor the foraging patterns of sheep, revealed less healthy animals chose to avoid high-quality vegetation due to a higher prevalence of ticks.

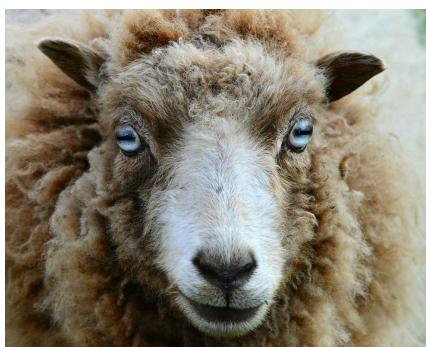
Researchers from the School of Biological Sciences and Bristol Veterinary School fitted 23 ewes in the uplands of Dartmoor with GPS trackers that were set to record their location every two minutes over a period of eight days. They then integrated the 114,093 location recordings from the

trackers with satellite data of vegetation quality, the field sampling data of tick prevalence, and parasite load and health measures for each sheep. An analysis of the data revealed that the less healthy sheep (those that were assessed as more anaemic) avoided vegetation where ticks are typically found, thereby reducing encounter rates and hence infection risk. Healthier sheep appeared to

favour areas providing greater high-quality vegetation and foraging intake despite the potential higher risk of infection from ticks.

*Discovering that the trade-off between maximising forage intake and minimising parasite encounter depends on the health status of individual sheep emphasises the need to study livestock as individuals, even in group-living animals... our study opens new possibilities to study free-living grazing systems.*

Caroline Liddell, lead author



Liddell C *et al.* (2020). [Response to resources and parasites depends on health status in extensively grazed sheep](#). *Royal Society Proceedings B*. 287(1920).

## Viewing the personalisation of online services

Whether we are looking for a restaurant tip, researching health information, or scrolling through social media posts, algorithms use the personal data they gather on us to determine what we are shown online. But how aware are people of the impact algorithms have on their digital environments? And what are their attitudes to personalised online services and data privacy? A team of researchers from the Max Planck Institute for Human Development and the University of Bristol has conducted a survey of 1,065

people in Germany to address these questions.

The findings of a representative online survey show that most Germans are well aware that artificial intelligence is used on the internet, and they accept customisation in the contexts of shopping, entertainment, or search engine results. But the results also show that internet users are against the personalisation of news sources or political campaigning online. Although Germans have serious concerns about data privacy and most of them object to the use of their personal data,

many respondents are willing to accept some personalised services. At the same time, only few of them are aware of and make use of available privacy measures.

Kozyreva A, Herzog S, Lorenz-Spreen P, Hertwig R & Lewandowsky S (2020). [Artificial intelligence in online environments](#). Max Planck Institute for Human Development.



© Max Planck Institute for Human Development

## Funding successes: Part 6

In September 2019 **Nesta UK** launched the second round of the [Collective Intelligence Grants](#) in partnership with [Wellcome Trust](#), [Cloudera Foundation](#), and [Omidyar Network](#). Together they created a £500,000 fund for experiments that could generate actionable insight on how to advance collective intelligence to solve social problems. Amongst the cohort of grantees using new digital technologies and collective intelligence methods to address issues ranging from air pollution to food shortages, disease diagnosis and cyber violence was Dr [Sabine Hauert](#) (Engineering). She

and her team will test whether a swarm of 100 small robots interacting with people in a crowd can facilitate new social interactions and opinion sharing that can help groups to reach a consensus.

Drs [Paul Dodson](#) and [Paul Chadderton](#) (Physiology, Pharmacology and Neuroscience) have been successful with their application to the **Biotechnology and Biological Sciences Research Council** for *The role of cerebellum in dopamine neuron reward prediction error coding*.

Dr [Abigail Jackson](#) (Tobacco and Alcohol Research Group) has received funding from the **Brigstow Institute** to facilitate

workshops with parents of children with autism. The Ideas Exchange Fund 2020 award will support *Barriers for Local Autistic Children: A parents view on community life*, which will create a new network and ideas exchange on the parents' involvement in research on autistic children.

The **Health Data Science** research strand (supported by the Elizabeth Blackwell Institute) awarded Dr [Jennifer Cooper](#) (Bristol Medical School: Population Health Sciences) funds for *Automated machine learning identification of clinical pathways from routinely collected patient health data*.



## New research groups launched

Bristol Health Partners has supported the creation of two new Health Integration Teams (HITs): ACE and BABCON. [Adverse Childhood Experiences](#) (ACE) are negative experiences in early life and childhood, such as abuse, neglect and domestic violence, that can have an impact on health and wellbeing throughout life. The [Bladder and Bowel Confidence](#) (BABCON) HIT will look at the often unspoken topic of bladder and bowel continence, and aims to

identify areas of improvement within the entire health and social care system approach to bladder and bowel continence care. The work of both HITs will cover the Bristol, North Somerset and South Gloucestershire area.

[GW4](#), in collaboration with the [Jean Golding Institute](#) and [The Alan Turing Institute](#), has launched a Data Science Network. The Network will act as a hub for news, events and funding opportunities in data science research that are available to staff and students

throughout GW4.

[Alhub.org](#) was launched on 27 January 2020 by Tom Di-etterich (Oregon State) and Dr [Sabine Hauert](#) (Engineering). A non-profit dedicated to connecting the AI community to the public, Alhub.org will host daily updates about the latest news, opinions, tutorials, and events in artificial intelligence. All information is produced by those working directly in the field, without filter or intermediary.

## External engagements

Drs [Olivia Maynard](#) and [Angela Attwood](#) (Psychological Science) alongside Policy-Bristol hosted an invite-only event on 4 March 2020 entitled *Drugs in the South West: working together to move forwards*. The goal was to build collaborative links and identify the next steps for research and practice in the South West by bringing together leading academics, policymakers and practitioners from Bristol and beyond. There were keynotes from Dr Nuno Capaz, a key architect in Portugal's innovative drug strategy, and Megan Jones, Policy Advisor for the West Midlands PCC, who talked about how and why they

have moved away from a criminal justice-based approach towards one that focuses on the health of drug users. There were also a range of presentations themed around harm reduction for people involved in the illicit drug markets.

Three undergraduate students from the University of Bristol took part in the national [Posters in Parliament](#) event on 11 March 2020, celebrating the best undergraduate research in the country.



The event saw 50 undergraduate students from across the UK presenting their research to policy makers and legislators. Representing the University were third year BA English student Shauna Roach and Psychology students Amelia-Jeme Thornton and Grace Spencer, who have been assisted by the [Bristol Institute for Learning and Teaching](#). Amelia and Grace presented *The steaks are high: creating sustainable diets*, in which they used an online food choice task to test the effects of eco-labelling and green nudging to see which is more effective at influencing consumers to act sustainably.

*L-R: Amelia-Jeme, Grace & Shauna*

## Tobacco-free vaping and alcohol-free drink in pubs

Pubs in Bristol could be forced to serve zero-alcohol draught beer and tobacco-free vaping areas could be introduced under radical plans by health chiefs to tackle problem drinking and smoking. The two-pronged attack, based on a report produced by Prof [Marcus Munafò](#) (Psychological Science), was considered by the city's health and wellbeing board on 27 February 2020. The proposal aims to "nudge" residents' habits and reduce associated deaths and serious illnesses. Councillors have since embraced the plans, but

sounded a note of caution on proposals for tobacco-free vaping zones to help smokers quit for fear of turning the clock back on areas where cigarettes are already banned.

The Council says the alcohol-free trial could begin as a pilot project at larger establishments in the city centre in an effort to increase consumption of the healthier drinks by making them more visible and socially acceptable, as they would look the same in a pint glass as an ordinary beer. Preliminary evidence from the University of Bristol suggests that this will increase the se-

lection of alcohol-free drinks, rather than alcoholic drinks, by increasing their availability. In order to reduce tobacco use, the proposal is to create opportunities for smokers to transition to e-cigarette use (whilst recognising the need to prevent uptake among young people), by creating a 'gradient' between smoking and vaping, so that the latter is easier than the former. For example, public spaces could be designated smoke-free whilst allowing vaping, or outside spaces in workplaces could be similarly designated as available for vaping but not smoking.

## National and global recognition

Bristol Veterinary School's [Animal Welfare and Behaviour Group](#) (AWB) has been ranked the most successful of its kind in the last 50 years, in the world - with new research demonstrating that it's the most widely published and highly cited in the field of animal welfare. AWB leads on a variety of impactful projects, including working with the British Horseracing Authority to develop a welfare assessment protocol for racehorses in training, and developing a pioneering 'cognitive bias' approach to understand how the level of optimism or pessimism shown by animals

reflects their underlying welfare state. Using an integrated approach, the group's research covers population health, global food security, fundamental studies of behaviour, cognition, emotion and development and validation of animal welfare assessment methodologies, as well as identifying and quantifying welfare problems and their causes in farm, laboratory, companion and working animals and then implementing research-based solutions.

Emerita Prof Gill Hague (Policy Studies, pictured), was awarded a CBE in the Queen's New Year Honours list 2020 in

recognition of 50 years' work to combat violence against women. [Prof Hague](#), along with Dr Ellen Malos, founded the University's [Centre for Gender and Violence Research](#) in 1990. She is especially known for influential research on raising the voices of women survivors of violence, on multi-agency work, on disabled women and domestic abuse, and on 'honour'-based violence.



## Breast screening film for women with learning difficulties

A film made by and for women with learning disabilities to take the fear out of going for breast screenings launched and premiered at [North Bristol NHS Trust](#) in November.

The [biggerhouse film](#) production for Avon Breast Screening tells the story of a woman with learning difficulties being asked to go for a mammogram and follows her through the process.

It has been well docu-

mented that women with learning disabilities are not well informed about breast cancer and that the uptake of breast screening in this group is very low. The team are hoping this video, which was filmed at North Bristol NHS

Trust, will help change perceptions for people with learning difficulties and encourage them to look after their health by going for the test.

More than 40 people attended the launch at North Bristol NHS Trust where the film was premiered.



**WATCH THE FILM:**  
[Do The Test - GO FOR IT!](#)

## Publications to watch out for

Prof [Mike Mendl](#) & Dr [Liz Paul](#) and [Vikki Neville](#) (Bristol Veterinary School) have published a trio of papers that aim to extend our understanding of animal emotional states (a key determinant of animal welfare) through the development of a new model of the role of affect in animal decision-making; a systematic review and meta-analysis of the Bristol-pioneered 'cognitive bias' approach to assessing animal affect; a comparative analysis of the challenges of identifying consciously experienced emotional states in animals and humans.

Mendl M & Paul ES (2020). [Animal affect and decision-making](#). *Neuroscience and*

*Biobehavioral Reviews*.

Neville V *et al.* (2020). [Pharmacological manipulations of judgement bias: a systematic review and meta-analysis](#). *Neuroscience and Biobehavioral Reviews*.

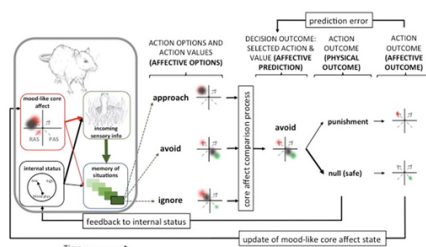
Paul ES *et al.* (2020). [Towards a comparative science of emotion: affect and consciousness in humans and animals](#). *Neuroscience and Biobehavioral Reviews*.

Paul ES *et al.* (2020). [Towards a comparative science of emotion: affect and consciousness in humans and animals](#). *Neuroscience and Biobehavioral Reviews*.

A paper by staff in Physiology, Pharmacology and Neurosci-

ence (PPN) alongside colleagues in Australia and Germany has been the subject of news articles in [Science](#) and [Science Translational Medicine](#). After two weeks their paper had an Altmetric score of 40. Kliewer A *et al.* (2020). [Morphine-induced respiratory depression is independent of  \$\beta\$ -arrestin2 signalling](#). *British Journal of Pharmacology*.

PhD student Matthew Wilkinson's (PPN) paper was highlighted in the British Neuroscience Association newsletter. Wilkinson MP *et al.* (2020). [Comparison of conventional and rapid-acting antidepressants in a rodent probabilistic reversal learning task](#). *Brain and Neuroscience Advances*.



## Reducing brain injury in preterm deliveries

Led by [University Hospitals Bristol NHS Foundation Trust](#), in partnership with the [National Institute for Health Research Collaboration for Leadership in Applied Health Research and Care \(NIHR CLAHRC\) West](#), and the [West of England Academic Health Science Network \(WEAHSN\)](#), the Prevention of cerebral palsy in pre-term labour (PReCePT) project is aiming to increase uptake of magnesium sulphate to protect babies' brains during premature births. Premature birth is the leading cause of brain injury and cerebral

palsy in babies. Evidence shows that babies can be protected from brain injury by giving women who are at risk of having a premature delivery magnesium sulphate. This reduces the risk of cerebral palsy in a third of cases. Despite this, more than half of premature babies in the UK do not receive this highly cost-effective treatment



(approximately £1 per dose). To increase uptake, a quality improvement package, PReCePT1, has been successfully implemented in five maternity units in the west of England. The proportion of women at these units receiving magnesium sulphate increased from an average of 21% before the intervention to around 88% after the intervention. This Scaling Up Improvement project, PReCePT2, will scale this quality improvement package to maternity units across England.

[Watch the video](#)

## Maintaining harmony in the household

As the nation grapples with public lockdown, the reality of all living under the same roof has taken on a whole new meaning. Cohabiting families, couples, and housemates across the country will be seeing rather more of each other for the foreseeable future, putting those relationships under unprecedented pressure. Fortunately, there are ways to manage the stresses and strains of being cooped up together for so long. Dr [Angela Rowe](#), a social psychologist (Psychological Science), has dedicated her research to understanding how we behave towards our nearest

and dearest, especially in tough times. Her tips and advice can help keep your relationships happy and harmonious despite the trying circumstances.

### It's good to talk

Having regular discussions about different family member's evolving wants and needs, and plans for joint activities, is important; try to establish an open dialogue from the outset.

### Identify pinch points

Being proactive and specific will help flush out potential sources of friction, ranging from rules about washing up to occupying communal areas.

### Cut each other some slack

No one is perfect even at the best of times, so now may not be the point to catch us on our best behaviour.

### Have fun together

Crises, like celebrations, bring close family and friends together. Although now doesn't seem the time to party, it's important to keep each other's spirits up and make time for relaxation.

### Give each other space

Living on top of each other in social lockdown is a recipe for relationship strife, take time out to keep your cool.

[Read the full article](#)



## Moths evolved noise-cancelling scales to evade

To avoid being eaten by bats many nocturnal insects evolved the ability to hear their ultrasonic calls. Many moth species, however, cannot hear. A research team wanted to investigate the alternative defences against bats that some species of deaf moths might have evolved. They discovered that the thorax scales of the moths *Antherina su-raka* and *Callosamia promethea* looked structurally similar to fibres that are used as noise insulation, so

wanted to explore whether the thorax scales of moths might be acting in some way to absorb the ultrasonic clicks of bats and dampen the echoes returning to the bat, offering the moths a type of acoustic camouflage. They measured that the scales on the body of a moth absorb as much as 85% of the incoming



sound energy and that the scales can reduce the distance a bat would be able to detect a moth by almost 25%, potentially offering the moth a significant increase in its survival chances. The team are now looking at ways to use these biological systems to inspire new solutions to sound insulating technology.

Neil TR *et al.* (2020). [Thoracic scales of moths as a stealth coating against bat biosonar](#). *Royal Society Interface*. 17 (163).

## Drug-based strategies for treating depression

Depression is a common problem in adults and is often treated with antidepressants. However, many people don't get better after their first course of antidepressants, known as treatment-resistant depression. For these people, there are a few different drug-based treatment options, including changing to a new antidepressant; adding a second antidepressant to ongoing treatment; or adding a different type of medication such as anti-anxiety medication or an antipsychotic. The National Institute for Health Research (NIHR) Applied Research Collaboration (ARC) West looked at the available evi-

dence to see which of these drug-based treatment options may be the best treatment for people with treatment-resistant depression. They analysed 10 randomised trials involving 2,731 people testing the three treatment plans. Most studies looked at the effects of adding an antipsychotic medication (cariprazine, quetiapine, ziprasidone or olanzapine) to current antidepressant treatment. These suggested that adding caripra-



zine results in a small reduction in depressive symptoms; adding quetiapine reduces depressive symptoms; and adding ziprasidone probably results in a small reduction in depressive symptoms. However, our results also suggest that adding these medicines to current treatment probably increases the likelihood of dropping out of treatment. The most common reasons for dropping out were side effects or adverse events. Nearly all (9/10) of the studies assessed the effects of treatment in the short-term – six or eight weeks after beginning the new treatment – so the longer-term effects of most treatments are unknown.

## Elizabeth Blackwell Institute COVID-19 funding call

The Elizabeth Blackwell Institute opened a [rapid response funding scheme](#) to support research in Coronavirus in March 2020. The initial round received over 50 applications; the scheme is now open on a rolling deadline until funds are depleted. Among the approved projects are:

- Dr [Hannah Christensen](#) (Bristol Medical School): *Social contacts and mixing patterns under COVID19 social distancing measures*
- Dr [Ellen Brooks-Pollock](#) (Bristol Veterinary School): *Health-care seeking behaviour and contact patterns during the COVID-19 pandemic: informing predictive*

*modelling*

- Prof [Stephan Lewandowsky](#) (Psychological Science): *Social Licensing of Privacy- Encroaching Policies to Address COVID*
- Prof [Bruce Hood](#) (Psychological Science): *Remote nudging as a way to support mental well-being during social isolation*
- Prof [John Coggon](#) (Law): *COVID-19: Explaining the Legal and Ethical Dimensions and Providing Professional and Public Guidance*
- Dr [Harriet Fisher](#) (Bristol Medical School): *Understanding the impact on, and experiences of, young people during the COVID-19 pandemic*
- Prof [Richard Huxtable](#) (Bristol

Medical School): *COVID-19 Clinical Ethics Support*

- Dr [Lucy Wenham](#) (Education): *Impacts on students' mental health, in light of the Covid-19 pandemic*
- Prof [Karen West](#) (Policy Studies): *Virtual Compassionate Communities for Extraordinary Circumstances*
- Dr [Emma Anderson](#) (Bristol Medical School): *Covid-19: Helping pregnant women adhere to behavioural restrictions*
- Dr [Ross Booton](#) (Bristol Veterinary School): *Real-time Mathematical Modelling of COVID-19 in South West England*

## Sleeping despite external sensory events

When we sleep, we lose our ability to respond to the environment. However, scientists have not fully understood how sleep is maintained despite ongoing external sensory events, nor how processes in the brain determine whether we will awake from a sensory cue in our surroundings. To test whether reduced locus-coeruleus norepinephrine (LC-NE) activity mediates unresponsiveness during sleep—and whether heightened LC-NE activity leads to

sensory-evoked awakenings, a research team monitored the brain activity of slumbering rats provided with sensory cues. They gained insights using a combination of LC single-neuron electrophysiology, behavioural, pharmacological, and optogenetic techniques. The researchers provide evidence that the level of LC-NE activity during sleep does, in fact, determine how likely a sleeper is to awake due to sensory stimu-

lation. The findings could help scientists better understand both sleep and neuropsychiatric disorders, as well as the effects of anaesthesia.

Hayat H *et al.* (2020). [Locus coeruleus norepinephrine activity mediates sensory-](#)

[evoked awakenings from sleep](#). *Science Advances*. 6(15).

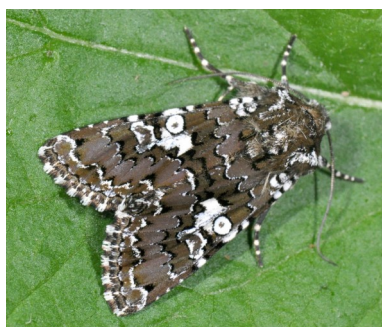
*The article made the front page of the journal*



## Improving camouflage

Most animals, like butterflies and frogs, have high-contrast markings have bilaterally symmetrical camouflage. Research from Bristol's [Camo Lab](#) shows that camouflaged symmetrical animals with patterns near their midline make themselves more detectable to predators. The team put ideas from perceptual psychology into the context of animal colours and patterns and applied them to Natural Pattern Analysis. The analysis enabled them to meas-

ure distances of markings from the midline point of the wings of 36 species of moth and butterfly. The results complemented findings of previous experiments and showed that camouflage patterns tended to be away from the midline, thereby re-



ducing the noticeability of the symmetry. The study is one of the first to put results from classic artificial target experiments into a natural context by using real animal specimens; the results have implications for the protective colouration of a wide variety of cryptically-coloured animals which wish to remain undetected.

Wainwright JB *et al.* (2020). [Overcoming the detectability costs of symmetrical coloration](#). *Proceedings of the Royal Society B*. 287(1918).

## Domestic violence programme reduces abuse by 82%

The government is being urged to set up domestic violence prevention programmes targeting offenders alongside victims. It follows the success of a pilot intervention project, evaluated by the University of Bristol, which led to a sustained reduction in abuse. The pilot scheme, [Drive](#), worked with 506 prolific domestic violence perpetrators, aged 17 to 81, mostly white men of whom nearly half were involved in ongoing legal proceedings in the criminal or civil courts. It operated in Essex, West Sussex and South Wales from 2016 to 2019, and was unique in focusing specifically on high harm perpe-

trators, including serial perpetrators who are deemed to cause the most harm. Drive involved a whole-system approach using intensive case management alongside a coordinated multi-agency response, working closely with victim services, the police, probation, children's social services, housing, substance misuse and mental health teams. It was innovative in using disruption and support to change perpetrator behaviour.

[Evaluation of the scheme](#) was carried out by a team led by Prof [Marianne Hester](#) (Policy Studies); it was the largest evaluation of a perpetrator intervention to-date,

using a randomised control design. The study found that, following the intervention, the number of Drive service users perpetrating high levels of physical abuse reduced by 82%; sexual abuse reduced by 88%; harassment and stalking behaviours reduced by 75% and jealous and controlling behaviours reduced by 73%.

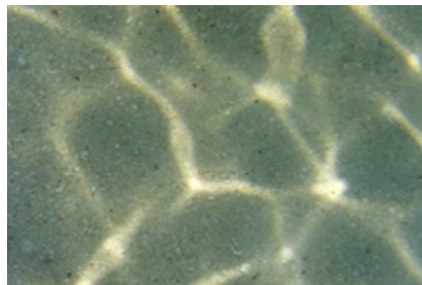
Together with over 70 organisations and experts, the Drive Partnership is calling on the Government to publish a strategy to crack down on the behaviour of domestic abuse perpetrators in England and Wales.



## Natural light flicker can help prevent detection

Movement breaks camouflage, making it risky for anything trying to hide. New research has shown that dynamic features common in many natural habitats, such as moving light patterns, can reduce being located when moving. Dynamic illumination is particularly common in coral reefs, where patterns known as 'water caustics' (pictured) play chaotically in the shallows. Wild Picasso triggerfish (*Rhinecanthus aculeatus*), a common reef fish, were trained to locate and attack moving prey items within computer-simulated

scenes. Each scene contained 'water caustics' that varied in terms of motion (static or moving), scale (fine or coarse) and sharpness (sharp or diffuse), to illustrate the diversity of water caustics seen in natural habitats. The presence of water caustics significantly increased the time for triggerfish to attack moving prey items compared to static caustic controls. Moreover,



manipulating the sharpness and scale of water caustics implies that this delay should be maximised in shallow water: scenes with fine scale and sharp water caustics induced the longest attack latencies. While being stationary remains the optimal strategy for the concealment of cryptic organisms, the findings highlight conditions under which the disadvantage of moving can be reduced.

Matchette SR *et al.* (2020). [Underwater caustics disrupt prey detection by a reef fish.](#) *Proceedings of the Royal Society B.*

## Parkinson's and other Movement Disorders HIT

The Parkinson's and Other Movement Disorders (MOVE) Health Integration Team (HIT), supported by Bristol Health Partners, has been working closely with the [Parkinson's UK](#) to embed their local advisor into clinics run at the [Bristol Brain Centre](#). This has helped the advisor give enhanced support to people diagnosed with Parkinson's, helping them to access over £250,000 in benefits per year, which in turn helps people with Parkinson's, and those close to them, to live more independent lives, with reduced reliance on local public services. A documentary featur-

ing members of the HIT won Best Science Documentary at the [Grierson 2019 British Documentary Awards](#) held in November 2019. [The Parkinson's Drug Trial: A Miracle Cure?](#) first aired on BBC2 in February 2019. Filmed over six years, it followed a group of volunteers with Parkinson's take part in a ground-breaking medical trial at Bristol's Frenchay and Southmead Hospitals testing a drug called GDNF. Forty-two patients underwent complex brain surgery and months of infusions via a port embedded into the side of their skull.

*The winning film stood out for its lean storytelling of a complex subject, its scale and its*

*heart. The film was an examination of the nature of progress, managing to straddle both the science involved with clarity and the emotional, human dimension with real compassion.*

The HIT, alongside Parkinson's UK, has also developed training sessions about the condition for exercise providers in the Bristol area. The sessions helped over 25 providers understand how best to work with people with Parkinson's. Exercise can help people with Parkinson's manage physical symptoms, as well as improving sleep, mood and mental health.



## Keeping bad habits at bay

With much of the world on public lockdown and scores of people working from home, stress levels are sky high which makes us all more vulnerable to temptation. Experts in the School of Psychological Science have suggested ways to better understand anxiety-fuelled cravings and offer ways to keep those weaknesses in check.

### Stay smoke-free

In the long-run, anxiety tends to go down after stopping smoking, so giving

up or staying smoke-free might actually be better for our mental health.

### Raise a small glass

Although many people use alcohol to relax, often it's the psychological effect of the tittle that helps as much as the effect of alcohol itself.

### Manage the munchies

Keep snacks out of sight, particularly energy-dense options like chocolate, crisps and sweets. Take the opportunity to be more creative in the kitchen and cook meals from

scratch.

### Vacate the couch

Staying active is vital and every step counts. When we expend less energy, we're not very good at reducing our energy consumption to balance this. That's why it's important to stay as active as possible.

[Read the full article](#)



## New materials for pain management

A new suite of materials, including a video and editable leaflets, have been developed by people living with chronic pain alongside researchers from the National Institute for Health Research Applied Research Collaboration West (NIHR ARC West). The materials are designed to support clinicians who run NHS [pain management programmes](#) (PMP), to assist patients in setting up their own peer support group after their PMP has ended.

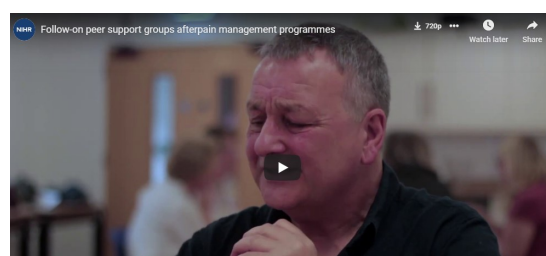
Research has found that these peer support groups are a low-cost and effective intervention, encourag-

ing people to consolidate self-management techniques learnt on PMPs into their lives and provide mutual support in the face of pain flare-ups or other setbacks. Chronic pain, which is pain lasting longer than three months, affects four out of 10 people in the UK. It can affect a person's entire life, including their relationships, sleep, employment and ability to participate in normal day-to-day activities. It often leads to isolation and depression. The NHS offers group PMPs to help people

understand and better manage chronic pain. PMPs can help people learn ways of dealing with the disabling effects and distress caused by being in pain to improve mobility, reduce reliance on drugs and gain a sense of control over their pain, helping them to re-establish their family, work and social roles.

Patients and staff at North Bristol NHS Trust (NBT) have tackled this problem by encouraging patients to develop their own follow-on peer support groups once they've finished their PMP, to sustain and build on the positive effects in the longer term.

[Watch the video](#)



## Non-smoking young adults who use e-cigarettes

Young people who have tried e-cigarettes but have never smoked before are nearly five times more likely to go on to try smoking; however, the findings do not provide clear support for the claim that e-cigs cause young people to start smoking (the so-called possible "gateway effect"). Researchers from the [Tobacco and Alcohol Research Group](#) (TARG), with support from the [MRC Integrative Epidemiology Unit](#) (IEU) and the [NIHR Bristol Biomedical Research Centre](#) (BRC), combined the results of 17 studies to investigate

whether e-cigarette use compared to non-use in young non-smokers is associated with subsequent cigarette smoking. The study found that young people who had never smoked before but had used e-cigarettes were four-and-a half times more likely to go on to use e-cigs. However, the research team also identified a number of issues with the studies included in this analysis, which makes them cautious to conclude that e-



cigarette use is causing young people to start smoking. The researchers recommend future studies should address the issues which have been highlighted by using more advanced tests to confirm whether or not young people are smokers or e-cigarette users, using different statistical analyses, and considering whether the e-cigarettes contain nicotine or not.

Khouja JN *et al.* (2020). [Is e-cigarette use in non-smoking young adults associated with later smoking? A systematic review and meta-analysis.](#) *Tobacco Control*.

## Co-operative male dolphins match the tempo

When it comes to working together, male dolphins co-ordinate their behaviour just like us. A team from the Universities of Western Australia and Bristol have provided insight into the importance of physical and vocal co-ordination in alliance forming animals. In humans, synchronised actions can lead to increased feelings of bonding, foster co-operation and diminish the perceived threat of rivals. Outside of humans, very few animals co-ordinate both vocal signals and physical movement when

working together. The study used long-term acoustic data collected from the famous population of dolphins in [Shark Bay](#), Western Australia, to show that allied male dolphins also match the tempo of their partner's calls when working together, and



would sometimes even produce their calls in sync. The study showed that male bottlenose dolphins not only synchronise their movements, but also co-ordinate their vocal behaviour when co-operating together in alliances. Such behaviour suggests this might help reduce tension between the males in a context that requires them to co-operate successfully.

Moore BL, Connor RC, Allen SJ *et al.* (2020). [Acoustic co-ordination by allied male dolphins in a cooperative context.](#) *Proceedings of the Royal Society B*. 287 (1924).

## Strokes and the ageing brain

Dr Michael Knight used an [Elizabeth Blackwell Institute Early Career Fellowship](#) to model the physical mechanisms behind ageing disease processes and strokes using Magnetic Resonance Imaging (MRI), physical biochemistry and software engineering. He developed 'relaxation anisotropy MRI imaging' as a tool for investigating the brain - this essentially uses the processes by which the MRI signals change over time to increase the amount of infor-

mation the MRI can extract. By understanding the criteria by which this relaxation anisotropy alters in brain disease states, it should be possible to increase the usefulness of MRI equipment in a variety of different ways, for example in understanding ageing, dementia assessment, and stroke onset diagnosis specific to strokes brought on by restriction in blood supply to tissue (ischaemia). recruited 40 people from 23 to 71 years old, with no known brain disorders, and performed a

range of MRI scans including the different modifications and analyses, and compared them to the computational models for anisotropy. Subtle but widespread changes as the brain ages could be detected, which raises the intriguing notion that different changes might be detectable in disease states, giving a much earlier diagnosis for e.g. Alzheimer's disease than is currently possible.

[Take a look at the publications arising from the project](#)

## The Body is (not) Here - Franko B's Archive

Renowned visual artist, curator and teacher Franko B. Franko donated his archive to the University of Bristol Theatre Collection in 2008 where it has recently been catalogued and conserved as part of a Wellcome Trust funded project. Rising to international prominence with his extraordinary body-based performances in the 1990s, Franko's deeply autobiographical work presents the human body as both a site and a material. Interweaving personal stories and universal themes – of pain, suffering, protest, life and

love – *The Body is (not) Here* exhibition, which opened on 14 February 2020, provides audiences with multiple encounters with Franko's body and the body of his archive, which like Franko's work, challenge the way we see, feel and experience the world around us; asking us to consider 'what it is to be hu-

man'. Having spent periods of his childhood in care in Italy, Franko moved to London in 1979. His experiences of suffering, neglect, homelessness and marginalisation as an adolescent, and then as a gay man and punk living in London during the AIDS epidemic in the 1980s deeply influenced his practice.



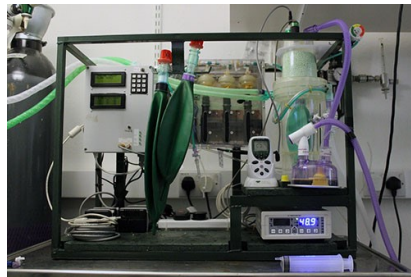
*Franko B Image:  
Hugo Glendinning*



## Can xenon help protect against neonatal brain damage?

Hypoxic-ischaemic encephalopathy (HIE) is brain damage caused by limited blood flow - and thus oxygen deprivation - in newborn babies, at or around the time of birth. HIE is managed using therapeutic hypothermia, which cools the body or the brain of the infant down three degrees below normal for 72 hours. This can limit the extent of the injury and allows the brain to recover. However, even with this treatment, half of the infants are prone to disorders such as cerebral palsy, epilepsy or cognitive issues. An [Elizabeth Black-](#)

[well Institute](#) Translational Acceleration and Knowledge Transfer ([TRACK](#)) award to Dr Ela Chakkarapani (Bristol Medical School) is allowing him to explore new treatments. Recently, inhaled xenon gas (which acts as an anaesthetic, and has been shown to protect brain cells from damage) has been investigated as a treatment alongside therapeutic hypothermia.



Previously Ela and colleagues showed that using the gas for 18 hours along with therapeutic hypothermia can double the brain protection in piglets; he wondered whether longer exposure to Xenon, for the whole 72 hours, might yield even better results, although hurdles would need to be overcome due to the gas' density and anaesthetic potential. He and his team developed an automated xenon delivery device (pictured) which doesn't need the continued presence of a physician. Further funding is being sought to continue the studies.

## Should we wave goodbye to the handshake?

On 3 March 2020, the UK government published guidance on its coronavirus (covid-19) action plan. As the number of cases reported in the UK continues to rise, identifying strategies for delaying an epidemic has become ever more important. One topic in particular is currently under scrutiny: the handshake. Some countries have recommended against hand shaking or other traditional forms of greeting (kissing on the cheek, nose to nose). However, the extent of the risk of transmission of infectious illnesses through handshaking is unclear. Alternative

greetings which reduce contact time and surface area of contact have been proposed with some, such as the open-hand wave or head bowing, removing the need for physical contact altogether. Avoidance of handshaking may also have potentially important benefits in terms of promoting and maintaining better hand hygiene habits. Emotion is one of the most powerful drivers of behaviour and operates automatically, without the need for conscious effort. Hygiene behaviours are driven by a fundamental emotion of disgust at the prospect of contamination. An effective way of prompting and motivating people to en-

gage in more handwashing is to increase emotional awareness that hand contact with other people (and the things they have touched) results in contaminated hands. In the UK, only 10% of the population reported avoiding handshakes. This may reflect the deeply ingrained nature of the handshake in British society. A reversal of the rules of etiquette may be required, to make it impolite or socially awkward to proffer a hand. Introducing a "hands-free" lapel badge or workplace policies could help to support any such public health policy.

[BMJ opinion](#), 10 March 2020



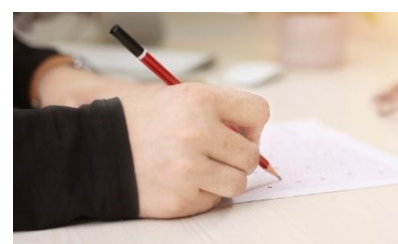
## Pupils' genes cannot predict educational achievement

Pupils' genetic data do not predict their educational outcomes with sufficient accuracy and shouldn't be used to design a genetically personalised curriculum or tailor teaching. To measure whether genetic data could predict a pupils' achievement, researchers from [Bristol Medical School](#) and the [MRC Integrative Epidemiology Unit](#) took genetic and educational data from 3,500 children in Bristol's [Children of the 90s](#) study. They compared pu-

pil's polygenic scores with their educational exam results at ages 7, 11, 14 and 16. Their analysis showed that while the genetic scores modestly predicted educational achievement at each age, these predictions were little better than using standard information known to predict educational outcomes, such as achievement at younger ages, parents' educational attainment or family socioeconomic position. Some of those who would be predicted from their genes to be in

the bottom 5% are actually in the top 5% of performers. This contradicts the notion that it is possible to accurately predict how well any one child will perform in education from their DNA.

Morris TT *et al.* (2020). [Can education be personalised using pupils' genetic data?](#). *eLife*.



## Motorboat noises make clownfish aggressive

Hormonal changes caused by motorboat noise cause clownfish to hide, skip meals and attack their neighbours - putting damselfish in distress. Working on the reefs around Moorea in French Polynesia, an international team of scientists exposed 40 pairs of clownfish to recordings of natural reef sounds or motorboat noise for up to two days. Motorboat noise caused clownfish to hide in the protective tentacles of their host anemone, move less into open water to feed and to be more aggressive towards domino damselfish

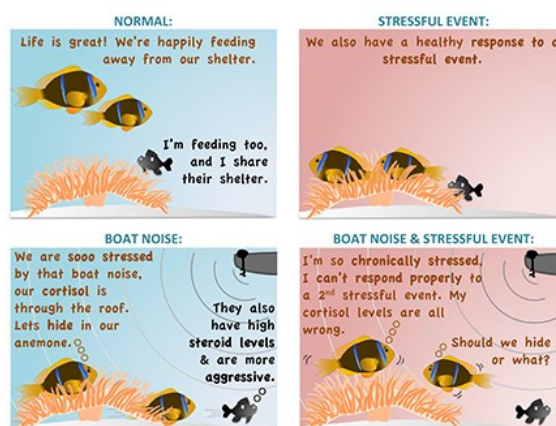
that also reside in the anemone.

They also found that noise-affected anemonefish were unable to respond appropriately to a second stressor, likely putting them at greater risk from threats such as predators and climate change. The study found noise-exposed fish had elevated lev-

els of the stress hormone cortisol and the reproductive hormones testosterone and 11-ketotestosterone, which corresponded with observed behavioural changes. These measurable hormones offer a window into complex behaviours and could be used to develop new noise-mitigation tools. The findings highlight the need to control man-

made noise in marine protected habitats.

Mills SC *et al.* (2020). [Hormonal and behavioural effects of motorboat noise on wild coral reef fish](#). *Environmental Pollution*.



## Deprived children face greater risk of partner violence

Women who spend longer periods of their early lives in less affluent neighbourhoods are at greater risk of experiencing violence during their early adulthoods at the hands of their intimate partners. The research, by the Universities of Oxford and Bristol, used the [Children of the 90s](#) study; participants were followed from birth and reported on their experiences of intimate partner violence between ages 18 to 21. They examined the level of deprivation in women's neigh-

bourhoods over the first 18 years of women's lives, based on England's official measure of area-level deprivation, the Indices of Multiple Deprivation. They found that women who had lived in the most deprived neighbourhoods for longer durations over their childhoods were 36% more likely to experience intimate partner violence between ag-



es 18-21. They also experienced this violence more frequently than women who had spent less or no time living in more deprived neighbourhoods. This is the first UK study to examine whether long-term exposure to neighbourhood deprivation affects the risk of intimate partner violence against women.

Yakubovich AR *et al.* (2019). [Long-term exposure to neighborhood deprivation and intimate partner violence among women: a UK birth-cohort study](#). *Epidemiology*.

## Countering Fake News? Learn from Cognitive Science!

Cognitive science has shown that if people know that they might be misled before any misinformation is presented, they become more resilient to being misinformed. To successfully debunk fake news, governments could enhance their horizon scanning capabilities to identify the strategies and tools of disinformers. Truth isn't the first casualty of war – it's the casualty that often causes war. Iraq was invaded in 2003 based on the presumed threat posed by its *weapons of mass destruction* (WMDs). Those weapons did not exist, but their presence was conjured in [a campaign](#) of deception by the UK and US

governments. Misinformation spread via Facebook fuelled the [ethnic cleansing of the Rohingya in Myanmar](#) in 2018. A primary task of conflict prevention must therefore involve the fight against misinformation and “fake news”.

### ***Any correction must be accompanied by an alternative explanation***

There is broad scientific agreement that combating misinformation requires that a correction be accompanied by an alternative explanation.

### ***Illustrate how misinformation and fake news work***

If people are made aware that they might be misled before the misinformation is presented, and if they are exposed to

a small dose of misinformation to illustrate, people tend to become more resilient to being misinformed afterwards.

### ***Enhance capabilities to identify strategies and rhetorical tools of disinformers***

It is essential to recognise the strategies and rhetorical tools employed by disinformers the moment they arise, and before they have found a foothold.

### ***Support independent NGOs that tackle misinformation***

Provision of accurate information can reduce levels of violence and tension.

[Read the full article](#) by Prof [Stephan Lewandowsky](#) (Psychological Science)

## Yoga for Mental Health

Whether your intention in joining a yoga class is to explore mind, body and soul or to tone your glutes, the practice will force you to slow down and breathe deeply. There are claims that this helps mentally and works as a kind of lifehack. Many Western yogis practice to gain physical benefits and continue because they notice subsequent mental improvements. Former University of Bristol undergraduate student Martha Allitt wanted to know what these mental benefits are, and

what yoga can offer us in a world rife with mental health problems.

During yoga, the slow controlled breathing activates the parasympathetic response, which is the nervous system's "rest and digest" mode. This could mean that yoga decreases levels of cortisol, a hormone produced during sympathetic mode responses ("fight or flight"). High levels of cortisol can damage nerve cells and switch on instructions for cellular suicide, which may play a key role in

contributing to symptoms of depression. The many stresses we face could increase the chances of mental health problems by sustaining an unnaturally over-active sympathetic nervous system and cortisol-induced damage. Beyond decreasing cortisol levels, yogic practices have shown to have other beneficial mental effects, such as increasing levels of nerve growth factor and oxytocin, a molecule key in social functioning.

[Read the full article](#)

## Suicide and the media: reporting could cost lives

News coverage of television presenter Caroline Flack's death by suicide raises public health concerns about media reporting of suicide. A new study which analysed the findings of 31 studies investigating associations between media reporting of deaths by suicide and population suicide rates, including those of celebrities, showed suicide rates increased by 13% cent on average over the 28 days following media reports of a celebrity death by suicide. The systematic review, led by Prof Thomas

Niederkrötenhaler at the Medical University of Vienna and involving an international team of researchers, was highlighted in a [BMJ editorial](#) by Prof [David Gunnell](#) and Dr [Lucy Biddle](#) (both Bristol Medical School).

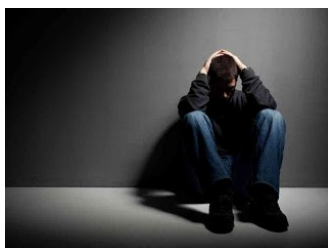
Together, the authors report this effect is substantial and suggests that regulation around some aspects of the media reporting of suicide is required. In the UK, where 6,507 people died by suicide in 2018 (542 per month), a

13% increase would amount to around 70 additional deaths. In the five months following

the death of international celebrity Robin Williams by suicide, deaths by suicide increased by almost ten per cent in the United States.

Media reporting of suicide methods is a particular concern, because it risks making specific methods "cognitively available." The authors found that reporting the method of suicide used by a celebrity was associated with a 30% increase in deaths by the same method.

Niederkrötenhaler T *et al.* (2020). [Association between suicide reporting in the media and suicide: systematic review and meta-analysis.](#) *British Medical Journal.*

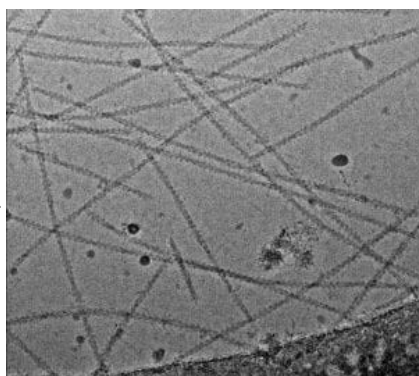


## Turing Network Data Study Group

Turing Fellow Dr [Danielle Paul](#) (Physiology, Pharmacology & Neuroscience) took part in the first [Turing Network Data Study Group](#), hosted by the [Jean Golding Institute](#), in August 2019. In a blog (posted Jan 20) she explained how the event, which united six Challenge Owners with 50 students, postdocs and senior academics, tackled real-world data science challenges.

Danielle presented the challenge: *Applying AI and machine learning to reveal the molecular basis of heart disease*. This was an image-

processing challenge with potential outcomes that could improve fundamental understanding of cardiac muscle proteins. Obtaining high-res molecular models of proteins involves the collection and processing of hundreds of thousands of images, which took six months. Automating



the protein-identification step would overcome a significant bottleneck in the workflow. The challenge team implemented several deep learning algorithms, known as [Convolutional Neural Networks](#), which were then trained to recognise our proteins in the images. The automated methods presented performed very well and upon testing, providing as much as 90% accuracy. The methods will be applied on larger datasets to test performance on slightly different data and imaging conditions.

[Read the full blog](#)

## Bristol pioneers use of VR for designing new drugs

Many drugs are small molecules, and discovering new drugs involves finding molecules that bind to biological targets like proteins. In the study, users were able to use VR to 'step inside' proteins and manipulate them, and the drugs binding to them, in atomic detail, using interactive molecular dynamics simulations in VR (iMD-VR). Using iMD-VR, researchers 'docked' drug molecules into proteins and were able to predict accurately how the drugs bind.

Many drugs work by binding to proteins

and stopping them working. To bind well, a small molecule drug needs to fit snugly in the protein. An important part of drug discovery is finding small molecules that bind tightly to specific proteins, and understanding what makes them bind tightly, which helps to design better drugs. To design new therapies, researchers need to understand how drug molecules fit into their biological

targets. To do this, we use VR to represent them as fully three-dimensional objects. Users can then fit a drug within the 'keyhole' of a protein binding site to discover how they fit together. Tests showed that users were able to predict how a drug binds to the targets; pulling the drug into the protein, they could build structures similar to the structures of the drug complexes found from experiments.

Deeds H *et al.* (2020). [Interactive molecular dynamics in virtual reality for accurate flexible protein-ligand docking](#). *PLOS One*.





## International COVID-19 Suicide Prevention Research Collaboration

Forty-two researchers from around the world, including Prof [David Gunnell](#) (Bristol Medical School), have formed the International COVID-19 Suicide Prevention Research Collaboration. Governments need to give 'urgent consideration' to their public health response to prevent any possible impact of the coronavirus pandemic on the number of suicides, they warn. There is growing concern about the far-reaching impact COVID-19 may have on people's mental health across the

globe, with the consequences likely to be present for longer and peak later than the actual pandemic. Examples of interventions include developing clear care pathways for people who are suicidal, remote or digital assessments for



people under mental health care, staff training to support new ways of working, support for helplines, providing easily accessible help for those who have lost a loved one to the virus, the provision of financial safety nets and labour market programmes, and dissemination of evidence-based online interventions.

Gunnell D *et al.* (2020). [Suicide risk and prevention during the COVID-19 pandemic](#). *The Lancet*.

## The student experience on University Mental Health Day

5 March 2020 was [University Mental Health Day](#), a day dedicated to inspiring conversations, taking action and creating change. Prof Sarah Purdy, University of Bristol Pro Vice Chancellor for Student Experience and Chair of the Elizabeth Blackwell Institute [Mental Health in Young People's research initiative](#), spoke about student experience, the need for a university-wide approach, and the importance of research to help understand the issues facing UK students today.

Mental health is one of the most challenging public health issues of our time.

Nationally, and indeed globally, there is increasing concern about mental health challenges facing young people as a result of the growing pressures of living, studying and working in today's world. We hope this research will help us to understand why young people are struggling with mental health nowadays to work out the most effective things to do if young people find their mental health isn't



as good as they would like it to be. Knowing what the issues are will help us deliver better support to our students when they come to the University of Bristol - and help to inform mental health and wellbeing initiatives for young people at other universities across the UK, and potentially even internationally.

We need to ensure we prevent people's mental health becoming worse while they're at university, help them receive the right interventions they need if their mental health does deteriorate, and support them throughout that process.

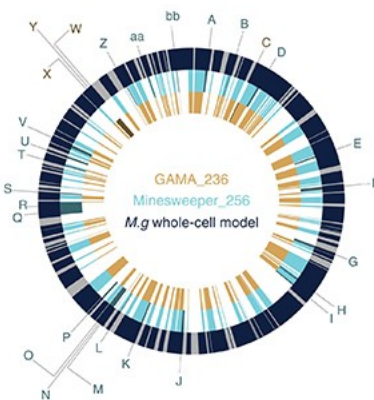
[Read the full blog](#)

## Technology takes a step forwards in genetic research

New research brings combined computational and laboratory genome engineering a step closer following the design of smaller and smaller genomes, to advance genetic manipulation, using supercomputers.

The size of genomes can be vast and vary across organisms. Genetic variety is still being explored and gene functions understood within biology. By minimising genomes, researchers can understand better what each gene does within a cell. Researchers at Bristol have found a way to design

a smaller genome using computational methods. Algorithms run on Bristol's supercomputers allowed the team to design a genome which is smaller, simpler, and can be easily manipulated. The research team tested designs within a computerised cell



model to see if the cells are able to grow and divide. The researchers plan to apply designs like these within real cells in the future. This will allow them to discover how advanced this technology really is. Making smaller genomes can contribute to understanding their properties.

Rees-Garbutt J *et al.* (2020). [Designing minimal genomes using whole-cell models](#). *Nature Communications*.

*Comparing the initial genome (outer ring) to two smaller versions produced using supercomputers*

## Safe-guarding the incarcerated

In his role as Chair of the United Nations Subcommittee on Prevention of Torture (SPT), [Sir Malcolm Evans](#), Professor of Public International Law at Bristol, has set out detailed [advice and measures](#) which governments and independent monitoring bodies should take to reduce health risks posed by coronavirus in the prisons, immigration detention facilities, closed refugee camps, and psychiatric hospitals for which they are responsible.

The guidance, issued by the SPT, includes considering reducing prison populations

by implementing schemes of early, provisional or temporary release of low-risk offenders, reviewing all cases of pre-trial detention, extending the use of bail for all but the most serious cases, as well as reviewing and reducing the use of immigration detention and closed



refugee camps. The advice emphasises that all detainees, people in quarantine and closed medical settings, their families, and all staff, including health care personnel, should receive reliable, accurate, and up-to-date information about all adopted measures and the reasons for them. The advice appeals to independent national monitoring bodies [National Preventive Mechanisms (NPM)] to continue to exercise their preventive mandate during the pandemic.

*Sir Malcolm Evans KCMG OBE was awarded a knighthood in 2015 for his services to torture prevention and religious freedom.*

## Mindfulness intervention for survivors of domestic violence

Women who have experienced domestic violence and abuse (DVA) often develop post-traumatic stress disorder (PTSD), which includes reliving traumatic events through nightmares and disturbing memories. Researchers from the [Centre for Academic Primary Care](#) and Bristol Biomedical Research Centre have adapted a standard mindfulness course for depression to address the special needs of DVA survivors with PTSD and are piloting

it in a small-scale study.

Unlike a one-off traumatic event, DVA results in chronic PTSD that is harder to treat. Standard treatment for PTSD is a 'past-focused' talking therapy, which teaches people how to change their negative thoughts and feelings into more positive ones through 'reliving' traumatic memories. Many survivors of DVA drop

out of the standard treatment because they find such an approach too upsetting or do not feel better.

In contrast, mindfulness is a 'present-focused' therapy that teaches people how to respond to thoughts and feelings arising from the past with acceptance and self-compassion. It is known to work well in the treatment of depression. The [coMfort \(Mindfulness for Trauma\)](#) study is funded by the NIHR Bristol Biomedical Research Centre.

[Read more](#)



## Is anorexia caused by nature or nurture?

Between 0.1% to 0.2% of the UK population has been diagnosed with anorexia nervosa, a mental disorder which often results in patients being severely underweight. The disorder is a culmination of cognitive, physical, emotional, and behavioural symptoms. These may involve obsessing over weight, not recognising one is underweight, heart palpitations, low blood sugar, skipping meals, and over-exercising.

Undergraduate student Ashley Chow (Physiological Science) explored how these behaviours come about on [Science Shorts](#), a

student-led Bristol blog.

Why would someone jeopardise their health and wellbeing by under-eating? It could be argued that anorexia itself is a symptom of the desire to comply to societal norms and beauty standards. On the other hand, maybe the disorder can be correlated with the presence of a certain mutation in the genome. This brings up the classic nature versus nurture debate. Does anorexia have a biological

cause or is it more influenced by the external environment?

There are many examples that support each aspect of the nature versus nurture debate. Ashley leans towards nurture being stronger; while an individual can have a predisposition to anorexia, they may grow up in an environment where thin figures are not as desirable, which may reduce the chances that they develop the disorder. Research into the biological causes of anorexia is fairly recent and hasn't produced results as strong as developed psychological models which explain anorexia's social cause.



## Conspiracy theories and how to stop them spreading

The coronavirus pandemic has resulted in the global scientific research community attacking the problem at an unprecedented rate. The new virus [was identified](#) and tests for it [were rapidly developed](#). Labs across the world are racing to develop a vaccine, which is estimated to be [around 12 to 18 months](#) away. At the same time, the pandemic has been accompanied by [an infodemic](#) of nonsense, disinformation, half-truths and conspiracy theories that have spread virally through social networks. This damages society

in a variety of ways, e.g. the myth that COVID-19 is less dangerous than seasonal flu was deployed by US president Donald Trump [as justification for delaying mitigation policies](#). The recent downgrading of COVID-19 death projections, which reveal the success of social-distancing policies, has been falsely used to justify [premature relaxing](#) of social distancing measures.

The new conspiracy theory that blames COVID-19 on the 5G broadband system is one of the most bizarre pieces of misinformation. An effective strategy for preventing con-

spiracy theories from spreading through social networks is, appropriately enough, [inoculation](#); if we inoculate the public by pre-emptively warning them of misleading misinformation, they develop resilience and are less likely to be negatively influenced.

An excerpt from the article by Prof [Stephan Lewandowsky](#) (Psychological Science) and John Cook in [The Conversation](#).

A new [Conspiracy Theory Handbook](#) by Prof Lewandowsky was published in March 2020 (download for free)

## How coronavirus has transformed the grieving process

To date, over 17,000 people have died of coronavirus in the UK. [Care England estimates](#) more than 1,400 people have died in care homes, with the toll expected to grow. As a result, a wave of grief will swell in the coming months, with more people experiencing a close bereavement related to COVID-19. The disease brings new challenges in caring for patients and supporting their family and friends; a particularly cruel one is that patients must be isolated to control the spread of infection. Since a patient's loved ones are often unable to accompany them to hospital,

and because patients with COVID-19 can deteriorate quickly, it is important to have conversations about [advance care planning](#) and document our preferences.

With an advance care plan in place, relatives and clinicians have a much clearer idea what the patient would want medically, even if they are too unwell to express it. This translates into [a better bereavement process](#) for relatives, should the patient die. Up to now, visiting patients seriously ill with COVID-19 has been impossible for many. Although it is time-consuming to dress relatives in PPE, and risks con-

tamination, if relatives are not in a high-risk category, in quarantine or unwell themselves, even [a short visit](#) of about 15 minutes could make a world of difference. Not being able to say goodbye [has been identified](#) as a cause of ["complicated grief"](#) among bereaved relatives. Where visits are not possible, the use of smartphones, tablet computers and other forms of connection can also be a great comfort in enabling patients to communicate with friends and relatives.

An excerpt from an article written by Dr Lucy Selman (Bristol Medical School), in [The Conversation](#).



## Is digital technology undermining democracy?

Democracy is debate. But unfortunately access to the “free marketplace of ideas” where citizens see all sides of the debate isn’t equal. The internet was going to fix that.

Instead, we now live in an era of democratic backsliding, with at least [80 countries having become less democratic during the last decade](#). And much of that decline is being [blamed on the internet](#), which facilitates the spread of disinformation, hate speech, incite-

ment, and foreign interference in elections.

This is exactly why universities around the world, including the University of Bristol’s Digital Futures Institute, are working with tech giants, governments and the third sector to examine how this happened and what we can do about it.

Rising social concern about the use of digital data and AI technologies in the political process is prompting big tech companies to do something about this. Google announced

it’ll [no longer permit microtargeting of political messages](#) – applicable in the forthcoming British election and rolled out globally in 2020. Although political campaigns reacted with outrage against the move, it’s a step in the right direction. It forces campaigns to be more palatable to a broader audience – making extremism less rewarding and opening the door to rebuttals.

Read the full article by Prof [Stephan Lewandowsky](#) (Psychological Science).

## Progressing young people’s mental health research

Research is urgently needed to understand the reasons for recent trends in young people’s wellbeing and to put in place effective prevention and support. On 28 November 2019 members of the [Elizabeth Blackwell Institute Mental Health in Young People research initiative](#) met for a workshop to hear about innovative research at Bristol, to strengthen connections and collaboration, and to identify future research needs in this area.

Approximately one in four people in the UK will experience a mental health problem each

year, and around 75% of adults with mental illness first experience symptoms before the age of 25. Students sometimes struggle; a recent analysis by Universities UK (UUK) highlighted a six-fold increase in the number of UK students who disclose a mental health condition to their university since 2007.

Bristol is well placed to develop evidence-based strategies

to support student mental health and wellbeing. With a network of academics from different backgrounds, and with strong Students Union representation, the Mental Health in Young People research initiative brings together experts in mental health and wellbeing to deliver high quality research in this area.

[Read about the workshop](#)

which included presentations on the importance of language, the science of happiness, the prevention of suicide, and anxiety and depression prevention initiatives, amongst others.



## The National Institute for Health Research (NIHR) in

The NIHR is the nation's largest funder of health research and Bristol does well in terms of NIHR funding.

The city, through its universities and hospitals, hosts key NIHR infrastructure.

The University of Bristol is the only university to host centres for all three NIHR schools; it also hosts one of only a handful of NIHR Blood and Transplant Research Units (BTRUs) – the [BTRU in Red Blood Cell Products](#), which is growing red blood cells in the laboratory to treat rare diseases.

Bristol Health Partners has given a [brief overview](#) of the NIHR in Bristol:

- NIHR South West Research

Design Service (RDS), a bespoke service to help you design studies and successfully apply for grants

- Bristol Trials Centre (BTC), collaborating with you to set up and manage studies, from grant application to publishing results



### National Institute for Health Research

- NIHR Clinical Research Network (CRN) West of England, helping you run clinical research in the NHS, public health and social care settings
- NIHR Bristol Biomedical Research Centre (BRC), bridging the gap between fundamen-

tal research and new treatments

- NIHR Applied Research Collaboration West (ARC West), applied health research to address the issues facing the health and social care system
- NIHR School for Primary Care Research (SPCR), driving forward primary care research to influence policy and practice
- NIHR School for Public Health Research (SPHR), driving forward public health research to influence policy and practice
- NIHR School for Social Care Research (SSCR), driving forward adult social care research to influence policy and practice

## Teenage anxiety and later harmful drinking

A study has found evidence of an association between generalised anxiety disorder at age 18 and harmful drinking three years later; it strengthens the evidence for a relationship between anxiety and later alcohol use as the researchers accounted for other factors such as adolescent smoking and cannabis use, and parental anxiety and alcohol use. Using questionnaire and clinical interview data from more than 2000 participants, they found generalised anxiety disorder at age 18 was linked

to frequent drinking, frequent bingeing, hazardous drinking, and harmful drinking at age 18. Generalised anxiety disorder continued to be associated with harmful drinking at age 21. Alcohol Change UK's research has shown that links between mental health problems and alcohol are common and complex; anxiety can be



both a result of stopping drinking and a risk factor in beginning to drink too much. More work is needed to better understand the connections between alcohol and mental health, as well as high-quality, accessible, integrated support for substance misuse and mental health issues.

Dyer ML *et al.* (2019). [Alcohol use in late adolescence and early adulthood: The role of generalized anxiety disorder and drinking to cope motives.](#) *Drug and Alcohol Dependence*. 205: 107480.

## Bristol City Fellows

The [Bristol City Fellows Programme](#), funded by a £118,000 Impact Acceleration Account grant from the [Economic and Social Research Council](#), is led by the University of Bristol with Bristol City Council's [City Office](#) and the Social Justice Project. The new fellows, announced at the Mayor's City Gathering on 10 January 2020, will work with charities and community groups over 18 months to ensure mar-

ginalised voices have a say in decision-making and in turn tackle systemic inequalities across Bristol. One of the fellows, Lucie Martin-Jones, Head of Community Services at The West of England Centre for Inclusive Living, will look at improving healthcare and support for disabled peo-

ple, ultimately creating new systems which are person-centred and allow disabled people more independence and control:

*We will be looking at existing healthcare systems to establish how effectively they are delivering what matters to our citizens and how they can be improved. This works towards Bristol's One City Plan aspirations for health and wellbeing.*



## Funding successes: Part 7

An £18.5 million funding award from the Biotechnology and Biological Sciences Research Council to the University of Bristol-led [South West Biosciences Doctoral Training Partnership](#) (SWBio DTP) will offer four-year PhD studentships over five cohorts starting in October 2020. Students will undertake interdisciplinary training in statistics, bioinformatics, coding, experimental design, innovation and understanding the impact of research. They will also undertake three-month Professional Internship for

PhD Students (PIPS) placements to develop their skills further and to explore possible future career directions. The partnership, led by Bristol together with [GW4](#) partners and alongside [Rothamsted Research](#), has recently expanded to include six new regional associate partners that will provide access to expertise and facilities across the South West and Wales.

The University of Bristol has committed £800,000 from its Quality Related (QR) Global Challenges Research Fund (GCRF) allocation to support research activities with partners in low and middle income countries. These [QR GCRF Investment Grant awards](#) will develop research

capacity and conduct research that will provide real impact in Ethiopia, Zimbabwe, South Africa, Peru, India, Pakistan and Nepal.

Dr [Ana Paula Abdala Sheikh](#) (PI), Dr [Zuner Bortolotto](#) and Prof [Clea Warburton](#) (Co applicants), all from the School of Physiology, Pharmacology and Neuroscience, in collaboration with Cerevance Ltd (Cambridge), were awarded a project grant by RettSyndrome.Org (USA). The title of the grant is *Investigation of the therapeutic potential of a lead mGluR7 modulator in Rett Syndrome*, the amount awarded is \$150,000 and this is for 2 years.



# ELIZABETH BLACKWELL FUNDING

Nurturing  
Research.  
Improving  
Health.



## EBI COVID-19 Rapid Response call

A funding call for research looking into COVID-19 / Novel Coronavirus. **Applications are accepted on a rolling basis.**

## Confidence in Concept (CIC) COVID-19 Special Call

Supports health related translational projects which are at the stage of proof of concept (Confidence in Concept Awards). We have decided to launch a special call to fund interventions which are targeted at the COVID-19 pandemic. **Deadline: 23 April 2020 at 12 noon.**

## EBI Postgraduate Discipline Hopping Fellowships

This scheme is designed to support a small number of postgraduate researchers currently enrolled on one of the UoB Wellcome Trust-funded 4 year PhD programmes. **Deadline: 30 April 2020.**

## EBI Translational Acceleration and Knowledge Transfer (TRACK)

This scheme provides funding to support health related translational projects. **Deadline: 6 May 2020.**

## 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](mailto: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 are accepted on a rolling basis.**

## 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). **Deadlines: 30 April and 31 October**

## 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 are accepted on a rolling basis.**

## EBI Seed Fund: Public Engagement with Health Research

Seed funding is available for health researchers who would like to deliver public engagement events and activities. **Applications are 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**

### **Medical Research Council**

[Research grants – neurosciences and mental health](#)

Closing date: 27-May-20

Award amount: £1 million

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. The board aims to support research that transforms the understanding of physiology and behaviour of the human nervous system

throughout the life course in health, illness, as well as how to treat and prevent disorders of the brain.

### **National Institute on Aging (USA)**

#### [Alzheimer's drug development programme \(U01 clinical trial optional\)](#)

Closing date: 05-Jun-20

Award amount: US\$5 million

Supports preclinical and early stage clinical development of small-molecule and biologic therapeutic agents that prevent Alzheimer's disease, slow its progression or treat its cognitive and behavioural symptoms.

### **Masonic Charitable Foundation**

#### [Large Grants](#)

Closing date: 15-Jun-20

Award amount: £60,000

These support charities in building better lives by enabling more opportunity, advancing healthcare and education and promoting independence for Freemasons, their families and the wider community. Current target areas are:

- creating the best start in life for disadvantaged children and young people; reducing isolation in later life; medical research into degenerative disease; care services in the hospice sector.

### **Roger De Spoelberch Foundation**

#### [Roger De Spoelberch prize](#)

Closing date: 30-Jun-20

Award amount: €750,000

This recognises a clinical and basic scientific research project within the field of neurodegenerative diseases and psychiatric disorders. Applicants must hold a PhD and be under the age of 55 when the application is submitted.

### **A-T Children's Project**

#### [Research Grants](#)

Closing date: 01-Jul-20

Award amount: USD \$150,000

Support basic science, translational and clinical research grants related to ataxia-telangiectasia.

### **National Institute for Health Research**

#### [Health technology assessment programme – commissioned calls](#)

Closing date: 29-Jul-20

Award amount: unspecified

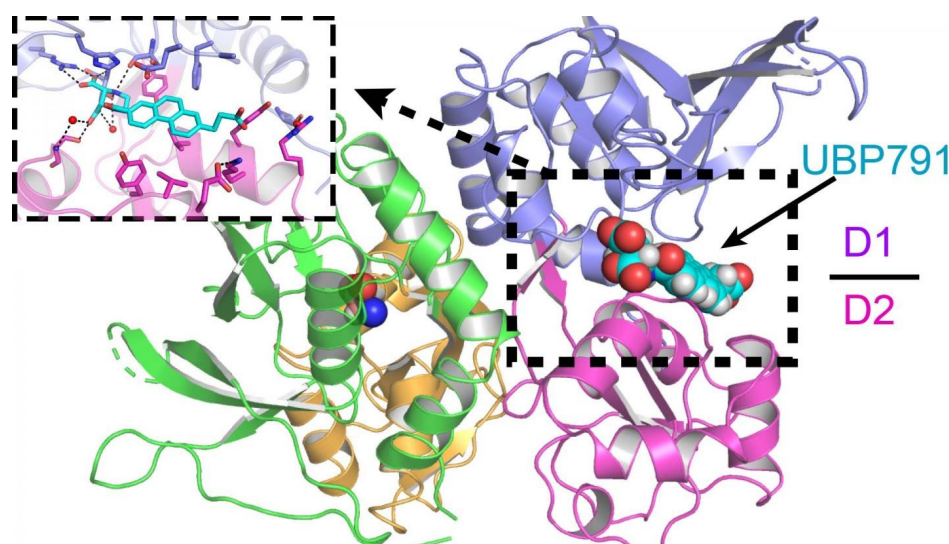
The programme aims to ensure that high quality research information on the effectiveness, costs and broader impact of health technology is produced in the most efficient way for those who use, manage, provide care in or develop policy for the NHS. Proposals may address: psychological intervention for complex post-traumatic stress disorder; guided self-help for depression in adults with autism spectrum disorder.

# SHOWCASED ARTICLE

## Structural basis of subtype-selective competitive antagonism for GluN2C/2D-containing NMDA receptors

Wang JX, Irvine MW, Burnell ES, Sapkota K, Thatcher RJ, Simorowski N, Volainskis A, Collingridge GL, Monaghan DT, Jane DE and Furukawa H. (2020). *Nature Communications*. 11: 423.

N-Methyl-D-aspartate receptors (NMDARs) play critical roles in the central nervous system. Their heterotetrameric composition generates subtypes with distinct functional properties and spatio-temporal distribution in the brain, raising the possibility for subtype-specific targeting by pharmacological means for treatment of neurological diseases. While specific compounds for GluN2A and GluN2B-containing NMDARs are well established, those that target GluN2C and GluN2D are currently underdeveloped with low potency and uncharacterized binding modes. Here, using electrophysiology and X-ray crystallography, we show that UBP791 ((2S\*,3R\*)-1-(7-(2-carboxyethyl)phenanthrene-2-carbonyl)piperazine-2,3-dicarboxylic acid) inhibits GluN2C/2D with 40-fold selectivity over GluN2A-containing receptors, and that a methionine and a lysine residue in the ligand binding pocket (GluN2D-Met763/Lys766, GluN2C-Met736/Lys739) are the critical molecular elements for the subtype-specific binding. These findings led to development of UBP1700 ((2S\*,3R\*)-1-(7-(2-carboxyvinyl)phenanthrene-2-carbonyl)piperazine-2,3-dicarboxylic acid) which shows over 50-fold GluN2C/2D-selectivity over GluN2A with potencies in the low nanomolar range. Our study shows that the L-glutamate binding site can be targeted for GluN2C/2D-specific inhibition.



NMDARs (N-methyl-D-aspartate receptors) serve as valves on nerve cells, controlling the flow of electrical signals in the brain. This special group of receptors is suspect in many neurological diseases, including Alzheimer's, epilepsy, stroke, and Parkinson's. Biologists from Cold Spring Harbor Laboratory (CSHL) and chemists from the University of Bristol have joined forces, creating a chemical com-

pound to enable more precise investigation of NMDAR activity. In this article, CSHL Professor Hiro Furukawa and colleagues detailed how they identified and perfected a chemical compound that inhibits, or stops the activity of certain NMDARs. By inhibiting some NMDARs while letting others function, researchers can now identify the roles different types of NMDA receptors play in both healthy and diseased brains.

[Read the full discussion on Bioengineer.org](#)

[Watch the video explaining how researchers have created a new chemical tool for revealing how specific types of brain cell receptors function in the brain](#)

# CONTACTS



## Bristol Neuroscience

**Director:** [Matt Jones](#), Professorial Research Fellow in Neuroscience

**Memory Hub Leader:** [Jack Mellor](#), Professor in Neuroscience

*Area of research* - synaptic plasticity and its role in learning and memory

**Movement Hub Leader:** [Jeremy Burn](#), Senior Lecturer Dynamics and Control

*Area of research* - modelling, simulation and control of civil, mechanical and aerospace engineering systems

**Sleep Hub Leader:** [Matt Jones](#) (interim), Professorial Research Fellow in Neuroscience

*Area of research* - neuronal networks in cognition and disease

**Mental Health Hub Leader:** in progress

**Network Facilitator:** [Jacqui Oakley](#) (Research Development)



**Network Administrator:** [Catherine Brown](#) (Elizabeth Blackwell Institute), Newsletter editor and creator



[b-n@bristol.ac.uk](mailto:b-n@bristol.ac.uk)

<http://www.bristol.ac.uk/neuroscience>

[@BristolNeurosci](https://twitter.com/BristolNeurosci)