

I&I NETWORK NEWSLETTER



Elizabeth Blackwell Institute
for Health Research

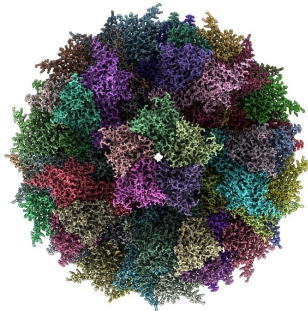
JANUARY - MARCH 2020

Synthetic vaccines to combat epidemics

A new type of vaccine that can be stored at warmer temperatures, removing the need for refrigeration, has been developed for mosquito-borne virus Chikungunya in a major advance in vaccine technology. Chikungunya, a virus transmitted by the bite of an infected mosquito, causes crippling headache, vomiting and swelling of limbs; when fevers abate chronic symptoms such as intense joint pain, insomnia and extreme prostration may remain. Formerly confined to sub-Saharan Africa, the disease

has recently spread worldwide as its mosquito host leaves its natural habitat due to deforestation and climate change, with recent outbreaks in the USA and Europe.

The team from the University of Bristol and the [French National Centre for Scientific Research](#) (Grenoble) teamed up



with [Oracle](#) to find a way to make vaccines that are thermostable, can be designed quickly and are easily produced.

Vragliau C et al. (2019). [Synthetic self-assembling AD-Domer platform for highly efficient vaccination by genetically encoded multi-epitope display](#). *Science Advances*. 5(9), eaaw2853.

ADDomer, a next generation synthetic vaccine that mimics features of Chikungunya virus, to efficiently prime the immune system to protect against this pathogen

Bristol Events / Other Events

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INFECTION
&
IMMUNITY



UoBRISTOL EVENTS

Zika virus neurotropism: the bad and the good

9 January 2020, 12.00 - 13.00, Cheng-Feng Qin (Professor of Virology, Beijing Institute of Microbiology and Epidemiology), E42 Biomedical Sciences Building



UHBristol annual Research Showcase

10 January 2020, 9.30 - 15.30, Julian Hamilton Shield, Maria Pufulete, John Sparrow, Colin Steward and Lucy Dabner, Rachael Goberman-Hill, John MacLeod. Lecture Theatre 1, Education Centre, Upper Maudlin Street, Bristol, BS2 8AE

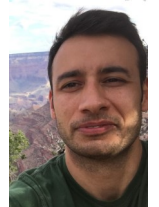
Infection and Immunity Early Career Researchers' symposium

10 January 2020, 9.30 - 14.00, Keynotes: Dr Selinda Orr (Queen's University Belfast) and Dr Maisem Laabei (University of Bath), G13-14 Life Sciences Building



Development and validation of the VACS Index

13 January 2020, 12.00 - 13.00, Janet Tate (Yale), room OS6, Oakfield House



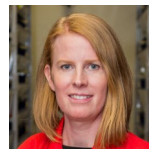
Heart regeneration in the Mexican cavefish

13 January 2020, 13.00 - 14.00, Mathilda Mommersteeg (Department of Physiology, Anatomy and Genetics, University of Oxford), C42 Biomedical Sciences Building



In silico development of TCR-based therapies

13 January 2020, 14.00 - 15.00, Dr David Cole (Immunocore), C42 Biomedical Sciences Building



RED Research Development International Drop in Session

14 January 2020, 9.00 - 13.00, Verdon Smith Room, Royal Fort House

AMR Force meeting

15 January 2020, 12.00 - 14.00, Ben Walker (Bristol Veterinary School), meeting room 2, Dolberry Building, Langford



T3 Technical Talk Time Seminar series

15 January 2020, 14.00 - 15.00, venue TBC

Bristol Veterinary School Research Mingle

15 January 2020, 16.00 - 17.00, Dolberry seminar Room, Langford campus



Recapitulation of developmental mechanisms to revascularise the ischemic heart

20 January 2020, 13.00 - 14.00, Nicola Smart (Department of Physiology, Anatomy and Genetics, University of Oxford), C42 Biomedical Sciences Building

From top: Cheng-Feng Qin, Selinda Orr, Miasem Laabei, Janet Tate, Mathilda Mommersteeg, David Cole, Nicola Smart

UoB EVENTS

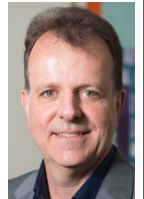
Their Stories: I'm not nervous, it's just how I talk - working with a stammer

30 January 2020, 12.30 - 13.30, Dr Lindsey Pike (University of Bristol), B16/17 Enderby Room, Physics, Tyndall Avenue, Bristol



Workshops: Above and Beyond (A&B) and Research Capability Funding (RCF) grants

6 February 2020, 8.00 - 9.00, Research & Innovation, Education & Research Centre, Tutorial Room 6



Open Presentation from MRC's Chief Science Advisor

7 February 2020, 13.00 - 14.30, MRC's Chief Science Advisor Dr Rob Buckle and Programme Manager Dr Mariana Delfino-Machín, venue TBC (likely Woodland Road)



Workshops: Above and Beyond (A&B) and Research Capability Funding (RCF) grants

11 February 2020, 12.30 - 13.30, Research & Innovation, Education & Research Centre, Tutorial Room 5

MESS meeting

12 February 2020, 12.00 - 13.00, G11 Canynge Hall

Bristol Veterinary School Research Mingle

12 February 2020, 13.00 - 14.00, Dolberry seminar Room, Langford campus

Workshops: Above and Beyond (A&B) and Research Capability Funding (RCF) grants

13 February 2020, 12.30 - 13.30, Research & Innovation, Education & Research Centre, Tutorial Room 1

Education Research Tutorials

19 February 2020, 12.00 - 14.00, Dr Ellayne Fowler, TLHP Seminar Room, Top Floor, 39-41 St Michaels Hill

T3 Technical Talk Time Seminar series

19 February 2020, 14.00 - 15.00, venue TBC

OTHER EVENTS

Practical introduction to evaluating public involvement in research workshop

16 January 2020, 11.00 - 15.00, Floor 9, Whitefriars, Lewins Mead, BS1 2NT

International Development Annual Speed Networking Event

29 January 2020, 16.30 - 18.30, Amory C501, Rennes Drive, University of Exeter

Children and Young People's Health Research Seminar

5 February 2020, 10.00 - 12.00, Room 2K11, Glenside Campus, University of the West of England

NEWS

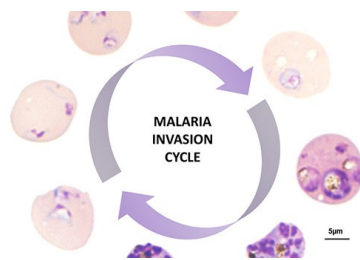
Artificial red blood cells help research into malaria invasion

A new model system that uses red blood cells grown in the laboratory to study how malaria parasites invade red blood cells provides a powerful new research tool for the identification of key host proteins and their domains that are involved in parasite infection. The team used a cell line which can produce unlimited numbers of immature 'progenitor cells' that can be pushed to produce new red blood cells (RBCs) in the lab. Using these cells they were able to show that RBCs generated using this technique

can support both invasion by and intracellular development of the parasite *Plasmodium falciparum*. By using CRISPR-Cas9 to edit the genome of the immature cells they were also able to remove the basigin protein which is normally present on the surface of RBCs and show that the RBCs generated from this edited line were completely re-

sistant to invasion. Reintroducing basigin restored invasion to normal levels, demonstrating that the cells can be used to remove and replace different blood cell proteins and how their absence or alteration affects the ability of the parasite to successfully invade.

Satchwell TJ *et al.* (2019). [Genetic manipulation of cell line derived reticulocytes enables dissection of host malaria invasion requirements](#). *Nature Communications*. 10: 3806.



Funding successes: Part 1

Drs [Ellen Brooks-Pollock](#) and [Katy Turner](#) (Bristol Veterinary School) are part of a team from the Universities of Bristol and Exeter who won a two-year contract worth over €600,000 to provide Mathematical Modelling and Economic Evaluation for the **European Centre for Disease prevention and Control** (ECDC). The Bristol Exeter Analysis CONSortium for Mathematical Modelling and Economic Evaluation (BEACON) will provide

advice to ECDC to improve infectious disease prevention and control strategies in EU/EEA countries. Projects include evaluating the potential impact of interventions to reduce morbidity and mortality and using economic evaluation to estimate the cost of disease and appraise and compare public health strategies.

Dr [Setor Kunutsor](#) (Bristol Medical School: Translational Health Sciences) from the **Bristol Orthopaedic Trust**,

£19,359 for *Debridement, antibiotics and implant retention for prosthetic joint infections: An individual participant data meta-analysis of treatment outcomes (The Global DAIR Collaboration)* starting 1 Oct 19 for five months.

Prof [Richard Coward](#) (Bristol Medical School: Translational Health Sciences) received four years funding for a studentship from **Kidney Research UK** worth £70,527 for *Is Diabetic Nephropathy the result of a Podocyte Tauopathy?*

New insight into bacterial infections found in cow noses

New research led by academics at the University of Bristol Veterinary and Medical Schools used the 'One Health' approach to study three bacterial species in the noses of young cattle and found the carriage of the bacteria was surprisingly different. The findings, which combined ideas and methods from both animal and human health research, could help prevent and control respiratory diseases. Cattle, like humans, harbour a wide range of bacteria in

their noses, microbes which are normally present and probably necessary for health like those that live in the gut. However, some species of these bacteria do cause serious illness at times, particularly when infection becomes established in the lower respiratory tract within the lungs. The research team took nasal swabs at intervals during the first year of life, to detect their presence and measure their abundance using a DNA-detection technique called

quantitative polymerase chain reaction (qPCR) that targeted genes found in three bacterial species well-known for their ability to cause respiratory disease in cattle: *Histophilus somni*, *Mannheimia haemolytica* and *Pasteurella multocida*.

Thomas AC *et al.* (2019). [Insights into Pasteurellaceae carriage dynamics in the nasal passages of healthy beef calves](#). *Scientific Reports*. 9: 11943.

Funding successes: Part 2

Dr [Richard Lee](#) (Bristol Medical School: Translational Health Sciences) received funding from **Above & Beyond** for *The Development of a Companion Biomarker For a Novel Anti-CCR6 Therapy in Steroid Refractory Diseases* starting Sep 19 for two years.

Prof [Andrew Dick](#) (Bristol Medical School: Translational Health Sciences) from the **National Eye Research Centre**, £9,997 for *Multimodal analysis of choroidal immune cells during ocular inflammatory disease* starting Aug 19 for one year.

Dr [Matthew Butler](#) (Bristol Medical School: Translational

Health Sciences) from the **Academy of Medical Sciences**, £19,708 for *Validating erythrocyte glycocalyx loss as an early predictor of diabetic microvascular disease* starting Aug 19 for one year.

Dr [Shoba Dawson](#) (Bristol Medical School: Population Health Sciences) from the **National Institute for Health Research** School for Primary Care Research, £7,476 for *Creative and novel approaches to engaging with children with eczema and their parents*, starting Aug 19 for 7 months.

Prof [Matthew Avison](#) (Cellular and Molecular Medicine) from the **Medical Research Council**,

£223,521 for *Improving empiric antibiotic prescribing by applying a Bayesian decision theory approach to phenotypic and genomic resistance data*, starting Oct 19 for 3 years.

Prof [Paolo Madeddu](#) (Bristol Medical School: Translational Health Sciences) from the **British Heart Foundation**, £212,341 for *A novel pericyte mechanism involving the transcriptional activator Nrf2 and the transcriptional repressor Bach1 modulates antioxidant defence response and angiotensin-dependent vascular stabilisation during reparative angiogenesis*, starting Nov 19 for three years.

External engagements: Part 1

During the week of 23 September 2019 Drs [Andrew Davidson](#), [Maia Kavanagh Williamson](#) (both Cellular and Molecular Medicine) and [Chris Arthur](#) (Chemistry) delivered a Newton/Medical Research Council-funded workshop on *Proteomics and lipidomics for understanding Flavivirus biology* at Mahidol University in Thailand, in col-



laboration with Prof Duncan Smith (see image below).

Dr [Nicola Rooney](#) (Bristol Veterinary School) was the International Guest Speaker at the 50th annual meeting of the Japanese Society of Digestion and Absorption held in Haneda, Tokyo on 5 October 2019 where she gave an invited lecture entitled *How can companion animals improve*

human health? The value of trained medical detection dogs.

BBC Radio 4's "Inside Science" programme on 3 October 2019 included a section on the retraction of a paper that stated the CCR5 delta-32 deletion causes an increase in mortality, relevant to the gene-edited babies in China who were CRISPR'd to have that deletion. Dr [Sean Harrison](#) (Bristol Medical School: Population Health Sciences), who tried and failed to replicate the result using UK Biobank data and posted his findings on Twitter, was invited to speak on the matter; [listen to the full interview](#).

Funding successes: Part 3

Dr [Bernadette Carroll](#), Vice Chancellor's Fellow in the School of Biochemistry, was awarded a **Royal Society and Wellcome Trust Sir Henry Dale Fellowship**. The award, *Dysregulation of mTORC in senescence*, is for Berni and a postdoc for five years and comes in just shy of £820,000.

Prof [Jan Frayne](#) (Biochemistry) in collaboration with colleagues in Edinburgh, from the **Medical Research Council**, £127,000 to investigate *An in vitro model for the human erythroid island niche: a tool to study*

congenital dyserythropoietic anaemia and to identify novel treatments, starting Jan 20 for three years.

Prof [Peter Vickerman](#) (Bristol Medical School: Population Health Sciences) from the **National Institute for Health Health Technology Assessment** programme (NIHR HTA), £411,402 for *A comprehensive model and economic evaluation of HCV elimination amongst people who inject drugs in England to guide case-finding intervention policy and implementation*, starting Jan 20 for three years.

Prof [Chris Metcalfe](#) (Bristol Medical School: Population Health Sciences) from the **National Institute for Health Programme Grants for Applied Research (PGfAR)** for *Reducing the impact of diabetic foot ulcers on patients and the health service: the REDUCE programme*, starting Jan 20 for 6 years.

Dr [Melanie Hezzell](#) (Bristol Veterinary School) from the **National Institutes of Health (USA)**, £2,739 for *Prognostic value of circulating cortisol in canine congestive heart failure*, starting Jan 20 for two years.

Hidden danger from pet dogs in Africa

Researchers at the universities of Abuja and Nigeria, in collaboration with the University of Bristol, have detected a potentially human-infective microbe in pet dogs in Nigeria. Dogs in tropical Africa run the risk of contracting canine trypanosomiasis if they are bitten by blood-sucking tsetse flies carrying trypanosomes – microscopic, single-celled organisms found in the bloodstream. In dogs, this disease runs a severe course and is often fatal;

“white eyes” or corneal cloudiness is one of the characteristic and obvious signs of the disease. Diagnosis relies on examination of a blood smear under the microscope; while trypanosomes are easily detected by their rapid motion among the blood cells, it is hard to determine the exact species of trypanosome by microscopy alone. To help with the diagnosis, Dr Paschal Umeakuana of University of Nigeria Veterinary Teaching Hospital (UNVTH) contacted

Prof [Wendy Gibson](#) (Biological Sciences), as Bristol’s [Trypanosome Research Group](#) has developed molecular-based methods for trypanosome identification. The collaboration led to the accurate identification of trypanosomes in 19 recent cases of canine trypanosomiasis referred to UNVTH.

Umeakuana P *et al.* (2019). [Identification of *Trypanosoma brucei gambiense* in naturally infected dogs in Nigeria](#). *Parasites & Vectors*. 12: 420.

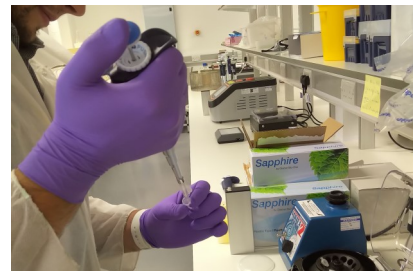
New test could identify antibiotic resistance in 2 hours

A new rapid patient test which could identify whether bacteria isolated from clinical samples are antibiotic resistant in under two hours is being trialled on a range of antibiotics commonly used to treat urinary tract infections (UTIs). If successful, the test could transform decision-making around antibiotic choice by helping inform the five million antibiotic prescriptions written each year in the UK for UTIs.

The rapid antimicrobial susceptibility test (AST), developed by University of Bristol spin-out company [Vitamica](#), uses novel optical technology to see inside bacteria cells

and detect tiny movements indicating whether the cells are alive or not and could be antibiotic resistant. Based on technology developed at Bristol’s School of Physics, the test is being trialled using bacteria derived from human UTI samples on a range of antibiotics commonly used to treat them. Bacteria treated with an effective antibiotic will show alterations in these movements after only a few minutes, so technicians can quickly tell whether an antibiotic is suitable for prescribing to an individual patient. They have produced promising results for a range of antibiotics commonly used to treat urinary infections, and are look-

ing to extend this testing to bacteria in other samples such as blood where sepsis is a real threat to life.



Vitamica has announced a bid to raise further funding to continue development of this test and is seeking to raise a further £1.5 million to extend the programme of research over the next two years.

A member of the Vitamica team working on the rapid antimicrobial susceptibility test © Vitamica

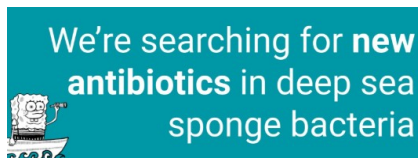
External engagements: Part 2

PhD student Bartholomew Harvey (Physiology, Pharmacology and Neuroscience), won the *CF's Got Talent!* event at the UK Cystic Fibrosis Conference on 26 September 2019 in London.



[Henry Stennett](#), a PhD student in Paul Race's lab (Biochemistry), won second prize for his poster at the De-

fence and Security Doctoral Symposium held 12-13 November 2019 in Swindon.



Research by [Fernando Sanchez-Vizcaino Buendia](#) (Bristol Veterinary School) featured on the [BBC's Inside Out](#) series on 28 October 2019. His work shows that the diagnosis of at least one dangerous disease the UK didn't used to have is increasing in dogs [Leishmania] and is potentially fatal to both dogs and humans. It is said that this is why the Dogs Trust doesn't

support importing.

On 20 November 2019 BBC Points West featured Bristol AMR research. Sally Challoner visited the University to interview Prof [Matthew Avison](#) (Cellular and Molecular Medicine) during which footage of the Bristol AMR – Colston Research Society Symposium was filmed. Dr [Kristen Reyher](#) (Bristol Veterinary School) was also interviewed. UoB's antibiotic drug discovery programmes exploiting natural products (deep sea sponges and fungi), responsible use of antimicrobials in livestock production and diagnostic innovation were all highlighted.

Impact award for changing antimicrobial use

Veterinary researchers from the universities of Bristol and Surrey have been awarded a prestigious award by the Veterinary Record, the official journal of the British Veterinary Association (BVA), for their contribution to changing antimicrobial use in veterinary practice. The researchers were awarded the 'Vet Record Impact Award' for their study which showed that ceasing the use of highest-priority antimicrobials (AMs) does not adversely affect cattle health and welfare on dairy farms. The

[study](#), published in April 18, involved work on dairy farms in South West England who were engaged in changing AM use through an active process of education and herd health planning meetings. Findings from the study demonstrated that cattle health and welfare can

be maintained and even improved alongside a complete cessation of use of highest-priority critically important antimicrobials (HP-CIAs) as well as an overall reduction of AM use on dairy farms. This work paved the way for a change to the Red Tractor Quality Assurance prescribing rules in June 2018 which have substantially reduced the use of HP-CIAs in the UK dairy industry as a whole.



L-R: Adele Waters, *Vet Record* editor; David Tisdall (Surrey), Andrea Turner (Bristol), BVA president Simon Doherty

EU grant to research the mechanism of viral infection

The European Research Council has awarded a Synergy Grant worth €7.6 million to the University of Bristol and Swiss partners, the Friedrich Miescher Institute for Biomedical Research (FMI) and the ETH Zurich, for a joint research project looking at the molecular mechanisms of viral infection. Dr [Yohei Yamauchi](#) (Cellular and Molecular Medicine) will work alongside Prof Patrick Matthias at FMI in Basel and Prof Jeffrey Bode at the ETH Zurich. The grant will allow

them to spend the next six years investigating the molecular mechanisms of viral infection, building fundamental knowledge of cellular regulation and developing new concepts for broad-spectrum anti-viral therapy. Little is known about the molecular mechanisms that viruses use to infect mammalian hosts and how they evade the immune system. Using multiple approaches the team will investigate the precise mechanisms and cellular pathways necessary for Influenza viral

infection and gain fundamental knowledge about their regulation. They will also test the strong possibility that numerous other virus types, such as Zika, Dengue and Ebola, utilise the same pathway. By identifying the pathways and interactions involved in the infection process – and by showing that blocking them in mice models reduces viral infection – this project will provide a wealth of novel insights and the basis for the development of a new generation of anti-viral therapies.

Funding successes: Part 4

Dr [Penny Whiting](#) (Bristol Medical School: Population Health Sciences) from the **National Institute for Health Health Technology Assessment** programme (NIHR HTA), £355,534 for *What is the optimum strategy for identifying adults and children with coeliac disease? A systematic review and economic models*, starting Jan 20 for 18 months.

Prof [Kathleen Gillespie](#) (Bristol Medical School: Translational Health Sciences) from the **J rome Lejeune Foundation**, £35,560 for *Why are children with Down's syndrome at increased risk of autoimmune conditions in-*

cluding type 1 diabetes?, starting Jan 20 for two years.

Dr [Laura Johnson](#) (Policy Studies) from the **Medical Research Council**, £281,479 for *Innovating behaviour and health surveillance for cardiovascular disease prevention in Malaysia*, starting Dec 19 for two years.

Prof [Nicola West](#) (Bristol Dental School) from **GSK Consumer Healthcare**, £57,900 for *A randomized controlled clinical study to evaluate the efficacy of an experimental dental/denture cleansing regimen for the treatment of gingivitis, compared to existing oral hygiene, in a population*

of partial denture wearers with generalized mild-moderate plaque-induced gingivitis: Study 212401 (Trident), starting Dec 19 for 7 months.

Prof [Peter Vickerman](#) (Bristol Medical School: Population Health Sciences) from the **World Health Organisation**, £60,225 for *APW to model the diagnostic accuracy and outcomes of different flowcharts to diagnose women with symptomatic and asymptomatic cervical and vaginal infection and to conduct cost analysis and cost-effectiveness of the different flowcharts*, for the month of November 2019.

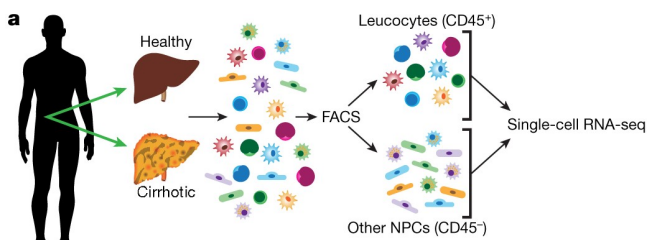
New insights could lead to new treatments for liver disease

The fight against liver disease could be helped by the discovery of cells that cause liver scarring. A team from the University of Edinburgh in collaboration with the Universities of Birmingham, Bristol, Cambridge, Charité University Medical Center, National Institute for Health Research (NIHR) Bristol Biomedical Research Centre (BRC) and NIHR Birmingham BRC, have identified new sub-types of cells

that, when they interact, accelerate the scarring process in diseased livers. Experts hope that by understanding more how these cells behave, new treatments can be developed more quickly for liver diseases.

The team single cell RNA sequencing to study liver scarring in high definition. They discovered sub-types of three key cells: white blood

cells – and scar-forming cells called myofibroblasts. Identifying new treatments for liver scarring is critical to tackling the epidemic of liver disease that we are currently facing. For the first time, we now have an in-depth understanding of how cells behave and talk to each other in diseased livers and, importantly, how we might block their activity as a treatment for liver scarring.



cells called macrophages, endothelial cells – which line blood ves-

sels – and scar-forming cells called myofibroblasts. Identifying new treatments for liver scarring is critical to tackling the epidemic of liver disease that we are currently facing. For the first time, we now have an in-depth understanding of how cells behave and talk to each other in diseased livers and, importantly, how we might block their activity as a treatment for liver scarring.

Ramachandran P *et al.* (2019). [Resolving the fibrotic niche of human liver cirrhosis at single-cell level](#). *Nature*. 575, pp 512–518 .

External engagements: Part 3

An interview with Prof [Adam Finn](#) (Bristol Medical School: Translational Health Sciences) about pre-school children being given mandatory vaccines was broadcast on [BBC Sunday Politics West](#) on 27 October 2019 (the piece starts 20:30 mins into programme).

[Gwen Rees](#) (Honorary Research Associate, Bristol Veterinary School) will lead a [Wales-wide](#) project to promote responsible use of antimicrobials in livestock which has been given the go-ahead.

Arwain Vet Cymru will see the establishment of a network of trained 'Prescribing Champions' at veterinary surgeries to encourage best practice when prescribing antibiotics and the responsible use of veterinary medicines.

The Animal Welfare Research Network, funded by the Biotechnology and Biological Sciences Research Council and Universities Federation for Animal Welfare and led from Bristol Veterinary School (Network Lead: Prof [Mike](#)

[Mendl](#); Network Manager: [Poppy Statham](#)), held its 4th Annual Meeting on 16-17 September 2019 at the Priors Road Complex. Over 100 delegates from the UK and abroad attended sessions covering *Global Animal Welfare: International Collaboration, Funding and Global Challenges, Behaviour Change Theory and Practice* and *New Developments in Animal Welfare Science*. Dr Phil Burnet (Oxford) gave a keynote on the *Microbiome and the Gut-Brain Axis*.

More funding successes and external engagements

Dr [Melanie Hezzell](#) (Bristol Veterinary School) has received funding from the **American Kennel Club** for Prognostic value of circulation cortisol in canine congestive heart failure; and from **Petsavers** for The 'EPIC' phenomenon; pimobendane use in primary veterinary practise, lead by The Small Animal Veterinary Surveillance Network (SAVSNET) and Liverpool.

Dr [Massimo Antognozzi](#)

(Physics) from the **Biotechnology and Biological Sciences Research Council**, £10,238 for Machine Learning To Detect Antibiotic Resistance, starting Oct 19 for three months.

Dr [Sabine Hauert](#) (Engineering) took part in the [Complexity podcast](#) hosted by the Santa Fe Institute on 16 October 2019. *Swarming Across Scales* talked about how swarms have changed the way we think about intel-

ligence, and how we build technologies for everything from drug delivery to home construction. Amongst other things, Sabine's lab seeks to understand how trillions of nanoparticles move and interact in tumour tissue which could help improve tissue penetration and cellular uptake of anti-cancer treatments. To this end they are designing a tumour-on-a-chip microfluidic device to screen nanoparticle dynamics under the microscope.

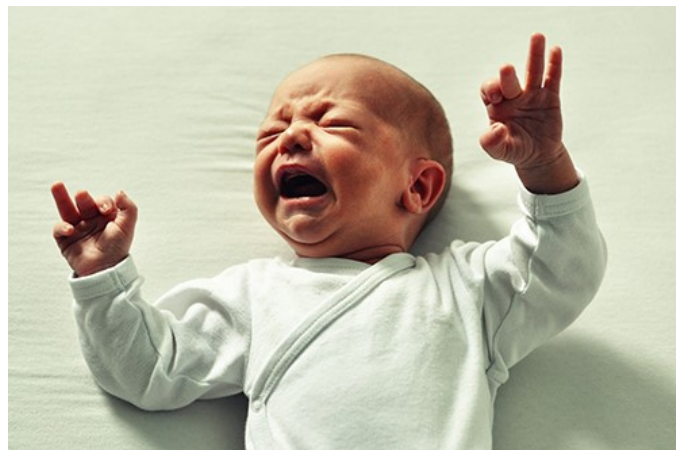
Complementary and alternative therapies to treat colic

A review of the evidence on the use of complementary and alternative (CAM) therapies to treat babies with colic has shown some that some treatments do appear to help. The review included 16 systematic reviews on a variety of therapies, including probiotics, herbal medicine, acupuncture and manipulation such as chiropractic massage. The researchers found that while probiotics, fennel extract and spinal manipulation all showed promise, these results should be treated with caution because of issues with the studies. These issues included small sample sizes, possible bias in the findings, the measurement of

outcomes through parent diaries which are highly subjective, and the inability to 'blind' therapists for many treatments, especially those that involved manipulation of the baby. Research into the use of probiotics for babies who are formula-fed was also lacking, which is significant as formula already contains pro-

biotics.

Perry R et al. (2019). [An overview of systematic reviews of complementary and alternative therapies for infantile colic](#). *Systematic Reviews*. 8: 271.

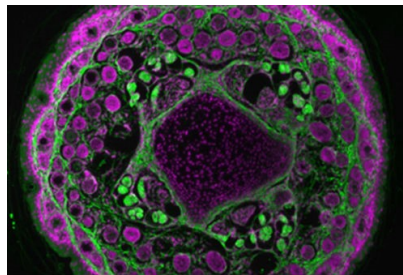


£4.3 million grant to look at ageing and wound healing

A collaborative Biotechnology and Biological Sciences Research Council Strategic Longer and Larger grant has been awarded to Prof [David Stephens](#) (Biochemistry and Bristol Lead) and Prof Karl Kadler (Manchester lead). The award seeks to discover how cells maintain and repair connective tissues such as skin, tendon and cartilage during ageing and wound healing and how this is influenced by the circadian (day/night) cycle. Their findings could help to improve wound healing and identify strategies to treat disease. The study will focus on the cell biology of matrix syn-

thesis, how the component molecules are transported within cells and secreted, the circadian timing mechanisms that coordinate these processes, and the interactions between the immune system and matrix. The team will pool their multidisciplinary expertise in fundamental aspects of cell and tissue biology, integrated experiments using *in vitro* and *in vivo* models, circadian

biology, mathematical modelling, and novel synthetic scaffolds, with a particular focus on how the collagen matrix is controlled in the short term across a circadian cycle and, in the long term, across the life course. Changes to collagen underpin many of the changes associated with ageing, such as loss of skin elasticity, poor wound healing, fibrosis, susceptibility to fracture and osteoarthritis. The team will investigate how collagen is made and how it is used in the body, how it responds to damage, and how the day/night cycle and our immune systems affect this.



Experts join forces to help African farmers

Farmers in African countries who face failing harvests due to insect vector plant diseases are being helped through a new training programme set up by leading experts in plant virology and vector-transmitted diseases. The CONNECTED network, led by an international consortium of universities including Bristol, is aiming to transform Sub-Saharan African agriculture through providing specialist training to crop researchers. Determined to find new solutions to plant diseases

that threaten food security, a network of leading plant virologists and entomologists joined forces to share their knowledge and skills with early-career researchers from 11 African countries with the aim of improving crop yields for local farmers. The comprehensive two-week programme combined scientific

talks, general lab training skills, specific virology and entomology lecture and practical work, workshops, field visits, career development, mentoring, and desk-based projects. The researchers also received peer mentoring and team-building input, as well as input focused on helping them communicate their science to a range of audiences.



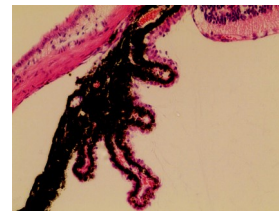
The [CONNECTED network project](#) is funded by a £2M grant from the UK government's Global Challenges Research Fund.

A cure for blindness: treating glaucoma with genes

Glaucoma is the leading cause of irreversible blindness worldwide; it affects roughly 2% of all people over 40. The underlying causes are varied and no cure exists, but studies have shown that high pressure in the eye (intraocular pressure, or IOP) is a key feature, and decreasing this pressure can largely prevent progression and further visual loss by halting damage to the optic nerve. At present, there is no definitive treatment.

The Elizabeth Blackwell Institute [MRC Confidence in Concept scheme](#) allowed [Dr Colin Chu](#) and Prof [Andrew Dick](#) (Bristol Medical School) to develop a system which potentially halts elevated IOP with a single injection. The injection contains a viral vector, one which has had pathogenic material removed and replaced with fragments of Ribonucleic acid (RNA), a polymeric molecule essential in various biological roles in coding, decoding, regulation

and expression of genes. The virus transports these to the cells in the eye's ciliary body, a tissue which produces the aqueous humour. Here, these RNA fragments interrupt the production of some of the cellular machinery that's responsible for maintaining the pressure in the eye, and thus lower the IOP.



[Read more](#)

Adult fly could help understand intestinal regeneration

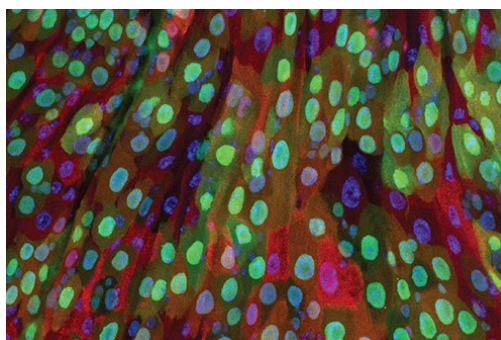
Intestinal epithelial cells (IECs) are exposed to diverse types of environmental stresses such as bacteria and toxins, but the mechanisms by which epithelial cells sense stress are not well understood. New research by the Universities of Bristol, Heidelberg and the German Cancer Research Center (DKFZ) have found that Nox-ROS-ASK1-MKK3-p38 signalling in IECs integrates various stresses to facilitate intestinal regeneration.

They used the adult fly intestine, which is remarkably like a human intestine, to understand how IECs sense stress or damage, defend themselves and promote

epithelial regeneration. The team found that NADPH Oxidase (Nox) in IECs produce reactive oxygen species (ROS) upon stress, but it wasn't fully understood how ROS promote intestinal regeneration. Their research showed that it is partly effected by Ask1-MKK3-p38 signalling in IECs, stimulating their production of intestinal stem cell (ISC) mitogens and ISC-mediated regeneration. p38 was previously found to facilitate

mammalian intestinal regeneration when damaged, but how it senses damage was not understood. The study also found damage activates stress sensing pathways in fly IECs but how these pathways effect IEC resilience and intestinal repair is not fully clear.

Patel PH *et al.* (2019). [Damage sensing by a Nox-Ask1-MKK3-p38 signaling pathway mediates regeneration in the adult *Drosophila* midgut.](#) *Nature Communications*.



A fly intestine under pathogenic infection. The green cells are new cells produced during intestinal regeneration. The red signal is p38 activation in IECs upon damage

Game on: Microbial Pursuit, anything but trivial

Dr Isabel Murillo Cabeza (Cellular and Molecular Medicine) has created an interactive version of Trivial Pursuit called Microbial Pursuit, to help University of Bristol undergraduates learn.

The game acts as a pedagogical tool that allows the students to revise their units while playing. In 2019 the Bristol Institute for Learning and Teaching (BILT) organised a series of seminars on the importance of games in higher education and funded Isabel's pro-

posal to develop the game. Microbial Pursuit is an interactive game-based activity, to be both made and played by students, which facilitates and stimulates learning in Microbiology. The game resembles Trivial Pursuit in that the board is divided into coloured squares and some of the rules of Trivial Pursuit are used. The coloured squares on the board

refer to six different topics according to the syllabus of the Microbiology unit. It is played in two sessions; during session one each group of six students will create questions and answers about one specific microbiology topic which are checked by academics prior to session two in which students are broken into different groups to play. Feedback has been

very positive, with both the learning and social aspects of the experience greatly appreciated.

[Read the Full Life Sciences blog](#)



£1.25M to study antimicrobial use on Argentinian farms

What drives the risks of antimicrobial resistance in Argentinian livestock farms? How can these risks be minimised through effective regulation? These are just some of the questions that an interdisciplinary group will answer, thanks to a £1.25 million grant from the Global AMR Innovation Fund, managed by the Department of Health and Social Care (DHSC) and UK Aid, administered by the Biotechnology and Biological Sciences Research Council. The project, *FARMS-SAFE: Future-*

proofing Antibacterial resistance Risk Management Surveillance and Stewardship in the Argentinian Farming Environment, will provide better surveillance information for antimicrobial resistance and use as well as support to Argentina and other Latin American countries to develop a risk-based ap-



proach to designing regulation. The consortium - Dr [Kristen Reyher](#) (Bristol Veterinary School), Prof [Matthew Avison](#) (Cellular and Molecular Medicine), Dr [Maria Paula Escobar](#) (Vet School) and Prof David Demeritt (Kings College London) - will collaborate with leading scientists at the Universidad Nacional de La Plata, Universidad Nacional de Río Cuarto and the National Food Safety and Quality Service for Argentina (SENASA).

A cattle yard in Buenos Aires © Jorge Royan / <http://www.royan.com.ar>

£10M for postgraduate biomedical sciences research

The Wellcome Trust has awarded the University of Bristol over £10 million in funding for two PhD programmes in the faculties of Health Sciences and Life Sciences. The programmes will provide four-year PhD studentships to support promising students to undertake in-depth postgraduate training in genetics and population health, and in molecular and cellular biology. The [Molecular, Genetic and Lifecourse Epidemiology](#) Programme

will train a new generation of researchers in the integration of genetic and molecular data in epidemiological studies (which focus on the incidence, distribution and control of disease in populations). The [Dynamic Molecular Cell Biology](#) Programme will train the next generation of cell biologists to examine the dynamics of living cells, tissues and organisms, and their role in human health and disease. Each pro-

gramme application was assessed for both scientific excellence and the culture of the research environment that students would be trained in, including supporting wellbeing, diversity, good research practice, strong supervisory and mentorship arrangements, and support for students to consider a range of onwards career destinations.

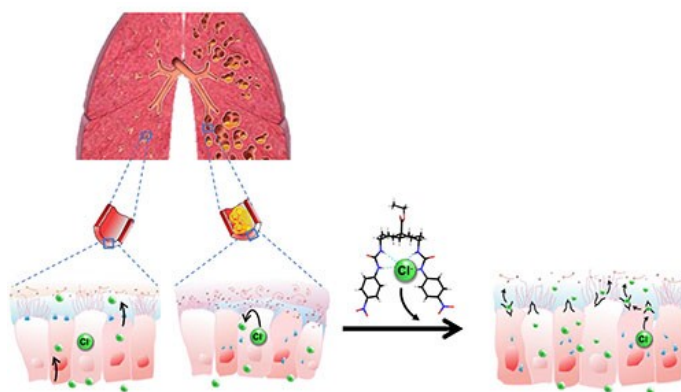


Synthetic molecules as a treatment for cystic fibrosis?

A new treatment for lung disease in cystic fibrosis (CF) for which there remains no cure could potentially benefit all patients. Caused by a defective gene, CF affects between 70,000 and 100,000 people worldwide; the result is they lack a key molecular component at the surface of cells lining ducts and tubes in their body. Called Cystic Fibrosis Transmembrane Conductance Regulator (CFTR), the molecule allows the passage of anions across the cell membrane. If CFTR is absent, the surface of cells becomes dehydrated and mucus thick and

sticky, making it difficult for patients to breathe and digest food. The research team aimed to restore transmembrane anion movement by identifying new molecules which transport anions efficaciously across cell membranes. They designed synthetic "anion carrier" molecules to do the same job as the missing CFTR. Using specialist equipment they tested

the synthetic molecules' efficacy in cystic fibrosis cells and found they were not only effective in transporting anions across the cell membranes, but also supplement the effects of new drugs targeting faulty CFTR by allowing more anion transport by cells than either the molecules or new drugs alone. These results suggest a new approach to treat cystic fibrosis.



Li H *et al.* (2019). [Anion carriers as potential treatments for cystic fibrosis: transport in cystic fibrosis cells, and additivity to channel-targeting drugs.](#) *Chemical Science*. 42.

Third cohort of Vice-Chancellor's Fellows

The Vice-Chancellor's Fellowships scheme offers an opportunity for early-career researchers to advance their research careers and develop their potential to become academic leaders. Fellows benefit from tailored, one-to-one mentoring and training, and they also have access to start-up funds and support to develop across the full spectrum of an academic role, including teaching, public engagement, impact development and innovation.

The 13 new Fellows include [Maria Carolina Borges](#), for her project *Unrav-*

elling the metabolic pathways of cardiovascular diseases across the life cycle. Using state-of-the-art technology, it recently became possible to have a fine-grained snapshot of a person's metabolic state by simultaneously quantifying hundreds to thousands of metabolites in the human body. This has substantial potential to lead to a much better understanding of factors in-

involved in the development and progression of cardiovascular diseases and to improve how we prevent and treat these diseases. Carolina's project is focused on exploring the effect of the metabolome on the development and progression of cardiovascular diseases, such as coronary artery disease, stroke, and heart failure, in large-scale population studies. Findings from this project



have substantial potential to reveal novel targets for clinical intervention and improve the unsustainable attrition rates in drug development.

Latest Elizabeth Blackwell Institute funding

Elizabeth Blackwell Institute runs a number of schemes supporting health-related translational projects, research which has the potential for practical application. The latest round of awardees for two of their translational project funding schemes include:



[Translational Acceleration and Knowledge Transfer \(TRACK\)](#) award to Dr

[Gavin Welsh](#) (Bristol Medical School: Translational Health Sciences) for *Improving drug discovery: An in vitro model of Glomerulosclerosis*. TRACK funding is designed to support projects which are at the stage of concept development.



MRC [Confidence in Concept \(CiC\)](#) scheme award to Dr [Darryl Hill](#) (Cellular and Molecular Medicine) for *Targeting DNA up-*

take to kill drug resistant Neisseria gonorrhoeae. These awards fund larger proof of concept studies which provide robust evidence to funders of the feasibility of a proposed solution to a health, clinical or product development need.



University of
BRISTOL

Elizabeth Blackwell Institute
for Health Research

Gut bacteria and bowel cancer

A study led by Dr [Kaitlin Wade](#) (Bristol Medical School and Elizabeth Blackwell Institute Early Career Fellow) is the first to use Mendelian randomisation to investigate the causal role played by bacteria in the development of bowel cancer. The technique uses complex statistical analysis of data from large populations to provide evidence for cause and effect, rather than just the existence of an association. Containing approximately

three trillion bacteria, the microbiome aids digestion and provides protection against infections and is determined by a person's individual genetic makeup and their environment. Kaitlin was interested to see whether variation in the human gut microbiome, like the number of bacteria or simply the numbers of different types of bacteria, can have an impact on bowel cancer. Using data from the Flemish Gut Flora Project, the German Food

Chain Plus study and the Pop-Gen study, the team found that genetic variation in the population in particular parts of the genome were linked to the presence or varying amounts of 13 types of gut bacteria, and that people with an unclassified type of bacteria from the *Bacteroidales* group had a higher risk of bowel cancer compared to people who did not have these bacteria.

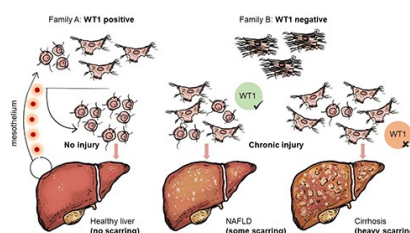
[Read the full story](#)

Cell family trees' role in tissue scarring and liver disease

A key cell type involved in liver injury and cancer consists of two cellular families with different origins and functions. The distinguishing feature of these families – whether or not they can make a protein called WT1 – has been identified as the major cause of the cell's shape and ability to produce scar tissue. Hepatic stellate cells (HSCs) are the main cells responsible for scar production following all liver injuries, from surgery to non-alcoholic fatty liver disease (NAFLD). Scarring or 'fibrosis' is a normal part of injury repair, but the densely packed web of collagen fibres that makes up scar tissue can in-

terfere with normal liver function. Heavy or repeated scarring can lead to liver cirrhosis and cancer. Growing activated HSCs collected from mouse livers, the team, from Bristol and Edinburgh, observed that the cells formed three distinct morphologies. These shapes have different scar-producing capacities and levels of WT1. Researchers were able to track generations of HSCs from development through to adulthood, showing that all WT1-producing cells in the liver

originate from tissue coating the liver and other internal organs (the mesothelium). When activated by injury, the cells show a very similar gene profile to their mesothelium-based ancestors, despite being in a different tissue environment. They deleted WT1 production, which caused more HSCs to morph into highly scar-producing cells. Although WT1 is only produced following activation by liver injury, the protein reduces the level of tissue scarring produced.



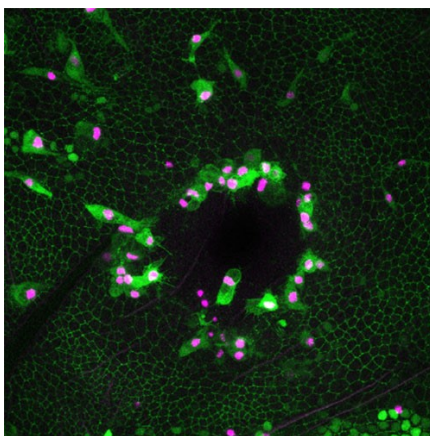
Kendall TJ et al. (2019). [Embryonic mesothelial-derived hepatic lineage of quiescent and heterogenous scar-orchestrating cells defined but suppressed by WT1](#). *Nature Communications*. 10: 4688.

Scientists discover body's protection shield

When tissue is damaged the body quickly recruits immune cells to the injury site where they fight infection by engulfing and killing invading pathogens, through the release of toxic factors such as peroxidases. However, these bactericidal products are also highly toxic to the host tissue and can disrupt the repair process. To counteract these effects the repairing tissue activates powerful protective machinery to 'shield' itself from the damage. A team have mapped the exact identities of these protective pathways and identified how to stimulate this pro-

cess in naïve tissues.

The findings have clear clinical relevance to patients because therapeutic activation of these cytoprotective pathways in the clinic could also offer an exciting approach to 'precondition' patient tissues prior to elective surgery.



Since we find that the protection machinery is activated by the same pathways that also initiate the inflammatory response, we think the resilience machinery has evolved as a fail-safe mechanism for tissue protection each time inflammation is triggered.

Helen Weavers
(Biochemistry)

Weavers H *et al.* (2019). [Injury activates a dynamic cytoprotective network to confer stress resilience and drive repair.](#) *Current Biology.*

Image of a fly wound and inflammation © Helen Weavers

Antibiotic prescriptions in the US could be inappropriate

As much as two fifths (43%) of antibiotic prescriptions in the United States could be inappropriate; a fact highlighted in an editorial by Prof [Alastair Hay](#) (Bristol Medical School: Population Health Sciences). Such a high degree of potentially unnecessary prescribing has important implications for antibiotic stewardship.

A team of researchers based in Oregon set out to estimate how often antibiotics are prescribed without a documented indication in non-hospital

(ambulatory) care settings in the United States, and what factors are associated with lack of documentation. According to their criteria, 57% (around 74 million) antibiotic prescriptions were deemed appropriate, while 25% (around 32 million) were considered inappropriate, and 18% (around 24 million) lacked either an appropriate or inappropriate documented indication. As such, the researchers say this study "demonstrates that indications for antibiotic prescribing

are not always adequately documented and this can lead to underestimates of the true burden of unnecessary antibiotic use in ambulatory care settings." Prof Hay stated that a comprehensive coding system is central to effective antibiotic stewardship.

Ray MJ *et al.* (2019). [Antibiotic prescribing without documented indication in ambulatory care clinics: national cross sectional study.](#) *BMJ.*

Hay AD (2019). [Coding infections in primary care.](#) *BMJ.*

Collaboration for data science and digital technologies

A formal partnership has been agreed between the University of Bristol and analytical instrumentation provider Malvern Panalytical. The Memorandum of Understanding formalises the organisations' relationship and focuses on mutual areas of interest and collaboration, including data analytics, machine learning, artificial intelligence, and the science underlying the structure and properties of materials. A key aim of this collabora-

tion is to establish a pipeline of talented graduates, equipped with skills and expertise in the fields of data science and digital technologies. The partnership follows the opening of Malvern Pana-

lytical's new Data Science Hub at Engine Shed, the University-run innovation space next to Bristol Temple Meads, in 2019. The company, which employs more than 2,000 people worldwide, is also working with academics across the University - from Chemistry to Law - to test some of its new technologies while exploring issues around the ownership of data.



[Read more](#)

Graphic Medicine on the wall

A new Bristol mural in the Stokes Croft area of the city is providing an accessible and inclusive way of representing and communicating issues surrounding healthcare. This

demic discourses and, at times, to enrich them, as new images and stories of illness and health emerge. The mural, titled *Wall #1*, is by Brighton-based physician,

tor might see during a surgery. The wall art was commissioned by the [Centre for Health, Humanities and Science](#), with the support of the Elizabeth Blackwell Institute.



approach, known as *Graphic Medicine*, 'resists the notion of the universal patient and vividly represents multiple subjects with valid and conflicting points of view'. Graphic Medicine is intended to stand alongside more aca-

comics artist and writer, Ian Williams. The artist was keen to see how a comic strip would work on an elongated wall and chose a series of wordless panels to give a sense of the passing of time and the kind of things a doc-

The Centre, which promotes work at the intersection of humanities, medicine, health and science, is opening the door to new arts-science collaborations by connecting researchers with clinicians and external partners.

Probiotics and prebiotics work differently in girls and boys

Baby boy's and girl's immune systems respond differently to prebiotics and probiotics, according to new research which suggests that differences in male and female immunity begin much earlier than previously thought. The team from the Universities of Bristol and Reading found that 28-day old piglets produced very different levels of immune cells, antibodies and other immune-associated molecules depending on their sex, contradicting previous evidence suggesting that the difference in immunity begins during puberty.

Correct development of the immune system is essential in ensuring it responds appropriately to both harmful and harmless stimulation throughout life and this development, even during the first days of life, depends on your sex. Although we don't know why, we know that young girls tend to produce a more protective immune response to vaccination than boys. But what we did not expect to find is that young girls also appear to have a more regulated immune environment in their intestinal tissues than boys. This is important because around 70 per cent of the immune

system is in the gut and this is also where its development is driven during early life, largely by the resident gut bacteria.

Dr Marie Lewis, Reading



Christoforidou Z *et al.* (2019). [Sexual dimorphism in immune development and in response to nutritional intervention in neonatal piglets.](#) *Frontiers in Immunology.*

£18.5 million boost for South West biosciences

PhD training across the biosciences has received a massive boost thanks to a £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).

The SWBio DTP will offer four-year PhD studentships over five cohorts starting in October 2020, during which students will undertake interdisciplinary training in statistics,

bioinformatics, coding, experimental design, innovation and understanding the impact of research. Students will also undertake three-month Professional Internship for PhD Students (PIPS) placement to develop their skills further and to explore possible future career directions. The partnership, which is led by Bristol together with the Universities of Bath, Cardiff and Exeter (the GW4 Alliance), alongside Rothamsted Research, has recently expanded to include six new re-

gional associate partners that will provide access to expertise and facilities across the South West and Wales. These encompass, the Marine Biological Association (MBA), Plymouth Marine Laboratory (PML), Swansea University, SetSquared Bristol, UCB Pharma and the University of the West of England (UWE).



Life Sciences growth in the south west

For the first time Life Sciences has been properly recognised locally as an enabler of growth. This could mean more opportunities for employment plus increased potential for research collaborations with partners. Richard Seabrook, Elizabeth Blackwell Institute’s Advisor for Business Development, explained in a GW4 opinion piece what’s next for the strategy to deliver long-term growth for the Life Sciences sector in the area. GW4 achieved [recognition for life](#)

[and health sciences innovation in Bristol and the South West of England](#) for the re-launched [UK Industrial Strategy Life Science Sector Deal](#). The University of Bristol have been working alongside partners such as [Invest Bristol and Bath](#), [Bristol Health Partners](#), University of Bath and [UWE](#), on the [West of England Combined Authority local Industrial Strategy](#) (WECA), launched Jul 19. WECA’s first ever Local Industrial Strategy sets out how the area will contribute to-

wards delivering the national Industrial Strategy’s aim to raise productivity levels and create high-quality, well paid jobs across the country. The strategy mentions Life Sciences as a sector growing at pace and draws on the unique strengths of the region, underlining their ambition to be a driving force for clean and inclusive growth. It focuses on four key priorities: cross-sectoral innovation; inclusive growth; the productivity challenge; innovation in infrastructure. [Read more](#)

20th Century views to drug use not fit for purpose

A report from *The Lancet*, co-authored by Prof [Matthew Hickman](#) and others from the [NIHR Health Protection Research Unit in Evaluation of Interventions](#) calls for a new international approach to drug use - using evidence-based policies, which adapt faster, and respond more humanely and effectively to new drugs and their changing availability and patterns of use.

- The authors warn that the effects of cannabis legalisation will probably not be seen for another decade, problems re-

sulting from stimulants are growing globally, and current responses to emerging substances may no longer be fit for purpose with rapid changes in drug supply and demand.

- To meet the growing challenges that drug use poses to future global health, policies and actions must be

based on science, and not on moral judgements.

- Authors call for increased research funding to improve treatments, and for global policymakers to implement only evidence-based policies and therapies – they estimate that increased provision of opioid agonist treatment could help avoid

around 8-26% of opioid-related deaths, compared to no treatment.

[Read the full press release](#)



Bristol's Children of the 90s project renewed

Bristol's Children of the 90s study will be supported for the next five years through an established collaboration between the University of Bristol, the Medical Research Council and The Wellcome Trust. A new commitment of up to £8.2 million will enable international research to continue into health, well-being and social science using data and samples from thousands of families.

Set up in 1991, [Children of the](#)



[90s](#) recruited 14,500 pregnant women from the Bristol area and has been charting their health, plus that of their children, ever since. Almost thirty years later the study is now recognised as the premier multi-generational birth cohort internationally with an outstanding reputation for enabling research.

The study's future plans include using face-to-face data and sample collection along with a growing collection of remote data collection technologies. This will ensure that as many

participants as possible can take part and help the study thrive and that over the next five years Children of the 90s will continue to lead the way in safe data storage and access for exciting new science. There are also plans to increase data collection from under-represented groups in health research such as fathers, continue recruiting the new generation (children of the Children of the 90s) and to find ways to make it easier for participants to stay involved with more flexible clinics, remote data collection and by making better use of existing official records.

UK Reproducibility Network

UK universities will collaborate to improve the quality of UK academic research output. Whilst the UK is at the leading edge of research globally, there is a need to constantly strive to improve in order to retain that positions. Crucially, institutions must produce research that is rigorous, robust and of high-quality, to ensure that the UK retains its reputation for producing world-leading research. The [UK Reproducibility Network](#) UKRN is currently an informal network of over 40

research institutions across the UK that works with researchers, universities, and a range of stakeholders to promote the adoption of initiatives in order to further improve research rigour, robustness and quality. Advances in science depend on research that is replicable, and this is underpinned by high-quality training and appropriate incentives for researchers. UKRN initiatives will include developing common training across career stages, aligning promotion and hiring criteria

to support open and reproducible research practices, and sharing best practices. Academic leads will liaise with grassroots networks of researchers at their institutions and with UKRN stakeholders, including funders and publishers. Prof [Marcus Munafò](#) (Experimental Psychology) is Chair of the [UK Reproducibility Network steering group](#).



Funding to research global challenges

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. Research activities span from developing a glacial flour from sediments released from melting glaciers to understanding the impact of HIV infections and its treatment on the effect menopause has on the musculoskeletal health of African women. The latter project is being lead by Dr [Celia Gregson](#) and partners from the Biomedical Research and Training Institute, Zimbabwe

and the University of the Witwatersrand, South Africa. The scale-up of antiretroviral treatment has dramatically improved survival, such that increasing numbers of women with chronic HIV are now reaching the menopause across Africa. The menopause is a period of rapid skeletal change which increases fracture risk. Research has seldom focussed on African woman at this stage of life. Understanding mechanisms of bone loss in the context of HIV infection will help inform interventions.

Spin-out raises £760,000 for biosensing technology

Rosa Biotech, a new University of Bristol spin-out which developed a sensing platform capable of detecting the faint chemical signature given off by chronic diseases, has raised £760,000 to commercialise its ground-breaking innovation. The artificial Intelligence (AI)-driven biosensing technology, which mimics mammals' sense of smell, has significant potential to transform the medical diagnostics and pharmaceuticals industries.

Inspired by the highly refined ability of dogs to smell malaria, Parkinson's and other life-changing diseases, the re-

searchers behind the technology demonstrated its strong potential to a wide range of sensing and diagnostic challenges. The team built a series of barrel-shaped proteins that resemble proteins of the mammalian olfactory system, but are much simpler, easier to make and easier to handle. It is these barrels that provide the basis for Rosa's technology. They make arrays of different barrels, load each barrel with a dye, and then expose the array to something they want to analyse, for instance a bodily fluid that may show signs of disease. Molecules in the sample dislodge the dyes but to

different extents across the array. This gives coloured patterns that are analysed using machine learning. By recording patterns for healthy and diseased samples, we hope to build sensors for early -stage diagnosis of disease.

[Read more](#)



The National Institute for Health Research (NIHR) in Bristol

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
- 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 fundamental 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

The Age of Antibiotics: The End or a New Beginning?

On 13-14 November 2019 the Bristol AMR Research Strand, funded by Elizabeth Blackwell Institute, hosted the Colston Research Society Symposium and Public Lecture on *The Age of Antibiotics: The End or a New Beginning?* The event brought together experts from many facets of research and policy development to highlight advances that have been made and interventions that are being taken to reduce the burden of AMR, particularly in a global context. One hundred and sixty-

five delegates attended from a wide range of disciplines and representatives attended from the Medical Research Council, the Wellcome Trust, the Medical Research Foundation, *The Lancet Infectious Diseases* and industry. The

annual Colston Research Society Public Lecture was given by the economist Lord Jim O'Neill of Gatley who chaired the UK government's AMR Review in 2016, on *Is there any progress in the fight against antimicrobial resistance*. Over 700 people attended the lecture in the Great Hall at the Wills Memorial Building.

The full lecture can be [listened to here](#).

Lord Jim O'Neill



ELIZABETH BLACKWELL FUNDING

Health Data Science Funding Call

The Health Data Science research strand has funding available to support exemplar projects involving multidisciplinary collaborations across computer science/mathematics, engineering, health and social care, epidemiology and applied statistics, social science, and with members of the public.

Deadline: 10:00 15 January 2020

Medical Humanities Funding Call

The Medical Humanities research strand has funding available for inter- and multidisciplinary projects carrying out research on health, illness and medicine.

Deadline: 30 January 2020

Rosetrees Interdisciplinary Award 2020

To develop new collaborative studies between researchers in the fields of medicine and chemistry. The aim of the award is to stimulate new research collaborations resulting in breakthroughs that have real potential to improve human health.

Deadline: 4 February 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

Closing date: none

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 accepted on a **rolling** basis.

Closing date: none

EBI Workshop Support

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

Closing date: none

Returning Carers Scheme

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

Closing date: 30 April and 31 October each year

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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
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European Research Council

[Horizon 2020: better health and care, economic growth and sustainable health systems](#)

Closing date: 07-Apr-20

Award amount: €30 million

- SC1-BHC-06-2020 digital diagnostics – developing tools for supporting clinical decisions by integrating various diagnostic data;
- SC1-BHC-20B-2020 public procurement of innovative solutions for diagnostics for infectious diseases;
- SC1-BHC-33-2020 addressing low vaccine uptake;
- SC1-BHC-34-2020 new approaches for clinical management and prevention of resistant bacterial infections in high prevalence settings;
- SC1-BHC-35-2020 creation of a European wide sustainable network for harmonised large-scale clinical research studies for infectious diseases;
- SC1-HCO-07-2020 ERA-NET to support the Joint Programming Initiative on Antimicrobial Resistance;

- SC1-HCO-17-2020 coordinating and supporting research on the human microbiome in Europe and beyond;
- SC1-HCO-19-2020 reliable and accessible information on cell and gene-based therapies

European and Developing Countries Clinical Trials Partnership

[Vaccines against Lassa virus diseases](#)

Closing date: 07-Apr-20

Award amount: not specified

This supports clinical research activities contributing to the development of Lassa candidate vaccines. Applications must include at least one clinical trial to be conducted in affected countries in Sub-Saharan Africa to test the safety, immunogenicity and efficacy of candidate vaccines.

Cancer Research UK

[Cancer immunology project awards](#)

Closing date: 21-May-20

Award amount: £300,000

These aim to catalyse research and build the UK's research base in cancer immunology by funding immunologists from non-cancer fields. Proposals should address any area of immunological research, providing the cancer relevance is clearly articulated in the proposal, including the following key areas:

- cellular and molecular immunology
- inflammation, allergy, transplantation and autoimmunity
- immune response to infection

CARB-X

[Research funding](#)

Closing date: expected 10-Jun-20

Award amount: unspecified

This supports research into the development of antibiotics, vaccines, diagnostics, devices and other products to combat drug-resistant bacteria. The programme focuses on high priority drug-resistant bacteria, primarily Gram-negatives, and supports projects in early development.

Healthcare Infection Society

[Major research grant](#)

Closing date: expected 01-Sep-20

Award amount: £99,000

This supports work on the subject of healthcare-associated infections and infection prevention and control. The grant is suitable for a PhD studentship, MD or other research worker and related consumables and equipment, with a preference towards translational research rather than pure science topics.

THIS ISSUE'S FEATURED ARTICLE

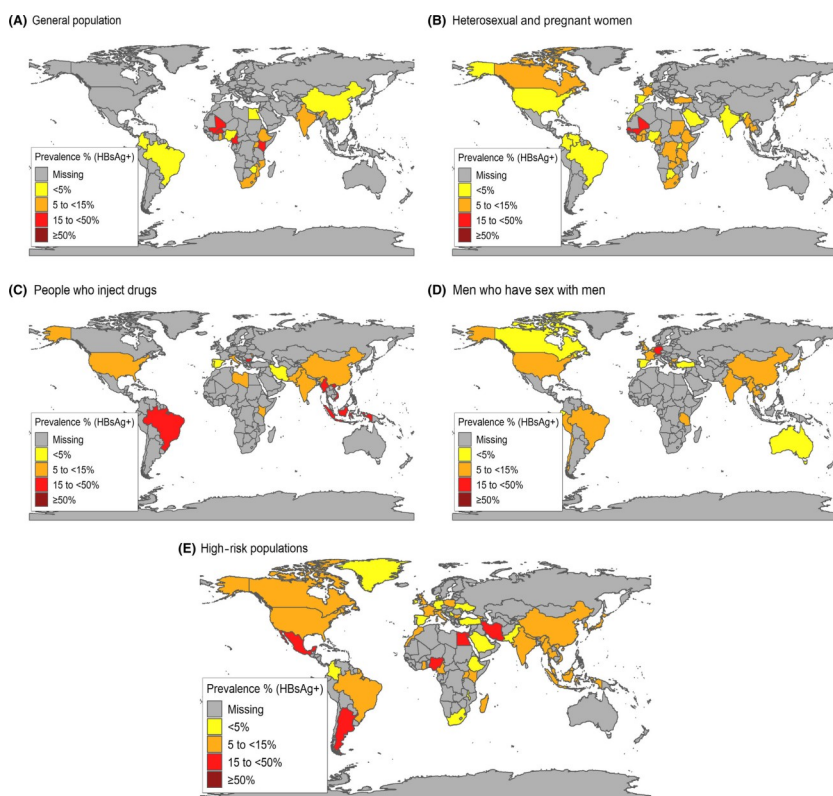
Prevalence and burden of HBV co-infection among people living with HIV: A global systematic review and meta-analysis

Platt L, French CE, McGowan CR *et al.* (2019). *Journal of Viral Hepatitis*.

First published 11 October 2019.

Globally, in 2017 35 million people were living with HIV (PLHIV) and 257 million had chronic HBV infection (HBsAg positive). The extent of HIV-HBsAg co-infection is unknown. We undertook a systematic review to estimate the global burden of HBsAg co-infection in PLHIV. We searched MEDLINE, Embase and other databases for published studies (2002-2018) measuring prevalence of HBsAg among PLHIV. The review was registered with PROSPERO (#CRD42019123388). Populations were categorized by HIV-exposure category. The global burden of co-infection was estimated by applying regional co-infection prevalence estimates to UNAIDS estimates of PLHIV. We conducted a meta-analysis to estimate the odds of HBsAg among PLHIV compared to HIV-negative individuals. We identified 506 estimates (475 studies) of HIV-HBsAg co-infection prevalence from 80/195 (41.0%) countries. Globally, the prevalence of HIV-HBsAg co-infection is 7.6% (IQR 5.6%-12.1%) in PLHIV, or 2.7 million HIV-HBsAg co-infections (IQR 2.0-4.2). The greatest burden (69% of cases; 1.9 million) is in sub-Saharan Africa. Globally, there was little difference in prevalence of HIV-HBsAg co-infection by population group (approximately 6%-7%), but it was slightly higher among people who inject drugs (11.8% IQR 6.0%-16.9%). Odds of HBsAg infection were 1.4 times higher among PLHIV compared to HIV-negative individuals. There is therefore, a high global burden of HIV-HBsAg co-infection, especially in sub-Saharan Africa. Key prevention strategies include infant HBV vaccination,

including a timely birth-dose. Findings also highlight the importance of targeting PLHIV, especially high-risk groups for testing, catch-up HBV vaccination and other preventative interventions. The global scale-up of antiretroviral therapy (ART) for PLHIV using a tenofovir-based ART regimen provides an opportunity to simultaneously treat those with HBV co-infection, and in pregnant women to also reduce mother-to-child transmission of HBV alongside HIV.



Best estimates of hepatitis B Surface Antigen co-infection prevalence among different population samples

CONTACTS

The Infection and Immunity Network is run by a Steering Group:

Co-Chair: [Ruth Massey](#)
Prof of Microbial
Pathogenicity



Co-Chair: [Adam Finn](#)
Prof of Paediatrics



- [Borko Amulic](#) - Lecturer in Immunology
- [Matthew Avison](#) - Co-Director, Bristol AMR
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