INFECTION AND IMMUNITY NETWORK NEWSLETTER



Elizabeth Blackwell Institute for Health Research

Dr Borko Amulic, a recent appointment to the School of Cellular and Molecular Medicine, has been awarded a Career Development Award worth £1.2m by the Medical Research Council (MRC) to lead research into how the natural ability of neutrophil immune cells can be boosted to fight infection in the postantibiotic age.

Neutrophils are immune cells that protect the body from infection by bacteria, fungi and parasites. The five-year award will allow Dr Amulic to lead a team investigating how

JUNE – JULY 2018

Career Development Award

neutrophil responses are regulated and how they carry out tasks such as engulfing parasites or entrapping them in neutrophil extracellular traps, or 'NETs'. These NETs are webs of DNA that neutrophils release in a 'kamikaze' cell

death attempt to control infec-tions.

The emergence of antimicrobial resistance threatens human health and one strategy to combat infection is to boost the natural ability of neutrophils to kill pathogens; the award aims to discover the genes and biochemical pathways regulating neutrophil functions.

Image showing neutrophils (green) accumulating in blood vessels in human placental tissue (red). © Borko Amulic



Bristol Events / Other Events	2-4	
Infection and Immunity Research and Staff News	5-16	
Elizabeth Blackwell Institute Funding Schemes	17	2
Funding Opportunities in Infection and Immunity	18-20	
This Issue's Showcased Article	21	
Contacts INFECTION TIMMUNITY	22	

Page 2

Uobristol events

Vaccine demand: how do we sustain, protect and improve vaccine acceptance and uptake?

27 June 2018, 12.00 - 13.30, Robb Butler (Programme Manager for Vaccines and Immunization, WHO European Regional Office), Room OS6, Oakfield House

Translation Toolkit seminar series

28 June 2018, 14.00 - 15.00, Andrew Wray (RED), Dr Shelby Temple (BBSRC Innovator of the Year), G13/14 Life Sciences Building

Algorave

29 June 2018, 20.00 - 02.00, The Island, Nelson Street, Bristol, BS1 2LE

Jean Golding Institute Showcase

3 July 2018, 11.30 - 19.30, Keynote speakers: Trevor Hastie (Professor of Statistics and Biomedical Data Science, Stanford University) and Dan Crichton (Program Manager, Principal Investigator and Principal Computer Scientist, NASA's Jet Propulsion Laboratory), Wills Memorial Building

Academia corrupts science: a fresh look at conflicts of interest

11 July 2018, 12.00 - 13.00, Prof Paul Garner (Liverpool School of Tropical Medicine), G12 Canynge Hall

L&R Postgraduate seminars

24 July 2018, 13.00 - 14.00, Yunfei Li (Year 1, PhD student) and Reham Mashat (Year 2, PhD student), Seminar rooms A&B, Level 2, Learning and Research Building, Southmead Hospital

Translation Toolkit seminar series: Why Science Policy Matters

27 July 2018, 14.00 - 15.00, Rhiannon Wilson (PolicyBristol) and Dr Hannah Rose-Vineer (Bristol Veterinary School), G13/14 Life Sciences Building

Forming an immune targeted spin-out

29 August 2018, 13.00 - 14.00, Richard Lee (University of Bristol), G13/14 Life Sciences Building

L&R Postgraduate seminars

11 September 2018, 13.00 - 14.00, Claire Williams (Year 1, PhD student) and Christopher Yau (Year 2, PhD student), Seminar rooms A&B, Level 2, Learning and Research Building, Southmead Hospital

Translation Toolkit seminar series: How to be an Effective Networker 13 September 2018, 14.00 - 17.00, with Vox Coaching



From top: Robb Butler, Shelby Temple, Trevor Hastie, Paul Garner, Hannah Rose-Vineer

Page 3

INFECTION AND IMMUNITY NETWORK

UoB EVENTS

Translation Toolkit seminar series: From lab bench to market 27 September 2018, 14.00 - 15.00, venue and speakers TBC

Come and make a Fun Palace 6 October 2018, 9.00 - 17.00, various around Bristol

Translation Toolkit seminar series: Funding for translation 25 October 2018, 14.00 - 15.00, venue and speakers TBC

L&R Postgraduate Presentations



13 November 2018, 13.00 - 14.00, Georgina Mortimer (Year 1, PhD student) and Amy Howell (Year 1, PhD student), Seminar rooms A&B, Level 2, Learning and Research Building, Southmead Hospital

OTHER EVENTS

IDEAL International Conference 13 - 14 September 2018, MShed, Princes Wharf, Wapping Rd, Bristol, BS1 4RN

CITER Annual Scientific Meeting 2018 17 - 18 September 2018, Dr Rhys Jones (Cardiff University), Cardiff University

Interactions between gut microbiota and host in health and disease

1 November 2018, 14.30 - 19.00, Prof Brigitta Stockinger (The Francis Crick Institute), The Francis Crick Institute, London

Frontiers in Human and Veterinary Antibody Discovery

26 - 27 November 2018, The Pirbright Institute, Ash Road, Pirbright, Surrey, GU24 ONF



INFECTION AND IMMUNITY NETWORK

Page 4

UoB EVENTS

Infection and Immunity Early Career event 2018 10 September 2018, 9.45 - 14.00

G13-G14, Life Sciences Building

The Infection and Immunity Research Network will be hosting its next Early Career Researchers' s (ECRs) symposium in September 2018. This morning event will comprise oral and poster presentations from ECRs as well as a keynote talk.

Abstract Submission

The Network's Steering Group invites all Early Career Researchers conducting research in *any* Infection and Immunity area to submit an abstract for consideration. Download the abstract submission form from the event website, or email <u>catherine.brown@bristol.ac.uk</u>.

Abstract submission deadline is 15 August 2018 at 12 noon **fff** PRIZES TO BE WON FOR BEST ORAL AND POSTER PRESENTATIONS **fff**

Please REGISTER to attend. Registration includes refreshments and a buffet lunch in the atrium. Registration closes 5 September 2018 at 12 noon.

The Infection and Immunity Research Network's Early Career Researchers' event is a fantastic opportunity for Early Career Researchers, junior and senior staff to hear about all the different research taking place across the wider Infection and Immunity community.

PhD students and post-docs are invited to share their methodologies, results, frustrations and skills to a wider audience in the expectation that discussions could lead to greater inter- and multidisciplinary understanding of the research in question and its potential relevance to other research areas.

Encouraging dialogue between researchers can reveals pools of experience and knowledge that can be applied elsewhere. This fosters not just the creation of new research directions but new ways of working, new ways to support and enable our academic community, and new learning experiences.

ATTENDANCE IS <u>FREE</u> AND <u>ALL</u> ARE WELCOME <u>REGISTER NOW</u>

NEWS

Herbert Tabor Young Investigator Award

Dr Catherine Back has been awarded the prestigious Herbert Tabor Young Investigator Award for her publication describing the structure and the 'catch-clamp' binding mechanism of the protein "CshA" involved in life-threatening infections of the heart. Herbert Tabor Young Investigator Awards are presented to early career investigators who have published the best articles in The Journal of Biological Chemistry. This year Dr Catherine Back has been honoured for her article

published in 2017 exploring the structure and binding mechanism of the protein, which is expressed by the oral bacterium *Streptococcus gordonii*, to human fibronectin. Understanding how CshA binds to fibronectin is important as this mechanism



may promote *S. gordonii* colonisation of damaged cardiac tissues, which is implicated in infective endocarditis.

Dr Back, currently a BrisSynBio post-doctoral researcher, worked on the paper during her PhD in the labs of Angela Nobbs and Howard Jenkinson

> at Bristol's Dental School. This was undertaken in collaboration with Dr Paul Race from the School of Biochemistry who provided access to the world class facilities needed to analyse the structure of CshA.

Funding successes: Part 1

Dr Lindsay Nicholson (CMM) from Fight for Sight, a £100,000 studentship for *Im*age fusion in the analysis of ocular inflammatory disease.

Dr Andrew Davidson (CMM) from the Medical Research Council, £376,555 for Analysis of flavivirus infection on the cellular lipidome: implications for virus particle production and replication. Start date 1 Apr 2018 for 3 years.

Dr Ruth Massey (CMM) from the **Biotechnology and Bio**-

logical Sciences Research Council, £14,010 for *Establishment and validation of a diagnostic test in an industrial setting*. Start date 1 Jul 2018 for 2 months.

Prof Andrew Dowsey (Bristol Veterinary School) from the **Biotechnology and Biological Sciences Research Council**, £10,240 for *Taming the application of statistics in proteomics and metabolomics. Start date 1 Apr 2018 for 6* months. Prof Wendy Gibson (Biological Sciences) from the **Biotechnology and Biological Sciences Research Council**, £445,822 for Sexual reproduction in trypanosomes. Start date 1 Apr 2018 for 3 years.

Dr Tom Williams (Biological Sciences) from the **Royal Society**, £9,740 for *Modelling lateral gene transfer on a new bacterial tree*. Start date 1 Mar 2018 for two years.

Page 6

UH Bristol part of study into childhood arthritis



Researchers from University Hospitals Bristol NHS Foundation Trust, led by Prof A. V. Ramanan, will join Medical Research Council-funded scientists from across the UK to begin a five year study of childhood arthritis and its linked eye inflammation, uveitis.

With nearly £5m in funding, the CLUSTER childhood arthritis study, led by the UCL Great Ormond Street Institute of Child Health, will follow the health trajectories of 5,000 children with the condition.

Juvenile Idiopathic Arthritis (JIA) and uveitis affects one in

1,000 16 year olds in the UK. This study aims to better understand how to treat the complex condition. This initiative hopes to move away from the one-size-fits-all approach and take into consideration a patients' genes, environment and lifestyle to create tailored therapies. Childhood arthritis can cause long-term disability and poor quality of life, sometimes well into adulthood. If it isn't diagnosed and treated early, patients may require hip and knee replacements, are significantly shorter than their peers, and some end up in wheelchairs.

For those patients who also have uveitis, a condition where the inside of the eyes become inflamed, there is also a significant risk of vision loss and blindness.

Currently, young people diagnosed with arthritis in the UK are given a single drug therapy, but it only works in about 50% of cases. The remaining half must try other treatments, one after the other, to find a therapy which works for them. Along the way, they may experience painful side effects, time out of school and even a worsening of their symptoms.

DNA screening of vampire bats

A new method of screening vampire bat DNA could help tackle rabies thanks to a joint Danish and British study.

The common vampire bat prefers to feed on the blood of domestic animals such as cows and pigs, risking transmission of pathogens such as rabies. Now a new study, led by the University of Copenhagen, with the Universities of Bristol and Glasgow, reveals a new method to screen the blood meals and faecal samples with a high rate of success to determine exactly which animals the bats have obtained blood meals from. Using DNA metabarcoding from samples collected in Peru, scientists can now both assess the vampire bat's diet and look at insights into its population structure.



Apart from feeding on domestic animals, vampire bats occasionally took blood from wild tapirs, so the method may be useful for determining the distribution of elusive mammal prey. Also to note, the team found no evidence of vampire bats feeding on humans from the DNA left over from their dinners.

Prof Kristine Bohmann, study lead from the Natural History Museum of Denmark, University of Copenhagen said: "Based on our study, in the future DNA metabarcoding can be used to empower projections of vampire bat related transmission risks, and this can be used to develop strategies to prevent exposure to rabies and humans and animals."

Two vampire bats take flight © Sherri and Brock Fenton

Gene editing to improve red blood cell transfusion

The provision of blood for patients who require repeated blood transfusions, as well as for individuals with rare blood types, presents an enormous challenge to transfusion services. While most people can safely receive a blood transfusion from donated blood, patients with blood disorders such as thalassemia or sickle cell disease require frequent transfusions. With repeated transfusion, patients eventually develop an immune response to all but the most specifically matched donor blood due to incompatibility at the level of minor blood group antigens.

Using CRISPR-Cas9 mediated



gene editing, the team of scientists based at the NIHR Blood and Transplant Research Unit (NIHR BTRU) in red cell products, BrisSynBio Centre and NHS Blood and Transplant in Bristol created individual cell lines in which specific blood group genes

> were altered to prevent the expression of blood group proteins that can cause immune reactions.

© Ashley Toye

Collaborative research to improve health and care

Scientists are collaborating with NHS and public health staff to ensure that research evidence is used effectively to improve public health and patient outcomes. Collaboration has increasingly become the watchword to guide research and health improvement.

Collaboration is at the heart of what the Collaboration for Leadership in Applied Health Research and Care West (NIHR CLAHRC West) does. They are part of a complex landscape of research and healthcare organisations with an array of inscrutable acronyms, all of which are united in a commitment to improve the health of the population and the delivery of health and social care.

CLAHRC West's particular focus is on encouraging the use of research evidence; they work collaboratively with patients and members of the public, providers of NHS services, NHS commissioners, universities, local authorities, charities and third sector organisations, to make research evidence more accessible so that it can be used to improve health and care.

Examples of the work they do include: Preventing disabilities in babies; Is it safe to drink when pregnant?; Improving online GP consultations; Safer syringes for drug users; Developing skills in research evidence.

Read more

A plant science conference in Uganda which drew together dozens of world-class researchers from across Sub-Saharan Africa and the UK this month has confirmed the growing strength of a network whose collaborations promise to deliver solutions to devastating crop diseases in the years ahead.

Delegates from ten African countries joined counterparts from the UK at the CONNECTED Virus Network Africa Launch Conference, which took place in Kampala, Uganda,

Plant disease research network

from May 7 to 9.

Bristol University-based CON-NECTED team members Dr Diane Hird and Richard Wyatt attended to co-ordinate operations along with local National Crops Resources Research Institute staff. It was immediately followed by a two-day training workshop aimed at early career researchers looking to develop skills including research grant proposal writing.

Prof Neil Boonham from Newcastle University and Co-Director of the CONNECTED project, says the outcomes of the conference confirm the value and potential of the

project, and is urging more people to come forward to join the growing network.

Importantly, we are not simply looking to recruit those working on issues directly related to plant disease, but also scientists and researchers working in other disciplines



Pig immunology comes of age

Researchers have generated tools that allow scientists to understand a vital area of the pig immune system which was previously inaccessible. The methods developed show how immune cells in pigs, CD8 (killer) T cells, are recruited in large numbers in the lung after infection with influenza or



aerosol vaccination. The tools can also be used to identify virus proteins that are recognised by the immune system, offering the potential to design more effective vaccines. The same methods can be applied to other important pig diseases such as foot-andmouth disease and African swine fever. The study brings methods for studying these vital immune cells up to the same standards that are available for humans and mice.

It will now be possible to track the number and loca-

tion of T cells in pig blood and tissues during infection, which can help determine the ability of vaccines to induce T cell immunity. The methods also allow researchers to predict which proteins will be recognised by pig T cells, therefore providing valuable information for vaccine improvement or development.

Tungatt K *et al.* (2018). Induction of influenza-specific local CD8 T-cells in the respiratory tract after aerosol delivery of vaccine antigen or virus in the Babraham inbred pig. *PLOS Pathogens.* 14(5): e1007017

How Nagana is carried by tsetse flies

When animals are bitten by tsetse flies, trypanosome microbes are squirted into the skin of the animal as the fly feeds and invade the bloodstream, causing the severe and sometimes fatal disease Nagana (or African Animal Trypanosomiasis) which most livestock are susceptible to.

Tsetse flies pick up the microbes when they take blood from an infected animal. The blood is digested inside the gut of the fly, but the trypanosomes need to find their way back to the mouthparts so that they can be passed on to the next animal the fly bites.

UoB's Trypanosome Research Group has now revealed details of this journey is completed. Before they migrate, the trypanosomes accumulate in a particular part of the tsetse fly gut, thus allowing researchers to study the population in detail over a time course of several days. The shape of each cell changed from long and thin to short and stout, before each then produced a new daughter cell, much smaller than itself. It is these daughter cells that

go on to produce the infectious microbes found in the fly's saliva.

Peacock L et

al. (2018). Shape-shifting trypanosomes: Flagellar shortening followed by asymmetric division in Trypanosoma congolense from the tsetse proventriculus. *PloS Pathogens*. 14(5): e1007043

Scanning electron micrograph of mother (bottom) and daughter (top) trypanosomes© Lori Peacock and Wendy Gibson; specimen prepared by Gini Tilly, Wolfson Bioimaging Facility (University of Bristol)

Ineffective treatment for childhood eczema

The BATHE trial has found that pouring emollient additives into the bath do not add any benefit over standard management. Standard management of childhood eczema includes soap avoidance, leave-on emollients and corticosteroid ointments. 482 children from 96 general practices took part, making it by far the largest trial of emollient bath additives to date. Children were randomly allocated to two groups: one group was asked to use bath additives for a whole year and the other was asked not to use them for a whole year. Families completed short questionnaires weekly for the first 16 weeks, then every 4 weeks from 16 to 52 weeks. There was no meaningful difference in eczema severity between the groups over the year. There was also no difference in the number of problems experienced with bathing, like stinging or redness following the bath, which affected a third of children in both groups. Families of children with eczema are advised to continue to use leave-on emollient moisturisers and to avoid soap.

Santer M *et al*. Emollient bath additives for the treatment of childhood eczema (BATHE): multicentre pragmatic parallel group randomised controlled trial of clinical and cost effectiveness. *BMJ*. 361:k1332

Prof Jonathan Clayden (right) is the Royal Society of Chemistry Tilden Prize winner for 2018. Jonathan studies how to control molecular shape and how to make shapeswitchable molecules that imitate the complex molecular structures found in nature. Some of these molecules offer possibilities of new treatments for diseases, while others help us learn how nature communicates information at a molecular level. "I was delighted to receive the Tilden award, which recognises the success of synthetic chemistry in building, simply and efficiently, carefully designed molecular devices to com-

Royal Society of Chemistry awards

plement those found in nature. The award of course also recognises the creativity and hard work of my research group in these recent years." The prize is awarded for work in the field of molecular conformation and the development of new reactivity using ureas and their congeners.

Prof Tom Simpson (left) is the



Royal Society of Chemistry Robert Robinson Award winner for 2018. Tom's work studies the biochemical pathways by which nature makes bioactive compounds in microorganisms such as fungi and bacteria. Once they understand the details of these pathways his team use molecular genetics to manipulate these pathways to make new or improved pharmaceuticals, antibiotics and agrochemicals. The award is for contributions to organic chemistry from a researcher over the age of 55. It is awarded for pioneering interdisciplinary work on natural products chemistry, biosynthesis and chemical biology.

At the forefront of combatting antimicrobial resistance

zation (FAO) of the United

Nations. AMR is a crucial ex-

ample of the importance of

the One Health concept,

which recognises that the

health of humans is connect-

ed to the health of animals

and the environment. Peo-

ple share many of the same

Food and Agriculture Organi-

Researchers from the Bristol Veterinary School are leading the way with farmers to combat and change antimicrobial (AM) use on farms. Antimicrobial resistance (AMR) is a global threat, with an estimated 700,000 people dying from resistant infections every year.

April 28th 2018 was World Veterinary Day and ongoing research from UoB has been showcased in a new video produced by the



for instance, they both suffer from age-related diseases and infections, such as pneumonia.

AMR research at the Bristol Vet School is led by the AMR Force and the group has inspired and enacted change in AM use on farms and in veterinary prescribing practice

> through collaboration and dialogue with suppliers, retailers, veterinarians, software development companies, government, livestock farmers and the livestock industries.

A home medical sensing device?



New research that could transform the future of healthcare will investigate whether it is possible to reuse WiFi radio waves as a medical radar system. The research is part of a new £1.5m grant awarded by the EPSRC, Toshiba and Decawave to the OPERA project, a consortium including the universities of Bristol and Oxford; University College London and Coventry University. The 3year project, starting in October 2018, will extend the current SPHERE pro-

ject, which is developing sensors for use in the home to spot health and wellbeing problems, with both projects running until 2021.

Physical activity and behaviour patterns play a significant role in a range of longterm chronic health conditions such as diabetes, dementia, depression, chronic obstructive pulmonary disease (COPD), arthritis and asthma. The UK currently spends 70% of its entire health and social care budget on these types of conditions. OPERA will attempt to build a complementary passivesensing platform by reusing existing home technologies; a receiver-only radar network that detects the reflections of ambient radio-frequency signals from people.

Read more

Recent media reports about the use and exploitation of personal data have increased public awareness of the benefits and drawbacks of the digital age. £11m has been awarded to 11 projects by the EPSRC to further the understanding of Trust, Identity, Privacy and Security (TIPS) issues in the Digital Economy. One of the 11 projects selected is INTUIT, a study that aims to identify and address fundamental TIPS challenges faced by those living with stigmatised

Data collection by people living with HIV

long-term conditions such as HIV in managing their health and interacting with care services, peer support networks, and private organisations. The project, led by research-

ers at Northumbria University in collaboration with the Universities of Bristol (Dr Jon Bird, Department of Computer Science), Edinburgh, UCL and City, University of London, will develop innovative digital tools to enable people to manage the secure sharing of their selfgenerated data with others.



The National Institute for Health Research (NIHR) has awarded the Research Design Service (RDS) a further five years of funding to continue the work of the RDS South West.

Proposals were invited from NHS organisations and Higher Education Institutions in England with proven expertise in research methodology and design. Ten organisations were successful and the combined Research Design Services will form a national network, liaising with each other to develop a consistent service to the research community across England.

Research Design Service (RDS)

The NIHR funding will allow RDS advisers in the South West to continue offering free and confidential advice, drawing on a unique breadth of experience and established track record in improving funding applications.

The RDS have been funded for the ten years prior to this round of funding and the advice offered by us to researchers represents a key contribution to the NIHR's commitment to delivery of high quality health and social care research.

Professor Gordon Taylor, Director of NIHR RDS SW: We look forward to continuing to support researchers, working in applied health, across the South West of England and to strengthen our engagement with partners in social care.

Find out more about how the RDS could help you by visiting the website or contacting the RDS South West Bristol Office:

The Education & Research Centre - Level 3 University Hospitals Bristol NHS Foundation Trust Upper Maudlin Street Bristol, BS2 8AE Tel: 0117 342 0233 Email: rds@uhbristol.nhs.uk

Page 12

The arms race between man and bacteria

Through computer simulations, scientists can predict if bacteria can be stopped with popular antibacterial therapies or not – a breakthrough which will help select and develop effective treatments for bacterial infections. Researchers focused on enzymes in bacteria that can split the structure of penicillin-type antibiotics, leading to resistance. To restore the effectiveness of these antibiotics, 'resistance blocking' molecules have been developed to block the activity of these enzymes. By treating patients with the right combinations of antibiotics and resistance blockers, doctors are able to gain the upper hand in the battle. Unfortu-



nately, bacteria can make many different enzymes able to destroy penicillins, and available resistance blockers work against only some of these. The findings show that it is now possible to use computer simulations to predict whether these resistance blockers will be effective or not. It is hoped that this information will help scientists to develop improved resistance blockers, which can restore the action of popular antibiotics against a wider range of resistant bacteria.

Read more.

A bacterial enzyme releasing fragments of clavulanic acid, a "resistance blocker" designed to overcome antibiotic resistant infections. Destroying clavulanic acid enables the enzyme to protect bacteria from the effects of antibiotics. © Marc van der Kamp

Funding successes: Part 2 and Awards

Dr Sinead English (Biological Sciences) from HEFCE, £26,700 for Transgenerational responses to environmental stress in a significant disease vector (ODA), start date 01 Feb 2018 for 7 months.

Prof Mark Szczelkun

(Biochemistry) from H2020 ERC for *EPICut* - *Molecular mechanisms, evolutionary impacts and applications of prokaryotic epigenetictargeted immune systems,* start date 3 April 2018. Many congratulations to this year's Three Minute Thesis competition runner-up, Sam Williams (School of Biochemistry), whose 180-second presentation focused on Antiobiotics from the abyss. The event took place on 8 May



on 8 May 2018 at Colston Hall. Funded by BrisSyn-Bio, Sam's supervisor Dr Paul Race and

colleagues are combining the innovations of synthetic biology with robotic environmental sampling to attempt to unblock the antibiotic discovery pipeline. To find new and interesting natural products the best place to look is in microorganisms that have been exposed to evolutionary pressures that necessitate the acquisition of unusual metabolic innovations. Read more on antibiotics from the abyss in the November 2017 press release.

Managing infectious disease in primary care

Researchers from UoB's Centre for Academic Primary Care and NIHR Health Protection Research Unit in Evaluation of Interventions have found promising evidence that local real-time surveillance of infectious disease, such as flu, could help GPs make better diagnostic and treatment decisions, reducing the amount of unnecessary antibiotic prescribing.

GPs are more likely to prescribe antibiotics when there is uncertainty about a diagnosis on a 'just in case' basis. The researchers wanted to find out whether having access to real-time information on infectious diseases circulating in their local area could help them make better decisions about diagnosis and, therefore, treatment. In a study funded by the NIH-R's School for Primary Care Research, the team identified surveillance systems in the US, Canada, New Zealand, Spain and Norway that use

weekly or daily emails or faxes to share locally relevant information on circulating illnesses to primary care centres. One of the systems was embedded in the electronic health record. Their review found evidence that these systems could be effective in reducing antibiotic prescribing. One observational study showed an over two-thirds reduction in antibiotic prescribing for upper respiratory tract infections alone. Read more

A new landmark report published by the MRC highlights the University's strengths in digital health research and other areas.

Mapping the Landscape of UK Health Data Research and Innovation is a new landmark report published by the Medical Research Council. The review, commissioned in 2017, encompasses 26 research organisations. The report highlights the complex and flourishing area of health data research in the UK, detailing key activities and ma-



Mapping the Landscape of UK Health Data Research & Innovation A snapshot of activity in 2017

Dr Ekaterini Blaveri October 2017

Health data review

jor investments made by UK public funders, government, charities and universities from across the country. Professor John Macleod, Professor in Clinical Epidemiology and Primary Care and Joint Head of CAPC, Bristol Medical School (PHS) said: "This is an important snapshot of the breadth and depth of UK Health Data Research. The fast-moving nature of this sector means that inevitably the report is already out of date. Bristol's unique strengths are clearly described and we will continue to grow these and realise their potential for impact on health improvement".

Read the full report

HIT annual updates

Prof Adam Finn, Dr Julie Yates and Dr Marion Roderick, Directors of the **Bristol Immunisation Group Health Integration Team** (BIG HIT), give an update on the HIT's progress in 2017-18.

We are making strides in our work on improving uptake of the immunisations programme in schools, with an immunisation team now embedded in the Healthy Schools team to promote and facilitate the programme. We discussed how to achieve greater access to and equity in uptake of the human papilloma virus (HPV) vaccination in schools with the young persons advisory group (YPAG). This led to us collaborating with Senior Research Fellow Dr Suzanne Audrey on a successful NIHR Research for Patient Benefit proposal looking at the impact of selfconsent on the uptake of schools-based HPV vaccination. The protocol paper has been published.

In Bristol there is a longstanding issue of very poor uptake of the tetanus booster. The establishment of the schools immunisation team has allowed this vaccine to be incorporated into the schools programme. Bristol was one of the few areas in the South West that wasn't delivering maternal immunisation at point of care. This led to very low uptake and preventable illness and mortality among newborn babies. Our collaborative work has led to overcoming significant barriers to changes in practice locally. We now have plans for service change in 2018/19.

Bristol continues to be one of the most active centres in immunisation research. This includes a recently completed commercial study of a new formulation of varicella vaccine in toddlers and a pilot study in Bristol of a meningitis B vaccine in teenagers. We are recruiting to a large national study of two meningitis B vaccines in teenagers to look at the impact on carriage. We are leading a study exploring transmission of pneumococcus within families using the nasal flu vaccine as a probe. We are also leading a national study to define the costs and impact on quality of life of varicella in children and an upcoming multi-centre commercial trial of meningococcal ACWY (MenACWY) conjugate vaccine in infants.

Directors Dr Emma Clark, Prof Emma Dures and Mr Sanchit Mehendale give an update on the 2017-18 activity of

the Bristol Bones and Joints Health Integration Team.

The HIT covers three disease areas: osteoarthritis, osteoporosis and inflammatory rheumatological disorders, underpinned by three themes of patient self-management, patient and public involvement and information technology. In osteoarthritis the infected arthroplasty service at North Bristol Trust continues to be a world-class referral centre with a multidisciplinary approach, thanks to the efforts of our HIT. The INFORM programme which we are leading, a randomised control trial of one versus two-stage revision of infected hip replacements, continues apace. The study brings together 14 NHS trusts and five universities and is funded by a £2 million NIHR grant.

In inflammatory rheumatological disorders we have developed and implemented the same referral proforma for patients with potential early inflammatory arthritis across Bristol and Weston. We have also updated our pan-Bristol shared-care guidelines for use and monitoring of disease modifying anti-rheumatic drugs (DMARDS) for GPs.

Read more

Preference for vaccines that prevent severe illness

The UK public has a clear preference for funding vaccination programmes which protect young children against severe diseases, finds a new study that considered the public's preferences on vaccines available on the NHS. The study suggests that the public's preferences about which vaccines are made available on the NHS, particularly children, are not reflected by the current approach.

Decisions regarding which vaccines the government fund are determined by cost -effectiveness analysis. For vaccines, this involves counting the cost of introducing a vaccine, versus the health benefits gained. Measuring such benefits is controversial, partly because assumptions are made about public preferences. The team interviewed members of the public to determine how they think policy makers should prioritise vaccinations. They found a general consensus that policy makers should prioritise vaccinations preventing severe disease in children as well as disease with high incidence, compared to those that fund milder infections.

Participants also agreed that

decisions on determining whether a vaccine should be made available on the NHS should be based on a number of factors including age, the impact on families caring long-term for a family member affected by a vaccinepreventable illness or disability, and social groups.

The findings indicate that the current approach may need to be refined when considering the benefit from childhood vaccinations.

Lasseter G et al. (2018). The views of the general public on prioritising vaccination programmes against childhood diseases: A qualitative study'. *PLOS ONE*. Published 13 June 2018.

Medicine use across UK beef farms

Researchers at UoB are to quantify and compare farm animal medicine use within and across UK beef operations. The project aims to help demonstrate and communicate the gains made to consumers, processors, retailers and policy makers.

Farmers and veterinary surgeons must demonstrate responsible and evidencebased farm medicines usage to maintain animal health and ensure safe and sustainable food production. Beef producers, however, face challenges in achieving recent Responsible Use of Medicines in Agriculture (RUMA) Alliance targets for farm medicine use, as significant data gaps exist regarding the quantities and types of medicines used.

The AMR Force team are leading the way with farmers and veterinarians to combat AMR by changing antimicrobial use on farms. Using innovative methods, the team will work in partnership with Dr Jude Capper (Livestock Sustainability Consultancy) to provide cattle producers with the tools and information needed to accurately assess, record and benchmark farm medicine use and to effectively communicate results to food industry stakeholders.



ELIZABETH BLACKWELL FUNDING

EBI MRC Proximity to Discovery Industry Engagement Fund (PtoD)

With support from the MRC, funding for short term two-way people exchanges between industry and academia which align to MRC strategic priorities in population health, cardiovascular research, infection and immunity, neuroscience and cancer.

The closing date for applications is 25 June 2018

EBI Translational Acceleration and Knowledge Transfer (TRACK)

This scheme provides funding to support health related translational projects.

The closing date for applications is 25 June 2018

EBI Identifying Candidates for Wellcome Trust Investigator Awards

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

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

EBI Workshop Support

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

Returning Carers Scheme

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

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

EBI Bridging Funds for Research Fellows

This scheme is designed to support a small number of academic staff at the University of Bristol who currently hold an externally funded research fellowship. Applications accepted on a **rolling** basis.



FUNDING OPPORTUNITIES

Would you like to receive timely, tailored funding opps information?

Do you want to know what funding opportunities come up in your research area? Get tailored funding alerts?

Research Professional provides access to an extensive database of funding opportunities, and can send out tailored alerts based on keywords that <u>you</u> 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.

For further information on Research Professional, go to the RED website.

Pfizer

Appropriate immunisations in adult patients with immune-mediated inflammatory conditions

Closing date: 18-Jul-18

Award amount: US\$150,000

This supports education and quality improvement programmes that focus on ensuring that adult patients with immune-mediated inflammatory conditions, specifically rheumatoid arthritis, spondyloarthritis and inflammatory bowel disease, are receiving appropriate vaccinations, as determined by their age, gender and specific clinical risk information such as age and the use of concomitant therapies. Two categories of support are available:

- category 1 grant support available to enhance or expand existing immunisation activities
- category 2 grant support to implement new immunisation initiatives

Healthcare Infection Society Major research grants

Closing date: 01-Sep-18

Award amount: £99,000

These support PhD students, MDs or other research workers in the subject of healthcare infection control. Preference is given to translational research rather than pure science topics.

Coeliac UK

Coeliac UK/Innovate UK joint grants

Closing date: 03-Sep-18

Award amount: £250,000

These aim to bring researchers and industry together to make improvements in three priority areas, for people living with coeliac disease: coeliac disease diagnostics; enhanced quality of gluten free foods; digitally supported self-care.

National Institute of Allergy and Infectious Diseases, USA Natural killer cells to induce immunological memory to prevent HIV infection (R01)

Closing date: 07-Sep-18

Award amount: USD unspecified

This supports multidisciplinary, hypothesis-driven research on NK cells, leading to the discovery of pathways relevant for early immune responses and immune regulation impacting the potential protective immunity to be induced by HIV vaccination. Secondary objectives include the development of novel technologies to allow for more definitive studies of human immune monitoring in the context of vaccine clinical trials and the recruitment of innate immunologists to the HIV vaccine field. The initiative supports research to understand the early events triggered by vectored or adjuvanted HIV vaccines and the impact of vaccination on the effector and immunoregulatory balance of NK cells.

De Duve Institute

Postdoctoral fellowships

Closing date: 15-Sep-18

Award amount: €70,000

These enable young scientists to pursue postdoctoral research within one of the research groups in the institute. The research groups are as following: cancer; genetics and development; infections and inflammation; metabolism and hormones. Candidates must hold a PhD not obtained at a Belgian university or a MD and must not have resided in Belgium for more than 12 months in the three years prior to application. It is mandatory to contact the group leader of the laboratory of choice before any application.

Medical Research Council

Research grants - infections and immunity

Closing date: 19-Sep-18

Award amount: £1m

These fund focused research projects that may be short- or long-term in nature related to infections and immunity, as well as method development and continuation of research facilities. Projects may involve more than one research group or institution.

Medical Research Council

New investigator research grant – infections and immunity

Closing date: 19-Sep-18

Award amount: unspecified

This supports researchers who are capable of becoming independent PIs and who are ready to take the next step towards that goal within the areas of infections and immunity. Applicants are expected to combine their time with a portfolio of other activities, such as other research grants or clinical duties, teaching, administration duties, or other time spent in faculty.

Medical Research Council

Programme grants – infections and immunity

Closing date: 19-Sep-18

Award amount: unspecified

These provide large and long-term renewable funding for projects related to infections and immunity. The purpose is to help the medical science community to think bigger. A programme is defined as a coordinated and coherent group of related projects that may address an interrelated set of questions across a broad scientific area. The expectation is that not all questions will necessarily be answered within the tenure of the award. Parts of the programme may be continuations of current activity, but other elements must be innovative and ambitious.

Horizon 2020: Societal Challenges

H2020-SC1-BHC-2019 better health and care, economic growth and sustainable health systems, two stage – topics BHC 1-2, 14, 19, 22, 25

Closing date: 02-Oct-18

Award amount: €20m

This supports projects that reconcile better health and healthy ageing with the need to develop sustainable health and care systems and growth opportunities for the health and care related industries. Proposals may address the following topics within personalised medicine, infectious diseases and improving global health and innovative health and care systems subheadings: SC1-BHC-01-2019 understanding causative mechanisms in co- and multimorbidities; SC1-BHC-02-2019 systems approaches for the discovery of combinatorial therapies for complex disorders; SC1-BHC-14-2019 stratified host-directed approaches to improve prevention, treatment or cure of infectious diseases; SC1-BHC-19-2019 implementation research for maternal and child health; SC1-BHC-22-2019 mental health in the workplace; SC1-BHC-25-2019 demonstration pilots for implementation of personalised medicine in healthcare.

A quarter of patients with type 1 diabetes have co-existing non-islet autoimmunity: the findings of a UK population-based family study

Kozhakhmetova A, Wyatt RC, Caygill C, Williams C, *et al.* (2018). *Clinical and Experimental Immunology*. 192 (3), pp251-258.

Individuals with type 1 diabetes (T1D) are at increased risk of coeliac disease (CD), autoimmune thyroiditis and autoimmune gastritis, but the absolute risks are unclear. The aim of this study was to investigate the prevalence of autoantibodies to tissue transglutaminase (TGA), thyroid peroxidase (TPOA) and gastric H+/K+-ATPase (ATPA) and their genetic associations in a well-characterized population-based cohort of individuals with T1D from the Bart's-Oxford family study for whom islet autoantibody prevalence data were already available. Autoantibodies in sera from 1072 patients (males/ females 604/468; median age 11.8 years, median T1D duration 2.7 months) were measured by radioimmunoassays; HLA class II risk genotype was analysed in 973 (91%) using polymerase chain reaction with sequence specific primers (PCR-SSP). The prevalence of TGA (and/or history of CD), TPOA and ATPA in patients was 9.0, 9.6 and 8.2%, respectively; 3.1% had two or more autoantibodies. Females were at higher risk of multiple autoimmunity; TGA/CD were associated with younger age and TPOA with older age. ATPA were uncommon in patients under 5 years, and more common in older patients. Anti-glutamate decarboxylase autoantibodies were predictive of co-existing TPOA/ATPA. TGA/CD were associated with human leucocyte antigen (HLA) DR3-DQ2, with the DR3-DQ2/DR3-DQ2 genotype conferring the highest risk, followed by DR4-DQ8/DR4-DQ8. ATPA were associated with DR3-DQ2, DRB1*0404 (in males) and the DR3-DQ2/DR4-DQ8 genotype. TPOA were associated with the DR3-DQ2/DR3-DQ2 genotype. Almost one-quarter of patients diagnosed with T1D aged under 21 years have at least one other organ-specific autoantibody. HLA class II genetic profiling may be useful in identifying those at risk of multiple autoimmunity.



The distribution of non-islet autoantibodies in healthy children and young patients with type 1 diabetes (T1D). Antibody levels are shown for anti-H+/K+-ATPase autoantibodies (ATPA). The thresholds indicated by the dotted lines were set at the 97.5th percentile of the 5470 children of the ALSPAC cohort for TGA, 318 schoolchildren for ATPA and 205 schoolchildren for TPOA. Those samples with levels below 1 TGA unit, 5 ATPA units/ml and 2 TPOA units/ml are represented by the numbers in boxes. The distribution of ATPA and TPOA levels in patients appears distinct from those of controls, while that of TGA seems similar in the two cohorts.

CONTACTS

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

Co-Chair: Ruth Massey Reader



Co-Chair: Adam Finn Prof of Paediatrics



- Andrew Davidson Senior Lecturer in Virology
- Wendy Gibson Professor of Protozoology
- Kathleen Gillespie Reader in Molecular Medicine, Head of the Diabetes and Metabolism Research Group
- Ruth Massey Reader in Cellular and Molecular Medicine
- David Morgan Reader in Immunology
- Peter Muir Clinical Virology
- Lindsay Nicholson Reader in Research
- Angela Nobbs Lecturer in Oral Microbiology
- Collette Sheahan Research Development Network Facilitator
- Annela Seddon Director of the Bristol Centre for Functional Nanomaterials
- Katy Turner Senior Lecturer in Veterinary Infectious Diseases
- Peter Vickerman Professor of Infectious Disease Modelling
- Linda Woolridge Chair in Translational Immunology
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