INFECTION AND IMMUNITY THEME NEWSLETTER



MAY - JUNE 2016

Elizabeth Blackwell Institute for Health Research

for Health Research The TARGET programme

aimed to improve the quality of primary care for children with respiratory tract infections (RTIs), the most common problem managed in primary care internationally. The study, carried out by the Centre for Academic Primary Care, was made possible thanks to funding from the NIHR programme grants for applied research.

The programme found new evidence to help parents, primary care clinicians and policy makers support im-

Primary Care Antibiotics

proved antimicrobial stewardship. The main findings are:

1) Symptoms of respiratory tract infections in children last longer than many parents and clinicians expect (some for more than 21 days); this is of great value to parents to help them know what to expect after seeing the doctor or nurse

 An important driver of prescribing is clinical uncertainty; evidence to help identify which children's symptoms will worsen is welcomed
 Decents value consistent

3) Parents value consistent

advice and would value more advice about symptom relief 4) Experience and training in recognising severe RTIs, plus evidence to identify levels of risk in patients, may help identify those most likely to benefit from antibiotics 5)The most effective interventions target parents and clinicians during consultations; promote clinician leadership in the intervention design; provide automatic prescribing prompts; and employ delayed prescribing.

More info: For clinicians and policymakers; For parents

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INFECTION AND IMMUNITY THEME

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UoBRISTOL EVENTS



Dr Simon Harris, Senior Staff Scientist, Sanger Institute

Rheumatoid arthritis: From genes to precision medicine and antigen-specific immunotherapy

> 24 May 2016 13.00 - 14.00

Prof Ranjeny Thomas (University of Queensland Diamantina Institute)

C42, Biomedical Sciences Building



Modelling HCV and Possible Interventions in a Variety of Settings 10 May 2016, 12.00– 13.00. Jack Stone and Georgios Kafanas, BCCS, 1-9 Old Park Hill

Bacterial transmission and evolution at the genomic scale 12 May 2016, 16.00 - 17.00. Simon Harris (Wellcome Trust Sanger Institute), G13 / G14, Life Sciences Building

Understanding the molecular mechanism of how ATP is made

17 May 2016, 10.00 - 11.00. John Walker (Emeritus Director, MRC Mitochondrial Biology Unit, Cambridge), E29, Biomedical Sciences Building

Health Sciences Educational Research

17 May 2016, 13.00 - 17.00. 35 Berkeley Square, Helen Wodehouse Building room 2.28

Molecular machinery of the cell

19 May 2016, 13.00 - 14.00. Morgan Beeby (Imperial), C44, Biomedical Sciences Building

International Clinical Trials Day 2016

20 May 2016, 9.00 - 16.00. Bristol Heart Institute atrium

A double-edged sword in the treatment of high-risk groups

23 May 2016, 16.00 - 17.00. Gabriela Gomes (Liverpool School of Tropical Medicine), Seminar Room OS6, Oakfield House

Mathematical modelling of an emerging epidemic: sexual hepatitis C transmission among HIV positive men who have sex with men 24 May 2016, 12.00 - 13.00. Louis Macgregor (UoB), BCCS 1-9 Old Park Hill

How to Prepare a Good Research Bid: Medical Faculties 9 June 2016, 10.00 - 16.30. Pam Johnstone, Cabot Room, The Hawthorns

BBSRC CEO open presentation

22 June 2016, 10.45 - 11.45. Melanie Welham (Chief Executive Officer, BBSRC), Pugsley Lecture Theatre, Queen's Building

Dr Naoya Kumagai (Institute of Microbial Chemistry, Tokyo) 4 July 2016, 16.15 - 17.15. MOTT Lecture Theatre, Physics (rear)

OTHER EVENTS

Soapbox Science 2016

16 July 2016, 10.00 - 17.00. Bristol

A Bitter Sweet Tale (Pint of Science Festival)

24 May 2016, 19.30 - 21.30. Anna Long and Kathleen Gillespie, Halo, 141 Gloucester Rd, Bristol, BS7 8BA

What's research ever done for us?

18 May 2016, 18.00 - 19.00. Chris Foy, Bridget Moore, Richard Lush, Peter Scanlon, Hugh Barr and Catherine Kendall, Park Campus, University of Gloucestershire, Cheltenham



An Introduction to Systematic Reviews and Meta- Analysis 28 June 2016, 9.00 - 16.45. The Foresight Centre, 1 Brownlow Street, Liverpool

Academia Europaea Annual Conference 2016 26 June 2016, 13.00 - 17.30. Cardiff University

2nd International Antibody Validation Meeting

15 September 2016, 9.00 - 16 September 2016, 13.00. Chancellors' Building, University of Bath, Claverton Down, BA2 7AY



Chief Researcher Naoya Kumagai, Shibasaki Lab



Dr Kathleen Gillespie, Reader in Molecular Medicine, SOCS



Peter Scanlon, Nuffield Department of Clinical Neurosciences/ Clinical Director NHS England Diabetic Eye Screening Programme

NEWS

Risk of Nematodirosis in Lambs

Nematodirosis, caused by the gutworm Nematodirus battus, is a disease affecting young lambs. Eggs deposited on pasture by lambs the previous year hatch in spring, triggered by warmer weather. Lambs take in large numbers of larvae as they graze, which damage their gut leading to foetid black diarrhoea and death.

Predicting when outbreaks might happen is becoming increasingly difficult due to variation in spring temperatures from year to year. Farmers can no longer rely on a standard timetable of treatments to avoid disease. As the damage is done by the larvae, faecal egg counts are of little use in detecting and controlling the infection.

An online risk forecast has been developed by Sustainable Control of Parasites in Sheep and researchers from the School of Veterinary Sciences to predict when eggs will hatch and when outbreaks are likely to happen. The forecast takes advantage of the temperature-driven synchronised hatching of the Nematodirus larvae and uses weather data from 140 weather stations provided by the Met Office and Forecast.io. The interactive Google map allows farmers and advisers to select the nearest or most representative weather

station and provides advice on how to relate the predicted risk to their particular farm and treatment options.

Cases of nematodirosis and eggs detected in routine faecal worm egg counts will also be mapped anonymously.

The forecast is based on a model developed and tested by Drs Eric Morgan, Jan van Dijk, Hannah Rose and colleagues at UoB. *Image © Eric Morgan*

Three-Minute Thesis

The Bristol Doctoral College, in conjunction with the Bristol Students' Union Postgraduate Network, hosted the 3rd Three Minute Thesis (3MT) competition which allows postgraduate research students across the University to present their research in language appropriate to a lay audience.

This year's semifinalists include Sam Abbott, Assessing the Evidence for Universal Bacillus Calmette-Guerin (BCG) Vaccination in England (supervisors Dr Ellen Brooks Pollock and Dr Hannah Christensen). They presented their research on 27 April 2016.

3MT is an opportunity to enhance the profile of postgraduate research; it is not designed to trivialise or 'dumb down' research, but encourages researchers to consolidate their ideas and crystallise their research discoveries.



The Elizabeth Blackwell Institute for Health Research introduced a Research for Health Challenge scheme to encourage healthcare practitioners and UoB researchers to work together to develop innovative thinking around clinical problems. This a challenge led scheme where consultation with healthcare workers, managers & commissioners gathers information about problems they encounter in their practice that could potentially be solved via innovative research at University of Bristol.

Challenge: Kate Rush, *MRSA in People Who Inject Drugs* – *Why do a significant but small number of injecting drug users in Bristol develop MRSA sepsis and what can we do to reduce this?*

Solution: Prof Matt Hickman , Preventing and managing community acquired

Research for Health Challenge

Challenge: Charlotte Bradbury, *Predicting patient responses to immunosuppressive treatment in autoimmune thrombocytopenia*

MRSA in PWID

Solution: Andrew Mumford, Peripheral blood markers of steroid resistance in autoimmune thrombocytopenia

The funds awarded include a contribution from the Institute's Wellcome Trust Institutional Strategic Support Fund.



Prof Neil Williams, MRC Confidence in Concept grant, £1,384,610. Starting 1 June 2016 for two years.

Prof Neil Williams, MRC Proximity to Discovery, £439,858. 1 June 2016 - 1 December 2017.

Prof Matthew Hickman, MRC Addiction Research Clinical Training Programme: MARC, £577,066. January 2016 - October 2021. MARC is a collaboration between Imperial, KCL and UoB; it will provide a range of complementary initiatives to increase capacity in academic addiction research, including PhD studentship projects with the objective of helping to understand pathways into addiction, the biological associations with and consequences from substance mis-

Recent Funding Successes

use and characterising preventative and therapeutic interventions.

Prof David Anstee, Wellcome Trust, A device for the removal of circulating autophagic vesicles from patients with sickle cell disease. £100,800. 1 January 2016 to 1 July 2017.

Dr Andrew Davidson, Academy of Medical Sciences Advanced Newton Fellowship, Targeted Proteomic Analysis of Chimeric Dengue Vaccine Candidates and the Host Response. £111,000, 1 March 2016 for three years.

Dr Allison Blair, Elizabeth Blackwell Institute, Development of pluronic micelle nanocarriers for the treatment of childhood acute lymphoblastic leukaemia. £49,205, 1 Feb 2016 -1 Oct 2017.

Threat from New Tick-Born Diseases

The Big Tick Project led by Prof Richard Wall launched last spring has become the largest-ever veterinary study of ticks and tick-borne disease in the UK. It is hoped that the results will highlight the challenge that an increasing distribution and prevalence of ticks brings to human and animal health.

babesiosis, a lifethreatening disease transmitted to dogs by infected ticks usually found in Europe is of huge significance. The fact that we now appear to have established populations of the tick Dermacentor reticulatus acting as vectors of the introduced pathogen Babesia canis is a new and important development and a major concern for

animal health. It clearly demonstrates the potential dangers from the inadvertent introduction of novel disease pathogens if vigilance and surveillance are not maintained.

A total of 1,461 veterinary practices responded sent in 6,372 ticks to the team; samples are currently being mapped by location and analysed for the presence of tick-





The emergence in four dogs in Essex of

Evaluation of Enhanced Paediatric Respiratory Infection Surveillance

Respiratory infections are the most common illnesses seen by GPs, especially in children. Previous research has focused on respiratory infections in the GP consultation, but not so much is known about how they develop out in the community. The EEPRIS study aims to collect information on the symptoms and microbiology of these circulating infections, and determine the possibility of creating an online resource for GPs and parents based on real-time infection information.

The project will collect information on the symptoms, how children are cared for at home, which bugs are causing them and when parents choose



to seek medical help. When children develop symptoms, parents will be asked more questions about the illness, and a research nurse will visit them at home to collect a saliva and nose swab from the child (to identify the bacteria or viruses causing the illness).

The study is being performed by the **Centre for Academic Primary Care thanks** to funding by the National Institute for **Health Research** Health Protection Research Unit (HPRU) in **Evaluation of Inter**ventions.

Throughout the world, children are frequent consumers of antibiotics; such routine use has been shown to increase the probability of antibiotic resistance in adults with urinary tract infections. However, little is known about the prevalence of bacterial resistance in children, or the risk factors of importance in this group.

Imperial reviewed studies investigating the prevalence of antibiotic resistance in urinary tract infections caused by Escherichia coli, the bacterium responsible for over 80 per cent of all urinary tract infections in children. They also set out to measure the association between previous exposure to antibiotics and subsequent resistance in the same child. Meta

-analysis of data in- w volving over 77,000 g samples show a high c global prevalence of antibiotic resistance B to some of the most If commonly prescribed P antibiotics in primary 0

care, in urinary tract

infections in children

caused by *E coli*.

Antibiotic Resistance in Urinary Infections

Within OECD countries, half of all samples were resistant to ampicillin, a third to co-trimoxazole, and a quarter to trimethoprim. Resistance was substantially greater in non-OECD countries.

Bryce A, Hay A, Lane IF *et al.* (2016). Global prevalence of antibiotic resistance in paediatric urinary tract infections caused by *Escherichia coli* and association with routine use of antibiotics in primary care: systematic review and metaanalysis. *BMJ.* 352

A team from UoB and

An estimated 2.3 million people living with HIV are coinfected with hepatitis C virus (HCV) globally. Of these, more than half are people who inject drugs (PWID). The study, conducted by colleagues at UoB and the London School of Hygiene and Tropical Medicine, also found that HIV-infected people are on average six times more likely than HIV-

uninfected people to have HCV infection, pointing to a need to improve integrated HIV/HCV services.

HIV and HCV infections are major global public health problems, with overlapping modes of transmission and affected populations. Globally, there are 37 million people infected with HIV, and around 115 million people with chronic HCV infection. However, very little was known about the extent of HIV/HCV coinfection.

Co-infections of HIV and Hepatitis C

Sponsored by the World Health Organisation (WHO), the study reviewed worldwide sources to build the first global estimates on coinfection prevalence.

There is a need to scale-up routine testing to diagnose HCV infection in HIV programmes worldwide, especially among high-risk groups, as the first step towards accessing the new, highly curative HCV treatments.

Platt L et al. (2016). Prevalence and burden of HCV coinfection in people living with HIV: a global systematic review and metaanalysis. The Lancet: Infectious Diseases. Published online 24 February 2016.

Targeting Treatment of Lung Disease

Lung disease is on the rise around the world. Some 300 million people suffer from asthma; chronic obstructive pulmonary disease (COPD) is predicted to become the thirdhighest cause of death by 2020; and respiratory infections are a leading cause of morbidity and mortality.

The most effective drug treatments for lung disease are de-

livered via aerosol inhalation, but the details of how pharmaceutical aerosols behave in the humid environment of the lung, and trigger a biological response, need to be better understood.

An Elizabeth Blackwell Institute Early Career Fellowship, funded by the Wellcome Trust, enabled Dr Allen Haddrell to lead a multidisciplinary study on how an aerosol's hygroscopic qualities affects total and regional dose in the lung during inhalation. He explore the behaviour of aerosol droplets during inhalation, then use this understanding to design starting formulations to deliver the dose most effectively to specific regions in the lung.

He and colleagues measured the hygroscopic behaviour of numerous FDA- approved chemicals (such as citric acid), modelled their subsequent deposition pattern within the lung, and established a strong causal relationship between the addition of specific chemicals and where, and how much of, the dose is delivered in the lung.



Rheumatologist wins impact award

Prof Athimalaipet Ramanan, a Consultant Paediatric Rheumatologist at University Hospitals Bristol NHS Foundation Trust and Honorary Professor at UoB, has won the Research Impact Award at the 2016 Bristol Health and Care Awards. The award is given in recognition of "excellent research that has made a real difference to people's lives."

Prof Ramanan won the award for his role as Chief Investigator for the SYCA-**MORE** trial which looks at the clinical effectiveness, safety and cost effectiveness of Adalimumab (an anti-TNF drug) for the treatment of juvenile idiopathic arthritis associated Uveitis. The study closed early and Adalimumab is now being used across the world to

halt the disease and prevent blindness in children.

Prof Ramanan said: "It's great for the entire team to have won this and for all the participants in this study. It's also good for child research and rare diseases research. I'm pleased Bristol can have an impact on a national and international level."





Antimicrobial Agent for Dentistry and Medicine

Pertinax Pharma Ltd, a spin-out working to advance the treatment and prevention of bacterial infection, has received a £900,000 funding boost from Mercia Fund Management, a private investor and Innovate UK.

The technology is likely to have significant impact across a number of areas including dentistry, where one

in seven composite fillings fail within seven years and 86% of these failures are caused by bacterial infection.

Based on years of research and development by Dr Michele Barbour, Pertinax is a new formulation of chlorhexidine (CHX), a proven antimicrobial agent used widely to prevent and treat a range of infections. In its traditional formulation it is effective for only very short periods; In its initial uses, Pertinax will help to lower the failure rate of dental fillings following tooth decay by acting as a component of the cement material used to fill cavities. It will maintain an environment which bacteria cannot colonise, reducing the risk of filling failure.

Pertinax will find applications in medicine, particularly as antibiotic resistance becomes more prevalent and doctors turn to non-antibiotic technologies to protect and treat their patients. The funding will enable the development of a robust, scalable production process. Image shows Michele

It is anticipated that

Clinical Communication and Viral Illnesses

A study led by Dr **Christie Cabral from** the Centre for Academic Primary Care looked at communication between doctors and parents about antibiotic prescribing for children with cough.

It found clinicians' explanations of when they did and didn't prescribe antibiotics contributed to the creation and reinforcement of parental beliefs that antibiotics were used when symptoms

were more severe.

The team found a mutually-reinforcing cycle of explanation and discussion across 60 primary care consultations for children with respiratory tract infections. Clinicians often talked about viral diagnoses in problem-minimising language, and antibiotic prescriptions in more problem-orientated language.

This strengthens the belief that antibiotics are needed for more

severe illness. Clinicians rarely say anything explicit to challenge parental beliefs about what indicates illness severity, so when antibiotics are prescribed, parents' beliefs about what indicated severity can be reinforced. The study also found that, while most parents' understanding of antibiotic resistance was poor, the majority supported reducing antibiotic prescribing and were happy to be

reassured that antibiotic treatment was not required. Results suggest that clearer explanations of the symptoms and signs of a child's illness would help reduce misconceptions.

Barbour

Cabral C et al. (2016). **Influence of Clinical** Communication on Parents' Antibiotic **Expectations for Chil**dren With Respiratory Tract Infections. Annals of Family *Medicine*. 14(2), pp141-147

New Antibiotics Production

With resistance growing to existing antibiotics, there is a vital and urgent need for the discovery and development of new antibiotics that are cost effective. Promising developments are derivatives of the antibiotic pleuromutilin, which are isolated from the mushroom Clitopilus passeckerianus.

These new compounds are some of the only new class of antibiotics to join the market recently as human therapeutics. Furthermore, with their novel mode of action and lack of cross-resistance, pleuromutilins and their derivatives represent a class with further great potential, particularly for treating resistant strains such as MRSA and extensively drug resistant tuberculosis (XTB).

However, mushrooms are basidiomycete fungi which are not generally amenable to within a more indusstrain improvement and fermentation. Therefore, in collaboration with pharma-

ceutical company GSK, production. A novel Bristol scientists including Prof Gary Foster carried out research to identify the genes involved in the production of pleuromutilin. They discovered that a sevengene cluster is required to produce the antibiotic in C. passeckerianus.

The seven-gene pleuromutilin cluster was then reconstructed trial fungus, Aspergillus oryzae, which resulted in a significant increase (2,106%) in

semisynthetic pleuromutilin, retapamulin, was launched by GSK as the drug Altabax.

Bailey A et al. Identification and manipulation of the pleuromutilin gene cluster from Clitopilus passeckerianus for increased rapid antibiotic production. Scientific Reports. 6, article 25202

Image © Prof Gary Foster



ELIZABETH BLACKWELL FUNDING OPPORTUNITIES

EBI Workshops Funding

Support for interdisciplinary workshops in health research at a new or emerging interface between two or more disciplines. Applications are reviewed on a rolling basis.

EBI Catalyst Fund

Pump priming awards can support the most promising and ambitious ideas across the widest interdisciplinary boundaries. These projects will be identified largely through the running of workshops to explore new possibilities and identify the big questions. Applications are reviewed on a rolling basis.

Returning Carers Scheme

UoB has introduced a Returning Carers' Scheme (RCS) 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 - such as maternity leave, adoption leave, additional paternity leave, or leave to care for a dependant.

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

EBI Postgraduate Extension Fellowships

Designed to support a small number of postgraduate researchers currently enrolled on one of the University of Bristol Wellcome Trust-funded 4 year PhD programmes ('Dynamic Cell Biology', 'Neural Dynamics' and 'Molecular, Genetic and Lifecourse Epidemiology').

Deadline for applications is 27 June 2016

EBI Proximity to Discovery Industry Engagement Fund

MRC have awarded UoB £155,000 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. MRC see these secondments as a key way of exchanging skills and knowledge and developing longer term working relationships.

Deadline for applications is 2 June 2016

FUNDING OPPORTUNITIES IN INFECTION & IMMUNITY

Set up via Research Professional (RP), a full calendar of funding opportunities for Infection and Immunity Research is available online. Subscribing to a calendar will place the entries in your own calendar, which will automatically update according to pre-specified search criteria. Staff and students have FREE access to Research Professional online from all computers on the University network. You can create your own personalised funding opportunity e-mail alerts by registering with RP. Find out all about it on the RED website.

* Research Professional

| Deadlines Calendar << < May 2016 > >> Closing dates for all funding opportunities matching your query | | | | | | | | |
|--|---|---|-------------------------------|---|--|---|--|--|
| Show opportunities on funder deadlines Show opportunities days before funder deadlines Show opportunities on internal deadlines (where available) Update calendar | | | | | | | | |
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| | | | Accelerating availability and | Terry Hennessey microbiol | HIV infection of the central Biology of manual therapies Functional genetics, epiger Development of assays for Biology of manual therapies | | | |
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| 16 | 17 | 18 Research grants – infection New investigator research Programme grants – infect | 19 | 20 | 21 | 22 | | |
| 23 Investigator-initiated studie | 24 | 25 | 26 | 27 | 28 | 29 | | |
| 30 | 31 CEA Eurotalents fellowship Visiting scientist awards - 1 | 1 Training courses and work Postgraduate teaching visit | 2 | 3 Research grants program | 4 | +10 more 5 Modelling of infectious dise Development of assays for Functional genetics, epiger Biology of manual therapies Investigations on primary ir | | |

INFRAVEC

Call for Access

Closing date: none

Award amount: unspecified

Enables researchers investigating the genetic control of mosquitos transmitting diseases to humans to access research infrastructure outside their own countries, either in person or through the provision of remote scientific services. Researchers may apply for access to the following facilities in Europe:

- Imperial College London's mosquito genetic facility
- Centro Agricoltura Ambiente G Nicoli's mosquito mass-rearing facility
- European Bioinformatics Institute's Vectorbase
- Università degli Studi di Perugia's mosquito confined release facility

Researchers, including PhD students, may apply individually or in groups. The leader and the majority of the group must work in an EU member state or associated country and apply for access for infrastructures outside their own countries. Access includes logistical, technological and scientific support, basic consumables and any specific training that is normally provided to external researchers using the infrastructure.

European Society of Clinical Microbiology and Infectious Diseases

Observerships

ESCMID MANAGING INFECTIONS PROMOTING SCIENCE

Closing Date: none

Award amount: €1,700

Aim at facilitating international training and collaboration by allowing members to visit ESCMID collaborative centres of infectious diseases or clinical microbiology in other countries. Members working at collaborative centres will be given priority. There are two types of funding available:

- Intra-European Observership visits: ESCMID member from Europe visits an ECC in Europe. Subsidies for travel costs and subsistence will bERA-CVDe maximum €1,200
- Intercontinental Observership visists: Outgoing: ESCMID member from Europe visits an ECC outside Europe, or incoming: ESCMID member from outside Europe visits an ECC in Europe. These subsidies are maximum €1,700

British Society for Immunology

Medical elective and summer placement award scheme

British Society for

Closing Date: none

Award amount: £1,500

Provides support to medical students and PhD and MSc students who are planning to undertake a formal placement in a selected laboratory for their medical elective or for a summer

placement. The placement must have immunological relevance. Applicants must be either medical students or PhD or MSc students. Placement must be greater than two weeks in duration. A minimum of four awards, worth £1,500 each, will be awarded in any one year.

European Society for Paediatric Infectious Diseases Collaborative research meeting award scheme

Closing date: none

Award amount: €5,000



Supports research meetings, which aid the initiation or development of interdisciplinary research projects and networks in paediatric infectious diseases. Scientists who are good standing ESPID members may apply. Applications should include researchers from at least three countries.

Awards support essential costs, including administration costs, hire of room space and equipment, travel subsistence and accommodation costs for delegates. Larger awards may be available for meetings of an unusually large or complex nature.

NIHR CLAHRC West

Training bursary scheme

Closing date: 01-Feb, 01-Jun, 01-Sep annually Award amount: £600

Gives staff from the local NHS, health and social care sector the opportunity to attend high quality research and evaluation training at half the price. Bursaries are available for 50 per cent of the course fees; the applicant or their employer is expected to fund the remaining 50 per cent. The bursary aims to promote wider engagement and improve skills in research and evidence in the CLAHRC West patch, particularly for those who have not previously had opportunities for this type of training.

BristolBridge

Funding for short projects

Closing date: 09-May-16 Award amount: unspecified

Will fund pump-priming research in the area of antimicrobial resistance. These will be novel, high-risk collaborative interdisciplinary research projects, which would otherwise be difficult or impossible to carry out, with the potential of real impact in AMR. We aim to foster collaborations, support potentially transformative research, to assist University of Bristol researchers in developing future projects and grant applications in AMR.

Strand 1: Tools and techniques for assays, screening, diagnostics and developing novel

antimicrobial compounds

Strand 2: Innovative antimicrobial materials, smart surfaces and wound dressings to prevent infection, and new drug delivery methods

Strand 3: Development of AMR surveillance and intervention techniques (

Funding will provide up to 3 months of Research Assistant staff time and can provide consumables, facility costs, essential equipment items, travel, subsistence and accommodation for Bristol staff to visit collaborating centres.

Bill and Melinda Gates Foundation

Explore new solutions in global health priority areas

BILL& MELINDA GATES foundation

Closing Date: 11-May-16 Award amount: US\$1M

Seek innovative ideas to assess the burden of disease, to develop better vaccines, and to develop new diagnostics, specifically to:

- better understand cause of death from tissue samples
- develop a quantitative measurement of mycobacterium tuberculosis bacterial load
- develop immunisation strategies that increase somatic hypermutation
- explore and develop approaches to immunisation that drive donor unrestricted cytotoxic T cell responses
- develop parenteral vaccines that induce mucosal immunity
- develop point-of-care nucleic acid diagnostics to below \$2 per test
- enable self-testing for cervical cancer
- develop malaria diagnostics to accelerate toward eradication

Medical Research Council

Research grants- infection and immunity

Closing date: 18-May-16 Award amount: £1M (80% of fEC)

For focused research projects and to support method development and continuation of research facilities and may involve more than one research group or institution. Support can include: salary of the principal investigator and co-investigators; support for additional posts – research, technical or other consumables; equipment; travel costs; data preservation, data sharing and dissemination costs.

Medical Research Council New investigator research grant – infections and immunity

Closing Date: 18-May-16

Award amount: unspecified



Aims to support researchers who are capable of becoming independent PIs. Applicants are expected to combine their time with a portfolio of other activities. Applicants should hold a PhD or a master's degree; there is no preferences on years of postdoctoral experience. Applicants may request support for: a salary commensurate with the time attributed to the project (capped at 50% of total contracted working time; support for additional research or technical costs; consumables and equipment; travel costs; data preservation, data sharing and dissemination costs.

Medical Research Council Research Grants

Closing date: 18-May-16 Award amount: £1M (80% fEC)

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

Makerere University

Visiting scientist awards



Closing Date: 31-May-16 Award amount: unspecified

Makerere University, in collaboration with the Uganda Virus Research Institute, invites applications for its visiting scientist awards under the joint research training programme in infection and immunity. These enable scientists from local, regional and international partner institutions to visit and work at Makerere University or UVRI.

European Society for Paediatric Infectious Diseases

Training courses and workshop awards

Closing date: 01-Jun-16 Award amount: €16,000

To fund training courses and workshops in paediatric infectious diseases. Events may be directed at clinical trainees, continuing medical education for career grade doctors, or both. Courses or workshops must be held in a European location. Applicants must be members of ESPID and courses must offer reduced registration fees for ESPID members.

Chronic Fatigue and Immune Deficiency Syndrome Association of America Research grants program

Closing date: 03-Jun-16

Award amount: US\$100,000

Seek to advance objective diagnosis and effective treatment of CFS. Of particular interest are proposals-

- that leverage existing resources and infrastructures, including but not limited to the SolveCFS BioBank, for subject enrollment and sample collection
- with robust biomarkers requiring validation and investigational therapeutics or off-label treatments with strong potential to enhance clinical practice for CFS

Cancer Research UK

Biotherapeutic drug discovery project awards



Closing Date: 01-Jun-16 Award amount: £300,000

Support milestone driven projects at all stages of drug discovery from target identification and validation to early preclinical studies. Applicants should discover and develop biological therapies, including the following areas:

- therapeutic antibodies
- cell based therapies
- viral therapies
- vaccines
- protein therapies
- gene therapies



National Institute of General Medical Sciences

Modelling of infectious disease agent study research projects (R01)

Closing Date: 05-Jun-16

Award amount: unlimited

Supports innovative research that will develop and apply computational tools and methods for modelling interactions between infectious agents and their hosts, disease spread, prediction systems and response strategies. Areas of interest include infectious disease research and computational, mathematical and statistical model research. The models should be useful to researchers, policymakers, or public health workers who want to better understand and respond to infectious diseases. This research opportunity encourages applications from institutions or organisations that propose to provide the scientific and public health communities better resources, knowledge, and tools to improve their ability to prepare for, identify, detect, control, and prevent the spread of infectious diseases caused by naturally occurring or intentionally released pathogens, including those relevant to biodefense.

National Institute of Allergy and Infectious Diseases Investigations on primary immunodeficiency diseases

Closing date: 05-Jun-16

Award amount: unspecified

Supports innovative investigations in primary immunodeficiency diseases. Of particular interest are the detection of primary immunodeficiency diseases, the identification of the molecular basis of these diseases and the design and pre-clinical development of innovative therapies for these diseases. Clinical trials will not be supported.

National Institute on Alcohol Abuse and Alcoholism

Alcohol impairment of immune function, host defence and tissue homeostasis

Closing date: 05-Jun-16 Award amount: unspecified

To study the consequences of alcohol consumption on immune function, with the goal of improving the outcome of patients who abuse alcohol.

This FOA also aims to attract research applications that utilise comprehensive approaches and cutting edge technology to address mechanistic questions about alcohol's effect on human health. In view of the complexity of the interactions within the immune system and among immune, neural and endocrine networks, systems approaches are encouraged.

GW4

Building Communities Initiator Funds and Accelerator Funds



Closing date: 06-Jun-16 Award amount: unspecified

Designed to build new, high-quality GW4 research communities or help existing collaborations to build on their work and secure long term sustainable funding.

Eunice Kennedy Shriver National Institute of Child Health and Human Development Advancing understanding, prevention and management of infections transmitted from women to their infants (R01)

Closing date: 06-Jun-16 Award amount: unspecified

Supports research that will increase scientific understanding of and treatments for highpriority perinatal infections. The aim is to stimulate investigations including translational, epidemiologic and clinical studies and trials that improve the understanding, prevention and clinical outcomes of non-HIV infections transmitted from women to their offspring during pregnancy, labour and delivery and breast-feeding.

European Federation of Immunological Societies Short-term fellowship



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Closing Date: 17-Jun-16

Award amount: €5,750

Supports scientific collaboration, advanced training and learning techniques or methods not available in the applicant's current place of work in order to build a strong network of immunological research within Europe. The proposed stay must be conducted in a European institution. Each applicant must be under the age of 35 and hold at least a master's degree. They must be a member of a society affiliated with EFIS. The fellowship is tenable for up to three months.

Agency for International Development (USAID)

Combating Zika and future threats

Closing Date: 17-Jun-16

Award amount: US\$1M

Aims to enhance disease prevention, detection, and response capabilities in both the short and long term by sourcing innovations that mitigate the spread and impact of the Zika virus by filling critical gaps in the pipeline, and improve our ability to prevent, detect and respond to future infectious disease outbreaks. Through this addendum, USAID will support the further development and refinement, adaptation, testing, introduction, and scale up of innovative solutions in the following areas:

- vector control
- personal and household protection
- healthcare worker safety
- surveillance
- clinic and laboratory systems
- diagnostics
- sample transport
- community engagement
- healthcare worker tools

British Council Newton Fund

Closing date: 27-Jun-16

Award amount: unspecified

An opportunity to initiate or develop international collaborations through official development assistance (ODA) funds. The Fund aims to promote the economic development and welfare of either the partner countries or, through working with the partner country, to address the problems of low-income and vulnerable populations.

Travel Grants for early-career researchers



BRITISH COUNCIL

Workshops for early-career researchers led by Leading Researchers Institutional Links that support collaboration between groups led by Leading Researchers or Established Researchers

Participating countries include: Brazil, Colombia, Egypt, India, Indonesia, Kazakhstan, Mexico, Philippines, Turkey, South Africa, Thailand

European Society for Immunodeficiencies Medium-term fellowships

Closing Date: 30 Jun 16

Award amount: €6.500

Support physicians or scientists under specialist training interested in pursuing research projects in the field of primary immunodeficiencies. Applicants must be current ESID junior members, who are under 35 years of age. Four fellowships are available, each worth €1,000 per month for a period of three to six months, plus a travel subsidy of up to €500.

European Society for Immunodeficiencies Short-term fellowship

Closing Date: 30 Jun 16

Award amount: €1,500

Supports physicians or a scientist under specialist training, interested in learning diagnostic and therapeutic procedures or laboratory techniques in the field of primary immunodeficiencies. Applicants must be current ESID junior members, who are under 35 years of age. Four fellowships are available, worth €1,000 for a period of up to one month, plus up to €500 for travel support.

British Infection Association Travel awards

Closing date: 30-Jun-16

Award amount: £1,000

British Infection Association

Support travel to major national or international meetings, in particular to the American Society for Microbiology, the Interscience Conference of Antimicrobial Agents and Chemotherapy, the Infectious Diseases Society of America and the European Congress of Clinical Microbiology and Infectious Diseases meetings, in order to present original research where an abstract has already been accepted.

Fonds InBev-Baillet Latour InBev-Baillet Latour grant fro medical research



Closing date: 30-Jun-16

Award amount: €150,000

Enables a young investigator of any nationality to conduct medical research in Belgium. **In 2016 the topic is infectious diseases**. Applicants must hold a full-time position and a salary secured for at least five years beyond the beginning of the GMR and conduct their research in a Belgian university or university hospital. They must hold a PhD awarded no more than 15 years before the deadline for application.

Association for Professionals in Infection Control and Epidemiology Research Foundation Grant awards

Closing date: 01-Jul-16 Award amount: US\$10,000

Support research projects under the following two programs:

- general research program. Grants are available to support a pilot study, a small project, or development and testing of an instrument. Applications should be directed toward the area of infection control and applied epidemiology;
- Steris focused research program. Grants are available for studies designed to demonstrate and quantify the value, and improve the practice of, infection prevention and control and applied epidemiology in all health care delivery settings.

British Society for Immunology

Communicating immunology grants

Closing date: 01-Jul-16

Award amount: £1,000

Enable individuals to stimulate interest, discussion and understanding of immunology amongst a wider audience with a particular interest in reaching new or traditionally hard to reach audiences, as well as support education on immunology. Applicants must have been society members for at least one year prior to application.

Infection Prevention Society Collaborative small projects grant

Closing date: 03-Jul-16



Infection Prevention Society

APIC^{*} Spreading knowledge. Preventing infection.

ofessionals in Infection Control and Epidemiology

Award amount: £5,000

Enables a team of up to five researchers to conduct research on any aspect of infection prevention and control. The lead applicant must have been a member of the society for 12 months and have an appropriate academic qualification or relevant research experience.

Infection Prevention Society

Postdoctoral grant

Supports research on any aspect of infection prevention and control. Applicants must be members of the society, and must hold an appropriate academic qualification or relevant research experience.

University of Bristol Vice-Chancellor's Impact Awards

Closing date: 04-Jul-16

Award amount: £1,500

Applications are invited from individual researchers or teams who can demonstrate the contribution that their research has made in benefiting society within the following categories:

- Business and Economy
- Policy and Practice
- Society and Culture
- Health and Well-being

European Research Council Starting Grants

Internal closing date: 12-Jul-16

Award amount: €1.5M

Intended to enable exceptional researchers between 2 and 7 years from PhD completion to become independent research leaders and strengthen their own research team or programme. All research fields are supported.

Proposals will be handled though the University's major bids process.

Infection Prevention Society Novice investigator grant

Closing Date: 18-Jul-16

Award amount: £3,000

Supports research at the master's or doctoral level focussing on any aspect of infection prevention and control. Applicants must have been members of the society for 12 months.

Innovative Medicines Initiative Joint Undertaking H2020-JTI-IMI2-2016-09 IMI ninth call for proposals – two stage

Closing Date: 26-Jul-16

Award amount: unspecified



medicines



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Aims to improve health by speeding up the development of, and patient access to, innovative medicines, particularly in areas where there is an unmet medical or social need.

- clinical burden of clostridium difficile infection, evaluation of the burden, current practices and set-up of a European research platform
- development of immune tolerance therapies for the treatment of rheumatic diseases
- data quality in preclinical research and development
- Next generation of electronic translational safety
- identification and validation of biomarkers for non-alcoholic steatohepatitis and across the spectrum of non-alcoholic fatty liver disease
- joint influenza vaccine effectiveness studies

Proposals must take the form of research and innovation actions, requiring participation by at least three legal entities, each established in a different EU member state or associated country

National Institute of Allergy and Infectious Diseases

Immunity in neonates and infants (U01)

Closing Date: 29-Jul-16 Award amount: US\$1,750,000

Aims to advance current knowledge of the developing immune system during the first year of life and to encourage innovative approaches to more fully understand the distinct characteristics of neonatal and infant immune responses. Applications are invited from institutions and organisations to participate in a co-operative research group, focusing on elucidating mechanisms regulating the development and function of the immune system in neonates and infants, including immune mechanisms triggered by non-pathogenic or pathogenic microbes, vaccines, exposure to allergens, or alterations in immune function due to environmental exposures to pollutants.

Healthcare Infection Society Major research grants

Closing date: 31-Jul-16

Award amount: £99,000

Support a PhD studentship, MD or other research worker in the subject of healthcare infection control.

Healthcare Infection Society Small research grants



Closing date: 31-Jul-16

Award amount: £10,000

Support small-scale research projects on the subject of healthcare associated infection, to be carried out in the UK or Eire. Funding can also support the costs associated with the visit of an overseas research fellow for up to six months.

National Institute of Allergy and Infectious Diseases

Innovation for HIV Vaccine Discovery (R01)

Deadline: 01-Aug-16 Award amount: US\$1.4M

Supports innovative, high risk, high impact research to identify novel HIV vaccine concepts and targets. It also encourages the design and development of an effective immunogen that may provide long-term safe protection from either acquisition of or ongoing infection by HIV. This call explicitly encourages applications from new investigators and investigators new to the HIV vaccine field, and seeks to promote interdisciplinary cross-collaborations among virologists, immunologists, molecular and systems biologists, microbiologists, clinical scientists and other relevant specialists. Applicants are required to identify within the application go/no-go decision criteria to be achieved for the year two progress report in order to obtain year three and four of funding. Achievement of the stated goals will enable a total of four years of support, while failure to achieve the stated goals will result in negotiation of a reduced budget for year three and award close out. Applications that do not include go/no-go decision criteria will not be reviewed.

European Haematology Association Research grants



EUROPEAN HEMATOLOGY ASSOCIATION

Closing date: 01-Aug-16

Award amount: €160,000

Support any aspect of the study of haematology in its broadest sense, including molecular biology and biochemistry, virology, immunology, cell biology, epidemiology and diagnostic and therapeutic strategies. The following awards are available:

- clinical fellowships applicants must be medical doctors who have research experience and a medial PhD, or medical doctors who have obtained their medical degree less than 12 months prior to the application;
- non-clinical advanced fellowships applicants must be non-medical scientists within eight years of receiving their PhD, or medical doctors who have obtained their medical degree less than 12 months prior to the application;
- non-clinical junior fellowships applicants must be non-medical scientists within four years of receiving their PhD.

Applicants must be members or guests of the society at the time of application.

Cancer Research UK Career Development Fellowship

Deadline: 11-Aug-16

Award amount: salary for one postdoc and one technician + £150,000 for equipment

Enables scientists to set up their first independent cancer research group in any area of CRUK's funding remit, with the exception of drug discovery and clinical trials. Areas may include cancer biology, biomarker research, cancer aetiology, imaging research, pre-clinical research, early diagnosis, epidemiology, statistics and methodology, radiotherapy research, cancer prevention and immunology. Post-doc and early-career researchers may apply. Applicants should have between three and eight years of research experience since completing their PhD at the time of applying.

Cancer Research UK Senior Cancer Research Fellowship

Deadline: 11-Aug-16

Award amount: unspecified

Enables scientists to establish or further develop an independent cancer research group in any area of the CRUK's funding remit, with the exception of clinical trials and drug discovery. Areas may include cancer biology, biomarker research, cancer aetiology, imaging research, preclinical research, early diagnosis, epidemiology, statistics and methodology, radiotherapy research, cancer prevention and immunology.

Established independent researchers may apply. Applicants should have between eight and 14 years of postdoctoral research experience since completing their PhD at the time of applying.

Cancer Research UK Career Establishment Awards

Deadline: 11-Aug-16

Award amount: salary for one postdoc and one technician +£150,000 for equipment

Enables new group leaders to enhance their cancer research in any area of CRUK's funding remit, with the exception of clinical trials and drug discovery. Areas may include cancer biology, biomarker research, cancer aetiology, imaging researcher, pre-clinical research, early diagnosis, epidemiology, statistics and methodology, radiotherapy research, cancer prevention and immunology.

Early-career researchers and established independent researchers may apply. Applicants should have at least three and no more than eight years of research experience after com-



pleting their PhD.

Department of Health

Health services and delivery research programme – researcher-led workstream

Deadline: 08-Sep-16

Award amount: unspecified

Supports research into the quality, appropriateness, effectiveness, equity and patient experience of health services. For this round, the emphasis is on large scale studies of national importance, such as research addressing issues of major strategic importance to the NHS, research likely to lead to changes in practice or having the potential to be applied to other conditions. Applicants may submit either a standard outline proposal or an evidence synthesis full proposal.

The workstream has a continued interest in primary care interventions, very rare diseases, antimicrobial resistance, long-term conditions in children. NIHR will fund HEIs at a maximum of 80 per cent of full economic costs, except for equipment worth over £50,000.

Medical Research Council

Clinical research training fellowship

Closing Date: 08-Sep-16 Award amount: salary, research expenses, travel costs

Enables clinically qualified, active professionals to undertake specialised or further research training in the biomedical sciences within the UK. Applications from basic studies to translational and developmental clinical research are welcome. The fellowship supports clinicians to undertake a higher research degree, while medically qualified applicants with a PhD can undertake early postdoctoral training enabling them to be competitive at the clinician scientist fellowship level.

Veterinarians may apply if they have equivalent qualifications. Postdoctoral applicants may apply if they are clinically qualified individuals who received their PhD five or more years ago and have not been active in academic research since.

Department of Health

Health technology assessment programme

Closing date: 15-Sep-16 Award amount: unlimited Invites expressions of interest for primary research in two stages, under the commissioned funding stream of its health technology assessment programme. Proposals are sought on the following topics:

biological response modifier drugs for rare autoimmune diseases
poorly controlled diabetes and outcomes of elective surgery

National Institute of Allergy and Infectious Diseases Partnerships for countermeasures against select pathogens (R01)

Closing Date: 03-Oct-16 Award amount: US\$3.75M

Supports milestone-driven research projects focused on preclinical development of lead candidate countermeasures against select NIAID emerging infectious diseases or pathogens. The objective is to advance the development and production of lead therapeutics, vaccines or medical diagnostics. Applications must include a product development strategy attachment and demonstrate substantive investment by at least one industrial participant.

Dowager Countess Eleanor Peel Trust

Peel and Rothwell Jackson postgraduate travelling fellowships

Closing Date: 04-Nov-16 Award amount: £30,000

Enable researchers to spend up to one year at a centre of international excellence for the purpose of research, advanced study or the acquisition of a new clinical skill unlikely to be available in the UK. Candidates should be qualified and registered to practise in medicine, nursing or another health profession.

European Federation of Immunological Societies

World fellowship

Closing Date: 28-Feb-17 Award amount: €12,000

Supports scientific collaboration, advanced training, learning techniques or methods not available in the applicant's current place of work. The main goal is to build a strong international network of immunological research, and fellowships may therefore be held anywhere in the world.

Each applicant must be under 35 years of age and a member of a society affiliated with EFIS. They must hold at least a master's degree. Applications are also open to applicants from European countries without a national society.

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THIS ISSUE'S SHOWCASED ARTICLE

Identification of human viral protein-derived ligands recognized by individual major histocompatibility complex class I (MHCI)-restricted T-cell receptors

Szomolay B, Liu J, Brown P, Miles JJ, Clement M, Llewellyn-Lacey S, Dolton G, Ekeruche-Makinde J, Lissina A, Schauenburg AJ, Sewell AK, Burrows SR, Roederer M, Price DA, Wooldridge L & van den Berg HA

Immunology and Cell Biology. Published online 29 March 2016.

Evidence indicates that autoimmunity can be triggered by virus-specific CD8⁺ T cells that crossreact with self-derived peptide epitopes presented on the cell surface by major histocompatibility complex class I (MHCI) molecules. Identification of the associated viral pathogens is challenging because individual T-cell receptors can potentially recognize up to a million different peptides. Here, we generate peptide length-matched combinatorial peptide library (CPL) scan data for a panel of virus-specific CD8⁺ T-cell clones spanning different restriction elements and a range of epitope lengths. CPL scan data drove a protein database search limited to viruses that infect humans. Peptide sequences were ranked in order of likelihood of recognition. For all anti-viral CD8⁺ T-cell clones examined in this study, the index peptide was either the top-ranked sequence or ranked as one of the most likely sequences to be recognized. Thus, we demonstrate that anti-viral CD8⁺ T-cell clones are highly focused on their index peptide sequence and that 'CPL-driven database searching' can be used to identify the inciting virus-derived epitope for a given CD8⁺ T-cell clone. Moreover, to aug-



ment access to CPL-driven database searching, we have created a publicly accessible webtool. Application of these methodologies in the clinical setting may clarify the role of viral pathogens in the etiology of autoimmune diseases.

Caption: Heat maps summarizing CPL scan data for: E7NLV (a), SB16 (b), SB14 (c), SB27 (d), 003 (e), 868 (f), ILA1 (g) and MEL5 (h). CPL scan data are normalized in each row so that the values range from high (red) to low (blue); the maximum intensity is the largest of all red values in the rows. Amino acids are grouped according to their physicochemical properties as follows: polar, uncharged amines: Q, N; polar, uncharged alcohols: T, S; small: G, A, C; hydrophobic: A–H; aliphatic: V, I, L; aromatic: Y, F, W, H; large: F, W; charged basic: H, K, R; and charged acidic: E, D.

RECENT PUBLICATIONS IN INFECTION & IMMUNITY

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Chaintarli K, Ingle S, Bhattacharya A, Ashiru-Oredope D, Oliver I & Gobin M (in press). Impact of a United Kingdom-wide campaign to tackle Antimicrobial Resistance on self-reported knowledge and behaviour change. *BMC Public Health*.

Verschave SH, Rose H, Morgan ER, Claerebout E, Vercruysse J & Charlier J (2016). Modelling *Cooperia oncophora*: Quantification of key parameters in the parasitic phase. *Veterinary Parasitology*. 223, pp111-114

Longstaff L, Gruffydd-Jones T, Buffington T, Casey R & Murray J (2016). Owner-reported lower urinary tract signs in a cohort of young cats. *Journal of Feline Medicine and Surgery*. Published online 21 April 2016.

Maxwell DJ, Partridge JC, Roberts NW, Boonham N & Foster GD (2016). The Effects of Plant Virus Infection on Polarization Reflection from Leaves. *PLoS ONE*. 11(4), e0152836



Image caption: Example false colour images showing the percentage polarization of blue channel light reflected from healthy, Tobacco Mosaic Virus, Pepino mosaic virus, and aphid-vectored viruses PVY or Second Content of Second Secon N. tabacum leaves on the adaxial (A) or abaxial (B) surfaces at 21 days post inoculation. The percentage polarization at each pixel is represented by colour, as shown in the scale bar.







Kemp K, Redondo J, Hares K, Rice C, Scolding N & Wilkins A (2016). Oxidative injury in multiple sclerosis cerebellar grey matter. Brain Research. 1642, pp452-460

Brain Research



and microglial infiltration in MS and control cerebellar grey matter. MS section showing DAB (brown) label-



ling of myelin basic protein (MBP) demonstrating demyelination within the granular layer of MS cerebellum. The hatched areas in (i) represent the higher magnified images (ii/iii) (Scale bar =100 μ m).

Benito-Alifonso D, Tremell S, Sadler JC, Berry M & Galan MC (2016). Imidazolium-tagged glycan probes for non-covalent labeling of live cells. Chemical Communications. 52(27), pp4906-4909



Image caption: Selective, bioorthogonal and fast labeling of glycoconjugates in living cells is a major challenge for synthetic and cellular biology. Here we report the use imidazolium tagged-mannosamine derivative (ITag-Man) for the non-covalent, rapid and site-specific labeling of sialic acid containing glycopro-



teins using commercial N-nitrilotriacetate fluorescent reagents in a range of cell lines.

Hay A, Sterne J, Hood KA, Little P et al. (in press). Improving the diagnosis and treatment of urinary tract infection in young children in primary care: results from the 'DUTY' prospective diagnostic cohort study. Annals of Family Medicine.

Gessner BD, Wraith DC & Finn A (2016). CNS infection safety signal of RTS,S/ ASO1 and possible association with rabies vaccine. Lancet. 387(10026), p1376

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Christensen H, Hellenbrand W, Irving TJ, Koch J, Trotter CL, Ultsch B, Weidemann F & Wichmann O (2016). Epidemiological impact and costeffectiveness of universal vaccination with Bexsero[®] to reduce meningococcal group B disease in Germany. *Vaccine*. Published online 22 April 2016.

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Birnie K, Caskey FJ, Ben-Shlomo Y, Sterne J, Gilg J, Nitsch D & Tomson C (2016). Erythropoiesis-stimulating agent dosing, haemoglobin and ferritin levels in UK haemodialysis patients 2005–13. *Nephrology Dialysis Transplantation*. Published online 24 March 2016.

May MT, Vehreschild, J-J, Trickey A *et al.* (2016). Mortality according to CD4 count at start of combination antiretroviral therapy among HIV positive patients followed for up to 15 years after start of treatment: collaborative cohort study. *Clinical Infectious Diseases*. Published online 29 March 2016.

French CE, Thorne C, Byrne L, Cortina-Borja M & Tookey PA (in press). Presentation for care and antenatal management of HIV in the United Kingdom: temporal trends and demographic variations, 2009-2014. *HIV Medicine*.











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Aquino LC, Kamani J, Haruna AM, Paludo GR, Hicks CA, Helps CR & Tasker S (2016). Analysis of risk factors and prevalence of haemoplasma infection in dogs. *Veterinary Parasitology*. 221, pp111-117

Sjostrom T, Nobbs AH & Su B (2016). Bactericidal nanospike surfaces via thermal oxidation of Ti alloy substrates. *Materials Letters*. 167, pp22-26







age caption: SEM images of nanospikes on Ti64 substrates after thermal oxidation at various Ar flow rates through the acetone bubbler. (a) 50 sccm, (b) 100 sccm, (c) 200 sccm and (d) 300 sccm. All surfaces were imaged after removal of carbon at 600 °C.

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Nedicine and Sur

Wraith D (2016). Autoimmunity: Antigen-specific immunotherapy. *Nature*. 530, pp422-423



Image caption: Clemente-Casares et al.1 produced nanoparticles coated with peptide fragments of the body's own proteins that are associated with autoimmune disease, bound to MHC class II proteins. They show that treating mice with these nanoparticles modifies the function of TH1 cells that have receptors specific for that particular peptide: instead of inducing an immune response against the self-protein, the TH1 cells differentiate into regulatory (TR1-like) T cells that secrete the anti-inflammatory protein IL-10. The IL-10 promotes the differentiation of B cells into IL-10secreting regulatory B cells, and also modifies the ability of antigenpresenting cells (APCs) to present the specific peptide to immune cells. Furthermore, the TR1-like cells can inhibit the activation of helper (CD4+) and cytotoxic (CD8+) T cells that are specific for other peptides presented by the same APC, and thus mediate bystander suppression. In this way, TR1-like cells can target APCs in tissues affected by autoimmune reactions and thereby suppress the inflammation associated with the disease.

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CONTACT INFORMATION

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

Co-Chair: Lindsay Nicholson Reader in Research



Co-Chair: Adam Finn Prof of Paediatrics



- Anders Johanson Senior Lecturer in Systems Engineering
- Alastair Hay Professor of Primary Care
- Andrew Davidson Senior Lecturer in Virology
- Angela Nobbs Lecturer in Oral Microbiology
- Catherine Brown Administrator for the Theme (Research Development)
- David Morgan Reader in Immunology
- Jonathan Dando Research Development Theme Lead
- Kathleen Gillespie Reader in Molecular Medicine
- Katy Turner Senior Lecturer in Veterinary Infectious Diseases
- Linda Woolridge Chair in Translational Immunology
- Mark Jepson Reader in Cell Biology
- Neil Williams Professor of Immunology
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- Peter Vickerman Professor of Infectious Disease Modelling
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