INFECTION AND IMMUNITY THEME NEWSLETTER

University of BRISTOL
Elizabeth Blackwell Institute for Health Research

FEBRUARY-MARCH 2016

I and I Annual Symposium

The fifth **Infection and Immunity Annual Symposium** was held on 12 January 2016 in the Life Sciences Building. Entitled *Putting models into action in Infection and Immunity Research*, we welcomed 60 members of the community to listen to an exciting programme of talks. Speakers included:

- Leon Danon (SSCM)
- Ellen Brooks-Pollock (SSCM)
- Eric Morgan (Biological Sciences and Veterinary Sciences)
- Kristen Reyher (Veterinary Sciences)
- Keynote: Thomas Connor (Cardiff University)

Presentations are available to view from the Theme's intranet site (SSO required).

Feedback on the day was extremely positive, with ALL respondents rating the event as "excellent" or "very good", and citing the excellence , variety and accessibility of the talks as particularly satisfying.

Ideas for future topics are welcomed, please just email the Theme with suggestions.

Thanks are extended to the Elizabeth Blackwell Institute for Health Research who supported the event.

Inside this issue:

Oxford Chemical Immunology Conference

4-5 April 2016

Keble College, Oxford

AAV 2016: Biology, vector design and implementation into human gene therapy

15 April 2016

University College London

BRISTOL EVENTS

Adaptive immunity in bacteria

11 February 2016, 13.00-14.00. Dr Edze Westra (University of Exeter), C42 Biomedical Sciences Building

Fellowship Bootcamp 2016

16 February 2016, 12.00-17.00. Room 4.10, 35 Berkeley Square

Antimicrobial stewardship: improving primary care for children's respiratory infections

26 February 2016, 10.15 –16.00. Led by Professor Alastair Hay (Respiratory Infections Health Integration Team), London

Using super-resolution microscopy to watch immune cells kill

1 March 2016, 13.00-14.00. Professor Daniel Davis (Manchester Collaborative Centre for Inflammation Research), C42 Biomedical Sciences Building

Dynamic interactions between normal and malignant haematopoietic cells

7 March 2016, 13.00-14.00. Cristina Lo Celso (Imperial College London), E29 Biomedical Sciences Building

Genome segregation in bacteria and archaea

10 March 2016, 13.00-14.00. Dr Daniella Barilla (University of York), C42 Biomedical Sciences Building

Surgical Trials Showcase 2016

18 March 2016, 9.00-17.00. M-Shed

OTHER EVENTS

NIHR Clinical Research Network: West of England primary care event

19 February 2016, 12.00-16.00. University of the West of England Conference Centre

South West Public Health Scientific Conference 2016

16 March 2016, 9.30-17.00. Mercure Bristol Holland House Hotel and Spa

The Fight Against Superbugs

An NIHR grant of £1.5M to PI Professor Alastair Hay will involve 500 children participating in a study to find out whether eardrops containing a combined local anaesthetic and painkiller can ease the pain of ear infections. The study will allow the CEDAR trial to test a new way of helping families to manage the distress and disruption caused by children's ear pain.

Antibiotics are prescribed to a higher proportion of children with middle ear infections than any other respiratory infection of childhood, in spite of evidence that they are rarely effective. Alternative treatments are urgently needed given the serious concerns about increasing resistance to antibiotics. This level of antibiotic use is inappropriate, unnecessary and contrary to NICE guidelines. It also encourages a culture of parental dependence on health care services, making them more likely to consult for future similar illness episodes.

Two-thirds of World's Population over 50 has Herpes 1

Herpes simplex 1 (HSV-1) is a highly infectious and incurable infection mainly transmitted by oral-oral contact and in many cases causes mouth cold sores. HSV-1 is also an important cause of genital herpes.

Some 140 million people aged 15-49 years are estimated to be infected with genital HSV-1 infection which highlights the large global burden of genital herpes .

The Bristol lead was Dr Katharine Looker from SSCM.

Reference: Looker KJ, Magaret AS, Turner KME *et al*. (2015). Global and Regional Estimates of Prevalent and Incident Herpes Simplex Virus Type 1 Infections in 2012. *PLOS ONE*. Published online 28 October 2015.

NEWS

Call for Participants

Researchers at Bristol can recruit participants online via *Call For Participants*, an advertising platform focused on bringing opportunities for taking part in academic research to the general public. A dedicated notice board will advertise surveys, interviews and other research studies. The company will also provide support and guidance on how to advertise research and communicate to the public. Go to their website to post an advert.

Exploring the genomic basis of parasitism

More than a billion people are infected with intestinal worms. Professor Mark Viney and colleagues compared the genomes of four soil-transmitted nematodes including the human pathogen *S. stercoralis*, with a free-living relative. Understanding the molecular and genetic differences between the two types is an essential step towards identifying novel drug targets and other methods of controlling parasitic worms and the diseases they cause.

The researchers found that most genes expanded in parasitic species are specifically used in the parasitic stages and are within genomic clusters, concentrated in regions of chromosome II. This is consistent with the idea that the within-host stages of parasitic nematodes deploy a specific biology that enables them to be successful parasites.

Hunt VL, Tsai IJ, Coghlan A et al. (2016). The Genomic Basis of Parasitism in the *Strongyloides* Clade of Nematodes. *Nature Genetics*. Published online 1 February 2016.

The parasitic worm Strongyloides *lives in the gut of its host. © Prof Mark Viney*

Higher Education Academy Recognition

Dr Ann Pullen, Reader in Immunology and Education in the School of Cellular and Molecular Medicine, has been made Senior Fellow of the Higher Education Academy (HEA) in recognition of her established record in teaching and learning. She completed the Level 3 experienced route of the CREATE programme, which is accredited by the HEA, demonstrating a thorough understanding of effective approaches to teaching and learning support as a key contribution to high-quality student learning.

Clinical Research and Imaging Centre

The Clinical Research and Imaging Centre (CRIC) has a new online facility. The page displays a comprehensive list of publications that have been drawn from research that has taken place at CRIC Bristol, many of which link to the online article.

CRIC is a joint venture between the University Hospitals Bristol NHS Foundation Trust and the University of Bristol. Facilities include a Siemens 3Tesla Magneton Skyra MRI scanner, a two-room sleep laboratory and four clinical investigation suites alongside a laboratory, meeting rooms, and access to high performance computing facilities.

NIHR Awards

The National Institute for Health Research regularly celebrates the performance, and growth, in the number of commercial contract studies supported by the Clinical Research Network. It recognizes the contributions of Principal Investigators who have personally driven the Life Sciences agenda within the NHS as clinical leaders, but also through their nominated role as study-site PIs. NIHR invited 100 nominated PIs to an event on 19 February 2016 in London where their achievements will be lauded.

Five UH Bristol PIs were invited, including Professor of Opthalmology Andrew Dick who consistently delivers to time and target.

Protein-protein Interactions to Target Drug Discoveries

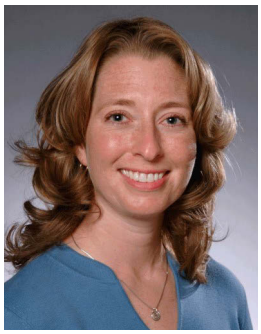
A £3.4M programme between the Universities of Leeds and Bristol, the Northern Institute for Cancer Research at Newcastle University, AstraZeneca and Domainex will be looking at protein-protein interactions that could be targets for new drugs. Developing an understanding of protein interactions will allow researchers to create the tools to make drug discovery easier by analysing and categorising the important features of these interactions. To develop new drugs scientists can block well-defined binding sites on proteins where small molecules can bind. This allows, for instance, many enzymes involved in disease processes to be disabled.

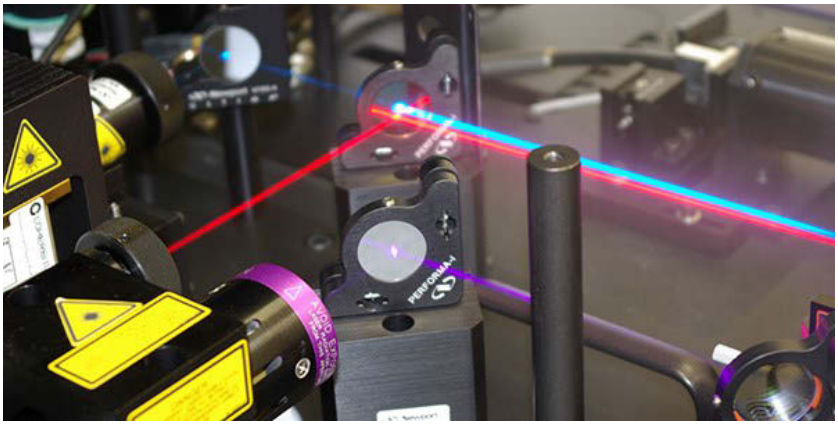
X-ray crystallography image of a protein-protein interaction. © Prof Andrew Wilson, University of Leeds

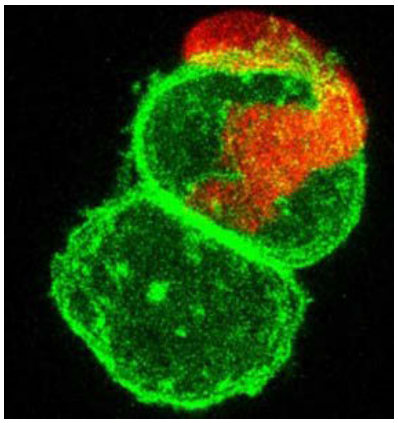
Online Teaching and Learning Resource for Vets

A free online resource aimed at making evidence-based veterinary medicine (EBVM) accessible to the veterinary profession worldwide has been launched by the EBVM Learning Consortium. The tutorial was led by Dr Kristen Reyher along with colleagues at the University of Nottingham. The resource, which can be used on various platforms and devices, is suitable for students and practitioners for self-study, and can be used as a stand-alone tutorial or as individual teaching modules to support other EBVM teaching or continuing professional development.

Kristen currently leads an interdisciplinary research group (the AMR Force) focussed on antimicrobial resistance as well as directs the first studies applying a counselling style called Motivational Interviewing to veterinarian-client communication.







Collaborative Doctoral Training Programme

Known as the *GW4 BioMed MRC Doctoral Training Partnership*, the new £4.6M programme will train postgraduate research students in three main areas: neuroscience and mental health; infection, immunity and repair; and population health.

Funded by the Medical Research Council (MRC), it will fund more than 50 postgraduate research students across four institutions over the next three years.

There will be a strong emphasis on addressing national priorities in areas such as quantitative and interdisciplinary skills and *in vivo* methodology. The training programme will have three strands in its curriculum: research skills; professional and career development skills; and opportunities to broaden horizons.

Students will be encouraged to undertake placements, research visits, public engagement internships, and will have the opportunity for clinical experience.

Human Cell Transformation

The recent development of a system that predicts how to create any human cell type directly from another type has resulted in *Mogrify*, a computational algorithm which Bristol lead Prof Julian Gough and PhD student Dr Owen Rackham spent five years building up. The algorithm is used to predict the cellular factors for cell conversions and was conceived from data collected as a part of FANTOM.

Mogrify will allow experimental biologists to bypass the need to create stem cells. Since the first artificial pluripotent stem cells were created in 2007, only a handful of further conversions have been discovered; the algorithm predicts how to create any human cell type from any other cell type directly. It was tested on two new human cell conversions, and succeeded first time for both. The speed with which this was achieved suggests *Mogrify* will enable the creation of a great number of human cell types in the lab.

This ability will lead directly to tissue therapies of all kinds, to treat conditions from arthritis to heart disease. The fuller understanding, at the molecular level of cell production leading on from this, may allow researchers to grow whole organs from somebody's own cells.

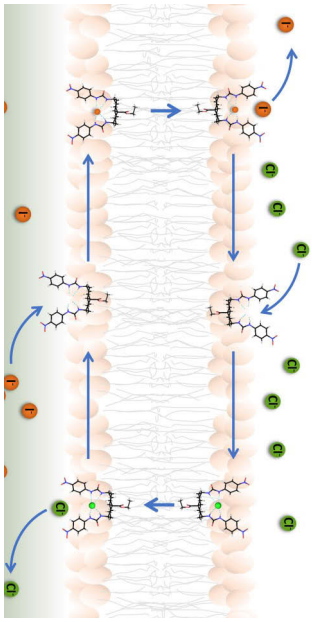
Rackham OJ, Firas J, Fang H *et al*. (2016). A predictive computational framework for direct reprogramming between human cell types. *Nature Genetics*. Published online 18 January 2016.

New therapy for diseases caused by defective anion transport

Research has taken the first steps towards new treatments for inherited diseases such as cystic fibrosis, one form of Bartter's syndrome, and two forms of myotonia which are linked to defective movement of anions across cell membranes.

To develop artificial anion transporters Prof Tony Davis, Dr David Sheppard and colleagues synthesised molecules with two distinct parts. One was designed to bind lipids; the other to form a cage-like structure to hold a chloride ion and protect it. These anionophores bind a chloride ion on one side of the cell membrane, shielding it from lipids as it is shuttled across the membrane, and then releasing it on the other side.

Dr Hongyu Li tested 15 anionophores on individual cells and epithelia. By monitoring chloride transport in real time through changes in cell fluorescence or electrical activity, he identified one compound with special promise: bis-(p-nitrophenyl) ureidodecalin. Of special interest are: a) it was deliverable to cell membranes, b) it exhibited robust activity as an anion transporter approaching levels achieved by natural anion transport pathways, c) its activity was long lasting, transporting chloride for about two hours following a 10-min treatment period, d) it showed no evidence of toxicity when tested on three different types of cells, e) its chemical properties approach those of drug-like chemicals.



BristolBridge: Recently Funded Projects

A sustained delivery chlorhexidine gel for prevention of umbilical cord infection in developing countries

Umbilical cord infection has a devastating impact in developing countries, and is responsible for many newborn deaths.

It is reported that 400,000 deaths of newborn babies *pa* can be attributed to infection in the first few days. There is increasing incidence of antibiotic resistant bacteria- antibiotic-based strategies are likely to become less successful, and incidence in the developed world may increase.

The WHO recommends application of chlorhexidine to the umbilical cord daily for 7 days post-partum in vulnerable communities. However, it is difficult for healthcare workers to achieve this in remote and/or traditional communities.

They propose to use a sustained chlorhexidine release material, developed at and patented by UoB (Michele Barbour) to generate an antimicrobial environment for the required period but with a single, gel-based application.

The team will formulate the chlorhexidine material into a gel form using the formulation expertise of a physical scientist (Jeroen van Duijneveldt) and test the efficacy of the gel against clinically relevant antibiotic-resistant microbes in the laboratories of a microbiologist with a particular interest in antibiotic-resistant species (Jim Spencer).

Biomimetic antimicrobial surfaces to combat antimicrobial resistant infection

Bo Su, Angela Nobbs, Wuge Briscoe, Paul May.

The project aims to develop novel antimicrobial surfaces based on biomimetic nanocones to combat bacterial infection associated with surgery requiring medical implants and prostheses.

The approach is inspired by nanostructured Cicada (*Psaltoda claripennis*) wings that kill bacteria through physical rupture of their cell walls. Unlike antibiotics, physical destruction of bacteria should not drive development of antimicrobial resistance. Su and colleagues are generating nanocone structures on clinically relevant materials and assessing their antimicrobial performance.

Developing novel biocompatible and antimicrobial coatings for orthopaedic implants

John Tarlton, Tom Scott, Tristan Cogan.

Aims to tackle AMR by developing 'smart' coatings for orthopaedic implants that promote biointegration and are capable of eliminating bacterial infections before, during and long after implementation. Up to 18M hip and knee arthroplasties take place worldwide each year, with an estimated 100 million procedures undertaken for orthopaedic fixation and dental implants. Bacterial infections leading to implant failure occur in around 5% of cases. Arthroplasty revision for infection usually involves two operations, separated by a course of local and systemic antibiotic for up to 3 months. The team will look to develop a photocatalytic titanium dioxide-based antimicrobial surface for use in implants capable of *in situ* decontamination without the need for revision surgery or the use of antibiotics.

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.

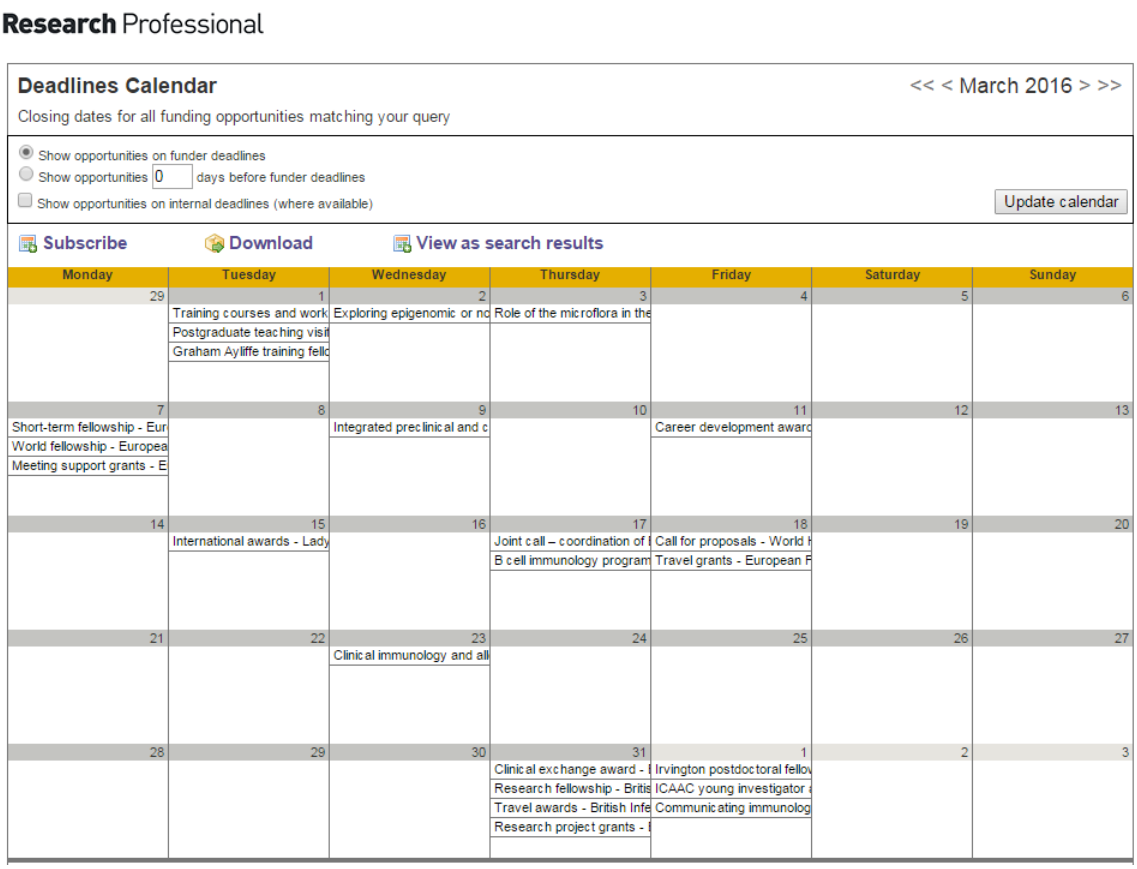
EBI Early Career Fellowships

Designed to support exceptionally talented and motivated researchers who wish to further their career by applying for prestigious, independent, externally-funded fellowships to be held at Bristol. This scheme is available to internal and external applicants.

Closing date: 12 February 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.



BristolBridge
Funding for short projects

Closing date: 10-Feb-16 Award amount: unspecified

Applications are invited for short projects to fund pump-priming research in the area of antimicrobial resistance (AMR), relevant to EPSRC, across the University of Bristol. There is funding to

support short projects to foster transformative research to combat AMR. 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.

University of Bristol
University Research Fellowships

Closing date: 12-Feb-16 Award amount: not specified

Enable academic staff to carry out a dedicated research project lasting twelve months.

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
- the 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

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

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.

NIHR

HPRU Emerging and Zoonotic Infections Strategic Research Funding Call

Closing date: 15-Feb-16 Award amount: £15,000

Open Funding Call: To support research which brings together new collaborators to the HPRU EZI. Max award £5k.

Cross NIHR Infrastructure Faculty Match Funded Pump Priming Scheme: Seeks to match fund research projects to create a strategic collaboration between HPRU EZI and one or more NIHR Infrastructure facilities. HPRU will provide £10k-£15k

Healthcare Infection Society

Graham Ayliffe training fellowship

Closing date: 01-Mar-16 Award amount: £70,000

Enables a healthcare professional in training to take one year leave of absence from their programme to develop a special interest in aspects of the prevention and control of infection.

Preference will be given to the following topics:

- work in a specialist service relevant to infection prevention and control
- development of specialist skills and expertise with the potential to become a regional or national resource of expertise

- undertaking a significant audit project with greater than local scope, completing a full audit cycle
- development of a guideline in an area of significant importance or need, including pilot implementation
- production of a structured review literature or meta analysis

Newton Fund

Mobility Grants / Research Collaboration Programme

Closing date: 02-Mar-16 Award amount: unspecified

Eligible partner countries: Brazil, Malaysia, Mexico, South Africa, Thailand (BA, RS), Turkey. These grants provide support for international researchers based in a country covered by the Newton Fund to establish and develop collaboration with UK researchers around a specific jointly defined research project. These one-year awards are particularly suited to initiate new collaborative partnerships, between scholars who have not previously worked together, or new initiatives between scholars who have collaborated in the past.

The grants intend to strengthen the research capacity/capability of, and contribute to promoting economic development and social welfare in, the overseas country. The awards will also initiate the development of longer-term links between the overseas and UK researchers

NIHR CLAHRC West

Implementation projects and research proposals

Closing date: 07-Mar-16 Award amount:

Funds will go towards projects that address two key issues: (a) Integrated working across the health system; (b) Effective and efficient optimal care

Institute for Advanced Studies

Enhances research and intellectual life at the University of Bristol by funding workshops and fellowships in pursuit of new ideas. They offer resources and opportunities to develop novel areas of research through funding for workshops (including virtual seminars) and for visits by experts and colleagues from abroad through the IAS Benjamin Meaker Visiting Professorships scheme.

Application Deadlines:

- Benjamin Meaker Visiting Professorships: 31-Mar-16 (May to August 2016), 26-Feb-16 (medium-term)
- University Research Fellowships: 12-Feb-16 (for University Research Fellowships, University Senior Research Fellowships, IAS Research Fellowships and Translational

Neuroscience Research Fellowships)

British Medical Association
Research grants

Closing Date: 07-Mar-16 Award amount: £50,000

Aim to encourage and further medical research in a variety of subject areas:

- HC Roscoe grant, worth £50,000, for which proposals on the common cold or other viral diseases of the human respiratory system may be submitted by BMA members
- Helen H Lawson grant, worth £50,000, for which proposals on novel technologies and organisational systems in patient care, primary care or public health may be submitted by registered medical practitioners who are members

European Federation of Immunological Societies
World fellowship

Closing Date: 07-Mar-16 Award amount: €10,500

Supports scientific collaboration, advanced training, learning techniques or methods not available in the applicant's current place of work. To build a strong international network of immunological research. Each applicant must be under 35 years of age and a member of a society affiliated with EFIS.

NIHR
Programme development grants
Closing date: 08-Mar-16 Award amount: £100,000

Aim to produce independent research findings that will have practical application for the benefit of patients and the NHS in the relatively near future. This is a complementary scheme to allow investigators to undertake preparatory research that will position them to submit a competitive Programme Grant application.

Healthcare Infection Society
Career Development Award

Closing date: 11-Mar-16 Award amount: £30,000

Supports infection prevention and control professionals to advance their careers by enhancing practice in their own institution or elsewhere within their health system in the sphere of

healthcare associated infection prevention and control. The award will enable professionals to acquire new skills and perspectives from having spent some time in another department, which includes enhanced surveillance or learning more about decontamination in challenging situations. Professionals who have been in their present post for a at least three years, and who are active in the field of infection prevention and control, may apply. Applicants must be members of the society.

ERA-NET Infect-ERA

European funding for infectious diseases research

Closing Date: 17-Mar-16 Award amount: unspecified

Funds transnational and translational research, bringing together basic, applied, technology-driven and clinical research approaches regarding human infectious diseases. Proposals may address the following topics:

- the host-pathogen interactions, with regard to clinically relevant microbial clones, focused on host susceptibility
- development of innovative strategies for the diagnostic and treatment of high clinically relevant microbial infections; optimisation of antimicrobial therapy in an individual patient and development of biomarkers to allow individual response prediction

A portion of the available funding is dedicated especially to consortia of young scientists.

World Health Organization

Call for proposals: Polio eradication initiative

Closing Date: 18-Mar-16 Award amount: US$300,000 (approx.)

For research projects that will significantly contribute to polio eradication. Priority is given to projects targeting the following objectives:

- detection and interruption of all poliovirus transmission
- strengthening of immunisation systems and withdrawal of oral polio vaccine

European Federation of Immunological Societies

Travel grants

Closing Date: 18-Mar-16 Award amount: €1,500

Enable young postdoctoral investigators and PhD students to attend the International Congress of Immunology, to be held from 21 to 26 August 2016 in Melbourne, Australia. Appli-

cants must be under 35 years of age and belong to an EFIS affiliated national society. They must be the first author of an abstract submitted to the ICI.

Bayer
Grants4Targets

Closing Date: 31-Mar-16 Award amount: €125,000

Aims to encourage research on novel targets and disease-related biomarkers in the fields of cardiology, hematology and ophthalmology. The following different types of grants, depending on the specifics of the target and its development phase will be awarded:
•support grants worth between €5,000 and €10,000 to advance research on targets that are at a very early stage of discovery;
•focus grants worth between €10,000 and €125,000 for more mature ideas, such as addressing specific aspects of a target as a first step towards transferring it to the drug discovery process.

British Infection Association
Travel awards

Closing Date: 31-Mar-16 Award amount: £1,000

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. PhD students must have a letter of support from their supervisor.

British Infection Association
Research Fellowship

Closing date: 31-Mar-16 Award amount: £70,000

Supports trainees undertaking infection-related research in an academic centre in the UK, or appropriate UK-linked centre overseas. Applications are open to clinically qualified trainees in infection or infection-related specialities who are not in a consultant level post, or non-clinical postdoctoral scientists within four years of the award of their PhD who are not in a tenured academic or top-grade scientist post.

European Foundation for the Study of Diabetes
European research programme in microvascular complications of diabetes

Closing Date: 01-Apr-16 Award amount: €300,000

Aims to stimulate and accelerate European basic and clinical research focusing on microvascular complications of diabetes. Projects involving clinical trials will not be considered. Grants are worth up to €100,000 for basic research projects and up to €300,000 for clinical research projects. Clinical research projects must have a maximum duration of three years.

British Society for Immunology

Communicating immunology grants

Closing Date: 01-Apr-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.

Department of Health

Health services and delivery research programme – researcher-led workstream

Closing Date: 14-Apr-16 Award amount: unspecified

Supports research into the quality, effectiveness and accessibility of health services, including evaluations of how the NHS might improve delivery of services. For this round, proposals around the organisation and quality of care in the last year are encouraged.

This includes research to identify cost-effective models of specialist palliative care and evaluation of other promising service innovations to provide joined up, person centred care to those at the end of life. Applicants may submit either a standard outline proposal or an evidence synthesis full proposal. The workstream has a continued interest in research areas including: surgical and implantable devices; primary care interventions; very rare diseases; long-term conditions in children.

NIHR will fund HEIs at a maximum of 80 per cent of fEC except for equipment worth over £50,000.

Above and Beyond and University Hospitals Bristol

Research Capability Funding

Closing date: 26-Apr-16 Award amount: £20,000

Aim to promote high quality biomedical research in UH Bristol. Applications are welcomed from any medical or non-medical UH Bristol employee, or university academic (Universities of Bristol and the West of England) holding an honorary contract with UH Bristol. Funds can be used to:

- Fund Research Sessions/PAs (for medical and non-medical staff) to allow time to prepare NIHR research grant applications;
- Fund the generation of preliminary or underpinning data to support an NIHR application (pump-priming)

National Institute of Allergy and Infectious Diseases

NK cells to induce immunological memory to prevent HIV infection (R01)

Closing date: 07-May-16 Award amount: not limited

To support 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.

National Institute of Allergy and Infectious Diseases

NIAID clinical trial implementation cooperative agreement (U01)

Closing Date: 13-May-16 Award amount: not limited

Support cooperative agreement applications for implementation of investigator initiated high-risk clinical trials and mechanistic studies associated with high-risk clinical trials. The trials must be hypothesis and milestone-driven.

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.

THIS ISSUE'S SHOWCASED ARTICLE

Cavalcanti IMG, Nobbs AH, Ricomini-Filho AP, Jenkinson HF & Cury AADB (2016). Interkingdom cooperation between *Candida albicans*, *Streptococcus oralis* and *Actinomyces oris* modulates early biofilm development on denture material. *Pathogens and disease*. Published online 10 January 2016.

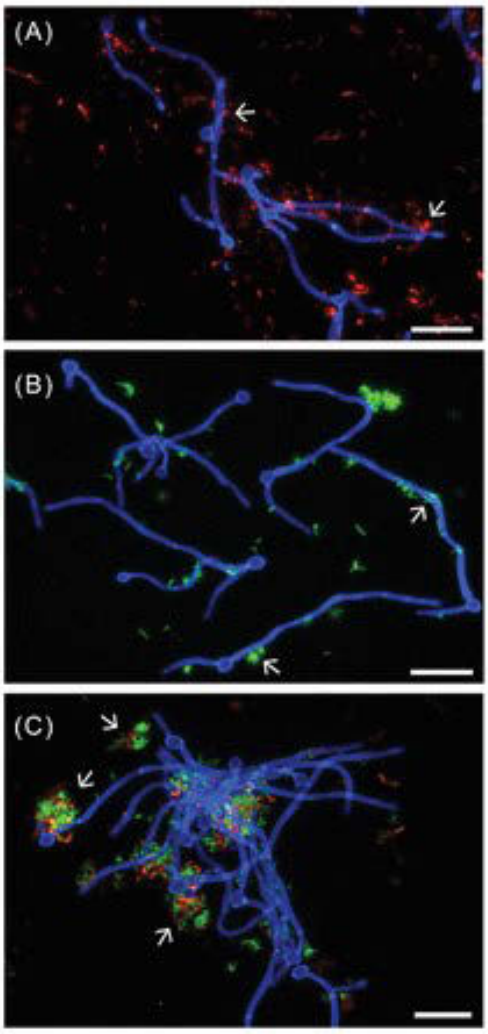


Image caption: Fluorescence micrographs of planktonic interactions between C. albicans hypha-forming cells and S. oralis or A. oris. Candida albicans cells were induced to form hyphae, as described in Materials and Methods section, and then incubated with TRITC-labelled (red) S. oralis (panel A), FITC-labelled (green) A. oris (panel B), or both bacterial species (panel C). Arrows in panel A show clusters of streptococci associated with hyphal filaments, while arrows in panel B show similar accumulations of actinomyces. In panel C, arrows indicate coaggregated clumps of bacteria adhered to hyphal filaments. Scale bars 50 µm.

Candida-associated stomatitis affects up to 60% of denture wearers, and *Candida albicans* remains the most commonly isolated fungal species. The oral bacteria *Actinomyces oris* and *Streptococcus oralis* are abundant in early dental plaque. The aims of this study were to determine the effects of *S. oralis* and *A. oris* on the development of *C. albicans* biofilms on denture material. Resin discs were coated with saliva and at early (1.5 h) or later (24 h) stages of biofilm development, cell numbers of each species were determined. Spatial distribution of microorganisms was visualised by confocal scanning laser microscopy of biofilms labelled by differential fluorescence or by fluorescence in situ hybridisation. Inter-kingdom interactions underpinning biofilm development were also evaluated planktonically utilising fluorescence microscopy. Synergistic interactions between all three species occurred within biofilms and planktonically. Bacterial cells co-aggregated with each other and adhered singly or in co-aggregates to *C. albicans* hyphal filaments. *Streptococcus oralis* appeared to enhance hyphal filament production and *C. albicans* biovolume was increased 2-fold. Concomitantly, cell numbers of *S. oralis* and *A. oris* were enhanced by *C. albicans*. Thus, cooperative physical and metabolic processes occurring between these three microbial species intensify pathogenic plaque communities on denture surfaces.

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Carver S, Beatty JA, Troyer RM, Harris R, Stutzman-Rodriguez K, Barrs VR, Chan C, Tasker S, Lappin MR & van de Woude S (2015). Closing the Gap on Causal Processes of Infection Risk from Cross-Sectional Data: Structural Equation Models to Understand Infection and Coinfection. *Parasites and Vectors*. 8, p658

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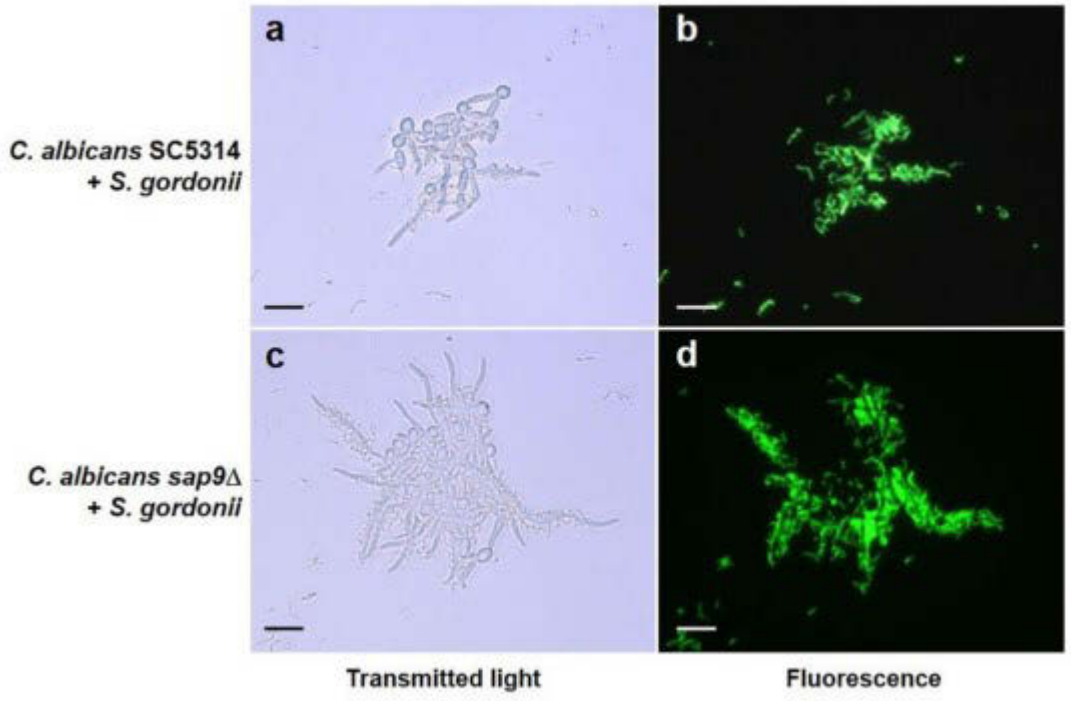

Image caption: Interactions of S. gordonii *DL1 cells with* C. albicans *SC5314 wild type or sap9Δ mutant.* C. albicans *cells were induced to form hyphae in YPT-Glc medium in suspension culture for 2 h at 37oC (planktonic conditions). Bacteria were fluorescently labelled with FITC (green) and were incubated for 1 h at 37oC with hyphae-forming cells in YPT-Glc. Transmitted light microscopic images (a, c) and corresponding fluorescence images (b, d) are shown. Scale bars = 20 µm.*

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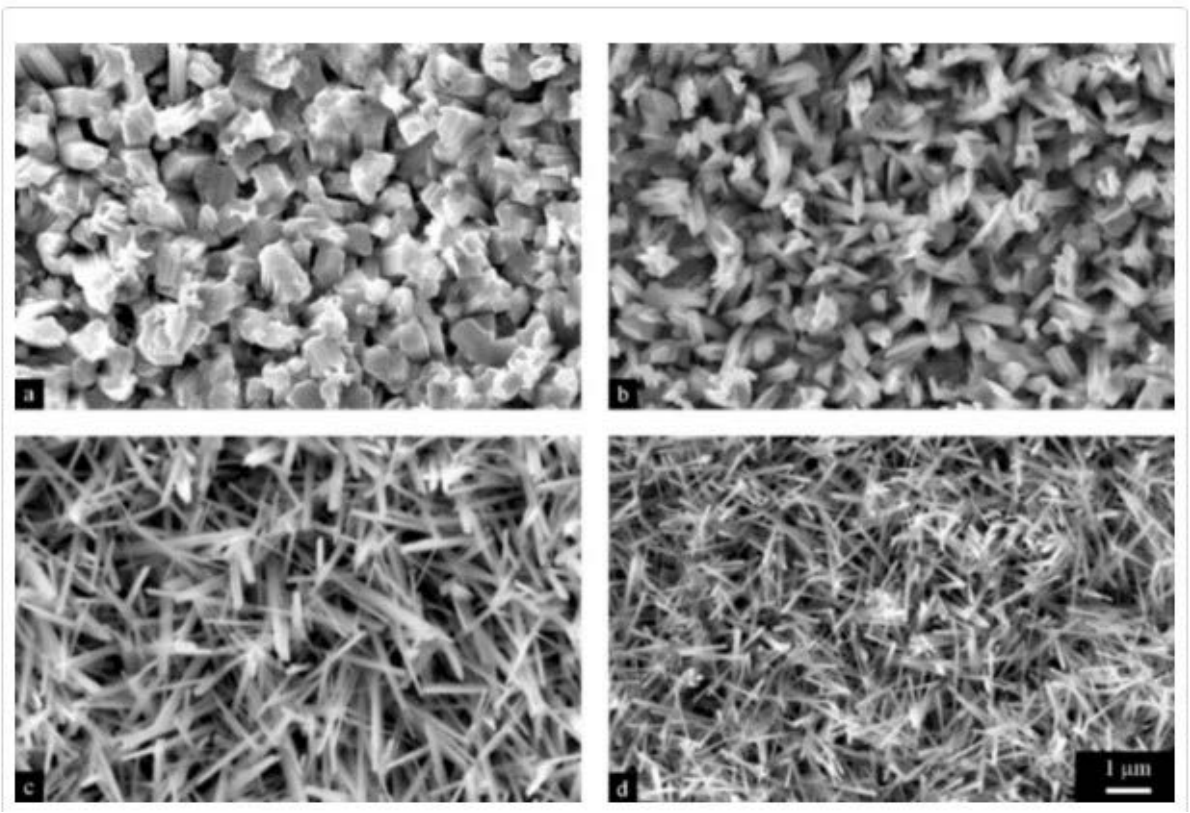

Image caption: SEM images of nanospikes on Ti64 substrates after thermal oxidation at various Ar flow rates through the acetone bubbler. (a) 50 sccm, (b) 100 sccm, (c) 200 sccm and (d) 300 sccm. All surfaces were imaged after removal of carbon at 600 °C.

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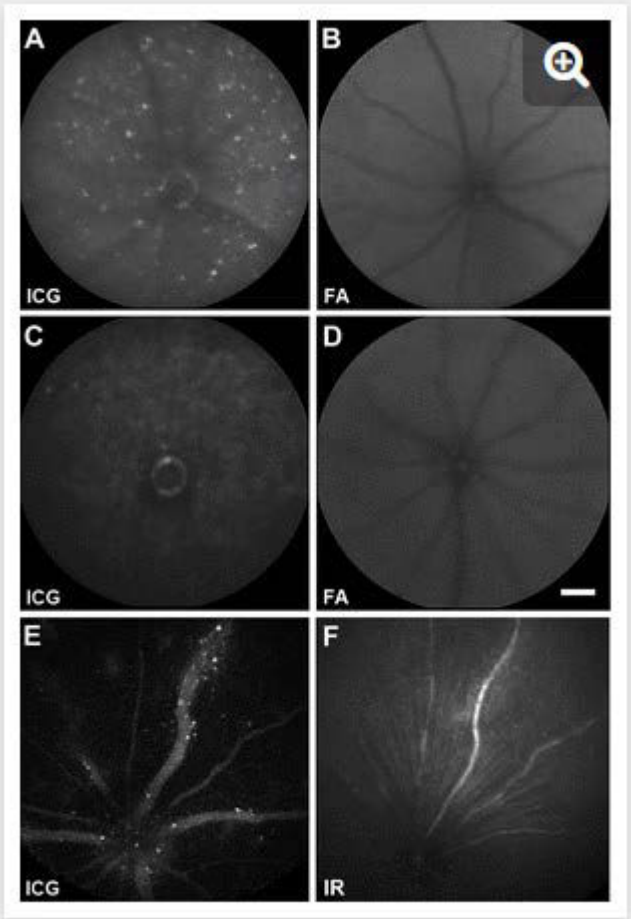

Image caption: In vivo *labelling of infiltrating leukocytes in two murine models of ocular inflammation. (A) Inflammatory infiltration of the deep retina/choroid of an eye with endotoxin-induced uveitis, imaged using a scanning laser ophthalmoscope with a near-infrared filter (790-nm diode excitation laser and 800-nm long-pass filter). ICG-labelled cells were visualized as white dots throughout the 55° field of view after an intraperitoneal (i.p.) injection of ICG (5 days before imaging) and induction of systemic inflammation with an i.p. injection of lipopolysaccharide (2 days before imaging). (B) An image of the deep retina/choroid of the same mouse was taken in the fluorescein angiography (AF) channel, using a blue-light filter (488-nm solid-state excitation laser and 500-nm long-pass filter). No white dots are present, demonstrating that white dots imaged in A are not a consequence of autofluorescence but ICG-labelled cells. (C) A control mouse that only received i.p. ICG (3 days before imaging). Imaging with a near-infrared filter showed only a few sporadic ICG-labelled cells, suggesting a low-level circulation of myeloid cells into the retina. (D) An image of the deep retina/choroid of the same mouse was obtained using the 488-nm channel, illustrating that the identified cells were not autofluorescent in this range. (E) Inflammation of a retinal vein (vasculitis) is visualized using the near-infrared filter in an eye at peak experimental autoimmune uveitis. ICG-labelled cells were visualised as white dots clustering around a segment of vasculitis. Mice with experimental autoimmune uveitis received an injection of i.p. ICG 3 days before imaging peak disease on day 26. (F) An infrared-reflectance (IR) image (820-diode excitation laser, no barrier filter) of the same mouse was obtained, which demonstrates the segment of retinal vein affected by vasculitis with increased reflectance (higher white intensity) of the vein itself, and surrounding tissues. Of note, no white dots were observed in this image, indicating that again, the white dots observed in (C) are not the result of autofluorescence but of ICG-labelled cells.*

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