

Bristol Infection And Immunity Research

Your
Future
Research
Partner



Introducing your future research partner

Infection and Immunity in Bristol is a core research theme, boasting an exceptional track record in clinical and commercial translation and entrepreneurship.

Approximately 120 academic and clinical research leaders work in state of the art research facilities, along with colleagues in local NHS trusts and the Health Protection Agency. Bristol I&I benefits from a strong culture of cross-disciplinary research, combining expertise ranging from genetics, molecular and cell biology, to whole animal, human and population studies.

The research capability of Bristol I&I has been extensively recognised by public funding bodies, national and international charities and industry. Our latest report (2009-2011) indicated that I&I attracted £14 million investment.

Our know-how in managing the academic-commercial interface, means that Bristol I&I can meet the differing needs of our partners, offering unique and exciting opportunities for projects and programs through from target discovery to drug, diagnostic and device development.

Our expertise spans the core aspects of infection and immunity, with particular emphasis in the following areas:

Autoimmunity and inflammation

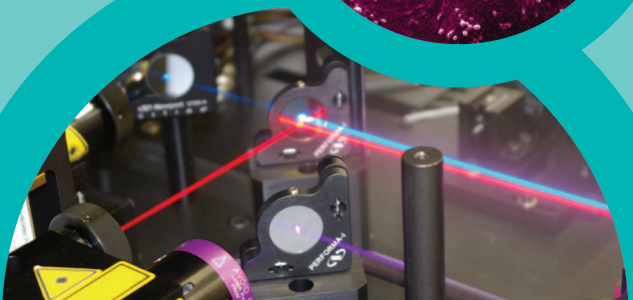
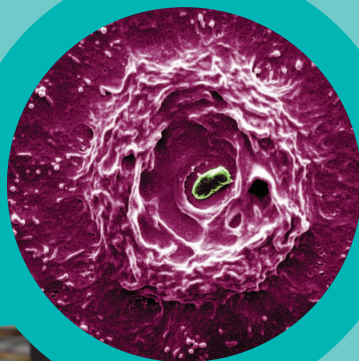
Infection and Immunity in Bristol has a proven track record in uncovering novel disease processes and therapeutic targets as well as an ability to develop these into lead candidates.

New therapies invented by our academics are in clinical trials in **multiple sclerosis, psoriasis and asthma**.

Disease pathogenesis studies have informed the design of clinical trials, and a wide range of *in vitro* and *in vivo* models can be used to inform target selection and lead optimisation.

Bristol I&I is internationally recognised for its excellence in autoimmune disorders, particularly those involving the brain and eye, where our initiatives have achieved success in the pull-through of immunotherapeutic targets into early phase trials in both multiple sclerosis and **uveitis**. Bristol, in collaboration with UCL and Moorfields Eye Hospital leads the Inflammation and Immunotherapy Theme of the UK's flagship centre for ocular experimental medicine, supported by collaborations with GSK, Novartis and a range of SMEs.

We are focusing current research on the two key challenges of inducing immune regulation for the treatment of the ever widening list of inflammatory disease targets, and identifying and tailoring therapies to stratified patient groups.



Microbial pathogenesis and antimicrobials

Research within Bristol I&I focuses on understanding the molecular basis of interactions between microbes and hosts, the mechanisms by which tissue damage occurs and the development of **antimicrobial resistance**. Integration of these areas of activity is key to the design of new therapies and adjunctive approaches to target biofilms and virulence. Our partnership with local NHS trusts and regional microbiology services provides access to clinically relevant strains and expertise for the testing and implementation of new diagnostic and therapeutic approaches. We have particular expertise in the study of **respiratory tract** and **gastrointestinal pathogens**.

Work is carried out in collaboration with academic and industrial partners to identify new pathways as targets and to determine the effects of novel treatments using *in vitro* and *in vivo* models of efficacy and pharmacokinetics/dynamics. We host the Bristol Centre for Antimicrobial Research and Evaluation (BCARE), through which we deliver to the needs of pharma and biotech companies.

Our broad-ranging research portfolio, spanning detailed 'omics' based approaches all the way through to examining the effects of new treatments in pathogen and host populations, makes Bristol I&I a unique partner for microbiology research and development.

Emerging and chronic viral diseases

Research in Bristol I&I focuses on virus interactions with the host and on the interplay between inflammation as a means of controlling infection and as a cause of pathology. These factors are increasingly recognized as the key to unlocking new therapeutic targets and to understanding how vaccination can best impact on disease.

Research spans genetic, molecular and cellular systems into epidemiology and mathematics and is

particularly focused on **coronaviruses, dengue, adenoviruses, hepatitis and HIV**. Elucidating how these viruses compromise host health and can manipulate the body in order to persist, spread and cause cancers is core to our research.

High throughput quantitative proteomics and deep sequencing approaches are used widely and offer a gateway through which we can develop new approaches to meet your need as our partner.

Mucosal and vaccine immunology

The development of better vaccines is the most attractive approach to the control of infectious diseases. I&I research in Bristol has long focused on the pathogens and processes that affect colonization of and immunological responses at mucosal surfaces. The use of *in vitro* and *in vivo* studies in models and natural hosts enables detailed determination of disease processes and of the impact of novel vaccine approaches and delivery systems.

Particular expertise can be accessed in Bristol I&I around naturally-acquired mucosal immunity to upper-respiratory tract pathogens such as **meningococcus and pneumococcus** and the impact and immune mechanisms of licensed and developmental vaccines. Bristol is one of the most active clinical vaccine trial centres in the UK, undertaking a range of publicly and industry-funded studies. As well as a large clinical research team, our labs provide a full range of human and animal humoral and cellular immune assays as well as culture and non-culture microbial detection methods.

An environment providing access to state of the art facilities

'OMICS'

Proteomics, genomics and transcriptomics facilities underpin the work of Bristol I&I. Our facilities offer a bespoke service to our research partners, integrating program design, sample analysis and data interpretation using the latest cutting edge technologies including: the Orbitrap™ Mass Spectrometry for whole proteome analysis and quantitative proteomics; the Ion Personal Genome machine and the Ion Proton (both utilising Ion Torrent Semi-Conductor Technology, Life Technologies) to perform high throughput Next Generation Sequencing of amplicons, sets of genes and small genomes, through to whole transcriptomes and large genomes.

Bioimaging

The Wolfson Bioimaging Facility houses a wide range of light and electron microscopes, including confocal, spinning disk, TIRF, TEM and SEM, together with a full suite of EM preparation equipment to support our basic and translational research. Specialised expertise in live cell imaging, correlative light/electron microscopy, cryo-EM and electron tomography is available to suit our partners' needs.

Flow cytometry

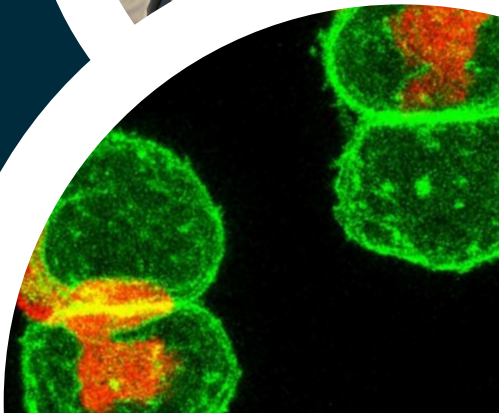
High speed digital benchtop cytometers provide a platform for cell analysis and the Fluorescence Activated Cell Sorter can isolate populations of interest from a wide variety of cells or other particles. Aseptically sorted cells can be cultured for downstream studies or used for nucleic acid profiling. Customised services in assay and dye optimisation help to maximize the value of research carried out with our partners. Currently the facility offers 12 parameter 4 way sorting.

In vitro and *in vivo* disease modeling

A commitment to the 3Rs over many years enables Bristol I&I to deliver optimal *in vitro* and *in vivo* models to support target validation and lead optimisation across inflammatory and infectious diseases. Our partnership with KWS BioTest Ltd, a University of Bristol spin-out company, offers true breadth and depth to study indication specific readouts and offer screening cascades for drug discovery. Our tissue bank facilitates access to a wide range of patient samples for Bristol I&I members with their partners.

Clinical trials and whole body imaging

Bristol houses a state of the art imaging centre with a Siemens 3 Tesla Magnetom Skyra MRI scanner, a two-room sleep laboratory and four clinical investigation suites alongside laboratory and computing facilities. This is part of a wide infrastructure facilitating UKCRC-registered clinical trials with our colleagues in the local NHS trusts, across a wide range of therapeutic areas and types of interventions. The MRC ConDuCT Hub provides a regional focus for cutting-edge research in randomised clinical trials, and DECIPHER is a UKCRC-funded collaboration between Bristol, Cardiff and Swansea, focused on developing and evaluating multi-level interventions for children and young people.



A culture of translation, enterprise and partnering

Bristol I&I offers partnering opportunities ranging from:

- Contract studies
- Joint programmes funded by our partners or as part of grant funded schemes such as CASE studentships, Biomedical Catalyst, KTP, TSB and RCUK MICA
- Licensing opportunities
- Joint venture opportunities.

Our spin-out companies include:

- Apitope Ltd - developing novel peptide-based therapies for autoimmune and inflammatory diseases
- Trident Pharmaceuticals Inc - developing immune modulating bacterial products for the treatment of inflammatory diseases
- KWS BioTest - a CRO offering services for drug discovery in immunology, inflammation, infection and bioanalysis.

Existing partnerships include:

AstraZeneca
Pfizer
GSK
Merck
Immbio
Novartis
Unilever

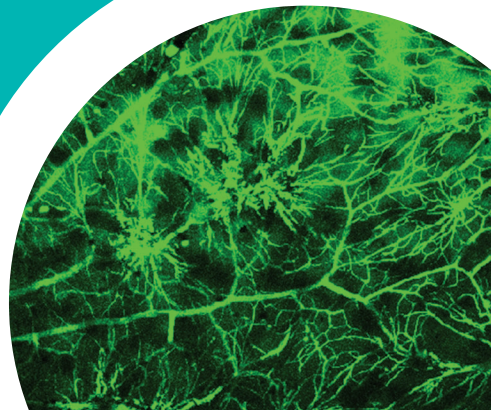
Research & Enterprise Development (RED) supports Bristol I&I working seamlessly in partnership to deliver your needs.

“GSK Vaccines has had a long standing and fruitful collaboration with Prof. Mumtaz Virji and her team in Infection and Immunity in Bristol since 2002. The success of this collaboration is the result of common research interests, mutual trust and a common vision on how to use the research outputs with the aim to develop new vaccine solutions.”

Philippe Denoel, PhD, Director, External R&D and Innovation, GlaxoSmithKline Vaccines

“Partnership with an industrial partner, Unilever, provided a more balanced, rounded approach to my PhD than would have been achieved in an academic environment alone. Having both academic and industrial supervisors allowed different perspectives to be sought, often generating new avenues for investigation.”

Dr. Suzanne Humphrey, former CASE PhD student



Contact Us

We are seeking to create strategic partnerships with industry, from small biotech companies to large multinationals. We offer the benefits of our multidisciplinary research approach, access to high-tech facilities and the opportunity to connect with world-renowned experts in the field.

If you would like to know more about the Bristol I&I theme or if you have a specific query; or would like to get in touch with a specific member of our team, please don't hesitate to contact us.

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