



Rigorous, Relevant Research

Communicable Diseases

► Introduction

Our interdisciplinary research team members are focused on the interface between microbes and their host. Through a fundamental understanding of the molecular mechanisms of infection and immunity we are improving our understanding of microbial pathogenicity and host responses to infection. Within world-class laboratories we use a range of leading molecular and cell biological approaches, including novel in vitro models of tissues, fluorescence and luminescence analysis and flow cytometry, for our research that includes key collaborations with clinical practitioners and pharmaceutical companies.

With insight gained from our research we are focused upon the development of innovative approaches for:

- Early, sensitive and specific diagnosis of infection
- Control and treatment of important infectious diseases due to MRSA, Clostridium difficile and other clinically relevant microorganisms associated with healthcare associated infection
- Improving understanding the risk of and management of infections at home, work and clinic
- Characterisation and modulation of the host response to infection
- Developing animal-free in vitro models for use in therapeutic evaluation

► Sponsors and funders

Our work is sponsored by a variety of organisations including research councils (BBSRC, EPSRC); charities (The Wellcome Trust, The Humane Research Trust, Nc3Rs), Department of Health, pharmaceutical companies, and medical industry.

► Link to group web page:

www.aston.ac.uk/lhs/research/biomedical/communicable/

► Key contact

Dr Andrew Devitt
e-mail: a.devitt1@aston.ac.uk
tel: 0121 204 4165

► Key projects

Our research includes a wide variety of work ranging from fundamental biological research though to applied clinical studies and defined project work. These projects include:

- Development and testing of novel anti-microbial approaches to antiseptics of skin and disinfection of surfaces and medical appliances
- Generation and testing of novel anti-microbial agents for therapy of infectious diseases (e.g. TB)
- Investigating novel strategies for elimination of Clostridium difficile spores from the environment
- Geographical information system (GIS) mapping of infectious disease
- Investigating the molecular characteristics of bacterial biofilms
- Establishing the role of animal and insect vectors in the transmission of infectious disease
- Comparative characterisation of the molecular mechanisms of pro-and anti-inflammatory effects of the innate immune system in responses to pathogens and apoptotic cells
- Characterisation of responses to infection and immune system challenge in a wide variety of immune and non-immune cells, including models of respiratory and gastric mucosal surfaces
- Characterising the molecular mechanisms underlying the role of the innate immune system in:
 - Clearance of pathogens and dying (apoptotic) cells
 - Response of cystic fibrosis (CF) airways epithelial cells
 - Responses to LPS, in primary cultures of colonic mucosa and in healthy and diseased models of human airways epithelium using LPS isolated from relevant respiratory pathogens
- Investigating early biomarkers of inflammation using multi-cellular, three-dimensional models of human airways
- Developing robust, authentic models of human airways for use in drug testing and validation