



## Rigorous, Relevant Research

## Molecular & Cell Biology

### Introduction

The study of molecular and cell biology is central to understanding mechanisms of health and disease and underpins technological advances in drug discovery. Research at Aston focuses on cell signalling, translation, membrane transport, membrane biology, actin remodelling, extracellular matrix cross-linking, innate immunity and protein oxidation.

This knowledge is exploited to facilitate drug development through the identification of suitable targets, their generation as recombinant proteins, the development of humane techniques which facilitate drug development and toxicity testing, and the use of novel materials for tissue repair.

We use a wide array of approaches including real-time microscopic imaging of live cells and their components, surface-plasmon resonance, molecular mutation, the exploitation of novel expression systems, and both genomic and proteomic analyses.

### Sponsors and funders

- BBSRC
- EPSRC
- The European Commission
- The Royal Society
- The Wellcome Trust
- The Humane Research Trust
- Antidote Direct
- Alzheimer's Research Trust
- Dunhill Medical Trust
- Astra Zeneca Ltd
- Applikon Biotechnology
- Unilever Ltd
- Glycoform Ltd
- Johnson & Johnson Ltd
- Pfizer Ltd

### Key projects

- Regulation of membrane transport via fibroblast growth factor receptor signalling
- Yeast biotechnology especially as applied to drug discovery pipelines

- Gaining mechanistic insight into recombinant protein production
- Development of a neurosphere system for the developmental toxicity modelling of human embryotoxicity
- Development of novel catheter coatings to prevent blockage by blood clots and subsequent infection by *Staphylococcus aureus*
- Production of novel collagen-derived biomaterials for the repair of damaged corneas
- Investigation of molecular mechanisms underlying the role of ICAM-3 in the phagocytic clearance of apoptotic leukocytes
- Evaluation of monocyte/macrophage function throughout the ageing process
- Characterisation of the molecular constitution of apoptotic bodies released during cell death and their role in macrophage chemoattraction
- Establishing the role of eukaryotic elongation factor isoforms in actin remodelling
- Consequences of eukaryotic elongation factor expression on cellular migration
- Systems biology approaches for engineering novel insulin secretion-promoting peptides
- Bead-based delivery of proteins to cells
- The use of cysteine-scanning accessibility mutagenesis to study the topography of the CGRP receptor
- Structural studies on RAMPs and CLR;
- Tetracyclines as anti-inflammatories
- Neuronal stem cell models of Alzheimer's and ageing
- Investigating plasma factors in patients with periodontitis

### Link to group web page:

[www.aston.ac.uk/lhs/research/biomedical/mcb](http://www.aston.ac.uk/lhs/research/biomedical/mcb)

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