Nurturing the future leaders in biomedical research

Lister Institute Prizewinners 2018

Dr Tom Baden, University of Sussex

Visual information processing and the natural input
We are interested how individual and small groups of neurons arranged into microcircuits break sensory patterns into parallel, highly specific representations of the outside world. We use a combination of 2-photon imaging of genetically encoded biosensors, electrophysiology, patterned light stimulation and computational modelling to probe the visual processing of individual and networks of neurons in the retina and brain of zebrafish and mice. We also study the distribution of visual features in the natural visual world to better understand how different visual systems have evolved to optimally process their own natural input.

Dr Rebecca Corrigan, University of Sheffield

The functioning of (p)ppGpp and the pathogenesis of *S. aureus*.
My research involves an in-depth characterisation of nucleotide signalling systems in the Gram-positive pathogen *Staphylococcus aureus*. *S. aureus* is a human pathogen responsible for a vast array of disease and morbidity worldwide, a problem that is exacerbated by the spread of antibiotic-resistant strains such as methicillin resistant *S. aureus* (MRSA).

Dr Mark Dodding, University of Bristol

A new chemical biology approach to target molecular motors for the manipulation of cytoskeletons and organelle dynamics
Research in my lab aims to understand the molecular mechanisms and signaling pathways that control the distribution and dynamics of subcellular components, focusing on structure, function, molecular mechanism and regulation of the key biomolecular machines and multiprotein complexes that regulate cellular organisation.

Dr Matthew Hepworth, University of Manchester

Targeting cell metabolism to regulate innate lymphoid cells in health and disease

My research programme focuses on understanding the innate immune pathways that act to regulate inflammation at mucosal barrier tissue sites. Cells of the innate system play key roles in interpreting cues from the tissue microenvironment in order to educate the adaptive immune system. Recent reports in mice and humans have identified subsets of innate lymphoid cells (ILCs) as key mediators of inflammation, immunity and tissue repair at mucosal barrier surfaces through the production of effector cytokines.

Dr Yanlan Mao, University College London

Mechanochemical regulation of tissue growth and morphogenesis

We are interested in understanding how tissues achieve their correct size, shape and complex three-dimensional architecture, both during normal development, and during regenerative growth. We use an interdisciplinary approach, combining *Drosophila* genetics, live imaging, automated image analysis, experimental biophysics, engineering and computational modelling, to understand the importance of mechanical forces in controlling tissue growth and regeneration and how these forces in turn influence gene expression and signalling pathways.

Dr Joseph Marsh, University of Edinburgh

The dominant-negative effect in protein complexes: implications for human genetic disease

We use computational methods to study the role of protein complexes in normal biological process and in human disease. We are investigating the types of proteins most likely to be associated with a dominant-negative mechanism and how this is related to their patterns of assembly and quaternary structure organisation.

Dr Amanda Sferruzzi-Perri, University of Cambridge

The environmental and genetic control of placental morphogenesis and function

My interest lies in understanding the aetiology of pregnancy complications and the regulation of developmental processes in a wider context. My laboratory has been investigating the environmental and genetic control of placental morphogenesis and function and its relevance for fetal development, maternal health and the long-term programming of disease.