

Sharon Tooze

Secretory Pathways Group

Organelle biogenesis is crucial for cell function and cell survival in both normal and pathological situations. Understanding how the compartmentalisation and function of subcellular organelles is affected by pathological situations is important in understanding disease. Our current research focuses on autophagy, a survival response upregulated by nutrient deprivation and stress. We aim to understand the induction and formation of autophagosomes and the signals leading to autophagy.



Helen Walden

Protein Structure Function Group

The ubiquitin-proteasome pathway (UPP) has emerged as a predominant cellular regulatory mechanism with roles in controlling cell division, signal transduction, development and the immune response. Studying the molecular mechanisms controlling protein turnover will enhance our understanding of these critical systems and also provide scaffolds for the design of therapeutics.



Richard Treisman

Transcription Group

We study how extracellular signals control transcription, using as a model the transcription factor Serum Response Factor (SRF), whose activity is regulated by multiple cofactors. Our studies focus predominantly on its MRTF cofactors, whose activity is regulated by interaction with G-actin, and by multiple constitutive and growth factor-controlled phosphorylations; and function of its TCF cofactors and ERK signalling to SRF in immune cells.



Michael Way

Cell Motility Group

Defects in cell adhesion and migration can be devastating, causing tumour cells to metastasise to distant parts of the body and establish new tumours. We work on understanding the molecular basis of signalling networks and their role in regulating the complex processes of cell adhesion and migration using imaging, biochemical and genetic approaches.



For further information about the London Research Institute, visit: www.london-research-institute.org.uk

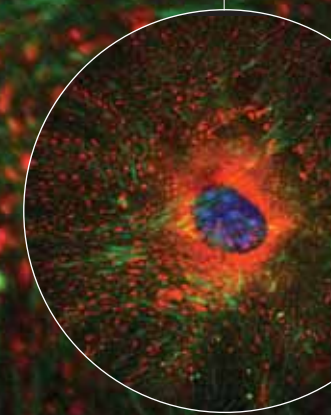
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Signal Transduction:
 Molecular Cell Biology



The Cancer Research UK London Research Institute has an international reputation for research into the basic biology of cancer. Themes of research are signal transduction (biology of tissues and organs, and molecular cell biology) and genome integrity (cell cycle and chromosomes, and DNA repair). Our group leaders who work on signal transduction, specifically molecular cell biology, have outlined their laboratories' research below.

Paul A Bates

Biomolecular Modelling Group

We are interested in understanding data that describes the structure and function of proteins, and in mapping how these interact with one another. This involves not only the analysis of the more than 30,000 known protein structures but also, with the aid of computer simulations, the way in which the flexibility, mobility and specificity of proteins can affect their interactions.

Axel Behrens

Mammalian Genetics Group

Mitogen activated protein (MAP) kinases are essential mediators of signal transduction between the cell surface and the nucleus in eukaryotic cells. Our focus is the elucidation of the molecular mechanism of MAP kinase signalling and the understanding of how an apparently generic signal can generate finely tuned cell type-specific biological responses.



Julian Downward

Signal Transduction Group

We are interested in the signalling networks regulating cell growth and transformation, in particular the differences between normal and cancerous cells. We use functional genomic approaches, including genome-scale RNA interference screening, to identify novel components of signalling pathways controlled by oncogenes such as Ras.

Caroline Hill

Development Signalling Group

The TGF- β superfamily of growth and differentiation factors has a prominent role in metazoan biology. We aim to understand how these ligands transduce their signals to the nucleus and the biological consequences of this signalling. We investigate the pathways both when they are functioning normally (early vertebrate development) and when signalling is perturbed (tumourigenesis).

Banafshe Larijani

Cell Biophysics Group

We study links between structural regulation and signalling during membrane fusion by applying nano-technology tools, such as fluorescence lifetime imaging microscopy (FLIM), NMR spectroscopy and lipid mass spectrometry, to provide increased insight into molecular associations in intact cells.

Neil McDonald

Structural Biology Group

We use X-ray crystallography and biochemical methods to investigate the molecular function of proteins relevant to human cancer. We aim to define key regulatory mechanisms at an atomic level: those governing the activity of protein kinase and phosphatase components of growth factor-dependent signalling pathways, and the endonucleases involved in the repair of intra- and inter-strand DNA crosslinks.

Peter Parker

Protein Phosphorylation Group

Protein kinases play critical roles in disease with mutations linked to various pathologies including a variety of somatic mutations that have been identified in human tumours. Developing our understanding of these proteins and how they link to the phenotypic hallmarks of cancer provides evidence on therapeutic, diagnostic and prognostic potential for these signalling pathways.

Giampietro Schiavo

Molecular Neuropathobiology Group

Our laboratory aims to provide an integrated approach to the study of membrane dynamics at the nerve terminal. We hope to define the mechanism responsible for the uptake and sorting of ligands to axonal transport pathways and the role of lipids in the regulation of exocytosis and endocytosis.

Almut Schulze

Gene Expression Analysis Group

Many signalling pathways transfer signals from cell surface receptors to the nucleus that result in altered gene expression. By analysing changes in gene expression induced by oncogene activation we hope to elucidate their mode of action and identify novel targets for therapeutic intervention. We aim to understand the way signalling processes that are targeted by oncogenes are wired to transcriptional control and gene expression.

Erik Sahai

Tumour Cell Biology Group

In order for cancer cells to spread through the body they must acquire the ability to move. We use high-resolution imaging of living tumours and 'organ culture' models to study cytoskeletal organisation of moving cancer cells and understand how factors in the local tumour environment promote motility.

Nic Tapon

Apoptosis and Proliferation Control Group

We are trying to understand how organ size is determined *in vivo*, using the fruit fly *Drosophila melanogaster* as a model organism. In particular, we are studying a pathway comprising the kinases Hippo (Hpo) and Warts (Wts), as well as the scaffold proteins Salvador and Mob1. These proteins normally restrict tissue size by promoting cell cycle exit and programmed cell death.

