IUBMB-FEBS-FASBMB
PROBio-Africa Fellowships
Host mentor / laboratory information

Name: Dr Greg Findlay
Affiliation: MRC-PPU, School of Life Sciences, University of Dundee, United Kingdom
Email: g.m.findlay@dundee.ac.uk
Lab webpage: https://www.ppu.mrc.ac.uk/research/principal-investigator/greg-findlay

Scientific interests: Embryonic Stem Cell Signalling in Health and Disease
Our lab applies cutting-edge chemical, genetic, proteomic and transcriptomic technologies to investigate signalling mechanisms that regulate Embryonic Stem (ES) cell biology. Using these approaches, we have uncovered a series of exciting new ES cell signalling pathways, providing key insights into regulation of stem cell maintenance, pluripotency and differentiation. The current aim of this project is to identify the mechanisms by which these pathways function to control ES cell biology. Recently, we have begun exploring how disruptions to stem cell signalling networks lead to human developmental disorders, particularly intellectual disability. A major goal is to pinpoint novel signalling components that are mutated in intellectual disability syndromes, and use stem cell models to elucidate the molecular mechanisms underpinning development of these disorders in patients.

Name: Prof. Irene Díaz-Moreno
Affiliation: University of Seville, Spain
Email: idiazmoreno@us.es
Lab webpage: https://www.iiq.us-csic.es/en/biointeractomics

Keywords: Protein-Protein Interactions, RNA Binding Proteins, Molecular Biocondensates and Liquid-Liquid Phase Separation, NMR-based Metabolomics on Agrifood Products

Scientific interests: Cells promote DNA damage repair and maintain genome integrity through a complex signaling network—the so-called DNA Damage Response (DDR). Recent advances in our research group show that respiratory cytochrome *c* (Cyt *c*) leaves the mitochondria and migrates to the nucleus soon after DNA damage even before caspase cascade activation and apoptosome formation in the cytoplasm. In the nucleus, Cyt *c* interacts with a variety of well-known histone chaperones, namely ANP32A/B, NPM, and SET-TAF-Iβ. We will get deep into the role of Cyt *c* in DDR with the aim to further understand such a molecular mechanism, which is crucial for cell life and fate.

Other info: We offer the opportunity of joining an international and translational team, which provides an interdisciplinary approach to their research work. The student will receive training in methods of research in cell and structural biology, as well as in structural biology and computational modeling.

Name: Dr Tony Ly
Affiliation: University of Dundee, United Kingdom
Email: tly@dundee.ac.uk
Lab webpage: https://www.dundee.ac.uk/people/tony-ly

Scientific interests: Proliferating cells must make an important cell fate choice with each cycle of cell division: to continue to divide, or to enter dormancy. The molecular mechanisms underpinning this cell fate choice are of fundamental and clinical interest.

My research group aims to address these mechanisms biochemically in vitro and in cells using human epithelial cell lines and primary T lymphocytes as model systems.

Name: Dr Ethel Queralt
Affiliation: Biomedical Institute of Valencia (IBV-CSIC), C/ Jaume Roig 11, Valencia, Spain
Email: equeralt@ibv.csic.es
Lab webpage: https://www.ibv.csic.es/en/project/eel1-division-and-cohesin apathies/

Keywords: Mitosis regulation, Saccharomyces cerevisiae, chromosome segregation, human fibroblasts, Cornelia de Lange Syndrome

Scientific interests: Our research interest is focused on the study of Cell Division and Rare Diseases. We investigate the fundamental mechanisms that control chromosome segregation and mitotic progression - the canonical role of mitotic proteins; and on the other hand, we study the functions of a chromosome segregation-associated complex, the cohesin complex, in a human disease such as the Cornelia de Lange Syndrome - the non-canonical role of mitotic proteins.

Name: Dr Seetharaman Parashuraman
Affiliation: Institute of Experimental Endocrinology and Oncology "Gaetano Salvatore" 2nd Unit, Italy
Email: raman.sp@cnr.it
Lab webpage: https://www.su.ieos.cnr.it/cell-physiology.html, https://www.su.ieos.cnr.it/overview.html

Scientific interests: We study the mammalian Golgi apparatus actively pursue the following these research directions:

1) Understanding the functional organization of the Golgi: The Golgi apparatus is a dynamically stable compartment with well-differentiated molecular and/or structural zones. We would like to understand how this organization contributes to the transport and processing (glycosylation) functions of the organelle. To this end, we are building a molecular map of the Golgi apparatus and are interrogating the contribution of the specific spatio-temporal molecular organization to the functioning of the organelle.
2) Functional interaction of Secretory pathway with other modules of the cell: The secretory pathway does not function in isolation and is integrated with other cellular functions (modules) of the cell. We are exploring and defining such relationships, using transcriptomics, in order to create an integrated functional map of the cell (from the perspective of the secretory pathway).

Name: Prof. Julia Shifman
Affiliation: Hebrew University of Jerusalem, Israel
Email: Jshifman@mail.huji.ac.il
Lab webpage: https://openscholar.huji.ac.il/shifmanlab

Keywords: Protein engineering and design, protein-protein interactions, therapeutic proteins, protein evolution

Scientific interests: Protein-protein interactions are crucial for all cellular pathways, including signal transduction, DNA replication, transcription/translation, among many others. Disruption of the protein-protein interactions pathways frequently leads to disease. In our lab, we engineer inhibitors of protein-protein interactions starting from natural binding partners as well as from unrelated small protein domains. Recent studies have proven a fantastic potential of protein-based inhibitors derived from natural effectors or unrelated small protein scaffolds. Such inhibitors could be evolved to selectively target only one family member among hundreds of homologs, making them attractive drug candidates. Using the computational methodology developed in our lab, we design mutations that convert the natural low-affinity binding partners into high-affinity and high-specificity binders. In addition, using computational and experimental methods, we engineer novel binders for various targets proteins. Our approaches are universal and could be applied to design therapeutics for any disease where a known protein-protein interaction plays a crucial role.

Other info: The student will learn the methods for computational protein design and structure prediction and for experimental protein expression, purification, and characterization. The student will become a part of a highly international research group and will be able to live in the multicultural city of Jerusalem.

Name: Dr Nino Sincic
Affiliation: University of Zagreb School of Medicine, Croatia
Email: nino.sincic@mef.hr
Lab webpage: www.mef.hr

Keywords: epigenetics, genetics, biomarker development

Scientific interests: Scientific group for research on epigenetic biomarker (epiMark) is focused on research of epigenetic modifications, mostly DNA methylation and miRNAs, in cancer and other human diseases or disorders. Main goal of the group is to provide novel scientific data for translation of epimutations in clinical practice as biomarkers in tissue or liquid biopsies. In addition, epiMark is performing research on epigenetics of cancer development, especially of testicular germ cell tumours, using in vivo and in vitro models. The group has well established infrastructure and know-how with prominent publications in the field and collaboration with related scientific groups in Croatia and EU.

Name: Dr Jack Sunter
Affiliation: Oxford Brookes University, United Kingdom
Email: jsunter@brookes.ac.uk
Lab webpage: https://www.brookes.ac.uk/research/units/hls/groups/molecular-cell-biology-of-parasite-morphology/

Keywords: leishmania, trypanosomes, microscopy, molecular biology, CRISPR

Scientific interests: In our group, we use the flagellated eukaryotic parasites Trypanosoma brucei and Leishmania mexicana to understand the fundamental processes that define the cell organisation underlying parasite interactions with their hosts and vectors. We focus on understanding the morphogenesis of cytoskeletal-membrane interfaces that contribute to:

i) cell and substrate attachments
ii) interaction with the insect vector and mammalian host.

To do this, we use a range of modern molecular cell biology techniques including CRISPR/Cas9 genome editing combined with advanced light and electron microscopy.

Name: Dr Richard White
Affiliation: Ludwig Cancer Research, Nuffield Department of Medicine, University of Oxford, UK
Email: richard.white@ludwig.ox.ac.uk
Lab webpage: https://www.ludwig.ox.ac.uk/research/richard-white-group-page

Keywords: Developmental biology, cancer biology, stem cells, zebrafish, skin colour, pigmentation

Scientific interests: My laboratory studies how developmental programs affect cancer progression. These programs allow tumor cells to take on new phenotypes above and beyond their genetic alterations. This will help us understand the origins of cancer, and how it may be prevented or treated. We primarily use the zebrafish as a model for these questions, given its strengths in genetic manipulation and imaging. To help facilitate this, we also developed a transparent strain of zebrafish called casper that allows for single and subcellular imaging of each step in cancer. We additionally used human pluripotent stem cells (iPS) cells to complement what can bed one in the zebrafish. Our discoveries broadly encompass a concept called oncogenic competence, which defines why DNA mutations give rise to cancer only in certain cells in the body, but not others. Our central findings from this line of work show that: 1) melanoma, a common skin cancer, relies upon a pre-existing transcriptional program associated with the embryonic neural crest, which are the developmental progenitors of the melanocytes, 2) that this neural cres t program is enforced through developmentally coordinated expression of chromatin factors and transcription factors, which cooperate with the acquired DNA mutations, and 3) that the anatomic position of the cell across the body axis determines which DNA mutation the cell will respond to. Our ongoing work aims to understand how tumor cells interact with cells in the local microenvironment, and whether interrupting this cell-cell communication can prevent the emergence of cancer.

Name: Dr Jinwei Zhang
Affiliation: University of Exeter, United Kingdom
Email: j.zhang5@exeter.ac.uk
Lab webpage: https://medicine.exeter.ac.uk/people/profile/index.php?web_id=Jinwei_Zhang

Scientific interests: My laboratory studies ion channels, transporters, and signalling pathways that associated with human diseases, for examples, stroke that regulated by WNK-SPAK/OSR1-KCC2/NKCC1, hypertension that regulated by WNK-SPAK/OSR1-NCC, and concern with elucidating and targeting ion transporters, kinases, protein-protein interactions using genetic mouse models, small molecules, CRISPR/Cas9 gene-editing technologies, exome sequencing, and electrophysiology to aid discovery and validation of new potential drug targets.