RILD Building Research Activities

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Introduction The RILD Building is a partnership between the University of Exeter and the Royal Devon And Exeter NHS Foundation Trust, and houses the Wellcome Wolfson Biomedical research laboratories. These purpose built facilities support the research activities of the following groups: The Institute of Biomedical and Clinical Science (IBCS), the National Institute for Health Research Exeter Clinical Research Facility (NIHR Exeter CRF), as well as the NHS Molecular Genetics Diagnostic labs and the 100,000 Genome - Genomic Medicine Centre. The close integration of clinical and laboratory services with our research groups is key to the success of the work conducted here.

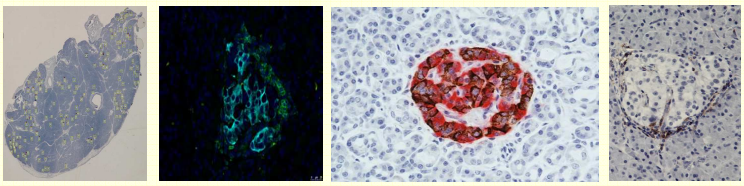
Facilities
The laboratories contain over £10M worth of state-of-the-art equipment for confocal and wide field microscopy; flow cytometry; genetics and genomics, as well as excellent facilities for tissue culture and sample management.

Co-operation in Action
We have both the space and the equipment, but creating a healthy cooperative environment is key to the continued success of the research groups based here. Each group has a nominated technical lead that attends regular lab meetings. Findings from this group then feed in to other committees that share the building and help bridge the institutional divides to ensure a continued productive working partnership.

IBCS Research Areas
The Institute comprises of groups with an active research profile in the following areas: Diabetes, Cardiovascular Risk and Ageing; Molecular Genetics, Mono & Polygenic; Genomics, Endocrine Pharmacology; Vascular Medicine, Epigenetics and Dementia.

IBCS Applied Research Profile
The IBCS conducts people-focussed research, designed to deliver direct benefit to patients, the NHS and the pharmaceutical industry. The aim is to understand the underlying molecular basis of disease and to apply this knowledge in innovative ways that lead to improved treatment and a better quality of life for patients.

Recent Research Findings
Type 1 diabetes results from the autoimmune mediated destruction of the insulin producing beta cells in the pancreas. Thus, detailed microscopic study at the site of the destruction is a critical tool used by our researchers to study the possible mechanisms which drive forward the beta cell demise and resultant diagnosis of Type 1 diabetes.



Studying multiple antigens with fluorescent probes begins to paint a picture of the processes that are occurring. Recent data gathered using this technology has lead to the understanding of two different forms of inflammation in the pancreas, which will ultimately inform more targeted therapies to aid in the prevention, or treatment of the disease. *Images and text courtesy of the Endocrine Pharmacology group.*

NIHR Exeter CRF
Testimonial from an Exeter CRF study participant:
"The CRF has engaged over 10,000 local people in regular research participation and actively involves us in the oversight of the facility. It is a true partnership of patients, doctors and scientists working together to improve healthcare. This fabulous new building was designed with our input to ensure that taking part in research has been, and continues to be, an enjoyable experience".

Bod Pod Body Composition Measurement

A new paper from the *Epigenetics Group* published in Genome Biology characterises the distribution of DNA hydroxymethylation (5hmC) in two regions of the human brain. Using oxidative bisulfite (oxBS) treatment with the Illumina Infinium 450K BeadArray to quantify genome-wide patterns of 5hmC in the prefrontal cortex and cerebellum. Distinct patterns of 5hmC were identified in each brain region, with notable differences in the genomic location of the most hydroxymethylated loci between these brain regions. This study demonstrates the utility of combining oxBS-treatment with the Illumina 450k methylation array to quantify 5hmC across the genome and the potential utility of this approach for epigenomic studies of brain disorders.

Exeter CRF Technical Team 2016

Fully monitored -80°C and liquid nitrogen storage facilities

The Exeter CRF has supported 225 studies, many of which have resulted in highly cited publications but the real impact comes from being able to improve the lives of individuals


Genetics and neonatal diabetes: how Jack was spared a life of injections

A genetic test meant the diabetes which left Jack Neighbour with brain damage could be treated with pills. 'It's completely changed our lives,' says his mother, Emma

theguardian