

## Department of Genome Sciences

Some of the research themes available to applicants for Honours or PhD study are listed here. Many other research topics and projects are available in this Department, and can be discussed with the Group leaders below.



### Dr Dan Andrews

*Genome Informatics – The Department of Genome Sciences*

- Relative contribution of mutation to disease, including measurement of mutational load in gene networks and complex disease
- The functional contribution of mutation in related genes and severity of resultant disease phenotype
- 'Big data' information systems to aggregate and mine very large volumes of human genome to identify causal variation specific to disease
- Human mutation as 'devolution' for insight into recent functional evolution



### Associate Professor Tamas Fischer

*The Fischer Group – Epigenetics and Genomic Stability*

- The role of chromatin in the repression of pervasive transcription
- Chromatin and RNA surveillance
- RNA-DNA hybrids in genome stability and DNA repair
- Development of a molecular tool for personalised cancer treatment – a synthetic biology approach



### Professor Thomas Preiss

*The Preiss Group - RNA Biology*

- Messenger RNA processing diversity in cardiac biology
- Gene regulation through interactions between RNA, enzymes and metabolites
- The role of epitranscriptomic marks on RNA in cancer
- Tracking ribosome footprints to reveal the intricacy and control of translation



**Professor David Tremethick**

*The Tremethick Group- Chromatin and transcriptional regulation during development*

- Uncovering new epigenetic-based regulatory mechanisms of gene expression: novel links between histone variants, RNA function and disease
- The special role of histone variants in regulating the inheritance and three-dimensional organisation of the epigenome
- A new paradigm for the control of cellular function: the dynamic reshaping of the epigenome by histone variants

