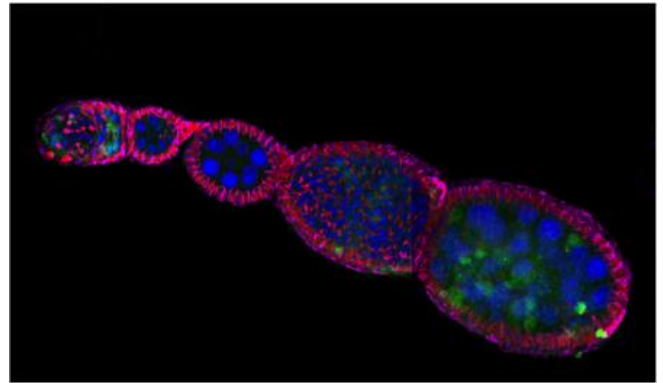


## ACRF Department of Cancer Biology and Therapeutics Projects

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.



### Associate Professor Anneke Blackburn

*The Blackburn Group - Cancer Metabolism & Genetics Group*

- Genetic factors involved in breast cancer susceptibility in mice and humans
- Treatment and prevention of cancer by targeting cancer cell metabolism with dichloroacetate.



### Dr Maurits Evers

*Bioinformatics Team, The Hannan Group, Cancer Therapeutics*

- Identification of genetic signatures of acquired resistance to Pol I transcription inhibitors in cancer
- Application of Bayesian modelling of high-throughput genomic data to obtain robust and interpretable estimates of model parameters
- Robust and reproducible high-throughput data analysis workflow using snakemake
- Simulation of “in-silico” genomic high-throughput sequencing data to assess and benchmark results from different computational tools, and to guide parameter optimisation



### Associate Professor Elizabeth Gardiner

*The Gardiner Group, Mechanisms of Thrombosis and Cancer*

- The molecular architecture of a thrombus in flowing blood
- The molecular pathology of platelet-based autoimmune diseases
- Investigating the role of platelets, neutrophils and other vascular cells in the tumour vascular environment, driving tumour metastasis and cancer-related thrombosis.
- Metalloproteinase activity in metastatic and non-metastatic tumours
- Platelet-tumour cell interactions in flowing blood



**Dr Ameer George**

*Ribosomal Proteins Team, The Hannan Group, Cancer Therapeutics*

- Use of robotic high throughput screening approaches to the role of nucleolar surveillance in regulating the tumour suppressor p53
- Understand the molecular mechanisms mediating ribosomopathies as a means to identify novel approaches for their treatment

**Dr Kate Hannan**

*Pol I transcription and Inhibitors Team, The Hannan Group, Cancer Therapeutics*

- Understanding the role of the Pol I transcription factor UBF in regulation rDNA chromatin through high throughput functional screens
- Discovery of novel Pol I inhibitors as therapeutics for cancer and their translation to Phase I/II clinical trials
- Understanding how Pol I inhibitors synergise with standard and novel therapies to overcome drug resistance in cancers.

**Professor Ross Hannan**

*The Hannan Group, Cancer Therapeutics*

- genetic and epigenetic regulation of ribosomal RNA gene transcription during malignant transformation
- development of novel small molecule therapies targeting the ribosome to treat cancer
- the role of RiBi in differentiation and high throughput functional screening approaches to understand ribosomopathies

**Dr Keisuke Horikawa**

*Lymphoma Team, The Quinn Group, Cancer Models*

- Mouse models for lymphoma associated mutations
- Mouse models for lymphocyte signalling pathways



### **Dr Nadine Hein**

*Pol I transcription and Differentiation Team, The Hannan Group, Cancer Therapeutics*

- Investigating the regulation of rDNA chromatin and Pol I transcription during differentiation, including dynamic changes in long range chromosomal interaction with the rDNA chromatin
- Elucidating the role of Pol I transcription and RiBi factors in stem cell maintenance and pluripotency
- Understanding how is Pol I transcription regulated in cancer stem cells and can this be therapeutically targeted to eradicate these cells



### **Dr Steve Lee**

*The Gardiner Group, Mechanisms of Thrombosis and Cancer*

- Developing laser-induced vascular injury models in mice
- Measuring cellular mechanosensing with lightsheet microscopy
- Understanding multiphoton photomodulation for genetic and drug delivery



### **Professor Chris Parish**

*The Parish Group, Cancer and Vascular Biology*

- Role of heparan sulfate and heparanase in tumour growth and metastasis and in autoimmunity
- Investigating the role of heparan sulfate in T cell development in the thymus
- Investigating why sarcomas are more highly metastatic than carcinomas
- Development of novel drugs that inhibit a range of immunopathologies, such as sepsis, by neutralising extracellular histones
- Designing novel cancer immunotherapies



### **Dr Leonie Quinn**

*The Quinn Group - Cancer Models*

- To identify new tumour markers and drug targets, by dissecting complex signalling and transcriptional mechanisms underlying cancer using *Drosophila* developmental models combined with molecular genetics.
- To determine how the stem cell microenvironment or “niche” behaves to prevent cancer stem cell formation and tumour progression.
- Elucidate molecular mechanisms driving brain tumours, ovarian cancer and leukaemia.



**Dr Dipti Talaulikar**

*Non-Hodgkins Lymphoma Team, The Hannan Group, Cancer Therapeutics*

- Characterising the plasma cell compartment in Waldenstrom Macroglobulinaemia
- Disease heterogeneity in NHL

