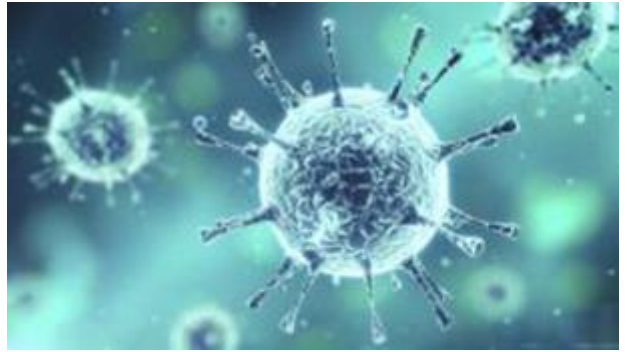


## Department of Immunology and Infectious Disease

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 Ruth Arkell

*The Arkell Group – Early Mammalian Development*

- Understanding how genetic mutations cause congenital disease
- Reprogramming adult skin cells into stem cells



### Dr Anne Bruestle

*The Bruestle Group - Inflammatory T cell responses / Autoimmune models of Neuroinflammation*

- Migration, effector function and transcriptional regulation of Th17 cells
- Neutrophils and their extracellular traps in MS pathology
- Tissue specific factors of Th17 cell mediated autoimmunity



### Dr Gaetan Burgio

*The Burgio Group – Genome Editing and Genetics of Host-pathogens interactions*

- Genetic of the host-parasite interaction during Malaria infection using CRISPR/Cas9 genome editing technology
- Genetics of the host response to multi-drug resistant bacteria or 'superbugs'
- Development of CRISPR/Cas9 genome editing technology



### Associate Professor Ian Cockburn

*The Cockburn Group – Malaria Immunology*

- Using live imaging to determine how T cells find pathogens in the liver
- How does the immune system mount antibody responses against the malaria parasite?



### **Professor Matthew Cook**

*The Cook Group - Translational Immunology/ Centre for Personalised Immunology (based at The Canberra Hospital)*

- Monogenic human immune deficiency disease
- Gene regulation in human neutrophils from patients with systemic vasculitis
- NF- $\kappa$ B signalling in human inflammatory disease



### **Dr Julia Ellyard**

*The Vinuesa Group - Genetics of Autoimmunity*

- Identifying genetic variants that induce autoimmune disease
- Understanding the cellular and molecular pathways that cause autoimmune disease



### **Associate Professor Anselm Enders**

*The Enders Group - Immunization Genomics*

- B cell development and function
- Primary human immunodeficiencies
- Regulation of the actin cytoskeleton in immune cells



### **Dr Si Ming Man**

*The Man Group – Innate Immunity and inflammasome Group*

- Uncovering how host cells recognise and respond to intracellular pathogens and danger signals
- Unravelling the molecular mechanisms of inflammasome formation
- Understanding the role of cytoplasmic innate immune sensors in regulating the development of cancer and the composition of the gut microbiota
- Identifying novel activators and inhibitors of the innate immune system to prevent and treat infection, autoinflammatory diseases and cancer



### **Associate Professor Brendan McMorran**

*The McMorran Group - Genetics and Infectious Diseases*

- Understanding why malarial parasites require host haem biosynthetic enzymes.
- Developing host-directed treatments for malarial infection.
- Understanding how platelets protect the host during malarial infection



**Associate Professor Charani Ranasinghe –**

*The Ranasinghe Group - Molecular Mucosal Vaccine Immunology*

- Assess novel vaccine adjuvants to enhance mucosal immunity
- Identification of antigen presenting cell subsets following mucosal vaccination
- Study IL-4/IL-13 cytokines and their receptor regulation specifically at the mucosae
- Study different innate lymphoid cell subsets at the mucosae



**Associate Professor Charmaine Simeonovic**

*The Simeonovic Group - Diabetes/Transplantation Immunobiology*

- Contribution of platelets and neutrophils to the development of Type 1 diabetes
- NET and histone-mediated damage of insulin-producing islet beta cells and prevention
- The role of heparanase in Type 1 diabetes



**Professor David Tschärke**

*The Tschärke Group – Viruses and immunity*

- Relating antigen presentation to immune responses
- Understanding how viruses evade immune responses
- The role of viral gene expression in herpes simplex virus latency
- Understanding genetic susceptibility to virus infection



**Associate Professor Di Yu**

*The Yu Group - T-cell Immune Mechanism, Monitoring and Modulation (TIM<sup>3</sup>)*

- The development of low-dose IL-2 therapy for inflammatory and autoimmune diseases
- The development of superagonist monoclonal antibodies to human IL-21 in immunotherapy for infection and cancer
- The differentiation and function of follicular cytotoxic T (T<sub>fc</sub>) cells in infection and cancer
- The regulation of follicular helper T (T<sub>fh</sub>) cells in vaccination and autoimmune diseases

