



Honours Research Program

Interested in undertaking life-changing cancer research?

About our program

The Department of Clinical Pathology's dynamic Honours program offers engaging coursework and a range of innovative projects focused on improving outcomes for cancer patients. The Department is located at the Parkville campus with offices and labs in the state-of-the-art Victorian Comprehensive Cancer Centre (VCCC) building.

The Clinical Pathology Honours Program is designed to support your development of essential research skills and to foster your professional identity as a researcher.

Tailored coursework focuses on skills such as critical analysis and scientific communication, in the context of contemporary topics in clinical pathology research. Learning is supported through expert seminars, workshops and small-group tutorials.

A highlight of our program is the opportunity for students to partner with cancer patients. You will learn from patients, clinicians and researchers about consumer engagement; an essential component of modern cancer research.

Our researchers are leaders in diagnosis, treatment and prevention of cancer to improve the lives of patients. We collaborate broadly with other Departments, Centres, Schools and Faculties of the University of Melbourne, health services, and medical research institutes, to collaborate on and improve cancer research.

Awards

Students undertaking a project within the Department of Clinical Pathology will be eligible to apply for the \$2,000 J.E. Taylor Honours Award for the top student undertaking a cancer-related Honours project.

Key dates

2026 Start-Year Intake

- Round 1 application closing date: 31 October 2025
- Round 1 project preferencing closing date: 07 November 2025
- Round 2 application closing date: 09 January 2026

How to apply

Start the application process early as it can take several weeks to find the right project and supervisor.

Apply online now!



Have a question? Contact us at
dcp-honours@unimelb.edu.au





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Honours Projects 2026

Department of
Clinical
Pathology

Available projects by research group

PHANTOM Lab

Professor Frederic Hollande

Group Overview: The PHANTOM Lab researches the ways cells communicate with each other as a tumour progresses and responds to cancer treatment.

Preclinical validation and mechanistic characterisation of novel targets to sensitise pancreatic cancer cells to chemotherapy

Supervisors: Prof. Frederic Hollande

Pancreatic ductal adenocarcinoma (PDAC) is the third-leading cause of cancer-related mortality. The 5-year survival rate is only 13%, among the lowest of all cancer types. This is due to a combination of late disease detection and high resistance of PDAC tumours to chemo and radiotherapy.

Resistance of cancer cells to therapy is a major bottleneck towards improving PDAC patient survival. Resistance mechanisms remain poorly understood and very few efficient targeted therapeutics have been developed against PDAC, emphasizing the need for innovative models and for novel strategies to design effective treatment combinations. Using 3D tumour organoids derived from surgical PDAC samples, we have performed a first of its kind whole genome CRISPR-Cas9 screen under chemotherapeutic pressure, enabling us to identify a novel list of candidate genes that play an important and specific role in the resistance of PDAC cells to FOLFIRINOX chemotherapy.

In this project, you will contribute to the preclinical characterisation and validation of three of these targets. Using single cell and spatial transcriptomics data, you will map the expression of these targets across PDAC molecular subtypes, characterise the mechanism of action that underpins the chemo-sensitising effect of their invalidation using technologies such as PerturSeq, and use pharmacological inhibition of these targets in vivo to confirm preclinical efficacy. These experiments will be performed using LeGO-barcode organoids to establish whether the role of these targets is homogenous across PDAC samples or whether resistance of specific cancer cell subsets is likely to occur. Combining several cell and molecular biology techniques, this project will represent an important step towards development of new therapeutic options for PDAC patients.

For more information about this project contact:
Prof Frederic Hollande frederic.hollande@unimelb.edu.au

Investigating the interaction of cancer-associated fibroblasts and Natural Killer cells in colorectal liver metastases

Supervisors: Prof. Frederic Hollande

Colorectal cancer is common and lethal, accounting for 9.4% of all cancer-related deaths worldwide. A patient diagnosed with metastatic disease has only a 13% chance of surviving the following five years. Chemotherapeutics and targeted therapies provide little clinical benefit for these patients, and T-lymphocyte-based immunotherapy has so far been unsuccessful in this disease, except in a very small subset of tumours.

Natural Killer (NK) cells represent a promising alternative immunotherapeutic target for the treatment of metastatic tumours. NK cells can kill disseminating tumour cells and impair metastasis progression in various experimental models, yet they exhibit reduced cytotoxicity in patients with colorectal liver metastasis (CRLM). Bulk and single-cell gene expression profiling of CRLM indicates that tumours infiltrated by NK cells are enriched with cancer-associated fibroblasts (CAFs), but it remains unclear how CAFs contribute to NK cell regulation. Our laboratory previously developed a co-culture model combining patient-derived tumour organoids and NK cells, and we used this model to screen for small molecules that stimulate NK cell activity against tumour cells. However, this model lacks some microenvironmental features that may influence the effect of these compounds on NK cells, including CAFs.

This project aims to further characterise the immunotherapeutic potential of these compounds by i) adapting the existing Cancer cell-NK co-culture model to accommodate CAFs, ii) evaluating how CAFs impact NK cell activity at baseline and following exposure to these drugs, and iii) Characterising the impact of CAF-NK interactions on the respective molecular phenotype of these cells. Using cellular, pharmacological, and molecular techniques, this project will improve our understanding of the CRLM microenvironment and advance potential immunotherapeutic approaches for the treatment of CRLM.

For more information about this project contact:
Prof Frederic Hollande frederic.hollande@unimelb.edu.au



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Available projects by research group



Cancer Bioinformatics Group Professor Lachlan Coin

Group overview: Interrogating genome and transcriptome data to identify novel cancer biomarkers and create new diagnostic tools.

New methods for interpretable polygenic risk scores for colorectal cancer

Supervisors: Prof Lachlan Coin, A/Prof Daniel Buchanan

Polygenic risk scores combine the effects of many genetic variants into a single risk score of disease. While highly predictive, they are difficult to interpret biologically. Genomewide association studies, on the other hand, attempt to identify variants that impact risk of disease on their own. This project will develop a new approach to develop interpretable polygenic risk scores. This will build on our recently published methodology for developing minimal signatures of disease.

For more information about this project contact:
Prof Lachlan Coin lachlan.coin@unimelb.edu.au



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Colorectal Oncogenomics Group

A/Prof Dan Buchanan

Group overview: The Colorectal Oncogenomics Group's research aims to identify the causes of colorectal cancer and colonic polyposis, particularly in young adults. They are developing methods to improve the diagnosis of hereditary cancer syndromes.

Unraveling the Genomic Landscape of Muir-Torre Syndrome in Colorectal Cancer Development

Supervisors: Dr Romy Walker, A/Prof Daniel Buchanan

This study investigates the unique genomic alterations and mutational pathways underlying colorectal cancer (CRC) development in individuals with Muir-Torre Syndrome (MTS). The aims are to 1) molecularly profile CRC subtypes in individuals with a confirmed MTS diagnosis and 2) characterise the genomic landscape observed in individuals with MTS who present with different tumour types.

For more information about this project contact:
Dr. Romy Walker romy.walker@unimelb.edu.au

Multi-omic Characterisation of DNA Mismatch Repair Protein Deficient Colonic Crypts in Patients Diagnosed with Lynch Syndrome

Supervisors: Dr Romy Walker, A/Prof Daniel Buchanan

This project aims to perform a comprehensive multi-omic analysis of DNA mismatch repair protein-deficient colonic crypts in individuals with Lynch syndrome to uncover early molecular events driving colorectal cancer initiation in this high-risk population.

For more information about this project contact:
Dr. Romy Walker romy.walker@unimelb.edu.au

Genetic risk factors for Familial Serrated Polyposis Syndrome

Supervisors: A/Prof Daniel Buchanan

This project will utilise existing genome-wide genetic data to investigate novel germline causes for Serrated Polyposis Syndrome that has developed in multiple family members.

For more information about this project contact:
A/Prof Dan Buchanan daniel.buchanan@unimelb.edu.au

How does the gut microbiome and colonic biofilms drive early-onset colorectal cancer development?

Supervisors: A/Prof Daniel Buchanan

This project will investigate novel genomic-derived subtypes of early-onset colorectal cancer and the differences in intra-tumoural bacteria composition and their relationship to biofilms within the colon.

For more information about this project contact:
A/Prof Dan Buchanan daniel.buchanan@unimelb.edu.au

Investigating novel causes of unexplained colonic polyposis syndromes

Supervisors: A/Prof Daniel Buchanan

This project will investigate 1) germline causes of colonic polyposis, 2) somatic mutation and DNA methylation drivers common to the multiple pre-malignant polyp lesions in a patient and 3) influence of the microbiome on the prospective development of polyps.

For more information about this project contact:
A/Prof Dan Buchanan daniel.buchanan@unimelb.edu.au