



THE UNIVERSITY OF
MELBOURNE

Faculty of Medicine,
Dentistry and Health
Sciences

Tumour Heterogeneity in Metastatic Cancer

Understanding the mechanisms of individual tumours.

The 'Tumour Heterogeneity in Metastatic Cancer' lab aims to understand mechanisms that underlie the genetic and non-genetic heterogeneity within individual tumours, and to characterise the role played by tumour heterogeneity on metastatic progression and treatment response. The group use innovative models to characterise the phenotype and genotype of drug resistant cell subpopulations, to identify molecular mechanisms that underlie the phenotypic plasticity of cancer cells, and to understand how this plasticity affects the response of tumour-initiating cells to anti-cancer treatments.

Opportunity for Masters and PhD projects

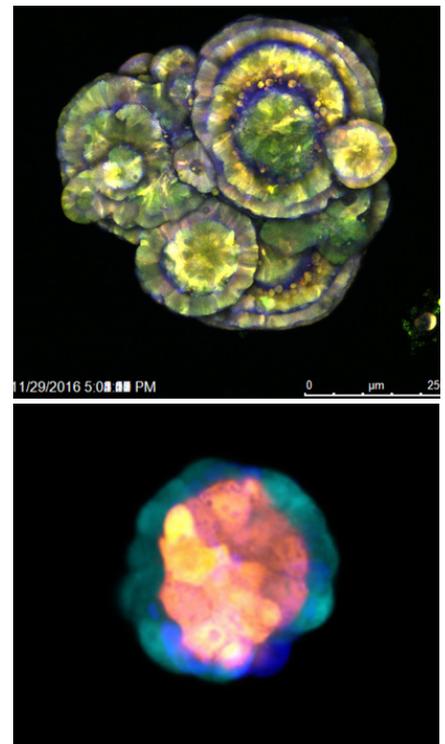
Characterising metastatic heterogeneity in colorectal cancer

A large number of cancer patients develop metastases and their survival rates are unfortunately very poor, with metastatic tumours responding poorly or growing back after treatment has stopped. Establishment of resistance and recurrence of initially treatment-responsive tumours are likely to involve the resistance of genetically unique clones, plasticity of tumour cells and self-renewal mechanisms driven by cancer stem cell populations.

Our current knowledge is insufficient to understand whether these mechanisms co-exist or whether individual tumours preferentially use one of these pathways to survive and evade treatment.

Using a combination of fluorescent and genetic barcoding techniques in vivo and in vitro, this project aims to analyse the development of tumour heterogeneity during the metastatic progression of colorectal cancer. It aims to determine whether the heterogeneity of liver metastases impacts on their ability to interact with the immune system and to analyse how it is affected by treatment with anti-cancer compounds. Outcomes from this project will significantly improve our understanding of metastatic heterogeneity and will inform clinical treatment decisions by understanding the mechanisms that underlie post-treatment relapse.

For more information, visit medicine.unimelb.edu.au/clinical-pathology



Cellular diversity in colorectal cancer organoids

Contact us

Associate Professor Frederic
Hollande

University of Melbourne
Department of Clinical Pathology
Victorian Comprehensive Cancer
Centre
Level 10, 305 Grattan Street
Melbourne, Victoria 3000

frederic.hollande@unimelb.edu.au