

Project Title	Investigating tumour-immune cell interactions for cancer immunotherapy using capillary-on-chip models
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Project Description	<p>Cancer immunotherapy is a promising new pillar of cancer management with very effective outcomes in recent clinical trials. Immune checkpoint inhibitors (CPI) such as PD-1/PD-L1 inhibitors are approved drugs for numerous cancer types that work by promoting the activity of immune cells against tumour cells. Our understanding of the working mechanisms of CPIs against primary tumours are relatively well established, primary tumours are not the cause of most cancer deaths. In fact, over 90% of cancer associated mortalities are a result of metastasis, which is driven by cancer cells that escape from primary tumours, enter the vasculature as circulating tumour cells (CTCs).</p> <p>It is currently not known how immune cells recognize CTCs before (immune systems are not activated) and after (activated) immunotherapy. In this ambitious project we will explore how immune cells recognize and interact with CTCs trapped within capillary beds. Specifically, we will explore how PD-1/PDL-1 inhibitors influence the ability of immune cells to recognise and destroy CTCs.</p> <p>To accomplish this, we will analyse cells trapped within organ-on-chip microfluidic devices that mimic human capillaries. This project has the potential to lead to the development of exciting new cancer immunotherapy agents that may prevent metastasis.</p>