PCL/24/01 - Investigating BRAF driven systemic neutrophilia and clinical utility of neutrophil blockade in colorectal cancer

Bowel cancer is common affecting many people across the world. Approximately 25% of people with bowel cancer will be diagnosed a late stage where the cancer has already spread to other areas of the body. Unfortunately, this means the cancer is incurable in most cases and approximately 60% of people will die from their cancer within 1 year of diagnosis. Therefore, understanding how cancers spread will help develop new treatment strategies for patients.

Cancer has a complex relationship with the body's immune system. Some parts of the immune system help fight cancers but other immune cells may help cancers survive and spread. One particular part of the immune system are cells called neutrophils. Whilst these cells help the body to fight infections, they may also protect cancers from other immune cells as well as priming other areas of the body for the cancer to spread to. There is growing evidence showing that neutrophils have a key role in promoting cancer spread. However, the exact way cancer cells recruit these neutrophils is not fully understood and more importantly no clinical trials have tested blocking neutrophils to see if it reduces cancer spread in people with bowel cancer.

This research project has three aims. The first is to understand how a particular cancer pathway (MAPK) can cause cancer cells to recruit high numbers of neutrophils and to see if using drugs to block this cancer pathway changes this. Next is to use state of the art technologies to see how immune cells and other cells interact with cancer cells. Finally, I will develop a clinical trial to use drugs to block neutrophils for people with bowel cancer. Overall, this research proposal should help deepen our understanding of how bowel cancers spread and hopefully lead to new and better treatment options for patients.