TCS/24/39 - Regression Evaluation of pancreatic cancer using Single-cell sPatial multi-Omics following Neoadjuvant therapy for Survival Enhancement (RESPONSE)

Pancreatic cancer (PC) continues to have extremely poor outcomes. Despite prompt investigation, diagnosis and treatment, long-term survival is rare. Chemotherapy given before surgery can improve survival of patients with PC; however, variation in chemotherapy responses remains a significant clinical challenge. An urgent need exists to understand how millions of cancer and immune cells interact in PC so we can understand not only the good and bad ‘chess pieces’, but also their location on the ‘board’. We will use the latest generation of molecular spatial microscopes to study the ‘geography’ of the PC battlefield.

Increasingly chemotherapy is given before surgery in order to shrink the tumour, prevent spread and improve survival for the patient. Charting ‘molecular maps’ before and after chemotherapy across hundreds of patients will help us to understand why some tumours show RESPONSE, while others do not. We will study valuable tumour samples from a large European clinical trial of pancreatic cancer and combine with the study of patient samples from Scotland.

We will use AI strategies to unlock and combine complex layers of data to decipher patterns to help understand the combinations, and communications between immune and cancer cells that survive after chemotherapy treatment. This could provide a foundation for tests that could firstly help doctors to tailor the choice of chemotherapy for an individual patient and in the future develop better treatments that interrupt communication networks between the cancer cells and the immune system which are vital to tackle this relentless disease.