

TCS/22/12 – Developing New Approaches To Enhance Drug Development For Soft Tissue Sarcoma.

Sarcomas are a rare type of cancer for which there are very few treatment options, and patients diagnosed with sarcoma have poor survival rates. New approaches are needed to find drugs that will provide benefit to sarcoma patients. For this to be effective it is important to use cancer models that faithfully mimic the heterogeneity of the disease in patients, and retain the 3-dimensional (3D) aspects of the environment in which tumours grow; both of which are critical for how tumours respond to drug treatment. Microfluidic devices allow for the precise delivery of very small amounts of liquids through multiple channels and can be used for very rapid screening of drugs. We will use a novel microfluidic 2 device which allows miniaturised drug screening in cancer tissue in 3D. Importantly this approach can be used to screen the activity of drugs in small amounts of tissue taken directly from the patient at the time of surgery. These small biopsy samples provide the best model for testing potential new treatments as they preserve the heterogenous 3D nature of the tumour. Combining this with sophisticated image analysis tools has the potential to provide an automated solution for personalised drug screening to guide treatment options of patients. We will use this approach to validate that loss of a gene called ATRX in sarcomas renders them sensitive to treatment with drugs known as PARP inhibitors which are currently used for the treatment of some ovarian and breast cancers.