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VORTEX-BIOBANK: Translational tissue banking for the future individualisation of radiation treatment

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Soft tissue sarcoma accounts for ~1% of adult cancers with ~1200 cases in the UK each year. Primary treatment is often surgery followed by adjuvant radiotherapy; however, many patients die of metastatic disease.

VORTEX-BIOBANK is a CR-UK TRICC funded translational study co-ordinated from the University of Manchester that is linked to the national VORTEX radiotherapy trial. The translational hypothesis of VORTEX-BIOBANK is based on the observation that tumour oxygenation status can predict for the likelihood of developing distant metastases in sarcoma patients. The study aims to collect and extract RNA from tumour and normal tissue samples for future RNA microarray analyses and the development of a hypoxia-associated pre-treatment tumour molecular profile. This profile could be used to identify patients with a poor prognosis at an early stage, and specifically target those who might benefit from adjuvant systemic therapy e.g. a hypoxia-modifying agent.

A secondary aim of the study is to investigate associations between common genetic variation (single nucleotide polymorphisms, SNPs) and radiation induced side-effects. DNA extracted from VORTEX-BIOBANK EDTA blood samples will contribute towards a larger radiogenomics study, RAPPER, to be used for SNP genotyping analyses. The overall aim is to develop a radiosensitivity gene signature, which could allow a greater individualisation of radiation dose prescription to optimise tumour control while reducing toxicity.

Accrual to the VORTEX clinical trial, and hence VORTEX-BIOBANK, has been slower than anticipated. However, recruitment has begun to improve as more centres come on board. Planned recruitment is 400 patients in 4 years, and just over 2 years into the study 116 patients have been registered and 73 randomised. Of this number VORTEX-BIOBANK has successful collected high quality fresh tissue from 89 patients and bloods from 70 patients so far. These samples represent a valuable resource for both sarcoma and radiotherapy research in the future.