H2020 MSCA - ITN - 2017 - 766030

CONTRA

Computational Oncology Training Alliance

ESR 14 - Spatial genetics and transcriptomics of pancreatic and ovarian cancer

Research project	Pancreatic ductal adenocarcinoma (PDAC) remains one of the most lethal malignancies and a major health burden. Patient survival after resection remains poor (median ~20 months) and more effective treatments are desperately needed. The underlying biology of pancreatic cancer is becoming better understood, but no actionable therapeutic targets have been validated to date. We have access to a large cohort of PDAC samples through the Cambridge Tissue Bank. We plan to use a combination of genomics and image analysis to comprehensively and deeply characterise multiple samples from 10 patients. In detail, at four locations in the resected tumour, we will take multiple sections. One section at each location will be marked by an expert pathologist (Dr Rebecca Brais) and the laser capture microdissected into four pieces (by CI histo-pathology core facility) that are then sequenced for an average of 60-fold. Neighbouring sections will be profiled by partner Spatial Transcriptomics for RNA expression. Two more neighbouring sections will be stained for immune cell infiltration. Our integrated image-genomics approach will embed intra-tumour heterogeneity into a tissue context. This approach will allow us not only to identify cancer clones with distinct genomes, but also to observe the microenvironment in which these clones evolve. These results will help to answer profound questions about the evolution of PDAC and lead to hypotheses about tumour-stroma interactions in PDAC.
Supervisor	name Florian Markowetz e-mail Florian.Markowetz@cruk.cam.ac.uk website www.markowetzlab.org
Host institution	University of Cambridge, United Kingdom Cancer Research UK Cambridge Institute (CRUK-CI)
PhD program	https://www.graduate.study.cam.ac.uk/courses/directory/cvcrpdmsc
Expected results	1) Spatial characterisation of the intra-tumour heterogeneity of PDAC 2) Hypotheses about tumour-stroma interactions in PDAC
Planned secondments	1) Spatial Transcriptomics to learn the details of the technique (2 months) 2) BCCRC - Sohrab Shah (Vancouver) for advanced models of tumour evolution (3 months)
Required profile	The successful candidate will have a degree in a quantitative discipline (computer science, statistics, mathematics, physics, ..) as well as data analysis and programming experience (ideally in R and Python). CRUK-CI is a very interdisciplinary place and excellent communication skills are important. Close engagement with cancer biology and experimental research is expected.