

ETM/433 - Novel sample preparation for improved circulating tumour DNA analysis

Solid tumours lead to the presence of free DNA in the circulation which provides a potential route for the early detection of disease and also molecular characterisation that is robust, non-invasive and inexpensive. However, detection sensitivity is a major barrier. We have developed a microfluidic plasma purification device that improves the detection of fetal DNA in the maternal circulation. We plan to evaluate this device in the preparation of ctDNA from breast cancer and glioblastoma patients prior to quantitative analysis by deep amplicon sequencing of a small number of selected frequent mutation targets, and combine this with ultrasensitive capture PCR. We believe our approaches have the immediate potential to increase the sensitivity of detection of ctDNA over normal circulating DNA by several fold thus supporting the use of this methodology not only to allow simpler and cheaper sequential tumour biopsy, but also enable earlier tumour detection.