

Diagnostic Tools for the Detection and Treatment of Cancer: From 3D Cell Culture to Detecting Single Molecules

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Diagnostic tools are required by the entire spectrum of cancer diagnosis and treatment. The different diagnostic tools however work on very different length scales from 3D cell cultures to the detection of single molecules. In this talk we will cover a range of diagnostic technologies we are developing that cover the lengths scales required for evaluation of drug treatments to the early detection of cancer.

Starting from the larger size scale, the talk will describe our bespoke 3D bioprinter for producing in vitro 3D cell spheroid cancer models [1]. The types of 3D cell biology assays will be described including our initial work on primary cell tumoroids for personalised medicine. We will then progress to technologies that allow us to capture rare cancer cells and then release single cells for further investigation on demand [2]. We will then switch the emphasis to diagnosis and ultrasensitive biosensors that can detect just a few microRNA molecules for early cancer diagnostics [3]. Finally approaches to developing quantitative biosensors that can detect single molecules will be discussed [4,5].

References:

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