"Integrating hypoxia imaging into the clinical workflow to improve radiotherapy response"

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Abstract

It is widely believed that hypoxia - the state of low oxygen that often arises in solid tumours - is a major negative predictor of radiotherapy response. Despite this, patients are rarely stratified by hypoxic status for modified treatments including dose-painting, hypoxia-activated pro-drugs, and altered fractionation schedules. This is largely due to the expense of current hypoxia imaging methods and, related to this, the absence of studies showing a benefit hypoxia-targeted therapies in large patient cohorts where patient hypoxic status is known. In this talk, I describe recent efforts at Princess Margaret Cancer Centre to investigate hypoxia imaging methodologies - including PET imaging with a hypoxia-sensitive agent and diffusion-weighted magnetic resonance imaging - as well as treatment modification strategies with the goal of developing a scalable hypoxia-stratification platform that can be used in large-scale clinical trials.