

MONITORING RADIOTHERAPY WITH FUNCTIONAL OCT: MICROVASCULAR RESPONSES AND CORRELATIONS WITH MRI

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Despite widespread use and tremendous technological and radiobiological advances, radiation therapy as a cancer treatment remains somewhat 'blind' – its relative success and outcome are often not known for weeks or months following treatment. Can advanced analysis of *in-vivo* optical coherence tomography (OCT) images of irradiated animal tumours detect early functional changes induced by radiotherapy? If yes, can these be used to 'shed light on radiotherapy' and optimize / personalize its treatment delivery? We address these questions by analyzing OCT temporal and spatial signal statistics (for microvascular and microstructural imaging, respectively). In this talk we will demonstrate the imaging and analysis pipeline for radiation response monitoring, show representative preclinical and clinical results, and discuss implications. In the context of potential clinical translation, correlations with contrast-enhanced MR imaging will also be discussed.