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Nanoscale Organisation  
and Dynamics Group

## **Multi-parametric MRI for Treatment Response Prediction and Monitoring in Rectal Cancer**

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**Abstract:** Functional imaging of cancer can provide information on tumour physiology that may predict for therapy response. Tumours are known to be heterogeneous, and this can affect response to therapy. Functional MRI is a non-invasive technique for providing 3D physiological assessment of tumour. This lecture will address the potential of functional MR techniques in the assessment of physiologic aspects of malignancy, such as tumour cellularity, hypoxia, and metabolism. Functional MR techniques that will be discussed include diffusion weighted imaging (DWI) and dynamic contrast enhanced MRI (DCE), and spectroscopy (MRS). Current functional MR techniques have shown promising results for the prediction and monitoring of response to radiotherapy in rectal cancer, but lack sufficient accuracy for clinical use. Single parameter measurements such as ADC or  $K^{\text{trans}}$ , may not adequately reflect tumour heterogeneity.

Multi-parametric MRI combining DWI and DCE may improve the accuracy of therapeutic response prediction in rectal cancer. We have developed a complete protocol and analysis strategy for 3D voxel-wise multi-parametric assessment of tumour heterogeneity and its changes in response to radiotherapy. Early results have shown that multi-parametric MRI correlates with pathologic complete response in rectal cancer, and this will be presented at this lecture.

### **Profile**

Dr Trang Pham is a Radiation Oncologist Staff Specialist at Liverpool Hospital, and Conjoint Associate Lecturer at the University of New South Wales. She specializes in the management of gastrointestinal malignancies, and has a special interest in the role of MRI for radiotherapy response prediction and monitoring. Her current PhD research involves the assessment of the role of multi-parametric MRI for treatment response prediction in rectal cancer. She is also involved in research collaborations with the Western Sydney University Nanoscale Organisation and Dynamics Group, which is currently investigating *ex vivo* High Field MR analysis of cancer tissue for the discovery of novel MR biomarkers in rectal cancer.

**Staff and students at all levels are welcome to attend.**

**Venue and Time:** Thursday 21<sup>st</sup> April at 2 pm at the Campbelltown Campus in CA-30.G.213.

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