



# PHYSICS AND ASTRONOMY COLLOQUIUM

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## **“MRI of Tissue Function and the Tumour Microenvironment”**

### Abstract

MRI offers access to a large array of functional parameters of tissue. Even though parameters used for straightforward morphological/anatomical characterization dominate MRI in the clinic, the most interesting recent developments are being used for the study of disease processes mostly in a research setting. Two techniques are of particular interest to us in the study of tumours and their treatment. Dynamic contrast-enhanced MRI is used to investigate the blood supply that is being recruited by these abnormal growths from the host tissue. Recent therapeutics are shifting from targeting proliferating cells to targeting the blood supply. Methods to design, refine and follow these treatments are needed and one such method could be dynamic contrast-enhanced MRI. I will present the challenges of this technique and our ideas of how to tackle them. We are in the process of designing a dual-tracer experiment that will allow the careful characterization of flow and vascular permeability. For this we seek to combine standard low-molecular weight Gd-based contrast agents with larger, high-molecular weight contrast agents. In tandem, we have to provide validation based in immunohistology. A further technique aimed at elucidating cellular structure and organization is diffusion-weighted MRI. I will present results using this technique but also highlight some of the pitfalls inherent to one of its most commonly used parameters: the fractional anisotropy of the diffusion tensor.

Wednesday, November 23, 2011

3:30 p.m.

Bob Wright Centre

Room A104