

Nanoscale Organisation and Dynamics Group

University of Western Sydney



The Australian MRI-Linac program: Transforming cancer treatment through real-time anatomic and functional image guided adaptive radiotherapy

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Abstract

Radiation therapy is used to treat 40% of cancer patients in Australia. A significant problem with current radiation therapy is that, due to patients' musculo-skeletal, respiratory, cardiac, gastro-intestinal and genito-urinary systems cancers move during radiotherapy. Consequently, even though the patients' anatomy is known prior to treatment, radiation beams can be off-target during treatment, missing the cancer and instead striking healthy tissue. This mistargeting results in reduced tumour control and increased treatment-related toxicity. To solve this problem, we are building an integrated MRI-linear accelerator 'MRI-linac' in which the cancer will be able to be imaged as it is moving. Patient treatments will be adapted in real-time so that the radiation is always targeting the cancer rather than healthy organs. We estimate, with evidence-based justification, that MRI-linac treatments will demonstrate measurable increases in overall survival and measurable decreases in toxic side-effects. There are three broad themes of the Australian MRI-Linac program focusing on (1) the ongoing development of the MRI-linac system, (2) the basic scientific and translation studies based around the MRI-linac, and (3) investigations into physiologic targeting capabilities to identify and deliver higher radiation doses to the most treatment-resistant cancer sub-volumes.

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Staff and students at all levels are welcome to attend.

Venue and Time:

This talk will be held on Tuesday July 23 at 2 pm at the Campbelltown Campus in Building 9, Lecture Theatre 4 (CA 9.G.02).

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