PHYSICS AND ASTRONOMY SEMINAR

(In Person)

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"Three dimensional spheroids and gold nanoparticles in combined cancer therapy"

Abstract

One of the major issues in cancer radiotherapy (RT) is normal tissue toxicity. Introduction of radiosensitizers like gold nanoparticles (GNPs) into cancer cells to enhance the local RT dose is a promising technique that is being explored. However, a large portion of experimentation involving GNPs has been done in simple two-dimensional (2D) monolayer models that cannot properly encapsulate the complex heterogeneous interactions that occur in vivo. By introducing an in vitro three-dimensional model that better mimics the tumour microenvironment, we can more rapidly facilitate a quicker translation of various treatment technologies like GNPs to the clinic. Further, clinical trials show that the combination of chemotherapy drug docetaxel (DTX) given in conjunction with RT can improve survival in high-risk cancers. Addition of GNPs to this current DTX/RT protocol is expected to further improve therapeutic benefits remarkably. Elucidation of a combined therapy of GNPs, DTX, and RT to optimize treatment can better improve patient outcome and reduce normal tissue toxicity by specifically targeting tumours and is completely novel research.

Wednesday, March 8, 2023
10:00 a.m. PST in ECS 108