

School of Pharmacy PhD Projects 2016/17

Project Title	Unravelling the impact of low-frequency sub-populations of cancer stem cells on response to chemo-radiation.
Supervisors	Prof Tracy Robson, Dr Helen McCarthy, Dr Jonathan Coulter (School of Pharmacy), and Prof Fred Currell (School of Mathematics and Physics)
Description	<p>Cancer stem cells (CSCs) are one of the main causes of tumour recurrence and resistance to both chemo and radiotherapy, therefore it is imperative that they are targeted effectively to improve treatment outcomes. CSCs exist in a state of flux and the CSC phenotype can be enhanced by microenvironmental influences that promote metastasis. Therefore, the development of CSC- and microenvironment-targeting strategies should limit metastases and in so improve clinical outcomes.</p> <p>This project will examine the inherent resistance of these cells in response to chemo-radiation. In particular, we will examine growth patterns in these cells in response to novel CSC-targeted therapies in order to establish whether we can re-sensitise these resistant cells. CSCs derived from tumour cell lines, in addition to clinically relevant biopsies, where available, will be grown as tumourspheres, with the number and rate of spheroid growth being the major factor analysed. Microenvironmental influences such as hypoxia will also be examined.</p> <p>In parallel, the student will feed their survival/growth data into a computational tumour/spheroid model that has been developed at QUB. The full computational model will also be correlated to 'real' clinical responses observed in patients, in order to assess whether changes in chemo-radiotherapy planning and scheduling strategies might be required before CSC-targeting agents can become adopted in the clinic.</p> <p>This project will take place within the Centre for Applied and Interdisciplinary Radiation Research (CAIRR), a new research Centre established at QUB with the aim of covering radiation processes both theoretically and experimentally from the most fundamental of processes all the way through to a full-patient description of radiotherapy.</p>
Start Date	September 2016
Keywords	Radiotherapy, gold nanoparticles, prostate cancer
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	How to Apply Postgraduate applications should be made using Queen's Online: http://pg.apply.qub.ac.uk/home/ Please note that there are two application processes: one for admission to the university and another for postgraduate awards.
	Further Information Additional information for prospective postgraduate students can be found on the School of Pharmacy website: http://www.qub.ac.uk/pha and the Queen's Postgraduate website: http://www.qub.ac.uk/home/ProspectiveStudents/PostgraduateStudents/

