***Title of studentship**	**ENERGY - E**nhanced **N**anoparticles **E**ngineered f**R**om **G**old for multi-modal therap**Y**
Value / what is covered?	Fully funded 100% of UK/EU tuition fees paid and an annual stipend for UK residents only (living expenses), currently at £14,777
Awarding body	DFE
Number of studentships	1
***Summary descriptive text / Example of research project**	The last five to ten years have seen exponential growth in the application of novel nanomedicines, attributed in part to the emergence of sophisticated analytical technologies. To date, gold nanoparticles (GNPs), predominantly spheres or rods, have demonstrated utility as efficient sensitisers to both radio- and chemotherapy in the treatment of various cancers. Furthermore, GNPs proficiently convert near infrared (NIR) light to thermal energy and can therefore act as novel photothermal agents. This cross disciplinary project will provide the appointed PhD student the opportunity to develop expertise in the synthesis, characterisation and biological evaluation of multiple exotic GNP structures (e.g. stars, prisms, cuboids, etc.). This project has three clear aims: i) to explore the influence of GNP shape on intracellular trafficking using state-of-the-art imaging modalities; ii) to determine the impact of multiple GNP geometries on therapeutic efficacy to both X-ray and NIR radiation; iii) to uncover the as yet unknown surface chemistry of the GNPs following radiation treatment, exploring the impact of functional surface ligands on therapeutic efficacy. Working alongside Dr Coulter, Senior Lecturer in Nanotherapeutics, Professor Bell, Chair in Physical Chemistry and Professor McCarthy, Chair in Nanomedicine, the diverse skill set and expertise gained during this project will provide a solid basis for future employability in both an academic or industrial environment.
***Supervisor(s)**	Dr Jonathan Coulter; Professor Stephen Bell; Professor Helen McCarthy.
***Eligibility / residence Status**	UK/EU only
Country	Northern Ireland
***Start date and duration**	1 October 2019 Funding covers a three-year full-time PhD.

***Faculty**	MHLS
***Research centre / School**	School of Pharmacy School of Chemistry and Chemical Engineering
Subject area	Nanotechnology and Experimental Therapeutics
Candidate requirements / Key skills required for the post	Applicants should have a 1st or 2.1 honours degree (or equivalent) in a relevant subject. Relevant subjects include Pharmacy, Molecular Biology, Pharmaceutical Sciences, Biochemistry, Biological/Biomedical Sciences, Chemistry, Engineering, or a closely related discipline.
***Deadline for applications**	7th January 2019
***How to apply / contacts**	Postgraduate Research applicants for Pharmacy who are interested in applying for a fully funded DFE studentship must have applied to Queen's, via the Direct Applications Portal, and submitted all required supporting documents by the closing date, which will be announced later in the Academic year. https://dap.qub.ac.uk/portal/user/u_login.php
Relevant links / more information	http://www.qub.ac.uk/schools/SchoolofPharmacy/Research/PostgraduatePositions/ http://www.qub.ac.uk/schools/SchoolofPharmacy/Research/
Keywords for search filters	Nanomedicine, Cancer, SERS, radiotherapy, photothermal therapy
Training provided through the research project	The PhD student appointed to this project will have a unique opportunity to work at the interface of the biological and chemical sciences and pharmaceutical engineering, carrying out research in a stimulating environment while receiving both subject-specific and generic skills training. Research techniques will involve physico-chemical analytical techniques (laser spectroscopy, dynamic light scattering, nanoparticle tracking analysis), specialist imaging techniques (Raman imaging microscopy; hyperspectral imaging; SEM/TEM) in addition to a suite of *in vitro* and *in vivo* biological assays to assess therapeutic efficacy. The School of Pharmacy, QUB, has a highly structured annual review process, with a variety of written and oral assessments. Importantly, this structure has ensured that 100% of PhD candidates have submitted within the allocated time period over the last four years. Additional generic skills training will be provided by QUB, supplementing project specific learning.
Expected impact activities	This project is aimed at creating technologies that will deliver patient benefit. This could be in helping to reduce the requirement for directly damaging cancer therapeutics (e.g. chemo- and radiotherapy). Alternatively, for deep seated tumours, using nanoparticle formulations could reduce the dose of radiotherapy required to achieve an equivalent therapeutic effect, which would limit debilitating off-target damage caused by radiotherapy. The student will be expected to help in preparation of documentation for protection of intellectual property they generate and also to participate in outreach activities which will help bring the findings to a wider audience.