



QUEEN'S UNIVERSITY BELFAST

*Title of studentship	Enhancing intracellular delivery of antibiotics using cold atmospheric plasma
Value / what is covered?	Tuition fees and Stipend
Awarding body	DFE
Number of studentships	1
*Summary descriptive text / Example of research project	<p>Atmospheric pressure non-thermal plasma or simply cold plasmas is a partially ionized gas generated at atmospheric pressure, at temperatures suitable for treatment of heat sensitive surfaces such as skin. This technology has demonstrated effectiveness for the control of microbial biofilms, combining its antimicrobial effects with modulation of cellular behaviors (i.e. immune cell activation and cell proliferation) leading to its primary clinical use for the treatment of chronic infected wounds. Cold plasma interacts with the exposed environment altering the aqueous milieu within tissue resulting in changes to pH, conductivity as well as the production of reactive oxygen and nitrogen species (RONS) such as hydrogen peroxide, nitrites, nitrates that interact with components within the environment, as well as having a role in cell signaling.</p> <p>This project seeks to address the rising tide of antimicrobial resistance through optimization of antibiotic treatments alongside cold plasma technology for the amelioration of persistent infections due to intracellular infections. This project aims to understand and develop how cold plasma technology can be utilized to enhance cellular drug uptake of nanoparticle loaded antibiotics thereby inactivating extracellular bacteria and improving clearance of intracellular bacteria using shortened plasma treatments and reduced drug doses. This is an inter-disciplinary research proposal at the leading edge of Plasma Medicine bringing together plasma physics with cell and micro-biology; integrating nascent cold plasma technology with drug delivery research.</p>
*Supervisor(s)	Dr. Padrig Flynn Professor Brendan Gilmore Dr Dimitrios Lamprou
*Eligibility / residence Status	UK/EU only
Country	Northern Ireland
*Start date and duration	1 October 2020
*Faculty	MHLS

*Research centre / School	Pharmacy
Subject area	Pharmaceutical Microbiology, Antibiotics, AMR, Plasma Medicine
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. Students who have a 2.2 honours degree and a Master's degree may also be considered, but the School reserves the right to shortlist for interview only those applicants who have demonstrated high academic attainment to date
*Deadline for applications	January 2020
*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	Cold plasma, Intracellular infections, AMR, Antibiotics
Training provided through the research project	The successful candidate will work alongside an experienced and multidisciplinary team within the School of Pharmacy. They will be trained and will develop expertise within microbiology, PK/PD assessment of antibiotic in an intracellular infection model, as well as developing skills and knowledge in nanoparticle formulation, plasma physics and medicine.
Expected impact activities	This project has the potential to deliver impact through the advancement of cold plasma technology alongside traditional drug delivery approaches to increase the potency and effectiveness of antibiotics and cold plasma treatments of infected tissue. The candidate will have the opportunity to present their findings at international conferences and publish in high impact peer reviewed journals.