



QUEEN'S UNIVERSITY BELFAST

*Title of studentship	Characterising biofilms in endotracheal tubes to direct a new strategy for preventing ventilator-associated pneumonia in critically ill adults
Value / what is covered?	
Awarding body	
Number of studentships	
*Summary descriptive text / Example of research project	<p>Endotracheal tubes (ETTs) are employed for invasive mechanical ventilation of critically ill patients with acute respiratory failure. In these patients the cough reflex is suppressed providing the opportunity for microbes from the upper airways to gain direct access to the lower airways via, for example, microaspiration. Furthermore, microbes can attach to the inner and outer surface of ETTs after only a few hours of mechanical ventilation and often become embedded in a matrix of exopolymeric substances such as DNA, protein and exopolysaccharide known as a biofilm. Biofilm fragments are a source of lung infection and can lead to ventilator-associated pneumonia (VAP), a serious condition occurring in up to a quarter of endotracheally-intubated patients. Prevention of VAP is an important area of unmet need due to the impact of this hospital-acquired infection on patient morbidity, the financial burden to healthcare services and increased mortality rates.</p> <p>There are no efficacious strategies to prevent biofilm formation on ETTs. Currently, our knowledge of the microbial ecology of ETT biofilms is limited by a paucity of data.</p> <p>The major aim of this PhD research project is to generate enhanced understanding of the ecology of ETT biofilms to inform the development of advanced ETT materials. The scientific objectives are to:</p> <ul style="list-style-type: none"> (i) Perform an extensive characterisation of the microbial ecology of ETT biofilms by imaging, and culture-dependent and culture-independent methodologies. (ii) Test the susceptibility of the isolated ETT microbes to currently employed antimicrobials. (iii) Test the susceptibility of the isolated ETT microbes to novel ETT surface-modifying compounds and examine the potential for resistance development.
*Supervisor(s)	Dr Laura Sherrard, Dr Nicola Irwin, Prof Colin McCoy, Prof Danny McAuley
*Eligibility / residence Status	Self-funded project
Country	Northern Ireland

*Start date and duration	1 October 2020
*Faculty	MHLS
*Research centre / School	Pharmacy
Subject area	Pharmacy, microbiome
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	
*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	Microbiome, biofilm, infection, intensive care
Training provided through the research project	The candidate will benefit from broad training in microbiology, molecular biology and statistical analysis of data. Presentation, writing and interpersonal skills will be developed.
Expected impact activities	This PhD research project will integrate microbiology with material science to address a recognised and highly significant clinical problem in intensive care and therefore, merge fundamental research to obtain translational outcomes in healthcare. The successful candidate will present the findings at local, national and international conferences and in scientific papers in peer reviewed journals.