



QUEEN'S UNIVERSITY BELFAST

*Title of studentship	Breaking the code: Deciphering the molecular mechanisms that regulate cell fate in the airways.
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	<p>The human airway epithelium is a complex multi-cellular layer of basal, secretory and ciliated cells which, with effective mucociliary clearance (MCC), provides a critical first line of defence against inhaled pathogens. This is particularly apparent in chronic airways diseases such as cystic fibrosis (CF) and chronic obstructive pulmonary disease (COPD) where impaired MCC leads to recurrent cycles of infection and inflammation resulting in tissue damage which is often associated with a devastating decline in lung function.</p> <p>For mucociliary clearance to be effective an optimal level of airways surface liquid is required. Our lab has a particular interest in the role of the epithelial sodium channel, dysregulation of which contributes to airways dehydration and the thickened secretions observed in CF. Aberrant tissue remodelling in the presence of tissue injury and chronic inflammation can however also play a role, altering the ratio of secretory to ciliated cells. The molecular mechanisms that regulate the selection (or fate) of these cells during basal cell differentiation is therefore an important area to understand, and would be particularly useful in the assessment of the effectiveness of new therapeutics in this area.</p> <p>We have a number of unique tools which may assist the deciphering of the code that dictates the fate of basal cells and whether they differentiate into either secretory or ciliated cells. This project will therefore take a mechanistic approach to investigate the processing of various secretory proteins to include growth and differentiation factors and their receptors and will study airway cell hyperplasia, mucus overproduction and extracellular matrix deposition using a variety of cell-based functional models. Rehydration of the airways and restoration of effective mucociliary clearance could reduce inflammation, infection and lung injury, thus delaying the progression of CF lung disease. Significant benefits would therefore be apparent not only in an improvement in the quality of life and life expectancy of individuals with CF but in disease management.</p>
*Supervisor(s)	Professor Lorraine Martin (School of Pharmacy) and Dr Damian Downey (Clinical Senior Lecturer, Centre for Experimental Medicine & Consultant in Respiratory Medicine, Belfast Trust)

*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	Pharmacy
Subject area	Biomolecular sciences to include novel therapeutic strategies and an understanding of molecular mechanisms of disease.
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 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	7 th 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	Professor Lorraine Martin Research Theme School of Pharmacy, QUB http://www.qub.ac.uk/schools/SchoolofPharmacy/Research/PostgraduatePositions/ http://www.qub.ac.uk/schools/SchoolofPharmacy/Research/
Keywords for search filters	Chronic airways disease, cystic fibrosis, proteases, inflammation, cell biology, molecular biology, biochemistry, airways
Training provided through the research project	The successful applicant will join a well-resourced, multi-disciplinary team focussed on collaborative, translational research. The project will entail culture of primary airways epithelial cells at air-liquid interface and will offer expert training in a wide range of protein biochemistry, genomic, electrophysiological and imaging techniques.
Expected impact activities	Students are expected to present at a minimum of one national and international meeting during their training and make a contribution to internationally excellent research outputs. Engagement with industry partners and participation in our on-going school's outreach programme on lung health and/or science festivals will be

	encouraged.
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<http://www.qub.ac.uk/schools/SchoolofPharmacy/Research/ResearchThemes/NanomedicineandBiotherapeutics/ProfessorLorraineMartin/>