

## School of Pharmacy PhD Project 2017 / 2018

Development of nasally delivered therapeutic vaccine for future therapies

Dr Vicky Kett and Dr Helen Mccarthy

It has been well documented that vaccination with nucleic acids, such as DNA, are highly effective. The 'problem' is that there is no effective delivery system to transport intact DNA into antigen presenting cells to evoke the desired immune response. Such delivery systems must be designed to overcome the biological barriers with high efficiency with low toxicity. Dr McCarthy has developed a series of bio-inspired peptides that are able to achieve this effect when delivered systemically. Dr Kett has developed a series of liposome-based vaccine delivery vehicles with improved mucosal penetration. In this project we will combine aspects of both research groups and compare the ability of bio-inspired peptides and mucus penetrating liposomes to efficiently target the immune system when delivered via the nasal route.

Nasal vaccine delivery offers both improved access to the immune system and effective needle-free immunisation. Combining this with thermal stability and cost-effective components creates the potential to develop vaccines suitable for populations in both developed and low to middle income countries (LMICs).

Formulation aspects of the project, led by Dr. Kett, will include liposome manufacture, drying techniques and physicochemical characterisation. Dr McCarthy will lead the molecular biology aspects including evaluation of the immune response, in vitro tissue culture along with prophylactic and therapeutic responses in vivo. Extensive training will be provided in both aspects of the project as part of internationally renowned research teams. We anticipate publication of the work resulting from this project in high impact journals; therefore, good scientific writing skills are vital.

### General Email Enquiries

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### Project Email Enquiries

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### How to Apply

Postgraduate applications should be made using Queen's University [Direct Applications Portal](#). 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](#) and the [Queen's Postgraduate website](#).