



School of Pharmacy PhD Projects 2014

Project Title	Biomedical devices with slippery liquid-infused porous surfaces which are ultra-resistant to infection
Supervisors	Professor Colin P. McCoy, Professor Steven E. J. Bell, Dr. Peter Nockemann
Description	<p>A major problem associated with medical devices is infection. Infection rates approach 100% in some devices, and methods to prevent formation of bacterial biofilm on device surfaces are urgently required. Recently, a new class of material surface – slippery liquid-infused porous surfaces (SLIPS) have been reported. These surfaces are typically ultra-repellent to fluids (including biological fluids), and are good candidates as inhibitors of bacterial growth. Currently-demonstrated systems, however, are limited in terms of their ability to form part of a medical device and also incorporate components which are not biocompatible.</p> <p>This project will develop methods to inhibit bacterial growth on the surfaces of polymers used in infection-prone medical devices such as endotracheal tubes, catheters and stents using a novel type of biocompatible SLIPS. The project will develop three key areas:</p> <ul style="list-style-type: none">• Methods to establish suitable surfaces of tuned roughness on PVC, and subsequently silicone, substrates.• Creating stable SLIPS from these using a wide range of functional ionic liquids.• Assessment of the ability to resist and/or eradicate developing biofilms. <p>The underpinning technology to be developed in the project is inexpensive, simple to produce and highly robust. Using an appropriate ionic liquid as a non-volatile liquid to fill our SLIPS in a prototype has showed outstanding resistance to bacterial adherence by <i>S. aureus</i>.</p>
Start Date	September 2014
Keywords	Biomaterials, surfaces, infection control, ionic liquids, polymers

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How to Apply

Postgraduate applications should be made using Queen's Online:

<http://go.qub.ac.uk/pgapply>

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:

<http://www.qub.ac.uk/pha>

and the Queen's Postgraduate website:

<http://www.qub.ac.uk/home/ProspectiveStudents/PostgraduateStudents/>