

School of Pharmacy PhD Project 2017 / 2018

Development of functional hydrogels for prolonged drug delivery

Hydrogels are three-dimensional, cross-linked polymeric networks with a high water content. This type of materials has been extensively used in clinical practice and experimental medicine. Nevertheless, they still present some limitations. The hydrophilic nature of the polymers, and its high water content, often results in relatively rapid drug release which limits the applications of these materials for hydrophobic drug delivery. Considering the amount of hydrophobic drugs commercially available, the applications of conventional hydrogels for this type of (?) drug delivery is limited. The proposed PhD research project will address some of these limitations by developing functional hydrogels capable of enhanced loading of hydrophobic molecules for prolonged drug release. Hydrogels will be synthesized using polymers that are well established as pharmaceutical excipients. The properties of these hydrogels will be subsequently modified to improve drug loading and allow sustained release. For this purpose, the proposed strategies are the chemical modification of the hydrogel network and the inclusion of nanoparticles within the hydrogel structure. The developed materials will be tested as mucosal drug delivery systems but other delivery routes may be explored if suitable. A few examples of the possible applications are: medicated wound dressings or drug eluting implants. The proposed research plan offers a good opportunity for a motivated student to start developing his/her career in drug delivery, pharmaceutical materials and nanotechnology.

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](#).