



School of Pharmacy PhD Projects 2015/16

Project Title Controlled Release of Nanomedicine for Tissue Regeneration

Supervisors Dr Thakur Raghu Raj Singh and Dr Helen McCarthy

Description Tissue regeneration therapy can be used in the treatment of a number of diseases (e.g., retinal diseases, diabetes and cancer), where the regeneration of tissues is naturally induced by delivery of bioactive proteins or biopharmaceuticals. Although bioactive proteins are required to promote tissue regeneration, the direct injection of these proteins in solution into the target site is generally not effective. This is due to the physicochemical properties, poor stability, poor permeability and low biodistribution of the proteins which prevent them from reaching their maximum therapeutic concentrations, at the site of action. Therefore, effective delivery of these proteins is technologically challenging. Alternatively protein delivery using controlled release implants provides several critical advantages namely, bioactive proteins are transported to the desirable milieu in biocompatible carriers, preserve the stability/biological activity of the encapsulated protein, release them in a controlled manner for long period of time and may be locally at the site of action to promote tissue regeneration.

In this 3 year, interdisciplinary, PhD research project, the aim is to formulate the bioactive proteins into nanomedicine that can be delivered via a long-acting polymeric implant system for tissue regeneration applications. Our approach is to encapsulate the bioactive proteins into nanocarriers and load them in a biodegradable controlled release implants. In this regard, potential PhD student will (i) experience design and development of this novel nanocarriers-loaded implants, (ii) conduct in vitro and ex vivo characterisation and (iii) evaluate them in in vivo models. The student will receive sufficient training in the experimental design and techniques for the development of these nanomedicine-based implants.

This project will also provide ample opportunity for the PhD student to gain exceptional knowledge in various aspects of pharmaceutical product development and tissue regeneration studies. It will also provide an opportunity for the PhD student to present their research at national and international conferences.

September 2015

Start Date

Bioactive proteins, biopharmaceuticals, controlled release, tissue regeneration, nanomedicine

Keywords

Contact Details

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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/>

