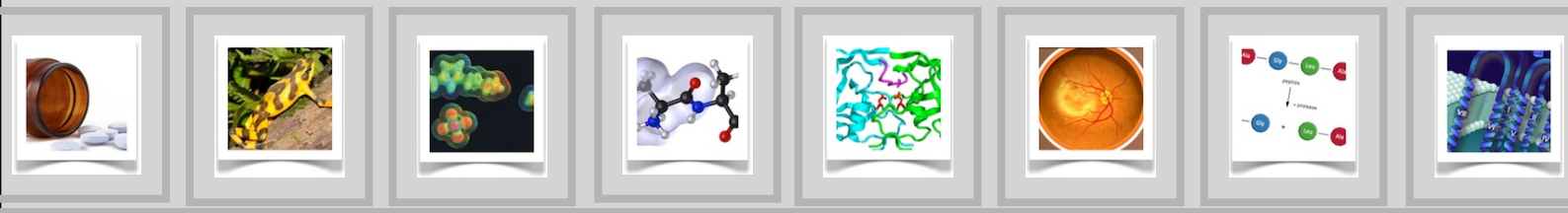

School of Pharmacy PhD Projects 2014

Project Title Development and evaluation of injectable implants for controlled ocular drug delivery

Supervisors Dr. Thakur R.R. Singh and Prof. David Jones

Description

Chronic eye diseases that originate at the back of the eye, such as age-related macular degeneration, diabetic macular edema, diabetic retinopathy, uveitis and glaucoma account for the majority of blindness Worldwide. Delivery of medications in these conditions has been the most challenging task to pharmaceutical scientists. This is due to the unique structure of the eye, which restricts the entry of drug molecules at the required site of action that is located at the back of the eye. Drug delivery through topical (e.g. eye drops) and systemic (e.g. oral tablets) routes result in low or sub-therapeutic drug levels due to multiple ocular barriers. Currently, the effective method of administering drugs in the above conditions is by frequent intravitreal injections (i.e., direct injection into the eye). However, injections causes significant tissue trauma, rise in intraocular pressure, uncomfortable and painful to patients, requires professional training, can cause severe injection-related infections (e.g. endophthalmitis, hemorrhage, and cataract), mechanical injury to the lens and retina, high drug-induced toxicities, and higher costs.

To avoid frequent injections, this project ***aims*** to develop injectable polymeric gels that form implants upon injection in the eye. These implants are designed to sustain drug release for long-term and therefore avoid frequent injections into the eye. In this regard, the student will experience development and characterization of polymeric-based drug delivery systems, develop analytical techniques for polymer and drug analysis, investigate *in vitro* release of drugs from the implants, examine the biodegradation and biocompatibility of the implants in cell-cultures and conduct *in vivo* examinations to determine the suitability of these implants for human applications. The student will receive sufficient training in the experimental design and techniques for the development of novel injectable implants. Furthermore, this project will also provide with ample opportunity for students to gain exceptional knowledge in various aspects of pharmaceutical product development. It will also provide opportunity for the PhD student to present their research at national and international conferences.

Start Date 1 October 2014

Keywords Ocular drug delivery, sustained release, injectable implants, drug delivery, age-related macular degeneration

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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
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