



School of Pharmacy PhD Projects 2014

Project Title	Development and Evaluation of Biodegradable Implants for long-term ocular drug delivery
Supervisors	Dr. Thakur R.R. Singh & Prof. David Jones
Description	<p>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. Therefore, this research project aims to develop novel biodegradable implants that will provide continues drug delivery for long-term, thereby avoiding the need for frequent injections into the eye.</p> <p>The PhD student will be involved in series of activities that will lead to development of novel sustained release ocular implant. Activities involve, preparation of biodegradable implants, evaluation of the implants for physico-chemical and mechanical properties, investigation of biodegradation kinetics of the implant, developing analytical techniques for drug analysis (e.g. HPLC. ELISA), conducting <i>in vitro</i> drug release studies and testing <i>in vivo</i> performance of the implants.</p> <p>The student will receive sufficient training in the experimental design and evaluation of the novel biodegradable 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.</p>
Start Date	1 October 2014
Keywords	Ocular drug delivery, controlled release, biodegradable implants, age-related macular degeneration, intravitreal injections

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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/>