# PGR Studentship Information Template 2021 entry

* Please complete the template with as much information as possible.
* \*fields are essential.
* If you have information that does not have a label, please create a new row in the table for it.

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| **\*Title of studentship** | Nanotherapeutics for Improved Ocular Drug Delivery of Biologics |
| **Value / what is covered?** |  |
| **Awarding body** |  |
| **Number of studentships** |  |
| **\*Summary descriptive text / Example of research project** | Eye diseases,such as age-related macular degeneration (AMD) are major causes of vision loss in the UK and worldwide. For example, approximately 600,000 people in the UK suffer from vision loss due to AMD. Although there is no permanent cure for these diseases, the clinical use of biologics (TPs) has been reported to be effective in stabilising and reducing visual impairment amongst patients. Although, biologics account for 7 out of the top 10 largest selling pharmaceutical products, delivery of biologics to tissues at the back of the eye remains a challenge. Administration of biologics by topical (eye drops), systemic (i.v) or periocular (sub-conjunctival) routes has shown little therapeutic benefit, due to multiple ocular barriers and inaccessibility of the target tissues (e.g. retina) that are located at the back of the eye. Currently, the effective method of administering biologics in the above conditions is by repeated intravitreal injections (i.e., direct injection into the eye) for every 4-8 weeks, indefinitely. Repeated 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 and cataract), retinal detachment, intraocular hemorrhage, high drug-induced toxicities, and higher costs.  Our proposed solution is to formulate nanocarriers encapsulating the biologics to improve its ocular delivery. The nanocarriers will be designed to provide sustained biologics release thereby reducing frequent injections into the eye. In this regard, during the 3-years of this PhD project, the student will (i) design, development and characterize biologics encapsulated nanocarriers, (ii) develop analytical techniques for polymer and protein analysis, (iii) investigate in vitro release of proteins from the nanocarriers, (iv) examine the biodegradation and biocompatibility of the nanocarriers, in cell-cultures and (v) conduct preliminary in vivo examinations to determine the suitability of these delivery system for human application. The student will receive sufficient training in the experimental design and techniques for the development of novel nanocarriers. |
| **\*Supervisor(s)** | Dr Raj Thakur |
| **\*Eligibility / residence Status** | UK/EU or non-EU |
| **Country** | Northern Ireland |
| **\*Start date and duration** | Sep/October 2021, 3 yrs |
| **\*Faculty** | MHLS |
| **\*Research centre / School** | School of Pharmacy |
| **Subject area** | Pharmacy, Pharmaceutical Sciences, or Polymer science, drug delivery, Ocular Drug delivery, Biologics |
| **Candidate requirements / Key skills required for the post** | Applicants should have a 1st or 2.1 honours degree (or equivalent) in a relevant subject. Relevant subjects include Pharmacy, Molecular Biology, Pharmaceutical Sciences, Biochemistry, Biological/Biomedical Sciences, Chemistry, Engineering, or a closely related discipline. Students who have a 2.2 honours degree and a Master’s degree may also be considered, but the School reserves the right to shortlist for interview only those applicants who have demonstrated high academic attainment to date |
| **\*Deadline for applications** | Open deadline |
| **\*How to apply / contacts** | Postgraduate Research applicants for Pharmacy who are interested in applying for a fully funded DFE studentship must have applied to Queen’s, via the Direct Applications Portal, and submitted all required supporting documents by the closing date, which will be announced later in the Academic year.  [https://dap.qub.ac.uk/portal/user/u\_login.php](about:blank) |
| **Relevant links / more information** | [http://www.qub.ac.uk/schools/SchoolofPharmacy/Research/PostgraduatePositions/](about:blank)  [http://www.qub.ac.uk/schools/SchoolofPharmacy/Research/](about:blank) |
| **Keywords for search filters** | Ocular drug delivery, drug deliver, polymer implants, biologics, protein delivery |
| **Training provided through the research project** | This project will also provide ample opportunity for the PhD student to gain exceptional knowledge in various aspects of pharmaceutical product development and ophthalmological techniques. It will also provide opportunity for the PhD student to present their research at national and international conferences. Students will get training in pharmaceutical formulation; pharmaceutical analysis; microbiology and sterilsiation. In addition, students will be trained in a wide range of R&D related activities throughout the PhD program that will enable them to become an independent research and/or ready for industrial positions |
| **Expected impact activities** |  |