# 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** | Development and evaluation of microneedle arrays for ocular drug delivery  |
| **Value / what is covered?**  | Fully funded100% of UK/EU tuition fees paid and an annual stipend for UK residents only (living expenses) |
| **Awarding body** | **DfE studentship** in collaboration with our partner **Pharma company**  |
| **Number of studentships** | 1 |
| **\*Summary descriptive text / Example of research project**  | Minimally invasive microneedles (MNs) offer unique opportunities to address current challenges in the effective management of ocular disorders, such as age-related macular degeneration (AMD) and diabetic retinopathy (DR) [1]. There is a clear unmet clinical need for efficient, safe, minimally/non-invasive and patient-friendly strategies for the treatment of prevalent diseases of the posterior segment of the eye. We have previously demonstrated how MN technology can enable localised drug delivery to target posterior segment tissues using both polymer based soluble MNs [2] and hollow MNs [3]. For example, delivering small molecules and biologics within the scleral tissue offers localised and minimally invasive alternative to highly invasive intravitreal injections that are given on a monthly/bi-monthly basis for the rest of the patient’s life. In this project, the PhD student will take a systematic approach to address some of the fundamental questions in ocular delivery using MNs. This will include comprehensive literature review; development of in vitro models to evaluate the mechanical properties of MNs and tissues; combination of computer modelling and in vitro evaluations of MNs to enable selection of optimum MN-based formulation; and analytical method development and validation for drug analysis. The project is in collaboration with a leading Pharma company, so the student will have an opportunity for secondments during the 3-yr period to gain additional knowledge and industrial experience.  References:1. Thakur *et al.* (2017) Minimally invasive microneedles for ocular drug delivery. *Expert Opinion on Drug Del*ivery, 14(4), 525–537. 2. Thakur *et al.* (2016) Rapidly dissolving polymeric microneedles for minimally invasive intraocular drug delivery. *Drug Delivery and Translational Research*, 6(6), 1–18. 3. Thakur *et al*. (2013) Microneedle-mediated intrascleral delivery of *in situ* forming thermoresponsive implants for sustained ocular drug delivery. *J Pharmacy and Pharmacology*, 66, 584-95   |
| **\*Supervisor(s)** | Dr Raj Thakur Prof Ryan Donnelly |
| **\*Eligibility / residence Status** | UK/EU  |
| **Country** | UK |
| **\*Start date and duration**  | 1 October 2021, 3 yrs  |
| **\*Faculty** | MHLS |
| **\*Research centre / School** | Pharmacy |
| **Subject area** | Pharmacy, Pharmaceutical Sciences, or Polymer science, drug delivery  |
| **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, 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.For DfE studentship eligibility, please check the link below.<https://www.nidirect.gov.uk/articles/department-economy-studentships> |
| **\*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>  |
| **Relevant links / more information**  | <http://www.qub.ac.uk/schools/SchoolofPharmacy/Research/PostgraduatePositions/><http://www.qub.ac.uk/schools/SchoolofPharmacy/Research/><https://www.qub.ac.uk/schools/SchoolofPharmacy/Research/find-a-phd-supervisor/dr-thakur-raghu-raj-singh.html><https://www.qub.ac.uk/schools/SchoolofPharmacy/Research/find-a-phd-supervisor/professor-ryan-donnelly.html> |
| **Keywords for search filters** | Microneedles, Ocular drug delivery, controlled release, polymer implants, biologics delivery |
| **Training provided through the research project** | Students will get training in pharmaceutical formulation; pharmaceutical analysis; microbiology; and mathematical modelling. 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. It will also provide opportunity for the PhD student to present their research at national and international conferences  |
| **Expected impact activities** | The project is expected to offer innovative approaches in ocular drug delivery. The PhD student will be encouraged to engage in a variety of impact activities, disseminate the research project findings through publications in relevant peer-reviewed journals, present the results of the study at conferences (in-person and/or online), and make them accessible to general public through broader channels, such as social media and popular science outlets.  |