# 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.

|  |  |
| --- | --- |
| **\*Title of studentship** | **Development of precisely engineered nanocrystals for selective tissue targeting** |
| **Value / what is covered?** |  |
| **Awarding body** |  |
| **Number of studentships** | 1 |
| **\*Summary descriptive text / Example of research project** | A considerable number of infectious diseases affect the lymphatic system and are difficult to treat because the pathogens that cause them can form reservoirs in such tissues, where current treatments can not provide sufficient concentrations of the active to eradicate these microorganisms. Lymphatic filariasis (LF) is an example of this. LF remains a challenge for public health, currently threatening 893 million people in 49 countries. LF impairs the lymphatic system and can lead to the abnormal enlargement of body parts, causing pain, severe disability and social stigma. In this project, the student will develop novel nanocrystal-based formulations to target parasite reservoirs in the lymphatic system by means of top-down approaches, such us high-pressure homogenisation and bead milling. The formulations will be fully characterised *in vitro* and successful candidates will be tested in animals models with the aim of evaluating their pharmacokinetics and biodistribution profiles. The student will be involved in a world-renowned research group and will count on the support of a multidisciplinary team and the availability of cutting-edge infrastructure to develop the project. A strong emphasis will be placed on boosting both theoretical and technical skills of the student, as well as enhancing their communication and teamwork abilities. All these aspects together will greatly improve the future professional perspective and employability of the candidate. |
| **\*Supervisor(s)** | Supervisor: Dr. Alejandro J. Paredes  Co-supervisor: Prof. Ryan F. Donnelly |
| **\*Eligibility / residence Status** | UK/EU/International |
| **Country** | UK |
| **\*Start date and duration** | October 1st 2021 |
| **\*Faculty** | MHLS |
| **\*Research centre / School** | School of Pharmacy |
| **Subject area** | Drug delivery, Nanocrystals, Selective organ targeting |
| **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** |  |
| **\*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/> |
| **Keywords for search filters** | Nanocrystals, Targeting, Lymphatic system, media milling |
| **Training provided through the research project** | The candidate will be involved in a multidisciplinary project, interacting with other students and experts in complementary research fields. The student will receive training-through-research in different formulation techniques and processes related to the production of solid drug nanoparticles (nanocrystals) by top-down and bottom-up approaches, with an emphasis on media milling, nanoprecipitation, freeze-drying and spray-drying. Nanoparticle characterisation will cover dynamic light scattering (size and distribution), electronic microscopy (morphology and size) and electrophoretic light scattering (surface charge). The student will perform release experiments using dialysis membranes and Franz cells. Moreover, they will be encouraged to obtain a UK Animal Handling License, which will allow them to perform pharmacokinetics and biodistribution experiments in rats. The student will receive comprehensive hands-on training in high-performance liquid chromatography (HPLC) for the quantification of drugs in different biological and non-biological samples. The student will learn to statistically process and present data to scientific audiences and also to communicate information to a broader public, in written form and orally. |
| **Expected impact activities** | Improving patients’ quality of life by the development of novel optimized therapies for difficult-to-treat diseases like lymphatic filariasis. The interaction with private partners from the pharmaceutical industry will allow the commercial development of nanocrystal-based products. The PhD candidate will improve their CV by receiving training-through-research and presenting their work at major international conferences, as well as publishing scientific papers in high-impact journals. |