# 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** | 3D-printing of medical devices to treat cardiovascular disease |
| **Value / what is covered?** |  |
| **Awarding body** |  |
| **Number of studentships** |  |
| **\*Summary descriptive text / Example of research project** | Cardiovascular Disease is the leading cause of death worldwide requiring millions of vascular bypass/replacement surgeries each year. Bypass surgery requires the incorporation of blood vessels to circumvent blocked arteries using blood vessels harvested from the patient, which is unsuitable for a large number of patients. Synthetic vascular-grafts can be use, however, they have low success rate. Therefore, this project proposes an interdisciplinary approach to tackle this problem. A 3D-bioprinter will be used to build synthetic blood vessels loaded with drugs and containing stem cells. These artificial blood vessels will provide a structure for the cells to form new blood vessels and subsequently will be biodegraded leaving a new functional blood vessel. The devices will contain drugs to prevent blood clot formation.  The first stage of the project will cover the design and manufacturing of these blood vessels. This first part will cover disciplines such as 3D-design, material sciences, advance manufacturing techniques and chemistry. On the other hand, the second part of the project anticoagulant drugs will be incorporated into the 3D-printed vascular grafts incorporating a pharmaceutical sciences angle to the project. The third part of the project will evaluate the incorporation of organoids generated from cells provided by donors into the vascular grafts. This part of the project will rely heavily on tissue culture, biological methods including in vivo studies. |
| **\*Supervisor(s)** | Dr. Eneko Larrañeta |
| **\*Eligibility / residence Status** | UK |
| **Country** | Northern Ireland |
| **\*Start date and duration** | 1 October 2021 (36 months) |
| **\*Faculty** | MHLS |
| **\*Research centre / School** | School of Pharmacy |
| **Subject area** | Drug delivery and medical devices |
| **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/>  <https://pure.qub.ac.uk/en/persons/eneko-larra%25C3%25B1eta> |
| **Keywords for search filters** | 3D printing / drug delivery / tissue engineering / medical devices |
| **Training provided through the research project** | This interdisciplinary project will provide training in a range of analytical methods, design, manufacture and assessment of novel medical devices and biological models for assessment of the potential clinical efficacy of formulations. Furthermore, student training will take place within a highly active international research culture. In addition to laboratory based-skills, the student will also undergo training in research methodology and statistics and will have opportunities to develop both verbal and written communication skills. The student will publish their research in journal articles and present at both national and international conferences. The student will also have the opportunity to actively participate in a range of outreach activities in the community and gain teaching experience on our undergraduate and postgraduate courses. |
| **Expected impact activities** | Enhanced patient care and quality of life, economic development for the pharmaceutical and medical devices industry. The student’s CV will be enhanced through training with a leading international Group |