# 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 of Advanced Cold Plasma Therapeutics for Orthopaedic Infection Control |
| **Value / what is covered?** | Fully Funded |
| **Awarding body** | R&D Office/DfE |
| **Number of studentships** | 1 |
| **\*Summary descriptive text / Example of research project** | Infection following joint replacement is a devastating complication that occurs in up to 1-2% of cases. The incidence is even higher in patients with: diabetes, obesity, surgical site infections, inflammatory disorders, poor wound healing, or for those who smoke. Because of the increasing prevalence of multi-drug resistant bacteria, there is a critical need to develop new therapeutic interventions to avoid untreatable, life-threatening infections. Cold plasma is a non-antibiotic intervention that can eradicate bacteria and destroy bacterial biofilms. This project will test the hypothesis that a multimodal cold plasma treatment applied during orthopaedic surgical procedures will eradicate existing bacteria and biofilm, thus preventing infection (or reinfection) and enhance surgical site healing and osseointegration, as part of an international collaboration (USA/UK/RoI).  The PhD student will join this multidisciplinary, international research consortium, based at Queen’s University Belfast. They will develop cold plasma experimental protocols for eradication of pathogenic biofilms from orthopaedic materials, bone and surrounding tissues, and to develop representative biofilm models of these complex, multispecies pathogenic states. The PhD will aim to describe the parameters necessary for rapid and accurate biofilm eradication by cold plasmas (either direct exposure, or plasma activated liquids), and to understand the consequences of sub-therapeutic or sub-lethal plasma exposures on biofilm bacteria, using advanced sequencing techniques and susceptibility/persister assays. Finally, the effects of short plasma exposures on macrophage and neutrophil activation within the biofilm milieu, building on previous studies within our research group. |
| **\*Supervisor(s)** | Prof Brendan Gilmore, Dr Padrig Flynn |
| **\*Eligibility / residence Status** |  |
| **Country** |  |
| **\*Start date and duration** | October 2021 – September 2024 |
| **\*Faculty** | Medicine, Health & Life Sciences |
| **\*Research centre / School** | School of Pharmacy |
| **Subject area** | Biomaterials and Infection Control |
| **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, Micorbiology, 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](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** | Biofilms, Infection Control, Cold Plasma |
| **Training provided through the research project** | The student will benefit from joining a dynamic research group focused on the science of bacterial biofilm microbiology and biofilm control, as part of an international research consortium and will join consortium meetings at the three partner institutions and present their data at relevant international research conferences. The candidate will be trained in the application of cold plasmas, biofilm microbiology, mammalian tissue culture and molecular biology. This programme is expected to significantly advance the application of cold plasma in clinical biofilm control. |
| **Expected impact activities** | Attendance at international conferences and consortium meetings, conference presentation and publication in international, peer-reviewed journals |