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| **\*Title of studentship** | Self-regulating, self-cleaning biomaterials |
| **Value / what is covered?**  | Fully funded  100% of UK/EU tuition fees paid and an annual stipend for UK residents only (living expenses), currently at **£15,285** |
| **Awarding body** |  |
| **Number of studentships** | 1 |
| **\*Summary descriptive text / Example of research project**  | A major problem associated with medical devices is infection. With infection rates of approaching 100% in some devices, ways to prevent formation of bacterial biofilm on medical device surfaces are urgently required. This project will develop methods in preventing the development of bacterial growth on polymer surfaces using a combination of strategies. Specifically, we will target polymeric devices such as urinary catheters and endotracheal tubes, which suffer badly from high infection rates, for improvement. The McCoy group has recently published a new way of using changes in chemical environment, such as that found at the onset of infection to trigger drug release. In this project, this technology will be developed further to exploit the changes which occur at the onset of infection to produce materials which can “self-clean” in the presence of an infection.Additionally, in this project, we will exploit our recent findings that it is possible to also impart the ability to resist encrustation in urinary biomaterials to develop simultaneously anti-fouling and anti-encrustation urinary biomaterials. The resulting next-generation biomaterials are aimed at reducing or eliminating infection, thereby reducing treatment costs and improving patient outcomes. This important project will give extensive experience as part of an internationally-funded research team. Expertise in polymer synthesis, spectroscopic characterisation, drug release, biocompatibility and microbiology will also be developed as part of the research programme. |
| **\*Supervisor(s)** |  Professor Colin McCoy, Dr. Matthew Wylie |
| **\*Eligibility / residence Status** |  |
| **Country** |  |
| **\*Start date and duration**  | 1 October 2022 |
| **\*Faculty** | MHLS |
| **\*Research centre / School** | Pharmacy |
| **Subject area** | Pharmacy, drug delivery, materials science |
| **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** | Drug delivery, antimicrobial, AMR, polymer, materials science, surface modification, surface chemistry |
| **Training provided through the research project** | The program will give specific training in polymer synthesis, drug delivery methodology, materials characterisation, microscopy, microbiology and spectroscopic techniques, including UV-visible, Raman and infrared spectroscopy. Additionally, presentation, writing and interpersonal skills will be developed |
| **Expected impact activities** | Attendance art conference, publication of scientific papers, collaboration with interested industrial partners. |