# 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** | Investigation of changes in gut virome composition associated with of administration of antibiotics |
| **Value / what is covered?** |  |
| **Awarding body** |  |
| **Number of studentships** |  |
| **\*Summary descriptive text / Example of research project** | Gut microbiome is a complex community of microorganisms, comprising bacteria, fungi, protists and viruses. The gut ecosystem has significant influence on the physiology of the host and its reorganisation in response to different stress factors, including antibiotics, has an immediate and pronounced impact on metabolic and regulatory processes of the host organism.  While the effects of antibiotic administration on gut bacteria have been extensively investigated, much less is known about the perturbations to the viral component (virome) of the gut microbiome. As a significant proportion of gut viruses are bacteriophages, which are known to incorporate functionally beneficial genes under stress-related conditions, including determinants of antibiotic resistance, a thorough investigation of the gut virome dynamics following the administration of antibiotics would help to better understand phage-bacteria interactions in the gut and the role of phages in the emergence of drug-resistant phenotypes of bacteria.  To this end, in this project faecal samples collected before and after adiminstration of antibiotics will be processed to isolate a fraction or virus-like particles. Viral DNA will be extracted and subjected to high-throughput sequencing and a comparative analsysis of changes in taxonomic and functional composition of viromes will be conducted. Special emphasis will be placed on determination of changes in relative abundance of antimicrobial resistance genes between samples. |
| **\*Supervisor(s)** | Dr Timofey Skvortsov  Prof Brendan Gilmore |
| **\*Eligibility / residence Status** |  |
| **Country** |  |
| **\*Start date and duration** | January 2020 |
| **\*Faculty** | MHLS |
| **\*Research centre / School** | School of Pharmacy |
| **Subject area** | Viromics, metagenomics, antimicrobial resistance, antibiotics |
| **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 Microbiology, Virology, 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** | Bacteriophage, virus, microbiome, antibiotics, molecular microbiology, pathogenic bacteria, anti-microbial resistance |
| **Training provided through the research project** | The aim of the proposed interdisciplinary project is to investigate the changes in taxonomic and functional compositions of faecal viromes associated with administration of antibiotics. During the project, the successful candidate will have an exciting opportunity to learn a variety of molecular microbiology techniques, including viral DNA extraction and purification. This work will also involve molecular biology and biochemistry, including molecular cloning (PCR, DNA ligation, endonuclease digestion etc.). The PhD student will be taught basics of next-generation sequencing and provided with necessary bioinformatics training in order to characterise viromes (assemble and annotate viral contigs, produce functional and taxonomic profiles of viromes) and identify gene sequences of antibiotic resistance genes.  Finally, the student will have an opportunity for further personal and professional development through a range of training activities available to postgraduate students at Queen’s University Belfast. |
| **Expected impact activities** | The expected outcome of the project is a detailed description of reorganisation of the viral component of gut microbiome caused by administration of antibiotics.  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. |