# 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** | Novel enzyme inhibitors for chemical biology and drug discovery |
| **Value / what is covered?** | 3-years (fully funded) |
| **Awarding body** | DfE |
| **Number of studentships** | 1 |
| **\*Summary descriptive text / Example of research project** | The goal of this project is the development of novel enzyme inhibitors and molecular tools to understand the role of glycans for chronic airways diseases such as COPD (chronic obstructive pulmonary disease). The project will provide new insights into the molecular basis of COPD and form the basis for the development of novel therapeutic approaches, which are urgently required.  The project will provide extensive multidisciplinary training at the chemistry/biology interface, including the design and synthesis of small organic molecules, and their *in vitro* evaluation in biochemical and pharmacological assays. It is ideally suited for a student with a strong background in organic/medicinal chemistry, chemical biology, or a related area, who wants to broaden their skill set in drug design, enzymology, cell biology, and pharmacology.  Changes in complex glycan structures are a characteristic molecular feature of chronic airways diseases, yet the precise role of these changes for disease progression and severity is not well understood. In contrast to proteins and nucleic acids, the biosynthesis of complex glycans is controlled not genetically, but by a complex network of biosynthetic enzymes. Inhibitors of these enzymes are therefore ideally suited to study their role, and those of their biosynthetic products, for chronic airways diseases.  The Wagner group has a long-standing track record in the development of inhibitors for glycosyltransferases, Nature’s glycosylation reagents (e.g., [Nat Chem Biol 2010](https://pubmed.ncbi.nlm.nih.gov/20364127/); [J Med Chem 2012](https://pubmed.ncbi.nlm.nih.gov/22356319/), [J Biol Chem 2013](https://pubmed.ncbi.nlm.nih.gov/23836908/), [J Biol Chem 2015](https://pubmed.ncbi.nlm.nih.gov/26527682/), [Bioorg Med Chem 2017](https://pubmed.ncbi.nlm.nih.gov/28462843/), [Bioorg Med Chem 2018](https://pubmed.ncbi.nlm.nih.gov/29602676/)).  Building on this previous work, you will apply novel design concepts to develop glycosyltransferase inhibitors with suitable properties for applications in cell culture and whole organisms. You will evaluate your inhibitors in relevant *in vitro* assays and, in collaboration with Prof Lorraine Martin (QUB), use your inhibitors to elucidate how changes to glycan structure drive phenotypic changes relevant to chronic airways diseases. |
| **\*Supervisor(s)** | Professor Gerd Wagner, Professor Lorraine Martin |
| **\*Eligibility / residence Status** | UK/EU |
| **Country** | Northern Ireland |
| **\*Start date and duration** | 1 October 2021 |
| **\*Faculty** | MHLS |
| **\*Research centre / School** | Pharmacy |
| **Subject area** | Chemistry, Medicinal Chemistry, Organic Chemistry, Chemical Biology, Pharmacy, Pharmaceutical Sciences |
| **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 Chemistry, Chemical Biology, Pharmacy, Pharmaceutical Sciences, Biochemistry, Biological/Biomedical Sciences, Engineering, or a closely related discipline. Students who have a 2.2 honours degree and a Masters 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** | 14 June 2021  Interviews are expected to take place w/c 21 June. |
| **\*How to apply / contacts** | Applications must be submitted electronically via the Queen’s Direct Applications Portal, including ALL required supporting documents, by the closing date.  <https://dap.qub.ac.uk/portal/user/u_login.php>  Informal enquiries should be directed to [g.wagner@qub.ac.uk](mailto:g.wagner@qub.ac.uk)  The title of the studentship should be referenced in all correspondence. |
| **Relevant links / more information** | <https://www.qub.ac.uk/schools/SchoolofPharmacy/Research/find-a-phd-supervisor/dr-gerd-wagner.html>  https://www.qub.ac.uk/schools/SchoolofPharmacy/Research/find-a-phd-supervisor/professor-lorraine-martin.html  <http://www.qub.ac.uk/schools/SchoolofPharmacy/Research/> |
| **Keywords for search filters** | drug discovery, chemical biology, organic synthesis, medicinal chemistry, carbohydrate chemistry, glycobiology, glycosyltransferase, multidisciplinary |
| **Training provided through the research project** | The student will receive in-depth training in a broad range of experimental techniques in medicinal chemistry and chemical biology, including rational inhibitor design, advanced organic synthesis, protein biochemistry, and *in vitro* assays. He/she will be primarily based in the John King Laboratory in the School of Pharmacy at QUB, but also have the opportunity to experience different research environments through collaboration with the group of Prof Lorraine Martin and external partners.  The project will also provide an ideal opportunity to acquire transferable and generic skills in time and project management, science outreach, and knowledge transfer and commercialisation. |
| **Expected impact activities** | It is anticipated that inhibitors developed in this project will create opportunities for knowledge transfer, translation, and commercialisation in the areas of drug development for chronic airways diseases. The project will also offer an opportunity for the student to contribute to a range of outreach activities such as the regular delivery of science workshops for school children and lay audiences. |