# 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** | **A microfluidic approach to supressing tumour metabolism and enhancing treatment sensitivity.** |
| **Value / what is covered?**  |  |
| **Awarding body** |  |
| **Number of studentships** |  |
| **\*Summary descriptive text / Example of research project**  | Altered tumour metabolism is a recognised enabling characteristic of resistance to existing cancer therapeutics (chemo- and radiotherapy). Indeed, this was first described by Otto Warburg in 1931, detailing that oxygenated tumour cells appear to favour energy production via glycolysis, a process more commonly associated with cells under oxidative stress. Recent research has identified that the preference for lactate as an energy source in oxygenated tumour cell, frees up high energy glucose for metabolism by hypoxic tumour cells, thereby promoting tumour survival under oxygen depletion stress. Therefore, one approach to sensitise both oxygenated and hypoxic tumour cells to existing cancer therapeutics (radiotherapy or chemotherapy) would be to cut off the tumour energy supply. Given tumour plasticity, and the ability to switch between either oxidative phosphorylation or glycolysis, it is likely to derive maximal effect, both energy pathways will require inhibition. The student appointed to this project will used cutting edge microfluidics to formulate nanoparticles (liposomes, polymer based) encompassing poorly soluble drugs against each energy pathway. The project will be comprised of two main arms: i) a pharmaceutics arms investigating nanoparticle composition, drug loading, drug release, stability etc. and ii) a cell biology arm where the nanoparticles will be tested for anti-tumour efficacy alone or in combination with chemo- and/or radiotherapy. These experiments will also be conducted under variable oxygen concentrations to establish efficacy against treatment resistant hypoxic cells. This projects forms part of an exciting collaborative partnership between Dr Jonathan Coulter, a prostate cancer expert in translational medicine and Dr Dimitrious Lamprou, a Reader in pharmaceutical engineering with expertise in microfluidics and controlled release systems.  |
| **\*Supervisor(s)** | Dr Jonathan Coulter & Dr Dimitrious Lamprou |
| **\*Eligibility / residence Status** | Home (DfE Scholarship deadline 8th January 2021), International Scholarship, International self-funding  |
| **Country** |  |
| **\*Start date and duration**  | September 2021 |
| **\*Faculty** | Medicine Health and Life Sciences |
| **\*Research centre / School** | School of Pharmacy |
| **Subject area** | Cancer biology, pharmaceutics, nanomedicine |
| **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** | All postgraduate research applicants for Pharmacy who are interested in the project must submit an application all required supporting documents via the Direct Applications Portal (link below). UK students considering applying for DfE scholarship support, applications must be submitted before **Friday 15th January 2021.** Any interested applicants can informally contact Dr Coulter by email at j.coulter@qub.ac.uk 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://www.qub.ac.uk/schools/SchoolofPharmacy/Research/ResearchThemes/NanomedicineandBiotherapeutics/https://www.qub.ac.uk/schools/SchoolofPharmacy/Research/find-a-phd-supervisor/dr-jonathan-coulter.htmlhttps://pure.qub.ac.uk/en/persons/dimitrios-lamprou |
| **Keywords for search filters** | Cancer biology, Nanomedicine, Drug Delivery, Hypoxia, Microfluidics |
| **Training provided through the research project** | Right from the start the PhD student will be involved in academic research designed to have translational/clinical application. This dual approach spans:1) Research Skills: the academic supervisors will ensure excellent training in nanoparticle formulation, systematic physical characterisation, *in vitro* cell and molecular biology techniques and potentially *in vivo* skills.2) Record keeping & monitoring: Monthly meetings with the student will take place with electronic records. Students must also complete a 3-month initial review and annual progress review to proceed to years 2 & 3. The annual progress review involves written work, presentation and/or mini *viva*. However, at each of these meetings, the primary supervisor will also be present ensuring that the maximal training benefit can be derived from these processes.3) Additionally, there will be opportunities to present at academic meetings, building professional networks, personal development on courses for animal licenses, advanced statistics, skills which are all relevant to subsequent employment opportunities. |
| **Expected impact activities** | Impact activities include but are not restricted to presenting the research to academic and industry peers through scientific conferences and students from different disciplines through the Graduate School. The student will also engage with patients, clinicians and key stake holders through a series of webinars/focus groups to understand how they can feed and shape the research plan. Other impact activities relate to commercialisation though IP protection processes, competitor analysis and engagement with clinical collaborators.  |