

Cancer Experimental and computational PhD

Understanding human glioblastoma initiation and its microenvironments

Application Deadline: **July 22nd 2024**
Project Start Date: **October 1st 2024**

Supervisors

Primary Supervisor: **Prof Simona Parrinello** ([UCL Cancer Institute](#))
s.parrinello@ucl.ac.uk

Secondary Supervisor: **Dr. Simone Zaccaria** ([UCL Cancer Institute](#))
s.zaccaria@ucl.ac.uk

In collaboration with Mr Ciaran Hill, academic consultant neurosurgeon UCLH and UCL Cancer Institute.

You are welcome to contact either supervisors for informal enquiries and questions.

Funding and Duration

CRUK, funding for 4 years (full-time).

- A non-taxable annual stipend of £23,000 per annum (current CRUK London rate)
- Tuition fees for Home status only.

There are no additional top up funds for overseas tuition fees.

About the Project

Glioblastoma (GBM) is a lethal and highly therapy-resistant primary brain tumour for which there are no adequate therapies. Recurrence is largely invariable and originates from tumour cells that infiltrate the healthy brain past the surgical resection margin and survive chemotherapy and radiation. Despite the central role of invasive cells in recurrence, current understanding of the disease originates almost exclusively from analysis of the readily accessible tumour bulk, which is routinely collected at surgical debulking. However, we and others have shown that margin and bulk cells are functionally and biologically distinct subpopulations. Thus, eradicating recurrence requires a deeper understanding of the unique biology of the margin and the development of novel strategies based this knowledge.

In analogy to many metastatic cancers, GBM invasion has been traditionally viewed as a late-stage event in the tumourigenic process, with transformed cells first forming a tumour bulk and later spreading away from it. However, emerging evidence from small-scale patient studies and our preliminary data in mouse models challenge this view; suggesting that invasion may instead be an early event that leads to the margin being seeded before the main tumour bulk develops. Understanding the ontology of margin development is central to the understanding of GBM evolution and has the potential to identify novel strategies for preventing it or curtailing its recurrence.

The aim of this project is to determine when and how the margin forms in GBM. Leveraging state-of-the-art mouse models of GBM recently developed in the Parrinello lab and a unique set of patient samples collected from the margin, the student will combine wet lab and bioinformatics approaches to:

- 1) Explore the impact of driver mutations on cell fate and migratory programmes using single cell ATAC-sequencing and RNA-sequencing technologies in mouse models of GBM.
- 2) Assess the timeline and evolutionary history of invasive clones in human GBM by carrying out phylogenetic and genomic analysis of patient material.

Formal supervisory meetings will be once weekly with primary and secondary supervisors. The student will participate in the UCL CI CIRPS seminars, departmental seminars and weekly lab meetings in addition to the UCL teaching and training meetings. Students are also supported by a Thesis Committee. All students take part in a [compulsory first year Cancer programme](#) and are part of the [UCL Doctoral School](#)'s Development Training Programme.

About the Department

The PhD student will be based at the UCL Cancer Institute joining the groups of Prof. Parrinello and Dr. Zaccaria at UCL Cancer Institute both embedded within the CRUK City of London Centre (<https://www.colcc.ac.uk>).

The University College London Cancer Institute (UCL CI) (<https://www.ucl.ac.uk/cancer/welcome-ucl-cancer-institute>) is the hub for cancer research at UCL, one of the World's leading universities. The Institute draws together over 400 talented scientists and over 150 PhD students who are working together to translate research discoveries into developing kinder, more effective therapies for cancer patients.

The Computational Cancer Genomics Research Group research group focuses on the development of computational methods to analyse tumour sequencing data for investigating different cancer evolutionary processes.

Entry Requirements

Experience in cell culture and basic wet lab techniques are desirable, and experience in molecular biology techniques, data analysis and computational biology are essential.

A UK master's degree, or a minimum of a first or an upper second-class UK Bachelor's degree, in a relevant discipline, or an overseas qualification of an equivalent standard. Candidates will need to demonstrate a strong research component. We welcome applicants from disadvantaged backgrounds, or via an unconventional career path.

English Language Requirements

If your education has not been conducted in the English language, you will be expected to demonstrate evidence of a good level of English proficiency. The English language level minimum for this programme is: **level 3**

Deadline and Application Process

The deadline for submission is: **17:00 July 22nd 2024**

Interviews will be online in the latter part of July. Successful candidates will be invited to visit the laboratory and meet members of the team.

To apply please send your selection materials to ci.pgreducation@ucl.ac.uk:

1. A CV
2. Two academic/ professional references: two scientists/ academics who are familiar with your academic work and/ or research experience and who can judge your potential as a PhD student. One should be your current or most recent employer/supervisor, at least one must be able to comment on your university academic record, and at least one must be able to comment on your previous research experience.
3. Transcript/s of the marks you achieved in your qualifications.
4. In your 1 page statement, please expand on:
 - a. why you want to do a PhD and why this one,
 - b. what are your career aspirations and previous experience.
 - c. Please give details on your research experience in cell culture and wet lab techniques, molecular biology, data analysis and computational biology as part of your statement.
5. If you are not a UK candidate, please explain how you will cover the difference in fees. Please note that we will only be able to offer studentships to candidates that have home tuition fee status or provide evidence that they can fund the international portion of the tuition fee from external sources (i.e. not self-funded).

Shortlisting will be immediately after the closing date so please make sure all your documents and your referees have provided their references before so your application can be processed. Shortlisted candidates only will be asked to apply formally through UCL.

We wish you every success in your application.