UNIVERSITY OF CAMBRIDGE
Department of Oncology

Early Cancer Institute Michael Cowan Non-Clinical PhD Studentship – Modelling progression risks in Barrett's oesophagus (Fixed Term)

We invite applications from UK students for this 3.5 year fully funded non-clinical studentship based in the Early Cancer Institute, Department of Oncology, University of Cambridge, UK.

Project details

This is an opportunity to work with Prof Fitzgerald and her group who are internationally renowned for their work on Barrett's oesophagus including the development of a novel, non-endoscopic capsule sponge test, and Prof Pashayan's group who are leading in quantitative methods to develop risk-based approaches to cancer screening.

The incidence of oesophageal cancer has increased rapidly in the past 30 years. Oesophageal adenocarcinoma (OAC), the most common form of oesophageal cancer in the US and UK, has <20% 5-year survival, which improves with early detection. Individuals known to have Barrett's oesophagus, an asymptomatic precursor condition to oesophageal adenocarcinoma, undergo surveillance with the goal of treating advanced (dysplastic) Barrett's oesophagus before it develops into cancer, thereby preventing cancer. Even if a cancer is not prevented, surveillance may detect it an earlier, asymptomatic, stage, where survival is better. However, currently the vast majority of Barrett's oesophagus cases are undetected. The recent development of the capsule-sponge (Cytosponge) by Prof Fitzgerald's lab has made screening for Barrett's oesophagus more accessible, since it is cheaper than endoscopy, the prior screening method, and can be performed at a GP practice. We therefore expect an increase in the number of people with detected Barrett's oesophagus, and therefore the number of people undergoing surveillance.

Current surveillance guidelines do not take into account quantitative data to guide surveillance intervals and are not tailored to the individual. To address this, we will develop a natural history model of Barrett's oesophagus using a Markov multistate modelling framework. This model will track disease progression through defined states over time: normal, Barrett's oesophagus, dysplasia, preclinical OAC, clinical OAC, and death. We will estimate the proportion of individuals with Barrett's oesophagus likely to progress to OAC, the sensitivity of the surveillance episode, and the duration individuals remain in the Barrett's oesophagus state before transitioning to dysplasia or OAC states. We will incorporate patient-specific and disease-related factors as covariates into the model to predict individual risk of disease progression and recommend surveillance only when the predicted risk exceeds a specified threshold.

To identify optimal surveillance strategies that reduce the burden of surveillance while increasing earlier detection of progressive disease, we will conduct microsimulations based on the multistate framework. These simulations will compare fixed surveillance schedules with personalised, risk-based schedules with varying risk thresholds. Additionally, we will evaluate endoscopy-based surveillance against capsule sponge-based surveillance, either as an alternative or as an adjunct to

endoscopy, for instance, using the sponge alone for low-risk individuals or alternating between the sponge and endoscopy for those at moderate risk.

The projects will use clinical data from large cohorts of individuals undergoing endoscopy surveillance in England, Scotland and Northern Ireland.

Funding

This studentship commences in October 2025. It provides a maintenance stipend of £21,500 per annum for 3.5 years, tuition fees at the **UK rate**. In addition, £1225 for personal development and overseas travel and £5000 for research consumables is provided per annum for the first 3 years.

Candidate

We are looking for a highly motivated and enthusiastic individual capable of thinking and working independently. Applicants should have or shortly expect to obtain a minimum of a good upper second-class honours degree from a UK university, or an equivalent standard from an overseas university, in a relevant discipline.

Eligibility

The funding for this studentship covers students with UK Home tuition fee status only. For more information on Home tuition fee status please visit the UKCISA website.

How to apply

Application closing date**:** 16th February 2025.

Before applying please ensure that you meet, or expect to meet our PhD entrance requirements, then submit a full PhD application via the University of Cambridge Postgraduate Applicant Portal. When making your application, you should:

- Select to commence study in Michaelmas term 2025 (October 2025).
- add 'Profs Rebecca Fitzgerald and Nora Pashayan' and 'RD44501' to the 'Proposed research title' section.
- Check **all** supporting documents (CV, References and Transcripts, if available) are uploaded by the studentship closing date (16th February 2025). Please note, it is the applicant's responsibility to ensure all supporting documents are submitted on time, failure to do so will result in rejection of your application.

Prospective candidates are encouraged to contact Prof Rebecca Fitzgerald (rcf29@cam.ac.uk) and Prof Nora Pashayan (np275@cam.ac.uk) to discuss this project in greater detail.

Further information about the PhD in Oncology course and how to apply can be found here and full information about making an application to the University of Cambridge can be found on the University's Postgraduate Study website.

Interview and selection process

Applicants will be informed of the outcome of their application via the University of Cambridge Postgraduate Applicant Portal by **March 2025.**

Shortlisted applicants will be invited to attend an online interview in **March 2025**. You will be interviewed by a panel of Principal Investigators from the Early Cancer Institute. Applicants will be notified of the outcome of their interview after completion of all the interviews. The successful applicant will receive a formal offer letter by **April 2025**.

For general enquiries about these PhD studentships or the application process, please contact the Department of Oncology Postgraduate Education Team at: postgradadmin@oncology.cam.ac.uk.

Please quote reference RD44501 in any correspondence about this vacancy.

The University actively supports equality, diversity and inclusion and encourages applications from all sections of society.

The University has a responsibility to ensure that all employees are eligible to live and work in the UK.

Student support and training

As a Postgraduate Student with the Department of Oncology, University of Cambridge, you will have access to a wide range of training opportunities and benefit from close supervision provided by a Principal Supervisor who oversees your research project and an Adviser who provides additional support. Our Postgraduate Student Administrator acts as the first point of contact for any student with a query or difficulty that is not directly related to their scientific work. All student matters in the department are overseen by our Director of Postgraduate Education and the Cancer Biology Postgraduate Education Committee. There are no taught elements or examined coursework in the PhD in Oncology course, but students are encouraged to attend the wide variety of lectures and training courses available across the department and wider University. This includes a centrally run Statistics course and the University Core Skills Training Programme, which covers sessions on Time Management, Presentation and Performance and Scientific Writing. Our Postgraduate Students are automatically made members of the University's Postgraduate School of Life Sciences, which also offers a wide variety of core skills and professional development training. We also expect that our Postgraduate Students register as members of the Cancer Research UK Cambridge Centre.