**Richard Elphick Studentship in Modelling progression risks in Barrett's oesophagus.**

The University of Cambridge Department of Oncology is pleased to advertise the Richard Elphick Studentship, a fully funded PhD studentship at Trinity College, established by friends and family in memory of Richard. The successful candidate will undertake research on "Modelling progression risks in Barrett's oesophagus" under the supervision of Professor Rebecca Fitzgerald (Department of Oncology) and Professor Nora Pashayan (Department of Public Health and Primary Care).

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

**Project Description**

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 can be improved 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 to prevent cancer before it develops OR to prevent progression to 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, and can be performed at a GP practice. As a result of this, we 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, large, multi-centre datasets will be used to 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. 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 will be estimated. Patient-specific and disease-related factors will be incorporated 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, microsimulations based on the multistate framework will be conducted. These simulations will compare fixed surveillance schedules with personalised, risk-based schedules with varying risk thresholds. Additionally, endoscopy-based surveillance will be evaluated 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.

Finally, the modelling will be translated into a prototype clinical decision-support and visualisation tool for personalised Barrett's oesophagus surveillance. Using traditional statistical models, AI approaches, or a combination, the tool will communicate an individual's predicted progression risk and support risk-based surveillance recommendations. This will provide a clear pathway from quantitative modelling to a clinically useful tool that can support decision-making for patients and clinicians.

**Funding**

The Richard Elphick Studentship will commence in the 2027-28 academic year and will provide full funding for 3.5 years, including tuition fees at either the UK Home or Overseas rate, a maintenance stipend at the applicable UKRI rate, and a research emolument. More details of the funding amounts can be found on the University's postgraduate funding webpages and the Trinity College website.

**Eligibility**

Applications are welcomed from UK and overseas candidates who have obtained, or expect shortly to obtain, a good upper second-class honours degree or above from a UK university, or an equivalent qualification from an overseas institution, in a relevant discipline. Information on international qualification equivalencies is available on the University's postgraduate admissions webpages.

**How to Apply**

Applicants should apply for the PhD in Oncology via the University's Applicant Portal and enter the project title and supervisor(s)' names in the relevant section of the application form. In their statement of interest, applicants should demonstrate how their skills align with the requirements of the project. A research proposal is not required for this application; however, to satisfy system requirements, applicants should upload a blank document in the designated research proposal section.

To be considered for the Richard Elphick Studentship, applicants must select "Yes - I wish to be considered for funding" within the application and choose the Richard

Elphick Studentship from the list of available funding opportunities and complete any additional funding-related questions.

Applicants are advised to indicate Trinity as the College of first preference on their application to the University.

Prospective applicants are encouraged to familiarise themselves with the entry requirements for the PhD in Oncology before applying. It is the applicant's responsibility to ensure that their application, including all supporting documentation and references, is complete and submitted by the funding deadline (8th December 2026).

**Further Information**

Enquiries regarding the research project, application process or the PhD in Oncology should be directed to the Postgraduate Administration Team, Department of Oncology (email: postgradadmin@oncology.cam.ac.uk)

Enquiries relating to the Richard Elphick Studentship should be directed to Trinity College (email: gradfunding@trin.cam.ac.uk).

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