



Postdoctoral Research Fellow in Artificial Intelligence for Radiotherapy Candidate Information

April 2026

The Institute of Cancer Research

About our organisation

We are one of the world's most influential cancer research institutes with an outstanding record of achievement dating back more than 100 years. We are world leaders in identifying cancer genes, discovering cancer drugs and developing precision radiotherapy. Together with our hospital partner The Royal Marsden, we are rated in the top four centres for cancer research and treatment worldwide. As well as being a world-class institute, we are a college of the University of London.

We came second in the league table of university research quality compiled from the Research Excellence Framework (REF 2021). We have charitable status and rely on support from partner organisations, charities, donors and the general public. We have more than 1000 staff and postgraduate students across three sites – in Chelsea and Sutton.

Computational Imaging Group

The Blackledge Lab is based at the Institute of Cancer Research (ICR) in London, England. The lab was founded in 2019 with a focus on understanding the interface between medical imaging and computational science in oncology. In particular they aim to develop techniques that monitor imaging changes that inform on patient response and toxicity following radiotherapy. Our enthusiastic team of scientists are passionate to translate their research into clinically practical solutions in order to ensure that patients can benefit from emerging computational techniques. We actively engage with commercial partners to transfer our research into clinical tools.

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The Division of Radiotherapy and Imaging

The Division of Radiotherapy and Imaging is investigating new imaging methods to diagnose cancer, and ways in which advances in technology and molecular biology can improve radiation treatment. It is also increasingly concerned with the use of imaging to evaluate the response to treatment in vivo, through techniques measuring aspects of tumour biology.

The ICR's leading role in the development of intensity-modulated radiotherapy (IMRT) and image-guided radiotherapy (IGRT) has helped to change the way that radiotherapy is provided in the UK and worldwide.

Researchers in the division are also interested in developing ways of increasing the effectiveness of radiotherapy by combining it with other treatments – including targeted drugs or viral therapies.

A major research focus is the development of multimodality imaging for evaluating response to treatment in vivo. Novel imaging techniques can provide non-invasive assessments of various facets of tumour biology such as tumour angiogenesis, cell proliferation and hypoxia.

The joint appointments of faculty in this division and the divisions of Cancer Biology, Cancer Therapeutics or Clinical Studies ensure scientific and technical developments are rapidly taken through to testing in the clinic.

The Job Role

Radiotherapy (RT) contributes to cancer control and survival in >50% of cancer patients but major challenges remain. RT needs to deliver better clinical outcomes for cancers of unmet need; kinder, targeted treatments with improved tumour control and reduced toxicity are required for bladder, lung, brain, head and neck and sarcoma cancers. Furthermore, a dramatic increase in cancer incidence, perhaps by as much as 55% from 2020 – 2040, will extend waiting times or even require rationing of access to state-of-the-art radiotherapy.

This role will deliver treatment-integrated, multimodal agentic AI to drive a step-change in clinical RT by i) improving patient outcomes for cancers of unmet clinical need; and ii) increasing the efficiency of RT by enabling safe ultra-hypofractionated treatments. Using existing RT planning data (images, quality-controlled contours, and dosimetric information), the candidate will develop new AI to drastically accelerate the precision of RT planning and enable clinicians to deliver treatment dose to where it matters. Technologies to be explored include **vision-language modelling** (VLMs) to combine imaging data with human gestures (including eye gaze and voice-dictated prompts) for robust tumour delineation, and **Bayesian-enhanced AI** to propagate uncertainties through the agentic workflow. The role will include attendance at relevant conferences and workshops, in addition to regular consultation with medical experts and publication of research in high-impact journals.

Our mission is to make the discoveries that defeat cancer.

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Our values

The ICR has a highly skilled and committed workforce, with a wide variety of roles, each requiring different skills. But whether you work as a researcher, or work as part of our corporate team, your work and behaviour is underpinned by these six values. They are what bring us together as one team - as 'One ICR'.



Pursuing excellence

We aspire to excellence in everything we do, and aim to be leaders in our field.



Acting with Integrity

We promote an open and honest environment that gives credit and acknowledges mistakes, so that our actions stand up to scrutiny.



Valuing all our people

We value the contribution of all our people, help them reach their full potential, and treat everyone with kindness and respect.



Working together

We collaborate with colleagues and partners to bring together different skills, resources and perspectives.



Leading innovation

We do things differently in ways that no one else has done before, and share the expertise and learning we gain.



Making a difference

We all play our part, doing a little bit more, a little bit better, to help improve the lives of people with cancer.



Our values set out how each of us at the ICR, works together to meet our mission – to make the discoveries that defeat cancer. They summarise our desired behaviours, attitudes and culture – how we value one another and how we take pride in the work we do, to deliver impact for people with cancer and their loved ones.”

Professor Kristian Helin
Chief Executive

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Job description

Department / division:	Radiotherapy and Imaging
Pay grade / staff group:	PDTF
Hours / duration:	Full time (35 hours per week), Monday to Friday. Fixed term contract for 3 years with possible extension.
Reports to:	Matthew Blackledge
Accountable to:	N/A
Main purpose of the job:	To develop agentic AI systems for personalized radiotherapy planning

Duties and responsibilities:

Agentic AI for radiotherapy patient modelling

Innovate multimodal deep learning for radiotherapy treatment planning, including use of relevant libraries (PyTorch, MONAI, and fine-tuning of existing vision-language models).

Assist with medical data curation tasks including image pre-processing, image-image registration, and data harmonization, in addition to developing pipelines for capturing clinician-derived prompts during patient plan optimization.

Develop implementation software, initially for research purposes through existing software APIs (<https://osirixgrpc.github.io/osirixgrpc/>), and eventually deploy successful methods within clinical workflows.

Help maintain software quality management standards within the research group, and to help others with their usage of such systems.

Assist with the mentorship of PhD students and summer undergraduate students, as well as developing and delivering course material on the development of responsible AI within medical research and healthcare.

Prepare research material for presentation at scientific conferences/workshops and author papers for publication in relevant journals.

Help develop material for future grant funding opportunities.

General

All staff must ensure that they familiarise themselves with and adhere to any ICR policies that are relevant to their work and that all personal and sensitive personal data is treated with the utmost confidentiality and in line with the General Data Protection Regulations

Any other duties that are consistent with the nature and grade of the post that may be required.

To work in accordance with the ICR's Values.

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To promote a safe, healthy and fair environment for people to work, where bullying and harassment will not be tolerated.

This job description is a reflection of the present position and is subject to review and alteration in detail and emphasis in the light of future changes or development.

Workforce Agreement

The ICR has a workforce agreement stating that Postdoctoral Training Fellows can only be employed for up to 7 years as PDTF at the ICR, providing total postdoctoral experience (including previous employment at this level elsewhere).

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Person specification

Education and Knowledge

A PhD in computational science, artificial intelligence and/or image processing.	Essential
Practical experience with Python programming.	Essential
Experience with medical datasets, including imaging, clinical reports and/or radiotherapy.	Essential
Experience with good coding practice (Git, unit-testing, documentation, continuous integration [e.g. GitHub Actions])	Desirable
Knowledge of scientific statistical design.	Desirable
Understanding of the ethics and biases in medical AI	Desirable

Skills

Python programming	Essential
AI modelling, including the use of relevant software libraries (Torch and MONAI)	Essential
Good verbal communication and presentation skills	Essential
Excellent scientific writing skills	Essential
Large-language modelling, including the use of Low-Rank Adaptation (LoRA)	Desirable

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Benefits

We offer a fantastic working environment, great opportunities for career development and the chance to make a real difference to defeat cancer. We aim to recruit and develop the best – the most outstanding scientists and clinicians, and the most talented professional and administrative staff.

The annual leave entitlement for full time employees is 28 days per annum on joining. This will increase by a further day after 2 years' and 5 years' service.

Staff membership to the Universities Superannuation Scheme (USS) is available. The USS is a defined benefit scheme and provides a highly competitive pension scheme with robust benefits. The rate of contributions is determined by USS and details of the costs and benefits of this scheme can be found on their website. If staff are transferring from the NHS, they can opt to remain members of the NHS Pension Scheme.

We offer a range of family friendly benefits such as flexible working, a parents' group, and a maternity mentoring scheme. Other great benefits include interest free loans for discounted season tickets for travel and bicycle purchases, access to the NHS discounts website, a free and confidential Employee Assistance Programme which offers a range of well-being, financial and legal advice services, two staff restaurants, and access to a gym and sporting facilities at our Sutton site.

Further information

You may contact Matthew Blackledge for further information by emailing matthew.blackledge@icr.ac.uk. This job description is a reflection of the current position and is subject to review and alteration in detail and emphasis in the light of future changes or development.