

The Role	Research Associate in Machine Learning for Cryo Electron Tomography
Franklin Challenge	Artificial Intelligence and Informatics for Predictive Biology
Location	Harwell Campus, Oxfordshire
Grade and salary	From £39,500 per annum (depending on skills and experience)
Hours full/part	Full Time (37.5 hours per week)
Contract type	2 Years Fixed-Term Contract (with the possibility of extension)
Reporting to	Prof. Owen Rackham
Vacancy reference	10417

The Rosalind Franklin Institute (the Franklin) is a technology institute for life science, creating innovative technologies that transform our understanding of life.
Our technologies, borne out of innovation in physical sciences, create collaborations and new avenues in life science which will lead to new therapeutics and advance our understanding of human biology.

The Rosalind Franklin Institute is a registered charity in England and Wales, No. 1179810
Company Limited by Guarantee Registered in England and Wales, No. 11266143. Funded by UK Research and Innovation through the Engineering and Physical Sciences Research Council.

The Role
As a Research Associate at the Franklin, you will bring scientific knowledge and skills to deliver a specific research project and/or you will bring independent, creative science, or specific skills to a team delivering a project or program. Through this work, you will build scientific independence, develop new science and leadership skills, and establish a growing reputation externally.

This research opportunity within the Virtual Cell project will advance molecular mapping of cells by expanding the range of proteins and macromolecular complexes that can be reliably detected and characterized in cryo-electron tomograms and develop methods to track how these change over time and in response to cellular perturbation.

The Research Associate will develop machine-learning methods for particle localisation, detection and classification in crowded cellular volumes. The work will emphasise learning from limited annotations, generalisation to additional molecular species and experimental datasets, and discovery of candidate particle populations beyond existing labelled classes. Methods will address low signal-to-noise ratios, missing-wedge artefacts, and variation in particle orientation, abundance and conformation.

The role will explore integration of complementary structural, molecular and imaging data, such as predicted or experimental protein structures, proteomics, molecular interaction data, and fluorescence or correlative microscopy. These sources will guide detection, constrain candidate molecular identities and support validation, with explicit consideration of their uncertainty, spatial resolution and potential biases.

Working closely with experimental and computational researchers, the role-holder will establish robust benchmarks, develop reproducible software, and validate detections and candidate identities through subtomogram analysis and complementary evidence. This role offers opportunities to develop scientific independence within an interdisciplinary team.

Key Responsibilities
As a Research Associate, you will:

- Develop and apply machine-learning methods to broaden the range of proteins and macromolecular complexes that can be detected and characterised in cryo-electron tomograms.
- Explore how complementary structural, molecular and imaging data can improve analysis and support interpretation of molecular organisation in cells.
- Work with experimental and computational colleagues to prepare datasets, evaluate methods and validate biological findings.
- Develop reproducible analysis workflows and research software, and share methods and findings through documentation, publications and presentations.
- Plan data acquisitions with experimentalists who conduct them, analyse and interpret results and supervise delivery of outputs (e.g. research report, patent application) in a scientific/technology area of interest.

The Rosalind Franklin Institute is a registered charity in England and Wales, No. 1179810
Company Limited by Guarantee Registered in England and Wales, No. 11266143. Funded by UK Research and Innovation through the Engineering and Physical Sciences Research Council.

- Work within a project team, contributing to wider projects around Franklin's key Challenges.
- Lead major contributions to outputs from research including papers, patents and both internal and external presentations.
- Support and develop others including day-to-day supervision of students or visitors in areas related to own research.
- Have supervised, staged progression to first stages of scientific independence with opportunities to further develop science and skills/experience.
- Enhance your research through collaboration with other researchers and make active contributions to exchanging ideas through your own network.
- Be able to understand, interpret, create and communicate appropriately within a research context.
- Develop search and discovery skills and techniques.
- Be supervised by a Scientist/Senior Scientist in delivery of research outputs, either in the context of a project or Challenge or as an early career development fellow.

Skills and Experience

Candidates will be shortlisted based on the extent to which they meet the criteria below, but we welcome applications from individuals who do not fully meet all role requirements.

	Skills and Experience
Selection Criteria	**Essential scientific and technical skills** • Hold a PhD/DPhil, or to have submitted a thesis for a PhD/DPhil (or equivalent), in computer science, physics, mathematics, computational biology, structural biology or a closely related subject. • Research experience developing and applying machine-learning methods to address scientific or technical problems. • Strong programming skills in Python or a comparable language, with practical experience using modern machine-learning tools. • Experience analysing complex datasets, with the ability to design experiments, evaluate methods critically and interpret results. • Ability to produce clear, reproducible research software and communicate findings to colleagues from different disciplines. • Interest in applying machine learning to biological imaging, with the ability and willingness to learn relevant cryoET methods and collaborate with experimental researchers. **Desirable scientific and technical skills** • Experience with image analysis, computer vision or other methods relevant to identifying patterns and structures in complex data. • Experience with biological or structural data, including microscopy, cryoEM or cryoET.

- Experience combining different types of data or prior knowledge or developing methods that work with limited labelled data or transfer to new datasets.

Standard requirements for this level:

- Core knowledge/basic understanding of concepts and building competence in own area.
- Ability to use project management techniques to define own project area and manage problems and conflicts.
- Understanding of recent advances in own research.
- Working towards making a unique contribution and gaining broader awareness within your area of specialism.
- Experience formulating research questions and devising strategies to address these.
- Excellent organisational and communication skills.
- Ability to learn new methods and grow research.
- Openness to new ideas and gaining experience.
- Ability to use a variety of research methods.
- Ability to adapt approach when required to; to seek guidance and recognise risk.
- Ability to build support and collaboration to attain goals, working well across disciplines.
- An understanding of established standards of good research practice.

The Rosalind Franklin Institute is committed to equality, diversity and inclusion and welcomes applications from all. This job description sets out the skills and experiences we believe are needed to be able to do this job but, research also tells us women are much more likely than men to take this list of requirements as absolute and self-select out of the process. If you think you can deliver this role then we want to hear from you, regardless of the boxes you did not tick.

Whilst the role is a postdoctoral researcher level and requires candidates to hold a PhD/DPhil (or equivalent), we may consider candidates who have submitted their PhD/DPhil thesis, in which case the initial appointment will be made at £38,500 per annum (to be increased on completion of the PhD/DPhil qualification).

The Rosalind Franklin Institute is a registered charity in England and Wales, No. 1179810
Company Limited by Guarantee Registered in England and Wales, No. 11266143. Funded by UK Research and Innovation through the Engineering and Physical Sciences Research Council.

Staff Benefits

- 25 days holidays, plus Bank holidays, and Christmas holiday shutdown
- Generous pension scheme (employer's contribution currently up to 18%)
- Group Life Assurance (also known as Group Life Insurance)
- Buying and Selling Annual Leave
- Workplace Nursery Salary Sacrifice Scheme
- Hybrid and Flexible Working
- Training and professional development opportunities for staff at all levels
- Bus pass discount scheme and good transport links to Oxford and surrounding area
- Access to employee discount platform (Perkbox)
- Occupational Health and Wellbeing support including Employee Assistance (24/7 support and counselling)
- Health Cash Plan
- Subsidised canteen and food outlets on campus
- Cycle to Work Scheme
- Free on-site parking
- Hub building with state-of-the-art laboratories
- A beautiful campus location set in stunning Oxfordshire with social and sports clubs open to staff

Flexible Working

We offer flexible working arrangements for employees including flexible hours, part-time hours and hybrid working to help everyone get the right balance between work and personal life.

Professional Development

As an organisation we appreciate that our people are one of our biggest strengths. We are committed to supporting your learning and development, helping you gain the skills you need to succeed in your role. Regardless of your level of experience and your role, we can assist you with building your expertise, experience, and professional qualifications at key career stages.

Reflecting the world we live in

Our underlying aim is to produce the best science for research today, and this means resolutely embracing a diverse team, who have a wide range of experiences, skills and knowledge to push forward on the innovative work our institution delivers. Both our work and our institution are better for it.

We are proud that our science teams reflect a wide range of both national and international expertise. With support given for sponsorship and relocation to the UK.

For further information, view our equality, diversity and inclusion policy.



The Rosalind Franklin Institute is a registered charity in England and Wales, No. 1179810
Company Limited by Guarantee Registered in England and Wales, No. 11266143. Funded by UK Research and Innovation through the Engineering and Physical Sciences Research Council.

Engineering and Physical Sciences Research Council






Adventure - Our projects, by their nature, carry significant risk, combined with significant pay-off in scientific, economic, and patient benefits if successful. Risk is mitigated by engaging experts from across disciplines and working together to approach large challenges.

Engagement - Our projects are not conceived of or delivered by one organisation alone, they engage multiple partners across academia and industry and there is demonstrable support for their development by these communities.

Novelty - Our technologies will be novel in their application and design, offering tools to the academic and industrial communities which enable significant new research potential and economic benefit.

Utility - Our technologies will be sought after by both academic and industrial communities, and access will be opened to as wide as possible, ensuring that the research benefits are maximised.

Partnerships & Collaborations

Our Funders

The Institute operates as an independent charity, with funding provided by the UK government through UK Research and Innovation, managed by UKRI-EPSRC.

Our Partners

The Institute has been formed by a group of ten university partners from across the UK, Diamond Light Source, and the research council UKRI-STFC.

- University of Oxford
- University of Birmingham
- Diamond Light Source
- University of Cambridge
- University of Edinburgh
- Imperial College London
- Kings College London
- University of Leeds
- University of Manchester
- University of Southampton
- University College London (UCL)
- STFC-UKRI

The Rosalind Franklin Institute is a registered charity in England and Wales, No. 1179810
Company Limited by Guarantee Registered in England and Wales, No. 11266143. Funded by UK Research and Innovation through the Engineering and Physical Sciences Research Council.

Collaborations

Developing our technologies is best done hand in hand with the communities who will use them – we are keen to collaborate in the development stage of our technologies, to bring both test questions and technical expertise. For more information on the types of collaborations that we are looking for at the Franklin, please visit our collaborations webpage

Our Location

The Hub at Harwell

The Rosalind Franklin Institute is a national interdisciplinary research centre, funded by the UK government through UK Research and Innovation (UKRI). We are dedicated to creating new disruptive technologies which will allow us to see the biological world in new ways, from picometre-scale atoms to centimetre-scale tumours. These technological advances will speed up the discovery of new medicines, help find new diagnostics and contribute to a deeper understanding of human health and disease.

The Franklin operates from a purpose-built research facility on the Harwell Science and Innovation Campus near Didcot, a unique community of government, academia and industry working to accelerate progress on key issues. The 700-acre campus is steeped in world-firsts, and technology and research are at the heart of everything Harwell does.

Our building houses both specialist laboratories, research scientists and operational staff within a state-of-the art facility designed to inspire our people in their work and create a welcoming hub for our collaborations and visitors. Our research values of adventure, novelty, engagement, and utility are drawn on and exemplified by the Franklin team through our collaborations with universities and industrial partners, both in the UK and internationally.

Harwell Campus



Harwell Campus is Europe's largest Science and Innovation Campus. With a heritage of 75 years at the forefront of UK innovation and discovery, The Campus continues to drive scientific advancements to the benefit of the UK economy and to improve the human condition, centered around an open innovation community and culture. The contribution that Harwell makes to the UK is significant - leading in research and achieving commercial success in key global markets, including Life Sciences, Space, Energy, Supercomputing, AI and Big Data. With 6,000 people employed across +200 public, private, and academic organisations, and an estimated Gross Value Added (GVA) of over £1billion, Harwell provides job creation and economic growth that benefits the whole country.

The Rosalind Franklin Institute is a registered charity in England and Wales, No. 1179810
Company Limited by Guarantee Registered in England and Wales, No. 11266143. Funded by UK Research and Innovation through the Engineering and Physical Sciences Research Council.

Recruitment Process

Inclusion and Reasonable Adjustments
Our approach to working is collaborative, welcoming, and encourages diversity in all its forms. We are committed to creating an inclusive environment where every applicant has an equal opportunity to showcase their talents and abilities. This includes making adjustments for candidates with specific needs. Please contact us at recruitment@rfi.ac.uk to discuss your requirements confidentially.

How to apply
To apply for our vacancies, you need to create an account via our recruitment portal, with your CV and a cover letter explaining why you think you are the right person for this job. Please include information about your education and work experience. To register please visit our website.

To browse all available employment opportunities at the Franklin please visit our current vacancies page here

Acknowledging your application
Once you have submitted your application you will receive an automatic email confirmation. You can check the progress of your application or change your contact details at any time by logging into your account. For any questions regarding applications please contact recruitment@rfi.ac.uk

Outcome of applications
We aim to provide an update on the status of your application within 6 weeks of the closing date of the vacancy. We may receive a large volume of applications for our vacancies, so it might not always be possible to respond individually to every application.

References
If you are successful at interview, we would like to obtain two professional/academic references at the offer stage. Please ensure your referees' contact details are up to date while applying.

Applicants should refer to our Candidate Privacy Policy

Informal enquiries can be addressed to recruitment@rfi.ac.uk

Prof. Owen Rackham
Secondee
View Profile

The Rosalind Franklin Institute is a registered charity in England and Wales, No. 1179810
Company Limited by Guarantee Registered in England and Wales, No. 11266143. Funded by UK Research and Innovation through the Engineering and Physical Sciences Research Council.