Theme: Structural Biology

<table>
<thead>
<tr>
<th>Job Title</th>
<th>Senior Scientist in Automation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project</td>
<td>AMPLUS/Structural Neurobiology/AI</td>
</tr>
<tr>
<td>Location</td>
<td>Harwell, Didcot</td>
</tr>
<tr>
<td>Grade and salary</td>
<td>£42,500 - £52,500 per annum (depending on experience)</td>
</tr>
<tr>
<td>Hours</td>
<td>Full Time</td>
</tr>
<tr>
<td>Contract type perm/FTC</td>
<td>5 years fixed-term contract</td>
</tr>
<tr>
<td>duration</td>
<td></td>
</tr>
<tr>
<td>Reporting to</td>
<td>Dr. Michael Grange</td>
</tr>
<tr>
<td>Vacancy reference</td>
<td>10315</td>
</tr>
</tbody>
</table>

Introduction

Structural Biology brings molecules to life in 3D so that we can unpick how they form, work, and interact. It has led to many new insights into how different molecules in the human body keep us healthy, and prompted new disease treatments that modify malfunctioning molecules, such as Tamiflu used to treat influenza, and numerous structure-based drugs that combat HIV. The Rosalind Franklin Institute’s ‘Structural Biology’ theme aims to remove this bottleneck by revolutionizing how molecule samples are produced, stabilized, delivered, and transferred.
The Role
The Rosalind Franklin Institute is a national research centre, funded by the UK government through UK Research and Innovation, dedicated to bringing about transformative changes in life science through interdisciplinary research and technology. We are currently seeking a highly motivated senior scientist to join our Structural Biology theme. Building on recent work demonstrating the use of focused ion beams (FIB) and scanning electron microscopes (SEM) to image cells and tissues (DOI: 10.1038/s41467-023-36372-9; 10.1101/2022.09.21.508877), we are looking to recruit a computational expert to develop and apply AI and automation of cryogenic FIB/SEM and lift-out of biological specimens for structural biology.

This will enable imaging high volumes of lamella of multicellular specimens, implemented alongside efforts to streamline high-precision targeting in 3D and structure determination and facilitate attempts to make the technique more widely applicable.

This post builds on recent success in obtaining funding for imaging tissues across scale and would be closely tied to projects between structural biology and artificial intelligence themes. The post is aimed at individuals keen to bring a combination of computer science, mathematics, and material science to address questions that bridge molecular-scale imaging with high throughput and on a grand scale. The ideal candidate would have a firm grasp on developing algorithms in python, C++ or other coding languages, and would be able to apply this to routines on advanced electron microscopes at the Franklin.

Role overview
Current in-situ structural biology workflows for cryoET in tissue are laborious, requiring individuals to remain at the side of the microscope. This is due to these capabilities being in their infancy, with critical parameters being established and targeting in bulk materials requiring methods able to recognise and identify regions of interest. At the Franklin, we are establishing workflows capable of investigating multiple tissue samples per day and generating sections able to be thinned to electron transparency. You will develop this working closely with researchers at the Franklin enabling the examination of disease-relevant observations in-situ using multimodal imaging to streamline the targeting of specific regions of interest, and optimising protocols for ion beam milling.

About You
Candidates must hold a post-graduate qualification/PhD (or equivalent experience) in computational sciences, mathematics, physics, material sciences, or another relevant subject. We are looking for candidates with a demonstrated ability to deliver project outputs (publications, datasets, patents etc) in a timely manner, the ability to work independently and as part of an interdisciplinary team, as well as strong organisational and communication skills. Experience with formulating research questions and devising strategies to address these questions is essential for this role.

This post would be ideal for a candidate who has a keen computational science or mathematical mind, but who is keen to develop their skills and apply them to the development of tools enabling an assessment of biology on the molecular scale. The ideal candidate would drive developments of a robust, bespoke platform for automated sample preparation (lift-out), targeting using multimodal imaging (SEM/fluorescence microscopy) approaches and data annotation (segmentation and sub volume averaging). They will enable projects and integrate this into plasma ion and electron microscopy technologies at the institute. The successful candidate would be expected to make significant intellectual contributions to the institute/group and provide mentorship for junior researchers. In return, the successful candidate will be afforded training in high end (cryo) SEM and transmission electron microscopy (TEM) methods, with access to latest and beyond state of art equipment.

The institute maintains several high-end transmission electron microscopes with emergent/new technologies, 2 florescence integrated plasma focused ion beam scanning electron microscopes, 2 (cryo) confocal microscopes and light sheet developments as well as other ancillary microscopes/equipment. The institute boasts plentiful computational resources, with access to GPU/CPU clusters and access to national high-performance compute (Baskerville HPC, Birmingham).

Responsibilities
You will:
• Develop new automation programs for cryo lift-out and multimodal targeting (serial FIB/SEM and fluorescence microscopy).
• Be a focal point of advice and supervision for junior researchers in in-situ structural methods.
Person specification

The table below includes the essential and desirable requirements needed in order to perform the job effectively. Candidates will be shortlisted based on the extent to which they meet these criteria.

<table>
<thead>
<tr>
<th>Essential</th>
<th>Desirable</th>
</tr>
</thead>
<tbody>
<tr>
<td>• A PhD in computer science, mathematics, engineering, physics, structural biology, biochemistry or another equivalent subject.</td>
<td>• Knowledge of electron microscopes or focused ion beam instruments.</td>
</tr>
<tr>
<td>• A high degree of proficiency in coding languages such as python, C++, MATLAB or another relevant language.</td>
<td>• Experience of electron microscopy (STEM, TEM, SEM).</td>
</tr>
<tr>
<td>• A Demonstrated ability to deliver project outputs (publications, datasets, patents, etc.) in a timely manner/</td>
<td>• Knowledge of fluorescent microscopy, super-resolution microscopy or correlative light/electron microscopy (CLEM).</td>
</tr>
<tr>
<td>• Ability to work independently and as part of an interdisciplinary team.</td>
<td>• A proven track record in applying computational approaches to material science or biological imaging approaches.</td>
</tr>
<tr>
<td>• Strong organisational and communication skills.</td>
<td></td>
</tr>
<tr>
<td>• The ability to manage multiple projects at a high level.</td>
<td></td>
</tr>
<tr>
<td>• Ability to problem solve and to troubleshoot nascent workflows.</td>
<td></td>
</tr>
<tr>
<td>• Knowledge of electron microscopes or focused ion beam instruments.</td>
<td></td>
</tr>
<tr>
<td>• Experience of electron microscopy (STEM, TEM, SEM).</td>
<td></td>
</tr>
<tr>
<td>• Knowledge of fluorescent microscopy, super-resolution microscopy or correlative light/electron microscopy (CLEM).</td>
<td></td>
</tr>
<tr>
<td>• A proven track record in applying computational approaches to material science or biological imaging approaches.</td>
<td></td>
</tr>
</tbody>
</table>

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)
• Hub building with state-of-the-art laboratories
• Training and 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
• Cycle to Work Scheme
• Free on-site parking
• A beautiful campus location set in stunning Oxfordshire with social and sports clubs open to staff

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.
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

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 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 Hub at Harwell
The heart of the Rosalind Franklin Institute is the new hub building located at Harwell Campus. The 5300m² hub building at Harwell will be a flagship new addition to the campus, with four storeys of world-leading scientific capability, complementing existing facilities at Harwell and at the partner spokes. The hub is the focal point for the Institute, and the heart of life sciences at Harwell Campus. The world-leading technology hosted at the hub is matched by the innovative design of the building itself – unique in its experimental capabilities.

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 £1 billion, Harwell provides job creation and economic growth that benefits the whole country.

Recruitment Process

How to apply
To apply for our vacancies you need to create an account. 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 shortlisted for an interview, we would like to obtain two professional/academic references as part of your application process. 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.