Theme: Biological Mass Spectrometry

Job Title	Postdoctoral Research Associate in Multimodal Cryo-Imaging
Location	Harwell, Didcot
Grade and salary	From £35,500 per annum (depending on skills and experience)
Hours	Full-Time (37.5 hours)
Contract type perm/FTC duration	2 Years Fixed-Term Contract (with the possibility to extend, subject to available funding)
Reporting to	Dr. Felicia Green
Vacancy reference	10333

Introduction

The Biological Mass Spectrometry theme aims to seed a functional proteomics revolution by bringing together the UK's world-leading technology companies and academic expertise. A key objective is to construct a unique multimodal-imaging mass spectrometer instrument, which will allow the molecular mapping of biological tissues at unprecedented sensitivity, chemical depth and spatial resolution. The instrument is envisioned not only to detect the building blocks of tissues, but also to provide proper structural characterization of all detected molecular species and supramolecular complexes.

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The Role

The Rosalind Franklin Institute (the Franklin) 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. Seeing life in 4-dimensions (space and chemistry) is crucial in understanding development and disease. Some of the most pressing needs for new insight in bioscience are neurodegeneration, cancer, cellular transport, metabolomics and bacterial multi-resistance. To enable new insights for treatment, researchers need new tools and methods able to probe life in new ways across scale and disciplines. The Franklin aim to impact life science delivering next generation instrumentation, in this case, for meso- and nanoscale imaging and chemical mapping of cells and tissue.

As a Research Associate, you will be adapting in-house a workflow to prepare vitrified tissue and cell for 3D chemical imaging, using secondary ion mass spectrometry (SIMS) and serial FIB/SEM. This will require you to work closely with the engineer on site to modify sample holders compatible for both the SIMS and the pFIB-SEM. You will also develop methods to register the sample between the two imaging methods to allow correlation. You will be part of a larger team working across different disciplines (Biological Mass Spectroscopy, Structural Biology, Artificial Intelligence), engaging in building novel MS instrumentation. As part of this team, your primary focus will be to characterise the impact of the size of the water cluster on the sputtering yield of vitrified biological sample. You will also characterise the impact of such milling on the sample to evaluate compatibility with subsequent correlative electron imaging technics. In parallel, you will be involved in the effort to develop ion transfer and post ionisation in SIMS using lasers and plasmas to increase the sensitivity of our instruments.

The post reports to the Franklin's SIMS expert, Dr Felicia Green and will be supported by Technology Lead Dr Gwyndaf Evans and Dr Maud Dumoux and her team.

Whilst the role is a Postdoctoral Research level and requires candidates to hold a PhD/DPhil (or equivalent), we may consider candidates who are close to completion of their PhD/DPhil qualification, in which case the initial appointment will be made at £34,500 per annum (to be increased on completion of the PhD/DPhil qualification).

Responsibilities

You will:

- Embrace the primary project of the role, namely developing the cryo-SIMS workflow.
- Collaborate with specialists at the Franklin and in the wider community to set up SIMS post ionisation and develop novel SIMS sources.
- Collaborate with SEM and TEM experts at the Franklin to ensure cohesive sample preparation and applications.
- Work with SEM experts to develop suitable protocols for comparing milling sources.
- Work with MS experts and structural biologists from the RFI and broader UK user community to understand the broader context of the application.
- Develop the scientific scope of the project, formulate relevant research questions, conduct individual research, analysing detailed and complex qualitative and/or quantitative data from a variety of sources, and generate original ideas by building on existing concepts.
- Publish research articles in leading academic journals.
- Present findings at national and international meetings/conferences.
- Take a formal or informal role (as required) in the supervision of research students, including recruitment, mentorship, and career development.
- Participate in and support the public engagement and widening access activities of the Franklin.

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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.

	Essential	Desirable
Selection Criteria	• Hold, or be close to completion of a PhD/DPhil (or equivalent) in Physics, Chemistry, Engineering or in a relevant field. • Ability to learn and adapt across different subject areas and experience working on cross-disciplinary projects. • Knowledge of mass spectrometry imaging and data analysis. • Knowledge of vacuum equipment and instrument development. • Experience with developing routine analytical methods. • Experience with devising research questions and to develop strategies to address them. • Ability to work both independently and as part of a team. • Strong organisational and communication skills. • Ability to discuss and coordinate experiments with a variety of colleagues from different disciplines.	• Experience in secondary ion mass spectrometry (SIMS). • Experience in tissue analysis and preparation. • Expert knowledge of FIB, SEM or TEM. • Experience in mass spectrometry imaging across multiple methods such as MALDI and DESI and multiple types of instrumentation. • Experience with cryo-instrumentation. • Experience with lasers and plasmas. • Experience with project management and demonstrated ability to deliver agreed milestones in a timely manner, adapt to changing priorities. • Knowledge of computer programming, computational chemistry and cheminformatics. • Experience with general analytical techniques such as chromatography, NMR or confocal microscopy etc. • An understanding of physical chemistry and molecular characterisation and fragmentation.

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.

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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.

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Our Location

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

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. 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

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

Dr Felicia Green
Associate Investigator
View Profile

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