UNIVERSITY OF LEEDS

CANDIDATE BRIEF

Research Fellow in Biophysics, Astbury Centre for Structural Molecular Biology, Faculty of Biological Sciences



Salary: Grade 7 (£34,304 – £40,927 p.a.) Due to funding restrictions it is unlikely an appointment will be made above £35,326 p.a.

Reference: FBSAS1048

Fixed-term for 26 months (external funding)

Post-doctoral Research Fellow in Biophysics Astbury Centre for Structural Molecular Biology, School of Molecular and Cellular Biology

Are you looking to apply your skills in Biophysics to help decipher the molecular mechanism of protein translocation across membranes by applying existing and developing new, advanced single molecule tools?

We are looking for an outstanding research fellow with experience in single molecule fluorescence techniques to join a well-established interdisciplinary team that is investigating how proteins are translocated across biological membranes. In particular, we are interested in energy transduction during protein translocation mediated by the SecYEG-SecA complex from *E.coli*. This will be achieved by application of a combination of single molecule fluorescence spectroscopy, other biochemical and biophysical methods and molecular dynamics simulations. We will probe the dynamics of the complex and its protein substrates during the translocation process using time resolved techniques on multiple timescales. The project is part of an on-going collaboration between the laboratories of Prof. Sheena Radford at the University of Leeds and that of Prof. Ian Collinson at the University of Bristol and Dr. Roman Tuma at the University of South Bohemia in Czechia.

You will be based in the laboratory of Professor Sheena Radford. You will have a PhD in Biophysics (or be close to completion) or a related discipline. You will also have experience designing and performing single molecule fluorescence experiments and related data analyses. In addition, practical experience with reconstitutution of membrane proteins into model lipid membranes is essential. Experience in the use of molecular dynamics computation to understand protein dynamics would be an advantage.

Further information about the project and our recent publications are available on the web sites listed below.





What does the role entail?

As a Research Fellow, your main duties will be:

- Designing, planning and conducting a programme of investigation, in consultation with Professor Sheena Radford and the collaborative team;
- Generating independent and original research ideas and methods in single molecule biophysics;
- Designing mutants of Sec constituents for labelling in consultation with collaborators in Bristol;
- Reconstituting labelled membrane proteins into iposomes, lipid nanodiscs and other model membrane systems;
- Developing new single molecule methods, including setting up new optical systems (e.g. combination of fluorescence with AFM), to study dynamic coupling within the translocon;
- Setting up and performing time-resolved multiple channel single molecule fluorescence experiments to study conformational changes and dynamics of membrane proteins;
- Developing advanced, custom data processing protocols to analyze the single molecule signals;
- Integrating information from single molecule fluorescence with molecular dynamics simulations and biochemical studies by collaborators to develop a dynamic allostery model for the Sec translocon;
- Contributing to the supervision of junior researchers and PhD students and acting as a mentor to less experienced colleagues;
- Working independently and as part of a larger team of researchers, both internally and externally to develop new research links and collaborations and engage in knowledge transfer activities where appropriate;
- Making a significant contribution to the dissemination of research results by publication in leading peer-reviewed journals, and by presentation at national and international meetings;
- Evaluating methods and techniques used and results obtained by other researchers and relating such evaluations to your own research.

These duties provide a framework for the role and should not be regarded as a definitive list. Other reasonable duties may be required consistent with the grade of the post. Please note that the role involves regular travel to the laboratories of our collaborators in Bristol and Czechia





What will you bring to the role?

As a Research Fellow you will have:

- A PhD (or be close to completion) in Biophysics, Biosciences or a related discipline;
- Extensive experience with developing optical instrumentation for single molecule fluorescence and new fluorescence based methods;
- Experience in the reconstitution of membrane proteins into model lipid membranes;
- Substantial experience of using single molecule fluorescence methods to study protein dynamics, including time-resolved fluorescence;
- Experience of working with proteins and protein complexes;
- Extensive experience with single molecule fluoresecence data analyses and capability to design and implement new custom approaches;
- Detailed understanding of protein structures and protein dynamics;
- Experience of successful collaborations and team working;
- Good data management, analytical and computer skills and advanced knowledge of Python programming;
- The ability to design, execute and write up experimental work independently as well as a proven ability to work effectively and responsibly without close supervision;
- The desire and drive to learn new skills and techniques;
- Imagination, creativity and ambition to drive new areas of science.

You may also have:

- A BSc in Biosciences, Chemistry, Biophysics or a related subject;
- Experience of working in the fields of molecular motors and other ATPases;
- Experience with computational modelling of proteins and their complexes;
- Experience with protein expression and purification.

How to apply

You can apply for this role online; more guidance can be found on our How to Apply information page. Applications should be submitted by **23:59** (UK time) on the advertised closing date.

Your application should include:





- A supporting statement providing evidence to support each requirement listed on the 'What will you bring to the role' section of the Candidate Brief (no more than two sides of A4, minimum font size 11);
- An academic curriculum vitae, including a list of your publications.

Contact information

To explore the post further or for any queries you may have, please contact:

Sheena E Radford**, Astbury Professor of Biophysics**
Tel: +44 (0)113 343 3170
Email: s.e.radford@leeds.ac.uk

> *'Please note: If you are not a British or Irish citizen, from 1 January 2021 you will require permission to work in the UK. This will normally be in the form of a visa but, if you are an EEA/Swiss citizen and resident in the UK before 31 December 2020, this may be your passport or status under the EU Settlement Scheme.'*

Additional information

Find out more about the Astbury Centre for Structural Molecular Biology in the School of Molecular and Cellular Biology in the Faculty of Biological Sciences. Further information and recent publications from the Radford research group alongside our collaborators in Bristol Professor Ian Collinson, and Czechia Professor Roman Tuma can be found on each web site.

Working at Leeds
Find out more about the benefits of working at the University and what it is like to live and work in the Leeds area on our Working at Leeds information page.

A diverse workforce
The University of Leeds and the Faculty of Biological Sciences are committed to providing equal opportunities for all and offer a range of family friendly policies. The University is a charter member of Athena SWAN (the national body that promotes gender equality in higher education), and the Faculty of Biological Sciences was awarded a Silver award in 2020. We are proud to be an inclusive Faculty that values all staff, and are happy to consider job share applications and requests for flexible





working arrangements from our employees. Our Athena SWAN webpage provides more information.

Candidates with disabilities
Information for candidates with disabilities, impairments or health conditions, including requesting alternative formats, can be found on our Accessibility information page or by getting in touch with us at disclosure@leeds.ac.uk.

Criminal record information

Rehabilitation of Offenders Act 1974
A criminal record check is not required for this position. However, all applicants will be required to declare if they have any 'unspent' criminal offences, including those pending.

Any offer of appointment will be in accordance with our Criminal Records policy. You can find out more about required checks and declarations in our Criminal Records information page.



