



DEPARTMENT OF BIOCHEMISTRY

Job Description

| Job title | Postdoctoral Research Associate in Single Molecule Bacterial Protein Import |
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| Division | Medical Sciences |
| Department | Biochemistry |
| Location | Dorothy Crowfoot Hodgkin Building, South Parks Road, Oxford, OX1 3QU |
| Grade and salary | Grade 7.1-7.3: £36,024-£38,205 per annum pro rata |
| Hours | Full time (37.5 hours per week) |
| Contract type | Fixed-term contract up to 30 th November 2026 in the first instance |
| Reporting to | Professor Colin Kleanthous |
| Vacancy reference | 167721 |
| Additional information | You are required to submit a CV and a supporting statement with your application, outlining how you meet each of the selection criteria for the role (see below for details). Your application will not be processed if you do not include both documents. |

| Research topic | Single molecule bacterial protein import |
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| Principal Investigator / supervisor | Professor Colin Kleanthous and Dr Dominika Gruszka (Department of Physics/Kavli Institute) |
| Project team | Kleanthous and Gruszka Groups |
| Project web site | https://www.bioch.ox.ac.uk/research/kleanthous |
| Funding partner | The funds supporting this research project are provided by BBSRC. |
| Recent publications | Mamou et al (2022) Peptidoglycan maturation controls spatiotemporal organisation of outer membrane proteins in Escherichia coli. Nature 606, 953-959. |



| Francis et al (2021) Porin threading drives receptor disengagement and establishes active colicin transport through Escherichia coli OmpF. EMBO J., e108610 |
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| Gruszka et al (2020) Single-molecule imaging reveals control of parental histone recycling by free histones during DNA replication. Science Advances 6, eabc0330 |

The role

The post is funded by a BBSRC grant to Prof Kleanthous and Dr Dominika Gruszka to investigate how antimicrobial proteins known as bacteriocins transport across the E. coli outer membrane. The Kleanthous lab have long-standing expertise in dissecting the mode of action of these potent toxins, using cell-based, biochemical and biophysical approaches. Dr Gruszka is a single-molecule biophysicist whose lab investigate chromatin dynamics during DNA replication. The groups have teamed up to devise a new import assay by which the import of single bacteriocin molecules attached to beads can be visualised in microfluidics devices. The project aims to exploit these developments to understand the underlying kinetics and energetics of the import process.

Responsibilities

- Express and purify engineered bacteriocin constructs for attachment to beads.
- Adhere bacteria to glass slides in bespoke microfluidics chambers and follow bacteriocin import through the displacement activity of beads under flow using fluorescence microscopy.
- Collect large imaging datasets and analyse outputs using various algorithms.
- Develop a new import assay based on single stranded DNA attached to bacteriocin-loaded beads.
- Develop methods to establish rate of import across the E. coli outer membrane and the pN force experienced by the importing bacteriocin.
- Maintain a laboratory notebook such that they meet the standards required for publication, and work in a safety conscious manner that meets with local COSHH and GMO regulations.
- Manage own academic research and administrative activities. This involves small scale project management, to co-ordinate multiple aspects of work to meet deadlines.
- Participate in the weekly Kleanthous lab meeting and journal club, engage with other members of the Kleanthous and Gruszka labs and contribute to communal duties in the Kleanthous lab, which include regular lab clean-ups, looking after pieces of equipment and occasional supervision of Part II project, visiting research students or new DPhil students.
- Submit monthly lab reports summarising progress in the work.
- Preparation of manuscripts and high-quality figures for publication, and preliminary data for future grant. proposals.

• Attendance at weekly lunchtime seminar programmes and presentation of the latest advances at national and international conferences.

Selection criteria

Essential selection criteria

- 1. Hold a PhD/DPhil, or be near completion of a PhD/DPhil, in Biochemistry or Molecular Biophysics or a related area.
- 2. Have experience in dissecting biological mechanism using biochemical and/or biophysical methods specific to a particular area of research.
- 3. Have experience in recombinant DNA molecular biology methods and expressing and purifying recombinant proteins.
- 4. Be able to demonstrate competence and success in solving biological problems through research as judged by publications in high quality peer reviewed journals. Evidence will be sought of a deep understanding of the applicant's previous fields of research and evidence of independent intellectual and practical contributions to previous research projects, as indicators that such attributes can be brought to bear on the present project.
- 5. Be viewed as a motivated, enthusiastic, organised self-starter; one who can work with a minimum of supervision but at the same time extract the benefits of an excellent research environment.
- 6. Demonstrate a willingness to learn new techniques and apply them in an interdisciplinary research environment. Be willing to participate in group journal clubs and workshops as a means to continuously improve technical and theoretical knowledge.
- 7. Communicate well in English in writing, oral and visual presentations. Be able to keep detailed laboratory records and report on progress at regular intervals.
- 8. Demonstrate an ability to work supportively in a laboratory environment, to supervise and educate junior co-workers and take part in joint projects through co-operation with the exchange of information, skills and reagents.

Desirable selection criteria

- 1. Experience in single molecule studies.
- 2. Experience in working with bacteria and bacterial cultures.
- 3. Knowledge of coding for analysis of biophysical data and/or use of ImageJ/Fiji.

Pre-employment screening

Standard checks

If you are offered the post, the offer will be subject to standard pre-employment checks. You will be asked to provide: proof of your right-to-work in the UK; proof of your identity; and (if we haven't done so already) we will contact the referees you have nominated. You will also be asked to complete a health declaration so that you can tell us about any health conditions or disabilities for which you may need us to make appropriate adjustments.

Please read the candidate notes on the University's pre-employment screening procedures at: <u>https://www.jobs.ox.ac.uk/pre-employment-checks</u>

Hazard-specific / Safety-critical duties

This job includes hazards or safety-critical activities. If you are offered the post, you will be asked to complete a health questionnaire which will be assessed by our Occupational Health Service, and the offer of employment will be subject a successful outcome of this assessment.

The hazards or safety-critical duties involved are as follows:

• Work with any substance which has any of the following pictograms on their MSDS:



About the University of Oxford

Welcome to the University of Oxford. We aim to lead the world in research and education for the benefit of society both in the UK and globally. Oxford's researchers engage with academic, commercial and cultural partners across the world to stimulate high-quality research and enable innovation through a broad range of social, policy and economic impacts.

We believe our strengths lie both in empowering individuals and teams to address fundamental questions of global significance, while providing all our staff with a welcoming and inclusive workplace that enables everyone to develop and do their best work. Recognising that diversity is our strength, vital for innovation and creativity, we aspire to build a truly diverse community which values and respects every individual's unique contribution.

While we have long traditions of scholarship, we are also forward-looking, creative and cutting-edge. Oxford is one of Europe's most entrepreneurial universities and we rank first in the UK for university spinouts, and in recent years we have spun out 15-20 new companies every year. We are also recognised as leaders in support for social enterprise.

Join us and you will find a unique, democratic and international community, a great range of staff benefits and access to a vibrant array of cultural activities in the beautiful city of Oxford. For more information, please visit <u>www.ox.ac.uk/about/organisation</u>.

Department of Biochemistry

The Department of Biochemistry in Oxford was established in 1920 and is now one of the largest in Europe. Situated in an attractive area close to the University Parks and River Cherwell, the Department is housed in the University Science Area and is currently undergoing a major expansion programme centred on the recently completed and award-winning New Biochemistry Building. The Science Area includes the Radcliffe Science Library and the Natural History Museum, and is conveniently located for easy access to the town centre and colleges.

The department includes research laboratories working in the areas of Cell Biology, Development and Genetics; Chromosomal and RNA Biology; Infection and Disease Processes; Microbiology and Systems Biology; and Structural Biology and Molecular Biophysics. It is particularly well equipped with an extensive computer network, all the basic hardware essential in today's research, together with an excellent range of state-of-the-art specialist equipment.

For more information please visit: <u>http://www.bioch.ox.ac.uk/</u>

The University of Oxford is a member of the <u>Athena SWAN Charter</u> and holds an institutional Bronze Athena SWAN award. The Department of Biochemistry is strongly committed to equality and valuing diversity and we operate a flexible working policy for all staff. The Department holds a departmental Silver Athena SWAN award to recognise advancement of gender equality: representation, progression and success for all.

Medical Sciences Division

The Medical Sciences Division is an internationally recognized centre of excellence for biomedical and clinical research and teaching, and the largest academic division in the University of Oxford. It includes 15 clinical departments and 5 non-clinical departments.

World-leading programmes, housed in state-of-the-art facilities, cover the full range of scientific endeavour from the molecule to the population. With our NHS partners we also foster the highest possible standards in patient care.

For more information please visit: <u>http://www.ox.ac.uk/divisions/medical_sciences.html</u>

How to apply

Applications are made through our online recruitment portal. Information about how to apply is available on our Jobs website <u>https://www.jobs.ox.ac.uk/how-to-apply</u>.

Your application will be judged solely on the basis of how you demonstrate that you meet the selection criteria stated in the job description.

As part of your application you will be asked to provide details of two referees and indicate whether we can contact them now.

You will be asked to upload a CV and a supporting statement. The supporting statement must explain how you meet each of the selection criteria for the post using examples of your skills and experience. This may include experience gained in employment, education, or during career breaks (such as time out to care for dependants).

Please upload all documents as PDF files with your name and the document type in the filename.

All applications must be received by **midday** UK time on the closing date stated in the online advertisement.

Information for priority candidates

A priority candidate is a University employee who is seeking redeployment because they have been advised that they are at risk of redundancy, or on grounds of ill-health/disability. Priority candidates are issued with a redeployment letter by their employing department(s).

If you are a priority candidate, please ensure that you attach your redeployment letter to your application (or email it to the contact address on the advert if the application form used for the vacancy does not allow attachments).

If you need help

Application FAQs, including technical troubleshooting advice is available at: <u>https://staff.web.ox.ac.uk/recruitment-support-faqs</u>

Non-technical questions about this job should be addressed to the recruiting department directly, please email jobs@bioch.ox.ac.uk

To return to the online application at any stage, please go to: <u>www.recruit.ox.ac.uk</u>. Please note that you will receive an automated email from our online recruitment portal to confirm receipt of your application. **Please check your spam/junk mail** if you do not receive this email.

Important information for candidates

Data Privacy

Please note that any personal data submitted to the University as part of the job application process will be processed in accordance with the GDPR and related UK data protection legislation. For further the University's Privacy information, please see Notice for Job Applicants at: https://compliance.admin.ox.ac.uk/job-applicant-privacy-policy. The University's Policy on Data Protection is available at: https://compliance.admin.ox.ac.uk/data-protection-policy.

The University's policy on retirement

The University operates an Employer Justified Retirement Age (EJRA) for very senior research posts at **grade RSIV/D35 and clinical equivalents E62 and E82**, which with effect from 1 October 2023 will be 30 September before the 70th birthday. The justification for this is explained at: <u>https://hr.admin.ox.ac.uk/the-ejra.</u>

For **existing** employees on these grades, any employment beyond the retirement age is subject to approval through the procedures: <u>https://hr.admin.ox.ac.uk/the-ejra.</u>

There is no normal or fixed age at which staff in posts at other grades have to retire. Staff at these grades may elect to retire in accordance with the rules of the applicable pension scheme, as may be amended from time to time.

Equality of opportunity

Entry into employment with the University and progression within employment will be determined only by personal merit and the application of criteria which are related to the duties of each particular post and the relevant salary structure. In all cases, ability to perform the job will be the primary consideration. No applicant or member of staff shall be discriminated against because of age, disability, gender reassignment, marriage or civil partnership, pregnancy or maternity, race, religion or belief, sex, or sexual orientation.

The University's Policy on Information Security Awareness

The information security awareness training is **compulsory** for all University staff; and as part of our responsibility as a Department, **ALL** employees of the Department will be required to complete the <u>online</u> <u>information security awareness module</u>, which provides a combination of information, case studies and links to additional resources relating to information security. You will be expected to complete this course as part of your induction process, on your first day working in the Department of Biochemistry. This training will also need to be completed in order to successfully complete your probationary period.

In order to ensure that we are compliant and up-to-date with the information security awareness training, we need to ensure that all staff members have completed the latest course, which may be accessed from the Information Security's website by using the following link:

https://www.infosec.ox.ac.uk/guidance-policy/training-and-awareness

You will also be required to undertake this course on an annual basis, in order to satisfy the security awareness training requirements of the University's Information Security Policy.

Benefits of working at the University

Employee benefits

University employees enjoy 38 days' paid holiday, generous pension schemes, travel discounts, and a variety of professional development opportunities. Our range of other employee benefits and discounts also includes free entry to the Botanic Gardens and University colleges, and discounts at University museums. See https://hr.admin.ox.ac.uk/staff-benefits

University Club and sports facilities

Membership of the University Club is free for all University staff. The University Club offers social, sporting, and hospitality facilities. Staff can also use the University Sports Centre on Iffley Road at discounted rates, including a fitness centre, powerlifting room, and swimming pool. See www.club.ox.ac.uk and https://www.sport.ox.ac.uk.

Information for staff new to Oxford

If you are relocating to Oxfordshire from overseas or elsewhere in the UK, the University's Welcome Service website includes practical information about settling in the area, including advice on relocation, accommodation, and local schools. See <u>https://welcome.ox.ac.uk/</u>

There is also a visa loan scheme to cover the costs of UK visa applications for staff and their dependents. See https://staffimmigration.admin.ox.ac.uk/visa-loan-scheme

Family-friendly benefits

With one of the most generous family leave schemes in the Higher Education sector, and a range of flexible working options, Oxford aims to be a family-friendly employer. We also subscribe to the Work+Family Space, a service that provides practical advice and support for employees who have caring responsibilities. The service offers a free telephone advice line, and the ability to book emergency back-up care for children, adult dependents and elderly relatives. See https://hr.admin.ox.ac.uk/my-family-care

The University has excellent childcare services, including five University nurseries as well as Universitysupported places at many other private nurseries.

For full details, including how to apply and the costs, see https://childcare.admin.ox.ac.uk/

Disabled staff

We are committed to supporting members of staff with disabilities or long-term health conditions. For further details, including information about how to make contact, in confidence, with the University's Staff Disability Advisor, see https://edu.admin.ox.ac.uk/disability-support

Staff networks

The University has a number of staff networks including the Oxford Research Staff Society, BME staff network, LGBT+ staff network and a disabled staff network. You can find more information at https://edu.admin.ox.ac.uk/networks

The University of Oxford Newcomers' Club

The University of Oxford Newcomers' Club is an organisation run by volunteers that aims to assist the partners of new staff settle into Oxford, and provides them with an opportunity to meet people and make connections in the local area. See <u>www.newcomers.ox.ac.uk</u>.