Job description

Post	Postdoctoral Research Associate
Department	Biology
Division	Mathematical, Physical and Life Sciences Division (MPLS)
Location	South Parks Rd, Oxford, OX1 3RB
Grade and salary	Researcher Grade 7: £38,674 - £46,913 per annum
Hours	Full time
Contract type	Fixed term (available from 1st January 2025 to 1st May 2026)
Reporting to	Paul Jarvis
Application deadline	Friday 15 November 2024
Vacancy reference	176394
Recruitment contacts	HR: hr@biology.ox.ac.uk PI: Professor Paul Jarvis – paul.jarvis@biology.ox.ac.uk
Additional information	Whilst the role is a grade 7 position, we would be willing to consider candidates with potential but less experience who are seeking a development opportunity, for which an initial appointment would be at grade 6 (£34,982 - £40,855 per annum) with the responsibilities adjusted accordingly. This would be discussed with applicants at interview/appointment where appropriate.

Research topic	Elucidating the role of the CHLORAD machinery in chloroplast protein degradation
Principal Investigator / supervisor	Professor R. Paul Jarvis
Project team	Jarvis Group
Project web site	https://users.ox.ac.uk/~dops0547/
Funding partner	The funds supporting this research project are provided by BBSRC
Recent publications	Li, N. and Jarvis, R.P. (2024) Recruitment of Cdc48 to chloroplasts by a UBX-domain protein in chloroplast-associated protein degradation. Nat. Plants 10: 1400-1417.

	Sun, Y. and Jarvis, R.P. (2023) Chloroplast proteostasis: import, sorting, ubiquitination, and proteolysis. Annu. Rev. Plant Biol. 74: 259-283. Ling, Q., Broad, W., Trösch, R., Töpel, M., Demiral Sert, T., Lymperopoulos, P., Baldwin, A. and Jarvis, R.P. (2019) Ubiquitin-dependent chloroplast-associated protein degradation in plants. Science 363: eaav4467. Ling, Q. and Jarvis, P. (2015) Regulation of chloroplast protein import by the ubiquitin E3 ligase SP1 is important for stress tolerance in plants. Curr. Biol. 25: 2527-2534. Jarvis, P. and López-Juez, E. (2013) Biogenesis and homeostasis of chloroplasts and other plastids. Nat. Rev. Mol. Cell Biol. 14: 787-802. Ling, Q., Huang, W., Baldwin, A. and Jarvis, P. (2012) Chloroplast biogenesis is regulated by direct action of the ubiquitin-proteasome system. Science 338: 655-659.
Technical Skills	Molecular biology; protein biochemistry; proteomics; plant genetics; plant physiology

The role

The human population is growing rapidly and set to exceed 9 billion by 2050, and there is ever increasing pressure on natural resources. Thus, the drivers for increased crop yields and resilience to climate change and sub-optimal growing conditions are stronger than ever. To meet these demands it will be essential to develop improved crop varieties through the application of novel technologies. Fundamental plant biology research in areas linked to plant yield and plant resilience will have a vital role to play in achieving these goals.

Through research on the model plant Arabidopsis thaliana (thale cress), we have made some significant breakthroughs that are relevant in this regard. We discovered a gene called SP1 that controls important aspects of plant growth, including plant responses to adverse environmental conditions such as water stress and high salinity. Arabidopsis plants can be made more tolerant of environmental stresses by modifying SP1 expression. Our subsequent research identified several other genes that function in the same regulatory pathway as SP1, and we named this new pathway CHLORAD (for “chloroplast-associated protein degradation”).

The CHLORAD system regulates the development of structures inside plant cells called chloroplasts. Chloroplasts are normal cellular constituents (organelles), and in many ways they define plants. They contain the green pigment chlorophyll and are responsible for photosynthesis, capturing sunlight energy and using it to power the activities of the cell. As photosynthesis is the only significant mechanism of energy-input into the living world, chloroplasts are of huge importance, not just to plants but to all life on Earth. Chloroplasts also have critical roles in plant responses to abiotic stress, and so are ideal targets for engineering stress tolerance in crops.

Chloroplasts are composed of thousands of different proteins, and most of these are encoded by genes in the cell nucleus and so are synthesized outside of the organelle in the cellular matrix known

as the cytosol. As chloroplasts are each surrounded by a double-membrane envelope, sophisticated machinery is needed to bring about the import of these proteins into the organelle. This comprises two molecular machines, one in each membrane, called TOC (for "Translocon at the Outer membrane of Chloroplasts") and TIC (for "Translocon at the Inner membrane of Chloroplasts"). Each machine is composed of several different proteins that work cooperatively.

The SP1 gene encodes a regulatory factor called a ubiquitin E3 ligase. Such regulators work by labelling-up unwanted proteins with a small tag called ubiquitin, to target them for removal. The SP1 E3 ligase mediates the removal of TOC components, and thereby controls TOC functions so that only the desired proteins are imported by chloroplasts. Such control enables major functional changes of chloroplasts during development and in adaptation to stress. But TOC proteins are deeply embedded in the chloroplast outer membrane, presenting a physical obstacle to their removal following labelling by SP1. We discovered a multicomponent "retrotranslocation" system that extracts proteins from the chloroplast membrane to overcome this obstacle. The SP2 gene encodes a channel across the chloroplast outer membrane, and our results show that it forms the exit gate for the removal of unwanted TOC proteins. Other key components of the retrotranslocation system are the cytosolic ATPase called Cdc48, and an outer membrane protein that acts to recruit Cdc48 to the chloroplast surface (a protein called PUX10). This project will study the CHLORAD machinery in detail to understand more clearly how it targets chloroplast proteins for degradation, elucidating molecular mechanisms and functions.

Responsibilities

- To plan, troubleshoot, and expertly execute the research work involved in this project.
- To actively foster the intellectual environment of the research group through interaction with colleagues.
- To present and discuss project data in the context of the relevant literature at lab meetings.
- To contribute to the daily organisation and management of the research laboratory.
- To analyse and prepare data and contribute to the preparation of manuscripts for publication, and research grant applications.
- To supervise research students and other junior researchers in the research group.
- To contribute to outreach and impact related activities relevant to the project.
- Ad-hoc teaching and demonstrating
- Embed the principles of mutual respect, equality, diversity, inclusivity and sustainability in all aspects of your work; undertake training as and when asked to do so.
- Teach or undertake ad-hoc teaching (this may include lecturing, demonstrating, small group teaching, tutoring of undergraduates and graduate students and supervision of projects).

Selection criteria

Essential selection criteria

- Hold, or be close to completion, of a relevant PhD/DPhil, in a relevant area
- Experience of protein biochemistry, including membrane protein analysis.
- Experience of molecular biology.
- High motivation with intellectual curiosity and rigour.
- Possession of a publication record in a relevant area.
- Ability to work independently and manage multiple tasks.
- Ability to assimilate and evaluate the relevant literature and its implications.
- Willingness and ability to communicate with colleagues and to assist their work.
- Track record of social responsibility in the laboratory.
- Statistical and data analysis skills relevant to the project.
- Ability to present data to colleagues and non-specialist audiences.

Desirable selection criteria

- Experience of proteomics or structural biology
- Experience of plant biology
- Experience of research on subcellular organelles, such as chloroplasts.

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. If you have previously worked for the University we will also verify key information such as your dates of employment and reason for leaving your previous role with the department/unit where you worked. 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: https://www.jobs.ox.ac.uk/pre-employment-checks

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:

- Lone Working
- Night working
- Work in hot or cold environments
- Working with Ionising Radiation
- Regular manual handling
- Working with category 3b or 4 lasers (laser safety class)
- Work with allergens, Eg laboratory animals, pollen, dust, fish or insects etc.
- Work with any substance which has any of the following pictograms on their MSDS:

- Travel outside of Europe or North America on University Business

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 spin-outs, 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 www.ox.ac.uk/about/organisation.

The Department of Biology

You will be joining the Department of Biology at an exciting time. The Department established from August 2022 as a result of a merger between the Departments of Zoology and Plant Sciences, and is preparing to move into the new state-of-the-art Life and Mind Building in two to three years time.

The Department of Biology is recognised internationally for its research in a wide range of fields spanning all levels from molecules to ecosystems, and tackling global challenges through fundamental bioscience research. Over time, the research interests of the Department has been focused on five primary themes: Behaviour & Biomechanics; Ecology & Conservation; Evolutionary Biology; Microbiology & Infectious Disease; and Molecular Plant Biology. Research is conducted in all spheres from laboratory and in silico analysis to theoretical and field-based research.

At all times we seek to reinforce the connections between research and our education offering, at both graduate and undergraduate level. The Department teaches a four-year undergraduate degree MBiol course in Biology, with fourth-year students undertaking a Masters-level research project. It also supports a variety of graduate placements and hosts the University's DPhil in Biology.

External research income to the Department is derived from over 50 different funding agencies, with the principal current funders being the European Research Council, the Royal Society, the Wellcome Trust, BBSRC and NERC. The Department has a significant record in integrating broader societal impacts of its research, including the provision of policy to government at the highest level, as well as supporting the commercialisation of research through spin-out companies and licensing arrangements that have generated hundreds of millions of pounds' worth of innovation.

The Department is located in the University's Science Area at two sites, and will move into the new £200m Life and Mind Building in 2024 that will include extensive laboratory provision with controlled environment rooms, glasshouses and an imaging suite. The Department also benefits from extensive facilities at the John Krebs Field Station at Wytham, with Wytham Woods nearby, as well as partnerships with organisations in the area such as the Oxford Botanic Gardens and Oxford Natural History Museum.

For more information please visit: https://www.biology.ox.ac.uk

The Mathematical, Physical and Life Sciences Division

The Mathematical, Physical, and Life Sciences (MPLS) Division is one of the four academic divisions of the University, alongside the Humanities, Social Sciences and Medical Sciences Divisions. It is led by an academic Head of Division (Professor Sam Howison) and an administrative Divisional Registrar (Dr Tracy Gale) and comprises nine of the University's academic departments – Biology, Chemistry, Computer Science, Earth Sciences, Engineering Science, Materials, the Mathematical Institute, Physics, and Statistics – as well as Begbroke Science Park, the multidisciplinary Ineos Oxford Institute for Antimicrobial Research and an interdisciplinary Doctoral Training Centre.

The disciplines within the MPLS Division regularly appear at the highest levels in rankings, including the Times Higher Education and QS world rankings. Nationally, the quality of the Division's research outputs and environment, and the resulting impact, was recognised through strong performances in the UK Research Excellence Framework in both 2014 and 2021.

MPLS is proud to be home to some of the most creative and innovative scientific thinkers and leaders in academia, whose interdisciplinary research is tackling major societal and technological challenges, from new energy solutions or improved cancer treatments to understanding climate change processes and helping to preserve biodiversity, tackling antimicrobial resistance, advancing AI and quantum technologies and space exploration, and much more. The quality and impact of our work have been recognised by successive rounds of the national Research Excellence Framework and Teaching Excellence and Student Outcomes Framework exercises, and our departments frequently top the major higher education league tables. We teach around 7,300 students (including around 3,400 graduate students) and are playing a key part in training the next generation of leading scientists.

Divisional activity is co-ordinated and represented by the MPLS Divisional Office based at 9 Parks Road, in the heart of Oxford's Science Area. The Divisional Office, which is led by the Divisional Registrar, has around 55 dedicated members of staff, as well as a number of colleagues who are embedded in divisional teams but based in central University services (e.g. in Finance, HR and Development).

To find out more, please visit: www.mpls.ox.ac.uk.

How to apply

Applications are made through our e-recruitment system and you will find all the information you need about how to apply on our Jobs website https://www.jobs.ox.ac.uk/how-to-apply.

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.

If you currently work for the University please note that:

- as part of the referencing process, we will contact your current department to confirm basic employment details including reason for leaving
- although employees may hold multiple part-time posts, they may not hold more than the equivalent of a full time post. If you are offered this post, and accepting it would take you

over the equivalent of full-time hours, you will be expected to resign from, or reduce hours in, your other posts(s) before starting work in the new post.

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

Help and support is available from: https://hrsystems.admin.ox.ac.uk/recruitment-support

If you require any further assistance please email recruitment@biology.ox.ac.uk.

To return to the online application at any stage, please go to: www.recruit.ox.ac.uk.

Please note that you will receive an automated email from our e-recruitment system 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 information, please see the University's Privacy 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**, of 30 September before the 70th birthday. The justification for this is explained at: https://hr.admin.ox.ac.uk/the-ejra.

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

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.

Benefits of working at the University

Employee benefits

University employees enjoy 38 days' paid holiday, generous pension schemes, flexible working options, travel discounts including salary sacrifice schemes for bicycles and electric cars and other discounts. Staff can access a huge range of personal and professional development opportunities. See https://hr.admin.ox.ac.uk/staff-benefits

Employee Assistance Programme

As part of our wellbeing offering staff get free access to Health Assured, a confidential employee assistance programme, available 24/7 for 365 days a year. Find out more https://staff.admin.ox.ac.uk/health-assured-eap

University Club and sports facilities

Membership of the University Club is free for University staff. It 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 includes practical information about settling in the area, including advice on relocation, accommodation, and local schools. See https://welcome.ox.ac.uk/

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

Family-friendly benefits

We are a family-friendly employer with one of the most generous family leave schemes in the Higher Education sector (see https://hr.web.ox.ac.uk/family-leave). Our Childcare Services team provides guidance and support on childcare provision, and offers a range of high-quality childcare options at affordable prices for staff. In addition to 5 University nurseries, we partner with a number of local providers to offer in excess of 450 full time nursery places to our staff. Eligible parents are able to pay for childcare through salary sacrifice, further reducing costs. See https://childcare.admin.ox.ac.uk/.

Supporting disability and health-related issues (inc menopause)

We are committed to supporting members of staff with disabilities or long-term health conditions, including those experiencing negative effects of menopause. Information about the University's Staff Disability Advisor, is at https://edu.admin.ox.ac.uk/disability-support. For information about how we support those going through menopause see https://hr.admin.ox.ac.uk/menopause-guidance

Staff networks

The University has a number of staff networks including for research staff, BME staff, LGBT+ staff, disabled staff network and those going through menopause. Find out more at https://edu.admin.ox.ac.uk/networks

The University of Oxford Newcomers' Club

The University of Oxford Newcomers' Club is 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 www.newcomers.ox.ac.uk.

Research staff

The Researcher Hub supports all researchers on fixed-term contracts. They aim to help you settle in comfortably, make connections, grow as a person, extend your research expertise and approach your next career step with confidence. Find out more https://www.ox.ac.uk/research/support-researchers/researcher-hub

Oxford's Research Staff Society is a collective voice for our researchers. They also organise social and professional networking activities for researchers. Find out more https://www.ox.ac.uk/research/support-researchers/connecting-other-researchers/oxford-research-staff-society