Job description and selection criteria

Job title	Postdoctoral Research Assistant in Machine Learning, Bioinformatics and Genome Editing
Division	Medical Science Division
Department	Radcliffe Department of Medicine
Location	MRC Weatherall Institute of Molecular Medicine, MRC Molecular Haematology Unit, John Radcliffe Hospital, Headington, Oxford, OX3 9DS
Grade and salary	Grade 7: £36,024 - £44,263 per annum
Hours	Full time (37.5 hours per week)
Contract type	Fixed-term for 12 months, funded by the NIHR Biomedical Research Centre (BRC)
Reporting to	Associate Professor James Davies
Vacancy reference	**173222**

Research topic	Machine Learning, Bioinformatics and Genome Editing
Principal Investigator / supervisor	http://www.imm.ox.ac.uk/people/james-davies
Project team	https://www.imm.ox.ac.uk/research/research-groups/davies-group-genome-function-and-advanced-cellular-therapy-development
Funding partner	The funds supporting this research project are provided the National Institute for Health Research, Biomedical Research Centre, Oxford
Recent publications	Badat, M., et al., (2023) Direct correction of Haemoglobin E with Base Editors Downes, D.J., et al., (2021). Identification of LZTFL1 as a candidate effector gene at a COVID-19 risk locus. Nat Genet. Hua, P., et al., (2021). Defining genome architecture at base-pair resolution. Nature. 595: 125-129.

The role

This is an exciting opportunity for a Postdoctoral Research Assistant to join [Associate Professor James Davies](#) to develop Deep Neural Network methods to develop genome editing strategies to treat rare disease. Around 1 in 20 people have a rare genetic disorder and we are interested in developing methods that will allow editing strategies to be developed at scale to treat these disorders.

The postholder will join a large multidisciplinary team covering molecular methodologies, genomics, single cell genomics/transcriptomics, computational biology and machine learning. The overarching aim of the project is to develop strategies to treat patients with rare genetic disorders at scale.

Responsibilities

- Develop software and algorithms for the prediction of genome editing strategies at scale.

- To develop Deep Neural Network models to assist in identification of the most effective editing strategies and to select disease variants.

- To form part of a team of Machine Learning scientists in the WIMM CCB building predictive machine learning networks to predict genome structure and behaviour for sequence using genomics data.

- To form a large component of a hybrid bench and computational team to develop and direct functional experiments to validate predictive Machine Learning approaches.

- To manage multiple simultaneous projects, meeting deadlines as required.

- To proactively collaborate and develop research activities with external groups both within the University and elsewhere.

- To contribute to the production of scientific reports and publications for high profile journals.

- To keep detailed, accurate and comprehensible records of work performed and communicate developments and results to colleagues on a regular basis, as required.

- To communicate and meet with Associate Professor Davies on a regular basis and with external collaborators as the need arises.

- To clearly present data at laboratory and scientific meetings, and to undertake further training as appropriate.

- To represent the team at international conferences and meetings and present the finding of the project.

- To maintain confidentiality regarding research data when interacting with non-collaborating researchers.

- To work as part of a team and independently as required, organizing work efficiently, prioritising workload and taking personal responsibility for assigned tasks.

Selection criteria

Essential

- Hold a relevant PhD (or be close to completion - thesis submitted at time of application) in Computational Biology, Bioinformatics, Computer Science, or related discipline.

- A strong background in Biology, Statistics/Mathematics and/or Computer Science. Extensive experience in software and algorithm development

- Familiarity with version control and GitHub

- Strong coding skills in Python

- Familiarity with PyTorch, JAX, TensorFlow, and/or Keras

- Broad experience in Machine Learning approaches applied to genomics or transcriptomics, especially Deep Neural Network based approaches.

- Wide experience in the analysis of transcriptomic data

- Experience in visualisation and presentation of complex data sets.

- Excellent organisational/planning skills with the ability to manage multiple simultaneous projects and achieve deadlines.

- Excellent communication skills, both oral and in writing.

- The ability to work as part of a team as well as independently.

Desirable

- Experience in Python package development

- Experience in genetic fine mapping approaches

- Experience in working in collaborative teams in large scale coding projects

- Previous experience in Variant Calling approaches from genome sequence

- Experience analysing non-standard transcriptomics for which standard pipelines do not exist.

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

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.

Radcliffe Department of Medicine (RDM)

The Radcliffe Department of Medicine (RDM) within the Medical Sciences Division is one of the largest departments in the University of Oxford. Headed by Professor Keith Channon, RDM is a multi-disciplinary department which aims to tackle some of the world's biggest health challenges by integrating innovative basic biology with cutting edge clinical research. The Department was formed in 2012 and comprises:

- The Division of Cardiovascular Medicine (CVM)
- The Investigative Medicine Division (IMD)
- The Nuffield Division of Clinical Laboratory Sciences (NDCLS)
- The Oxford Centre for Diabetes, Endocrinology and Metabolism (OCDEM)
- The majority of research groups from the MRC Weatherall Institute of Molecular Medicine (WIMM)

The Department has internationally renowned programmes in a range of areas, including cardiovascular sciences, diabetes and endocrinology, immunology, haematology and pathology. Our work is underpinned by excellence in molecular medicine, stem cell biology, genomics and clinical laboratory science.

The Department employs in the region of 535 staff, has around 140 postgraduate research students and has an annual turnover of around £63m of which £42m is externally funded grants and contracts.

RDM supports a culture that is inclusive and supportive of all members, including those with caring responsibilities and those who work flexibly for other reasons. We are proud to be a family friendly department, and are committed to creating a working environment that offers opportunities for working parents/carers to achieve their professional goals and develop their careers without having a detrimental effect on family life. To support this, we have a range of family friendly policies and practices including maternity, paternity and adoption leave, shared parental leave and unpaid parental leave, flexible/part-time working and scheduling meetings within core hours (9.30am - 2.30pm). Many of our staff work flexibly, with arrangements managed informally or formally.

The University of Oxford is a member of the Athena Swan Charter and holds an institutional Silver Athena Swan award. RDM also holds a departmental Silver Athena Swan award in recognition of our efforts to introduce organisational and cultural practices that promote gender equality to create a better working environment.

For more information on the Department please visit: www.rdm.ox.ac.uk

Nuffield Division of Clinical Laboratory Sciences (NDCLS)

Led by Professor Deborah Gill, the Nuffield Division of Clinical Laboratory Sciences brings together all of the clinical laboratory-based disciplines within the Oxford Medical School (Microbiology, Genetics, Cellular Pathology, Haematology and Clinical Biochemistry). The original Nuffield Departments date from Lord Nuffield's original benefaction to the Oxford Medical School in 1938.

As well as the teaching of Undergraduate and Clinical Medical Student courses, NDCLS has an active research programme, holding more than £5.3m per annum (£25m in total) of research grants from Research Councils and charities.

For more information please visit www.ndcls.ox.ac.uk

MRC Weatherall Institute of Molecular Medicine

The MRC Weatherall Institute of Molecular Medicine (MRC WIMM) at the University of Oxford was founded in 1989 by Sir David Weatherall to foster research in molecular and cell biology, with the aim of improving human health. Through our excellent basic and applied research, we have become leaders in translational medicine. Our research has resulted in improved understanding, diagnosis and treatment of a wide range of human diseases.

The Institute hosts staff and students from seven different departments within the Medical Sciences Division. We bring together over 500 researchers, staff and students with a passion for translational science and who share an interest in our five core research areas: rare diseases, haematology, immunology and infection, stem cells and developmental biology and cancer biology.

Our interaction with clinical departments at the Oxford University Hospitals Foundation NHS Trust, is a vital aspect of our work. A third of our faculty are clinically qualified and many are practicing clinicians. Half our groups have productive collaborations with biotech and pharma and we collaborate extensively with researchers and clinicians across the UK and further afield. Our international collaborations in the US, China, Vietnam, Thailand, Sri Lanka, East and West Africa form a major aspect of our clinical programmes directed towards progress in global health.

We also centrally provide excellent, state-of-the-art core facilities to support our researchers and work with them to develop and apply new technologies to current scientific and clinical problems.

MRC Molecular Haematology Unit

At the MRC MHU we aim to understand how stem cells produce mature blood cells in a healthy context, and how this process is perturbed in common blood disorders. Our ultimate goal is to improve the prognosis of patients with inherited and acquired blood diseases.

The MRC Molecular Haematology Unit (MRC MHU) was founded in 1980 and is located in the MRC Weatherall Institute of Molecular Medicine, University of Oxford, at the John Radcliffe Hospital. The Unit includes 14 research teams with over 100 scientists who share a common interest in understanding the process by which multipotential haemopoietic stem cells become committed and differentiate into the highly specialised cells found in the peripheral blood (red cells, granulocytes, lymphocytes and platelets). We also study how these processes are perturbed in acquired and inherited blood diseases such as thalassaemia, myelodysplasia and leukaemia.

Our work is closely integrated with the provision of NHS service to patients with blood diseases via the clinical Department of Haematology. Several permanent members of the MRC MHU are practicing

clinicians working in the University's Department of Haematology and Paediatrics, providing the Unit with access to clinical material and ensuring that our scientific developments are rapidly translated into improved clinical care.

For more information please visit: http://www.imm.ox.ac.uk/mrc-molecular-haematology-unit

Medical Sciences Division

The Medical Sciences Division is an internationally recognized centre of excellence for biomedical and clinical research and teaching. We are the largest academic division in the University of Oxford.

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: http://www.medsci.ox.ac.uk

How to apply

Applications are made through our online recruitment portal. Information about how to apply is available 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 three 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: https://staff.web.ox.ac.uk/recruitment-support-faqs

Non-technical questions about this job should be addressed to the recruiting department directly – please email recruitment@imm.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 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 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 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 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. 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/. We also subscribe to the Work+Family Space, a service that provides practical advice and support for employees who have caring responsibilities for dependants of all types. See https://hr.admin.ox.ac.uk/my-family-care

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 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 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