## Job description and selection criteria

<table>
<thead>
<tr>
<th><strong>Job title</strong></th>
<th>Postdoctoral Researcher in Computational Genomics</th>
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<tbody>
<tr>
<td><strong>Division</strong></td>
<td>Medical Sciences Division</td>
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<tr>
<td><strong>Department</strong></td>
<td>Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences</td>
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<tr>
<td><strong>Location</strong></td>
<td>Kennedy Institute of Rheumatology, Old Road Campus, Oxford, OX3 7FY</td>
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<tr>
<td><strong>Grade and salary</strong></td>
<td>Grade 7: Salary in the range £31,076 - £38,183 per annum</td>
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<tr>
<td><strong>Hours</strong></td>
<td>Full time</td>
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<tr>
<td><strong>Contract type</strong></td>
<td>Fixed-term (3 years)</td>
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<tr>
<td><strong>Reporting to</strong></td>
<td>Dr Stephen Sansom</td>
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<tr>
<td><strong>Vacancy reference</strong></td>
<td>128130</td>
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| **Research topic**            | Computational genomics analysis of the immune system |
| **Principal Investigator / supervisor** | Dr Stephen Sansom |
| **Project team**              | Computational Genomics                             |
| **Project web site**          | [https://www.kennedy.ox.ac.uk/research/computational-genomics](https://www.kennedy.ox.ac.uk/research/computational-genomics) |
| **Funding partner**           | This research is supported by a Wellcome Trust Strategic Award and the Kennedy Institute of Rheumatology Trust |


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The role

Research context

We are using single-cell and functional genomics approaches to investigate the immune system in health and disease. We collaborate closely with world-leading experimental groups to design, execute and interpret genomic experiments. Working as a computational biologist within the group, you will be expected to undertake research projects within two major areas of interest:

- In the first we are studying the role of thymic epithelial cells (TEC) in shaping the T cell receptor repertoire. TEC guide this selection by challenging developing T cells with a 'molecular mirror' of self-antigens. We study this process at the systems-level as part of dynamic research consortium funded by a Wellcome Trust Strategic Award (WTSA, titled “The Homunculus in our Thymus: a cellular genomics approach”). The WTSA team is comprised of experimental, computational and mathematical researchers based at the University of Oxford, the University of Edinburgh and the Wellcome Trust Sanger Institute and European Bioinformatics Institute in Cambridge. It is by co-led by Prof. Georg Holländer and Prof. Chris Ponting.

- The second focus of our work is to identify and understand the context-specific changes in immune cell abundance and phenotype that underlie chronic inflammation. Here we are collaborating with the group of Prof Fiona Powrie to understand the roles that infiltrating leukocytes, resident immune and stromal cells play in the pathogenesis of inflammatory bowel diseases (IBDs) such as Crohn’s Disease and Ulcerative Colitis. We are using the latest single-cell transcriptomic approaches to study mouse models and patient cohorts with the ultimate aim of identifying pathogenic cell-types, factors and pathways as targets for selective therapies.

Role overview

In this role you will conduct original research projects, guided by relevant literature, your own experience and discussion with the project supervisors and scientists. You will be expected to develop your existing abilities and to learn new research skills. You will work closely with wet-lab researchers to design, analyse and interpret single-cell genomics experiments using our state-of-the art high performance compute (HPC) facility.

Responsibilities

Key responsibilities

- To perform scientific research, developing and acquiring relevant skills.
- To analyse, contextualise and interpret data, publishing your findings in peer-reviewed journals.
- To actively participate in the research team, sharing skills and knowledge with colleagues in Powrie group and WTSA consortium, and to take part in wider activities as appropriate.
- To communicate results in regular meetings, by poster and oral presentations at scientific meetings, or via other suitable means.
- To write and maintain software pipelines and programs for data analysis.
- To identify training needs and to follow an agreed strategy to meet them.
- To train and supervise graduate and undergraduate students as appropriate.
• To keep abreast of the relevant literature and methodological developments.

Relationships

• The Postdoctoral Researcher in Computational Genomics is a member of the Computational Genomics team led by Dr Stephen Sansom at the KIR.
• The post-holder will work with graduate students and post-doctoral researchers in the Powrie group and WTSA consortium.
• The post-holder will be a member of the Oxford University Consortium for Single Cell Biology.

Additional security pre-employment checks
This job will require a satisfactory Disclosure Scotland/criminal records check due to the nature of the work carried out at the Kennedy Institute.

Selection criteria

Essential

• A PhD/DPhil in a discipline of direct relevance to computational genomics and/or immunology.
• Demonstrable skills and experience in the statistical analysis and interpretation of genomic data sets.
• A passion for problem-solving and research in the areas of immunology, genomics and single-cell biology that is grounded in expert-level knowledge or experience.
• Competence with a programming language such as Python or Perl and experience of a statistical package such as R.
• Excellent interpersonal skills, able to work independently and collaboratively.
• Excellent communication skills, both oral and written.
• Good working knowledge of office software.
• Excellent organisational skills – managing both time and records effectively.
• Able to use own initiative to solve problems.

Desirable

• Good publication track record and experience of presenting work at meetings.
• Cross-disciplinary collaborative experience.
• Good project management skills and a track record in meeting deadlines.
• Experience with the analysis of single-cell RNA-seq data.
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, and in providing all of our staff with a welcoming and inclusive workplace that supports everyone to develop and do their best work. Recognising that diversity is a great strength, and 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. Income from external research contracts in 2014/15 exceeded £522.9m and ranked first in the UK for university spin-outs, with more than 130 spin-off companies created to date. 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

Medical Sciences Division

The Medical Sciences Division is an internationally recognised 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: www.medsci.ox.ac.uk

Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences

The Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences (NDORMS) is part of the Medical Sciences Division and is the largest European academic department in its field, running a globally competitive programme of research and teaching.

Our mission is to discover the causes of musculoskeletal and inflammatory conditions to deliver excellent and innovative care that improves people’s quality of life. Our highly skilled teams have expertise in a broad range of areas, including orthopaedic surgery, inflammation, immunology, rheumatology, medical statistics, epidemiology, and clinical trials.

We currently have 500 staff and students and over 100 honorary staff, have a grants portfolio worth £100 million, and an annual turnover in excess of £30 million.
The Botnar Research Centre enables and encourages research and education into the causes of musculoskeletal disease and their treatment.

The Centre provides world-class facilities for scientists in the field of musculoskeletal research. It takes a multidisciplinary approach, encompassing orthopaedic, rehabilitation and rheumatology clinical scientists, bone oncologists, laboratory scientists, epidemiologists, engineers and statisticians. The Botnar also hosts the Oxford Clinical Trials Research Unit (OCTRU) and the Centre of Statistics in Medicine (CSM), providing excellent statistical support to all aspects of clinical research.

The Botnar opened in 2002, with a large annex completed in 2013. The Botnar is now home to around 300 staff and postgraduate students enjoying the international and friendly atmosphere of this workplace and benefits from the vast knowledge of leading experts in the field of musculoskeletal research.

To accommodate its rapid growth, the Centre will open another wing in 2018 and building is already underway. This will provide research space for the new Professor of Biomaterials. The new space will include 1000m² of office and 1000m² of laboratory space. The laboratory space includes a GMP clean room facility suitable for the manufacturing of biomaterials for human implantation.

Sharing the site of the Nuffield Orthopaedic Centre, the largest specialist academic musculoskeletal hospital in the UK, puts the Botnar in a unique position to foster the collaboration between basic scientists and clinicians, which is essential to success in medical research.

Kennedy Institute of Rheumatology is world famous for its discovery of anti-TNF therapy for the treatment of chronic inflammatory diseases like rheumatoid arthritis, which has established the current standard of care and heralded the wider use of biologic drugs to treat chronic disease. The Institute carries out fundamental research in the areas of immunity and microbiome, inflammation biology and tissue remodelling and regeneration, with the long-term objective of ‘translating’ this research into clinical application. The major diseases of interest are rheumatoid arthritis, osteoarthritis, inflammatory bowel disease and cancer.

The Kennedy Institute was formed in 1965 as the Mathilda and Terence Kennedy Institute of Rheumatology, in London. It is closely linked to the Kennedy Trust for Rheumatology Research (KTRR), but also receives funding from numerous sources including Arthritis Research UK, the Wellcome Trust, Research Councils UK, the European Commission and a variety of smaller charities.

After a 12-year association with the Faculty of Medicine, Imperial College London, the Kennedy Institute joined the University of Oxford in August 2011, as an independent constituent Institute within NDORMS. The Institute's new building in Oxford opened in July 2013 and provides space to house close to 200 researchers and support staff. The Institute supports a wide range of research from basic mechanistic studies to pre-clinical and clinical investigations. It is equipped with outstanding core technology platforms including flow and mass cytometry, advanced imaging and microscopy, computational biology, histology and a newly constructed germ-free facility for microbiome research. Fiona Powrie has taken the helm of the KIR since October 2014 and brings her vision for integrating an understanding of
the microbiome into basic function of the immune system and treatment of gastrointestinal, joint and systemic autoimmune and inflammatory diseases.

The Institute leads the NIHR Oxford Biomedical Research Centre Gastroenterology and Mucosal Immunity Theme in close collaboration with the University of Oxford’s Translational Gastroenterology Unit. In 2017 the Institute is also launching the Arthritis Therapy Acceleration Programme. This new initiative recently received £7m funding from the KTRR and will harness existing strengths in translational research at the Universities of Oxford and Birmingham to accelerate development and testing of new therapies based on the underlying causes of inflammatory disease.

The Institute is sited on the Old Road Campus, in close proximity to the Wellcome Trust Centre for Human Genetics, The Jenner Vaccine Institute, the Ludwig Institute for Cancer Research, the Structural Genomics Consortium, the Division of Structural Biology (STRUBI), the Target Discovery Institute (TDI) and the University of Oxford’s Big Data Institute.

For more information please visit: http://www.kennedy.ox.ac.uk or download the 2016 Kennedy Institute Brochure https://www.kennedy.ox.ac.uk/about/kennedy-report_web.pdf

Athena Swan

The Athena SWAN Awards specifically recognise success in developing employment practices to further and support the careers of women in science, technology, engineering, maths and medicine (STEMM) departments in academia. Within NDORMS, we feel that we have an established culture of equality but are using the process to spur on-going improvement that benefits everyone involved in the Department. Our on-going progress was rewarded in May 2014 with an Athena Swan Bronze Award and in October 2015 with a Silver Award. Our development in this area has resulted in a number of commitments to our staff, central to which are:

- establishing an open, supportive and family-friendly research environment
- supporting career progression through teaching programmes, personal development reviews and mentoring
- proactive communication of support policies such as flexible working, provision of leave, promotion and career support schemes

NDORMS aims to actively promote the implementation of the University’s family-friendly policies to help foster a family friendly working environment, including provision of family leave (such as policies for maternity, paternity, parental, carers and adoption leave), flexible/part-time working and scheduling inclusive meetings.

The University’s childcare services support staff with a Childcare Voucher Scheme to help staff save tax and national insurance on childcare costs, offer information on nursery providers and a nursery fee Salary Sacrifice Scheme, work in partnership with playscheme providers to help support families during school holidays and signpost staff to parenting, local authority and other organisations that help support families and parents.
The Department is also committed to ensuring that staff undertaking part-time or flexible working receive the same access to benefits and entitlements as full-time staff, including the same opportunities for training and promotion, a pro-rata entitlement to leave including bank holidays and careful consideration of requests to work part-time (particularly for those by staff returning from maternity leave).

For more information please visit:
http://www.admin.ox.ac.uk/personnel/staffinfo/benefits/family/ and
http://www.admin.ox.ac.uk/personnel/during/flexible/

We are also actively working to uphold the University’s aim of providing an inclusive environment and equal career opportunities by promoting equality, valuing diversity and maintaining a working, learning and social environment in which the rights and dignity of all staff are respected. Separate University policies are also in place to ensure race, disability and gender equality.

For more information, please visit: http://www.admin.ox.ac.uk/eop/

How to apply

Before submitting an application, you may find it helpful to read the ‘Tips on applying for a job at the University of Oxford’ document, at:
http://www.ox.ac.uk/about_the_university/jobs/research/.

If you would like to apply, click on the Apply Now button on the ‘Job Details’ page and follow the on-screen instructions to register as a new user or log-in if you have applied previously. Please provide details of two referees and indicate whether we can contact them now. You will also be asked to upload a CV and a supporting statement.

Supporting Statement

The supporting statement should explain how you meet the selection criteria for the post using examples of your skills and experience. This may include experience gained in employment, education/training, voluntary/community work or during career breaks (such as time out to care for dependants or travel).

Your application will be judged solely on the basis of how you demonstrate that you meet the selection criteria stated in the job description and we are happy to consider evidence of transferrable skills or experience which you may have gained outside the context of paid employment or education. **We will short list for interview those whose applications best demonstrate that the applicant meets the selection criteria, so it is important that you use your supporting statement to explain clearly, point by point, how you match them.** Please note that a copy of a CV will not be accepted as substitute for a supporting statement.

References

Please give the details of people who have agreed to provide a reference for you. If you have previously been employed, your referees should be people who have managed you for a considerable period, and at least one of them should be your formal line manager in your most recent job. Otherwise they may be people who have supervised you in a recent college, school, or voluntary experience. It is helpful if you can tell us briefly how each referee knows you (e.g. ‘line manager’, ‘college tutor’). Your referees should not be related to you.
Your referees will be asked to comment on your suitability for the post and to provide details of the dates of your employment and of any disciplinary processes which are still considered ‘live’. We will assume that we may approach them at any stage unless you tell us otherwise. If you wish us to ask for your permission before approaching a particular referee, or to contact them only under certain circumstances (for example, if you are called to interview) you must state this explicitly alongside the details of the relevant referee(s).

If you currently work, or have previously worked, for the University of Oxford, we will also take up a reference from the head or administrator of the previous employing department. This will be in addition to taking references from the referees you have provided.

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

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

**Information for priority candidates**

A priority candidate is a University employee who is seeking redeployment owing to the fact that 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 departments.

**If you are a priority candidate, please ensure that you attach your redeployment letter to your application.**

**Once your priority application has been submitted please email**

personnel@ndorms.ox.ac.uk, **disclosing your name and the vacancy reference.**

Should you experience any difficulties using the online application system, please email recruitment.support@admin.ox.ac.uk. Further help and support is available from www.ox.ac.uk/about/jobs/support/. To return to the online application at any stage, please go to: www.recruit.ox.ac.uk.

Please note that you will be notified of the progress of your application by automatic emails from our e-recruitment system. **Please check your spam/junk mail** regularly to ensure that you receive all emails.

**Important information for candidates**

**Pre-employment screening**

Please note that the appointment of the successful candidate will be subject to standard pre-employment screening, as applicable to the post. This will include right-to-work, proof of identity and references. We advise all applicants to read the candidate notes on the University’s pre-employment screening procedures, found at:

www.ox.ac.uk/about/jobs/preemploymentscreening/.

**The University’s policy on retirement**

The University operates an employer justified retirement age for all academic and academic-related posts (grade 6 and above), for which the retirement date is the 30 September
immediately preceding the 68th birthday. The justification for this is explained at: www.admin.ox.ac.uk/personnel/end/retirement/revisedejra/revaim/.

For existing employees any employment beyond the retirement age is subject to approval through the procedures: www.admin.ox.ac.uk/personnel/end/retirement/revisedejra/revproc/

There is no normal or fixed age at which support staff in posts at grades 1–5 have to retire. Support staff may retire once they reach the minimum pension age stipulated in the Rules of the pension scheme to which they belong.

**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

Training and Development
A range of training and development opportunities are available at the University. Further details can be found at www.ox.ac.uk/staff/working_at_oxford/training_development/index.html.

For research staff only: Support for Research Staff
There is a particularly wide range of support for career development for research staff. Please visit: www.ox.ac.uk/research/support-researchers to find out more.

Pensions
The University offers generous occupational pension schemes for eligible staff members. Further details can be found at www.admin.ox.ac.uk/finance/epp/pensions/pensionspolicy/.

Information for international staff (or those relocating from another part of the UK)
A wealth of information is available on the University's International Staff website for staff who are relocating to Oxford from abroad, at www.admin.ox.ac.uk/personnel/staffinfo/international/.

The University of Oxford Newcomers’ Club
The Newcomers’ Club is aimed at helping partners of newly-arrived visiting scholars, graduate students and academic members of the University to settle in and to meet people in Oxford.

Transport schemes
The University offers a range of travel schemes and public transport travel discounts to staff. Full details are available at www.admin.ox.ac.uk/estates/ourservices/travel/.

University Club and University Sports Facilities
The University Club provides social, sporting and hospitality facilities. It incorporates a Club bar, a cafe and sporting facilities, including a gym. See www.club.ox.ac.uk for all further details.

University staff can use the University Sports Centre at discounted rates, and have the chance to join sports clubs. Please visit www.sport.ox.ac.uk/oxford-university-sports-facilities.

Childcare and Childcare Vouchers
The University offers quality childcare provision services at affordable prices to its employees. For full details about the services offered, please visit www.admin.ox.ac.uk/childcare/. NB: Due to the high demand for the University's nursery places there is a long waiting list.

The University also offers nursery fee payment schemes to eligible staff as an opportunity to save tax and national insurance on childcare costs. Please visit www.admin.ox.ac.uk/childcare.

Disabled staff
The University is committed to supporting members of staff with a disability or long-term health condition and has a dedicated Staff Disability Advisor. Please visit www.admin.ox.ac.uk/eop/disab/staff for further details.

BUPA - Eduhealth
Bupa Eduhealth Essentials private medical insurance offers special rates for University of Oxford staff and their families www.eduhealth.co.uk/mini-site/.

All other benefits
For other benefits, such as free entry to colleges, the Botanic Gardens and staff discounts offered by third party companies, please see www.admin.ox.ac.uk/personnel/staffinfo/benefits/.