Nuffield Department of Medicine

Job description and selection criteria

<table>
<thead>
<tr>
<th>Job title</th>
<th>Postdoctoral Research Scientist – Computational Epigenetics</th>
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<tbody>
<tr>
<td>Division</td>
<td>Medical Science Division</td>
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<tr>
<td>Department</td>
<td>Nuffield Department of Medicine</td>
</tr>
<tr>
<td>Location</td>
<td>Ludwig Institute for Cancer Research, NDM Research Building, Old Road Campus, Headington, Oxford, OX3 7FZ</td>
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<tr>
<td>Grade and salary</td>
<td>Grade 8: £40,798 - £48,677 per annum</td>
</tr>
<tr>
<td>Hours</td>
<td>Full time</td>
</tr>
<tr>
<td>Contract type</td>
<td>Fixed-term for 3 years</td>
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<tr>
<td>Reporting to</td>
<td>Dr Chunxiao Song, Principal Investigator</td>
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<tr>
<td>Vacancy reference</td>
<td>137878</td>
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</tbody>
</table>

The group has been focused on developing technologies in epigenetics and applying them to elucidate epigenetic mechanisms in tumour biology and develop clinical applications in epigenetics. Recently we developed a novel bisulfite-free and base-resolution sequencing of DNA methylation (bioRxiv doi: https://doi.org/10.1101/307538). It could replace bisulfite sequencing as the new standard in DNA epigenetic analysis. We expect it to revolutionize DNA epigenetic analysis, and to have wide applications in academic research and clinical diagnostics, especially in sensitive low-input samples, such as circulating cell-free DNA and single-cell analysis.

Principal Investigator / supervisor | Dr Chunxiao Song |

Project team | Chemical Epigenetics |

Project web site | [http://www.ludwig.ox.ac.uk/research-overview-song](http://www.ludwig.ox.ac.uk/research-overview-song) |

Funding partner | The funding supporting this research project is provided by Cancer Research UK. |
**Introduction**

**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. Income from external research contracts in 2016/17 exceeded £564m and we rank first in the UK for university spin-outs, with more than 130 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](http://www.ox.ac.uk/about/organisation)

**Medical Sciences**

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.
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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 Clinical Medicine (NDM)… fostering your career in science

The Nuffield Department of Clinical Medicine (NDM) is one of the largest departments of the University of Oxford and is part of the Medical Sciences Division, with responsibility for a significant part of the teaching of clinical students within the Medical School.

NDM has significant financial turnover and complexity, resulting from its diverse research portfolio, its geographical spread and its close links with NHS funding and strategic teams involved in the development and delivery of increasingly integrated clinical research platforms. For more information please visit: http://www.ndm.ox.ac.uk/home

The Nuffield Department of Clinical Medicine has been presented with a Departmental Athena SWAN Silver award in recognition of the commitment made to promote gender equality through our organisational and cultural practices and our efforts to improve the working environment for both men and women. For more information please see our Departmental Athena SWAN pages: https://www.ndm.ox.ac.uk/working-for-ndm/aboutndmatheneswan/

The NDM Research Building

Situated on the Old Road Campus this new building represents the latest phase in continued development of the Medical Research Campus. This £22M new building allows the development of the Target Discovery Institute and expansion of existing research groups of NDM with research synergies. The building is 5,300 sq m (GIA) laboratory and office space housing some 160 research and support staff.

The NDM Research Building constructed for the Nuffield Department of Medicine includes the Target Discovery Institute (TDI) with many academic partners such as the Department of Cardiovascular Medicine and BHF Centre of Research Excellence (BHF Centre for Cardiovascular Target Discovery), Department of Radiation Oncology and Biology, Ludwig Cancer Institute, Kennedy Institute of Rheumatology, Structural Genomics Consortium and the Department of Chemistry.

TDI research facilities include high-throughput cell-based screening facility, cell-based assay development program, proteomics laboratory, medicinal chemistry and chemical biology programs and containment level three laboratories. There is support space for the scientists including a 90 seat seminar room, advanced IT and AV infrastructure and additional meeting rooms and break out spaces.
The Ludwig Institute for Cancer Research (LICR)

Ludwig Cancer Research, Oxford Branch is headed by Professor Xin Lu. The Branch combines basic research with the ability to translate its discoveries and conduct clinical trials to accelerate the development of new cancer diagnostics and therapies.

One of the research focuses of the branch is to improve early diagnosis and understanding of risk to prevent cancer progression. The scientists are researching a wealth of different molecular mechanisms to understand key cancer-causing molecular pathways, identify cancer initiating cells and understand the molecular basis of cancer risks. Cutting-edge technologies are also being developed to enhance the sensitivity and accuracy of detection and to minimise invasive procedures. Research in this area include transcriptomic signatures and single cell analysis (Professor Xin Lu, Professor Sir Peter Ratcliffe); computational analysis of clinical images (Professor Jens Rittscher); DNA methylation signatures (Professor Skirmantas Kriaucionis, Dr Chunxiao Song); Mutational landscapes (Dr Benjamin Schuster-Boeckler); Risk factors in inflammation-associated cancer (Professor Mads Gyrd-Hansen); inherited genetic variation in cancer risk (Professor Gareth Bond); cancer vaccines to prevent progression (Professor Benoit Van den Eynde); and technologies for epigenetic-based diagnostics (Dr Chunxiao Song).

The research groups at Ludwig Cancer Research, University of Oxford, have strong overlapping interests yet maintain diversity, enabling the effective sharing of ideas and technologies. By working together the scientists maximise their research potential.

The Oxford Branch currently employs approximately 120 staff at the Old Road Campus Research Building in Headington, Oxford, and has plans for further expansion over the coming 2-3 years.

For more information please visit: [http://www.ludwig.ox.ac.uk/](http://www.ludwig.ox.ac.uk/)
Job description

Overview of the role

The group has been focused on developing technologies in epigenetics and applying them to elucidate epigenetic mechanisms in tumour biology and develop clinical applications in epigenetics. Recently we developed a novel bisulfite-free and base-resolution sequencing of DNA methylation (bioRxiv doi: https://doi.org/10.1101/307538). It could replace bisulfite sequencing as the new standard in DNA epigenetic analysis. We expect it to revolutionize DNA epigenetic analysis, and to have wide applications in academic research and clinical diagnostics, especially in sensitive low-input samples, such as circulating cell-free DNA and single-cell analysis.

We aim to use this technology to establish a database of tissue- and disease-specific DNA epigenetic modification map and focus on the two following research areas: 1) epigenetic sequencing of the circulating cell-free DNA to develop non-invasive early cancer detection, and 2) single-cell epigenetic sequencing to study the heterogeneity of tumours. This represents exciting opportunities for a bioinformatician to join the team not only to develop new computational tools, but also provides large datasets to develop clinical diagnostics and uncover new biological findings.

The post holder will participate in research programme led by Dr Chunxiao Song in the Ludwig Institute funded by Ludwig Institute for Cancer Research, Cancer Research UK, NIHR Oxford Biomedical Research Centre, and Conrad N. Hilton Foundation.

Responsibilities/duties

- Identify, define and plan new projects which contribute to the overall aims of studies and clinical trials
- Advise and supervise biostatistical and laboratory staff on a day-to-day basis
- Conduct detailed analysis of datasets
- Develop novel methodologies for analysis and data collection in collaboration with members of the research team
- Develop or tailor analytical tools and resources appropriate to the work
- Identify and troubleshoot technical or scientific problems, working collaboratively with database experts and scientific programmers
- Contribute to discussions planning the overall aims and objectives of the group
- Provide bioinformatics input into outline and full grant proposals, as a co-applicant
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- Contribute to the production of scientific reports and publications for high profile journals, including taking leadership in more specialised publications on novel aspects of bioinformatics.

- Attend scientific seminars, meetings and to contribute to presentations or other means of disseminating results as appropriate

All employees will have to ensure that their work in the laboratory is conducted safely at all times and, in particular, that work is undertaken following the appropriate health and safety policies and procedures for the particular area, without compromise to their own safety or that of others who may be affected.

Hazard-specific / Safety-critical duties
This job includes the following hazards or safety-critical activities which will require successful pre-employment health screening through our Occupational Health Service before the successful candidate will be allowed to start work:

- Lone working

Selection criteria
Essential

- A PhD (or equivalent) in a relevant scientific subject with research experience in academia or industry.
- Proficiency in the use of statistical programming languages and high-performance computing.
- Experience and technical expertise in the analysis and managing of largescale NGS genomic data (such as whole-genome sequencing, WGS) or epigenetic data (such as whole-genome bisulfite sequencing, WGBS).
- Excellent communication skills, both written and oral, with the ability to present to the scientific community.
- Proven ability to deliver high quality novel research in bioinformatics or computational biology, for example through journal publications, patents and other IP or authoring widely-used software.
- Evidence of independent thinking and understanding of how to lead a successful research programme.
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Desirable

- Knowledge of next-generation sequencing (NGS) technologies.
- Knowledge of epigenetic modifications and mechanisms.
- Experience in single-cell analysis or liquid biopsy analysis.
- Experience in machine learning techniques.
- Experience of working alongside experimental personnel to gather appropriate data, validate methodologies and test hypotheses.
- Previous experience in supervising staff and/or students

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 https://www.ox.ac.uk/about/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. 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).

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

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 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 departments.

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)
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_the_university/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.
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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/.

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: www.admin.ox.ac.uk/councilsec/compliance/gdpr/privacynotices/job/. The University's Policy on Data Protection is available at:

www.admin.ox.ac.uk/councilsec/compliance/gdpr/universitypolicyondataprotection/.

The University’s policy on retirement

The University operates an Employer Justified Retirement Age (EJRA) for all academic posts and some academic-related posts. From 1 October 2017, the University has adopted an EJRA of 30 September before the 69th birthday for all academic and academic-related staff in posts at grade 8 and above. The justification for this is explained at:

www.admin.ox.ac.uk/personnel/end/retirement/acrelretire8+.

For existing employees, any employment beyond the retirement age is subject to approval through the procedures: www.admin.ox.ac.uk/personnel/end/retirement/acrelretire8+.

From 1 October 2017, there is no normal or fixed age at which staff in posts at grades 1–7 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.
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**Benefits of working at the University**

**University Club and sports facilities**

Membership of the University Club is free for all University staff. The University Club provides 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](http://www.club.ox.ac.uk) and [www.sport.ox.ac.uk/oxford-university-sports-facilities](http://www.sport.ox.ac.uk/oxford-university-sports-facilities).

**Information for international staff**

The University offers support and advice to international staff, including a visa loan scheme to cover the costs of UK visa applications for staff and their dependents. See [www.admin.ox.ac.uk/personnel/permits/reimburse&loanscheme/](http://www.admin.ox.ac.uk/personnel/permits/reimburse&loanscheme/).

**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 [www.welcome.ox.ac.uk](http://www.welcome.ox.ac.uk).

**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 to settle into Oxford and to provide them with an opportunity to meet people in the area. See [www.newcomers.ox.ac.uk](http://www.newcomers.ox.ac.uk).

**Childcare**

The University has excellent childcare services with five University nurseries, as well as University-supported places at many other private nurseries. For full details including how to apply and the costs, see [www.admin.ox.ac.uk/childcare](http://www.admin.ox.ac.uk/childcare).

**Family-friendly benefits**

The University subscribes to My Family Care service through which staff are eligible to register for emergency back-up childcare and adultcare services, a ‘speak to an expert’ advice service and a wide range of guides and webinars through a website called the Work+Family space. See: [www.admin.ox.ac.uk/personnel/staffinfo/benefits/family/mfc/](http://www.admin.ox.ac.uk/personnel/staffinfo/benefits/family/mfc/).

**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 [www.admin.ox.ac.uk/eop/disab/staff](http://www.admin.ox.ac.uk/eop/disab/staff).
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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 www.admin.ox.ac.uk/eop/inpractice/networks/.

Additional benefits
Staff can enjoy a range of other benefits and discounts, including free entry to the Botanic Gardens and University colleges, and discounts at University museums. See www.admin.ox.ac.uk/personnel/staffinfo/benefits.