Nuffield Department of Medicine

Job description and selection criteria

Job title	Postdoctoral Research Scientist – Epigenetics
Division	Medical Science Division
Department	Nuffield Department of Medicine
Location	Ludwig Institute for Cancer Research, NDM Research Building, Old Road Campus, Headington, Oxford, OX3 7FZ
Grade and salary	Grade 7: £ 32,236- £ 39,609 per annum
Hours	Full time
Contract type	Fixed term for 2 years in the first instance, with potential for extension
Reporting to	Dr Chunxiao Song, Principal Investigator
Vacancy reference	141095

Research topic	The group has been 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 direct base-resolution sequencing of DNA methylation (***Nat. Biotechnol.*** 2019*, 27,* 424–429.). It could replace bisulfite sequencing as the new standard in 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, single-cell epigenetics, and long-read epigenetic sequencing.
Principal Investigator / supervisor	Dr Chunxiao Song
Project team	Chemical Epigenetics
Project web site	http://www.ludwig.ox.ac.uk/research-overview-song

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Funding partner	The funds for this postion is provided by NIHR Oxford Biomedical Research Centre
Recent publications	Liu Y, Siejka-Zielińska P, Velikova G, Bi Y, Yuan F, Tomkova M, Bai C, Chen L, Schuster-Böckler B, Song CX. (2019). Bisulfite-free direct detection of 5-methylcytosine and 5-hydroxymethylcytosine at base resolution. ***Nat. Biotechnol*.** 37, 424-429. Yuan F, Bi Y, Siejka-Zielinska P, Zhou YL, Zhang XX, Song CX. (2019). Bisulfite-free and base-resolution analysis of 5-methylcytidine and 5-hydroxymethylcytidine in RNA with peroxotungstate. ***Chem. Commun. (Camb.)*** 55, 2328-2331.

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.

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

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 Medicine

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 and Target Discovery Institute (TDI)

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. These include 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.

The TDI consists of six research groups covering high-throughput biology (Ebner group), advanced biological mass spectrometry (Kessler group), medicinal chemistry (Brennan group), chemoproteomics (Huber group), imaging (Rittscher group) and pharmacogenomics (Nijman group). TDI research facilities include technology platform facilities for high-throughput cell-based screening, cell-based assay development programs, discovery proteomics laboratory, medicinal chemistry and chemical biology programmes. 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)

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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 rick (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/

Job Description

Overview of the role

The group has been 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 direct base-resolution sequencing of DNA methylation, called TAPS (***Nat. Biotechnol.*** 2019*, 27,* 424–429.). TAPS could replace bisulfite sequencing as the new standard in 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 epigenetic sequencing, long-read epigenetic sequencing and single-cell epigenetic sequencing.

We aim to use TAPS on the following research areas: 1) cell-free DNA epigenetic sequencing for non-invasive early cancer detection, 2) long-read epigenetic sequencing for cancer-associated viral methylome analysis, 3) single-cell epigenetic sequencing to study tumor heterogeneity. This represents exciting opportunities for a postdoc to join the team to lead various applications with TAPS, to not only develop clinical diagnostics but also uncover new biological findings.

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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

- Manage own academic research and administrative activities. This involves small scale project management, to co-ordinate multiple aspects of work to meet deadlines
- Adapt existing and develop new scientific techniques and experimental protocols
- Test hypotheses and analyse scientific data from a variety of sources, reviewing and refining working hypotheses as appropriate
- Contribute ideas for new research projects
- Develop ideas for generating research income, and present detailed research proposals to senior researchers
- Collaborate in the preparation of scientific reports and journal articles and occasionally present papers and posters
- Use specialist scientific equipment in a laboratory environment
- Act as a source of information and advice to other members of the group on scientific protocols and experimental techniques
- Represent the research group at external meetings/seminars, either with other members of the group or alone
- Carry out collaborative projects with colleagues in partner institutions, and research groups

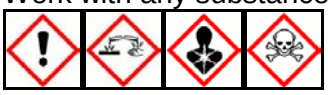
All employees will have to ensure that their work in the laboratory is conducted safely at all times and, in particular, that work is undertaken following the appropriate health and safety policies and procedures for the particular area, without compromise to their own safety or that of others who may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

- Working with blood, human products and human tissues
- Work with any substance which has any of the following pictograms on their MSDS:



Selection criteria

Essential

- Hold or be close to completion of a PhD (or equivalent) in Molecular Biology/Biochemistry/Genetics/Chemistry or a related science degree
- Strong skill set in standard Molecular Biology/Biochemistry/Chemical Biology techniques
- Experience with NGS techniques (WGS or WGBS)
- Experience of communicating results clearly and logically as part of a diverse research team
- At least one peer-reviewed first author publication in a relevant subject (e.g. epigenetics) in high impact science journals
- Evidence of independent thinking and ability to lead the project

Desirable

- More than one publication in high impact science journals
- Extensive knowledge of epigenetics
- Experience in single-cell sequencing
- Experience in PacBio SMRT sequencing or Oxford Nanopore Technologies
- Experience with bioinformatic data analysis
- 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.

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 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 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

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 (EJRA) for all academic posts and some academic-related posts. 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+/.

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

Employee benefits

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

University Club and sports facilities

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

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.
There is also 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/.

Family-friendly benefits

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

Childcare

The University has excellent childcare services, including 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/.

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.

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/.

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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.