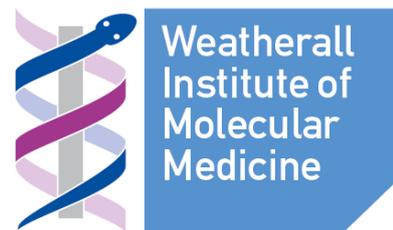




HR EXCELLENCE IN RESEARCH



Job description and selection criteria

| | |
|-------------------------------|---|
| Job title | Postdoctoral Scientist in Developmental and Stem Cell Biology |
| Division | Medical Sciences |
| Department | Nuffield Division of Clinical Laboratory Sciences, 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: £31,076 - £38,183 per annum |
| Hours | Full time (37.5 hours per week) |
| Contract type | Fixed-term for 3 years, funded by the British Heart Foundation, (BHF) |
| Reporting to | Professor Catherine Porcher |
| Vacancy reference | 128592 |
| Additional information | This position is being re-advertised, previous applicants need not apply. |

The role

This new post allows a talented, driven and high-calibre scientist to develop an exciting project aimed at investigating the earliest specification events giving rise to mesodermal lineages.

Background and project outline

How the first lineage-affiliated cells are specified during development is still a matter of debate.^{1,2} Specifically, whether these cells arise from restricted or multi-lineage progenitors, at which stage of development (epiblast versus primitive streak stages) and how these mechanisms are spatio-temporally regulated is unclear.³⁻⁵ This is essential information not only for a better understanding of these fundamental mechanisms, but also to gain further insight into the mechanistic bases underlying congenital diseases and to define optimum culture conditions supporting the development of lineage-fated cells from pluripotent stem cells.

These questions will be addressed through retrospective *in vivo* clonal lineage tracing of mesodermal lineages and single cell analyses from mouse embryos. The post-holder will identify the earliest discernable progenitors of cardiac, blood and paraxial lineages, and determine the

relatedness of these progenitors and their progeny to reconstruct mesoderm patterning and lineage specification. They will particularly focus on the specification of cardiac-affiliated cells, such as endocardial and cardiomyocytes, and their developmental relationship with blood and vascular lineages.⁶⁻⁸ This will give insight into the earliest molecular mechanisms governing cell fate decisions.

This work will involve the development of clonal lineage tracing systems through genome engineering, mouse embryo dissection and confocal imaging, FACS-sorting, clonogenic replating assays, single cell RNA-sequencing and bioinformatics analyses, amongst other approaches.

References:

1. Arnold SJ, Robertson EJ. Making a commitment: cell lineage allocation and axis patterning in the early mouse embryo. *Nat Rev Mol Cell Biol.* 2009;10(2):91-103.
2. Tam PP, Parameswaran M, Kinder SJ, Weinberger RP. The allocation of epiblast cells to the embryonic heart and other mesodermal lineages: the role of ingression and tissue movement during gastrulation. *Development.* 1997;124(9):1631-1642.
3. Lescroart F, Chabab S, Lin X, et al. Early lineage restriction in temporally distinct populations of *Mesp1* progenitors during mammalian heart development. *Nat Cell Biol.* 2014;16(9):829-840.
4. Padron-Barthe L, Temino S, Villa Del Campo C, Carramolino L, Isern J, Torres M. Clonal analysis identifies hemogenic endothelium as the source of the blood-endothelial common lineage in the mouse embryo. *Blood.* 2014;124(16):2523-2532.
5. Chan SS, Shi X, Toyama A, et al. *Mesp1* patterns mesoderm into cardiac, hematopoietic, or skeletal myogenic progenitors in a context-dependent manner. *Cell Stem Cell.* 2013;12(5):587-601.
6. Milgrom-Hoffman M, Harrelson Z, Ferrara N, Zelzer E, Evans SM, Tzahor E. The heart endocardium is derived from vascular endothelial progenitors. *Development.* 2011;138(21):4777-4787.
7. Schoenebeck JJ, Keegan BR, Yelon D. Vessel and blood specification override cardiac potential in anterior mesoderm. *Dev Cell.* 2007;13(2):254-267.
8. Bussmann J, Bakkers J, Schulte-Merker S. Early endocardial morphogenesis requires *Scf/Tal1*. *PLoS Genet.* 2007;3(8):e140.

The postholder will work directly with Professor Catherine Porcher and her team, and interact with other teams in the WIMM focussing on embryonic development (Prof M. de Bruijn), genome engineering (Drs A. Smith and P. Hublitz), the WIMM core facilities (single cell, high-throughput sequencing, imaging, FACS) as well as other groups within Oxford University sharing common interests.

For further details about Professor C. Porcher's laboratory: <http://www.imm.ox.ac.uk/catherine-porcher-2>

Responsibilities

- To manage and drive own project intellectually and technically using experience, methodical approach, attention to detail and evaluation of the literature in embryonic development, mesoderm patterning, lineage specification, bioinformatic/computational analysis of NGS of RNA, functional in vivo and in vitro assays and genome engineering. This involves small-scale project management, to co-ordinate multiple aspects of work to meet deadlines, organizing and prioritizing work efficiently and effectively, and taking personal responsibility for assigned tasks.
- To test hypotheses and analyse scientific data from a variety of sources, reviewing and refining working hypotheses as appropriate.

- To carefully document experiments and write clear, updated experimental protocols and scientific techniques for existing and developing new methods within the laboratory.
- To continuously broaden, deepen and consolidate scientific and technical knowledge and skill through reading, scientific seminars, training opportunities and meetings.
- To clearly and succinctly present research data at internal laboratory meetings and represent the research group at scientific meetings and externally at conferences as required.
- To lead on writing manuscripts as a first author contributing the bulk of primary data for publication.
- To contribute ideas for new research projects, and, as appropriate, lead on writing grants and fellowship applications.
- To act as a source of information and advice to other members of the group on scientific protocols and experimental techniques. In particular providing knowledge and problem solving skills, where applicable.
- To coordinate interactions with collaborators to ensure key research experiments are completed in a timely manner.
- To develop ideas for generating research income and present detailed research proposals to senior researchers.
- To be responsible with others for the daily housekeeping of the laboratory area, ensuring good laboratory practice.

This job description is not intended to be exhaustive and the postholder will be expected to adopt a flexible approach to working within this multi-disciplinary group.

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:

- Work with allergens (mice)

Additional security pre-employment checks

This job includes duties which will require additional security pre-employment checks:

- A satisfactory Disclosure Scotland or University Overseas Security check (if applicable) due to working in a research environment where the post holder may have knowledge or information concerning animal research and/or other knowledge of pathogens and toxins.

Essential selection criteria

- A PhD or near to completion in a relevant area, together with relevant experience.
- A strong publication record in peer-reviewed journals (at least two second tier or one first tier first author publication(s)).
- Excellent communication skills, including the ability to write for publication, present research proposals and results, and represent the research group at meetings.
- Excellent organisational and time-management skills with a methodical and careful approach to working in the laboratory.
- Experience in dissecting and working with mouse embryos.
- Experience with independent multi-colour FACS analysis.

- Experience in molecular techniques such as molecular cloning, qRT-PCR, RNA-seq, CRISPR/Cas9 genome engineering etc.
- Ability to manage and independently drive, innovate (generate novel scientific ideas) and complete own research and associated activities.
- Ability to learn and assimilate new ideas and advice.
- Ability to contribute ideas for new research projects and research income generation
- Communicate results clearly and succinctly in presentations, manuscripts and grant applications.
- Ability to work as a team member and to work independently as required.

Desirable selection criteria

- Bioinformatics expertise (RNA-Seq) including coding in “R”.
- Background in mesoderm (blood/cardiac) specification and embryonic development.

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 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>

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 Hugh Watkins, RDM is a multi-disciplinary department with research interests that span the translational spectrum, from basic biological research through to clinical application. The Department was formed in 2012 and includes:

- 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 broad range of sciences related to medicine, from cardiovascular, diabetes, endocrinology, and stroke research, to molecular medicine, immunology, haematology and pathology, including programmes in stem cell & regenerative medicine.

The Department employs in the region of 700 staff, has around 125 postgraduate research students and an annual turnover of around £59m.

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, unpaid parental leave, flexible/part-time working and scheduling departmental meetings and seminars within core hours (9.30 a.m. -2.30 p.m.). Many of our staff work flexibly, with arrangements managed informally or formally.

The Department currently holds a Silver Athena SWAN award in recognition of its efforts to introduce organisational and cultural practices that promote gender equality in SET and create a better working environment for both men and women.

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



Nuffield Division of Clinical Laboratory Sciences (NDCLS)

Led by Professor Alison Banham, 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 fosters research in molecular and cell biology with direct application to the study of human disease. Housing around four hundred scientists, we are proud to be at the forefront of an exciting research field impacting on our understanding and treatment of diseases ranging from Cancer to AIDS.

The Institute was founded by Professor David Weatherall in 1989. The three main sponsors of research in the Institute are the [University of Oxford](http://www.ox.ac.uk), The [Medical Research Council](http://www.mrc.ac.uk) and [Cancer Research UK](http://www.cancerresearchuk.org). Significant funding also comes from the [Wellcome Trust](http://www.wellcome-trust.org) and other medical research charities.

For more information please visit: <http://www.imm.ox.ac.uk/home>

The MRC Molecular Haematology Unit

The MRC Molecular Haematology Unit was founded in 1980 and is located in the Weatherall Institute of Molecular Medicine. It includes nine research teams with a total of about eighty 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 are particularly interested in how the erythroid (red cell) and megakaryocytic (platelet) lineages are specified during embryonic, fetal and adult life.

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

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 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 three 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 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, 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 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/.

