



DEPARTMENT OF PHYSIOLOGY, ANATOMY AND GENETICS

Job description, selection criteria and further particulars

Job title	Postdoctoral Research Scientist: Development of the embryonic human heart
Division	Medical Sciences
Department	Physiology, Anatomy & Genetics
Location	Le Gros Clark Building, South Parks Road, Oxford OX1 3QX
Grade and salary	Grade 7: £32,817 - £35,845 per annum
Hours	Full time (37.5 hours)
Contract type	Fixed term until 31 st October 2022 in the first instance
Reporting to	Professor Paul Riley
Vacancy reference	AV20017

Research topic	Human heart development- developing 3D organotypic cultures for lineage and morphological analyses.
Principal Investigator / supervisor	Professors Paul Riley and Shankar Srinivas
Project team	Riley and Srinivas Groups (with wider outreach across the HDBI groups)
Project web site	https://www.dpag.ox.ac.uk/research/riley-group
Funding partner	The funds supporting this research project are provided by Wellcome



Job Description

Overview of the role

Wellcome has recently funded a major new and exciting Human Developmental Biology Initiative (HDBI) <https://wellcome.ac.uk/press-release/wellcome-funded-initiative-unlock-secrets-human-development>, with the overarching goal of building the lineage history of the human embryo, in order to establish viable models to investigate human-specific mechanisms guiding tissues and organ development. The HDBI focuses on development of four specific stages/organs: the pre-implantation stage, the central nervous system, immune/haematopoietic systems and the cardio-pulmonary (heart and lung) system.

We are looking for a talented and enthusiastic individual with prior graduate student or post-doctoral experience in developmental biology, to join our multi-disciplinary team and to study the human cardio-pulmonary system. Specifically, the post-holder will focus on the development of the human heart.

Heart development has been extensively analysed in mice and other animal models, however, differences in overall size and structure of human organs require human-specific approaches to validate and extend insights from the mouse. We propose to develop 3D culture of explanted human foetal hearts to enable studies investigating spatial gene expression, cell lineage contributions and morphological process such as outflow tract development and septation/division of the atrial and ventricular chambers- both of which are major contributors to human congenital heart disease (CHD).

The post-holder will work closely with members of the Riley group and also our collaborator on the HDBI heart development project Professor Shankar Srinivas. S/he will develop physiologically-mimetic culture systems, capable of supporting explanted human foetal hearts and will develop combined random and lineage-specific multi-colour cell labelling techniques and computational approaches for cell fate tracking and image analysis of dynamic 3D structures. They will also perform multi-omic characterisation of the developing heart at single cell level, as well as characterise the expression patterns of key cardiac marker genes in a 3D context using multiplexed Hybridization Chain Reaction.

The post-holder will have an invaluable opportunity to regularly interact with the HDBI consortium of leading experts across the four main organ systems, and in particular will work in close collaboration with the group of Dr Emma Rawlins (Gurdon Institute, Cambridge). Dr Rawlins' group will be developing equivalent technologies directed at understanding human lung (pulmonary) development and, in combination, will test the hypothesis that dynamic, multipotent progenitor populations contribute to the entire cardio-pulmonary system during human foetal stages.

Prospective applicants are encouraged to contact Prof. Riley for further details. Previous applicants need not apply.

Responsibilities/duties

- Pursue the research objectives described above.
- Manage his/her own academic research and administrative activities. This involves small scale project management, co-coordinating multiple aspects of work, meeting deadlines and supporting interactions with research collaborators.
- Adapt existing and develop new scientific techniques and experimental protocols. The successful candidate must be familiar with or have the capacity to become quickly familiar with: basic molecular biology techniques, fluorescence imaging approaches and cell biology.

- Test hypotheses and analyse scientific data from a variety of sources, reviewing and refining working hypotheses as appropriate.
- Contribute ideas for new research projects.
- Undertake comprehensive and systematic literature reviews and write up the results for publication in peer-reviewed journals.
- Collaborate in the preparation of scientific reports and journal articles and the presentation of papers and posters at conferences.
- Act as a source of information and advice to other members of the group on scientific protocols and experimental techniques.
- Supervise project and other students.
- 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.
- Ensure that all work in the laboratory is conducted safely and in particular, that work is undertaken following the appropriate health and safety policies and procedures for the particular area, without compromise to his/her 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:

- Night working (11pm-6am)
- Lone Working
- Working with blood, human products and human tissues
- Work with any substance which has any of the following pictograms on their MSDS



- Travel outside of Europe or North America on University Business

Additional security pre-employment checks

- A satisfactory basic DBS security check
- University security screening (eg identity checks)

Essential Selection criteria

- Must have completed a PhD/DPhil or equivalent in a relevant area of research (molecular genetics, developmental biology, cell biology, transcriptomic approaches or related biological discipline).
- Must have laboratory experience in molecular/cellular biology relevant to the project described above.
- Must have the ability to contribute significant intellectual input to the progress and direction of the research project and to take the lead in some areas.
- Must be strongly motivated with a highly enthusiastic approach to science with good organisational, verbal and interpersonal skills.

- An ability to work both independently and as part of a research team.
- An ability to communicate effectively with others, particularly with regard to the presentation of scientific data and the training of other individuals in the lab.
- Must be capable of obtaining a Home Office personal licence with relevant authorities to conduct required procedures. NB. professional training will be provided if you do not already have a personal licence.

Desirable selection criteria

- Developmental biology/embryology experience
- Cardiovascular biology experience
- A good record of publications in peer-reviewed journals appropriate to career stage
- Experience in developing organotypic culture systems or equivalent
- Experience with time-lapse imaging of cultured samples
- Experience in computational methods or developing bespoke solutions to image analysis such as machine learning based automated segmentation approaches
- Experience of embryology (animal models)
- Experience making DNA constructs using standard recombinant DNA technology or similar molecular cloning techniques (eg. recombineering).
- Experience in single cell sequencing or similar techniques
- Experience of supervising student research projects
- Knowledge of the Human Tissue Act

The Department of Physiology, Anatomy and Genetics (DPAG)

DPAG is the largest pre-clinical department within the Division of Medical Sciences. It has a world-class reputation in both its research and teaching. The Department was part of the University of Oxford's Biological Sciences submission to the Research Excellence Framework in 2014 that was rated top for its world-leading research. Its mission is to build on its strong programmes of multi-disciplinary biomedical research, interfacing between the basic physical and life sciences and clinical/translational medicine, while creating an adaptable and forward-looking environment to provide outstanding training to the clinicians and biomedical scientists of the future.

The Department has a distinctive, forward-looking and integrative biomedical research programme where we host 4 research Centres: the *Centre for Integrative Neuroscience*, the *Centre of Neural Circuits and Behaviour (CNCB)*, the *Centre for Integrative Physiology*, and the *Burdon Sanderson Cardiac Science Centre*. We also have strong overarching cross cutting themes in *Imaging*, *Cell Biology & Development* and *Genetics & Genomics*. The research Centres and thematic areas

brings together researchers who address a range of fundamental issues in the biosciences at molecular, cellular and systems levels.

For the second year running, the department has been ranked number one in the world for Anatomy & Physiology in the Top Universities QS rankings in 2018 (see <https://www.topuniversities.com/university-rankings/university-subject-rankings/2018/anatomy-physiology>). This ranking is based on Academic Reputation, Citations per Paper, Employer Reputation and H-index of Faculty.

The Department currently comprises approximately 450 staff. Professor David Paterson is Head of the Department. There are approximately 60 academic staff and research fellows, each with active research groups, and a further 170 researchers supported by external grants. Over 160 graduate students are registered for higher degrees in the Department. Both the teaching and research activities of the Department are supported by teams of technical, clerical and administrative staff.

The Department of Physiology, Anatomy and Genetics holds a Departmental Athena SWAN Silver award.

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

The 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: www.medsci.ox.ac.uk

The University

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 2015/16 exceeded £537.4m 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.

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The University of Oxford is a member of the Athena SWAN Charter to promote women in Science, Engineering, Technology and Medicine. The University holds an Athena SWAN bronze award at institutional level. Contact equality@admin.ox.ac.uk for further information about Athena SWAN at the University of Oxford.

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 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 (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.

Benefits of working at the University

University Club and sports facilities

The University Club provides social, sporting and hospitality facilities. It incorporates a bar, café and sporting facilities, including a gym. 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 international staff (or those relocating from another part of the UK)

If you are relocating to Oxfordshire from overseas, or elsewhere in the UK, the University's International Staff website includes practical information related to moving to and settling in Oxford such as advice on immigration, relocation, accommodation, or registering with a doctor.

See: www.internationalstaffwelcome.admin.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/

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.

Family-friendly benefits

The University subscribes to My Family Care (www.admin.ox.ac.uk/personnel/staffinfo/benefits/family/mfc/) and staff are eligible to register for emergency back-up childcare and adultcare services, a 'speak to an expert' phone line and a wide range of guides and webinars through a website called the Work + Family space.

Disabled staff

We are committed to supporting members of staff with disabilities or long-term health conditions. Please visit www.admin.ox.ac.uk/eop/disab/staff for further details including information about how to make contact, in confidence, with the University's Staff Disability Advisor.

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/

Other benefits

Staff can enjoy a range of other benefits such as free visitor access to the University's colleges and the Botanic Gardens as well as a range of discounts.

See www.admin.ox.ac.uk/personnel/staffinfo/benefits