# Job Description and Selection Criteria

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<th>Post</th>
<th>Postdoctoral Research Scientist and Junior Research Fellowship: Determining the role of autoimmunity during heart failure.</th>
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| Location              | Institute of Developmental and Regenerative Medicine (IDRM)  
IMS-Tetsuya Nakamura Building  
Old Road Campus, Roosevelt Drive  
Headington, Oxford, OX3 7TY |
| Grade and salary      | Grade 7.1: £36,024 per annum                                                                                               |
| Hours                 | Full time (37.5 Hours)                                                                                                       |
| Contract type         | Fixed-term: 30 months                                                                                                       |
| Reporting to          | Professor Paul Riley                                                                                                        |
| Research topic        | To investigate the role of autoimmunity after a heart attack and how release of cardiac proteins following the initial insult can lead to loss of tolerance, production of autoactivated T-cells and anti-heart antibodies which accelerate the progression to heart failure. |
| Principal Investigator| Professor Paul Riley                                                                                                        |
| Project team          | Riley Group                                                                                                                 |
| Project web site      | [https://www.idrm.ox.ac.uk/research/cardiology/cardiology-research-groups/riley-group](https://www.idrm.ox.ac.uk/research/cardiology/cardiology-research-groups/riley-group) |
| Funding partner       | Jesus College, Oxford                                                                                                       |
| Recent publications   | [https://www.nature.com/articles/nature14483](https://www.nature.com/articles/nature14483)  
[https://www.jci.org/articles/view/97192](https://www.jci.org/articles/view/97192) |
Overview of the research role

The College, in conjunction with the Institute of Developmental and Regenerative Medicine (IDRM) invites applications for a Postdoctoral Research Scientist (Junior Research Fellowship at the College) in Determining the mechanisms of optimal immunomodulation after a heart attack, tenable full-time for a fixed term of 30 months from 1 July 2024, or as soon as possible thereafter. This post is non-renewable. The Fellowship is intended for candidates who are at an early stage in their academic career. Applicants should have been awarded their doctorate or be nearing submission of their doctoral thesis.

The objectives of the College in making this appointment are to develop and strengthen the research profile of the College, and more generally to contribute to the goal of maintaining the University of Oxford as a leading centre for research.

The post-holder will join a team working within Professor Riley's group on the IDRM Cardiovascular Floor studying immunomodulation of the injured/diseased heart to facilitate optimal heart repair and regeneration after acute injury or reduce the chronic progression to heart failure. The project will specially investigate the role of autoimmunity during heart failure and how release of cardiac proteins after a heart attack can lead to loss of tolerance, production of autoactivated T-cells and anti-heart antibodies in the draining lymph nodes, which prolong cardiac injury after the initial insult and accelerate the progression to heart failure. This is thought to be due to T-cells escaping central tolerance towards cardiac self-antigens during development in the thymus, whereby the thymus does not express the cardiac proteins thus is unable to instruct the T-cells that they are to be considered as “self”. This is a collaborative project with Professor Georg Holländer (Head of the Immunology theme at IDRM and Professorial Fellow at Jesus College) who is an expert on thymus development and the mechanisms of central tolerance. The ultimate goal of the project is to determine whether restoring tolerance improves disease progression during heart failure.

Responsibilities/duties

- Carry out bioinformatics analyses with existing expertise from the Riley/Holländer groups on existing human and mouse thymus samples generated by the Holländer lab, obtained from different timepoints to pinpoint how and when T-cells escape central tolerance in the thymus. This will incorporate scRNA-seq, ChIP-seq and ATAC-seq data to determine epigenetic regulation of cardiac genes in the thymus (chromatin accessibility, gene regulation, gene expression etc.) at different timepoints;

- Interrogate the autoimmune profile in mice hearts, mediastinal lymph nodes (MLN) and blood in models of HFrEF (following MI and/or spontaneous myocarditis) and HfPEF (following diet intervention). Profiling will involve the use of ELISA, western blots, immunohistochemistry and flow Cytometry to determine the presence of antibodies against cardiac antigens (anti-α-MHC antibodies) within the blood and tissue of injured mice, alongside an increase in adaptive immune cells focussed on the humoral response (Follicular Helper T-cells, Plasma B-cells). Surgery to perform mouse MI is available in house and mice with a genetic predisposition to developing spontaneous myocarditis (through T-cells sensitised towards α-MHC; TCRM) are also available in house. A model of HfPEF may become available in the future;

- Induce T-cell central tolerance towards cardiac antigens by engineering thymic epithelial cells to express the cardiac antigen α-MHC (through a FoxN1-Cre promoter (in collaboration with the Holländer group). This transgenic line will be used to determine whether restoring tolerance improves disease progression in HF. There is also potential to investigate inducing peripheral T-cell tolerance towards cardiac antigens (through oral administration of cardiac myosin peptide).
Inhibiting T-cell egress from lymphatic vessels utilising Fingolimod, a sphingosine-1-phosphate receptor modulator. Fingolimod is used as therapy for multiple sclerosis, a disease exacerbated by auto-reactive T-cells against myelin antigens. Inhibiting the egress of autoactivated T-cells from the lymphatics is predicted to reduce re-circulation and their homing to the heart and prevent additional damage arising from autoimmunity.

In addition to pursuing the research objectives described above, the successful applicant will:

- Manage their 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 applicant must be familiar with or have the capacity to become quickly familiar with basic molecular biology techniques, tissue histology, cell biology and fluorescence imaging approaches;
- 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;
- Represent the research group at external meetings/seminars, either with other members of the group or alone;
- Carry out collaborative work with colleagues in Bristol, Edinburgh and KCL and in partner institutions and research groups;
- Ensure that all work in the laboratory is conducted safely and 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.

Other Duties:

- Undertake any necessary training identified and continuing professional development in order to stay up-to-date professionally including annual Information Governance training;
- Comply with Health and Safety regulations;
- Comply with the policies and procedures set out in the Handbook for University Support staff (or) Academic-Related staff;
- Any other duties that may be required from time to time commensurate with the grade of the job;
- Act as a College advisor to a small number of postgraduates at Jesus College.

This job description should be regarded only as a guide to the duties required and is not intended to be definitive. It may be reviewed in the light of a change in circumstances following consultation with the post-holder. The Job Description does not form part of the contract.
Please note that the appointment of the successful candidate will be subject to standard compulsory pre-employment screening, such as right to work checks.

**Hazard-specific / Safety-critical duties**

This job includes hazards or safety-critical activities. If you are offered the post, you will be asked to complete a health questionnaire which will be assessed by our Occupational Health Service, and the offer of employment will be subject a successful outcome of this assessment.

The hazards or safety-critical duties involved are as follows:

- Night working (11pm-6am);
- Lone Working;
- Working with category 3b or 4 lasers (laser safety class);
- Working with blood, human products and human tissues;
- Work with allergens, e.g. laboratory animals, pollen, dust, fish or insects etc.;
- Work with any substance which has any of the following pictograms on their MSDS:
  ![Pictograms]
- Travel outside of Europe or North America on University Business.

Please read the candidate notes on the University’s pre-employment screening procedures at: [https://www.jobs.ox.ac.uk/pre-employment-checks](https://www.jobs.ox.ac.uk/pre-employment-checks).

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

- A satisfactory basic Disclosure and Barring Service check;
- University security screening (e.g. identity checks).

**Selection criteria**

- Must have, or be near to completing, a PhD/DPhil or equivalent in a relevant area of research (molecular genetics, cell biology, cardiovascular biology, transcriptomic approaches or a 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 the successful does not already have a personal licence.
Desirable selection criteria

- Be at an early stage of their career;
- A good record of publications in peer-reviewed journals appropriate to career stage;
- Experience in cardiovascular research;
- Experience with animal models and in particular use of primary tissues for analyses;
- Experience of tissue histology and immunostaining;
- Experience making DNA constructs using standard recombinant DNA technology or similar molecular cloning techniques (e.g. recombineering);
- Imaging experience, including use of confocal microscopy;
- Experience of supervising student research projects.

Application Procedure

To apply please complete the online form at https://ams.jesus.ox.ac.uk/Forms/url/IDRMJRF by 12 noon on Monday, 8 January 2024.

Please note that you will be asked to upload the following (in PDF file format only):

1. 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).
2. A Curriculum Vitae containing a list of publications.
3. A note containing the names and contact details, including email addresses, of two referees.
4. Applicants who have not yet submitted their doctoral thesis should include a clear timetable for its completion within 3 months of taking up the post (expected to be 1 July 2024).

The College will seek references at the shortlisting stage. There is no need for referees to send in a reference prior to being contacted.

It is anticipated that interviews will take place on Monday, 5 February 2024. If interviews are conducted in-person, reasonable interview expenses will be reimbursed, and overnight accommodation can be offered if required. Interviews may be conducted remotely.

Queries may be addressed through the Principal’s PA, Mrs Helen Gee (helen.gee@jesus.ox.ac.uk) or to Professor Paul Riley (paul.riley@idrm.ox.ac.uk).
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. It consistently has the highest external research income of any university in the UK (the most recent figures are available at www.ox.ac.uk/about/organisation/finance-and-funding), and we rank first in the UK for university spin-outs, with more than 190 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.

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 Department of Physiology, Anatomy and Genetics (DPAG)

Oxford Anatomy and Physiology ranked #1 in the QS World University Rankings by subject 2017, 2018, 2020 and 2021. This ranking is based on Academic Reputation, Citations per Paper, Employer Reputation and H-index of Faculty.

Our mission is empowering discovery in the physiological sciences to improve health and educate the next generation of doctors and biomedical scientists. For more information, please visit: www.dpag.ox.ac.uk.

The Department is a large pre-clinical department within the Medical Sciences Division, with over 360 staff and students. 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 2014 that was rated top for its world-leading research.

The Department has a distinctive, forward-looking and integrative biomedical research programme organised into five research Centres. Centre for Integrative Neuroscience (Director: Professor AJ King FRS), Centre for Neural Circuits and Behaviour (Director: Professor G Miesenboeck FRS), Centre for Cellular & Molecular Neurobiology (Professor Dame Kay Davies FRS and Professor Dame Frances Ashcroft FRS), Centre for Integrative Physiology (Professor A Parekh FRS) and the Burdon Sanderson Cardiac Science Centre (Director: Professor Manuela Zaccolo FRSB).
We also have strong cross-cutting themes in cardiac sciences, cell physiology, development and cell biology, functional genomics, metabolism and endocrinology and neuroscience. The Research Centres and thematic areas bring together researchers who address a range of fundamental issues in the biosciences at molecular, cellular, tissue and systems levels of organisation.

**Information about staff in the Department**

Professor David Paterson FRSNZ is the Head of Department and current President of the Physiological Society. There are four named Statutory Professors: the Dr Lee’s Professor of Anatomy (vacant), the Waynflete Professor of Physiology (Professor Gero Miesenböck, FRS FMedSci), the BHF Professor of Regenerative Medicine and Professor of Development and Reproduction (Professor Paul Riley, FMedSci), and the Krebs Chair in Physiological Metabolism (vacant). Other appointments include three Professorial Research Fellows (Professor Dame Frances Ashcroft, FRS; Professor Dame Kay Davies CBE, FRS FMedSci; Professor Anant Parekh FMedSc FRS), two Wellcome Trust Principal Research Fellows (Professor Andrew King, FMedSci FRS and Professor Scott Waddell), 12 further full professors and 26 associate professors. There are approximately 175 academic-related research staff supported by external grants and over 100 graduate students registered for higher degrees in the Department. The teaching and the research activities of the department are supported by teams of professional services and technical staff.

For more information, please visit [www.dpag.ox.ac.uk](http://www.dpag.ox.ac.uk).

**The Institute of Developmental and Regenerative Medicine (IDRM)**

_A unique flagship institute at the University of Oxford combining insights into organ development and regeneration to treat birth defects and acquired disease._

The Institute of Developmental and Regenerative Medicine (IDRM) is a stand-alone research Institute housed in the IMS-Tetsuya Nakamura Building, on the Old Road Medical Campus at the University of Oxford. The IDRM is dedicated to meeting an ambitious challenge: two thirds of all deaths world-wide are due to non-communicable diseases, many of which are cardiovascular, neurological or immune system disorders that have a developmental origin, representing an urgent unmet clinical need. The mission of the IDRM is the development of new drugs and therapeutic strategies to tackle these chronic illnesses.

At its core the IDRM is a formal merger of developmental biology and regenerative medicine in the form of 15-20 world leading research groups; comprising 240 cardiovascular, neuroscience and immunology scientists integrating their expertise to foster multidisciplinary collaborations. The IDRM houses core facilities including -omics (single cell and spatial transcriptomics), FACS/flow sorting and advanced imaging as part of the Oxford-Zeiss Centre of Excellence. Administrative support (Finance, Research Grants, HR) is provided by the two host Departments of Physiology, Anatomy and Genetics and Paediatrics.

The IDRM Director is Professor Paul Riley, who also acts as the Cardiovascular theme lead with leadership in Neuroscience and Immunology provided by Professors Matthew Wood and Georg Holländer, respectively.

For more information, please visit [https://www.idrm.ox.ac.uk/](https://www.idrm.ox.ac.uk/).

**Equality, Diversity and Inclusion in the IDRM and DPAG**

The Institute of Developmental & Regenerative Medicine (IDRM) and Department of Physiology, Anatomy and Genetics (DPAG) are committed to promoting a diverse and inclusive community. We have an active Equality, Diversity and Inclusion (EDI) committee and are taking active steps to promote race equality and reduce the risk of bias and discrimination. We hold an Athena SWAN silver award in recognition of our efforts to introduce organisational and cultural practices which promote gender equality and create a better working environment for all. The Department promotes family-friendly policies and supports flexible working arrangements where possible.
The University offers 450 nursery places for staff and students at five dedicated University nurseries and a network of local community nurseries. We will be happy to provide you with information about nurseries and schools in Oxford upon request.

We encourage applications from suitably qualified, experienced, and eligible candidates regardless of sex, race, disability, age, sexual orientation, transgender status, religion or belief, marital status, or pregnancy and maternity. We embrace our differences and you are very welcome at DPAG, without the need to hide any part of who you are.

Applications are particularly welcome from women and black and minority ethnic candidates.

To learn more about EDI in DPAG, visit our website: [https://www.dpag.ox.ac.uk/work-with-us/equality-diversity-inclusion](https://www.dpag.ox.ac.uk/work-with-us/equality-diversity-inclusion).

For more information about the University’s family friendly benefits, please also see [https://hr.admin.ox.ac.uk/information-for-parents-and-carers](https://hr.admin.ox.ac.uk/information-for-parents-and-carers).

**Jesus College**

Jesus College has a strong commitment to promoting and enabling education, learning, scholarship and research at the highest levels amongst its students and academic staff, whilst preserving an informal and friendly atmosphere. Founded in 1571 by Elizabeth I, the College is a self-governing educational charity and is one of the 39 constituent colleges of Oxford University. With Professor Sir Nigel Shadbolt FRS FREng, as its Principal, the College comprises over 100 Fellows, 50 lecturers, just over 330 graduates and just under 400 undergraduates, and 90 support staff. The College is located on an attractive historic site in the centre of Oxford, with excellent access to the Bodleian Library and other University libraries, the Science Area, and the University’s department and faculty buildings. Two annexe sites, in north and east Oxford, allow the College to provide accommodation for almost all its students.

In 2022 the College opened the Cheng Yu Tung Building on its main Oxford site. In addition to postgraduate accommodation, teaching and learning spaces and other student facilities, this transformational space includes the Cheng Kar Shun Digital Hub, fostering innovation with digital technology, within and across disciplines, and enabling researchers to explore new methodologies and share research results in innovative ways. The Digital Hub engages academics, students, staff, schools, and the public with digital research and teaching, events and activities, thus building on the University of Oxford’s world-leading research, teaching, collections, and technologies.

The College encourages the academic achievements of its students (being regularly towards the top of the table for the best performance in final examinations) with excellent teaching, and generous and varied financial support. Similarly it celebrates and supports the academic endeavours of its Fellows, both in research and teaching.

The College held a [Strategic Review of its activity for 2023-2027](https://www.jesus.ox.ac.uk/about-jesus-college/our-community/people/), setting out a number of important academic themes.

Full information about the College is available on the [College website](https://www.jesus.ox.ac.uk/about-jesus-college/our-community/people/).

Information about academic staff at Jesus College, including their research and teaching interests, may be found at [https://www.jesus.ox.ac.uk/about-jesus-college/our-community/people/](https://www.jesus.ox.ac.uk/about-jesus-college/our-community/people/).
**College Benefits, Terms and Conditions**

1. **Salary**: starting at Grade 7 point 1 (National Spine Point 29) - of £: £36,024 per annum (with effect from 1 August 2023). Increment rise each October.

2. **Pension**: the person appointed will be eligible to join USS, under which scheme (currently) 9.8% of salary is deducted.

3. **Office space**: in College (equipped with a standard Windows desktop PC and black & white printer).

4. **Accommodation**: a single Fellow may rent furnished rooms, if available.

5. **Dining rights**: the Fellow will be entitled to lunch and dinner free of charge with members of the Senior Common Room during term and vacation, except when the kitchens are closed.

6. **Membership of the Senior Common Room (SCR)**: £60 per annum charge payable.

7. **Research allowance**: to the value of £1,000 per annum (reviewed annually) is available towards the support of research, e.g. laboratory expenses, purchase of books, travel, or attendance at conferences.

8. **Major Research Grants Fund**: Junior Research Fellows are eligible to apply to a cash-limited Major Research Grants Fund, currently worth approx. £40,000 per annum. Applications are invited in spring each year. Preference may be given to Fellows at an early stage in their career and to those with little access to alternative funding sources.

Please note that a Junior Research Fellowship does not carry with it membership of Governing Body.

**Intellectual life and the College community**

Each term there are a number of events for members of the Senior and Middle Common Rooms to meet to present and discuss their research, as well as many varied and interesting online events open to Fellows, staff and alumni. Additional events throughout the year include student musical, dramatic and choral productions.

The Fellows of the College form a lively multi-disciplinary and international community. Weekday lunches in particular are a popular time and there would be excellent opportunities for the Junior Research Fellow to speak to a broad range of other Fellows and lecturers in many different disciplines. Guest Nights on Wednesdays and Fridays during term offer very pleasant occasions for Fellows to entertain professional and personal guests, and a chance to meet a wide range of interesting people. The College hosts a number of well-attended formal dinners throughout the year, at which the Junior Research Fellow and their guest would be most welcome.

**Facilities**

Junior Research Fellows may make use of the College's well-equipped seminar and other rooms for meetings, entertainment, conferences etc., and can book accommodation for guests in dedicated Fellows’ guest rooms. Junior Research Fellows regularly use College facilities to host seminars, colloquia and conferences of several days’ duration. The Fellows’ Resources Room provides networked computers, printers, fax, and photocopiers. The College's beautiful 17th-century library offers working and reading spaces for all Fellows, with Wi-Fi (the student library is separate and may also be used).
Other Terms and Conditions

Probation: the appointment will be subject to an initial probationary period of one year, during which the appointment may be terminated by three months’ notice on either side. Probation is assessed in the third term by the Governing Body on the basis of a self-report from the JRF, and two references. A usual condition of passing probation is that any JRF who took up the post without having completed their doctorate should have gained their doctorate by the time they write the probationary report. Upon satisfactory completion of the initial first year of appointment, the post-holder will be eligible for re-election for the remainder of their contract (non-renewable). A further self-report should be submitted at the end of the Fellowship tenure.

Mentor: the College will ascribe a Fellow in a cognate area to be the Junior Research Fellow’s academic mentor.

Teaching: Junior Research Fellows are encouraged to develop their teaching skills, if appropriate, and may undertake a maximum of six hours teaching per week in term. However, there is no requirement to undertake any teaching at all during the Fellowship if the holder does not wish to do so.

Equal opportunities: Jesus College welcomes and celebrates diversity. We strive towards creating an inclusive environment, where our staff and those associated with the College feel valued and respected. We want them to thrive, regardless of their age, disability, gender reassignment, marriage and civil partnership, pregnancy and maternity, race, religion or belief, sex, and sexual orientation. Our staff are an integral part of our community, and we cherish equally those qualities that make each of us unique, and those that bring us together.

Applicants invited for interview will be asked whether they require any particular arrangements to make the interview more convenient and effective for them. Where suitably qualified individuals are available, the selection committee will contain at least one member of either sex.

Data protection: All data supplied by applicants will be used only for the purposes of determining their suitability for the post and will be held in accordance with the principles of the Data Protection Act 2018 and the College’s Data Protection Policy.

Work permits: All appointments are made in accordance with the University of Oxford Equal Opportunities Policy and Code of Practice and applications are welcomed from a wide range of candidates. The University undertakes not to discriminate unlawfully against any applicant on the basis of any information revealed.

The Immigration, Asylum and Nationality Act 2006 makes it a criminal offence for employers to employ someone who is not entitled to work in the UK. We therefore ask applicants to provide proof of their right to work in the UK before employment can commence.

Applicants who would need a work visa if appointed to the post (the salary is above the general salary threshold of £26,200 for a Skilled Worker visa) are asked to note that under the UK’s points-based migration system they will need to demonstrate that they have sufficient points, and in particular that:

(i) they have sufficient English language skills (evidenced by having passed a test in basic English, or coming from a majority English-speaking country, or having taken a degree taught in English) and
(ii) that they have sufficient funds to maintain themselves and any dependants until they receive their first salary payment.

Further information is available at: https://www.gov.uk/guidance/new-immigration-system-what-you-need-to-know#skilled-workers.