

Summary

<b>Job title</b>	Postdoctoral Researcher in Biomaterials and Bioreactors for Tissue Engineering
<b>Division</b>	Medical Sciences Division
<b>Department</b>	Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences
<b>Location</b>	Botnar Research Centre, Windmill Road, Oxford, OX3 7LD
<b>Grade and salary</b>	Grade 7: £36,024-£44,263 per annum
<b>Hours</b>	Full time
<b>Contract type</b>	Fixed-term (up to 3 years)
<b>Reporting to</b>	Prof Pierre-Alexis Mouthuy
<b>Vacancy reference</b>	172551
<b>Research topic</b>	Bioreactors, Biomaterials, Tissue engineering
<b>Funding partner</b>	The funds supporting this research project are provided by MRC.



## The role

### Research context

We are seeking a uniquely skilled and highly motivated postdoctoral researcher to join a research team led by Associate Professor Pierre-Alexis Mouthuy, working on the development of biomaterials and bioreactors for soft tissue repair applications. The Soft Tissue Engineering group is based at the Botnar Research Centre in Oxford.

Through their work, the successful candidate will contribute to the UK Research and Innovation Musculoskeletal Functional Genomics Initiative Cluster (MSK Cluster), which aims to accelerate the translation of genetic results into tangible benefits for patients. The cluster is led by Professor Dominic Furniss, and provides support for researchers spanning the breadth of a translational medicine pipeline from basic genetics, bioinformatics and AI, through functional genomic readouts and tissue imaging, to human tissue models, organoids, and bioreactors.

The successful candidate will also contribute to translational work in the group such as to the development of synthetic electrospun implants. This is an exciting opportunity for individuals looking to gain valuable experience in the field of translational research related to biomaterials and medical devices, with also the possibility of supporting the research team in designing and manufacturing new implants.

Your specific role will be to develop further the humanoid bioreactor platform (currently focusing on the shoulder) by looking at other joints such as the knee, wrist and finger. You will design and fabricate relevant chambers, and scaffolds, taking into account anatomical structures and joint biomechanics. You will interface with robotic teams and companies to support the development of suitable robotic systems. You will establish loading regime protocols and culture human cells on the different platforms. You will contribute to the analysis of genetic, transcriptomic, proteomic, and imaging data, using conventional analyses and machine learning. You will also support in vivo work that is being carried out in the team as part of its translational activities, including through performing animal surgeries and data analysis.

Teamwork and strong communication skills are essential. You will be an enthusiastic, highly organised individual with the ability to produce work to a high standard.

### Role overview

In this role you will conduct original research projects, guided by relevant literature, your own experience and discussions with the supervisor, team and cluster members. You will be expected to develop your existing abilities and to learn new research skills. You will work closely with bioengineers, computer modelling engineers, mathematicians, biologists and medical doctors.

## Responsibilities

### Key responsibilities

- To perform high quality scientific research, developing and acquiring relevant skills.
- To analyse, contextualise and interpret data, recording your findings in internal reports and/or publishing them in peer-reviewed journals.
- To troubleshoot experimental setups and protocols.
- To actively participate in the wider research team, including the MSK cluster, sharing skills and knowledge with colleagues, and to take part in external activities as appropriate.
- To communicate results in regular meetings, such as by poster and oral presentations at scientific meetings and other public/outreach events.
- To write and maintain protocols for data collection and analysis.
- To keep clear and meticulous record of data to enable development of new IP / technical know how.

- To identify training needs and to follow an agreed strategy to meet them.
- To train and supervise graduate and undergraduate students as appropriate.
- To stay up-to-date with the relevant literature and methodological developments.

## Relationships

The successful candidate will be a member of the multidisciplinary group led by Prof Mouthuy at the Botnar Research Centre. The post-holder will also interface with various groups involved in the MSK Cluster and, as such, will be part of an interdisciplinary team of scientists and clinician researchers, spread across both Oxford and Manchester Universities, with international collaborators in Europe and the USA, as well as industrial partners. In addition, it is anticipated that there will be close collaboration with the other funded clusters in Edinburgh and London.

## Selection criteria

### Essential selection criteria

- A PhD/DPhil (or near completion) in a discipline of direct relevance to tissue engineering or regenerative medicine.
- Outstanding experience and competences with bioreactor work, including design, experiments and troubleshooting.
- Extensive experience with human primary or stem cell culture, as well as with in vivo work, including small and large animal models.
- Extensive experience with cells/tissue graft characterisation techniques such as (but not limited to) viability assays, proliferation assays, fluorescence microscopy, histology, gene expression. Outstanding experience in characterising materials physically (mechanical/chemical/morphological properties).
- Excellent interpersonal and organisational skills, able to work independently and in a team-oriented environment, highly self-motivated, able to use own initiative to solve problems and committed to pursuing interdisciplinary research, in particular at the interface between life sciences and robotics.
- Excellent communication skills, both oral and written.
- Able to use own initiative to solve problems.
- Able to conduct research in a multidisciplinary, fast paced research environment, occasionally with tight deadlines. Good project management skills and a track record in meeting deadlines.
- Proven track record in authorship of peer-reviewed publications in related fields.
- Cross-disciplinary collaborative experience.

### Desirable selection criteria

- Experience with scaffold design, manufacturing and characterization.
- Extensive experience with physical characterisation techniques such as mechanical testing, scanning electron microscopy and microCT.
- Outstanding background in cellular biology and tissue biomechanics, in particular soft tissue biomechanics at the shoulder joint.
- Experience of interacting with clinicians.
- Experience with robotic systems .
- Strong competences in the use of CAD software to design bioreactors.
- Knowledge in electrospinning and traditional textile manufacturing methods.

## Pre-employment screening

### Standard checks

If you are offered the post, the offer will be subject to standard pre-employment checks. You will be asked to provide: proof of your right-to-work in the UK; proof of your identity; and (if we haven't done so already) we will contact the referees you have nominated. You will also be asked to complete a health declaration so that you can tell us about any health conditions or disabilities for which you may need us to make appropriate adjustments.

Please read the candidate notes on the University's pre-employment screening procedures at:

<https://www.jobs.ox.ac.uk/pre-employment-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:

- Working at heights
- Night working (11pm-6am)
- Lone Working
- Work in hot or cold environments
- Regular manual handling
- Working with category 3b or 4 lasers (laser safety class)
- 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

## 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 and we rank first in the UK for university spin-outs, and in recent years we have spun out 15-20 new companies every year. We are also recognised as leaders in support for social enterprise.

Join us and you will find a unique, democratic and international community, a great range of staff benefits and access to a vibrant array of cultural activities in the beautiful city of Oxford.

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

### **Medical Sciences Division**

The Medical Sciences Division is an internationally recognised 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](http://www.medsci.ox.ac.uk)

### **Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences**

The Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences (NDORMS) is part of the Medical Sciences Division and is the largest European academic department in its field, running a globally competitive programme of research and teaching.

Our mission is to discover the causes of musculoskeletal and inflammatory conditions to deliver excellent and innovative care that improves people's quality of life. Our highly skilled teams have expertise in a broad range of areas, including orthopaedic surgery, inflammation, immunology, rheumatology, medical statistics, epidemiology, and clinical trials.

We currently have 480 staff, approximately 120 post-graduate students and have a grant portfolio worth over £180 million.

The **Botnar Research Centre** enables and encourages research and education into the causes of musculoskeletal disease and their treatment.



The Centre provides world-class facilities for scientists in the field of musculoskeletal research. It takes a multidisciplinary approach, encompassing orthopaedic, rehabilitation and rheumatology clinical scientists, bone oncologists, laboratory scientists, epidemiologists, engineers and statisticians. The Botnar also hosts the Oxford Clinical Trials Research Unit (OCTRU) and the Centre of Statistics in Medicine (CSM), providing excellent statistical support to all aspects of clinical research.

The Botnar opened in 2002, with a large annex completed in 2013. The Botnar is now home to around 300 staff and postgraduate students enjoying the international and friendly atmosphere of this workplace and benefits from the vast knowledge of leading experts in the field of musculoskeletal research.

To accommodate its rapid growth, the Centre has opened another wing in early 2022. The new space provides additional 1000m<sup>2</sup> of office and 1000m<sup>2</sup> of laboratory space. The laboratory space includes a GMP clean room facility suitable for the manufacturing of biomaterials for human implantation.

Sharing the site of the Nuffield Orthopaedic Centre, the largest specialist academic musculoskeletal hospital in the UK, puts the Botnar in a unique position to foster the collaboration between basic scientists and clinicians, which is essential to success in medical research.

**The Kennedy Institute** is a biomedical research centre uniquely bringing together discovery science and early-stage clinical research, to develop transformative new therapies for chronic inflammatory and musculoskeletal conditions.



Broadly focused on the thematic areas of immunity and microbiome, inflammation biology and tissue remodelling and repair, the Institute's research is relevant for a range of common diseases such as arthritis, inflammatory bowel disease, fibrosis and cancer.

The Institute has capacity for up to 260 staff and students who work collaboratively across 25 research groups. This enables a multidisciplinary approach of molecular and cellular biology, combined with analysis of disease models, patient tissue samples and longitudinal clinical data. Collectively, these studies seek to uncover the biological processes that maintain tissue health and how these pathways break down in disease.

Research at the Institute is supported by a suite of core technology platforms, as well as through strategic partnerships with other basic and clinical research centres in Oxford, across the UK and internationally. These state-of-the-art technologies include the Oxford-Zeiss Centre for Excellence and other advanced microscopy and imaging facilities, mass and flow cytometry, as well as capabilities for microbial genomics and functional microbiome studies made available through the Oxford Centre for Microbiome Studies.

Complementing a strong programme of lab-based research, the Institute has established a core of expertise and technologies in data science including single cell genomics, statistical genetics, computational biology, and research informatics. A recent extension to the Institute building with a new third floor creates additional space purposely designed for computationally intensive research.

A true trendsetter in innovative and transformational research, the Kennedy also boasts a relaxed and friendly atmosphere, revolving around its bright and airy atrium that provides a space for colleagues to meet over coffee and tea to talk about their research and beyond throughout the day.

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

## Athena Swan

The [Athena SWAN Awards](#) specifically recognise success in developing employment practices to further and support the careers of women in science, technology, engineering, maths and medicine (STEMM) departments in academia. In May 2015 the charter was expanded to recognise work undertaken in arts, humanities, social sciences, business and law (AHSSBL), and in professional and support roles. Within NDORMS, we feel that we have an established culture of equality but are using the process to spur on-going improvement that benefits everyone involved in the Department. Our on-going progress was rewarded in May 2014 with an Athena Swan Bronze Award and in October 2015 with a Silver Award.

Our development in this area has resulted in a number of commitments to our staff, central to which are:



- establishing an open, supportive and family-friendly research environment
- supporting career progression through teaching programmes, personal development reviews and mentoring
- proactive communication of support policies such as flexible working, provision of leave, promotion and career support schemes



NDORMS aims to actively promote the implementation of the University's family-friendly policies to help foster a family friendly working environment, including provision of family leave (such as policies for maternity, paternity, parental, carers and adoption leave), flexible/part-time working and scheduling inclusive meetings.



The University's childcare services support staff with a Childcare Voucher Scheme to help staff save tax and national insurance on childcare costs, offer information on nursery providers and a nursery fee Salary Sacrifice Scheme, work in partnership with playscheme providers to help support families during school holidays and signpost staff to parenting, local authority and other organisations that help support families and parents.



The Department is also committed to ensuring that staff undertaking part-time or flexible working receive the same access to benefits and entitlements as full-time staff, including the same opportunities for training and promotion, a pro-rata entitlement to leave including bank holidays and careful consideration of requests to work part-time (particularly for those by staff returning from maternity leave).

For more information please visit: <http://www.admin.ox.ac.uk/personnel/staffinfo/benefits/family/> and <http://www.admin.ox.ac.uk/personnel/during/flexible/>

We are also actively working to uphold the University's aim of providing an inclusive environment and equal career opportunities by promoting equality, valuing diversity and maintaining a working, learning and social environment in which the rights and dignity of all staff are respected. Separate University policies are also in place to ensure race, disability and gender equality. For more information, please visit: <http://www.admin.ox.ac.uk/eop/>

## How to apply

Applications are made through our online recruitment portal. Information about how to apply is available on our Jobs website <https://www.jobs.ox.ac.uk/how-to-apply>.

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

As part of your application you will be asked to provide details of two referees and indicate whether we can contact them now.

You will 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)

Please upload all documents **as PDF files** with your name and the document type in the filename.

All applications must be received by **midday** UK time 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 department(s).

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).

---

## If you need help

Application FAQs, including technical troubleshooting advice is available at:

<https://staff.web.ox.ac.uk/recruitment-support-faqs>

Non-technical questions about this job should be addressed to the recruiting department directly [hr@ndorms.ox.ac.uk](mailto:hr@ndorms.ox.ac.uk).

To return to the online application at any stage, please go to: [www.recruit.ox.ac.uk](http://www.recruit.ox.ac.uk).

Please note that you will receive an automated email from our online recruitment portal to confirm receipt of your application. **Please check your spam/junk mail** if you do not receive this email.

## Important information for candidates

### Data Privacy

Please note that any personal data submitted to the University as part of the job application process will be processed in accordance with the GDPR and related UK data protection legislation. For further information, please see the University's Privacy Notice for Job Applicants at: <https://compliance.admin.ox.ac.uk/job-applicant-privacy-policy>. The University's Policy on Data Protection is available at: <https://compliance.admin.ox.ac.uk/data-protection-policy>.

### The University's policy on retirement

The University operates an Employer Justified Retirement Age (EJRA) for very senior research posts at **grade RSIV/D35 and clinical equivalents E62 and E82**, which with effect from 1 October 2023 will be 30 September before the 70<sup>th</sup> birthday. The justification for this is explained at: <https://hr.admin.ox.ac.uk/the-ejra>.

For **existing** employees on these grades, any employment beyond the retirement age is subject to approval through the procedures: <https://hr.admin.ox.ac.uk/the-ejra>.

There is no normal or fixed age at which staff in posts at other grades 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

### 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 <https://hr.admin.ox.ac.uk/staff-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](http://www.club.ox.ac.uk) and <https://www.sport.ox.ac.uk/>.

### 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 <https://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 <https://staffimmigration.admin.ox.ac.uk/visa-loan-scheme>

### 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 the Work+Family Space, 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 <https://hr.admin.ox.ac.uk/my-family-care>

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 <https://childcare.admin.ox.ac.uk/>

### 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 <https://edu.admin.ox.ac.uk/disability-support>

### 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 <https://edu.admin.ox.ac.uk/networks>

### 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](http://www.newcomers.ox.ac.uk).