POSITION DESCRIPTION

Position Title: Postdoctoral Research Fellow in Biomechanics-inspired Tissue Engineering
Organisation Unit: School of Chemical Engineering
Position Number: NEW
Type of Employment: 3 year, Fixed-Term
Classification: Research Academic Level A

THE UNIVERSITY OF QUEENSLAND

The University of Queensland (UQ) contributes positively to society by engaging in the creation, preservation, transfer and application of knowledge. UQ helps shape the future by bringing together and developing leaders in their fields to inspire the next generation and to advance ideas that benefit the world. UQ strives for the personal and professional success of its students, staff and alumni. For more than a century, we have educated and worked with outstanding people to deliver knowledge leadership for a better world.

UQ ranks in the world’s top universities, as measured by several key independent ranking, including the CWTS Leiden Ranking (32), the Performance Ranking of Scientific Papers for World Universities (40), the US News Best Global Universities Rankings (42), QS World University Rankings (47), Academic Ranking of World Universities (54), and the Times Higher Education World University Rankings (66). Excluding the award component, UQ is now ranked 45th in the world in the ARWU, and is one of the only two Australian universities to be included in the global top 50.

UQ has an outstanding reputation for the quality of its teachers, its educational programs and employment outcomes for its students. Our students remain at the heart of what we do. The UQ experience – the UQ Advantage – is distinguished by a research enriched curriculum, international collaborations, industry engagement and opportunities that nurture and develop future leaders. UQ has a strong focus on teaching excellence, winning more national teaching excellence awards than any other in the country and attracting the majority of Queensland’s highest academic achievers, as well as top interstate and overseas students.

UQ is one of Australia’s Group of Eight, a charter member of edX and a founding member of Universitas 21, an international consortium of leading research-intensive universities.

Our 53,000-plus strong student community includes more than 16,400 postgraduate scholars and more than 17,000 international students from 135 countries, adding to its proud 260,000-plus alumni. The University has more than 6,600 academic and professional staff (full-time equivalent) and a $2.15 billion annual operating budget. Its major campuses are at St Lucia, Gatton and Herston, in addition to teaching and research sites around Queensland and Brisbane city. The University has six Faculties and four University-level Institutes. The Institutes, funded by government and industry grants, philanthropy and commercialisation...
activities, have built scale and focus in research areas in neuroscience, biomolecular and biomedical sciences, sustainable minerals, bioengineering and nanotechnology, as well as social science research.

UQ has an outstanding track-record in commercialisation of our innovation with major technologies employed across the globe and integral to gross product sales of $11billion+.

UQ has a rapidly growing record of attracting philanthropic support for its activities and this will be a strategic focus going forward.

Organisational Environment

The School of Chemical Engineering is an international leader in the chemical engineering field and has an excellent reputation, built over many decades at The University of Queensland. We deliver quality programs and leadership in chemical engineering education, research and development, and expert consulting to support the process industries. Undergraduate teaching within the School focuses on the disciplines of chemical, biological, environmental and metallurgical engineering and postgraduate programs are available in growing fields including water, sustainable energy and biomedical engineering.

The School has recently been awarded funding under an Australian Research Council Industrial Transformation and Training Centre focussed on Joint Biomechanics (ARC ITTC – JB), a collaboration between UQ, QUT and UNSW, along with multiple industry partners and practicing clinicians. This Centre is focussed on developing the advances required to transform personalised surgical treatment of joints through integrated technologies of computer tools for pre-surgical planning and decision making, computer simulation systems for surgical training and medical device design, development and assessment, and post-surgical assessment tools. This role will be join this newly established UQ-node of the Centre, more specifically, under Program 3 - Scaffold simulator: Optimization of engineered scaffolds for improved scaffold integration, tissue growth, repair and functional regeneration.

For more Information about the School, please visit: www.uq.edu.au/chemeng

Information for Prospective Staff

Information about life at UQ including staff benefits, relocation and UQ campuses is available online.

The University of Queensland Enterprise Agreement outlines the position classification standards for Levels A to E.

DUTY STATEMENT

Primary Purpose of Position

The Research Fellow in “Biomechanics-Inspired Tissue Engineering”, working under Program 3 - Scaffold simulator: Optimization of engineered scaffolds for improved scaffold integration, tissue growth, repair and functional regeneration of the ARC ITTC-JB, will be responsible for the design, development, optimisation and validation of engineered scaffolds for improved integration, tissue growth, repair and functional regeneration of the rotator cuff. The design criteria and construction of these scaffolds will be informed by the development of multiscale computational models that characterise the biomechanics of the shoulder joint and the rotator cuff, in particular. It is expected that through the experimental validation of these computational platforms, this program will significantly reduce the trial and error
process of developing mechanically-matched tissue scaffolds for interfacial musculoskeletal tissues, improving patient outcomes and reducing the cost and time of manufacturing scaffolds for rotator cuff repairs.

The Research Fellow will also assist with the supervision of undergraduate and postgraduate students within the UQ-node of the Centre.

As a member of the School, the Research Fellow will have the opportunity to also undertake limited teaching into units within the degree/s in your area of expertise.

**Duties**

Duties and responsibilities include, but are not limited to:

**Research**
- Design multicomponent, multimodal scaffolds, informed by available and newly generated biomechanical data and models of rotator cuff and associated tissues within the shoulder joint and clinical practice.
- Development of techniques and methods to fabricate multicomponent, multimodal biomaterial scaffolds, along with their physical, chemical and biological (using adult stem cell-based assays) characterization and evaluation.
- Develop close scientific collaborations with members of the Tissue Engineering and Microfluidics (TEaM) and the Grondahl group Laboratories at the University of Queensland and academic, clinical and industrial members of the ARC ITTC for Joint Biomechanics, assuming a leadership role in biomechanical modelling and characterisation, biomaterial composite production, scaffold fabrication techniques, and relevant biological assays.
- Provide written and verbal reports (inclusive of manuscript submissions) on outputs from research activities, inclusive of associated data analyses.
- Assist in the supervision and training of research higher degree students.
- Maintain absolute confidentiality regarding the project results where appropriate and when requested.
- Assist in the preparation of grant applications.

**Service and Engagement**
- Perform a range of administrative functions in the Tissue Engineering and Microfluidics Laboratory.
- Contribute to the processes that enable the academic team to manage the work of the School, including participate in School decision-making and serve on School committees
- Foster the School’s relations with industry, government departments, professional bodies and the wider community.
- Any other duties as reasonably directed by your supervisor

**Other**
- Ensure you are aware of and comply with legislation and University policy relevant to the duties undertaken, including but not exclusive to:
  - the [University's Code of Conduct](#)
  - requirements of the Queensland occupational health and safety (OH&S) legislation and related [OH&S responsibilities and procedures](#) developed by the University or Institute/School.
o the adoption of sustainable practices in all work activities and compliance with associated legislation and related University sustainability responsibilities and procedures
o requirements of the Education Services for Overseas Students Act 2000, the National Code 2007 and associated legislation, and related responsibilities and procedures developed by the University

Organisational Relationships

The position reports to the Head of School, Professor Justin Cooper-White.
SELECTION CRITERIA

- Completion of a PhD qualification in Chemical, Materials, Mechanical or Biomedical Engineering, or an equivalent combination of relevant experience and/or education/training.
- Demonstrated research expertise and experience in experimental investigations in tissue biomechanics, biomaterials engineering and characterisation, scaffold fabrication and tissue engineering, with emphasis on the musculoskeletal system, as evidenced by publications in high quality research journals and conferences.
- Demonstrated experience in (or at minimum, an evidenced comprehensive understanding of) computational biomechanical modelling of the musculoskeletal system.
- Demonstrated experience in translating modelling outcomes to device conception, design and fabrication.
- Demonstrated understanding of the principles of stem cell biology, culture, and associated characterisation techniques.
- Strong interpersonal and communication skills including the ability to collaborate with internal and external stakeholders, and the wider research community.
- Demonstrated capacity to work collaboratively and proactively as part of a multi-disciplinary and multi-institution research team, as well as proven ability to work effectively with minimal supervision.
- Proven ability to use initiative and contribute new ideas to the research of biomechanics, along with a demonstrated adherence to ethical standards in research confidentiality.

Seminar

Applicants invited for interview may be expected to present a seminar in conjunction with the selection interview process.

Qualification Verification

An appointment to this position is subject to the verification of the highest academic qualification from the conferring institution.

Vaccinations and Immunisation

It is a condition of employment for this role that if you are required now or in the future, to work or interact in Queensland Health clinical facility; or in an equivalent clinical health facility; or health care role; or will be required to perform work tasks that put you at risk of exposure to vaccine-preventable disease you are required to be immunised against, and remain immunised against, certain vaccine preventable diseases (VPDs) in accordance with the University’s Vaccinations and Immunisation Guidelines (PPL 2.60.08). The employee is required to provide evidence of immunisation against VPDs.

The University of Queensland values diversity and inclusion and actively encourages applications from those who bring diversity to the University. Please refer to the University’s Diversity and Inclusion webpage for further information and points of contact if you require additional support.

This role is a full-time position; however flexible working arrangements may be negotiated.

Accessibility requirements and/or adjustments can be directed to recruitment@uq.edu.au.