



Postdoctoral Researcher in Multiscale Modelling of Medical Devices for Bone Tissue Regeneration

DCU Centre for Medical Engineering Research (MEDeng)

School of Mechanical & Manufacturing Engineering

2 Year Fixed Term

Introduction

Dublin City University (www.dcu.ie) is a research-intensive, globally-engaged, dynamic institution that is distinguished by both the quality and impact of its graduates and its focus on the translation of knowledge into societal and economic benefit. DCU prepares its students well for success in life, and in the workplace, by providing a high-quality, rounded education appropriate to the challenges and opportunities of the 21st century. As Ireland's University of Enterprise and Transformation, DCU is characterised by a focus on innovation and entrepreneurship and a track-record of effective engagement with the enterprise sector, including commercial, social and cultural enterprises. Excellence in its education and research activities has led to DCU's consistent position in the rankings of the world's top young universities. DCU has a strong track record in attracting both Irish and European Union funding under FP7, Horizon 2020, Marie Curie Actions and Erasmus. We offer a dynamic and internationally focused environment in which to advance your academic career.

MEDeng

The Centre for Medical Engineering Research (MEDeng), a key research centre at Dublin City University is focused on translating engineering and materials research into healthcare solutions. The centre has six overarching research themes based at the interface of materials science, engineering and biology - providing the underpinning fundamental research to facilitate the stratified clinical and industrial framework for the development of medical devices and implants for tissue repair and regeneration.

1. Design and Manufacture of Medical Devices
2. Biomaterials and Drug Delivery Systems
3. Surface Engineering and Coating Technology
4. Biomechanics
5. Tissue Engineering and Regenerative Medicine
6. Clinical Orthopaedics

The MEDeng Centre is a multidisciplinary research network that brings academic, industrial and clinical communities together with the purpose of pioneering advances in medical engineering for global wellbeing.

Role Profile

MEDeng is currently offering a 24-month H2020 funded postdoctoral researcher position to develop multiscale models of medical devices for bone fracture healing. Osteoporosis can lead to different types of fractures located in dissimilar body parts and thus the main project objective will be targeted through the development of three different medical devices designed to treat specific osteoporotic fractures through a synergistic convergence of smart nanomaterials, 3D fabrication technologies and targeted cell activation. The overall objective of GIOTTO is then to implement solutions and tools to enhance active ageing thereby mitigating the economic burden to health systems and bringing within grasp benefits for the elderly.

These positions will begin in *the summer of 2020* and offer exciting job opportunities where you have access to competent technical, infrastructural and administrative assistance and the opportunity to evolve a multi-faceted skill set. The researchers will join an international team of PhD students and Postdoctoral researchers and will work in close collaboration with researchers from 14 industry and university partners. The postdoctoral researcher will be based in MEDeng in the School of Mechanical and Manufacturing Engineering at DCU and will work under the supervision of Prof. Nicholas Dunne and Dr. David MacManus.

Qualifications and Experience

Applicants should have a PhD in Mechanical Engineering, Biomedical Engineering, or a cognate discipline, a strong research track record, evidence of knowledge of multiscale computational modelling, constitutive modelling, continuum mechanics and basic programming skills. The candidate should have excellent analytical and problem-solving skills, and excellent communication skills as well as knowledge of the relevant academic literature. In addition, candidates should have a high level of interpersonal skills, team working skills, report writing, time management skills and ability to work to deadlines. Desirable attributes include experience in industry-led research, presentation skills and academic article writing skills. It is desirable that the candidate has relevant postdoctoral experience in at least one of the following areas:

- Multiscale finite element modelling;
- Medical device design;
- Computational biomechanics.

Duties and Responsibilities

Reporting to Prof. Dunne and Dr. MacManus on the duties and responsibilities attached to the post including, but are not restricted to, the following:

- Conduct a specified programme of research under the supervision and direction of Prof. Dunne and Dr. MacManus.
- Develop multiscale models of novel medical devices for bone tissue regeneration.
- Use computational techniques to optimise the design for material configurations that maximise architecture, mechanical performance, and biomaterial degradation.
- Disseminate research outcomes in which they are engaged including funder reporting, industrial demonstrations and publishing in high quality peer reviewed journals of international standing.
- Assist Prof. Dunne, Dr. MacManus and MEDeng in the development and implementation of the broader research programme.
- Develop research proposals for specific national and international funding calls.
- Assist graduate research students associated with your research group.
- Take responsibility as requested for report generation, and administration as well as site visit preparation and other administrative work associated with the programme of research and the research group.

Competencies

- Discipline knowledge and Research skills – Demonstrates knowledge of a relevant research discipline and the ability to conduct a specific programme of research within that discipline.
- Understanding the Research Environment – Demonstrates an awareness of the research environment (for example funding bodies) and the ability to contribute to grant applications.
- Communicating Research – Demonstrates the ability to communicate their research with their peers and the wider research community (for example presenting at conferences and publishing research in relevant journals) and the potential to teach and tutor students.
- Managing & Leadership skills – Demonstrates the potential to manage a research project including the supervision of undergraduate students.