



Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin



Fondúireacht Eolaíochta Éireann
Dá bhfuil romhainn
Science Foundation Ireland
For what's next

PhD Positions in 3D Bioprinting and Tissue Engineering at Trinity College Dublin

Positions: 2 PhD Studentships (including stipend and fees)

Funding: Science Foundation Ireland

Project Title: Engineering structurally anisotropic and mechanically functional musculoskeletal tissues by guiding the fusion, differentiation and (re)modelling of stem cell derived cartilage spheroids

Project Description:

Regeneration of musculoskeletal tissues requires engineered grafts that mimic the heterogeneous and anisotropic structure and mechanics of the native tissue. The goal of this project is to leverage emerging biofabrication technologies to provide physical boundary conditions and spatially localised morphogens to (stem cell derived) cartilage spheroids to guide their fusion and (re)modelling to engineer truly biomimetic articular cartilage. To realise this goal, this project will build upon our lab's extensive expertise in bioprinting and bioink development to produce a new biofabrication platform that provides physical boundaries, matrix (re)modelling factors and spatiotemporally defined patterns of growth factors to self-organizing cellular aggregates, microtissues or organoids. To demonstrate the utility of this biofabrication platform, it will be used to engineer articular cartilage grafts that mimic the depth-dependant structure, composition and mechanical properties of the native tissue. The ability to bioprint such functional tissues has the potential to transform the field of orthopaedic medicine, providing grafts to biologically resurface large areas of damaged synovial joints and thereby prevent the development of osteoarthritis – a debilitating disease affecting millions of people. The impact this project will not be limited to the orthopaedic space, as it is envisioned that this new bioprinting platform will find numerous applications in regenerative medicine.

For more information about the individual PhD and postdoctoral positions, please contact Prof. Daniel Kelly (kellyd9@tcd.ie).

Applicant criteria:

Degree in Biomedical Engineering, Mechanical Engineering, Biomedical Sciences or a related discipline. Previous experience in biomaterials, tissue engineering, 3D (bio)printing, cell culture and/or biomechanical testing would be desirable.

Start Date: From November 2023 onwards; positions will remain open until they are filled.

How to apply: CVs with the names and contact details of three referees should be submitted *via* email to Prof. Daniel Kelly (kellyd9@tcd.ie).

The Kelly Lab: Dr Daniel Kelly is the Professor of Tissue Engineering at Trinity College Dublin. He is also the co-lead of the 'Materials for Health' platform in AMBER, the Science Foundation Ireland funded materials science centre based in Trinity College Dublin. He is a past recipient of a Science Foundation Ireland President of Ireland Young Researcher Award, a Fulbright Visiting Scholar grant (at the Department of Biomedical Engineering in Columbia University, New York) and five European Research Council awards (Starter grant 2010; Consolidator grant 2015; Proof of Concept 2017, 2023; Advanced grant 2021). His lab focuses on developing novel tissue engineering and 3D bioprinting strategies to regenerate damaged and diseased musculoskeletal tissues. The successful applicant will join a dynamic, multidisciplinary lab consisting of 15 postdoctoral researchers and PhD students based in the Trinity Centre for Biomedical Engineering. More information can be found here: <https://www.tcd.ie/biomedicalengineering/regenerative/kellylab/>

About the Advanced Materials and Bioengineering Research Centre (AMBER): AMBER is a Science Foundation Ireland funded centre that provides a partnership between leading researchers in materials science and industry. More information can be found at <http://ambercentre.ie/>

The AMBER research centre, as a community of researchers, welcomes its responsibility to provide equal opportunities for all. We are actively seeking diversity in our research teams and particularly encourage applications from underrepresented groups.

About the Trinity Centre for Biomedical Engineering (TCBE): TCBE is a key research centre in Trinity College combining fundamental research with translation to clinical practice. TCBE provides a structure to bring bioengineers, basic scientists and clinicians together to focus on important clinical needs and has four key research themes: Medical Devices & Advanced Drug Delivery, Neural Engineering, Biomechanics & Mechanobiology, Tissue Engineering & Regenerative Medicine. The project work will be carried out in our state-of-the-art facilities located in the Trinity Biomedical Sciences Institute.