



Centre for Bioengineering and Nanomedicine

Te Pokapū mō te Pūkaha Koiora me te Whaiora Mōkitokito

Christchurch Regenerative Medicine and Tissue Engineering (CReaTE) Group University of Otago Christchurch, New Zealand Department of Orthopaedic Surgery | Centre for Bioengineering & Nanomedicine

PhD position available within the CReaTE group, New Zealand:

A 3 year fully funded PhD project is available in the CReaTE Group (University of Otago Christchurch), funded by the New Zealand MedTech Centre of Research Excellence (CoRE).

Project: Biofabrication of hybrid scaffolds for skeletal regenerative medicine

Supervisors: Assoc Prof Tim Woodfield, Dr Khoon Lim

Project outline:

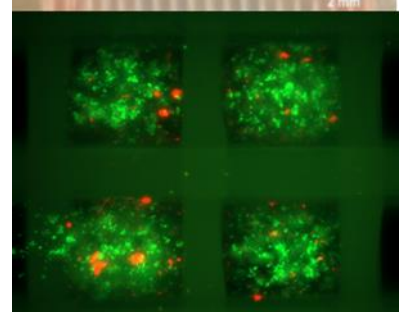
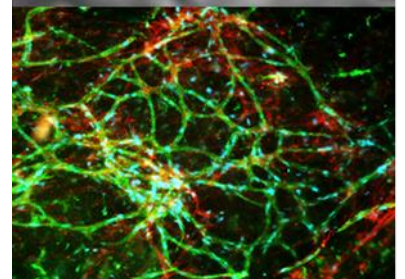
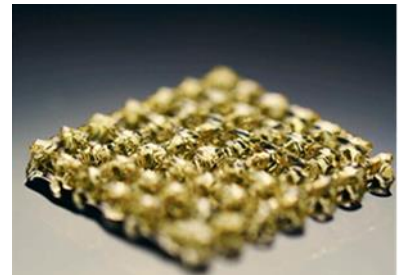
Bone, cartilage and tendon are three musculoskeletal tissues where optimal repair or regeneration is often not achievable. This project will focus on hybrid Biofabrication strategies for successful orthopaedic tissue repair, particularly fabrication of functional tissues for bone, cartilage and tendon.

Additive manufacturing and 3D printing are shaping the future of orthopaedic surgery and regenerative medicine. Research within the CReaTE group focuses on the development of additive-manufactured orthopaedic implants and regenerative medicine strategies targeting repair of cartilage, bone and tendon for the treatment of musculoskeletal disease. Utilising a platform of 3D bioprinting or biofabrication technologies the group has developed novel bioinks and spheroid/organoid 3D Bio-assembly approaches aimed at producing new classes of tissue engineered constructs for tissue repair.

Biofabrication of hybrid constructs capable of controlling delivery of stem cells and/or bioactive factors to enhance repair and regeneration of cartilage, along with design and fabrication of cellular micro-tissues combined with Bio-assembly processes will be a key focus of this project. Application and testing of constructs will be carried out in relevant *in vivo* models, with the goals of improving on the current state of the art, enhancing understanding of the underlying biological processes, and progressing a repair strategy toward the clinic.

Skills required:

We are looking for enthusiastic PhD candidate who has a strong Engineering/Bioengineering background and a keen interest in Bioprinting/Biofabrication and Biomaterials. It would be desirable to have significant experience with 3D scaffold fabrication, 3D Bioprinting, biomaterial characterisation techniques, and mechanical testing. CAD/FEA, micro-CT imaging, and histology processing experience is preferred, and *in vitro* cell culture and biochemical analysis techniques would be highly valued, as well as an intrinsic motivation and independence.



You will work within the CReaTE Group, a multidisciplinary research team of bioengineers, biologists and clinicians working at the interface of cell biology, biomaterials science and engineering. There will be significant opportunities for PhD candidates to interact with medical device industry partners as well as orthopaedic and veterinary surgeons. You will work in close collaboration with partners within the NZ\$26M MedTech Centre of Research Excellence (www.cmdt.org.nz/medtechcore) a national consortia of medical technology researchers and industry partners in New Zealand developing a translational research platform taking basic research toward application for economic growth and healthcare outcomes. You will have the opportunity to attend courses as part of the MedTech CoRE Doctoral Training Programme (www.cmdt.org.nz/dtp)

Qualifications:

Applicants should hold an Undergraduate and/or Masters degree in one of the following areas: Biomaterials & Tissue Engineering, Biofabrication/3D Printing, Bioengineering, Polymer Chemistry or other related biological sciences or engineering disciplines, and preferably should have an 'A' grade average (or equivalent GPA).

Funding Arrangements:

A \$27,000 per annum stipend including fees (approx. \$10,000) for the duration of the 3-year PhD degree with a possible 1 year extension.

To Apply:

All candidates with high motivation, independent thinking, and good communication skills (both written and oral) should apply. Please send a copy of your full CV including references to publications/conference proceedings; copies of undergraduate/ postgraduate academic transcripts; the names of two referees, and any other supporting information relevant to the project (e.g. lab/assay skills, software/hardware expertise)

to create.research@otago.ac.nz by 30th September 2019.

Location:

The research will primarily take place at the University of Otago Christchurch, a multi-disciplinary campus recognized for its outstanding reputation for combining basic science and clinical health research. The University of Otago is a member of the Mataraki network of universities and rated 5 stars for quality in 2018 per QS stars rankings. Christchurch is a vibrant city based on the coast and close to the Southern Alps of New Zealand, with ample opportunities for outdoor activities locally including mountain biking, surfing, hiking and skiing. Christchurch was recently rated as one the world's top 10 cities to visit by Lonely Planet.

For a video all about Christchurch and what it's like to undertake research in the CReaTE Group and University of Otago Christchurch campus – visit www.youtube.com/watch?v=ATGya9IGroY

For lots more information on the CReaTE Group, facilities, staff, students and projects visit...

www.otago.ac.nz/regenerative-medicine/index.html