

6th Annual Mechanobiology Symposium (MBS)

We are happy to announce our international keynote speakers - Professor Richard Oreffo (University of Southampton), Dr Cameron Brown (University of Oxford), and Professor Xuebin Yang (University of Leeds) – who will be talking on the theme of Regenerative Medicine. We also have an exciting program lined up with updates on the latest mechanobiology research taking place in the University since last year's meeting. As always the MBS is a great opportunity for our relatively small yet significant community of interdisciplinary researchers to get together for a day and interact both at business and social levels. As a free event we are always grateful to our sponsors and supporters and wish all in attendance a good day of science! :)

Wednesday, 3rd December 2014, 9am-6pm

Lecture theatre 505-007, Ground floor, Faculty of Medical and Health Sciences, Grafton.

This free event is organised and sponsored by: the Department of Chemical and Materials Engineering (UoA), the Auckland Bioengineering Institute (UoA), the School of Medical Sciences (UoA), Royal Society NZ (Marsden Grant), and Coherent Scientific.

What is Mechanobiology?

“Mechanobiology: the study of how mechanical stimuli regulate biological processes.” – from website of **Stanford Skeletal Mechanobiology Research**.

“An overriding objective of the Mechanobiology Lab is to elucidate the fundamental nature of how cells sense and respond to mechanical stimuli, and to employ the principles revealed by these studies to seek new treatments for vascular disease and to develop tissue constructs for drug and toxicity screening.” - from website of the **MIT Mechanobiology Laboratory**, (Roger D Kamm)

“Mechanobiology is a quantitative and interdisciplinary approach to understanding biological functions. Physical, geometrical, and mechanical events are not just side-effects of biochemistry, but are themselves important triggers and regulators of processes such as cancer metastasis and stem cell differentiation.” – from website of The **Mechanobiology Institute, Singapore**.

“Mechanobiology is the study of the interrelationship of force and biology. It is important in many areas of physiology, medicine, and medical device design.” – from the website of Mechanobiology Laboratory, **Penn State University**

“Mechanobiology is the new and emerging science, coupling mechanical and biological analysis, that will enable these breakthroughs to become reality.” From the website of the **University of Oxford Mechanobiology group**.

“Mechanical forces shape the form and function of living cells and tissues, affecting biological activity across all levels and scales. Mechanical cues guide embryonic development, tissue growth, and wound healing and impact the physiology of normal health and disease.” – website of **Mechanobiology Research Group, Imperial College London**.

Programme

09.00	Opening and Welcome: Organising Committee
SESSION I: Chaired by Dr Justin Fernandez	
09.05	Professor Richard Oreffo , University of Southampton <i>Skeletal development across the lifecourse- a multi-scale lifescience approach</i>
9.50	Dr Ju Zhang , University of Auckland <i>Femur Shape analysis for musculoskeletal modelling</i>
10.05	Dr Mats Mosti , Norwegian University of Science and Technology/University of Auckland <i>The combined effects of the peroxisome proliferator-activated receptor alpha (PPARα) agonist fenofibrate and jumping exercise on bone and muscle in ovariectomized rats</i>
10.30-11.00 MORNING TEA	
SESSION II: Chaired by A/Prof Thor Besier and Dr Sue McGlashan	
11.00	Professor Xuebin Yang , University of Leeds <i>The effect of mechanical loading on osteogenesis of human dental pulp stromal cells in a novel in vitro model.</i>
11.45	Dr Kumar Mithraratne , University of Auckland <i>Modelling facial expressions: Biomechanics and beyond I</i>
12.00	Dr Tim Wu , University of Auckland <i>Modelling facial expressions: Biomechanics and beyond II</i>
12.15	Studies on Early Osteoarthritis: Introduction by A/Prof Ashvin Thambyah <i>Comparing healthy with early degenerate cartilage and bone in the bovine model of early OA:</i> <ul style="list-style-type: none"> - Changes in the cartilage matrix – Mieke Nickien - Changes in the underlying bone – Emily Hargrave-Thomas - Changes in the protein profile – Bincy Jacob
1.00-2.00 LUNCH	
SESSION III: Chaired by Dr David Musson and Dr Ashika Chhana	
2.00	Dr Vitor Correlo , University of Minho, Portugal <i>Natural based materials for tissue engineering of connective tissues</i>
2.20	Dr. Ben Schon , University of Otago, (Christchurch Medical School). <i>Fabricating scaffolds with good mechanical properties for articular cartilage tissue assembly</i>
2.35	Dr. Ryan Gao , University of Auckland <i>A critical-sized bone defect model in rats for evaluating bone healing substitutes</i>
2.50	Gabriella Lindberg , University of Otago, (Christchurch Medical School). <i>Covalent incorporation of heparin in gelatin hydrogels for improved chondrocyte re-differentiation</i>
3.05	Taryn Saggese , University of Auckland <i>Differential Response of Notochordal and Mature Nucleus Pulposus Cells to Pathological Stimuli</i>
3.20	Andrea Fotticcia , Loughborough University <i>Electrospun angle-ply laminates seeded with mesenchymal stem cells as potential annulus fibrosus artificial replacement</i>
15.35 – 16.00 AFTERNOON TEA	
SESSION IV: Chaired by Dr Kelly Wade and Ms Taryn Saggese	
4.00	Dr Cameron Brown , Oxford University <i>What does collagen piezoelectricity do in joint tissue?</i>
4.40	Samantha Rodrigues , University of Auckland <i>A Multiscale Structural Investigation of the Annulus-Endplate Anchorage System and its Mechanisms of Failure</i>
5.00pm Networking, drinks and nibbles in the Atrium	