

ABC 11 - Program – DAY 1

3rd Dec 2018

7:00 pm to 9:00 pm	Registration and Opening Ceremony
9 am to 9.30 am	<p>Invited Speaker - Dr Elizabeth Clarke University of Sydney/ Kolling Institute On: IN VIVO AND IN VITRO EXPERIMENTAL MODELS OF INJURY</p>
9.30 am to 10.30am	<p>CLINICAL BIOMECHANICS I – <i>Scientific Presentations</i></p> <ul style="list-style-type: none"> • Hip muscle activation in femoroacetabular impingement syndrome – Laura Diamond (Griffith University) • Validation of automated clinical gait assessment using a smart knee brace – Andrew McDaid (University of Auckland) • Sensor validation of a smart knee brace – Andrew McDaid (University of Auckland) • How pelvic tilt influences modes of spinal motion segment failure under direct compression - Nurul Haiza (Zaza) Sapiee (University of Auckland) • Combined EMG-informed neuromusculoskeletal and surrogates of finite element models estimate localised Achilles tendon strain in real-time – Claudio Pizzolato (Griffith University)
10.30 am – 11.00 am	MORNING TEA
11.00 am to 11.30 pm	<p>Invited Speaker - A/Prof Sam Veres Saint Mary's University On: MEETING THE IN VIVO LOADING REQUIRMENTS OF COLLAGENOUS TISSUES THROUGH STRUCTURAL SPECIALIZATION OVER MULTIPLE LENGTH SCALES: INSIGHTS FROM THE STUDY OF FUNCTIONALLY DISTINCT TENDONS</p>
11.30 am to 12.30 pm	<p>CLINICAL BIOMECHANICS II - <i>Scientific Presentations</i></p> <ul style="list-style-type: none"> • Can 3-dimensional motion analysis and fuzzy entropy detect movement differences in general movement assessment categories in the normative infant population? – Michelle McGrath – Queensland Health • Effect of ankle push-off haptic biofeedback on lower-limb kinetics and gait symmetry – Duncan Bakke (University of Auckland) • Why are certain discs vulnerable to herniation? – Kelly Wade (Ulm University)

	<ul style="list-style-type: none"> • The influence of feedback and engagement on pedaling performance in stroke patients –Mukesh Soni (University of Melbourne) • The use of feedback and video engagement on exercise performance during pedaling - Mukesh Soni (University of Melbourne)
12.30 pm to 1.30 pm	<p>LUNCH <i>With:</i></p> <ul style="list-style-type: none"> - Poster Viewing - Student Round Table
1.30 pm to 2.00 pm	<p>Invited Speaker - Professor Patria Hume Auckland University of Technology On: HOW SPORTS BIOMECHANICS HELPS IMPROVE PERFORMANCE AND REDUCE RISK</p>
2.00 pm to 3.00 pm	<p>SPORTS BIOMECHANICS - Scientific Presentations</p> <ul style="list-style-type: none"> • Characterizing stress patterns in the brains after traumatic brain injury– Vickie Shim (University of Auckland) • Inter- and intra-day reliability of common injury screening measures in rugby league is variable – Tim Doyle (Macquarie University) • Foot pronation is associated with increased knee joint loading rate and adduction after long distance running – Justin Fernandez (University of Auckland) • Lower limb impact accelerations vary with sensor placement – Daniel Glassbrook (Macquarie University) • Stride length, thorax and pelvic positioning during lawn bowls deliveries – Samantha Birse (La Trobe University)

3.00 pm to 3.30 pm	AFTERNOON TEA
3.30 pm to 4.00 pm	Invited Speaker - Dr Marcos Domingos University of Manchester On: 3D BIOPRINTING: CURRENT AND FUTURE TRENDS IN SKELETAL TISSUE REGENERATION
4.00 pm to 5.00 pm	ORTHOPAEDIC BIOMECHANICS - <i>Scientific Presentations</i> <ul style="list-style-type: none"> • Understanding the scaphoid kinematics after sectioning of scapholunate ligament - Ita Suzana Mat Jais (Singapore General Hospital) • Exploring lesser known mechanisms of structural failure in mechanically-induced disc herniations - Vonne van Heeswijk (University of Auckland) • Effects of lower limb anthropometry on gait stability - Sandro Mhradi (Institut Teknologi Bandung) • Bone microarchitecture damage due to press-fit femoral knee implantation quantified using HR-pQCT and digital volume correlation- Egon Perelli (Flinders University) • Comparing Cartilage thickness and subchondral bone microarchitecture in varus- and valgus-aligned osteoarthritic tibiae with controls – Sophie Rapagna (Flinders University)
5.00 pm to 6.30 pm	Special Session of the CLINICAL MOTION ANALYSIS GROUP (CMAG): TRANSLATING TECHNOLOGY INTO THE CLINICAL GAIT LABORATORY <ul style="list-style-type: none"> • Invited Speaker: The use of patient specific neuromusculoskeletal modelling in clinical motion analysis - Dr Chris Carty • Gait model results are sensitive to impaired muscle size profiles in cerebral palsy – Geoffrey Hansfield (University of Auckland) • Invited Speaker: Assumptions in foot modelling: what are we ignoring - Dr Luke Kelly • Personalised 3d printing ankle-foot orthoses for children with charcot-marie-tooth disease – Elizabeth Wojciechowski (University of Sydney) • PANEL DISCUSSION on: “How well are we translating technology into the clinical gait laboratory?”
6.30 pm till late	OFFICIAL WELCOME EVENT Student group Event – Details TBA ECR group Event – Details TBA

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ABC 11 - Program – DAY 2

4th Dec 2018

9 am to 9.30 am	<p>AWARDS SESSION I</p> <p>Invited Speaker Professor Peter Hunter – University of Auckland</p> <p>Scientific Presentations</p>
9.30 am to 10.30am	<ul style="list-style-type: none"> • Wearable Sensors: Towards Evaluating Knee Joint Replacement Recovery – Shasha Yeung (University of Auckland) • Effect of neuromuscular exercise on joint contact forces in people following partial meniscectomy: secondary analysis of a randomised controlled trial – Scott Starkey (University of Melbourne) • Development of a virtual reality acetabulum reaming simulator and the need for biomechanical data - Mario Lorenz (Chemnitz University Of Technology) • Towards cellular epidemiology of degenerative diseases using geographic information systems, multisem and machine learning approaches – Anton Nathanson (University of New South Wales) • Imaging of structural and molecular transport compartmentalisation in an in vivo osteoarthritis model – Lucy Ngo (University of New South Wales)
10.30 am – 11.00 am	MORNING TEA
11.00 am to 11.30 pm	<p>AWARDS SESSION II</p> <p>Invited Speaker VI Professor Neil Broom – University of Auckland On: EXPLORING SOFT-HARD JUNCTIONS IN THE MUSCULOSKELETAL SYSTEM: AN EXPERIMENTAL APPROACH</p> <p>Scientific Presentations</p>
11.30 am to 12.30 pm	<ul style="list-style-type: none"> • Structural Integration Across the Endplate Cement Line - Nurul Haiza (Zaza) Sapiee (University of Auckland)

	<ul style="list-style-type: none"> • Muscle architecture in the medial gastrocnemius of stroke patients: a diffusion tensor imaging investigation – Arkiev D'Souza (Neuroscience Research Australia) • Sub-critical knee injury: a risk factor for critical injury and osteoarthritis in mice - Carina Blaker (University of Sydney) • Speed-adaptive myoelectric ankle exoskeleton to improve post-stroke walking performance – Taylor Dick (University of Queensland) • Assessment of thorax and rib cage joint rigidity on spinal loading - Hossein Mokhtarzadeh (Harvard Medical School) • Pericellular matrix thickness distribution around chondrocytes is orientation-dependent - Eng Kuan Moo (University of Calgary)
12.45 pm to 1.30 pm	LUNCH and POSTER VIEWING
1.30 pm to 2.00 pm	<p>COMPUTATIONAL MODELING I</p> <p>Invited Speaker</p> <p>Professor Tim David – University of Canterbury</p> <p>On: PARALLEL INTEGRATED MODELS OF NEUROVASCULAR COUPLING AND BOLD SIGNALS</p> <p>Scientific Presentations</p>
2.00 pm to 3.15 pm	<ul style="list-style-type: none"> • Effects of pth treatment in osteoporosis – insights from a mechanistic pk-pd model. Maxence Lavail (Queensland University of Technology) • Can humeral fractures occur spontaneously in infant while rolling? A finite element study - Zainab Altai (University of Sheffield) • Time-course changes of lower limb kinematics during military load-carriage - Jodie Wills (Macquarie University) • Development of a deep neural network for automated electromyographic pattern classification – Riad Akhundov (Griffith University and University of Newcastle) • Incorporating motor-unit territories in homogenized 3d skeletal muscle models Harnoor Saini (University of Stuttgart) • Hip arthokinematics determined using subject-specific mri and mesh contact theory – David Saxby (Griffith University)
3.15 pm to 3.45 pm	AFTERNOON TEA

3.45 pm to 4.15 pm	<p>COMPUTATIONAL MODELING II</p> <p>Invited Speaker Invited Speaker Dr Alys Clarke – University of Auckland/ Auckland Bioengineering Institute</p> <p>On: BIOMECHANICS OF PREGNANCY: FROM CONCEPTION TO DELIVERY</p> <p>Scientific Presentations</p>
4.15 pm to 5.30 pm	<ul style="list-style-type: none"> • Biomechanical role of anterolateral ligament in ACL-deficient knee: a 3D finite element study Duraisamy Shriram (Singapore University of Technology and Design) • Image-driven Modelling and Simulation of Micro-scale Articular Cartilage Mechanics - Scott Sibole (University of Calgary) • Identifying the unloaded shape and stiffness of the breast - Thiranjaa Prasad Babarenda Gamage (University of Auckland) • How to estimate the friction coefficient of articular cartilages using in-vivo imaging of the joints? - Saeed Miramini (University of Melbourne) • Rapid prediction of personalized achilles tendon tissue strains with a machine learning technique – Vickie Shim (University of Auckland) • Influence of the reference state on estimators of cardiac contractility – Mario Habenbacher (Graz University of Technology)
5.00 pm to 6.00 pm	<p>Poster Viewing with Reception</p>
6.00 pm onwards	<p>Join Larry Sherman in his TEDx-style talk: From Music to the Matrix: How Music Influences the Developing and Aging Brain</p> <p><i>(This is a Matrix Biology Society of Australia and New Zealand event and is open to all ABC11 registrants.)</i></p>

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ABC 11 - Program – DAY 3

5th Dec 2018

8.30 am – 9.00 am **Welcome ceremony: 10th Annual Mechanobiology Symposium**

MECHANOBIOLOGY – ABC11 and MBSANZ

<p>09.00 am to 10.45am</p>	<p>Invited Speaker Professor Toshiro Ohashi – Hokkaido University On: INVESTIGATION OF ENDOTHELIAL MECHANOTRANSDUCTION MECHANISM: MECHANICAL PROPERTIES OF PRIMARY CILIA</p> <p>Scientific Presentations</p> <ul style="list-style-type: none"> • A model of bone mechanostat directed by osteocytes mechanosensation – Madge Martin (Queensland University of Technology) • Ultrastructural Characterisation of the Osteocyte Lacunar-Canalicular Network During Aging – Mechanobiological Implications - Peter Pivonka (Queensland University of Technology) • MBSANZ presentation • MBSANZ presentation • MBSANZ presentation
<p>10.45 am – 11.15 am</p>	<p>MORNING TEA</p>
<p>11.15 am to 01.00 pm</p>	<p>MECHANOBIOLOGY TOOLBOX</p> <p>Invited Speakers A/Prof Tim Woodfield – University of Otago Chris Killiams</p> <p>Scientific Presentations</p> <ul style="list-style-type: none"> • Quantifying birefringence in the bovine model of early osteoarthritis using polarisation-sensitive optical coherence tomography and mechanical indentation - Matthew Goodwin (University of Auckland) • MBSANZ presentation • MBSANZ presentation • MBSANZ presentation

1.00pm to 2.00pm	LUNCH and ANZSB General Meeting
2.00pm to 3.45 pm	<p>CELL and TISSUE MECHANICS</p> <p>Invited Speaker Professor Peter Torzilli – Cornell University and Hospital for Special Surgery, NY.</p> <p>On: SOFT TISSUE BIOMECHANICS AND MECHANOBIOLOGY OF ARTICULAR CARTILAGE</p> <p>Scientific Presentations</p> <ul style="list-style-type: none"> • A XRD study of biomimetically re-calcified bovine bone tissue - Lei Zhao (Hokkaido University) • How much force is required to perforate a colon during colonoscopy? - Niels Hammer (University of Otago) • Mildly degenerative structural changes in the fibrillar matrix of cartilage influences the extent of chondrocyte death following impact loading - Joshua Workman (University of Auckland) • Application of 3d printing technology to facilitate and standardize the testing soft tissues - Niels Hammer (University of Otago) • Shock-absorbing ability of damaged vs undamaged equine cartilage-bone - Fatemeh Malekipour (University of Melbourne) • Three-dimensional bulging of the human medial gastrocnemius muscle during isometric contractions in vivo - Bart Bolsterlee (Neuroscience Research Australia)
3.45 pm to 4.00 pm	AFTERNOON TEA
4.00 pm to 6.00 pm	<p>IMAGING AND MODELLING</p> <p>Invited Speaker Professor Simo Saarakala</p> <p>On: IMAGING OF JOINT TISSUES: IMPLICATION FOR BETTER UNDERSTANDING, DIAGNOSTICS AND PREDICTION OF OSTEOARTHRITIS</p> <p>Scientific Presentations</p> <ul style="list-style-type: none"> • Geometric shape fitting of the tibia and femur in the development of a coordinate system for the knee- Stuart Millar (University of South Australia) • Raman imaging of calcified cartilage and subchondral bone for osteoarthritis research – Shuvashis Das Gupta (University of Oulu)

	<ul style="list-style-type: none"> • Parameterisation of diffusion weighted magnetic resonance images of the heart to extract fiber and sheet orientations - Bianca Freytag (University of Auckland) • Investigation of spectral CT for use in bone mineral density assessment and association with histopathological grade - Kenzie Baer (Christchurch Regenerative Medicine and Tissue Engineering Group) • MBSANZ presentation • MBSANZ presentation • MBSANZ presentation
8.00 pm till late	ABC 11 Conference Dinner and Awards Presentation <i>followed by</i> Closing Ceremony

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POSTERS

1. The mechanical significance of the articular cartilage surface layer on tissue swelling. – Emma Brown (University of Auckland)
2. Fascia stress patterns are highly dependent on tissue structure. - Vickie Shim (University of Auckland)
3. Design and manufacturing of a low-cost robotic ankle for Indonesian trans-tibial amputees. – Ferryanto Ferryanto (Institut Teknologi Bandung)
4. Reliability and sensitivity of radiographic outcome measures for hip dysplasia in paediatric Charcot-Marie-Tooth disease. – Leanne Purcell (Sydney Musculoskeletal, Bone & Joint Health Alliance)
5. Right-to-left shape differences in the ulna – Desney Greybe (University of Auckland)
6. Clustering healthy runner based on 3-d kinematics patterns of pelvic during running using hierarchical method – Davood Khezri (University Of Mazandaran)
7. Kinematic study of clean and jerk lift in the 69-kg category weightlifting – Ferryanto Ferryanto (Institut Teknologi Bandung)
8. The effect of strengthening the muscles of the foot on common ligament injury mechanism in females participating in court sports. – Carla Van Der Merwe (Massey University)
9. Rapid quadrupedal locomotion – Hasti Hayati (University Of Technology Sydney)
10. Non-invasive estimate of left ventricular pressure using ultrasound – Amila Perera (University of Auckland)
11. Safe Lifting Ergonomics Program for Truck-Loaders: A Multi-site Case Study with Qualitative and Econometric Analyses - Hezekiah Oluwale Adeyemi (Olabisi Onanbanjo University)
12. The effects of heel lifts on lower limb biomechanics – Chantel Rabusin (La Trobe University)
13. Impact of walking speed on joint angular velocity Benjamin Mentiplay (La Trobe University)
14. A network model for lung parenchyma for describing the interplay between the crucial components of the extracellular matrix – Amin Iravani (University of Auckland)
15. Multivariate splines to estimate muscle-tendon length and moment arms in the upper limb - Thorben Pauli (University of Auckland)
16. Probing the Mechanisms of Muscle Degeneration in Cerebral Palsy using Agent-Based Modelling - Stephanie Khoo (University of Auckland)
17. Validation of three workflows to obtain bone and cartilage meshes for computational human knee modelling – Nynke Rooks (University of Auckland)
18. The effect of splint type on the stress distribution of bruxism patient's teeth – Satrio Wicaksono (Institut Teknologi Bandung)
19. MAP-OpenSim model hip muscles' pathways determined using optimized wrapping surfaces – Simao Brito Da Luz (Griffith University)
20. OpenSim-compatible library for kinematic reconstruction using inertial measurement units – Ted Yeung (University of Auckland)
21. A comparison of four factorization methods for muscle synergy extraction – Mohammad Rabbi (Griffith University)
22. Magnetic resonance imaging and freehand 3d ultrasound methods provide similar estimates of free achilles tendon geometry - Daniel Devaprakash (Griffith University)