

University of Calgary

12th Annual Biomedical Engineering Undergraduate Summer Research Symposium

August 21st, 2018 KNB 214 & 427, 9:00AM – 4:15PM

Welcome to the 12th Annual Biomedical Engineering Undergraduate Summer Research Symposium! The Biomedical Engineering Summer Symposium is an opportunity for undergraduate students to showcase their summer work, practice their presentation skills, and learn about the exciting biomedical research being conducted at the University of Calgary.

Many of the student presenters have received awards allowing them to participate in academic research, and their presentations cover a range of topics including biomechanics, imaging, and cellular and tissue engineering. Made possible by the Biomedical Engineering Graduate Program, the Centre for Bioengineering Research and Education, and Dr. Walter Herzog the BME Summer Symposium is a day to acknowledge the hard work of our undergraduate researchers and biomedical research as a whole at the University of Calgary.

Symposium At-A-Glance

9:00-9:30	WELCOME: Networking and Coffee – 2 nd Floor Atrium (KNB 2234)	
9:30-11:50	KNB 214 Session 1 Cell and Tissue Engineering, Gene Therapies, and Bioinformatics	KNB 427 Session 1 Biomechanics #1
12:00-13:00	LUNCH – 2 nd Floor Atrium (KNB 2234)	
13:00-15:40	KNB 214 Session 2 Medical Imaging, Optics, and Wearables	KNB 427 Session 2 Biomechanics #2
15:40-16:00	Closing Remarks – 2 nd Floor Atrium (KNB 2234)	
16:00-16:15	Presentation of Awards – 2 nd Floor Atrium (KNB 2234)	

Acknowledgments

Thank you to the BME Graduate Program and CBRE Administration for their help in organizing this event. Special thanks to Dr. Herzog for sponsoring award prizes. Thank you also to BMEG, graduate and undergraduate volunteers, and the session chairs and judges.



**BIOMEDICAL
ENGINEERING**
Graduate Students'
Association

Event Sponsored By:
Biomedical Engineering Graduate Program
Centre for Bioengineering Research and Education (CBRE)



UNIVERSITY OF CALGARY
Biomedical Engineering Graduate Program

Prizes Sponsored By:
Dr. Walter Herzog

9:00 – WELCOME (Coffee Provided), 2nd Floor Atrium

**KNB 214 SESSION 1-
Cell and Tissue Engineering,
Gene Therapies, and Bioinformatics**

9:30 – *IL-1b Coated Endovascular Coils promote MSC differentiation and proliferation*
Presenter: Adbhut Mangal
Supervisor: Dr. Alim Mitha

9:43 – *An in vitro Model for the Study of Islet Biology*
Presenter: Muhammad Bilal Hafeez
Supervisor: Dr. Mark Ungrin

9:56 – *Development of an electronic point-of-care device for detection of biomarkers of chronic and infectious disease with split trehalase reagents*
Presenter: Katrin Smith
Supervisor: Dr. Jeroen De Buck

10:09 – *Affects of Bioreactor Shear Stress on Maintenance of Embryonic Stem Cell Pluripotency Cultured in the Absence of LIF*
Presenter: Brett Abraham
Supervisor: Dr. Michael Kallos

10:22 – *Creation of a Glucagon Reporter Cell Line Allows for Efficient Differentiation of Alpha Cells from Human Pluripotent Stem Cells*
Presenter: Victor Tong
Supervisor: Dr. Mark Ungrin

10:35 – *The Effect of Retinal Pigment Epithelium Maturation on Photoreceptor Survival*
Presenter: Saud Sunba
Supervisor: Dr. Mark Ungrin

10:48 – *Biomarker discovery of abdominal aortic aneurysms*
Presenter: Alina Kunitskaya
Supervisor: Dr. Kristina Rinker

11:01 – *Oxygen Diffusion and Permeability of Polymers Used in Tissue Culture*
Presenter: Anthony Demong
Supervisor: Dr. Mark Ungrin

11:14 – *Differential Cytoskeleton Expression between Organotypic and Monolayer Cultures are dependent on Cell Type*
Presenter: Jarin Thundathil
Supervisor: Dr. Mark Ungrin

11:27 – *(iGEM) Toward a Safer Gene Therapy*
Presenter: Thomas Coderre
Supervisor: Dr. Mayi Arcellana-Panlilio

11:40 – *Transcriptional Profile of Schwann Cells Using Bioinformatics Approach*
Presenter: Sourav Saha
Supervisor: Dr. Rajiv Midha

12:00 – LUNCH (Provided), 2nd Floor Atrium

**KNB 214 SESSION 2 -
Medical Imaging, Optics, and Wearables**

13:00 – *Monitoring Hydration Using Microwaves: Towards System Validation*
Presenter: Brendon Besler
Supervisor: Dr. Elise Fear

13:13 – *Assessing Hand Osteoarthritis with HR-pQCT: A Pilot Study*
Presenter: Shaheer Chishti
Supervisor: Dr. Sara Manske

13:26 – *Machine Learning for Automated Landmarking of 3D Face Scans*
Presenter: Sebastian Kopacz
Supervisor: Dr. Nils Forkert

13:39 – *Development of Focused Ultrasound Device For Use In Live Cell Microscopy*
Presenter: Alan Coreas
Supervisor: Dr. Samuel Pichardo

13:52 – *Fiber Photometry for Fluorescence in Deep Brain Structures while Correcting for Hemodynamic Artifacts*
Presenter: Iain Barkley
Supervisor: Dr. Kartikeya Murari

14:05 – *Latency of response evoked by touch vs. thalamic electrical stimulation: Implications for neural prosthesis*
Presenter: Nicole Zalasky
Supervisor: Dr. Zelma Kiss

14:18 – *Optimizing femoral neck fracture surgical treatments using computational methods*
Presenter: Nick Yee
Supervisor: Dr. Steven Boyd

14:31 – *Online data processing with GE human clinical MRI scanners*
Presenter: Craig Macsemchuk
Supervisor: Dr. Samuel Pichardo

14:44 – *Evaluating Handheld 3D Structured Light Scanning for the Quantification of Topographical Indices in Pectus Carinatum*

Presenter: Emma Gray

Supervisor: Dr. Janet Ronsky

14:57 – *Developing a Wearable Intervention to Prevent Lower Back Pain Among Nursing Students: A Pilot Study*

Presenter: Fazeela Mulji

Supervisor: Dr. Linda Duffett-Leger

15:10 – *Effects of 2.45 GHz Radiofrequency Electromagnetic Radiation on Neurite Growth and Synapse Formation*

Presenter: Eric Fung

Supervisor: Dr. Colin Dalton

15:23 – *Investigation of phase-amplitude coupling in major depressive disorder*

Presenter: Matthew Skarsgard

Supervisor: Dr. Zelma Kiss

15:40 – **Closing Remarks**

16:00 – **Presentation of Awards**

9:00 – WELCOME (Coffee Provided), 2nd Floor Atrium

**KNB 427 SESSION 1-
Biomechanics #1**

9:30 – Mechanical fatigue behavior of the rabbit tibia

Presenter: Mattea Lee

Supervisor: Dr. Brent Edwards

9:43 – Computational hemodynamic analyses predict abdominal aortic aneurysmal degeneration and rupture risk

Presenter: Huneza Nadeem

Supervisor: Dr. Elena Di Martino

9:56 – The effects of moderate exercise and prebiotic fibre supplementation on vastus lateralis muscle in a rat model of obesity

Presenter: John Michaiel

Supervisor: Dr. Walter Herzog

10:09 – The Effect of Chondrocyte Depletion on the Structural and Functional Properties of Murine Articular Cartilage

Presenter: Jessica May Corpuz

Supervisor: Dr. Roman Krawetz

10:22 – In-vivo Knee Loading Apparatus

Presenter: Billy Hornaday

Supervisor: Dr. Janet Ronsky

10:35 – Effect of contraction type on serial sarcomere number adaptations

Presenter: Louise Neave

Supervisor: Dr. Walter Herzog

10:48 – Multi-Photon Microscopy of Collagen and Elastin Microstructure in Healthy Porcine and Aneurysmal Human Aortic Tissue under Loading Conditions

Presenter: Larissa Tse

Supervisor: Dr. Elena Di Martino

11:01 – Does residual force enhancement depend on the amount of muscle or fibre stretching?

Presenter: Sheharzad Mahmood

Supervisor: Dr. Walter Herzog

11:14 – Noninvasive assessment of strain in aortic tissue

Presenter: Wafa Anam

Supervisor: Dr. Elena Di Martino

12:00 – LUNCH (Provided), 2nd Floor Atrium

**KNB 427 SESSION 2-
Biomechanics #2**

13:00 – An investigation of biomechanical risk factors of sport-specific movement tasks in youth basketball players

Presenter: Mathieu Chin

Supervisor: Dr. Kati Pasanen

13:13 – Investigating The Effects of Constraining Pedal Force Direction in Cycling on Force Output, and the Role of Bi-Articular Muscles in Force Control

Presenter: Brennan O'Yeung

Supervisor: Dr. Walter Herzog

13:26 – Kinematics of Patellar Tendinopathy using Computed Tomography Imaging and High-Speed Biplanar Videography

Presenter: Jongsuk Han

Supervisor: Dr. Janet Ronsky and Dr. Gregor Kuntze

13:39 – Force after active stretch is not reduced in damaged skinned muscle fibres

Presenter: Sadhiq Nazeer

Supervisor: Dr. Walter Herzog

13:52 – The Mechanical Properties of the Aponeurosis and Achilles Tendon System From Uniaxial Tensile Tests

Presenter: Maria Hernandez

Supervisor: Dr. Walter Herzog

14:05 – Control of Pedal Force Direction in Cycling

Presenter: Joonhwan Shin

Supervisor: Dr. Walter Herzog

14:18 – Chondrocyte Viability in Cracked Articular Cartilage under Dynamic Loading

Presenter: Neum Jelani

Supervisor: Dr. Walter Herzog

14:31 – Effects of load carriage on biomechanical variables associated with tibial stress fracture during running

Presenter: Michael Esposito

Supervisor: Dr. Brent Edwards

14:44 – 2D Cartilage Strain Distribution Map for Physiological Loadings Conditions

Presenter: Ross Crichton

Supervisor: Dr. Walter Herzog

14:57 – *Chondrocyte Deformations for Dynamic Loading Conditions in Articular Knee Cartilage*

Presenter: Matteo Biglioli

Supervisor: Dr. Walter Herzog

15:40 – **Closing Remarks**

16:00 – **Presentation of Awards**