

## 2016 Summer Biomechanics, Bioengineering, and Biotransport Conference Student Paper Competition

### Introduction

As in past years, a Student Paper Competition was held at the 2016 Summer Biomechanics, Bioengineering, and Biotransport Conference (SB<sup>3</sup>C). There were three competition levels: Ph.D., M.S., and B.S. The competition was divided into multiple technical areas to provide for a fair evaluation of students' work. There were also cash awards for the top three student papers in each area. We are pleased to recognize the following awardees from the 2016 SB<sup>3</sup>C.

### B.S. Competition Winners

*Physiology and Diseases, Cellular and Tissue Mechanics, and Biomaterial and Material Characterization.*

First Place: **John P. Carruth**, University of Minnesota, "Ultrasound Measurement of Shape Change During In Vitro Inflation of an Arterial Bifurcation."

Second Place: **Jason A. Shar**, University of Mount Union, "The Characterization of the Bone Marrow Mechanical Environment Using Poroelastic Models With Material Properties Determined From Micro-Finite Element Modeling."

Third Place: **Jesse W. Geringer**, University of Illinois, Chicago, "Three-Element Windkessel Model to Describe Pulmonary Vasculature Changes in Hypertensive Rat."

*Imaging, Devices, Human Dynamics and Injury, Fluids and Microfluidics, and Heat Transfer.*

First Place: **Boston C. Terry**, University of Utah, "DTI Voxel-Wise Analysis of Mild TBI in Neonatal Pigs Following Non-Impact Head Rotation."

Second Place: **Nicole L. Zaino**, Clarkson University, "Characterizing a Novel Ex-Vivo Animal Knee Model: ACL Rupture and Meniscus Compressive Strength."

Third Place: **Mark C. Daley**, Bucknell University, "Characterization of Particulate and Vapor Phase Nicotine in Electronic Cigarettes."

### M.S. Competition Winners

*Physiology and Diseases, Cellular and Tissue Mechanics, and Biomaterial and Material Characterization.*

First Place: **Sonia Kartha**, University of Pennsylvania, "Early Production of Phospholipase A2 Accompanies Spinal Neuroinflammation and Pain Following Nerve Root Compression."

Second Place: **Thien-Khoi N. Phung**, University of Virginia, "Effect of Ablation Pattern on Mechanical Function the Atrium: A Finite-Element Study."

Third Place: **Babak N. Safa**, University of Delaware, "Long-Term Exposure to Buffer Solution Alters Tendon Structure and Mechanics-Implications for Fatigue Studies."

Third Place: **Sonia Bansal**, University of Pennsylvania, "Disorganized Layers Within an Otherwise Aligned Fibrous Network Preserve Bulk Mechanics and Promotes Strain Reconstitution in the Context of Radial Tears."

*Imaging, Devices, Human Dynamics and Injury, Fluids and Microfluidics, and Heat Transfer.*

First Place: **David R. Rutkowski**, University of Wisconsin, "Comprehensive Hemodynamics of Living Donor Liver Transplant."

Second Place: **Brian A. Smith**, Virginia Commonwealth University, "Patient Specific Computational Models to Optimize Surgical Correction for Flatfoot Deformity."

Third Place: **Eamon Campolettano**, Virginia Tech, "Drill-Specific Head Impact Exposure in Youth Football Practice."

### Ph.D. Competition Winners

*Signaling and Remodeling.*

First Place: **Alison Schroer**, Vanderbilt University, "Cadherin-11 Exacerbates Maladaptive Remodeling After Myocardial Infarction."

Second Place: **Chantal M. J. de Bakker**, University of Pennsylvania, "Reproduction Induces Adaptation of the Maternal Skeleton and Alters Patterns of Postmenopausal Bone Loss."

Third Place: **Lauren M. Mangano**, Boston University, "Local Changes to the Growth Plate in Response to Injury."

*Mechanosensing and Mechanics.*

First Place: **Brian D. Cosgrove**, University of Pennsylvania, "N-Cadherin Adhesive Interactions Modulate ECM Mechanosensing and Fate Commitment in Mesenchymal Stem Cells."

Second Place: **Jared L. Zitnay**, University of Utah, "Molecular Level Detection and Quantification of Collagen Mechanical Damage Using Collagen Hybridizing Peptides."

Third Place: **Julia C. Quindlen**, University of Minnesota, "A Multiphysics Model of the Pacinian Corpuscle."

*Tissue Mechanics and Modeling.*

First Place: **Christopher E. Korenczuk**, University of Minnesota, "Tsai-Hill Maximum-Work Theory as a Failure Criterion for Fibrous Biological Tissues."

Second Place: **Vahhab Zarei**, University of Minnesota, "Subject-Specific vs. Averaged Structural Models of the Collagen Network in the Lumbar Facet Capsular Ligament."

Third Place: **Jack A. Martin**, University of Wisconsin, "Dynamic Imaging of Tendon Tissue Stress."

*Biomechanics of Injury.*

First Place: **Fidel Hernandez**, Stanford University, "Coronal Head Rotation and Rapid Corpus Callosum Tract Strain in Sports-Related Mild Traumatic Brain Injury."

Second Place: **Krista M. Durney**, Columbia University, “Principal Component Analysis of Friction Force Hysteresis Curves for Detecting Fatigue Failure and Generating Frictional S-N Curves for Articular Cartilage.”

Third Place: **Chelsey Dunham**, Washington University, “Alterations in the Anterior Capsule Correlate With Impaired Joint Mechanics in a Rat Elbow Model of Post-Traumatic Joint Stiffness.”

*Cardiac and Vascular.*

First Place: **David A. Schreier**, University of Wisconsin, “Acute Effects of Cell Free Hemoglobin and Sickled Red Blood Cells on Pulmonary Vascular Impedance in Otherwise Healthy Mice.”

Second Place: **Zaw Win**, University of Minnesota, “Cellular Architecture Dictates Anisotropic Mechanical Properties of Vascular Smooth Muscle Cells.”

Third Place: **Abhay B. Ramachandra**, Stanford University, “Virtual Evaluation of Surgical Revascularization Techniques in Coronary Artery Bypass Surgery.”

*Devices, Microfluidics, and Sensing.*

First Place: **Bhavana Mohanraj**, University of Pennsylvania, “Programming ‘On-Demand’ Delivery From Mechanically Activated Microcapsules.”

Second Place: **Nicole Varble**, SUNY University at Buffalo, “Error and Uncertainty Quantification of a Commercial CFD Solver in an Intracranial Aneurysm.”

Third Place: **Yiru Wang**, University of Minnesota, “Thermal Contrast Amplification (TCA) Readers Improve the Limit of Detection for Influenza and Malaria Lateral Flow Assays.”