Summer Biomechanics, Bioengineering and Biotransport Conference 2019

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Volume 1 of 2

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1 Podium Sessions

Tuesday, June 25	3:45PM - 5:15PM

Thermal Damage Processes in Tissues — Sunburst

Session Chair: Rupak Banerjee *University of Cincinnati*
Session Co-Chair: Liang Zhu *University of Maryland Baltimore County*

3:45PM **Adventures In Thermal Therapy: From Surgery To Cancer Treatment** SB^{3}C2019-001
John Pearce[1], [1]*The University of Texas at Austin, United States*

4:00PM **Microwave Thermal Therapy of Benign Adrenal Adenomas For Treatment of Primary Aldosteronism** SB^{3}C2019-002
Punit Prakash[1], Martin O'Halloran[2], Michael Dennedy[2], [1]*Kansas State University, United States,* [2]*National University of Ireland - Galway, Ireland*

4:15PM **Metabolize Or Die: John Pearce'S Fascination With Bioenergetics In Cancer, and What We Know (and do Not Know) Now** SB^{3}C2019-003
Michael Graner[1], Petr Paucket[2], Natalie Serkova[3], Anthony Fringuello[1], Steven Ojemann[1], Aviva Abosch[1], Julia Craft[1], Xiaoli Yu[1], [1]*University of Colorado Denver, Anschutz Medical Campus, Department of Neurosurgery, United States,* [2]*University of Colorado Denver, Anschutz Medical Campus, Department of Neurology, United States,* [3]*University of Colorado Denver, Anschutz Medical Campus, Department of Anesthesiology, United States*

4:30PM **Examining Arrhenius Kinetics Over A Large Temperature Range** SB^{3}C2019-004
Daipayan Sarkar[1], Peiyuan Kang[1], Zhenpeng Qin[1], [1]*University of Texas at Dallas, United States*

4:45PM **Heating Protocol Design Affected By Thermal Damage Model In Magnetic Nanoparticle Hyperthermia For Cancer Treatment** SB^{3}C2019-005
Manpreet Singh[1], Qimei Gu[1], Ronghui Ma[1], Liang Zhu[1], [1]*University of Maryland Baltimore County, United States*

Tuesday, June 25	3:45PM - 5:15PM

Heart Valve Mechanics and Cardiovascular Devices — Snowflake

Session Chair: Ankush Aggarwal *University of Glasgow*
Session Co-Chair: Ali Akyildiz *Erasmus Medical Center*

3:45PM **A Physiologically-Driven Biaxial Bioreactor System To Investigate Valve Interstitial Cell Phenotypic State After Surgical Repair** SB^{3}C2019-006
Salma Ayoub[1], Jordan Graves[1], Chung-Hao Lee[2], Michael Sacks[1], [1]*The University of Texas at Austin, United States,* [2]*The University of Oklahoma, United States*

4:00PM **Restriction of Annulus Movement Alters The Dynamic Deformation and Strain Distribution of The Tricuspid Valve Leaflets: A Simulation Study** SB^{3}C2019-007
Keyvan Amini Khoiy[1], Rouzbeh Amini[1], [1]*The University of Akron, United States*

4:15PM **Tricuspid Valve Leaflet Strains In The Beating Ovine Heart** SB^{3}C2019-008
Manuel Rausch[1], Mrudang Mathur[1], William Meador[1], Marcin Malinowski[2], Tomasz Jazwiec[2], Tomasz Timek[2], [1]*University of Texas at Austin, United States,* [2]*Spectrum Health, United States*

4:30PM **Materially Heterogeneous Annuloplasty Ring Reduces Loading On Posterior Annular Sutures** SB^{3}C2019-009
Beatrice Ncho[1], Eric Pierce[1], Ajit Yoganathan[1], [1]*Georgia Institute Of Technology, United States*

4:45PM **3d Reconstructions of Deployed Coronary Stents In The Clinical Setting: Investigation of Distortion Effects From Curvature On The Circumferential Orientation of Oct Images** SB^{3}C2019-010

Mark Elliott[1], David Molony[2], Brigham Smith[3], Sarang Joshi[1], Habib Samady[2], Lucas Timmins[1], *[1]University of Utah, United States, [2]Emory University School of Medicine, United States, [3]University of Utah School of Medicine, United States*

5:00PM **Effects of Right Ventricular Assist Device On Treating Pulmonary Arterial Hypertension: An In-Silico Study Using Image Based Biventricular Modeling Framework** SB^{3}C2019-011

Sheikh Mohammad Shavik[1], Lik Chuan Lee[1], *[1]Michigan State University, United States*

Tuesday, June 25 | 3:45PM - 5:15PM

Cardiovascular Biomechanics and Tissue Engineering — Wintergreen

Session Chair: Joao Soares *Virginia Commonwealth University*
Session Co-Chair: Zhijie Wang *Colorado State University*

3:45PM **Controlling Compliance of Polycaprolactone/gelatin Tissue Engineered Vascular Graft In A Rat Model** SB^{3}C2019-012

Kenneth Furdella[1], Shinichi Higuchi[1], Kang Kim[1], William Wagner[1], Jonathan Vande Geest[1], *[1]University of Pittsburgh, United States*

4:00PM **A Bio-Chemo-Mechanical Computational Model of Tissue Engineered Vascular Graft Development In Vivo** SB^{3}C2019-013

Ramak Khosravi[1], Abhay Ramachandra[1], Jason Szafron[1], Christopher Breuer[2], Jay Humphrey[1], *[1]Yale University, United States, [2]Nationwide Children's Hospital, United States*

4:15PM **Role of Hyaluronic Acid In Regulation of Contractile Forces In Heart Valve Tissue Constructs** SB^{3}C2019-014

Ying Lei[1], Luciano Bortolin[1], Frank Benesch-Lee[1], Teniola Oguntolu[1], Kristen Billiar[1], *[1]Worcester Polytechnic Institute, United States*

4:30PM **Adipose Stromal Cell Secreted Factors Induce The Elastogenesis Cascade Within Aortic Smooth Muscle Cells** SB^{3}C2019-015

Aneesh Ramaswamy[1], Rachel Sides[1], Eoghan Cunnane[2], David Vorp[1], Justin Weinbaum[1], *[1]University of Pittsburgh, United States, [2]University of Pittsburgh; Royal College of Surgeons in Ireland, United States*

4:45PM **Quantifying and Modeling Spatial Heterogeneity In Valve Interstitial Cells** SB^{3}C2019-016

Emma Lejeune[1], Alex Khang[1], Michael Sacks[1], *[1]University of Texas at Austin, United States*

5:00PM **Cyclic Stretch Causes Liberation of Caveolin-1 In Extracellular Vesicles From Vascular Smooth Muscle Cells** SB^{3}C2019-017

Mohammad Shaver[1], Jessica Molina[1], Joshua Daniel Hutcheson[1], *[1]Biomedical Engineering Department of Florida International University, United States*

Tuesday, June 25 | 3:45PM - 5:15PM

Mechanics of Cartilage in Health and Disease — Seasons 1-3

Session Chair: Corinne Henak *University of Wisconsin-Madison*
Session Co-Chair: Corey Neu *University of Colorado Boulder*

3:45PM **Focal Chondral Defects In The Dysplastic Hip Cause Activity- and Size-Dependent Increases In Stress and Strain** SB^{3}C2019-018

Jocelyn Todd[1], Travis Maak[1], Jeffrey Weiss[1], [1]*University of Utah, United States*

4:00PM **Mechanical Property Changes In The Tibial Plateau Cartilage Following Traumatic Injury and Repair Procedures To The Lapine Knee** SB^{3}C2019-019

Patrick Vaughan[1], Feng Wei[1], Albane Fauron[1], Loic Dejardin[1], Tammy Haut Donahue[2], Roger Haut[1], [1]*Michigan State University, United States,* [2]*University of Massachusetts - Amherst, United States*

4:15PM **Collagen-Derived Residual Stress Enhances The Biphasic Lubrication Property In Articular Cartilage** SB^{3}C2019-020

Hiromichi Fujie[1], Soh Morishita[1], Seido Yarimitsu[1], [1]*Tokyo Metropolitan University, Japan*

4:30PM **Shorter More Regular Activity Improves Cartilage Function Compared To Longer Less Regular Activity** SB^{3}C2019-021

Brian Graham[1], Axel Moore[2], David Burris[1], Christopher Price[1], [1]*University of Delaware, United States,* [2]*Imperial College London, United Kingdom*

4:45PM **Impact of Decorin On Cartilage Pericellular Matrix Micromechanics and Chondrocyte Mechanotransduction** SB^{3}C2019-022

Daphney R. Chery[1], Prashant Chandrasekaran[1], Qing Li[1], Biao Han[1], Su Chin J. Heo[2], Renato V. Iozzo[3], Motomi Enomoto-Iwamoto[4], Robert L. Mauck[2], Lin Han[1], [1]*School of Biomedical Engineering, Science and Health Systems, Drexel University, United States,* [2]*Department of Orthopaedic Surgery, University of Pennsylvania, United States,* [3]*Department of Pathology, Anatomy and Cell Biology, Thomas Jefferson University, United States,* [4]*Department of Orthopedics, University of Maryland, United States*

5:00PM **Through-Thickness Patterns of Shear Strain Change With Early-Stage Progression of Osteoarthritis** SB^{3}C2019-023

Franz Maier[1], Courtland G. Lewis[2], David M. Pierce[1], [1]*University of Connecticut, United States,* [2]*Hartford Healthcare, United States*

Tuesday, June 25 | 3:45PM - 5:15PM

Reproductive and Abdominal Biomechanics — Seasons 4-5

Session Chair: Raffaella De Vita *Virginia Tech*
Session Co-Chair: Kristin Miller *Tulane University*

3:45PM **Material Property Characterization of Human Cervical Tissue Based On Biphysical Viscoelastic Model** SB^{3}C2019-024

Lei Shi[1], Joy Vink[2], Ronald Wapner[2], Kristin Myers[1], [1]*Department of Mechanical Engineering, Columbia University, United States,* [2]*Department of Obstetrics and Gynecology, Columbia University, United States*

4:00PM **Effects of Pelvic Organ Prolapse On The Biaxial Biomechanical Behavior of Post-Menopausal Uterosacral Ligament** SB^{3}C2019-025

Elvis Danso[1], Jason Schuster[1], Isabella Johnson[1], Emily Harville[1], Laurephile Desrosiers[2], Leise Knoepp[2], Kristin Miller[1], [1]*Tulane University, United States,* [2]*Ochsner Clinical School, United States*

4:15PM **Rupture Mechanisms of The Vagina Under Inflation** SB^{3}C2019-026

Jeffrey McGuire[1], Woowon Lee[2], Kimani Toussaint[2], Caleb Stine[1], Jennifer Munson[1], Raffaella De Vita[3], [1]*Virginia Tech, United States,* [2]*University of Illinois at Urbana Champaign, United States,* [3]*Virginia tech, United States*

4:30PM **Remodeling of The Diabetic Urinary Bladder: A Comparison of An Obese and A Lean Animal Model of Type Ii Diabetes** SB^{3}C2019-027

Marissa Grobbel[1], Matthew Lewis[1], Anne Tonson[1], Robert Wiseman[1], Sara Roccabianca[1], [1]*Michigan State University, United States*

4:45PM **Lactating Human Breast Response To Infant Oral Movements** SB^{3}C2019-028
Diana Alatalo[1], Lin Jiang[1], Fatemeh Hassanipour[1], *[1]The University of Texas at Dallas, United States*

5:00PM **Contribution To The Understanding of The Genese of The Ligamental System of The Pelvic System** SB^{3}C2019-029
Olivier Mayeur[1], Mathias Brieu[2], Michel Cosson[3], *[1]Centrale Lille, France, [2]California State University, United States, [3]CHR Lille - Jeanne de Flandres, France*

Tuesday, June 25	**3:45PM - 5:15PM**

Biomedical Engineering Education — Hemlock

Session Chair: Sara Wilson *University of Kansas*
Session Co-Chair: Choon Hwai Yap *National University of Singapore*

3:45PM **Broadening Research Exposure and Research Participation In Mechanical Engineering: Findings From The Umbc Me S-Stem Scholarship Program** SB^{3}C2019-030
Liang Zhu[1], Ronghui Ma[1], Deepa Madan[1], Charles Eggleton[1], L. D. Timmie Topoleski[1], Shuyan Sun[1], *[1]University of Maryland Baltimore County, United States*

4:00PM **Lessons Learned: Five Years of The Biomedical Engineering In Simulations, Imaging, and Modeling (bme-Sim) Reu Site** SB^{3}C2019-031
Stephanie George[1], *[1]East Carolina University, United States*

4:15PM **Incorporating Clinical Rotations, Online Lectures, and Business Concepts In Bme Senior Capstone Design: Are We There Yet?** SB^{3}C2019-032
Alan Eberhardt[1], Joel Dobbs[1], *[1]University of Alabma at Birmingham, United States*

4:30PM **Outcomes of Incorporating Clinical Simulation Laboratories In Biomedical Engineering Education** SB^{3}C2019-033
Anita Singh[1], Dawn Ferry[1], *[1]Widener University, United States*

4:45PM **Industrial Ergonomics Risk Assessment Meets Research In The Biomechanics Classroom** SB^{3}C2019-034
Johannes Brombach[1], Megan DeRidder[2], Laurel Kuxhaus[2], *[1]University of Applied Sciences, Germany, [2]Clarkson University, United States*

5:00PM **On The Role of Project-Based Active Learning Techniques On Computer Programming Self-Efficacy of Undergraduate Biomedical Engineering Students and The Interactive Effects of Gender** SB^{3}C2019-035
S. Cyrus Rezvanifar[1], Rouzbeh Amini[1], *[1]The University of Akron, United States*

Tuesday, June 25	**3:45PM - 5:15PM**

Respiratory, Lymphatic, Ocular and Other Organ System Fluid Mechanics — Fox Den

Session Chair: Jessica Oakes *Northeastern University*

3:45PM **Numerical Modeling of Lamina Cribrosa Hemodynamics** SB^{3}C2019-036
Yi Hua[1], Bryn L. Brazile[1], Ian A. Sigal[1], *[1]University of Pittsburgh, United States*

4:00PM **Particle Deposition Correlates With Wall Shear Stress Divergence In Human Airways** SB^{3}C2019-037
Ali Farghadan[1], Kamran Poorbahrami[2], Sahar Jalal[3], Jessica Oakes[2], Filippo Coletti[3], Amirhossein Arzani[1], *[1]Northern Arizona University, United States, [2]Northeastern University, United States, [3]University of Minnesota, United States*

4:15PM **Computational Modeling of Pathogen Leakage Through N95 Respirators** SB^{3}C2019-038
Prasanna Hariharan[1], Neha Sharma[2], Gavin D'Souza[2], Suvajyoti Guha[1], Rupak Banerjee[2], Matthew Myers[1], *[1]US Food and Drug Administration, United States, [2]University of Cincinnati, United States*

4:30PM **Regional Targeting of Therapeutic Particles In Healthy and Asthmatic Lungs** SB^{3}C2019-039
Kamran Poorbahrami[1], Sean Fain[2], David Mummy[2], Jessica Oakes[1], *[1]Northeastern University, United States, [2]University of Wisconsin-Madison, United States*

4:45PM **Differential Effects of Bladder Outlet Obstruction Associated Pressure Cycling On Urothelial Cell Inflammation and Fibrosis In Vitro** SB^{3}C2019-040
Cody Dunton[1], Todd Purves[2], Francis Hughes[2], Jiro Nagatomi[1], *[1]Clemson University, United States, [2]Duke University Medical Center, United States*

5:00PM **Effect of Airway Cilia Properties On Its Physiological Functioning** SB^{3}C2019-041
Uduak George[1], *[1]San Diego State University, United States*

Wednesday, June 26	**9:30AM -11:00AM**

Drug Delivery in Cancer, Ocular, and Central Nervous Systems

Sunburst

Session Chair: Ying Li *University of Connecticut*
Session Co-Chair: Bryn Martin *University of Idaho*

9:30AM **In Vivo Measurement of Bevacizumab Diffusion Coefficient In The Rabbit Vitreous Humor Using Fluorescein Labeling** SB^{3}C2019-042
Anita Penkova[1], Shuqi Zhang[1], Komsan Rattanakijsuntorn[2], Mark Humayun[1], Juan Carlos Martinez[1], Alejandra Gonzalez Calle[1], Ana Galesic[1], Abegail Tadle[1], Mattew Pratt[1], Mark Thompson[1], Satwindar Sadhal[1], *[1]University of Southern California, United States, [2]Ubon Ratchathani University, Thailand*

9:45AM **Precise Targeting of Polr2a As A Therapeutic Strategy For Human Triple Negative Breast Cancer** SB^{3}C2019-043
Jiangsheng Xu[1], Xiaoming He[1], *[1]University of Maryland, United States*

10:00AM **Characterization of Injection-Induced Tissue Swelling During Subcutaneous Injection of Biologics** SB^{3}C2019-044
Yingnan Shen[1], Bumsoo Han[1], *[1]Purdue University, United States*

10:15AM **Analysis of Convective and Diffusive Transport In The Brain Interstitium** SB^{3}C2019-045
Lori Ray[1], Jeff Iliff[2], Jeff Heys[1], *[1]Montana State University, Chemical & Biological Engineering, United States, [2]Ohsu, United States*

10:30AM **Three-Dimensional Nonlinear Biphasic Finite Element Model of Backflow During Flow-Controlled Infusions Into The Brain** SB^{3}C2019-046
Gustavo Orozco[1], Joshua Smith[2], Jos Garca[3], *[1]University of Eastern Finland, Finland, [2]Lafayette College, United States, [3]Universidad del Valle, Colombia*

10:45AM **Relating Chemical and Physical Properties of Oligonucleotide Polyelectrolyte Complex Micelles** SB^{3}C2019-047
Alexander Marras[1], Jeffrey Vieregg[1], Jeffrey Ting[1], Matthew Tirrell[1], *[1]University of Chicago, United States*

Wednesday, June 26	9:30AM -11:00AM

Growth Remodeling and Repair I — Snowflake

Session Chair: Colleen Witzenburg *University of Wisconsin*
Session Co-Chair: Sara Roccabianca *Michigan State University*

9:30AM **Structural Remodeling and Volumetric Growth In The Right Ventricle Under Pulmonary Arterial Hypertension** SB^{3}C2019-048
Reza Avaz[1], Emilio Mendiola[1], Michael Sacks[2], *[1]UT Austin, United States, [2]University of Texas at Austin, United States*

9:45AM **Mathematical Modeling of Regional Hypertensive Aortic Remodeling Reveals A Critical Role For Inflammation** SB^{3}C2019-049
Marcos Latorre[1], Matthew Bersi[2], Jay Humphrey[1], *[1]Yale University, United States, [2]Vanderbilt University, United States*

10:00AM **Effect of Glucose On The Interlamellar Bonding of Arterial Elastin** SB^{3}C2019-050
Ruizhi Wang[1], Xunjie Yu[1], Yanhang Zhang[1], *[1]Boston University, United States*

10:15AM **Cortical Thickness Differences Emerge From Passive Physical Forces Generated By Growth** SB^{3}C2019-051
Maria Holland[1], Ellen Kuhl[2], Alain Goriely[3], *[1]University of Notre Dame, United States, [2]Stanford University, United States, [3]University of Oxford, United Kingdom*

10:30AM **Targeting Cadherin-11 For Renal Fibrosis** SB^{3}C2019-052
Tessa Huffstater[1], Leslie Gewin[1], W. David Merryman[1], *[1]Vanderbilt University, United States*

10:45AM **Plastic Remodeling of Collagen Upon Tumor Growth Alters Fluid Transport Properties of The Extracellular Matrix** SB^{3}C2019-053
Jacopo Ferruzzi[1], Meng Sun[1], Anastasia Gkousioudi[1], Anahita Pilvar[1], Darren Roblyer[1], Yanhang Zhang[1], Muhammad Zaman[1], *[1]Boston University, United States*

Wednesday, June 26	9:30AM -11:00AM

Celebration of YC Fung's 100th Birthday — Wintergreen

Session Chair: Grace O'Connell *UC Berkeley*

9:30AM **Yc Fung Symposium Introduction** SB^{3}C2019-054
Robert Nerem

9:45AM **Pulmonary Arterial Mechanics: Something Old, Something New, Something Borrowed, Something Blue** SB^{3}C2019-055
Naomi Chesler[1], *[1]University of Wisconsin - Madison, United States*

10:00AM **Coronary Calcifications: From Vesicles To Plaque Rupture** SB^{3}C2019-056
Natalia Maldonado[1], Luis Cardoso[2], Sheldon Weinbaum[2], *[1]New York City College of Technology, United States, [2]The City College of New York, United States*

10:15AM **The Impact of Hemodynamic Reflex Compensation Following Myocardial Infarction On Subsequent Ventricular Growth** SB^{3}C2019-057
Colleen Witzenburg[1], Jeffrey Holmes[2], *[1]University of Wisconsin, United States, [2]University of Virginia, United States*

10:30AM **Effect of Ltbp-3 On The Circumferential and Axial Mechanics of The Aorta In A Mouse Model of Marfan Syndrome** SB^{3}C2019-058

Arina Korneva[1], Arunika Makam[2], Jay Humphrey[1], Chiara Bellini[2], *[1]Yale University, United States, [2]Northeastern University, United States*

10:45AM **Contribution of Matrix Remodeling To Biaxial Mechanics of Right-Ventricular Myocardium In Pulmonary Arterial Hypertension** SB^{3}C2019-059

Daniela Velez-Rendon[1], Justin Shieh[2], Daniela Valdez-Jasso[2], *[1]University of Illinois at Chicago, United States, [2]University of California San Diego, United States*

Wednesday, June 26 | 9:30AM -11:00AM

Biomechanics of Lower and Upper Extremities — Seasons 1-3

Session Chair: Mariana Kersh *University of Illinois at Urbana-Champaign*
Session Co-Chair: Jennifer Wayne *Virginia Commonwealth University*

9:30AM **Flexion Angle Dependent Differences In Joint Kinematics and Acl Force In Response To Applied Loads Are Conserved Throughout Skeletal Growth In The Porcine Stifle Joint** SB^{3}C2019-060

Stephanie Cone[1], Danielle Howe[1], Emily Lambeth[1], Jorge Piedrahita[2], Jeffrey Spang[3], Matthew Fisher[1], *[1]North Carolina State University and the University of North Carolina – Chapel Hill, United States, [2]North Carolina State University, United States, [3]University of North Carolina – Chapel Hill, United States*

9:45AM **A Novel Geometric Ratio To Predict The Flexion Gap In Total Knee Arthroplasty** SB^{3}C2019-061

Shady Elmasry[1], Peter Sculco[1], Timothy Wright[1], Andrew Pealre[1], Michael Cross[1], David Mayman[1], Cynthia Kahlenberg[1], Geoffrey Westrich[1], Carl Imhauser[1], *[1]Hospital for Special Surgery, United States*

10:00AM **Micromotion In Tibial Components Recovered Post Mortem: A Pilot Study** SB^{3}C2019-062

Heath Baskin[1], Elie Ghanem[1], Jack Lemons[1], Alan Eberhardt[1], *[1]University of Alabama at Birmingham, United States*

10:15AM **Computational Mechanics Demonstrate How A Transcondylar Screw Enhances Healing of Subchondral Bone Cysts** SB^{3}C2019-063

Lance Frazer[1], Elizabeth Santschi[2], Kenneth Fischer[1], *[1]University of Kansas, United States, [2]Kansas State University, United States*

10:30AM **A Generalized Framework For Objective Determination of Functional Musculoskeletal Joint Coordinate Systems** SB^{3}C2019-064

Tara Nagle[1], Ahmet Erdemir[1], Robb Colbrunn[1], *[1]Cleveland Clinic, United States*

10:45AM **Cartlage Contact Stiffness Effects On Contact Pressure and Area At The Elbow Joint** SB^{3}C2019-065

Jonathan Parman[1], Cuneyd Gunay[2], Akin Cil[1], Antonis Stylianou[1], *[1]University of Missouri - Kansas City, United States, [2]Eskisehir Osmangazi University, Turkey*

Wednesday, June 26	9:30AM -11:00AM

Ocular Biomechanics — Seasons 4-5

Session Chair: Rouzbeh Amini *The University of Akron*
Session Co-Chair: Andrew Feola *Atlanta VA and Georgia Institute of Technology*

9:30AM **A Multiscale Finite Element Modeling Approach To Characterize Iris Deformation** SB^{3}C2019-066
Vineet Thomas[1], Sam Salinas[1], Anup Pant[1], Syril Dorairaj[2], Rouzbeh Amini[1], *[1]The University of Akron, United States, [2]Mayo Clinic, United States*

9:45AM **Correlation of Human Lamina Cribrosa Strain Response To Axon Counts In The Optic Nerve Across Racioethnic Donor Eyes** SB^{3}C2019-067
Hirut Kollech[1], Reza Behkam[1], Katelyn Axman[1], Jr-Jiun Liou[1], Jonathan Vande Geest[1], *[1]University of Pittsburgh, United States*

10:00AM **Tensile Behavior of Anterior and Posterior Corneal Flaps Subjected To Cxl Treatment Procedure** SB^{3}C2019-068
Hamed Hatami-Marbini[1], *[1]University of Illinois at Chicago, United States*

10:15AM **Genomic Loci Modulating Ocular Compliance In Mice** SB^{3}C2019-069
Elizabeth Boazak[1], Cassandra Chu[1], Rebecca King[2], Joseph Sherwood[3], Darryl Overby[3], Eldon Geisert[2], C. Ross Ethier[1], *[1]The Georgia Institute of Technology, United States, [2]Emory University, United States, [3]Imperial College London, United Kingdom*

10:30AM **Characterizing The Actin and Gfap Network Structure of The Astrocytic Lamina In Mouse Eyes** SB^{3}C2019-070
Yik Tung Tracy Ling[1], Mary Pease[2], Harry Quigley[2], Thao (Vicky) Nguyen[1], *[1]Department of Mechanical Engineering, Johns Hopkins University, United States, [2]Wilmer Eye Institute, Johns Hopkins University, United States*

10:45AM **Snapshot Polarized Light Microscopy To Visualize and Quantify Collagenous Soft Tissue Microstructure At 156 Frames/second** SB^{3}C2019-071
Bin Yang[1], Po-Yi Lee[1], Bryn Brazile[1], Ian Sigal[1], *[1]University of Pittsburgh, United States*

Wednesday, June 26	9:30AM -11:00AM

Human Movement and Gait — Hemlock

Session Chair: Wu Pan Zagorski *Lear Corporation*
Session Co-Chair: Antonis Stylianou *University of Missouri Kansas City*

9:30AM **A Human Cadaveric Model For Quantifying Knee Joint Mechanics During Simulated Gait: Effect of Astm and Iso Derived Input Profiles** SB^{3}C2019-072
Amanda Wach[1], Olufunmilayo Adebayo[1], Caroline Brial[1], Tony Chen[1], Russell Warren[1], Peter Torzilli[1], Suzanne Maher[1], *[1]Hospital for Special Surgery, United States*

9:45AM **Predicted Gait Alterations Due To A Unilateral Reduction In Muscle Synergies** SB^{3}C2019-073
Marleny Arones[1], Carolynn Patten[2], Benjamin J. Fregly[1], *[1]Rice University, United States, [2]University of California, United States*

10:00AM **System Identification of Pressure-Measuring Insoles For Determining Ground Reaction Force During Walking** SB^{3}C2019-074
Jessica DeBerardinis[1], Janet S. Dufek[1], Mohamed B. Trabia[1], Yann Le Gall[2], Nicolas Da Silva Sacoto[2], *[1]University of Nevada Las Vegas, United States, [2]Ecole Superieure d'Electronique de l'Ouest, France*

10:15AM **Utilizing Cross-Correlation To Determine Phase Shift In Gait Data For A Neural Prosthesis** SB^{3}C2019-075
Martin L. Tanaka[1], David Hudson[1], *[1]Western Carolina University, United States*

10:30AM **Movement Patterns In Dancers** SB^{3}C2019-076
Rita Patterson[1], Nathan Hersberger[1], Elizabeth Balyakina[1], Sajid Surve[1], *[1]University of North Texas Health Science Center, United States*

10:45AM **Can Superhydrophobic Slip Flow Improve Centrifugal Blood Pump Performance and Reduce Blood Damage?** SB^{3}C2019-077
Wei Xuan Chan[1], Vivek Vasudevan[1], Jia Jun Low Adriel[1], Janani Venkatesan[1], Choon-Hwai Yap[1], *[1]National University of Singapore, Singapore*

Wednesday, June 26 | 9:30AM -11:00AM

Data Driven Fluid Mechanics Modeling and Visualization — Fox Den

Session Chair: Alejandro Roldan-Alzate *University of Wisconsin-Madison*

9:30AM **Non-Invasive Diagnostics of Coronary Artery Disease Using Machine Learning and Computational Fluid Dynamics** SB^{3}C2019-078
Kritika Iyer[1], Christopher J. Arthurs[2], Cyrus P. Najarian[1], S.M. Reza Soroushmehr[1], Brahmajee K. Nallamothu[1], C. Alberto Figueroa[1], *[1]University of Michigan, United States, [2]King's College London, United Kingdom*

9:45AM **Statistical Modeling For Assessment of Aneurysm Rupture Status - Implications For Japanese and Finnish Populations** SB^{3}C2019-079
Felicitas Detmer[1], Sara Hadad[1], Sven Hirsch[2], Philippe Bijlenga[3], Yuya Uchiyama[4], Juhana Frsen[5], Juan Cebral[1], *[1]George Mason University, United States, [2]ZHAW University of Applied Sciences, Switzerland, [3]University of Geneva, Switzerland, [4]Tokyo University of Science, Japan, [5]Kuopio University Hospital, Finland*

10:00AM **Accelerating Cardiovascular Model Building With Convolutional Neural Networks** SB^{3}C2019-080
Gabriel Maher[1], Nathan Wilson[2], Alison Marsden[1], *[1]Stanford University, United States, [2]Open Source Medical Software Corporation, United States*

10:15AM **Cardiac Motion Tracking From Noisy Ultrasound Images - Exploiting Cyclic Constraint Fitted To Non-Ridgid Image Registration** SB^{3}C2019-081
Hadi Wiputra[1], Wei Xuan Chan[1], Yoke Yin Foo[1], Yu Zheng[1], Sheldon Ho[1], Choon Hwai Yap[1], *[1]National University Of Singapore, Singapore*

10:30AM **Deep Neural Networks For Hemodynamic Analysis of Human Thoracic Aorta** SB^{3}C2019-082
Liang Liang[1], Wenbin Mao[2], Wei Sun[2], *[1]Department of Computer Science at University of Miami, United States, [2]Georgia Institute of Technology and Emory University, United States*

10:45AM **Effect of Nonlinear Elastic Properties of Arterial Walls On Pulse Wave Propagation** SB^{3}C2019-083
Alberto Coccarelli[1], Sanjay Pant[1], Ankush Aggarwal[2], *[1]Swansea University, United Kingdom, [2]University of Glasgow, United Kingdom*

Wednesday, June 26	11:15AM -12:45PM

Biotransport in a Tumor Microenvironment — Sunburst

Session Chair: Sihong Wang *The City College of New York*
Session Co-Chair: Rana Zakerzadeh *University of Texas at Austin*

11:15AM **Fast Tumor Spheroid Growth In Microfluidic Device** SB^{3}C2019-084
Yaling Liu[1], Chris Uhl[1], Yuyuan Zhou[1], *[1]Lehigh University, United States*

11:30AM **A Microfluidic Tissue Array For Mid-Throughput Drug Screening Using Tumor Tissues For Personalized Medicine** SB^{3}C2019-085
AH Rezwanuddin Ahmed[1], Xuejun Jiang[2], Sarat Chandarlapaty[2], Sihong Wang[1], *[1]The City College of New York, United States, [2]Memorial Sloan Kettering Cancer Center, United States*

11:45AM **Circulating Tumor Cell Transport and Adhesion In Microfluidic Devices** SB^{3}C2019-086
Jifu Tan[1], Zhenya Ding[2], Wei Li[2], *[1]Northern Illinois University, United States, [2]Texas Tech University, United States*

12:00PM **An In Vitro Tumor Platform For Modeling Breast Tumor Stromal Interactions and Characterizing The Subsequent Response** SB^{3}C2019-087
Manasa Gadde[1], Marissa Rylander[1], *[1]University of Texas at Austin, United States*

12:15PM **Computational Fluid Dynamics Model of Pressurized Intraperitoneal Aerosol Chemotherapy: Gravity Matters!** SB^{3}C2019-088
Mohammad Rahimi-Gorji[1], Leen Van de Sande[1], Charlotte Debbaut[1], Patrick Segers[1], Wouter Willaert[1], Wim Ceelen[1], *[1]Ghent University, Belgium*

12:30PM **Microtissues For Biomechanical Investigations of Angiogenesis** SB^{3}C2019-089
M.K. Sewell-Loftin[1], Priscilla Hwang[1], Joshua Katz[1], Steve George[2], Gregory Longmore[1], *[1]Washington University School of Medicine in St. Louis, United States, [2]University of California, Davis, United States*

Wednesday, June 26	11:15AM -12:45PM

Cardiac Mechanics — Snowflake

Session Chair: Manuel Rausch *University of Texas at Austin*
Session Co-Chair: Colleen Witzenburg *University of Wisconsin*

11:15AM **A Robust 3d Constitutive Model For The Passive Properties of Left Ventricular Myocardium** SB^{3}C2019-090
David Li[1], Reza Avazmohammadi[1], Samer Merchant[2], Tomonori Kawamura[3], Edward Hsu[2], Joseph Gorman[3], Robert Gorman[3], Michael Sacks[1], *[1]The University of Texas at Austin, United States, [2]University of Utah, United States, [3]University of Pennsylvania, United States*

11:30AM **Fast Predictions of Cardiac Growth During Ventricular Dyssynchrony** SB^{3}C2019-091
Pim Oomen[1], Colleen Witzenburg[2], Thien-Khoi Phung[1], Kenneth Bilchick[1], Jeffrey Holmes[1], *[1]University of Virginia, United States, [2]University of Wisconson, United States*

11:45AM **Role of Talin1 In Cardiac Fibroblasts On Cardiac Hypertrophy** SB^{3}C2019-092
Natalie Noll[1], Qinkun Zhang[1], Hind Lal[1], W. David Merryman[1], *[1]Vanderbilt University, United States*

12:00PM **Modeling of Anisotropic Reverse Cardiac Growth In Response To Local Alteration of Electromechanics** SB^{3}C2019-093

Jayavel Arumugam[1], Ghassan Kassab[2], Lik Chuan Lee[1], [1]*Michigan State University, United States,* [2]*California Medical Innovations Institute, United States*

12:15PM **The Effect of Collagen Heterogeneity On Rat Myocardial Infarct Mechanics In A Multiscale Fiber Network Model** SB^{3}C2019-094

Christopher Korenczuk[1], William Richardson[2], Victor Barocas[1], [1]*University of Minnesota - Twin Cities, United States,* [2]*Clemson University, United States*

12:30PM **Analyzing The Biomechanical Response of Failing Right Ventricular Tissue To Sacubitril/valsartan Treatment** SB^{3}C2019-095

Danial Sharifikia[1], Claire Tushak[1], Evan Benza[2], Kang Kim[3], Marc Simon[3], [1]*Department of Bioengineering, University of Pittsburgh, United States,* [2]*Heart and Vascular Institute, University of Pittsburgh Medical Center (UPMC), United States,* [3]*Department of Bioengineering, University of Pittsburgh; Division of Cardiology, School of Medicine, University of Pittsburgh; Heart and Vascular Institute, University of Pittsburgh Medical Center (UPMC); McGowan Institute for Regenerative Medicine, Univer, United States*

Wednesday, June 26 | 11:15AM -12:45PM

Celebration of YC Fung's 100th Birthday — Wintergreen

Session Chair: Spencer Lake *Washington University in St. Louis*

11:15AM **Osmotic Swelling Behavior of The Pregnant Mouse Cervix and The Contribution of Hyaluronic Acid** SB^{3}C2019-096

Charles Jayyosi[1], Shanmugasundaram Nallasamy[2], Priya Madhukaran[2], Mala Mahendroo[2], Kristin Myers[1], [1]*Columbia University, United States,* [2]*University of Texas Southwestern Medical Center, United States*

11:30AM **From Biomechanics To T Cell Affinity To Systems Immunology My Path In Biomedical Engineering That Is Inspired By Dr. Yc Fung** SB^{3}C2019-097

Ning Jiang[1], [1]*University of Texas at Austin, United States*

11:45AM **A Mathematical Model For The Post-Implant Collagen Maturation Behavior of Engineered Tissues** SB^{3}C2019-098

Michael Sacks[1], [1]*University of Texas at Austin, United States*

12:00PM **Non-Invasive Brillouin Moduli and Membrane Fluctuation Measurements of Live Tumor Cell Nuclei** SB^{3}C2019-099

Anya Roberts[1], Vijay Singh[1], Peter So[1], Roger Kamm[1], [1]*Mit, United States*

12:15PM **A Micromechanical Model For Collagenous Tissues and Applications To Study Growth and Remodeling** SB^{3}C2019-100

Thao Vicky[1], [1]*Johns Hopkins University, United States*

12:30PM **Yc Fung Symposium Conclusion** SB^{3}C2019-101

Savio Woo

Wednesday, June 26 | 11:15AM -12:45PM

Mechanics of Cartilage and Meniscus — Seasons 1-3

Session Chair: Deva Chan *Rensselaer Polytechnic Institute*
Session Co-Chair: David M Pierce *University of Connecticut*

11:15AM **Mechanical Property Changes In The Meniscus In A Novel Closed Joint Animal Impact and Surgical Model** SB^{3}C2019-102

Gerardo Narez[1], Albane Fauron[2], Loic Dejardin[2], Feng Wei[2], Roger C. Haut[2], Tammy L. Haut Donahue[1], *[1]University of Massachusetts, Amherst, United States, [2]Michigan State University, United States*

11:30AM **Non-Invasive Mri Assessment of Meniscus and Cartilage Changes In A Large Animal Model of Meniscus Injury** SB^{3}C2019-103

Kyle Meadows[1], Sonia Bansal[2], John Peloquin[1], Liane Miller[2], Jay Patel[2], Kamiel Saleh[2], Michael Hast[2], Miltiadis Zgonis[2], Robert Mauck[2], Dawn Elliott[1], *[1]University of Delaware, United States, [2]University of Pennsylvania, United States*

11:45AM **Maintaining Cartilage Hydration During Sliding Part 2: Modes and Competitive Recovery Rates** SB^{3}C2019-104

David Burris[1], Axel Moore[2], Brian Graham[1], Jamie Benson[1], Caroline Kook[1], Steven Voinier[1], Christopher Price[1], *[1]University of Delaware, United States, [2]Imperial College London, United Kingdom*

12:00PM **Collagen Fiber Orientation and Mechanical Properties Correlate Across Human Articular Cartilage Zones** SB^{3}C2019-105

Kristine Fischenich[1], Joseph Wahlquist[1], Virginia Ferguson[1], *[1]University of Colorado at Boulder, United States*

12:15PM **Toward Quantifying Changes In The Collagen Network of Human Articular Cartilage During Early-Stage Osteoarthritis** SB^{3}C2019-106

Szarek E. Phoebe[1], Magnus B. Lilledahl[2], Courtland G. Lewis[3], David M. Pierce[1], *[1]University of Connecticut, United States, [2]Norwegian University of Science and Technology, Norway, [3]Hartford Healthcare, United States*

12:30PM **Type III Collagen Is A Key Regulator of Collagen Fibrillar Structure In Cartilage Pericellular Matrix** SB^{3}C2019-107

Chao Wang[1], Becky Brisson[2], Qing Li[1], Masahiko Terajima[3], Motomi Enomoto-Iwamoto[4], Mitsuo Yamauchi[3], Susan Volk[2], Lin Han[1], *[1]Drexel University, United States, [2]University of Pennsylvania, United States, [3]University of North Carolina, United States, [4]University of Maryland, United States*

Wednesday, June 26 | 11:15AM -12:45PM

Injury: Imaging — Seasons 4-5

Session Chair: Steve Rowson *Virginia Tech*
Session Co-Chair: Liming Voo *Johns Hopkins University Applied Physics Laboratory*

11:15AM **A Comparison of The Deformation Response of The Brain To Mild Acceleration In The Axial and Sagittal Planes In A Healthy Volunteer** SB^{3}C2019-108

Andrew Knutsen[1], Arnold Gomez[2], Jerry Prince[2], Philip Bayly[3], John Butman[4], Dzung Pham[1], *[1]The Henry M Jackson Foundation, United States, [2]Johns Hopkins University, United States, [3]Washington University in St. Louis, United States, [4]National Institutes of Health, United States*

11:30AM **Longitudinal Head Impact Exposure and White Matter Integrity Analysis Among Returning Youth Football Players** SB^{3}C2019-109

Mireille Kelley[1], Jillian Urban[2], Derek Jones[2], Elizabeth Davenport[3], Logan Miller[2], Beverly Snively[4], Alexander Powers[5], Christopher Whitlow[6], Joseph Maldjian[3], Joel Stitzel[2], *[1]Virginia Tech-Wake Forest School of Biomedical Engineering and Sciences, United States, [2]Virginia Tech-Wake Forest University School of Biomedical Engineering and Sciences, United States, [3]Department of Radiology, University of Texas Southwestern, United States, [4]Department of Biostatistical Sciences, Wake Forest School of Medicine, United States, [5]Department of Neurosurgery, Wake Forest School of Medicine, United States, [6]Department of Radiology (Neuroradiology), Wake Forest School of Medicine, United States*

11:45AM **Imaging and Mechanical Characterization of The Pia-Arachnoid Complex** SB^{3}C2019-110

Nikolaus Benko[1], Emma Luke[2], Yousef Alsanea[1], Brittany Coats[1], *[1]University of Utah Mechanical Engineering, United States, [2]University of Rochester Biomedical Engineering, United States*

12:00PM **Mechanical and Interfacial Characterization of Meningioma Through Mr Imaging** SB^{3}C2019-111
Efe Ozkaya[1], Dominic Nistal[2], Zeynep Suar[1], Alexander Chartrain[2], Cassandra Gologorsky[3], Priti Balchandani[2], Raj Shrivastava[2], Mehmet Kurt[1], *[1]Stevens Institute of Technology, United States, [2]Icahn School of Medicine at Mount Sinai, United States, [3]Cornell University, United States*

12:15PM **A Network-Based Brain Injury Metric For Concussion Prediction** SB^{3}C2019-112
Shaoju Wu[1], Wei Zhao[1], Bethany Rowson[2], Steve Rowson[2], Songbai Ji[1], *[1]Worcester Polytechnic Institute, United States, [2]Virginia Tech, United States*

12:30PM **Changes In Brain Tissue In Vivo Deformation Following Decompression Surgery In Chiari Patients** SB^{3}C2019-113
Maggie Eppelheimer[1], Blaise Simplice Talla Nwotchouang[1], Soroush Heidari Pahlavian[2], John Oshinski[3], Daniel Barrow[3], Rouzbeh Amini[1], Francis Loth[1], *[1]The University of Akron, United States, [2]USC Stevens Neuroimaging and Informatics Institute University of Southern California, United States, [3]Emory University, United States*

Wednesday, June 26 | 11:15AM -12:45PM

UG Design Competition — Hemlock

Session Chair: Michael Moreno *Texas A&M University*
Session Co-Chair: Ted Conway *Florida Institute of Technology*

11:15AM **Design and Optimization of A Finger-By-Finger Vibrational Therapy** SB^{3}C2019-114
Joshua Posen[1], George Durrant[1], Samuel Langlois[1], Chirsteen Abdalla[1], Gary Drzewiecki[1], *[1]Rutgers University, United States*

11:30AM **Jogging Stroller Attachment Device For Natural Arm Motion** SB^{3}C2019-115
Tamara Chambers[1], Amy Ramos[1], Meghan Blanks[1], *[1]Embry-Riddle Aeronautical University, United States*

11:45AM **Assistive Device For Stretching Exercise In Patients With Frozen Shoulder Syndrome** SB^{3}C2019-116
Maria Owsiak[1], Monsour Al Awami[1], Ryan Daher[1], Scott Goeltz[1], Rebecca Gomezrueda[1], Russel Maurer[1], Andrew Saylor[1], Ria Mazumder[1], *[1]Widener University, United States*

12:00PM **Wearable Robotic Wrist Orthosis For Stroke Rehabilitation** SB^{3}C2019-117
Neshat Baset[1], Dona Antony[1], Mahdi Haghshenas-Jaryani[1], Muthu Wijesundara[1], *[1]University of Texas at Arlington Research Institute, United States*

12:15PM **Design of 3d Printed Robotic Glove Augmenting Manual Manipulation of Humans** SB^{3}C2019-118
Mason Araujo[1], Immanuel Ponminissery[1], Seok Chang Ryu[1], *[1]Texas A&M University, United States*

12:30PM **Assistive Device For Muscular Degeneration In The Upper Arm** SB^{3}C2019-119
Alexandria Barber[1], Emily Eaton[1], Jillian Farmer[1], Samantha Gladd[1], Natalie Jagelski[1], Jenny Lin[1], *[1]Clarkson University, United States*

Wednesday, June 26 | 11:15AM -12:45PM

Translational Cardiovascular Diagnosis and Treatment — Fox Den

Session Chair: John LaDisa *Marquette University*

11:15AM **Analyses of Hemodialysis Arteriovenous Fistula Geometry Obtained By Serial Magnetic Resonance Imaging** SB^{3}C2019-120
Yong He[1], Daniel Pike[2], Yan-Ting Shiu[2], Prabir Roy-Chaudhury[3], Alfred Cheung[2], Scott Berceli[1], *[1]University of Florida, United States, [2]University of Utah, United States, [3]University of Arizona, United States*

11:30AM **Effect of Gravity On Hemodynamics In Cerebral Aneurysms - An In Vitro Study** SB^{3}C2019-121

Melissa Brindise[1], Sean Rothenberger[1], Susanne Schnell[2], Michael Markl[2], David Saloner[3], Vitaliy Rayz[1], Pavlos Vlachos[1], *[1]Purdue University, United States, [2]Northwestern University, United States, [3]University of California San Francisco, United States*

11:45AM **A Nonlinear Mechanics-Based Virtual Coiling Method For Intracranial Aneurysm** SB^{3}C2019-122

Seyyed Mostafa Mousavi Janbeh Sarayi[1], Robert J. Damiano[1], Palak Patel[1], Gary Dargush[1], Adnan H. Siddiqui[1], Hui Meng[1], *[1]University at Buffalo, The State University of New York, United States*

12:00PM **Computational Assessment of Left-Ventricular Outflow Tract Hemodynamic Alterations In Discrete Subaortic Stenosis** SB^{3}C2019-123

Jason Shar[1], Sundeep Keswani[2], Jane Grande-Allen[3], Philippe Sucosky[1], *[1]Wright State University, United States, [2]Texas Children's Hospital, United States, [3]Rice University, United States*

12:15PM **Blood Flow Modeling of Cerebral Aneurysm Treated With Intrasaccular Flow Diverting Devices** SB^{3}C2019-124

Fernando Mut[1], Bong Jae Chung[2], Juan Cebral[1], *[1]George Mason University, United States, [2]Montclair State University, United States*

12:30PM **Impact of Post-Tavr Patient-Specific Geometry On Neo-Sinus Flow: A Computational Fluid Dynamics Study** SB^{3}C2019-125

Shelly Singh-Gryzbon[1], Sanchita Bhat[1], Vahid Sadri[1], Joseph Choi[1], Mandy Salmon[1], Zhenglun (Alan) Wei[1], Philipp Ruile[2], Franz-Joseph Neumann[2], Philipp Blanke[3], Ajit Yoganathan[1], *[1]Georgia Institute of Technology, United States, [2]University Heart Center Freiburg-Bad Krozingen, Germany, [3]St Paul's Hospital and University of British Colombia, Canada*

Thursday, June 27 | 9:30AM -11:00AM

PhD Paper Competition: Cell & Tissue Engineering — Sunburst

Session Chair: Tamara Bush *Michigan State University*
Session Co-Chair: Zhenpeng Qin *The University Of Texas At Dallas*

9:30AM **Igf-1 Suppresses Trpv4 Osmosensation Through The Map7 Binding Domain In Chondrocytes** SB^{3}C2019-126

Nicholas Trompeter[1], Lauren Hurd[1], Joseph Gardinier[2], Victor DeBarros II[1], Mary Boggs[1], Randall Duncan[1], *[1]University of Delaware, United States, [2]Henry Ford Health System, United States*

9:45AM **High-Velocity Stretching Causes Mechanically-Induced Tau Pathology In Neurons** SB^{3}C2019-127

Nicholas Braun[1], Dezhi Liao[1], Patrick Alford[1], *[1]University of Minnesota - Twin Cities, United States*

10:00AM **Introduction of Heterogeneous Cell Properties For Modeling Emergent Stress Fields In Multicellular Systems** SB^{3}C2019-128

Zachary Goldblatt[1], Heather Cirka[1], Habibeh Ashouri Choshali[1], Nima Rahbar[1], Dannel McCollum[2], Kristen Billiar[1], *[1]Worcester Polytechnic Institute, United States, [2]UMASS Medical School, United States*

10:15AM **Concentration Dependent Tgf-Beta Internalization Rate In Engineered Musculoskeletal Tissues** SB^{3}C2019-129

Sedat Dogru[1], Danial Sharifikia[1], Samuel Sze[1], Michael Albro[1], *[1]Boston University, United States*

10:30AM **A Micropatterning Approach To Study Cellular Communication Via Mechanical Forces In Fibrous Microenvironments** SB^{3}C2019-130

Christopher Davidson[1], Brendon Baker[1], *[1]University of Michigan, United States*

10:45AM **Endothelial Nitric Oxide Synthase Glycosylation Is A Potential Target For Reducing Endothelial Dysfunction** SB^{3}C2019-131

Sarah Basehore[1], Alisa Morss Clyne[1], *[1]Drexel University, United States*

Thursday, June 27	9:30AM -11:00AM

PhD Paper Competition: Imaging, Injury, and Biomedical Engineering Education — Snowflake

Session Chair: Corinne Henak *University of Wisconsin-Madison*
Session Co-Chair: Victor Barocas *University of Minnesota*

9:30AM **Developing A Stem+m Identity In Underrepresented Minority Groups Through Sports and Biomechanics** SB^{3}C2019-132

Brittany Marshall[1], Amy Loya[2], John Drazan[3], Anthony Prato[4], Nicole Conley[5], Stavros Thomopoulos[1], Katherine Reuther[1], *[1]Columbia University, United States, [2]Rensselaer Polytechnic Institute, United States, [3]University of Pennsylvania, United States, [4]SUNY Geneseo, United States, [5]Union College, United States*

9:45AM **3d Strain Gradients Correlate With Murine Myocardial Infarct Severity** SB^{3}C2019-133

Arvin Soepriatna[1], John Boyle[2], Abigail Clifford[1], Alex Yeh[1], Semih Bezci[3], Grace O'Connell[3], Craig Goergen[1], *[1]Purdue University, United States, [2]Washington University in Saint Louis, United States, [3]University of California Berkeley, United States*

10:00AM **Development of A Dual-Venc 4d Flow Mri Framework For The Generation of Patient Specific Aortic Finite Element Models** SB^{3}C2019-134

Jamie Concannon[1], Kevin Moerman[1], Peter Dockery[1], Peter McHugh[1], Christof Karmonik[2], Patrick McGarry[1], *[1]National University of Ireland Galway, Ireland, [2]MRI Core, Debakey Heart and Vascular Center, Houston Methodist, TX, USA, United States*

10:15AM **5-Ht2b Antagonism Controls Border Zone Mechanics To Improve Outcomes Following Myocardial Infarction** SB^{3}C2019-135

J. Caleb Snider[1], Qinkun Zhang[1], Hind Lal[1], W. David Merryman[1], *[1]Vanderbilt University, United States*

10:30AM **An Integrated Machine Learning-Inverse Finite Element Approach For Identification of Patient-Specific Material Properties of The Aortic Wall From Clinical Ct Images** SB^{3}C2019-136

Minliang Liu[1], Liang Liang[2], Fatiesa Sulejmani[1], Xiaoying Lou[3], Glen Iannucci[3], Edward Chen[3], Bradley Leshnower[3], Wei Sun[1], *[1]Georgia Institute of Technology, United States, [2]University of Miami, United States, [3]Emory University, United States*

10:45AM **Comparative Analysis of Head Impact Kinematics In High School and Collegiate Football Using Mig2.0 Instrumented Mouthguard** SB^{3}C2019-137

Ileana Pirozzi[1], Michael Fanton[1], Chiara Giordano[1], Sohrab Sami[1], India Rangel[1], William Mehring[1], Pritha Roy[1], Brett Avery[1], Michael Zeineh[1], Gerald Grant[1], David Camarillo[1], *[1]Stanford University, United States*

Thursday, June 27	9:30AM -11:00AM

PhD Paper Competition: Extracellular Matrix Biomechanics — Wintergreen

Session Chair: Alejandro Roldan-Alzate *University of Wisconsin-Madison*
Session Co-Chair: Bahareh Behkam *Virginia Tech*

9:30AM **Plasticity and Elasto-Plastic Damage Mechanics Using Reactive Constrained Solid Mixtures: A Modeling Approach For Biomedical Materials** SB^{3}C2019-138

Brandon Zimmerman[1], Gerard Ateshian[1], *[1]Columbia University, United States*

9:45AM **Inflammatory and Non-Inflammatory Synovial Fluids Exhibit Distinct Tribological Phenotypes** SB^{3}C2019-139

Elizabeth Feeney[1], Devis Galesso[2], Cynthia Secchieri[2], Roberta Ramonda[3], Lawrence Bonassar[1], *[1]Cornell University, United States, [2]Fidia Farmaceutici S.p.A., Italy, [3]University of Padua, Italy*

10:00AM **Failure Mechanisms In The Tendon Enthesis Under Quasistatic, Cyclical, and Pathological Loading** SB^{3}C2019-140
Mikhail Golman[1], Adam Abraham[2], Iden Kurtaliaj[2], Brittany Marshall[2], Guy Genin[3], Victor Birman[4], Stavros Thomopoulos[2], *[1]Columbia Univeristy, United States, [2]Columbia University, United States, [3]Washington University in St. Louis, United States, [4]Missouri Science & Technology, United States*

10:15AM **Real-Time Measurement of Collagen Architecture and Deformations At Sub-Micron Resolution** SB^{3}C2019-141
Po-Yi Lee[1], Bin Yang[1], Ian A Sigal[1], *[1]University of Pittsburgh, United States*

10:30AM **Collagen Fatigue Damge Evolves With Creep Strain and Is Strain Rate Dependent** SB^{3}C2019-142
Jared Zitnay[1], Gang Seob Jung[2], Allen Lin[1], Zhao Qin[2], Yang Li[1], Markus Buehler[2], S. Michael Yu[1], Jeffrey Weiss[1], *[1]University of Utah, United States, [2]Massachusetts Institute of Technology, United States*

10:45AM **Collagen Denaturation Occurs Upon Tissue Failure In Energy Storing Tendons** SB^{3}C2019-143
Allen Lin[1], Jared Zitnay[1], Alexandra Allan[1], Jeffrey Weiss[1], *[1]University of Utah, United States*

Thursday, June 27	**9:30AM -11:00AM**

Bone Mechanics — Seasons 1-3

Session Chair: Daniel Nicolella *Southwest Research Institute*

9:30AM **Metabolic Acidosis Causes Physio-Chemically Induced Mechanical and Compositional Changes To Murine Bones** SB^{3}C2019-144
Kathryn Morozov[1], Brian Wingender[1], Anna Peterson[1], Alix Deymier[1], *[1]UConn Health, United States*

9:45AM **Effect of Hydration On Mechanical Properties of Individual Collagen Fibrils and Extrafibrillar Matrix** SB^{3}C2019-145
Heber Martinez Barron[1], Wei Gao[1], Xiaodu Wang[1], *[1]University of Texas at San Antonio, United States*

10:00AM **Effects of Exercise and Posture On Subchondral Bone Density and Thickness of Sheep** SB^{3}C2019-146
Hyunggwi Song[1], John Polk[1], Mariana Kersh[1], *[1]University of Illinois at Urbana-Champaign, United States*

10:15AM **Statistical Shape Analysis For The Assessment of Proximal Femur Shape Features Meaningful To Osteoporotic Risk of Fracture** SB^{3}C2019-147
Alessandra Aldieri[1], Mara Terzini[1], Cristina Bignardi[1], Alberto L. Audenino[1], Umberto Morbiducci[1], *[1]Politecnico di Torino, Italy*

10:30AM **Nondestructive Mapping of 3d Bone-Implant Contact and 3d Peri-Implant Strain** SB^{3}C2019-148
Yuxiao Zhou[1], Chujie Gong[1], Mehran Hossaini-Zadeh[2], Jing Du[1], *[1]The Pennsylvania State University, United States, [2]Temple University, United States*

Thursday, June 27	**9:30AM -11:00AM**

Frontiers in Experiments, Imaging, and Modeling in Tissue Solid Mechanics — Seasons 4-5

Session Chair: Adrian Buganza Tepole *Purdue University*
Session Co-Chair: Mathias Brieu *California State University - Los Angeles*

9:30AM **Choroidal Swelling Is Predicted To Cause Significant Optic Nerve Head Deformation: Potential Relevance To Sans** SB^{3}C2019-149

Andrew Feola[1], Brian Samuels[2], Brandon Macias[3], Michael Stenger[4], Nimesh Patel[5], C. Ross Ethier[6], [1]*Atlanta VA and Georgia Institute of Technology, United States,* [2]*University of Alabama at Birmingham, United States,* [3]*KBRwyle, United States,* [4]*Nasa-jsc, United States,* [5]*University of Houston, United States,* [6]*Georgia Tech, United States*

9:45AM **Biomechanical Characterization of Active and Passive Properties of Murine Branch Pulmonary Arteries** SB^{3}C2019-150

Abhay B. Ramachandra[1], Jay Humphrey[1], [1]*Yale University, United States*

10:00AM **Effects of Long Term Spinal Cord Injury On The Mechanical Behavior of The Urinary Bladder Extracellular Matrix** SB^{3}C2019-151

Tyler Tuttle[1], Heidi Lujan[1], Stephen DiCarlo[1], Sara Roccabianca[1], [1]*Michigan State University, United States*

10:15AM **Multi-Scale Model of Pressure-Driven Hypoxia In The Skin Resulting From Microvascular Collapse** SB^{3}C2019-152

Vivek Sree[1], Manuel Rausch[2], Adrian Buganza Tepole[1], [1]*Purdue University, United States,* [2]*The University of Texas at Austin, United States*

10:30AM **A Comparative Classification Analysis of Abdominal Aortic Aneurysm By Machine Learning Algorithms** SB^{3}C2019-153

Balaji Rengarajan[1], Wei Wu[1], Crystal Weidner[2], Satish Mukul[3], Mark Eskandari[4], Ender Finol[1], [1]*Department of Mechanical Engineering University of Texas at San Antonio San Antonio, TX, U.S.A., United States,* [2]*Department of Management Science and Statistics University of Texas at San Antonio San Antonio, TX, U.S.A., United States,* [3]*Department of Thoracic & Cardiovascular Surgery, Allegheny General Hospital Allegheny Health Network Pittsburgh, PA, U.S.A., United States,* [4]*Division of Vascular Surgery, Feinberg School of Medicine Northwestern University Chicago, IL, U.S.A., United States*

10:45AM **Design, Calibration, and Preliminary Testing of A System To Measure The Viscoelastic Properties of A Pacinian Corpuscle** SB^{3}C2019-154

Tiffany Senkow[1], Emily Chandler[1], Amy Moeller[2], Victor Barocas[1], [1]*University Of Minnesota, United States,* [2]*Twin Cities Orthopedics, United States*

Thursday, June 27 | 9:30AM -11:00AM

Rehabilitation and Assistive Technologies — Hemlock

Session Chair: Sara Wilson *University of Kansas*
Session Co-Chair: Carrie Peterson *Virginia Commonwealth University*

9:30AM **The Effect of Intermittent Theta Burst Stimulation On Biceps Corticomotor Excitability In Nonimpaired Individuals and Individuals With Tetraplegia** SB^{3}C2019-155

Neil Mittal[1], Blaize Majdic[1], Carrie Peterson[1], [1]*Virginia Commonwealth University, United States*

9:45AM **Inertial Measurement Units Used To Quantify Arm Elevation Angles of Manual Wheelchair Users and Able-Bodied Controls Throughout A Typical Day** SB^{3}C2019-156

Brianna Goodwin[1], Stephen Cain[2], Meegan Van Straaten[1], Emma Fortune[1], Melissa Morrow[1], [1]*Mayo Clinic, United States,* [2]*University of Michigan, United States*

10:00AM **Exercise Therapy Affects Glenohumeral Kinematics In Patients With Isolated Supraspinatus Tears** SB^{3}C2019-157

Luke Mattar[1], Camille Johnson[1], Tom Gale[1], Adam Popchak[1], James Irrgang[1], William Anderst[1], Volker Musahl[1], Richard Debski[1], [1]*University of Pittsburgh, United States*

10:15AM **Changes In Hand Function Due To Basal Joint Suspensionplasty** SB^{3}C2019-158

Joshua Drost[1], James Clarkson[1], Tamara Bush[1], [1]*Michigan State University, United States*

10:30AM **Macroscopic Surface Deformation of Retrieved Glenoid Components For Total Shoulder Arthroplasty** SB^{3}C2019-159

Giuliana Davis[1], Noah Bonnheim[1], Louis Malito[1], Stephan Gunther[2], Tom Norris[3], Lisa Pruitt[1], *[1]Department of Mechanical Engineering, University of California, Berkeley, United States, [2]Martha Jefferson Hospital, United States, [3]San Francisco Shoulder, Elbow & Hand Clinic, United States*

10:45AM **Development of An Annular Flow Mechanism For Maintaining Intraocular Pressure With A Glaucoma Drainage Device** SB^{3}C2019-160

Sara Wilson[1], Anna Donovan[1], Hussain Alantari[2], Paul Munden[3], Ronald Dougherty[1], *[1]University of Kansas, United States, [2]University of Missouri - Kansas City, United States, [3]Oklahoma City VA Health Care System, United States*

Thursday, June 27 | 9:30AM -11:00AM

Ventricular and Valvular Flow — Fox Den

Session Chair: Lakshmi Prasad Dasi *Ohio State University*

9:30AM **Aortic Sinus Vortex Spatio-Temporal Variations With Leaflet Calcification** SB^{3}C2019-161

Hoda Hatoum[1], Lakshmi Prasad Dasi[1], *[1]The Ohio State University, United States*

9:45AM **An Initial Fluid Mechanics Study of Bioprosthetic Heart Valves In An Accelerated Dynamic Environment** SB^{3}C2019-162

Sailahari Ponnaluri[1], Ming-Chen Hsu[2], Michael Sacks[3], Keefe Manning[1], *[1]The Pennsylvania State University, United States, [2]Iowa State University, United States, [3]University of Texas, United States*

10:00AM **Experimental Testing of Polymeric Tavr Valve Performance In Patient-Specific Models** SB^{3}C2019-163

Brandon Kovarovic[1], Oren Rotman[1], Marvin Slepian[2], Danny Bluestein[1], *[1]Department of Biomedical Engineering, Stony Brook University, Stony Brook, NY, United States, [2]Sarver Heart Center, University of Arizona,Tucson, AZ, United States*

10:15AM **Comparative Quantification of Mitral Regurgitation By Computer Modeling and Simulated Echocardiography** SB^{3}C2019-164

Wenbin Mao[1], Andrs Caballero[1], Rebecca Hahn[2], Susheel Kodali[2], Wei Sun[1], *[1]Georgia Institute of Technology, United States, [2]Columbia University Medical Center, United States*

10:30AM **The Effects of Anterior Mitral Leaflet Laceration On Left Ventricular Flow With Transcatheter Mitral Valves: An In Vitro Study** SB^{3}C2019-165

Thomas Easley[1], Vahid Sadri[1], Pranav Dorbala[1], Norihiko Kamioka[2], Vasilis Babaliaros[2], Ajit Yoganathan[1], *[1]Georgia Institute of Technology, United States, [2]Emory University, United States*

10:45AM **Patient-Specific Modeling of The Left Ventricular Hemodynamics Using The Chimera Overset Mesh Technique** SB^{3}C2019-166

Federico Can[1], Matteo Selmi[2], Gianluca De Santis[3], Alberto Redaelli[4], Patrick Segers[1], Joris Degroote[5], *[1]IBiTech bioMMeda, Department of Electronics and Information Systems, Ghent University, Belgium, [2]Division of Cardiac Surgery, Department of Surgery, Universit di Verona, Italy, [3]FEops NV, Belgium, [4]Department of Electronics, Informatics and Bioengineering, Politecnico di Milano, Italy, [5]Department of Flow, Heat and Combustion Mechanics, Ghent University, Belgium*

Thursday, June 27	11:15AM -12:45PM

PhD Paper Competition: Computational Biomechanics and Diagnostic Models

Sunburst

Session Chair: Chiara Bellini *Northeastern University*
Session Co-Chair: Craig Goergen *Purdue University*

11:15AM **Designing Tissue Engineered Vascular Grafts For Young and Aged Hosts: In Vivo, Ex Vivo and In Silico Study** SB^{3}C2019-167

Piyusha Gade[1], Keewon Lee[1], Yadong Wang[2], Anne Robertson[1], *[1]University of Pittsburgh, United States, [2]Cornell University, United States*

11:30AM **Computational Fluid Dynamics Modeling of Myocardial Bridging Using Coronary Angiography** SB^{3}C2019-168

Mohammadali Sharzehee[1], Ran Gao[2], Yuan Chang[2], Jiangping Song[2], Hai-Chao Han[3], *[1]University Of Texas At San Antonio, United States, [2]Fuwai Hospital, China, [3]Professor, United States*

11:45AM **Axial Stretch Modulates Lymphatic Contractility: An Experimental-Computational Approach In A Novel Rat Tail Model** SB^{3}C2019-169

Mohammad S. Razavi[1], Julie Leonard-Duke[1], Rebecca Hardie[1], Brandon Dixon[1], Rudolph Gleason[1], *[1]Georgia Institute of Technology, United States*

12:00PM **Simulation of Cardiac Flow: Analysis of Geometry Simplification** SB^{3}C2019-170

Fanwei Kong[1], Christoph Augustin[2], Kevin Sack[3], Shawn Shadden[1], *[1]Department of Mechanical Engineering, University of California, Berkeley, United States, [2]Institute of Biophysics, Medical University of Graz, Austria, [3]Division of Biomedical Engineering Department of Human Biology, University of Cape Town, South Africa*

12:15PM **A Combined Mri Arterial Spin Labeling and Computational Modeling Strategy To Quantify Patient-Specific Blood Flow and Perfusion In Cerebrovascular Occlusive Disease** SB^{3}C2019-171

Jonas Schollenberger[1], Luis Hernandez-Garcia[2], C. Alberto Figueroa[3], *[1]Department of Biomedical Engineering, University of Michigan, United States, [2]fMRI Laboratory and Department of Biomedical Engineering, University of Michigan, United States, [3]Departments of Surgery and Biomedical Engineering, University of Michigan, United States*

12:30PM **Evaluation of Artificial Neural Networks As A Potential Rupture Discrimination Model** SB^{3}C2019-172

Sricharan S Veeturi[1], Hamidreza Rajabzadeh-Oghaz[1], Jason M Davies[1], Hui Meng[1], *[1]University at Buffalo, United States*

Thursday, June 27	11:15AM -12:45PM

PhD Paper Competition: Morphogenesis, Development, Growth, and Remodeling

Snowflake

Session Chair: Kristin Miller *Tulane University*
Session Co-Chair: Jeffrey Weiss *University of Utah*

11:15AM **Systematic Modulation of Cell-Cell Adhesion In Vivo Modulates Epithelial Tissue Mechanics and Remodeling** SB^{3}C2019-173

Xun Wang[1], Karen Kasza[1], *[1]Columbia University, United States*

11:30AM **Relating Bone Strain To Local Changes In Radius Microstructure Following 12 Months of Axial Forearm Loading In Women** SB^{3}C2019-174

Megan Mancuso[1], Karen Troy[1], *[1]Department of Biomedical Engineering, Worcester Polytechnic Institute, United States*

11:45AM **Effects of Reproduction and Lactation History On Rat Maternal Bone Mechano-Responsiveness and Osteocyte Microenvironment** SB^{3}C2019-175

Yihan Li[1], Ashutosh Parajuli[2], Chantal de Bakker[1], Hongbo Zhao[1], Wei-Ju Tseng[1], Rebecca Chung[1], Liyun Wang[2], X. Sherry Liu[1], *[1]University of Pennsylvania, United States, [2]University of Delaware, United States*

12:00PM **Biphasic Network Model of Collagen and Elastin Remodelling Recapitulates Compositional and Organizational Changes During Aortic Growth and Development** SB^{3}C2019-176

Ryan Mahutga[1], Victor Barocas[1], *[1]University of Minnesota, United States*

12:15PM **Pregnancy and Lactation Impair Subchondral Bone Leading To Reduced Rat Supraspinatus Tendon Failure Properties** SB^{3}C2019-177

Ashley Fung[1], Snehal Shetye[1], Yihan Li[1], X. Sherry Liu[1], Louis Soslowsky[1], *[1]University of Pennsylvania, United States*

12:30PM **Modeling Adaptive Remodeling of The Bladder Wall During Aging** SB^{3}C2019-178

Fangzhou Cheng[1], Lori Birder[1], Paul Watton[2], Anne Robertson[1], *[1]University of Pittsburgh, United States, [2]University of Sheffield, United States*

Thursday, June 27	**11:15AM -12:45PM**

PhD Paper Competition: Cellular Mechanics, Drug Delivery, and Therapeutics

Wintergreen

Session Chair: Sarah Bentil *Iowa State University*
Session Co-Chair: Brendon Baker *University of Michigan*

11:15AM **Membrane Wrapping Efficiency of Elastic Nanoparticles During Endocytosis: Size and Shape Matter** SB^{3}C2019-179

Zhiqiang Shen[1], Huilin Ye[1], Xin Yi[2], Ying Li[1], *[1]University of Connecticut, United States, [2]Peking University, China*

11:30AM **Neck Skin Thermal Features As A Measure of Stenosis In The Carotid Artery: Computational and In-Vivo Study** SB^{3}C2019-180

Ashish Saxena[1], Eddie Yin Kwee Ng[1], Vignesh Raman[1], Soo Teik Lim[2], *[1]Nanyang Technological University, Singapore, [2]National Heart Center Singapore, Singapore*

11:45AM **A Cold-Responsive Nanoparticle Enables Intracellular Delivery and Rapid Release of Trehalose For Fast Freezing of Stem Cells** SB^{3}C2019-181

Samantha Stewart[1], Xiaoming He[2], *[1]Unviersity of Maryland, College Park, United States, [2]University of Maryland, College Park, United States*

12:00PM **Engineering and Characterization of Collagenase-Expressing Salmonella Typhimurium For Enhanced Interstitial Transport In Tissue** SB^{3}C2019-182

Eric Leaman[1], Bahareh Behkam[1], *[1]Virginia Tech, United States*

12:15PM **A Systematic Approach To The Thermal Mitigation of Irreversible Electroporation Therapy** SB^{3}C2019-183

Timothy O'Brien[1], Melvin Lorenzo[1], Yajun Zhao[1], Robert Neal, II[2], John Robertson[1], S. Nahum Goldberg[3], Rafael Davalos[1], *[1]Department of Biomedical Engineering and Mechanics, Virginia Tech, United States, [2]AngioDynamics, United States, [3]Department of Radiology, Hadassah Hebrew University Hospital, Israel*

12:30PM **Optical Opening of Blood-Brain Barrier For Macromolecules Penetration By Laser Excitation of Vasculature-Targeted Plasmonic Nanoparticles** SB^{3}C2019-184

Xiaoqing Li[1], Hejian Xiong[1], Vamsidhara Vemireddy[2], Xiuying Li[1], Monica Giannotta[3], Heather Hayenga[1], Edward Pan[2], Shashank Sirsi[1], Elisabetta Dejana[3], Robert Bachoo[2], Zhenpeng Qin[1], *[1]University of Texas at Dallas, United States, [2]University of Texas Southwestern Medical Center, United States, [3]FIRC Insititute of Molecular Oncology Foundation, Italy*

Thursday, June 27	11:15AM -12:45PM

Musculoskeletal Tissue Engineering — Seasons 1-3

Session Chair: Alix Deymier *UConn Health*
Session Co-Chair: Spencer Szczesny *Pennsylvania State University*

11:15AM **Recapitulating The Complex Biomechanical Properties of Intervertebral Disc Using Tunable 3d Printing** SB^{3}C2019-185
Samantha Marshall[1], Timothy Jacobsen[1], Kevin Anton[1], Archana Murali[1], Nadeen Chahine[1], *[1]Columbia University, United States*

11:30AM **Orientation and Size of The Porcine Anterior Cruciate Ligament Vary Between Yorkshire and Yucatan Breeds At Early Adolescence** SB^{3}C2019-186
Stephanie Cone[1], Danielle Howe[1], Emily Lambeth[1], Jorge Piedrahita[2], Lynn Fordham[3], Jeffrey Spang[3], Matthew Fisher[1], *[1]North Carolina State University and the University of North Carolina – Chapel Hill, United States, [2]North Carolina State University, United States, [3]University of North Carolina – Chapel Hill, United States*

11:45AM **For Ligaments, Material Stiffness Is Not What It Appears To Be: How To Build More Accurate Material Models and Implications On Acl Graft Selection** SB^{3}C2019-187
Callan Luetkemeyer[1], Ellen Arruda[1], *[1]University of Michigan, United States*

12:00PM **An Engineered Biomaterial Microenvironment To Direct The Formation of A Living Barrier To Seal Cartilage Defects** SB^{3}C2019-188
Jay Patel[1], Claudia Loebel[1], Brian Wise[1], Kamiel Saleh[1], James Carey[1], Jason Burdick[1], Robert Mauck[1], *[1]University of Pennsylvania, United States*

12:15PM **Sustained Release of Tgf-3 From Heparinized Collagen Biofabric Induces Chondrogenic Differentiation of Human Mesenchymal Stem Cell Macromass** SB^{3}C2019-189
Hyungjin Jung[1], Phillip McClellan[1], Ozan Akkus[1], *[1]Case Western Reserve University, United States*

Thursday, June 27	11:15AM -12:45PM

Nano to Micro Multiscale Mechanics — Seasons 4-5

Session Chair: Kristin Myers *Columbia University*
Session Co-Chair: Vicky Nguyen *Johns Hopkins University*

11:15AM **A Computational and Experimental Study of Short Bowel Syndrome Biomechanics** SB^{3}C2019-190
Hadi S. Hosseini[1], Jordan S. Taylor[1], James C. Y. Dunn[1], *[1]Stanford University, United States*

11:30AM **A Discrete Fiber Network Model of Arterial Elastin Considering Inter-Fiber Crosslink** SB^{3}C2019-191
Xunjie Yu[1], Yanhang Zhang[1], *[1]Boston University, United States*

11:45AM **In Vivo Lamin A/c Deficiency Maintains Bulk Nuclear Shape and Stiffness, But Leads To Abrogated Intranuclear Mechanics and Chromatin Organization** SB^{3}C2019-192
Soham Ghosh[1], Adrienne Scott[1], Jessica Kelly[1], Benjamin Seelbinder[1], Xin Xu[1], Stephanie Schneider[1], Corey Neu[1], *[1]University of Colorado Boulder, United States*

12:00PM **Tunable Dna Nanocalipers Capable of Applying Forces To Biomolecules** SB^{3}C2019-193
Jenny Le[1], Kyle Crocker[1], Michael Darcy[1], Michael Poirier[1], Ralf Bundschuh[1], Carlos Castro[1], *[1]The Ohio State University, United States*

12:15PM **Microstructure of Tendon Reveals Helically Wrapped Fibrils With The Potential To Mediate Mechanical Load Transfer By Friction** SB^{3}C2019-194

Babak N. Safa[1], John Peloquin[1], Jessica Natriello[1], Jeffrey Caplan[1], Dawn Elliott[1], [1]*University of Delaware, United States*

12:30PM **Deformation Characteristics of The Rat Pia-Arachnoid Complex Through Multimodal Imaging** SB^{3}C2019-195

Zeynep M. Suar[1], Gloria Fabris[1], Luke Langner[1], Mehmet Kurt[1], [1]*Stevens Institute of Technology, United States*

Thursday, June 27	**11:15AM -12:45PM**

Vascular Biomechanics — Hemlock

Session Chair: Patrick Alford *University of Minnesota*
Session Co-Chair: Seungik Baek *Michigan State University*

11:15AM **Uncertainty Analysis of Vascular Surrogate Models** SB^{3}C2019-196

Zhenxiang Jiang[1], Jongeun Choi[2], Seungik Baek[1], [1]*Michigan State University, United States,* [2]*Yonsei Unversity, South Korea*

11:30AM **Effect of Calcification & Fibrous Tissue Features On Rupture Risk In Atherosclerotic Plaques** SB^{3}C2019-197

Bas Vis[1], Hilary Barrett[1], Astrid Moerman[1], Frank Gijsen[1], Ali Akyildiz[1], [1]*Erasmus Medical Center, Netherlands*

11:45AM **Initiation of Dissection In The Aortic Arch** SB^{3}C2019-198

Brian FitzGibbon[1], Kevin Moerman[1], Peter McHugh[1], Patrick McGarry[1], [1]*National University of Ireland Galway, Ireland*

12:00PM **Comparative Biomechanical Phenotyping of The Murine Central Vasculature** SB^{3}C2019-199

Jay Humphrey[1], [1]*Yale University, United States*

12:15PM **Regional Anisotropic Mechanical Characterization of Porcine Pulmonary Arteries** SB^{3}C2019-200

Narasimha Rao Pillalamarri[1], Sourav Patnaik[1], Senol Piskin[1], Ender Finol[1], [1]*University of Texas at San Antonio, United States*

12:30PM **Investigating The Effects of Extracellular Stiffness On Vascular Smooth Muscle Cell Stress and Mechanical Properties** SB^{3}C2019-201

Elizabeth Shih[1], Patrick Alford[1], [1]*Department of Biomedical Engineering at University of Minnesota Twin Cities, United States*

Thursday, June 27	**11:15AM -12:45PM**

Patient-Specific Flow and Physiology — Fox Den

Session Chair: Amirhossein Arzani *Northern Arizona University*

11:15AM **Cardiac Flow Dynamics of Healthy Volunteers : Sex Differences** SB^{3}C2019-202

David Rutkowski[1], Gregory Barton[1], Christopher Francois[1], Alejandro Roldan-Alzate[1], [1]*University of Wisconsin-Madison, United States*

11:30AM **Wall Shear Stress Topological Skeleton Identification In Cardiovascular Flows: A Practical Approach** SB^{3}C2019-203

Valentina Mazzi[1], Diego Gallo[1], Karol Cal[1], Muhammad O. Khan[2], David A. Steinman[3], Umberto Morbiducci[1], *[1]Polito BIOMed Lab, Department of Mechanical and Aerospace Engineering, Politecnico di Torino, Turin, Italy, [2]Cardiovascular Biomechanics Computation Lab, Department of Pediatrics Stanford University, Stanford, United States, [3]Biomedical Simulation Laboratory, Department of Mechanical & Industrial Engineering University of Toronto, Toronto, Canada*

11:45AM **Patient-Specific Fluid-Structure Interaction Analysis of A Bicuspid Aortic Valve** SB^{3}C2019-204

Monica Emendi[1], Ram Ghosh[2], Matteo Bianchi[2], Francesco Sturla[3], Filippo Piatti[3], Alberto Redaelli[1], Danny Bluestein[2], *[1]Politecnico di Milano, Italy, [2]Stony Brook University, United States, [3]IRCCS Policlinico San Donato, Italy*

12:00PM **Introduction of A Simple 2d Computational Model To Predict Risk of Coronary Obstruction During Transcatheter Aortic Valve Replacement** SB^{3}C2019-205

Megan Heitkemper[1], Hoda Hatoum[1], Amirsepher Azimian[1], Breandan Yeats[1], Jennifer Dollery[1], Bryan Whitson[1], Gregory Rushing[1], Juan Crestanello[1], Scott Lilly[1], Lakshmi Prasad Dasi[1], *[1]The Ohio State University, United States*

12:15PM **Machine Learning For Discrimination of Posterior Communicating Artery Aneurysm Rupture Status** SB^{3}C2019-206

Felicitas Detmer[1], Daniel Lckehe[2], Fernando Mut[1], Martin Slawski[1], Sven Hirsch[3], Philippe Bijlenga[4], Gabriele von Voigt[2], Juan Cebral[1], *[1]George Mason University, United States, [2]Leibniz University Hannover, Germany, [3]ZHAW University of Applied Sciences, Switzerland, [4]University of Geneva, Switzerland*

12:30PM **A Reduced Order Modeling Method For Cardiovascular Flow** SB^{3}C2019-207

Mehran Mirramezani[1], Shawn Shadden[1], *[1]University of California, Berkeley, United States*

Friday, June 28	**12:00PM - 1:30PM**

Biotransport in Thermal Therapy and Cryopreservation — Sunburst

Session Chair: R. Lyle Hood *University of Texas at San Antonio*
Session Co-Chair: Nilay Chakraborty *University of Michigan Dearborn*

12:00PM **Whole Body Hyperthermia Induced Interstitial Fluid Pressure Reduction and Enhanced Nanoparticle Delivery To Pc3 Tumors** SB^{3}C2019-208

Qimei Gu[1], Shuaishuai Liu[1], Arunendra Saha Ray[1], Lance Dockery[1], Marie-Christine Daniel[1], Charles Bieberich[1], Ronghui Ma[1], Liang Zhu[1], *[1]University of Maryland Baltimore County, United States*

12:15PM **Quantification of Tissue Electrical and Thermal Response Due To High Frequency Irreversible Electroporation: A Pilot Study In Ex Vivo Perfused Livers** SB^{3}C2019-209

Melvin Lorenzo[1], Tim O'Brien[2], Kenneth Aycock[1], Navid Manuchehrabadi[3], Rafael Davalos[1], *[1]Department of Biomedical Engineering and Mechanics Virginia Polytechnic and State University, United States, [2]Virginia Department of Biomedical Engineering and Mechanics Virginia Polytechnic and State University, United States, [3]AngioDynamics, United States*

12:30PM **Magnetic Nanoparticle Hyperthermia For Pancreatic Cancer: A Computational Study** SB^{3}C2019-210

Anilchandra Attaluri[1], Sri Kamal Kandala[2], Robert Ivkov[3], *[1]The Pennsylvania State University - Harrisburg, United States, [2]University of Texas MD Anderson Cancer Center, United States, [3]Johns Hopkins University School of Medicine, United States*

12:45PM **In Situ Photo-Inactivation of Proteins By Molecular Hyperthermia** SB^{3}C2019-211

Peiyuan Kang[1], Xiaoqing Li[1], Stephanie Shiers[1], Hejian Xiong[1], Theodore Price[1], Zhenpeng Qin[1], *[1]The university of texas at dallas, United States*

1:00PM **Diffusion Limited Cryopreservation of Arterial Tissue To 1.5 Mm With Radiofre-Quency Heated Metal Forms** SB^{3}C2019-212

Zonghu Han[1], Zhe Gao[1], Anirudh Sharma[2], John Bischof[2], *[1]University Of Minnesota, United States, [2]University of Minnesota, United States*

1:15PM **Counterintuitive Scaling Effects In The Developing Thermomechanical Stress During Cryogenic Cooling of The Kidney With Implications To Electromagnetic Rewarming For Organ Banking** SB^{3}C2019-213

Prem Solanki[1], Yoed Rabin[1], *[1]Carnegie Mellon University, United States*

Friday, June 28	**12:00PM - 1:30PM**

Aneurysm Mechanics — Snowflake

Session Chair: Spandan Maiti *University of Pittsburgh*
Session Co-Chair: Yanhang (Katherine) Zhang *Boston University*

12:00PM **Patient-Specific Estimation of Ascending Thoracic Aortic Aneurysim Growth and Remodeling: Fem Based Constrained Mixture Model** SB^{3}C2019-214

S. Jamaleddin Mousavi Mousavi[1], Stephane Avril[1], *[1]Mines Saint-Etienne, Univ Lyon, Univ Jean Monnet, INSERM, U 1059 Sainbiose, Centre CIS, F - 42023 Saint-Etienne France, France*

12:15PM **Machine Learning Prediction of Rupture Strength of Ascending Aortic Aneurysm Tissue** SB^{3}C2019-215

Xuehuan He[1], Anna Ferrara[2], Yuanming Luo[1], Ferdinando Auricchio[2], Jia Lu[1], *[1]University Of Iowa, United States, [2]Universit degli Studi di Pavia, Italy*

12:30PM **Wall Stress and Geometric Measures In Electively Repaired Abdominal Aortic Aneursyms** SB^{3}C2019-216

Balaji Rengarajan[1], Wei Wu[1], Mirunalini Thirugnanasambandam[2], Shalin Parikh[2], Raymond Gomez[1], Ender Finol[1], *[1]Department of Mechanical Engineering University of Texas at San Antonio San Antonio, TX, U.S.A., United States, [2]UTHSA/UTHSA Joint Graduate Program in Biomedical Engineering University of Texas at San Antonio San Antonio, TX, U.S.A., United States*

12:45PM **A Particle-Based Model Reveals An Insidious Feed-Back Loop Between Aortic Lamellar Disruption and Cell Apoptosis** SB^{3}C2019-217

Hossein Ahmadzadeh[1], Jay Humphrey[1], *[1]Yale University, United States*

1:00PM **Alterations In Biomechanical Properties of Aortic Wall In A Mouse Model of Marfan Syndrome** SB^{3}C2019-218

Nazli Gharraee[1], Rahul Raghavan[1], Yujian Sun[1], Susan Lessner[1], *[1]University of South Carolina, United States*

1:15PM **Can The Elastase Induced Aneurysm Model Be Used To Study Remodeling In Saccular Aneurysms** SB^{3}C2019-219

Chao Sang[1], David Kallmes[2], Watkins Simon[1], Anne Robertson[1], *[1]University of Pittsburgh, United States, [2]Mayo Clinic, United States*

Friday, June 28	**12:00PM - 1:30PM**

Mechanobiology - a Symposium in Memory of Christopher R. Jacobs — Wintergreen

Session Chair: Eno Ebong *Northeastern University*
Session Co-Chair: Ed Guo *Columbia University*

12:00PM **Adhesion Models For Cell Migration Simulator On Continuous Substrate** SB^{3}C2019-220

Jay Hou[1], Liam Tyler[1], Daniel Keefe[1], David Odde[1], Victor Barocas[1], *[1]University of Minnesota, United States*

12:15PM **Red Blood Cell Biomechanics In Chronic Fatigue Syndrome** SB^{3}C2019-221
Amit Saha[1], Brendan Schmidt[2], Arun Kumar[2], Amir Saadat[1], Vineeth Suja[1], Vy Nguyen[2], Justin Do[2], Wendy Ho[2], Mohsen Nemat-Gorgani[1], Eric Shaqfeh[1], Anand Ramasubramanian[2], Ronald Davis[1], *[1]Stanford University, United States, [2]San Jose State University, United States*

12:30PM **Development of Recombinant Inner-Ear Motor Protein Prestin Equipped With Affinity Tag** SB^{3}C2019-222
Michio Murakoshi[1], Hiroshi Wada[2], *[1]Kanazawa University, Japan, [2]Tohoku Bunka Gakuen University, Japan*

12:45PM **Inhibition of Gsk-3 By Licl Does Not Affect Msc Differentiation In Vitro Or Bone Formation In Situ** SB^{3}C2019-223
Alyssa Oberman[1], Angela Patel[1], Glen Niebur[1], *[1]University of Notre Dame, United States*

1:00PM **Mechanical Feedback and Cooperativity In A Theoretical Model of Airway Smooth Muscle Cell-Matrix Adhesion** SB^{3}C2019-224
Linda Irons[1], Markus Owen[2], Reuben O'Dea[2], Bindi Brook[2], *[1]Yale University, United States, [2]University of Nottingham, United Kingdom*

1:15PM **Extracellular Matrix Stiffness Regulates Calcium Oscillations In Multicellular Ensembles, But Not In Isolated Cells** SB^{3}C2019-225
Suzanne Stasiak[1], Ryan Jamieson[1], Harikrishnan Parameswaran[1], *[1]Northeastern University, United States*

Friday, June 28 | 12:00PM - 1:30PM

Imaging and Mechanics of Ligament and Tendon — Seasons 1-3

Session Chair: Mona Eskandari *University of California Riverside*
Session Co-Chair: Mariana Kersh *University of Illinois at Urbana-Champaign*

12:00PM **Elastography Evaluation of The Elbow Ulnar Collateral Ligament In Overhead Throwing Athletes** SB^{3}C2019-226
Seyedali Sadeghi[1], Dov Bader[1], Daniel Cortes[1], *[1]Penn State University, United States*

12:15PM **Assessment of Tendon Hydraulic Permeability Using Osmotic Loading and Biphasic Finite Element Modeling** SB^{3}C2019-227
Babak N. Safa[1], Ellen Bloom[1], Andrea Lee[1], Michael Santare[1], Dawn Elliott[1], *[1]University of Delaware, United States*

12:30PM **Three Dimensional Morphological Changes In Carpal Tunnel Ligament Arch In Response To Wrist Compressive Forces** SB^{3}C2019-228
Rakshit Shah[1], Zong-Ming Li[1], *[1]Hand Research Laboratory, Department of Biomedical Engineering, United States*

12:45PM **Fibroblast-Like Synoviocytes Alter Matrix Mechanics & Neuronal Mmp-1 Expression Under Tensile Failure To Different Degrees Depending On Concentration** SB^{3}C2019-229
Meagan Ita[1], Nicholas Stiansen[1], Sarah St Pierre[2], Beth Winkelstein[1], *[1]University of Pennsylvania, United States, [2]Worcester Polytechnic Inst, United States*

1:00PM **Aging Adversely Affects Different Rat Rotator Cuff Tendons Similarly** SB^{3}C2019-230
Joseph Newton[1], George Fryhofer[1], Snehal Shetye[1], Ashley Rodriguez[1], Andrew Kuntz[1], Lou Soslowsky[1], *[1]University of Pennsylvania, United States*

1:15PM **Comparison of The Deformation Behavior of The Anterior Cruciate Ligament In Response To Various External Knee Loadings** SB^{3}C2019-231
Satoshi Yamakawa[1], Richard Debski[1], Hiromichi Fujie[2], *[1]University of Pittsburgh, United States, [2]Tokyo Metropolitan University, Japan*

Friday, June 28	12:00PM - 1:30PM

Injury: Models — Seasons 4-5

Session Chair: Brittany Coats *University of Utah*
Session Co-Chair: Mehmet Kurt *Stevens Institute of Technology*

12:00PM **Development of Finite Element Model of Subhuman Primate Brain and Investigation of Diffuse Axonal Injury Thresholds Induced By Head Rotation** SB^{3}C2019-232

Tushar Arora[1], Priya Prasad[2], Liying Zhang[1], *[1]Wayne State University, United States, [2]Prasad Engineering, LLC, United States*

12:15PM **Development of A Computational Biomechanics Mouse Model For Traumatic Axonal Injury** SB^{3}C2019-233

Connor Bradfield[1], Liming Voo[1], KT Ramesh[2], *[1]Johns Hopkins Applied Physics Lab, United States, [2]Johns Hopkins Department of Mechanical Engineering, United States*

12:30PM **A Study of The Brain-Skull Interface Conditions of The Worcester Rat Head Injury Model (wrhim)** SB^{3}C2019-234

Wei Zhao[1], Brian Stemper[2], Songbai Ji[1], *[1]Worcester Polytechnic Institute, United States, [2]Marquette University & Medical College of Wisconsin, United States*

12:45PM **Probabalistic Analysis of Injury Risk Using Human Body Finite Element Models** SB^{3}C2019-235

Travis Eliason[1], Matthew Davis[2], Derek Jones[2], Daniel Nicolella[1], *[1]Southwest Research Institute, United States, [2]Elemance, United States*

1:00PM **Characterization of Injured Brain Tissue After Controlled Cortical Impact** SB^{3}C2019-236

Suhao Qiu[1], Wenheng Jiang[2], Changxin Lai[1], Tianyao Wang[3], Wei Chen[2], Luyang Tao[2], Mingyuan Gao[2], Jun Liu[3], Jianfeng Zeng[2], Yuan Feng[1], *[1]Shanghai Jiao Tong University, China, [2]Soochow University, China, [3]Fudan University, China*

1:15PM **A Model of Tension-Induced Organization of Subcortical Axons During Cortical Folding of The Brain** SB^{3}C2019-237

Kara Garcia[1], Christopher Kroenke[2], Philip Bayly[3], *[1]Indiana University School of Medicine, United States, [2]Oregon Health and Science University, United States, [3]Washington University in St. Louis, United States*

Friday, June 28	12:00PM - 1:30PM

Cardiovascular and Musculoskeletal Device Design — Hemlock

Session Chair: Amy Throckmorton *Drexel University*
Session Co-Chair: Lucas Timmins *University of Utah*

12:00PM **Synthesis and Characterization of Porous Shape Memory Polymer Materials For Use In The Design of Implantable Medical Devices** SB^{3}C2019-238

Robert Kunkel[1], Jingyu Wang[1], Jishan Luo[1], Bradley Bohnstedt[2], Yingtao Liu[1], Chung-Hao Lee[1], *[1]University of Oklahoma, United States, [2]University of Oklahoma Health Sciences Center, United States*

12:15PM **Dual-Support Mechanical Assistive Technology For Pediatric and Young Adult Patients** SB^{3}C2019-239

Carson Fox[1], Randy Stevens[2], Joseph Rossano[3], Francisco Arabia[4], Amy Throckmorton[1], *[1]Biomedical Engineering, Drexel University, United States, [2]St. Christopher's Hospital for Children, United States, [3]Cardiology, The Children's Hospital of Philadelphia, United States, [4]Cardiothoracic Surgery, University of Arizona, United States*

12:30PM **Durable and Flexible Superhydrophobic and Blood-Repelling Surface With Shape-Customizable Features For Biomedical Applications** SB^{3}C2019-240

Zhe Li[1], Ba Loc Nguyen[2], Junmin Xue[3], Graeme MacLaren[4], Choon Hwai Yap[1], *[1]Department of Biomedical Engineering, National University of Singapore, Singapore, Singapore, [2]National University of SingaporeDepartment of Biomedical Engineering, National University of Singapore, Singapore, Singapore, [3]Department of Material Science and Engineering, National University of Singapore, Singapore, Singapore, [4]Department of Surgery, Yong Loo Lin School of Medicine, National University of Singapore, Singapore, Singapore*

12:45PM **Quantifying The Capacitance and Resistance of A Double-Walled Aortic Stent-Graft Prototype** SB^{3}C2019-241

Shannen B Kizilski[1], Omid Amili[1], Filippo Coletti[1], Rumi Faizer[1], Victor H Barocas[1], *[1]University of Minnesota, United States*

1:00PM **Developement and Evaluation of An Intratracheal Aerosol Delivery Device For Avian Wildlife Conservation Efforts** SB^{3}C2019-242

Carlos Ruvalcaba[1], Susana Ramirez-Perez[1], Stephanie Ortega[1], Lisa Tell[1], Jean-Pierre Delplanque[1], *[1]University of California Davis, United States*

Friday, June 28	**12:00PM - 1:30PM**

Thrombosis Hemolysis and Mechanical Circulatory Support — Fox Den

Session Chair: Keefe Manning *The Pennsylvania State University*

12:00PM **Superhydrophobicity and Vortex Generators Potential To Reduce Thrombogenicity After Prosthetic Valve Implantation** SB^{3}C2019-243

Hoda Hatoum[1], David Bark[2], Hamed Vahabi[2], Sanli Movafaghi[2], Brandon Moore[2], Marcio Forleo[2], Arun Kota[2], Ketul Popat[2], Lakshmi Prasad Dasi[1], *[1]The Ohio State University, United States, [2]Colorado State University, United States*

12:15PM **A Multiscale Model For Simulating Platelet Aggregation: Correlating With In Vitro Results** SB^{3}C2019-244

Peng Zhang[1], Prachi Gupta[1], Jawaad Sheriff[1], Changnian Han[1], Marvin J. Slepian[2], Yuefan Deng[1], Danny Bluestein[1], *[1]Stony Brook University, United States, [2]University of Arizona, United States*

12:30PM **3d Flexible Non-Newtonian Computational Framework To Study Thrombosis Initiation** SB^{3}C2019-245

Sabrina R. Lynch[1], Christopher J. Arthurs[2], Zelu Xu[3], Onkar Sahni[3], Jose A. Diaz[1], C. Alberto Figueroa[1], *[1]University of Michigan, United States, [2]King's College London, United Kingdom, [3]Rensselaer Polytechnic Institute, United States*

12:45PM **Refining A Numerical Model For Device-Induced Thrombosis** SB^{3}C2019-246

Ling Yang[1], Steven Deutsch[1], Keefe Manning[1], *[1]Department of Biomedical Engineering, The Pennsylvania State University, United States*

1:00PM **Investigation of The Interplay Between Blood and Thrombus Mechanical Properties: A 3d Fluid-Solid Interaction Model** SB^{3}C2019-247

Fatama T. Huda[1], Tarek Abdel-Salam[1], Nathan E. Hudson[1], Ali Vahdati[1], *[1]East Carolina University, United States*

1:15PM **Numerical Models of Valve-In-Valve Deployment To Evaluate The Risk of Leaflets Thrombosis** SB^{3}C2019-248

Halit Yaakobovich[1], Dar Weiss[1], Uri Zaretsky[1], Shmuel Einav[1], Gil Marom[1], *[1]Tel Aviv University, Israel*

Friday, June 28	1:45PM - 3:15PM

Biotransport in Disease Detection and Therapy — Sunburst

Session Chair: Zhongping Huang *West Chester University*
Session Co-Chair: Rebecca Heise *Virginia Commonwealth University*

1:45PM **Accurate Detection of Differential Interaction Strengths In Energy Landscapes Using Machine Learning** SB^{3}C2019-249
Ahmad Haider[1], Alan Liu[1], Todd Sulchek[1], [1]*Georgia Institute of Technology, Atlanta, United States*

2:00PM **Aerosolized Surfactant Replacement Therapy In An In Vivo Rodent Lung Injury Model** SB^{3}C2019-250
Franck J Kamga Gninzeko[1], Michael Valentine[1], Sahil Chindal[1], Susan Boc[2], Sneha Dhapare[1], Michael Hindle[1], Dale Farkas[1], P. Worth Longest[1], Rebecca Heise[1], [1]*Virginia Commonwealth University, United States,* [2]*Virginia Commonealth University, United States*

2:15PM **Numerical Analysis of Dense Suspension Rheology of Red Blood Cells In A Shear Flow** SB^{3}C2019-251
Naoki Takeishi[1], Marco Rosti[2], Yohsuke Imai[3], Shigeo Wada[1], Luca Brandt[2], [1]*Osaka University, Japan,* [2]*Royal Institute of Technology (KTH), Sweden,* [3]*Kobe University, Japan*

2:30PM **Deep Learning Assisted Label-Free On-Chip Selective Extraction of Single-Cell-Laden Droplets From Oil Into Aquous Solution With Dielectrophoresis** SB^{3}C2019-252
Alisa White[1], Yuntian Zhang[2], Gang Zhao[2], Xiaoming He[1], [1]*University of Maryland College Park, United States,* [2]*University of Science and Technology of China, China*

2:45PM **Biotransport In The Glymphatic System: Measuring and Modeling Flow Through Perivascular Spaces** SB^{3}C2019-253
Humberto Mestre[1], Jeffrey Tithof[2], Ting Du[1], Wei Song[1], Weiguo Peng[1], Amanda Sweeney[1], Genaro Olveda[1], John Thomas[2], Maiken Nedergaard[1], Douglas Kelley[2], [1]*University of Rochester Medical Center, United States,* [2]*University of Rochester, United States*

Friday, June 28	1:45PM - 3:15PM

Vascular Pathology and Disease Progression — Snowflake

Session Chair: Umberto Morbiducci *Politecnico di Torino*

1:45PM **Prediction of Carotid Restenosis Risk After Endarterectomy By Hemodynamic and Geometric Analysis: A 5-Years Follow-Up** SB^{3}C2019-254
Diego Gallo[1], Maurizio Domanin[2], Christian Vergara[3], Umberto Morbiducci[1], [1]*Politecnico di Torino, Italy,* [2]*Universit di Milano, Italy,* [3]*Politecnico di Milano, Italy*

2:00PM **Comparison of Healthy and Pulmonary Hypertension Hemodynamics** SB^{3}C2019-255
Senol Piskin[1], Ender A. Finol[1], [1]*University Of Texas At San Antonio, United States*

2:15PM **Functional Characterization of Arteriovenous Fistula On Swine Models Using Mri** SB^{3}C2019-256
Eleonora Tubaldi[1], Jose A. Rosado-Toro[1], Diego Celdran-Bonafonte[1], Prabir Roy-Chaudhury[1], [1]*University of Arizona, United States*

2:30PM **Impact of Hemodynamics and Endothelial Glycocalyx On Cancer Cell Adhesion To Vascular Wall Endothelium** SB^{3}C2019-257
Solomon Mensah[1], Alina Nersesyan[1], Ian Harding[1], Mark Niedre[1], Vladimir Torchilin[1], Eno Ebong[1], [1]*Northeastern University, United States*

2:45PM **Pulmonary Artery Hemodynamic Changes In Pediatric Patients With Ventricular Septal Defects** SB^{3}C2019-258
Melody Dong[1], Weiguang Yang[1], Marlene Rabinovitch[1], Jeffrey Feinstein[1], Alison Marsden[1], *[1]Stanford University, United States*

3:00PM **Fluid-Solid Growth Modeling of Pulmonary Vascular Tree: Establishing A Homeostatic Baseline State** SB^{3}C2019-259
Hamidreza Gharahi[1], Seungik Baek[1], Vasilina Filonova[2], C. Alberto Figueroa[2], *[1]Michigan State University, United States, [2]University of Michigan, United States*

Friday, June 28	**1:45PM - 3:15PM**

Mechanobiology - a Symposium in Memory of Christopher R. Jacobs — Wintergreen

Session Chair: Kara Garcia *Indiana University School of Medicine*
Session Co-Chair: Tammy Haut Donahue *University of Massachusetts Amherst*

1:45PM **An Active Chemo-Mechanical Model Predicts Adhesion and Microenvironmental Regulation of 3d Cell Shapes** SB^{3}C2019-260
Xingyu Chen[1], Veronika te Boekhorst[2], Peter Friedl[2], Vivek Shenoy[1], *[1]University of Pennsylvania, United States, [2]University of Texas MD Anderson Cancer Center, United States*

2:00PM **Myosin-Independent Regulation of Cell and Nuclear Structures In Wavy Patterns** SB^{3}C2019-261
Bor-Lin Huang[1], Chin-Hsun Huang[1], Richard Assoian[2], Pen-hsiu Grace Chao[1], *[1]National Taiwan University, Taiwan, [2]University of Pennsylvania, United States*

2:15PM **Mapping 3d Mechanical Strains During Tissue Formation With A Novel Fibronectin-Based Nanomechanical Biosensor** SB^{3}C2019-262
Daniel Shiwarski[1], Joshua Tashman[1], Alkis Tsamis[1], Quintin Jallerat[1], Malichi Blundon[1], John Szymanski[1], Brooke McCartney[1], Lance Davidson[2], Adam Feinberg[1], *[1]Carnegie Mellon University, United States, [2]University of Pittsburgh, United States*

2:30PM **Tendon Enthesis Cilium Assembly Is Driven By Mechanical Loading and Hedgehog Signaling** SB^{3}C2019-263
Fei Fang[1], Andrea Schwartz[2], Stavros Thomopoulos[1], *[1]Columbia University, United States, [2]Washington University in St. Louis, United States*

2:45PM **Sensing The Curvature: Protrusive Sensitivity of Invasive Breast Cancer Cells** SB^{3}C2019-264
Apratim Mukherjee[1], Bahareh Behkam[1], Amrinder Nain[1], *[1]Virginia Tech, United States*

3:00PM **Towards Fiber-Level Traction Force Microscopy In Collagen Gels** SB^{3}C2019-265
Lauren Bersie-Larson[1], Jay Hou[1], Victor Barocas[1], Paolo Provenzano[1], *[1]University Of Minnesota, United States*

Friday, June 28	**1:45PM - 3:15PM**

Spine Biomechanics — Seasons 1-3

Session Chair: Alicia Jackson *University of Miami*
Session Co-Chair: Daniel Cortes *Penn State University*

1:45PM **Inhibition of The Integrin Beta-1 Subunit Increases Strain Thresholds For Peripheral Neuron Dysfunction and Injury** SB^{3}C2019-266
Sagar Singh[1], Beth Winkelstein[1], *[1]University of Pennsylvania, United States*

2:00PM **Vertebral Endplate Remodeling Reduces Small Molecule Diffusion Into Degenerative Intervertebral Discs** SB^{3}C2019-267

Beth Ashinsky[1], Edward Bonnevie[1], Sai Mandalapu[1], Stephen Pickup[1], Chao Wang[2], Lin Han[2], Robert Mauck[1], Harvey Smith[1], Sarah Gullbrand[1], *[1]University of Pennsylvania, United States, [2]Drexel University, United States*

2:15PM **In-Plane Shear Mechanical Characterization of The Lumbar Facet Capsular Ligament** SB^{3}C2019-268

Emily Bermel[1], Arin Ellingson[1], Victor Barocas[1], *[1]University of Minnesota - Twin Cities, United States*

2:30PM **Direct Quantification of Intervertebral Disc Water Content Using Magnetic Resonance Imaging** SB^{3}C2019-269

Bo Yang[1], Michael Wendland[1], Yu Ma[1], Grace O'Connell[1], *[1]University Of California Berkeley, United States*

2:45PM **Location-Wise Fatigue Damage Prediction For The Intervertebral Disc Annulus of The Cervical Spine** SB^{3}C2019-270

Adhitya Vikraman Subramani[1], Phillip Whitley[2], Harsha Teja Garimella[2], Reuben Kraft[1], *[1]Pennsylvania State University, United States, [2]CFD Research, United States*

3:00PM **Bone Volume Fraction Vs. Bone Mass Density As A Predictor For Mechanical Properties of The Cancellous Bone of Human Lumbar Vertebral Bodies** SB^{3}C2019-271

Francesco Travascio[1], Abeer Al-Barghouthi[2], Loren Latta[1], *[1]University of Miami, United States, [2]Max Biedermann Institute for Biomechanics, Mount Sinai Medical Center, United States*

Friday, June 28	**1:45PM - 3:15PM**

Growth Remodeling and Repair II: Musculoskeletal System Seasons 4-5

Session Chair: Reuben Kraft *Penn State University*
Session Co-Chair: Johannes Weickenmeier *Stevens Institute of Technology*

1:45PM **Murine Rorator Cuff Tendinopathy Models: The Role of Muscle Loading** SB^{3}C2019-272

Adam Abraham[1], Fei Fang[1], Mikhail Golman[1], Panagiotis Oikonomou[1], Stavros Thomopoulos[1], *[1]Columbia University, United States*

2:00PM **The Effect of Fatigue On The Impact Response of Rat Ulna** SB^{3}C2019-273

Chenxi Yan[1], Mariana Kersh[1], *[1]University of Illinois Urbana Champaign, United States*

2:15PM **Microindentation Maps Two Gradients In Mechanical Properties Across The Zones of The Growth Plate** SB^{3}C2019-274

Kevin Eckstein[1], Karin Payne[2], Virginia Ferguson[1], *[1]University of Colorado at Boulder, United States, [2]University of Colorado at Anschutz, United States*

2:30PM **Fibrous Network Topography Regulates Fibrotic Phenotypes In Annulus Fibrosus Cells** SB^{3}C2019-275

Edward Bonnevie[1], Sarah Gullbrand[1], Beth Ashinsky[2], Tonia Tsinman[1], Dawn Elliott[3], Harvey Smith[1], Robert Mauck[1], *[1]University of Pennsylvania and CMC VA Medical Center, United States, [2]University of Pennsylvania, CMC VA Medical Center, and Drexel University, United States, [3]University of Delaware, United States*

2:45PM **Mitochondria Function, Structural, and Mechanical Outcomes After Exposure To Near-Infrared Light During Tendon Maturation and Adult Healing** SB^{3}C2019-276

Ryan Locke[1], Elisabeth Lemmon[1], Ellen Dudzinski[1], Sarah Kopa[1], Harrah Newman[1], Elahe Ganji[1], Megan Killian[1], *[1]University of Delaware, United States*

3:00PM **Primary Synovial Fibroblast-Collagen Gels Exhibit Unique Tensile Failure Properties & Microstructure From 3t3-Collagen Gels** SB^{3}C2019-277

Meagan Ita[1], Harrison Troche[1], Beth Winkelstein[1], *[1]University of Pennsylvania, United States*

Friday, June 28	1:45PM - 3:15PM

Soft Tissue Mechanics — Hemlock

Session Chair: Kristin Myers *Columbia University*
Session Co-Chair: Joao Soares *Virginia Commonwealth University*

1:45PM **Contact Experiments Reveal Pressure Evolution In Soft Hydrated Interfaces** SB^{3}C2019-278
Christopher Johnson[1], Jiho Kim[1], Alison Dunn[1], *[1]University of Illinois at Urbana-Champaign, United States*

2:00PM **Harmonic Shear Wave Imaging: A New Elastography Method To Evaluate Mechanical Properties of Soft Tissues** SB^{3}C2019-279
Seyedali Sadeghi[1], Daniel Cortes[1], *[1]Penn State University, United States*

2:15PM **Strong Triaxial Coupling and Anomalous Poisson Effect In Collagen Networks** SB^{3}C2019-280
Ehsan Ban[1], Hailong Wang[2], J Matthew Franklin[3], Jan Liphardt[3], Paul Janmey[1], Vivek Shenoy[1], *[1]University of Pennsylvania, United States, [2]University of Science and Technology of China, China, [3]Stanford University, United States*

2:30PM **Fiber Orientation and Structure Characterization of Pregnant and Nonpregnant Human Uterus** SB^{3}C2019-281
Shuyang Fang[1], James McLean[2], Christine Hendon[2], Joy Vink[3], Kristin Myers[1], *[1]Department of Mechanical Engineering Columbia University, United States, [2]Department of Electrical Engineering Columbia University, United States, [3]Department of Obstetrics and Gynecology Columbia University Medical Center, United States*

2:45PM **Cadherin-11 Regulates Aortic Valve Interstitial Cell Force Generation and Mechanical Properties** SB^{3}C2019-282
Matthew Bersi[1], Meghan Bowler[1], W. David Merryman[1], *[1]Vanderbilt University, United States*

3:00PM **A Volumetric Growth Model For Healing Post-Infarction Scar** SB^{3}C2019-283
Derek Bivona[1], Ana Estrada[1], Jeffrey Holmes[1], *[1]University of Virginia, United States*

Friday, June 28	1:45PM - 3:15PM

Emerging Computational and Experimental Methods in Fluid Mechanics — Fox Den

Session Chair: C. Alberto Figueroa *University of Michigan*

1:45PM **A Multiscale Flow-Mediated Platelet Adhesion Model and Its Experimental Validation** SB^{3}C2019-284
Peng Zhang[1], Jawaad Sheriff[1], Peineng Wang[1], Marvin J. Slepian[2], Yuefan Deng[1], Danny Bluestein[1], *[1]Stony Brook University, United States, [2]University of Arizona, United States*

2:00PM **Deep-Learning Based Region-of-Interest Selection In 3d Cerebrovascular Images** SB^{3}C2019-285
Tatsat Rajendra Patel[1], Prakhar Jaiswal[1], Nikhil Paliwal[1], Adnan H Siddiqui[1], Rahul Rai[1], Hui Meng[1], *[1]University at Buffalo, United States*

2:15PM **A Forward Incremental Prestressing Approach For Nonlinear Fluid-Structure Interaction Hemodynamics** SB^{3}C2019-286
Nitesh Nama[1], Miquel Aguirre[2], Jay D. Humphrey[3], C. Alberto Figueroa[1], *[1]University of Michigan, United States, [2]Mines Saint-tienne, France, [3]Yale University, United States*

2:30PM **Fsi Modeling of Cyclic Aspiration For Acute Ischemic Stroke Patients** SB^{3}C2019-287
Bryan Good[1], Francesco Costanzo[1], Scott Simon[2], Keefe Manning[1], *[1]The Pennsylvania State University, United States, [2]Penn State Hershey Medical Center, United States*

2:45PM **A Systematic Methodology For Correcting Pc-Mri and Cfd Incompatibilities** SB^{3}C2019-288
Thomas Puiseux[1], Anou Sewonu[2], Franck Nicoud[1], Simon Mendez[1], Ramiro Moreno[2], *[1]IMAG, Univ. Montpellier, CNRS, France, [2]ALARA Expertise, France*

3:00PM **Reduced-Order Leaflet Models For Numerical Experiments On Transcatheter Aortic Valves** SB^{3}C2019-289
Shantanu Bailoor[1], Jung-Hee Seo[1], Hoda Hatoum[2], Lakshmi Prasad Dasi[2], Rajat Mittal[1], *[1]Johns Hopkins University, United States, [2]Ohio State University, United States*

Friday, June 28	**3:30PM - 5:00PM**

Multiscale Biotransport in Hemodynamics and Lymphatics — Sunburst

Session Chair: Brandon Dixon *Georgia Institute of Technology*
Session Co-Chair: Mona Eskandari *University of California Riverside*

3:30PM **Biotransport In The Glymphatic System: Pulsation, Peristalsis, and High Blood Pressure** SB^{3}C2019-290
Humberto Mestre[1], Jeffrey Tithof[1], Ting Du[1], Wei Song[1], Weiguo Peng[1], Amanda M. Sweeney[1], Genaro Olveda[1], John H. Thomas[1], Maiken Nedergaard[1], Douglas H. Kelley[1], *[1]University of Rochester, United States*

3:45PM **Micro Particle Image Velocimetry For In Vitro Assessment of Patient Specific Whole Blood Rheology** SB^{3}C2019-291
Erdem Kucukal[1], Yuncheng Man[1], Ailis Hill[1], Shichen Liu[1], Jane Little[1], Umut Gurkan[1], *[1]Case Western Reserve University, United States*

4:00PM **Patient-Specific Metrics From Quantitative Rheology of Whole Sickle Blood Using Microfluidics** SB^{3}C2019-292
Jose Valdez[1], Yvonne Datta[2], John Higgins[3], David Wood[1], *[1]University of Minnesota-Department of Biomedical Engineering, United States, [2]University of Minnesota-Department of Medicine, United States, [3]Harvard University-Department of Systems Biology, United States*

4:15PM **Instability of Phospholipid Bilayer Under Shear Flow: Molecular Dynamics Simulation** SB^{3}C2019-293
Taiki Shigematsu[1], Kenichiro Koshiyama[2], Shigeo Wada[3], *[1]Global Center for Medical Engineering and Informatics, Osaka University, Japan, [2]Graduate School of Technology, Industrial and Social Sciences, Tokushima University, Japan, [3]Graduate School of Engineering Science, Osaka University, Japan*

4:30PM **Computational Simulations of Thrombolytic Therapy In Acute Ischaemic Stroke** SB^{3}C2019-294
Boram Gu[1], Andris Piebalgs[1], Yu Huang[1], Dylan Roi[2], Kyriakos Lobotesis[2], Rongjun Chen[1], Simon A. Thom[3], Xiao Yun Xu[1], *[1]Department of Chemical Engineering, Imperial College London, United Kingdom, [2]Imaging Department, Charing Cross Hospital, Imperial College Healthcare NHS Trust, United Kingdom, [3]National Heart & Lung Institute, Imperial College London, United Kingdom*

4:45PM **Combined Microfluidic-Computational Approach To Quantify The Effect of Sickle-Cell Disease On Blood Rheology** SB^{3}C2019-295
Marisa Bazzi[1], Jose Valdez[2], David Wood[2], Victor Barocas[2], *[1]Department of Chemical Engineering and Material Science University of Minnesota, United States, [2]Department of Biomedical Engineering University of Minnesota, United States*

Friday, June 28	3:30PM - 5:00PM

Cardiovascular Mechanics: Other — Snowflake

Session Chair: Seungik Baek *Michigan State University*
Session Co-Chair: Sourav Patnaik *University of Texas at San Antonio*

3:30PM **Mechanical Characterization of Atherosclerotic Coronary Arteries By Ex-Vivo Inflation Testing and Inverse Finite Element Modeling** SB^{3}C2019-296
Su Guvenir[1], Giulia Gandini[1], Irene Berselli[2], Veronica Codazzi[2], Francesco Migliavacca[2], Claudio Chiastra[2], Frank J.H. Gijsen[1], Ali C. Akyildiz[1], *[1]Erasmus Medical Center, Netherlands, [2]Politecnico Di Milano, Italy*

3:45PM **Histomechanical Analysis of Decellularized Porcine Internal Thoracic Arteries** SB^{3}C2019-297
Colton Kostelnik[1], Wayne Carver[2], John Eberth[2], *[1]University of South Carolina - Department of Biomedical Engineering, United States, [2]University of South Carolina School of Medicine - Department of Cell Biology and Anatomy, United States*

4:00PM **Understanding The Transmural Variation In Extracellular Matrix Fiber Orientation Using Multi-Photon Microscopy** SB^{3}C2019-298
Anastasia Gkousioudi[1], Jacopo Ferruzzi[1], Yanhang Zhang[1], *[1]Boston University, United States*

4:15PM **Kinematic Analysis of Murine Cardiac Hypertrophy Using High-Frequency Four-Dimensional Ultrasound** SB^{3}C2019-299
Frederick Damen[1], Mauro Costa[2], Craig Goergen[1], *[1]Purdue University, United States, [2]The Jackson Laboratory, United States*

4:30PM **Selective Stiffening of A Myocardial Infarct Improves Predicted Systolic Function Without Impairing Filling** SB^{3}C2019-300
Kyoko Yoshida[1], Ana Estrada[1], Jeffrey Holmes[1], William Richardson[2], *[1]University of Virginia, United States, [2]Clemson University, United States*

4:45PM **Hypertension-Induced Changes In The Mechanical Behvaior of The Left Ventricular Wall** SB^{3}C2019-301
Marissa Grobbel[1], Ari Hollander[1], Analeeza Dubay[1], Emma Darios Flood[1], Kibrom Alula[1], Gregory Fink[1], Stephanie Watts[1], Lik Chuan Lee[1], Sara Roccabianca[1], *[1]Michigan State University, United States*

Friday, June 28	3:30PM - 5:00PM

Biofabrication and 3D in Vitro Systems — Wintergreen

Session Chair: Matthew Fisher *NC State University*
Session Co-Chair: Anna Grosberg *University of California, Irvine*

3:30PM **Bioprinting 3d Breast Epithelial Spheroids To Study Vascular Interactions In Human Cancer** SB^{3}C2019-302
Swathi Swaminathan[1], Alisa Morss Clyne[1], *[1]Drexel University, United States*

3:45PM **Fabricating 3d Cellular Aggregates Via Laser Direct-Write Bioprinting: Size- and Shape-Controlled Embryoid Bodies and Tumor Spheroids** SB^{3}C2019-303
David Kingsley[1], Cassandra Roberge[1], David Corr[1], *[1]Rensselaer Polytechnic Institute, United States*

4:00PM **Fluid-Structure Interaction At Drop-Drop Interface During Drop-On-Demand Printing of Hydrogel-Based Soft Materials** SB^{3}C2019-304
Cih Cheng[1], George T. C. Chiu[1], Bumsoo Han[1], *[1]Purdue University, United States*

4:15PM **Directed Self-Assembly of 3d In Vitro Tissue Models Using Droplet Microfluidics** SB[3]C2019-305
Jasmine Shirazi[1], Michael Donzanti[1], Jason Gleghorn[1], *[1]University of Delaware, United States*

4:30PM **Engineering A 3d Model of Ductal Carcinoma In Situ Using Multimaterial Fresh 3d Bioprinting** SB[3]C2019-306
Joshua Tashman[1], Thomas Hinton[1], Daniel Brown[2], Daniel Shiwarski[3], Andrew Lee[1], Andrew Hudson[1], Adrian Lee[2], Adam Feinberg[1], *[1]Carnegie Mellon University, United States, [2]University of Pittsburgh, United States, [3]Canegie Mellon University, United States*

4:45PM **Integrating In Vitro and In Silico Technologies: Development of A Perfusion Bioreactor and Its Digital Twin** SB[3]C2019-307
Liesbet Geris[1], Mohammad Mehrian[1], Sebastien de Bournonville[2], Toon Lambrechts[2], Jean-Marie Aerts[2], Frank Luyten[2], Ioannis Papantoniou[2], *[1]University of Lige, Belgium, [2]KU Leuven, Belgium*

Friday, June 28	**3:30PM - 5:00PM**

Mechanics and Modeling of Musculoskeletal Soft Tissues Seasons 1-3

Session Chair: Sara Roccabianca *Michigan State University*
Session Co-Chair: Adrian Buganza Tepole *Purdue University*

3:30PM **Sex-Dependent Orientation and Size of The Anterior Cruciate Ligament Throughout Skeletal Growth In The Porcine Stifle Joint** SB[3]C2019-308
Danielle Howe[1], Stephanie Cone[1], Jorge Piedrahita[2], Lynn Fordham[3], Jeffrey Spang[3], Matthew Fisher[1], *[1]North Carolina State University and the University of North Carolina- Chapel Hill, United States, [2]North Carolina State University, United States, [3]University of North Carolina- Chapel Hill, United States*

3:45PM **Decorin, Alone and In Tandem With Biglycan, Alters Viscoelasticity In Aged Tendons** SB[3]C2019-309
Ryan Leiphart[1], Snehal Shetye[1], Stephanie Weiss[1], Louis Soslowsky[1], *[1]University of Pennsylvania, United States*

4:00PM **Bath Osmolarity Alters Multiscale Mechanics and Damage In Tendon** SB[3]C2019-310
Ellen Bloom[1], Andrea Lee[1], Dawn Elliott[1], *[1]University of Delaware, United States*

4:15PM **Quantifying Differences In The Mechanical Properties of The Flexor and Extensor Muscles In The Human Forearm Using Mr Elastography** SB[3]C2019-311
Daniel Smith[1], Andrea Zonnino[1], Peyton Delgorio[1], Raymond Duda[1], Fabrizio Sergi[1], Curtis Johnson[1], *[1]University of Delaware, United States*

4:30PM **Sex-Related Differences In Carpal Arch Morphology** SB[3]C2019-312
Kishor Lakshminarayanan[1], Rakshit Shah[1], Zong-Ming Li[1], *[1]Hand Research Laboratory, Department of Biomedical Engineering, United States*

4:45PM **Utilizing Arfi Imaging To Predict Linear Region Modulus of Tendons From Toe Region Data** SB[3]C2019-313
Gerald A Ferrer[1], Waqas Khalid[1], Volker Musahl[1], Kang Kim[1], Richard E Debski[1], *[1]University of Pittsburgh, United States*

Friday, June 28	3:30PM - 5:00PM

Injury: Biomechanics — Seasons 4-5

Session Chair: Songbai Ji *WPI*
Session Co-Chair: Yuan Feng *Shanghai Jiao Tong University*

3:30PM **Shear Wave Propagation and Estimation of Material Parameters In A Nonlinear, Fibrous Material** SB^{3}C2019-314
Zuoxian Hou[1], Ruth Okamoto[1], Philip Bayly[1], [1]*Washington University in St.Louis, United States*

3:45PM **Shock Wave Propagation In Brain Tissue** SB^{3}C2019-315
Donghoon Keum[1], Soroush Assari[1], Kurosh Darvish[1], [1]*Temple University, United States*

4:00PM **Effect of Corpus Callosum Demyelination On Murine Brain Injury Mechanism** SB^{3}C2019-316
Javid Abderezaei[1], Gloria Fabris[1], Zachary Lopez[1], Cassandra Gologorsky[2], Johannes Weickenmeier[1], Mehmet Kurt[1], [1]*Stevens Institute of Technology, United States,* [2]*Cornell University, United States*

4:15PM **High-Rate Anisotropic and Region-Dependent Properties In Human Infant Cranial Bone** SB^{3}C2019-317
Robert Metcalf[1], Jessica Comstock[2], Brittany Coats[1], [1]*University of Utah, Mechanical Engineering, United States,* [2]*University of Utah, Pediatric Pathology, United States*

4:30PM **Bilateral Skull Fractures Due To Controlled Head Drops In Infant Porcine Specimens** SB^{3}C2019-318
Patrick Vaughan[1], Alexis Goots[1], Todd Fenton[1], Roger Haut[1], Feng Wei[1], [1]*Michigan State University, United States*

4:45PM **Estimates of High-Risk Single and Cumulative Head Impact Doses In American Football** SB^{3}C2019-319
Adam Bartsch PhD[1], [1]*Prevent Biometrics, United States*

Friday, June 28	3:30PM - 5:00PM

Government Perspectives on Multiscale Biomechanics, Bioengineering, and Biotransport — Hemlock

Session Chair: Alisa Morss Clyne, *University of Maryland*

Grace Peng, *NIH Program Director,* Division of Discovery Science & Technology and Mathematical Modeling, Simulation, and Analysis

Michele Grimm, *NSF Program Director,* Biomedical Engineering

Laurel Kuxhaus, *ASME Federal Fellow*

Friday, June 28	3:30PM - 5:00PM

Pediatric and Congenital Fluid Mechanics — Fox Den

Session Chair: Amy Throckmorton *Drexel University*

3:30PM **Stent Intervention Improves Flow Distribution and Vascular Growth In Porcine Pulmonary Artery Stenosis** SB^{3}C2019-320
Ryan Pewowaruk[1], Klarka Mendrisova[1], Carolina Larrain[1], Christopher Francois[1], Luke Lamers[1], Alejandro Roldan-Alzate[1], [1]*University of Wisconsin - Madison, United States*

3:45PM **Shear Stress Modulates Cardiomyocyte Proliferation Via Endothelial Cell-Cardiomyocyte Signaling** SB^{3}C2019-321

Matthew Watson[1], Lauren Black[2], Erica Kemmerling[3], *[1]Tufts University, Department of Mechanical Engineering and Department of Biomedical Engineering, United States, [2]Tufts University, Department of Biomedical Engineering, United States, [3]Tufts University, Department of Mechanical Engineering, United States*

4:00PM **Computational Surgical Planning For Peripheral Pulmonary Artery Stenosis In Children With Alagille and Williams Syndromes** SB^{3}C2019-322

Ingrid Lan[1], Weiguang Yang[2], Jeffrey Feinstein[3], Alison Marsden[3], *[1]Bioengineering, Stanford University, United States, [2]Pediatric Cardiology, Stanford University, United States, [3]Bioengineering and Pediatric Cardiology, Stanford University, United States*

4:15PM **Fluid-Structure Analysis of A Collapsible Axial Impeller and Protective Cage For Dysfunctional Fontan Physiology** SB^{3}C2019-323

Matthew Hirschhorn[1], Evan Bisirri[1], Randy Stevens[2], Joseph Rossano[3], Amy Throckmorton[1], *[1]Drexel University, United States, [2]St. Christopher's Hospital for Children, United States, [3]Children's Hospital of Phildelphia, United States*

4:30PM **Mechanics and Efficiency of The Zebrafish Embryonic Heart Tube** SB^{3}C2019-324

Alireza Sharifi[1], Alex Gendernalik[1], Deborah Garrity[1], David Bark Jr.[1], *[1]Colorado State University, United States*

4:45PM **Whole Embryonic Heart Ultrasound Imaging, Motion Tracking and Flow Simulations Reveal Hemodynamic Role of Embryonic Atria** SB^{3}C2019-325

Sheldon Ho[1], Wei Xuan Chan[2], Nhan Phan-Thien[2], Choon Hwai Yap[2], *[1]Biomedical Engineering, National University of Singapore, Singapore, [2]National University of Singapore, Singapore*

2 Poster Sessions

2.1 Poster Session I	Wednesday, June 26 12:45PM - 2:15PM

Posters - BS Level Competition: Cardiovascular System

Assessment of Pulmonary Arterial Structure and Its Association With Right Ventricular Function SB^{3}C2019-P001

Frankangel Servin[1], Rebecca R Vanderpool[2], Rajesh Janardhanan[3], Jose Rosado[4], Franz P Rischard[5], Jason X.J Yuan[6], *[1]University of Arizona, Department of Biomedical Engineering, United States, [2]University of Arizona, Department of Biomedical Engineering, Division of Translational and Regenerative Medicine, United States, [3]University of Arizona, Department of Medical Imaging, United States, [4]University of Arizona, Department of Medical Imaging, United States, [5]University of Arizona, Division of Pulmonary, Allergy, Critical Care and Sleep Medicine, United States, [6]University of Arizona, Division of Translational and Regenerative Medicine, United States*

Quantitative Analysis of Flow Distribution Within The Fetal Heart Using In-Vitro 4d Flow Mri SB^{3}C2019-P002

Lucille Anzia[1], Katrina Ruedinger[1], Shardha Srinivasan[2], Barbara Trampe[1], Timothy Heiser[1], J. Igor Iruretagoyena[2], Alejandro Roldan-Alzate[1], *[1]University of Wisconsin Madison, United States, [2]University of Wisconsin School of Medicine and Public Health, United States*

On The Use of Pentagalloyl Glucose For Mechanistic Suppression of Abdominal Aortic Aneurysm SB^{3}C2019-P003

Vangelina Osteguin[1], Sourav Patnaik[1], Alycia Berman[2], Craig Goergen[2], Ender Finol[1], *[1]University of Texas at San Antonio, United States, [2]Purdue University, United States*

Novel Method of Detecting The Effect From Inhaled Anesthetics On Peripheral Venous Pressure Waveforms SB^{3}C2019-P004

Kaylee Henry[1], Ali Al-Alawi[1], Md Abul Hayat[1], Patrick Bonasso[2], Hanna Jensen[1], Jingxian Wu[1], Kevin Sexton[2], Morten Jensen[1], *[1]University of Arkansas, United States, [2]University of Arkansas for Medical Sciences, United States*

Fluvastatin Decreases Endothelial Nitric Oxide Synthase O-Glcnacylation SB^{3}C2019-P005

Danika Meldrum[1], Sarah Basehore[1], Alisa Morss Clyne[1], *[1]Drexel University, United States*

Investigations of The Chordae Tendineae'S Mechanical Properties of Porcine Atrioventricular Heart Valves SB^{3}C2019-P006

Colton Ross[1], Devin Laurence[1], Yan Zhao[2], Ming-Chen Hsu[3], Ryan Baumwart[4], Yi Wu[1], Chung-Hao Lee[1], *[1]The University of Oklahoma, United States, [2]The University of Oklahoma Health Sciences Center, United States, [3]Iowa State University, United States, [4]Oklahoma State University, United States*

Relationship of Platelet Adhesion With Surface Topography In The Penn State Pvad SB^{3}C2019-P007

Cecilia Richardsen[1], Ashlyn Mueser[1], Branka Lukic[2], Christopher Siedlecki[2], William Weiss[2], Keefe Manning[1], *[1]Pennsylvania State University, United States, [2]Penn State Hershey Medical Center, United States*

Mouse Aortic Mechanical Properties From Finite Element Model Optimized To Match Ring-Pull Experiments SB^{3}C2019-P008

Carl Schoephoerster[1], Ryan Mahutga[1], Victor Barocas[1], *[1]Department of Biomedical Engineering, University of Minnesota-Twin Cities, United States*

A Computational Study of The Role of The Pericardium On Cardiac Function In Normal and Hypertensive Hearts SB^{3}C2019-P009

Emilio A. Mendiola[1], Huan Nguyen[1], Reza Avaz[1], Michael S. Sacks[1], *[1]The University of Texas at Austin, United States*

Estimating The Contribution of The Endovascular Catheter On Cerebral Hypoperfusion During Mechanical Thrombectomy SB^{3}C2019-P010

Christina Ngo[1], Jeffrey Pyne[2], Jaiyoung Ryu[3], Shawn Shadden[2], *[1]Department of Bioengineering, UC Berkeley, United States, [2]Department of Mechanical Engineering, UC Berkeley, United States, [3]Department of Mechanical Engineering, Chung-Ang University, South Korea*

Alteration of The Mechanical Response of Porcine Tricuspid Valve Anterior Leaflets Following Exposure To De-Ionized Water SB^{3}C2019-P011

Margaret Clark[1], Samuel Salinas[1], Rouzbeh Amini[1], *[1]The University of Akron, United States*

On The Distribution of Aortic Valve Cusp Calcification SB^{3}C2019-P012

Varshini Guhan[1], Megan Heitkemper[1], Lakshmi Prasad Dasi[1], *[1]The Ohio State University, United States*

An Investigation of Layer-Specific Tissue Biomechanics of Porcine Atrioventricular Valve Anterior Leaflets SB^{3}C2019-P013

Cortland Johns[1], Katherine Kramer[1], Anju Babu[1], Chung-Hao Lee[1], *[1]Biomechanics and Biomaterials Design Lab, School of Aerospace and Mechanical Engineering, The University of Oklahoma Norman, OK, USA, United States*

A Study of Pressure Dynamics Across A Stenotic Orifice SB^{3}C2019-P014

Tori Burton[1], Hoda Hatoum[1], Lakshmi Prasad Dasi[1], *[1]Department of Biomedical Engineering at The Ohio State University, United States*

A Study of The Effects of An Increased Beat Rate On The Penn State Pediatric Ventricular Assist Device SB^{3}C2019-P015

Brady Houtz[1], Sailahari Ponnaluri[1], Maureen Gallagher[1], Charlee Dawson[1], Bryan Good[1], Steven Deutsch[1], Keefe Manning[1], *[1]Pennsylvania State University, United States*

Hemodynamics of Coronary Artery Aneurysms In Kawasaki Disease An Idealized Aneurysm Model SB^{3}C2019-P016

Alex Lu[1], Noelia Grande Gutierrez[1], Alison Marsden[1], *[1]Stanford University, United States*

Fluid Dynamics Study of An Implantable Blood Pump For Patients With A Failed Fontan Circulation SB^{3}C2019-P017

Cody Kubicki[1], Bryan Good[1], William Weiss[2], Keefe Manning[1], *[1]The Pennsylvania State University, United States, [2]Penn State Hershey Medical Center, United States*

Posters - BS Level Competition: Musculoskeletal, Respiratory, Ocular and Other Systems

Heterogeneity and Anisotropy In The Microscale Energy Dissipating Properties of The Knee Meniscus SB^{3}C2019-P018

Kevt'her Hoxha[1], Chao Wang[1], Biao Han[1], Robert Mauck[2], Lin Han[1], *[1]Drexel University, United States, [2]University of Pennsylvania, United States*

2d Or Not 2d; Comparing 2d and 3d Measurements of Collagen Microstructure SB^{3}C2019-P019

Gosia Fryc[1], Bin Yang[1], Alexandra Gogola[1], Bryn Brazile[1], Yi Hua[1], Tian Yong Foong[1], Ian A. Sigal[1], *[1]University of Pittsburgh, United States*

The Effect of A Cannabinoid Receptor 2 Agonist On Motor Function After Blast-Induced Neurotrauma SB^{3}C2019-P020

Bayan Alturkestani[1], Soroush Assari[1], Ola M Sharaf[1], Ian Hendricks[1], Sara J. Ward[1], Ronald F. Tuma[1], Kurosh Darvish[1], *[1]Temple University, United States*

Drone Blade Induced Skin Laceration and Eye Injury Risk; An Investigation of Skin and Eye Surrogate Models SB^{3}C2019-P021

Lauren Duma[1], Mark Begonia[2], Barry Miller[1], Stefan Duma[1], *[1]Virginia Tech, United States, [2]Virgina Tech, United States*

Direct Measurement of Collagen Fiber Orientation Along The Surface of Ligaments and Tendons of The Knee In A Porcine Model SB^{3}C2019-P022

Emily Lambeth[1], Stephanie Cone[1], Matthew Fisher[1], *[1]North Carolina State University and the University of North Carolina - Chapel Hill, United States*

Elastase Treatment Increases and Accelerates Stress Relaxation In Tendon. SB[3]C2019-P023

James Abraham[1], Jeremy Eekhoff[2], Spencer Lake[3], *[1]Department of Mechanical Engineering and Materials Science at Washington University in St. Louis, United States, [2]Department of Biomedical Engineering at Washington University in St. Louis, United States, [3]Department of Mechanical Engineering and Materials Science at Washington University in St. Louis , Department of Biomedical Engineering at Washington University in St. Louis , Department of Orthopaedic Surgery at Washington University in St. Louis, United States*

Ultrasound Shear Wave Elastography of The Anterior Cruciate Ligament SB[3]C2019-P024

Gabi Schwartz[1], Rachel Heller[1], Seyedali Sadeghi[1], Daniel Cortes[1], *[1]Penn State, United States*

Extracellular Matrix Stiffness Alters Chondrocyte Phenotype Through Trpv4 Regulation SB[3]C2019-P025

Ryan Skinner[1], Mallory Griffin[1], Nicholas Trompeter[1], Cindy Farino[1], Omar Banda[1], John Slater[1], Randall Duncan[1], *[1]University of Delaware, United States*

Asthmatic and Healthy Airway Morphology Measured From Ct-Based Geometries SB[3]C2019-P026

Irina Pyataeva[1], Kamran Poorbahrami[1], Ellesse Cooper[1], Ben Piperno[1], David Mummy[2], Sean Fain[2], Jessica Oakes[1], *[1]Northeastern University, United States, [2]University of Wisconsin-Madison, United States*

Contributions of Collagen Ii, Laminin, and Fibronectin To Vitreoretinal Adhesion In Human Eyes SB[3]C2019-P027

Joseph Phillips[1], Christopher Creveling[1], Brittany Coats[1], *[1]University of Utah, United States*

Rapid Quantitative Assessment of Postural Control Function For Mild Traumatic Brain Injury: Evaluation of A Portable Force Plate Device SB[3]C2019-P028

Jonathan VanPaepeghem[1], Kunal Dave[1], Liying Zhang[1], *[1]Wayne State University, United States*

Mechanical Influence of Graphitic Carbon Nitride Filler On Poly(vinyl Alcohol) Thin Film Hydrogels For Wound Healing SB[3]C2019-P029

Bradley Henderson[1], Katelyn Cudworth[1], Andrew Clifford[2], Dylan Quintana[2], John Thurston[2], Trevor Lujan[1], *[1]Boise State University, United States, [2]College of Idaho, United States*

A Novel Workflow For Generation of Patient-Specific Asthmatic Airway Models From Ct Data SB[3]C2019-P030

Ellesse Cooper[1], Kamran Poorbahrami[1], Ben Piperno[1], David Mummy[2], Sean Fain[2], Jessica Oakes[1], *[1]Northeastern University, United States, [2]University of Wisconsin, United States*

Water Sport Head Injuries; Ability of Helmets To Reduce Head Impact Accelerations SB[3]C2019-P031

Brock Duma[1], Mark Begonia[1], Casey Charron[1], Stefan Duma[1], *[1]Virginia Tech, United States*

The Influence of Radiographic Projection Angle On Visualization of The Subtalar Joint SB[3]C2019-P032

Kalebb Howell[1], Nicola Krahenbuhl[2], Rich Lisonbee[1], Beat Hintermann[2], Charles Saltzman[1], Andrew Anderson[1], Alexej Barg[1], Amy Lenz[1], *[1]University of Utah, United States, [2]Kantonsspital Baselland, Switzerland*

Effects of Volumetric Boundary Conditions On The Compressive Mechanics and Modeling of Passive Skeletal Muscle SB[3]C2019-P033

Anurag Vaidya[1], Benjamin Wheatley[1], *[1]Bucknell University, United States*

Posters - MS Level Competition: Solid Mechanics

The Effect of In Vivo Ionizing Radiation On The Micromechanics of Mouse Vertebrae SB[3]C2019-P034

Tongge Wu[1], Megan Pendleton[1], Noah Bonnheim[1], Joshua Alwood[2], Tony Keaveny[1], *[1]University of California, Berkeley, United States, [2]NASA Ames Research Center, United States*

Investigating Sex-Specific Accuracy of Proximal Femur Coordinate Systems Derived From Statistical Shape Models SB[3]C2019-P035

Carla Winsor[1], Xinshan Li[2], Ju Zhang[3], Corinne Henak[1], Heidi-Lynn Ploeg[4], *[1]University of Wisconsin - Madison, United States, [2]University of Sheffield, United Kingdom, [3]Auckland Bioengineering Institute, New Zealand, [4]Queen's University, Canada*

Effects of Collagenase and Elastase On The Mechanical Properties of Porcine Abdominal Aorta SB^{3}C2019-P036

Celeste Blum[1], Chris Korenczuk[2], Victor Barocas[2], *[1]University of Minnesota - Twin Cities, United States, [2]University of Minnesota- Twin Cities, United States*

Finite Element Simulation Framework For Investigating Pathological Effects On Organ-Level Tricuspid Valve Biomechanical Function SB^{3}C2019-P037

Devin Laurence[1], Emily Johnson[2], Ming-Chen Hsu[2], Arshid Mir[3], Harold Burkhart[3], Yi Wu[1], Chung-Hao Lee[1], *[1]University of Oklahoma, United States, [2]Iowa State University, United States, [3]University of Oklahoma Health Sciences Center, United States*

An Integrated Opto-Mechanical System For Quantification of Dynamic Microstructure and Mechanics of Heart Valve Tissues SB^{3}C2019-P038

Samuel Jett[1], Zachary Schuermann[1], Arshid Mir[2], Harold Burkhart[3], Chung-Hao Lee[1], *[1]Biomechanics and Biomaterials Design Laboratory, School of Aerospace and Mechanical Engineering, The University of Oklahoma Norman, OK, USA, United States, [2]Division of Pediatric Cardiology, Department of Pediatrics, University of Oklahoma Health Sciences Center, Oklahoma City, OK, USA, United States, [3]Division of Cardiothoracic Surgery, Department of Surgery, University of Oklahoma Health Sciences Center, Oklahoma City, OK, USA, United States*

Computational Analysis of Unhelmeted Bicycle Accidents Through Multi-Body and Finite Element Simulations SB^{3}C2019-P039

Lise Gheysen[1], Michel Woering[2], Markos Kapeliotis[2], Jos Vander Sloten[2], *[1]UGent, Belgium, [2]KU Leuven, Belgium*

Repeated Non-Injurious Loading Induces Changes In Local Mechanics & Collagen Fiber Organization That May Be Injurious SB^{3}C2019-P040

Travis Kotzur[1], Beth Winkelstein[1], *[1]University of Pennsylvania, United States*

Investigation of Scaling Techniques Used For Developing Brain Injury Criterion By Finite Element Models of The Primate and Human Head Simulating Head Rotation SB^{3}C2019-P041

Tushar Arora[1], Priya Prasad[2], Liying Zhang[1], *[1]Wayne State University, United States, [2]Prasad Engineering, LLC, United States*

Determination of Tissue Level Injury Threshold For Ocular Trauma By Finite Element Analysis SB^{3}C2019-P042

Kunal Dave[1], Liying Zhang[1], *[1]Wayne State University, United States*

Computational Analysis of Lisfranc Surgical Repairs SB^{3}C2019-P043

M. Tyler Perez[1], John Owen[1], Robert Adelaar[2], Jennifer Wayne[1], *[1]Virginia Commonwealth University, United States, [2]McGuire VA Medical Center, United States*

McDespot Quantitative Mri Correlates With Articular Cartilage Material Properties SB^{3}C2019-P044

Matthew Grondin[1], Fang Liu[1], Michael Vignos[1], Richard Kijowski[1], Corinne Henak[1], *[1]University of Wisconsin-Madison, United States*

Characterization of Shear Wave Speed-Stress Relationship In Collateral Ligaments SB^{3}C2019-P045

Jonathon Blank[1], Joshua Roth[1], Darryl Thelen[1], *[1]Department of Mechanical Engineering, University of Wisconsin-Madison, United States*

Tribocorrosion Behavior of Metallic Implants: A Comparative Study of Cocrmo and Ti6al4v SB^{3}C2019-P046

Mihir Patel[1], Edward Cudjoe[1], Jae Joong Ryu[1], *[1]Youngstown State University, United States*

An Age-Aware Constitutive Model For Human Sclera Incorporating Experimentally-Measured Collagen Fiber Tortuosity SB^{3}C2019-P047

Tian Yong Foong[1], Yi Hua[1], Alexandra Gogola[1], Rouzbeh Amini[2], Ian A. Sigal[1], [1]*University of Pittsburgh, United States,* [2]*University of Akron, United States*

Posters - MS Level Competition: Biotransport, Fluids, Tissue Engineering and Dynamics

Stochastic Model For Platelet Spreading Under Flow SB^{3}C2019-P048

Iain Briongos[1], Peter Hammes[1], David Bark[1], [1]*Colorado State University, United States*

Evaluating Single Muscle Contraction Using Electrical Stimulation and Shear Wave Elastography SB^{3}C2019-P049

Heer Patel[1], Seyedali Sadeghi[1], Daniel Cortes[1], [1]*The Pennsylvania State University, United States*

Implementing Real-Time Extrinsic Muscle Control In A Robotic Gait Simulator For Investigating Lower Extremity Function SB^{3}C2019-P050

Watson Spivey[1], Cody O'Cain[1], Bronislaw Gepner[1], Edward Sprately[1], Jason Kerrigan[1], [1]*University of Virginia, Center for Applied Biomechanics, United States*

Evaluation of Accuracy of Four Muscle Models Using Intramuscular Pressure A Surrogate For Muscle Force SB^{3}C2019-P051

Grant Boggess[1], Mohammad Shorijeh[1], Filiz Ates[2], William Litchy[2], Krista Coleman-Wood[2], Kenton Kaufman[2], BJ Fregly[1], [1]*Rice University, United States,* [2]*Mayo Clinic, United States*

The Effects of Ankyloglossia On The Tongue Motility of Infants During Breastfeeding SB^{3}C2019-P052

Yiela Saperstein[1], David Elad[2], Andrew Laine[1], Scott Siegel[3], Catherine Watson Genna[4], [1]*Columbia University, United States,* [2]*Tel Aviv University, Israel,* [3]*Stony Brook University, United States,* [4]*Private Practice, United States*

Development of A Computational Model of Braided Stent For Cerebral Aneurysm Treatment SB^{3}C2019-P053

Shunya Shiozaki[1], Tomohiro Otani[1], Shigeo Wada[1], [1]*Department of Mechanical Science and Bioengineering, Graduate School of Engineering Science, Osaka University, Japan*

Accelerometers Used To Measure Magnitude and Frequency of Hand Movement For Children With Cerebral Palsy During Constraint Induced Movement Therapy SB^{3}C2019-P054

Brianna Goodwin[1], Emily Sabelhaus[2], Ying-Chun Pan[1], Kristie Bjornson[1], Kelly Pham[1], William Walker[1], Katherine Steele[1], [1]*University of Washington, United States,* [2]*Seattle Children's Hospital, United States*

Reduction of Wall Shear Strain Rates In Arteriovenous Graft Venous Anastomoses SB^{3}C2019-P055

Dillon Williams[1], Guy Genin[1], Mohamed Zayed[1], [1]*Washington University, United States*

Flow Through Soft Tissue Equivalents: Measuring The Hydraulic Permeability of Collagen Gels SB^{3}C2019-P056

Christopher Vidmar[1], Brittany Fisher[1], Victor Lai[1], [1]*Department of Chemical Engineering at the University of Minnesota-Duluth, United States*

Effect of Different Inlet Velocity Profiles On Patient-Specific Cfd Simulations of Healthy Trachea SB^{3}C2019-P057

Bipin Tiwari[1], Tarun Kore[1], Sandeep Bodduluri[2], Surya Bhatt[2], Vrishank Raghav[1], [1]*Auburn University, United States,* [2]*University of Alabama at Birmingham, United States*

Quantifying Distortion Energy In Collagen Matrices Subjected To Complex Loads Using A Biaxial Bioreactor SB^{3}C2019-P058

Katherine Hollar[1], Danielle Siegel[1], John Everingham[1], Abdullah Ahmad[1], Alvaro Morfin[1], Gunes Uzer[1], Trevor Lujan[1], [1]*Boise State University, United States*

An Intercalating Crosslinkable and Biocompatible Hydrogel System For Resurfacing Damaged Cartilage SB^{3}C2019-P059

Brian Wise[1], Jay Patel[1], Claudia Loebel[1], Jason Burdick[1], Robert Mauck[1], [1]*University of Pennsylvania, United States*

Engineering Spatial Gradients of Diamagnetic Particles and Cells In Hydrogels Using Negative Magnetophoresis SB^{3}C2019-P060

Hannah Zlotnick[1], Andy Clark[2], Xuemei Cheng[2], Robert Mauck[1], *[1]University of Pennsylvania, United States, [2]Bryn Mawr, United States*

Posters - Fluids: Cardiovascular Fluid Mechanics

Computational Hemodynamics & Complex Networks Integrated Platform To Study Intravascular Flow In The Carotid Bifurcation SB^{3}C2019-P061

Karol Cal[1], Diego Gallo[1], Valentina Mazzi[1], Stefania Scarsoglio[1], Muhammad O. Khan[2], David A. Steinman[3], Luca Ridolfi[1], Umberto Morbiducci[1], *[1]Polito BIOMed Lab, Department of Mechanical and Aerospace Engineering, Politecnico di Torino, Turin, Italy, [2]Cardiovascular Biomechanics Computation Lab, Department of Pediatrics, Cardiology, Stanford University, Stanford, United States, [3]Biomedical Simulation Lab, Department of Mechanical & Industrial Engineering, University of Toronto, Toronto, Canada*

Automatic Techniques For Determining Boundary Condition Parameters In Computational Haemodynaics SB^{3}C2019-P062

Christopher J. Arthurs[1], C. Alberto Figueroa[2], *[1]King's College London, United Kingdom, [2]University of Michigan, United States*

Developing A Scalable Open-Source Solver To Simulate Hemodynamics In The Human Pulmonary Vasculature SB^{3}C2019-P063

Narasimha Rao Pillalamarri[1], Senol Piskin[1], Ender Finol[1], *[1]University of Texas at San Antonio, United States*

Solution Adaptive Refinement of Cut-Cell Cartesian Meshes Improves Mechanical Heart Valve Simulation Performance SB^{3}C2019-P064

Ryan Pewowaruk[1], Tim Ruesink[1], Yanheng Li[2], David Rowinski[2], Alejandro Roldan-Alzate[1], *[1]University of Wisconsin - Madison, United States, [2]Convergent Science, United States*

Uncertainty Quantification of Outflow Boundary Conditions On Non-Invasive Pressure Quantification In Aortorenal Artery System SB^{3}C2019-P065

Huidan (whitney) Yu[1], Monsurul Khan[1], Hao Wu[1], Xiaoping Du[1], Alan Sawchuk[1], *[1]Indiana University-Purdue University Indianapolis, United States*

Modeling Pulse Wave Propagation For Idealized and Physiological Arteries With Fluid-Structure Interactions In Febio SB^{3}C2019-P066

Jay Shim[1], Vittorio Gatti[1], Pierre Nauleau[1], Grigorios Karageorgos[1], Elisa Konofagou[1], Gerard Ateshian[1], *[1]Columbia University, United States*

In Vitro Volumetric Lagrangian Particle Tracking and 4d Pressure Field In A Left Ventricle Model SB^{3}C2019-P067

Hicham Saaid[1], Matteo Novara[2], Jason Voorneveld[3], Christiaan Schinkel[4], Jos Westenberg[5], Frank Gijsen[6], Patrick Segers[1], Pascal Verdonck[1], Johan Bosch[6], Sasa Kenjeres[4], Daniel Schanz[2], Sebastian Gesemann[2], Andreas Schrder[2], Tom Claessens[7], *[1]BioMMeda, Institute Biomedical Technology Ghent University, Belgium, [2]Institute of Aerodynamics and Flow Technology, German Aerospace Center (DLR), Germany, [3]Thoraxcenter Biomedical Engineering, Erasmus Medical Center, Netherlands, [4]Department of Chemical Engineering Delft University of Technology, Netherlands, [5]Department of Radiology Leiden University Medical Center, Netherlands, [6]Thoraxcenter Biomedical Engineering Erasmus Medical Center, Netherlands, [7]Department of Materials, Textiles And Chemical Engineering, Ghent University, Belgium*

Impact of Different Bifurcation Stenting Techniques On The Endothelial Shear Stress Within A Peripheral Bifurcation SB^{3}C2019-P068

Azadeh Lotfi[1], Tracie Barber[1], *[1]UNSW Australia, Australia*

Improvement and In Vitro Validation of A Finite Element Based Virtual Coiling Method For Intracranial Aneurysm SB^{3}C2019-P069

Robert Damiano[1], Saeb Ragani[1], Adnan Siddiqui[1], Jason Davies[1], Hui Meng[1], *[1]University at Buffalo, United States*

Automated Segmentation of Cerebral Arteries From Patient-Specific 3d Cerebrovascular Images Using Deep-Learning and Group Morphology SB^{3}C2019-P070

Tatsat Rajendra Patel[1], Nikhil Paliwal[1], Prakhar Jaiswal[1], Adnan H Siddiqui[1], Rahul Rai[1], Hui Meng[1], *[1]University at Buffalo, United States*

Fabrication of A Flexible Idealized 3d Printed Aortic Dissection For In Vitro Analysis SB^{3}C2019-P071

Sylvana Garca-Rodrguez[1], Alexander B. Holtz[1], Huairen Zhou[1], Rafael Medero[1], Alejandro Roldan-Alzate[1], *[1]University of Wisconsin-Madison, United States*

Experimental Evaluation of Two Fast Virtual Stenting Algorithms For Modeling Flow Diverters In Patient-Specific Intracranial Aneurysms SB^{3}C2019-P072

Saeb Ragani Lamooki[1], Vincent Tutino[1], Nikhil Paliwal[1], Setlur Nagesh[1], Robert Damiano[1], Adnan Siddiqui[1], Hui Meng[1], *[1]University at Buffalo, United States*

Adhesion Effect On Localization of Deformable Micro-Particles In Blood Flow SB^{3}C2019-P073

Huilin Ye[1], Zhiqiang Shen[1], Ying Li[1], *[1]University of Connecticut, United States*

4d Flow Mri Determination of Windkessel Parameters For Patient Specific Cardiovascular Simulation SB^{3}C2019-P074

Ryan Pewowaruk[1], Alejandro Roldan-Alzate[1], *[1]University of Wisconsin - Madison, United States*

Differences In Parent Artery Geometry Between Acom and McA Aneurysms SB^{3}C2019-P075

Fernando Mut[1], Megan Lawson[1], Juan Cebral[1], *[1]George Mason University, United States*

Predicting Aneurysmal Degeneration In The Dissected Thoracic Aorta: A Computational Fluid Dynamic Approach SB^{3}C2019-P076

Arianna Forneris[1], Alina Ismaguilova[1], Giampaolo Martufi[1], Jehangir Appoo[1], Elena Di Martino[1], *[1]University of Calgary, Canada*

Patient-Specific Evaluation of Post-Tevar Hemodynamic Performance In Aortic Dissection SB^{3}C2019-P077

Selene Pirola[1], Claudia Menichini[1], Baolei Guo[2], Simone Saitta[1], Weiguo Fu[2], Zhihui Dong[2], Xiao Yun Xu[1], *[1]Imperial College London, United Kingdom, [2]Fudan University, China*

Image-Based Assessment of The Hemodynamic Performance of Surgical and Transcatheter Aortic Valve Replacements SB^{3}C2019-P078

Selene Pirola[1], Omar A. Jarral[1], Mohammad Y. Salmasi[1], Declan P. ORegan[1], John R. Pepper[2], Thanos Athanasiou[1], Xiao Yun Xu[1], *[1]Imperial College London, United Kingdom, [2]Royal Brompton and Harefield NHS Fundation Trust, United Kingdom*

Hemodynamic Characteristics Associated With Cerebral Aneurysms Evolution SB^{3}C2019-P079

Seyedeh Fatemeh Salimi Ashkezari[1], Fernando Mut[1], Juan Raul Cebral[1], *[1]George Mason University, United States*

Intensity of Stenosis-Induced Flow Instabilities of The Internal Carotid Artery: A Computational Approach SB^{3}C2019-P080

Viviana Mancini[1], Aslak W. Bergersen[2], Kristian Valen-Sendstad[2], Patrick Segers[1], *[1]IBiTech bioMMeda, Ghent University, Belgium, [2]Department of Computational Physiology, Simula Research Laboratory, Norway*

Predicting Thrombosis Risk In The Left Atrial Appendage of Human Heart SB^{3}C2019-P081

Breandan Yeats[1], Hoda Hatoum[1], Thura Harfi[1], Lakshmi Prasad Dasi[1], *[1]The Ohio State University, United States*

Effects of Subject-Specific, Spatially Reduces, and Idealized Boundary Conditions On The Predicted Hemodynamic Environment In The Murine Aorta SB^{3}C2019-P082

Kelly Smith[1], Samer Merchant[1], Edward Hsu[1], Lucas Timmins[1], *[1]University of Utah, United States*

Pre-Procedural Patient-Specific In-Silico Deployment of Sapien and Evolut Transcather Aortic Valves SB^{3}C2019-P083

Sri Krishna Sivakumar[1], Hoda Hatoum[1], Jennifer Dollery[1], Scott Lilly[1], Lakshmi Prasad Dasi[1], *[1]The Ohio State University, United States*

Effects of Resolution and Dynamic Range of Dual-Venc 4d Flow Mri On Flow Measurements In Cerebral Aneurysms: In Vitro 4d Flow Study In A Scaled Model SB^{3}C2019-P084

Sean Rothenberger[1], Melissa Brindise[1], Joseph Muskat[1], Susanne Schnell[2], Pavlos Vlachos[1], Vitaliy Rayz[1], *[1]Purdue University, United States, [2]Northwestern University, United States*

In-Silico Characterization of Patient-Specific Pulmonary Hypertension Hemodynamics SB^{3}C2019-P085

Narasimha Rao Pillalamarri[1], Senol Piskin[1], Sourav Patnaik[1], Alifer Bordones[1], Vitaly Kheyfets[2], Ender Finol[1], *[1]University of Texas at San Antonio, United States, [2]University of Colorado, Denver, United States*

Development of An Experimental System Exploring The Efficacy of Cyclic Aspiration On Clot Displacement In A Cerebral Thrombectomy Model SB^{3}C2019-P086

Joshua Kugel[1], Connor Foust[1], Bryan Good[1], Keefe Manning[1], *[1]The Pennsylvania State University, United States*

Posters - Solid Mechanics: Bone Mechanics

Assessing Femural Implant Failure Risk By Applying Controllable Torque With Robot Manipulator and 6 Dof Sensor SB^{3}C2019-P087

Marius Gudauskis[1], Abel Pietros[2], Brian L. Davis[2], Brandon Jonard[3], *[1]Institute of Mechatronics, Kaunas University of Technology, Lithuania, [2]Department of Biomedical Engineering, The University of Akron, United States, [3]Department of Orthopaedics, Summa Healthcare System, United States*

Drill Plunge In Orthopedic Surgery Defined SB^{3}C2019-P088

Scott Baskerville[1], Ted Conway[1], Samantha Schultz[1], *[1]Florida Institute of Technology, United States*

A Preliminary Study On Correlations Between Microarchitectural Parameters of Human Trabecular Bone SB^{3}C2019-P089

Pengwei Xiao[1], Joel Gomez[1], Matthew Kirby[1], Ed Guo[2], Xiaodu Wang[1], *[1]The University of Texas at San Antonio, United States, [2]Columbia University, United States*

Posters - Solid Mechanics: Cardiovascular Tissue Mechanics

Three-Dimensional Anisotropic Residual Stresses In The Abdominal Aorta SB^{3}C2019-P090

Taisiya Sigaeva[1], Gerhard Sommer[2], Gerhard A. Holzapfel[3], Elena Di Martino[1], *[1]University of Calgary, Canada, [2]Graz University of Technology, Austria, [3]Graz University of Technology, Norwegian University of Science and Technology, Austria*

A Biomechanics-Based Risk Prediction Metric For Thoracic Aortic Dissection SB^{3}C2019-P091

Spandan Maiti[1], James Thunes[1], Leonid Emerel[1], Thomas Gleason[1], David Vorp[1], *[1]University of Pittsburgh, United States*

Physiologic Strength of Ascending Thoracic Aortic Tissue Depends On Stress Biaxiality SB^{3}C2019-P092

James Thunes[1], Ronald Fortunato[1], Thomas Gleason[1], David Vorp[1], Spandan Maiti[1], *[1]University of Pittsburgh, United States*

Inverse Mixed Strain Method For Aneurysm Stress Analysis SB^{3}C2019-P093

Yuanming Luo[1], Jia Lu[1], *[1]the University of Iowa, United States*

Microstructural Characterization of Intraluminal Thrombus In Abdominal Aortic Aneurysms SB^{3}C2019-P094

Pete Gueldner[1], Sourav Patnaik[1], Senol Piskin[1], Mirunalini Thirugnanasambandam[1], Satish Muluk[2], Ender Finol[1], *[1]University of Texas at San Antonio, United States, [2]Allegheny General Hospital, United States*

Material Characterization of Atherosclerotic Plaques With Virtual Fields Method SB^{3}C2019-P095

Ronald van den Berg[1], Stephane Avril[2], Frank Gijsen[1], Ali Akyildiz[1], *[1]Erasmus Medical Center, Netherlands, [2]Mines Saint-Etienne, France*

Microstructure-Based Finite Element Modeling Framework For Simulating Passive Inflation of The Left Ventricle SB^{3}C2019-P096

Ce Xi[1], Ghassan Kassab[2], Lik Chuan Lee[1], *[1]Michigan State University, United States, [2]California Medical Innovations Institute, United States*

A Thermodynamically Motivated Cross-Bridge Cycling Framework To Predict Myofibril Remodeling Under Conditions Accosiated With Lv Hypertrophy SB^{3}C2019-P097

Eoin McEvoy[1], Patrick McGarry[1], *[1]National University of Ireland Galway, Ireland*

Contractility Modelling Towards Predicting Eccentric Hypertrophy In A Patient-Specific Heart Model SB^{3}C2019-P098

Ryan Coleman[1], Eoin McEvoy[1], Patrick McGarry[1], *[1]NUI Galway, Ireland*

Cardiac Growth and Remodeling: Using Machine Learning To Correlate Cell and Organ Scales SB^{3}C2019-P099

Mathias Peirlinck[1], Francisco Sahli Costabal[2], Kevin Sack[3], Jenny Choy[4], Ghassan Kassab[4], Julius Guccione[5], Matthieu De Beule[1], Patrick Segers[1], Ellen Kuhl[2], *[1]Ghent University, Belgium, [2]Stanford University, United States, [3]University of Cape Town, South Africa, [4]California Medical Innovations Institute, Inc., United States, [5]University of California at San Francisco, United States*

Changes In The Anisotropic and Viscoelastic Properties of The Ovine Right Ventricle Under Chronic Pressure Overload SB^{3}C2019-P100

Wenqiang Liu[1], Michael Nguyen-Truong[1], Elisabeth Gray[1], Jeremiah Easley[1], Eric Monnet[1], Christian Puttlitz[1], Zhijie Wang[1], *[1]Colorado State University, United States*

Mechanical Characterization of Bovine Embolus Analogs For Investigating Acute Ischemic Stroke Recanalization SB^{3}C2019-P101

Gretchen Hiller[1], Bryan Good[1], Keefe Manning[1], *[1]Department of Biomedical Engineering The Pennsylvania State University University Park, PA, United States*

Assessment of Ascending Aortic Wall Stresses For Nondissected Patients With Bicuspid Aortic Valve and Dissected Patients With Tricuspid Aortic Valve SB^{3}C2019-P102

Sreyas Ravi[1], David Vorp[1], Spandan Maiti[1], *[1]University of Pittsburgh, United States*

Application of Digital Image Correlation To The Local Strain Analysis of Mouse Aortas: Novel Method To Create Speckle Pattern SB^{3}C2019-P103

Liya Du[1], Brooks Lane[1], John Eberth[1], Susan Lessner[1], *[1]University of South Carolina, United States*

Towards An Ultrasound Imaging Framework For Transmural Evaluation of Right Ventricular Myocardial Fiber Orientation Under Loading SB^{3}C2019-P104

Danial Sharifikia[1], Marc Simon[2], Kang Kim[2], *[1]Department of Bioengineering, University of Pittsburgh, United States, [2]Department of Bioengineering, University of Pittsburgh; Division of Cardiology, School of Medicine, University of Pittsburgh; Heart and Vascular Institute, University of Pittsburgh Medical Center (UPMC); McGowan Institute for Regenerative Medicine, Univer, United States*

Improved Strain Analysis of Left Ventricular Function Post Myocardial Infarction In Mice SB^{3}C2019-P105

Danielle Wilson[1], Zhen Zhu[1], Stephanie George[1], Jitka Virag[1], *[1]East Carolina University, United States*

Structural Changes In The Progression of Pulmonary Arterial Hypertension SB^{3}C2019-P106

Erica Pursell[1], Daniela Valdez-Jasso[1], *[1]Ucsd, United States*

Dynamic Mechanics of Cyclically Stretched Vascular Smooth Muscle Cells SB^{3}C2019-P107

Taylor Rothermel[1], Patrick Alford[1], [1]*University of Minnesota - Twin Cities, United States*

Mechanics of The Bulbus Arteriosus In Zebrafish: Why The Shape of The P-D Loop Is Crucial SB^{3}C2019-P108

Matthias Van Impe[1], Patrick Sips[2], Julie De Backer[2], Patrick Segers[1], [1]*Ghent University, Belgium,* [2]*Ghent University Hospital, Belgium*

The Effect of Leaflet Residual Strains On Aortic Valve Dynamics SB^{3}C2019-P109

Rana Zakerzadeh[1], Ming-Chen Hsu[2], Michael Sacks[1], [1]*University of Texas at Austin, United States,* [2]*Iowa State University, United States*

Effects of -80c Freezing Onthe Biomechanical Response of Tricuspid Valve Leaflets SB^{3}C2019-P110

Samuel Salinas[1], Margaret Clark[1], Rouzbeh Amini[1], [1]*The University of Akron, United States*

Role of Glycosaminoglycans In Biaxial Mechanical Behaviors of Porcine Atrioventricular Heart Valve Leaflets SB^{3}C2019-P111

Chung-Hao Lee[1], Colton Ross[1], Devin Laurence[1], Lauren Evans[1], Jacob Richardson[1], Anju Babu[1], Ean Beyer[1], Yi Wu[1], Gerhard Holzapfel[2], Arshid Mir[3], Harold Burkhart[3], [1]*The University of Oklahoma, United States,* [2]*Graz University of Technology, Austria,* [3]*The University of Oklahoma Health Sciences Center, United States*

State of The Art Simulation of The Early Stages of Bioprosthetic Heart Valve Fatigue SB^{3}C2019-P112

Will Zhang[1], Rana Zakerzadeh[2], Michael Sacks[2], [1]*University of Michigan, United States,* [2]*The University of Texas at Austin, United States*

Image-Based Simulation of The Mitral Valve Repair Surgery In Ischemic Mitral Regurgitation Patients SB^{3}C2019-P113

Amir Khalighi[1], Bruno Rego[1], Robert Gorman[2], Joseph Gorman[2], Michael Sacks[1], [1]*The University of Texas at Austin, United States,* [2]*University of Pennsylvania, United States*

A Non-Invasive Method To Quantify Aortic Valve Leaflet Deformation SB^{3}C2019-P114

Bruno Rego[1], Samuel Potter[2], Alison Pouch[3], Robert Gorman[3], Michael Sacks[2], [1]*University of Texas at Ausin, United States,* [2]*University of Texas at Austin, United States,* [3]*University of Pennsylvania, United States*

Collagen Architecture, Cellularity, and Biaxial Mechanics of Ovine Tricuspid Valve Leaflets SB^{3}C2019-P115

William Meador[1], Mrudang Mathur[1], Marcin Malinowski[2], Tomasz Jazwiec[2], Tomasz Timek[2], Manuel Rausch[1], [1]*The University of Texas at Austin, United States,* [2]*Spectrum Health, United States*

Quantification of Simultaneous Structure, Strain, and Stress Behaviors In Layered Soft Tissues SB^{3}C2019-P116

Samuel Potter[1], Will Goth[1], James Tunnell[1], Michael Sacks[1], [1]*The University of Texas at Austin, United States*

The Role of Sclerostin In Calcific Aortic Valve Disease SB^{3}C2019-P117

J. Ethan Joll[1], W. David Merryman[1], [1]*Vanderbilt University, United States*

A Spatial Mean Curvature Map of The Aortic Valve-Relevance To Calcification SB^{3}C2019-P118

Amanda Barreto[1], Asad Mirza[1], Sharan Ramaswamy[1], [1]*FIU-Biomedical Engineering Department, United States*

Posters - Solid Mechanics: Growth Remodeling and Repair

Matching Material and Cellular Timescales Maximizes Cell Spreading On Viscoelastic Substrates SB^{3}C2019-P119

Ze Gong[1], Spencer Szczesny[2], Steven Caliari[3], Elisabeth Charrier[1], Ovijit Chaudhuri[4], Xuan Cao[1], Yuan Lin[5], Robert Mauck[1], Paul Janmey[1], Jason Burdick[1], Vivek Shenoy[1], [1]*University of Pennsylvania, United States,* [2]*The Pennsylvania State University, United States,* [3]*University of Virginia, United States,* [4]*Stanford University, United States,* [5]*University of Hong Kong, Hong Kong*

Extracellular Matrix Microstructure Modulates Myofibroblast Differentiation Within 3d Fibrous Microenvironments In Vitro SB^{3}C2019-P120

Daniel Matera[1], Brendon Baker[1], [1]*University of Michigan, United States*

Architecture and Function of Chick Embryonic Heart Cells Are Mediated By Geometric Ecm Patterning Cues SB^{3}C2019-P121

Bernard Cook[1], Patrick Alford[1], [1]*University of Minnesota, United States*

Three-Dimensional Ct Morphometric Image Analysis of The Clivus and Sphenoid Sinus In Chiari Malformation Type I SB^{3}C2019-P122

Blaise Simplice Talla Nwotchouang[1], Maggie Eppelheimer[1], Paul Bishop[2], Dipankar Biswas[1], Janna Andronowski[1], Jayapalli Bapuraj[3], David Frim[4], Rick Labuda[5], Rouzbeh Amini[1], Francis Loth[1], [1]*University of Akron, United States,* [2]*Cleveland Clinic, United States,* [3]*University of Michigan Health System, United States,* [4]*University of Chicago, United States,* [5]*Conquer Chiari, United States*

Controlled Release From Mechanically-Activated Microcapsules In Developing Tissue Microenvironments SB^{3}C2019-P123

Ana Peredo[1], Yun Kee Jo[1], Daeyeon Lee[1], George Dodge[1], Robert Mauck[1], [1]*University of Pennsylvania, United States*

Finite Element Modeling To Study Musculoskeletal Growth: A Comparison of Node and Element-Based Approaches SB^{3}C2019-P124

Danielle Howe[1], Nikhil Dixit[2], Katherine Saul[2], Matthew Fisher[1], [1]*North Carolina State University and the University of North Carolina- Chapel Hill, United States,* [2]*North Carolina State University, United States*

Mitral Valve Leaflet Remodeling Following Myocardial Infarction SB^{3}C2019-P125

Bruno Rego[1], Amir Khalighi[1], Eric Lai[2], Robert Gorman[2], Joseph Gorman[2], Michael Sacks[1], [1]*The University of Texas at Austin, United States,* [2]*University of Pennsylvania, United States*

A Machine Learning Material Model For Soft Tissue Remodeling SB^{3}C2019-P126

Wenbo Zhang[1], Tan Bui-Thanh[1], Michael Sacks[1], [1]*The University of Texas at Austin, United States*

Biomechanical Restoration Potential of Pentagalloyl Glucose After Arterial Extracellular Matrix Damage SB^{3}C2019-P127

Sourav Patnaik[1], Narasimha Rao Pillalamarri[1], Senol Piskin[1], Mirunalini Thirugnanasambandam[1], Vangelina Osteguin[1], Gladys P. Escobar[2], Eugene Sprague[2], Ender A. Finol[1], [1]*University of Texas at San Antonio, United States,* [2]*University of Texas Health San Antonio, United States*

Low-Energy Mechanical Impacts To Articular Cartilage Increase At Least One Anabolic Protein In Chondrocytes SB^{3}C2019-P128

Stephany Santos[1], Kelsey Richard[1], Melanie C. Fisher[2], Caroline N. Dealy[2], David M. Pierce[1], [1]*University of Connecticut, United States,* [2]*University of Connecticut Health Center, United States*

Alpha Smooth Muscle Actin-Expressing Bone Marrow Progenitor Cells Contribute To Tunnel Integration Following Acl Reconstruction SB^{3}C2019-P129

Timur Kamalitdinov[1], Keitaro Fujino[1], Yaping Ye[1], Xi Jiang[1], Snehal Shetye[1], Ashley Rodriguez[1], Miltiadis Zgonis[1], Andrew Kuntz[1], Nathaniel Dyment[1], [1]*University of Pennsylvania, United States*

In Silico Modeling of Soft Tissue Failure From Subfailure Damage To Complete Rupture SB^{3}C2019-P130

Ronald Fortunato[1], Anne Robertson[1], Chao Sang[1], Spandan Maiti[1], [1]*University of Pittsburgh, United States*

Myofibroblast Activation In Synthetic Fibrous Matrices Composed of Dextran Vinyl Sulfone SB^{3}C2019-P131

Christopher Davidson[1], Danica Jayco[1], Daniel Matera[1], William Wang[1], Brendon Baker[1], [1]*University of Michigan, United States*

Interaction of Pentagalloyl Glucose With The Microenvironment of Macrophages SB^{3}C2019-P132

Sourav Patnaik[1], Vangelina Osteguin[1], Tina Rodgers[1], Rohini Vishwanath[1], Craig Goergen[2], Dan Simionescu[3], Gabriela Uribe[1], Ender Finol[1], *[1]University of Texas at San Antonio, United States, [2]Purdue University, United States, [3]Clemson University, United States*

Posters - Cell & Tissue Engineering: Quantitative Micro/Nanodevices

Rapid Actuation and Tunable Control of Dna Machines SB^{3}C2019-P133

Alexander Marras[1], Stephanie Lauback[2], Ze Shi[3], Gaurav Arya[4], Ratnasingham Sooryakumar[5], Carlos Castro[5], *[1]University of Chicago, United States, [2]Juniata College, United States, [3]University of California San Diego, United States, [4]Duke University, United States, [5]Ohio State University, United States*

High-Throughput Cell Mechanical Property Measurements From Creep Experiments In An Extensional Flow Microfluidic Device SB^{3}C2019-P134

Huda Irshad[1], Safwa Ali[1], Gwendolyn Cramer[1], Jonathan Celli[1], Joanna Dahl[1], *[1]University of Massachusetts Boston, United States*

Posters - Cell & Tissue Engineering: Cardiovascular

A Computational Approach For Optimal Design of Tissue Engineered Vascular Grafts SB^{3}C2019-P135

Jason Szafron[1], Abhay Ramachandra[1], Christopher Breuer[2], Alison Marsden[3], Jay Humphrey[1], *[1]Yale University, United States, [2]Nationwide Children's Hospital, United States, [3]Stanford University, United States*

Curling Angle Measurement of Lv Bi-Layered Surface Strip Reviews Residual Stress In The Epicardium SB^{3}C2019-P136

Xiaodan Shi[1], Yue Liu[2], Katherine Copeland[1], Sara McMahan[1], Song Zhang[3], Ryan Butler[3], Yi Hong[1], Michael Cho[4], Pietro Bajona[5], Huajian Gao[2], Jun Liao[1], *[1]University of Texas at Arlington, United States, [2]Brown University, United States, [3]Mississippi State University, United States, [4]University of Texas Arlington, United States, [5]University of Texas Southwestern Medical Center, United States*

Effects of Microgravity On 3d Bioprinted Constructs To Assess Cardiovascular Disorders SB^{3}C2019-P137

Likitha Somasekhar[1], Prabhuti Kharel[1], Kenia Nunes[1], Paul Gatenholm[2], Kunal Mitra[1], *[1]Florida Institute of Technology, United States, [2]Chalmers university of Technology, Sweden*

Patient Specific, In Vitro Studies of Pathologies Caused By Heart Disease Associated Lamin A/c Mutations SB^{3}C2019-P138

Mehrsa Mehrabi[1], Richard Tran[1], Halida Widyastuti[1], Cecilia Nguyen[1], Michael V. Zaragoza[1], Anna Grosberg[1], *[1]University of California, Irvine, United States*

Adipose Stromal Cell Derived Extracellular Vesicles Induce Elastin and Collagen Deposition By Aortic Smooth Muscle Cells SB^{3}C2019-P139

Eoghan Cunnane[1], Aneesh Ramaswamy[1], David Vorp[1], Justin Weinbaum[1], *[1]University of Pittsburgh, United States*

Posters - Cell & Tissue Engineering: Mechanobiology - a symposium in memory of Christopher R. Jacobs

Tissue-Engineered Intra-Arterial Barrier For Mechanobiology Studies SB^{3}C2019-P140

Sara Ben Saadon[1], David Elad[1], *[1]Tel Aviv University, Israel*

The Role of Prestress In Calcification of Human Coronary Artery Smooth Muscle Cells In Vitro SB^{3}C2019-P141

Amirala Bakhshian Nik[1], Daniela Medina[1], Manuel Garcia Russo[1], Walter Heatherly[1], Joshua Daniel Hutcheson[1], *[1]Florida International University, United States*

Regulation of Nuclear Architecture, Mechanics and Nucleo-Cytoplasmic Shuttling of Epigenetic Factors By Cell Geometric Constraints SB^{3}C2019-P142

Farid Alisafaei[1], Doorgesh Sharma Jokhun[2], GV Shivashankar[2], Vivek Shenoy[1], *[1]University of Pennsylvania, United States, [2]National University of Singapore, Singapore*

Computational Models of Endothelial Cell Biochemical Responses To Shear Stress SB^{3}C2019-P143

Jonathan Garcia[1], Alisa Morss Clyne[1], *[1]Drexel University, United States*

Perlecan Deficiency Impairs The Intracellular Calcium Signaling In Mechanically Loaded Bone and Osteocytes SB^{3}C2019-P144

Shaopeng Pei[1], Sucharitha Parthasarathy[1], Ashutosh Parajuli[1], Jerahme Martinez[1], Mengxi Lv[1], Sida Jiang[1], Danielle Wu[2], Shuo Wei[1], X. Lucas Lu[1], Mary C. Farach-Carson[2], Catherine B. Kirn-Safran[1], Liyun Wang[1], *[1]University of Delaware, United States, [2]University of Texas Health Center, United States*

A Modified Bioreactor Configuration To Study Effects of Low Intensity Pulsed Ultrasound Treatment SB^{3}C2019-P145

Abdolrasol Rahimi[1], Zach Pittz[1], Nicholas Weaver[1], Natasha Case[1], *[1]Saint Louis University, United States*

Design and Computational Modeling of An Ultrasound Bioreactor For Stimulation of Cell-Seeded Scaffolds SB^{3}C2019-P146

Jacob Crapps[1], Abdolrasol Rahimi[1], Natasha Case[1], *[1]Saint Louis University, United States*

Pulsatile Electromagnetic Fields Regulate Bone Integrity Through Activation of Voltage Sensitive Calcium Channels SB^{3}C2019-P147

Abigail Dela Paz[1], Case Gregory[1], Randall Duncan[1], Mark Mirotznik[1], *[1]University of Delaware, United States*

Posters - Cell & Tissue Engineering: Other

Creating The Storkel: A Water Occluding Device For Accidental Submersion With A Tracheostoma SB^{3}C2019-P148

Claire M. Chaisson[1], Samantha K. Denning[1], Kelli E. Grimes[1], William J. Pelowski[1], Michael A. Valleau[1], Byron D. Erath[1], *[1]Clarkson University, United States*

Dynamic Tracking of Fluorescently Labeled Type I Collagen Molecules; Direct Quantification of Molecular Association With Native Fibrils SB^{3}C2019-P149

Seyed Mohammad Siadat[1], Jeffrey Ruberti[1], *[1]Northeastern University, United States*

Mechanical Advances In Cardiopulmonary Resuscitation SB^{3}C2019-P150

Jeffrey Stransky[1], Morgan Dean[1], Thomas Merrill[1], Jennifer Kadlowec[1], *[1]Rowan University, United States*

2.2 Poster Session II	Thursday, June 27 12:45PM - 2:15PM

Posters - Biotransport

Thermal Analysis of Partial Vitrification With Application To Large-Size Cryopreservation SB^{3}C2019-P151
Purva Joshi[1], Yoed Rabin[1], [1]*Carnegie Mellon University, United States*

Point-of-Care Diagnosis of Respiratory Syncytial Virus By Digital Nanobubble Detection SB^{3}C2019-P152
Yaning Liu[1], Varsha Godakhindi[1], Ruth Levitz[2], Jeffrey Kahn[2], Zhenpeng Qin[1], [1]*University of Texas at Dallas, United States,* [2]*University of Texas Southwestern Medical Center, United States*

Safe Duration of A Person Soaking Inside A Hot Tub: Theoretical Prediction of Temperature Elevations In Human Bodies Using A Whole Body Heat Transfer Model SB^{3}C2019-P153
Myo Min Zaw[1], Manpreet Singh[1], Ronghui Ma[1], Liang Zhu[1], [1]*University of Maryland Baltimore County, United States*

Creating A Distinct Capture Zone In Microfluidic Flow Greatly Enhances The Throughput and Efficiency of Cancer Detection SB^{3}C2019-P154
Jiangsheng Xu[1], Xiaoming He[1], [1]*University of Maryland, United States*

Fundamental Aspects of Paper-Based Microchip Electrophoresis Ph Gradient SB^{3}C2019-P155
Muhammad Noman Hasan[1], Ran An[1], Asya Akkus[1], Derya Akkaynak[2], Adrienne Minerick[3], Umut Gurkan[1], [1]*Case Western Reserve University, United States,* [2]*Princeton University, United States,* [3]*Michigan Technological University, United States*

Robustness of Convolutional Neural Networks For Malaria Parasite Identification In Thin Blood Smear Images With Adversarial Image Noise SB^{3}C2019-P156
Bill Sun[1], Liang Liang[2], [1]*Walton High School, United States,* [2]*Department of Computer Science at University of Miami, United States*

Towards Patient Specific Vascular Navigation of Therapeutics SB^{3}C2019-P157
Luke Puller[1], Matthew Charles[1], Darien Perez[1], Scott Anderson[1], Anilchandra Attaluri[1], [1]*The Pennsylvania State University - Harrisburg, United States*

Theoretical Evaluation of Temperature Elevation, Thermal Damage, Tumor Porosity Enhancement, and Magnetic Nanoparticle Migration In Tumors During Local Heating SB^{3}C2019-P158
Manpreet Singh[1], Ronghui Ma[1], Liang Zhu[1], [1]*University of Maryland Baltimore County, United States*

Aloe Alginate Hydrogels For Cervical Cancer Treatment: Antioxidant and Drug Release Activity SB^{3}C2019-P159
Sierra McConnell[1], Patrick Charron[1], Rachael Oldinski[1], [1]*University of Vermont, United States*

Modelling Lymph Propulsion In A Series of Pumping Lymphangions SB^{3}C2019-P160
Ghazal Adeli Koudehi[1], Matthias Van Impe[1], Carlos Alejandro Silvera Delgado[1], Charlotte Debbaut[1], Christophe Casteleyn[1], Pieter Cornillie[1], Patrick Segers[1], [1]*Ghent University, Belgium*

A 2d Axisymmetric Computational Model For The Study of Mass Transport Into Lymphatic Capillaries and Pre-Collector Vessels SB^{3}C2019-P161
Carlos Alejandro Silvera Delgado[1], Ghazal Adeli Koudehi[1], Matthias Van Impe[1], Charlotte Debbaut[1], Patrick Segers[1], [1]*Ghent University, Belgium*

Microfluidic Assessment of Red Blood Cell Deformability and Microvascular Occlusion Risk In Malaria and Sickle Cell Disease SB^{3}C2019-P162
Yuncheng Man[1], Erdem Kucukal[1], Quentin Watson[1], Jurgen Bosch[1], Jane Little[1], Peter Zimmerman[1], Umut Gurkan[1], [1]*Case Western Reserve University, United States*

Microfluidic Assessment of Red Blood Cell Detachment In Simulated Microvascular Flow SB^{3}C2019-P163

Utku Goreke[1], Shamreen Iram[1], Gundeep Singh[1], Jane A Little[1], Michael Hinczewski[1], Umut A Gurkan[1], *[1]Case Western Reserve University, United States*

Effects of Leaky Tumor Vasculature On Tissue Stress and Porosity In A Biphasic Model of Brain Glioma SB^{3}C2019-P164

Julian Rey[1], Malisa Sarntinoranont[1], James Ewing[2], *[1]Mechanical and Aerospace Engineering, University of Florida, Gainesville, FL, United States, [2]Henry Ford Health System, Detroit, Michigan, United States*

Modelling Advection-Based Nanoparticle Drug Delivery To The Left Ventricle Using A Splitting Method For Advection-Diffusion Kinetics SB^{3}C2019-P165

Alexandra Diem[1], Kristian Valen-Sendstad[1], *[1]Simula Research Laboratory, Norway*

Posters - Design Dynamics & Rehabilitation

Comparison of Principal Component Analysis and Non-Negative Matrix Factorization In Prediction of Unmeasured Muscle Excitations SB^{3}C2019-P166

Di Ao[1], Mohammad Shourijeh[1], Carolynn Patten[2], Benjamin Fregly[1], *[1]Rice University, United States, [2]UC Davis, United States*

Variance In Swimmer Symmetry Due To Effort and Fatigue SB^{3}C2019-P167

Casey Main[1], Craig Goehler[1], *[1]Valparaiso University, United States*

Joint Stiffness Modulation of Gait Variability In A Stroke SB^{3}C2019-P168

Geng Li[1], Di Ao[1], Mohammad Shourijeh[1], Marleny Arones[1], Carolynn Patten[2], Benjamin Fregly[1], *[1]Rice University, United States, [2]UC Davis, United States*

Analytical Calculation of Musculoskeletal Joint Stiffness SB^{3}C2019-P169

Mohammad S. Shourijeh[1], Di Ao[1], Carolynn Patten[2], Benjamin J. Fregly[1], *[1]Rice University, United States, [2]UCDavis, United States*

Identifying Postural Instability Using Topological Data Analysis SB^{3}C2019-P170

Kyle Siegrist[1], James Chagdes[1], Amit Shukla[1], Ryan Kramer[2], Michael Cinelli[3], *[1]Miami University, United States, [2]Air Force Research Laboratory, United States, [3]Wilfrid Laurier University, Canada*

A Novel Strategy For Concurrent Reduction of Fluid Reduction of Fluid Drag and Protein Adsorption For Cardiovascular Medical Devices. SB^{3}C2019-P171

Cheng Yi-Chih[1], Yap Choon Hwai[1], *[1]National University of Singapore, Taiwan*

Integrated Switchable Ventricular Assist Device For Pediatric Patients SB^{3}C2019-P172

Harut Sarkisyan[1], Randy Stevens[2], Amy Throckmorton[1], *[1]Biomedical Engineering, Drexel University, United States, [2]St. Christopher's Hospital for Children, United States*

Experimental Modeling of Coronary Intervention: Towards Computational Simulation SB^{3}C2019-P173

Maxwell Bean[1], David Jiang[2], Sam Stephens[1], Megan Laughlin[1], Hanna Jensen[1], Barry Uretsky[3], Lucas Timmins[2], Morten Jensen[1], *[1]University of Arkansas, United States, [2]University of Utah, United States, [3]University of Arkansas for Medical Sciences, United States*

Agonist / Antagonist Control Combining Mixed Sensitivity Design and Iterative Learning SB^{3}C2019-P174

Patrick Schimoler[1], Jeffrey Vipperman[2], Mark Carl Miller[1],*[1]Allegheny General Hospital, United States, [2]University of Pittsburgh, United States*

Analysis of A Poly(ethylene Glycol) Diacrylate (PEGDA) Optical Sensor-Based Whispering Gallery Mode Shift Subjected To Shock Wave Impact SB^{3}C2019-P175

Ling Zhang[1], Maurizio Manzo[2], Sarah Bentil[1], *[1]Iowa State University, United States, [2]University of North Texas, United States*

Exercise Therapy Affects Glenohumeral Joint Stability In Patients With Isolated Supraspinatus Tears SB^{3}C2019-P176

Luke Mattar[1], Camille Johnson[1], Tom Gale[1], Adam Popchak[1], James Irrgang[1], William Anderst[1], Volker Musahl[1], Richard Debski[1], *[1]University of Pittsburgh, United States*

Biceps Voluntary Activation: Method To Calculate Pre-Stimulus Moment Affects Magnitude But Not Reproducibility SB^{3}C2019-P177

Thibault Roumengous[1], Paul Howell[1], Carrie Peterson[1], *[1]Virginia Commonwealth University, United States*

Posters - Education

Effectiveness of An Extensively Active and Authentic Learning Environment In An Undergraduate Biomedical Engineering Module A Case Study In A South-East Asian Cohort SB^{3}C2019-P178

Vivek Vasudevan[1], Alberto Corrias[1], Martin Buist[1], Hwa-Liang Leo[1], Choon-Hwai Yap[1], *[1]National University of Singapore, Singapore*

Injury Prevention Via Computer Modeling of Stud Traction SB^{3}C2019-P179

Justin Rittenhouse[1], Peter Gustafson[1], *[1]Western Michigan University, United States*

An Ecg Analysis Determining The Impact of Mother'S Metabolic Equivalent Value In Pregnancy On Infant Heart Rate Variability SB^{3}C2019-P180

Alexandra Williams[1], Colby Jolly[1], Christy Isler[1], Kelley Haven[1], Edward Newton[1], Linda May[1], Stephanie George[1], *[1]Ecu, United States*

For Your Information: Student Evaluations of Teaching Are Biased Against Women and Faculty of Color SB^{3}C2019-P181

Naomi Chesler[1], Dante Fratta[2], Elizabeth Harris[1], Wayne Pferdehirt[1], Heidi Ploeg[3], Barry Vanveen[1], *[1]University of Wisconsin - Madison, United States, [2]University of Wisconsin-Madison, United States, [3]Queens University, Canada*

Incorporating National Biomechanics Day Into Biomechanical Engineering Courses SB^{3}C2019-P182

Sara Wilson[1], *[1]University of Kansas, United States*

Posters - Fluids: Cardiovascular Fluid Mechanics

Developing The Components of A Multiscale Computational Platform In The Design of A Geometrically Tunable Blood Shunt For Norwood Recipients SB^{3}C2019-P183

Ellen Garven[1], Kara Spiller[1], Randy Stevens[2], Amy Throckmorton[1], *[1]Drexel University, United States, [2]St. Christopher's Hospital for Children, United States*

Quantifying Hemodynamics In Hypoplastic Left Heart Syndrome SB^{3}C2019-P184

Banafsheh Zebhi[1], Hadi Wiputra[2], Lisa Howley[3], Bettina Cuneo[3], Dawn Park[3], Hilary Hoffman[3], Lisa Gilbert[3], Choon Hwai Yap[2], David Bark Jr[1], *[1]Colorado State University, United States, [2]National University of Singapore, Singapore, [3]Children's Hospital Colorado, United States*

On The Quantification of Hemodynamics In The Ascending Aorta To Predict Pathogenesis In Bicuspid Aortic Valve Disease SB^{3}C2019-P185

Tejas Canchi[1], Sargon A Gabriel[1], Mustafa Gok[1], David F Fletcher[2], Stuart Michael Grieve[1], *[1]The Heart Research Institute, Australia, [2]The University of Sydney, Australia*

Multiple Mitraclips: The Balancing Act Between Pressure Gradient and Regurgitation SB^{3}C2019-P186

Shelley Gooden[1], Hoda Hatoum[1], Konstantinos Boudoulas[1], Lakshmi Prasad Dasi[1], *[1]The Ohio State University, United States*

Basilica-Type Leaflet Laceration To Reduce Risk of Thrombosis In Transcatheter Aortic Valve Replacement SB^{3}C2019-P187

Hoda Hatoum[1], Pablo Maureira[2], Scott Lilly[1], Lakshmi Prasad Dasi[1], *[1]The Ohio State University, United States, [2]Centre Hospitalier Universitaire de Nancy, France*

Early Diagnosis of Reduced Leaflet Mobility After Transcatheter Aortic Valve Replacement SB^{3}C2019-P188

Hoda Hatoum[1], Jung-Hee Seo[2], Shantanu Bailoor[2], Scott Lilly[1], Rajat Mittal[2], Lakshmi Prasad Dasi[1], *[1]The Ohio State University, United States, [2]Johns Hopkins University, United States*

Hemodynamics, In Addition To Morphology, Predicts Long-Term Outcome of Intracranial Aneurysms Treated With Flow Diverters SB^{3}C2019-P189

Nikhil Paliwal[1], Jason Davies[1], Adnan Siddiqui[1], Hui Meng[1], *[1]University at Buffalo, United States*

Correlation of Computational Instantaneous Wave-Free Ratio With Fractional Flow Reserve In The Case of Multiple Intermediate Coronary Artery Stenosis In A Left Main Bifurcation SB^{3}C2019-P190

Arash GhorbanniaHassankiadeh[1], David S. Marks[2], John F. LaDisa, Jr.[1], *[1]Marquette University and Medical College of Wisconsin, United States, [2]Medical College of Wisconsin, United States*

The Effects of Oscillatory Shear Regulation On Paracrine Signaling Between Vascular Endothelial Cells and Vascular Smooth Muscle Cells SB^{3}C2019-P191

Chia-Pei Hsu[1], Alexandra Tchir[1], Joshua Hutcheson[1], Sharan Ramaswamy[1], *[1]Florida International University, United States*

Non-Linear Cd31 Expression In Vascular Endothelial Cells In Response To Increasing Oscillatory Flow Conditions SB^{3}C2019-P192

Alexandra Tchir[1], Chia-Pei Hsu[1], Sharan Ramaswamy[1], *[1]Florida International University, United States*

Intra-Valvular Pressure Dynamics and Valve Specific Pressure Recovery In Transcatheter Aortic Valve Replacement: Implication On Validity of Echo Derived Gradient SB^{3}C2019-P193

Hoda Hatoum[1], Maurice Alston[1], David Orsinelli[1], Gregory Rushing[1], Susan O'Neil[1], Nancy Matre[1], Konstantinos Boudoulas[1], Scott Lilly[1], Lakshmi Prasad Dasi[1], *[1]The Ohio State University, United States*

Design of A Cost-Effective Cardiac Flow Loop For Testing Tavr Placement In Patient-Specific Anatomy SB^{3}C2019-P194

Christine Buffinton[1], Benjamin Conser[1], M. Laura Beninati[1], Shikhar Agarwal[2], *[1]Bucknell University, United States, [2]Geisinger Medical Center, United States*

Effect of Leaflet Opening Geometry On Turbulent Characteristics For Prosthetic Aortic Valve Applications SB^{3}C2019-P195

Megan Heitkemper[1], Hoda Hatoum[1], Jun Kim[1], Lakshmi Prasad Dasi[1], *[1]The Ohio State University, United States*

In Vitro Forward Flow Performance of The Konect Resilia Aortic Valved Conduit SB^{3}C2019-P196

Vahid Sadri[1], Immanuel David Madukauwa-David[1], Ajit Yoganathan[1], *[1]Georgia Institute of Technology, United States*

Posters - Fluids: Respiratory and Other Fluid Mechanics

Autonomous Pumping In A Physical Model of A Multi-Lymphangion System SB^{3}C2019-P197

John Montani[1], Luke Riexinger[1], Lance Munn[2], James Baish[1], *[1]Bucknell University, United States, [2]Harvard Medical School, United States*

Culture of Lymphatic Endothelial Cells In A Custom Bioreactor For Studies Combining Stretching and Fluid Shear Stress SB^{3}C2019-P198

Caleb Davis[1], Walter Cromer[2], David Zawieja[2], Michael Moreno[1], *[1]Texas A&M University, United States, [2]Texas A&M Health Science Center, United States*

In Vitro Anthropomorphic Model of The Cerebrospinal Fluid System: Application To Subarachnoid Hemorrhage Filtration SB^{3}C2019-P199

Lucas Sass[1], Mohammadreza Khani[1], Gabryel Conley Natividad[1], Elliott Marsden[1], Shavaine Byass[1], Omolola Bangudu[1], Aaron McCabe[2], Laura Zitella Verbick[2], Shivanand Lad[3], Bryn Martin[1], *[1]University of Idaho, United States, [2]Minnetronix Neuro, Inc., United States, [3]Duke University, United States*

Impact of Cerebrospinal Fluid Filtration On Subarachnoid Hemorrhage Clearance: A Computational Fluid Dynamics Study SB^{3}C2019-P200

Mohammadreza Khani[1], Lucas Sass[1], M. Keith Sharp[2], Aaron McCabe[3], Laura Zitella Verbick[3], Shivanand Lad[4], Bryn Martin[1], *[1]University of Idaho, United States, [2]University of Louisville, United States, [3]Minnetronix Neuro, Inc., United States, [4]Duke University School of Medicine, United States*

Towards Physiologically-Relevant Vocal Fold Models For Voiced-Speech Investigations SB^{3}C2019-P201

Mohsen Motie-Shirazi[1], Natalie Jagelski[2], Byron Erath[1], *[1]Clarkson University, United States, [2]Clarkson Univeristy, United States*

Computational Methodology To Estimate Resistance To Cerebrospinal Fluid Motion In The Spinal Canal For Chiari Patients With Specific and Nonspecific Symptoms SB^{3}C2019-P202

Alaaddin Ibrahimy[1], Rafeeque Bhadelia[2], Abraham Bezuidenhout[2], Francis Loth[1], *[1]The University of Akron, United States, [2]Beth Israel Deaconess Medical Center, United States*

Multiphase Fluid Dynamics of Shear-Thinning Droplets In A Microfluidic Flow-Focusing Device SB^{3}C2019-P203

Ali Bozorgnezhad[1], Jason Gleghorn[1], *[1]University of Delaware, United States*

Posters - Solid Mechanics: Injury

Fracture Patterns In Concentrated 4-Point Bending of The Ovine Femora: The Effects of Age and Rate of Loading SB^{3}C2019-P204

Patrick Vaughan[1], Feng Wei[1], Roger Haut[1], *[1]Michigan State University, United States*

The Importance of Skull Morphology In Remote Blunt Impact Induced Fracture Initiation SB^{3}C2019-P205

Paul Snyder[1], Steven Rundell[2], Todd Fenton[1], Roger Haut[1], Feng Wei[1], *[1]Michigan State University, United States, [2]Explico Engineering Company, United States*

Subject-Specific Madymo Analysis of A Low Speed Rear-End Collision SB^{3}C2019-P206

David Sproule[1], Stephanie Rossman[1], Paul Snyder[1], Keith Button[1], Brian Weaver[1], Steve Rundell[1], *[1]Explico Engineering, United States*

Development of A Portable Suction Device For Combat Medics SB^{3}C2019-P207

Forhad Akhter[1], Austin Schoppe[1], Omar Navarro[1], Christopher Carroll[1], Priya Jain[1], Ricardo Pescador[1], Robert De Lorenzo[2], Bruce D. Adams[2], Yusheng Feng[1], R. Lyle Hood[1], *[1]University of Texas at San Antonio, United States, [2]University of Texas Health Science Center at San Antonio, United States*

Finite Element Model of Neonatal Brachial Plexus and Spinal Cord SB^{3}C2019-P208

Anita Singh[1], Christian D'Andrea[2], Sriram Balasubramanian[2], *[1]Widener Univ, United States, [2]Drexel Univ, United States*

Development of Visual Analysis Tracking Method For Use In Conjunction With Novel Animal Model of Mtbi SB^{3}C2019-P209

Allison Gleason[1], Lisa Pruitt[1], Daniela Kaufer[1], Ellen Parker[2], *[1]University of California - Berkeley, United States, [2]Dalhousie University, Canada*

Biomechanical Response of The Mandible To Blunt Impact and Corresponding Biofidelity of The Focus Headform SB[3]C2019-P210

Charles Weisenbach[1], Jodie Gomez[1], Andrea Dargie[1], Ray Daniel[1], Valeta Chancey[2], Frederick Brozoski[1], *[1]U.S. Army Aeromedical Research Laboratory, United States, [2]U.S. Army Aeromedical Research Laborary, United States*

Converting The Worcester Head Injury Model From Abaqus To Ls-Dyna SB[3]C2019-P211

Kianoosh Ghazi[1], Wei Zhao[1], Songbai Ji[1], *[1]Worcester Polytechnic Institute, United States*

Quasi-Linear Viscoelastic Fitting of Thoracic Tissues and Ballistics Gel For Modeling Behind Armor Blunt Trauma SB[3]C2019-P212

Madelyn Eaton[1], Robert Salzar[1], *[1]University of Virginia, United States*

Inhibiting Spinal Phospholipase A2 Prevents Pain and Modifies Spinal Neuron Activity & Glutamate Signaling Early After Nerve Root Compression SB[3]C2019-P213

Julia Quindlen-Hotek[1], Sonia Kartha[1], Prabesh Ghimire[1], Beth Winkelstein[1], *[1]University of Pennsylvania, United States*

Viscoelastic Response of Shock Wave Impacted Brain Tissue SB[3]C2019-P214

Annastacia McCarty[1], Ling Zhang[1], Sarah Hansen[1], William Jackson[1], Sarah Bentil[1], *[1]Iowa State University, United States*

Effects of Excessive Impact On Bone Conduction In Contact Sports SB[3]C2019-P215

Shinji Hamanishi[1], Namkeun Kim[2], Seongho Mo[2], Takashi Watanabe[1], Yoshihiro Aoki[1], *[1]Sendai National College of Technology, Japan, [2]Incheon National University, South Korea*

Properties of The Six Layers of The Gray Matter SB[3]C2019-P216

Arpad Bakonyi[1], Alan Faitelewicz[2], Siavash Hashemi[2], Ali Sadegh[2], *[1]University of Applied Sciences Technikum Vienna, Austria, [2]The City College of the City Univ. of New York, United States*

Helmeted Head-Neck Kinematics With Localized Impacts and Implications For Brain Injury Metrics SB[3]C2019-P217

Narayan Yoganandan[1], John Humm[1], Mark Meyer[1], Frank Pintar[1], Tyler Rooks[2], Frederick Brozoski[2], Joseph McEntire[2], Valeta Chancey[2], *[1]Medical College of Wisconsin, United States, [2]Usaarl, United States*

Investigate The Variations of The Head Impact Response In A Rodent Head Impact Acceleration Model By Finite Element Modeling SB[3]C2019-P218

Runzhou Zhou[1], Liying Zhang[1], *[1]Wayne State University, United States*

Injury Risk Curves Using A Novel (bayesian) Techinque To Describe Human Tolerance In Impact Biomechanics SB[3]C2019-P219

Nicholas DeVogel[1], Anjishnu Banerjee[1], Narayan Yoganandan[1], *[1]Medical College of Wisconsin, United States*

Designing An Impact Pendulum To Test Different Concussion Prevention Helmet Acessories SB[3]C2019-P220

Farryl Groder[1], Efe Ozkaya[1], Luca Conetta[2], Mehmet Kurt[1], *[1]Stevens Institute of Technology, United States, [2]The Packer Collegiate Institute, United States*

Head Impact Characterization In Men'S and Women'S Collegiate Rugby SB[3]C2019-P221

Emily Kieffer[1], Grace Pierce[1], Chase Vaillancourt[1], Steven Rowson[1], *[1]Virginia Tech, United States*

History Dependent Damage Modelling For Axonal Fiber Tracts of The Brain SB[3]C2019-P222

Ritika Menghani[1], Ouniol Aklilu[1], Reuben Kraft[1], *[1]The Pennsylvania State University, United States*

Chestband-Based Injury Metrics In Far-Side Impacts SB[3]C2019-P223

Yuvaraj Purushothaman[1], John Humm[2], Hans Hauschild[2], Klaus Driesslein[2], Frank Pintar[2], Narayan Yoganandan[2], *[1]Medical College Of Wisconsin, United States, [2]Medical College of Wisconsin, United States*

Application of Six-Year-Old Child Human Body Finite Element Models With Accurate Anatomical Characteristics For Understanding The Injury Mechanisms SB^{3}C2019-P224

Haiyan Li[1], Yongqiang Huang[1], Wenle Lv[1], Shihai Cui[1], Lijuan He[1], Shijie Ruan[1], Chunxiang Wang[2], *[1]International Joint Research Centre of modern automobile safety technology, Tianjin University of Science and Technology, China, [2]Tianjin Children Hospital, China*

Effect of Microstructural Variation In The Biomechanics of Oligodendrocyte-Neuron Co-Cultures SB^{3}C2019-P225

Zeynep M. Suar[1], Mateusz Urbanski[2], Gloria Fabris[1], Carmen V. Melendez-Vasquez[2], Mehmet Kurt[1], *[1]Stevens Institute of Technology, United States, [2]Hunter College, United States*

An Atlas-Based Finite Element Model of Mouse Brain For Controlled Cortical Impact SB^{3}C2019-P226

Changxin Lai[1], Suhao Qiu[1], Yuan Feng[1], *[1]Shanghai Jiao Tong University, China*

Biomechanical Characterization of Ovine Pia Arachnoid Complex SB^{3}C2019-P227

Gabryel Conley Natividad[1], Sophia Theodossiou[1], Nathan Schiele[1], Gordon Murdoch[2], Goutham Burla[1], Gabriel Potirniche[3], Bryn Martin[1], *[1]University of Idaho, Department of Biological Engineering, United States, [2]University of Idaho, Department of Animal and Veterinary Science, United States, [3]Univerisyt of Idaho, Department of Mechanical Engineering, United States*

Posters - Solid Mechanics: Joint and Spine Mechanics

Template Models For Surface Manipulation of Musculoskeletal Extremity Regions SB^{3}C2019-P228

Sean Doherty[1], Ben Landis[1], Tammy Owings[1], Ahmet Erdemir[1], *[1]Cleveland Clinic, United States*

A Parametric Study of Transcondylar Screw Effectiveness To Enhance Healing of Subchondral Bone Cysts of Varied Sizes SB^{3}C2019-P229

Lance Frazer[1], Elizabeth Santschi[2], Kenneth Fischer[1], *[1]University of Kansas, United States, [2]Kansas State University, United States*

Reducing Kinematic Data Uncertainty During Mechanical Testing of Orthopaedic Implants: The Benefits and Pitfalls of Auxiliary Motion Capture Systems SB^{3}C2019-P230

Callan Gillespie[1], Quinn Saluan[1], Tara Nagle[1], Joe Little[2], Willy Theodore[2], Robb Colbrunn[1], *[1]Cleveland Clinic, United States, [2]360 Knee Systems, United States*

Effect of Pelvis and Limb Position On Radiographic Leg Length Discrepancy Measurement: A Sawbones Model SB^{3}C2019-P231

Isaac Livshetz[1], Awais Hussain[1], Matthew Robinson[1], Farid Amirouche[1], Mark Gonzalez[1], *[1]University of Illinois College of Medicine at Chicago, United States*

Clinical Representation of Joint Coordinate System Forces SB^{3}C2019-P232

Callan Gillespie[1], Tara Nagle[1], Robb Colbrunn[1], *[1]Cleveland Clinic, United States*

Biomechanics of Three-Level Cervical Fusion Comparing A Stand-Alone Cage Construct To Anterior Plate and Cages Construct - A Cadaveric Study SB^{3}C2019-P233

Robert McGuire[1], Abeer Al-Barghouthi[2], Loren Latta[3], Francesco Travascio[3], *[1]University of Mississippi, United States, [2]Max Biedermann Institute for Biomechanics, Mount Sinai Medical Center, United States, [3]University of Miami, United States*

A Posture Controlling Test Device To Dynamically Load Lumbar Spinal Columns SB^{3}C2019-P234

John Humm[1], Narayan Yoganandan[2], *[1]Medical College of Wisconsin and Marquette University, United States, [2]Medical College of Wisconsin, United States*

3d Surface Kinematics of The Lumbar Facet Capsular Ligament During Inflation Testing SB^{3}C2019-P235

Elizabeth Gacek[1], Emily Bermel[1], Arin Ellingson[1], Victor Barocas[1], *[1]University of Minnesota Twin-Cities, United States*

Dorsal Subluxation of The First Metacarpal At The Basilar Thumb Joint During Key Pinch: Comparison To Osteoarthritis Grading Systems SB^{3}C2019-P236

Nolan Norton[1], Brandon Barnds[2], Terence McIff[2], E. Bruce Toby[2], Kenneth Fischer[1], *[1]University of Kansas, United States, [2]University of Kansas Medical Center, United States*

Wheelchair Seat Position and Footprint Length Effects On Shoulder and Elbow Angles On Graded Surfaces SB^{3}C2019-P237

Amogha Vijayvargiya[1], Sarah Bass[2], Hailee Kulich[2], Alicia Koontz[2], *[1]University of Pittsburgh, United States, [2]Human Engineering Research Laboratories, United States*

Posters - Solid Mechanics: Musculoskeletal Soft Tissue Mechanics

An Alternative Method To Characterize Poroelastic Material Properties of Murine Articular Cartilage SB^{3}C2019-P238

Alexander Kotelsky[1], Joseph Carrier[1], Mark Buckley[1], *[1]University of Rochester, United States*

Comparison of The Effects of Boundary Lubricants On The Tribological Rehydration of Articular Cartilage SB^{3}C2019-P239

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Effect of Counterface Surface Roughness On Tribological Rehydration of Articular Cartilage SB^{3}C2019-P240

Meghan Kupratis[1], Margot Farnham[1], David Burris[1], Christopher Price[1], *[1]University of Delaware, United States*

Maintaining Cartilage Hydration During Sliding Part 1: The Effect of Migration Length SB^{3}C2019-P241

Jamie Benson[1], Caroline Kook[1], Axel Moore[2], Steven Voinier[1], Christopher Price[1], David Burris[1], *[1]University of Delaware, United States, [2]Imperial College London, United Kingdom*

Improved Methods For Mechanically Testing Foot and Ankle Ligaments: Preparation, Length Estimation, Environmental Maintenance, and Semi-Automation SB^{3}C2019-P242

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Testing Medial Ulnar Collateral Ligament Fatigue Failure SB^{3}C2019-P243

David Jordan[1], Alexander Kharlamov[2], Patrick Schimoler[3], Patrick DeMeo[2], Mark Carl Miller[3], *[1]University of Pittsburgh, United States, [2]Allegheny General Hospital, United States, [3]Allegheny General Hospital and University of Pittsburgh, United States*

Experimental Measurement of Embryonic Tendon Multiscale Mechanics SB^{3}C2019-P244

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Femoral Tunnel Location Affects Acl Excursion During Knee Flexion SB^{3}C2019-P245

Patrick Schimoler[1], J. Jared Guth[1], Alexander Kharlamov[1], J. Daniel Thompson[1], Sam Akhavan[1], Mark Carl Miller[1], *[1]Allegheny General Hospital, United States*

Utilization of Multi-Foci Arfi Imaging To Generate Larger Tendon Displacement SB^{3}C2019-P246

Gerald A Ferrer[1], Waqas Khalid[1], Volker Musahl[1], Kang Kim[1], Richard E Debski[1], *[1]University of Pittsburgh, United States*

Using Optical Tracking To Calculate Non-Recoverable Strain In The Glenohumeral Capsule SB^{3}C2019-P247

Jocelyn Hawk[1], Calvin Chan[1], Robert Tisherman[1], Richard Debski[1], *[1]Orthopaedic Robotics Laboratory, United States*

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Intramuscular Pressure and Shear Modulus of Lower Leg Muscles Are Correlated SB^{3}C2019-P249

Seyedali Sadeghi[1], Dov Bader[2], Daniel Cortes[1], *[1]Penn State University, United States, [2]Penn State College of Medicine, United States*

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Katie Harte[1], Gary Menary[1], Alex Lennon[1], *[1]Queen's University Belfast, United Kingdom*

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Justin Scott[1], Sheng Chen[1], Sara Roccabianca[1], Tamara Reid Bush[1], *[1]Michigan State University, United States*

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Iden Kurtaliaj[1], Ethan Hoppe[2], Dong Hwan Yoon[2], Lester Smith[3], Victor Birman[4], Guy Genin[2], Stavros Thomopoulos[1], *[1]Columbia University, United States, [2]Washington University, United States, [3]Indiana University, United States, [4]Missouri Science & Technology, United States*

Optimizing Non-Linear Mechanical Behavior of Soft Tissues In Finite Element Model of Human Thigh SB^{3}C2019-P253

Eli Broemer[1], Sheng Chen[1], Justin Scott[1], Tamara Bush[1], Sara Roccabianca[1], *[1]Michigan State University, Mechanical Engineering, United States*

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Mingliang Jiang[1], Michael Moreno[1], *[1]Texas A&M University, United States*

Dissimilar Linear Friction Welding (lfw) Technology For Manufacturing of Functional Materials: Bi-Metallic Ti6al4v-Cocrmo Joint Implants SB^{3}C2019-P255

David Irwin[1], Christina Seydlorsky[1], Agraha Gautam[1], Aspen Glaspell[1], Kyosung Choo[1], Jae Joong Ryu[1], *[1]Youngstown State University, United States*

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Automated Fiber Orientation Quantification In Three Dimensional Images SB^{3}C2019-P256

Jeremy Eekhoff[1], Spencer Lake[1], *[1]Washington University in St. Louis, United States*

The Effect of Composition and Hydration On The Mechanics of Carbonated Apatite SB^{3}C2019-P257

Brian Wingender[1], Masashi Azuma[1], Christina Krywka[2], Paul Zaslansky[3], John Boyle[4], Alix Deymier[1], *[1]UConn Health, United States, [2]Zentrum fr Material- und Kstenforschung GmbH, Germany, [3]Charit - Universittsmedizin Berlin, Germany, [4]Columbia University, United States*

Application of Micro-Raman Spectroscopy To Mechanical Characterization of Hydrogels SB^{3}C2019-P258

Hui Zhou[1], John M. Maloney[1], Alexander M. Knapp[1], Malisa Sarntinoranont[1], Chelsey S. Simmons[1], Ghatu Subhash[1], *[1]University of Florida, United States*

High Fidelity Modeling of 3d Euler Buckling and Stress Transmission Through Mother-Daughter Crosslink Captures Reversible Collapse In Compressing Dendritic Actin Mesh SB^{3}C2019-P259

Jyothirmai Simhadhri[1], Preethi Chandran[1], *[1]Howard University, United States*

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Peiyuan Kang[1], Daipayan Sarkar[1], Zhenpeng Qin[1], *[1]The University of Texas at Dallas, United States*

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Chanyoung Lee[1], Jesse Rohr[2], Austin Sass[2], Stuart Sater[2], Bryn Martin[2], Arslan Zahid[1], John Oshinski[1], C. Ross Ethier[1], *[1]Georgia Institute of Technology and Emory University, United States, [2]University of Idaho, United States*

Peripapillary Deformation and Its Relation To Material Properties of The Eye Globe SB[3]C2019-P262

Jafar A. Mehr[1], Heather M. Moss[2], Hamed Hatami-Marbini[1], *[1]University of Illinois at Chicago, United States, [2]Stanford University, United States*

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Anup Pant[1], Rodolfo Repetto[2], Syril Dorairaj[3], Rouzbeh Amini[1], *[1]University of Akron, United States, [2]University of Genoa, Italy, [3]Mayo Clinic, United States*

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Shuolun Wang[1], Hamed Hatami-Marbini[1], *[1]University of Illinois at Chicago, United States*

Microsturctural Changes At The Vitreoretinal Interface With Region and Age In Human Eyes SB[3]C2019-P266

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Usmaan Siddiqui[1], Nathan Gallant[2], *[1]University of South Florida, United States, [2]Univeristy of South Florida, United States*

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Sarah Johnson[1], Juyu Chueh[2], Matthew Gounis[2], Michael Glivarry[3], Ray McCarthy[3], Patrick McGarry[1], Peter McHugh[1], *[1]National University Of Ireland Galway, Ireland, [2]University of Massachusetts Medical School, United States, [3]Cerenovus, Johnson & Johnson, Ireland*

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Bart Spronck[1], Jay D. Humphrey[1], *[1]Department of Biomedical Engineering, Yale University, United States*

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Kristen Cirincione[1], Joshua Smith[1], *[1]Lafayette College, United States*

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Samaneh Sattari[1], Mona Eskandari[1], *[1]University of California, Riverside, United States*

Does The Random Generation Algorithm Affect The Results of Numerical Models For Mechanical Response of Filamentous Networks? SB[3]C2019-P272

Hamed Hatami-Marbini[1], *[1]University of Illinois at Chicago, United States*

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Sae-Il Murtada[1], Yuki Kawamura[1], Alexander Caulk[1], Nicole Guerrera[2], Hossein Ahmadzadeh[1], Nathan Maulding[2], Kristin Zimmerman[2], Dar Weiss[1], Marcos Latorre[1], Dillon Kavanagh[2], Zhenwu Zhuang[2], Demetrios Braddock[2], Jay Humphrey[1], *[1]Yale University, United States, [2]Yale School of Medicine, United States*

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Bingrui Wang[1], Yi Hua[2], Fengting Ji[2], Ian A. Sigal[2], *[1]Southwest Jiaotong University, China, [2]University of Pittsburgh, United States*

A Connectome-Based Network Model To Simulate Prion-Like Protein Propagation In Neurodegenerative Diseases SB^{3}C2019-P275

Xuesong Zhang[1], Johannes Weickenmeier[1], *[1]Stevens Institute of Technology, United States*

Determination of The Linear Viscoelastic Behavior of Aponeurosis SB^{3}C2019-P276

Keith Grega[1], Benjamin Wheatley[1], *[1]Bucknell University, United States*

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David Rutkowski[1], Shane Wells[1], Brian Johnson[1], Wei Huang[1], David Jarrard[1], Joshua Lang[1], Steve Cho[1], Alejandro Roldan-Alzate[1], *[1]University of Wisconsin-Madison, United States*

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Gabrielle Clark[1], Laurephile Desrosiers[2], Leise Knoepp[2], Kristin Miller[1], *[1]Tulane University, United States, [2]Ochsner Clinical School, United States*

Toward Fast and Accurate Automated Female Pelvic Floor 3d Geometric Model Reconstruction Based On Deep Convolutional Neural Networks SB^{3}C2019-P279

Fei Feng[1], James A. Ashton-Miller[2], John O.L. DeLancey[3], Jiajia Luo[1], *[1]University of Michigan Shanghai Jiao Tong University Joint InstituteShanghai Jiao Tong University, China, [2]Department of Mechanical EngineeringUniversity of MichiganAnn Arbor, United States, [3]Department of Obstetrics and GynecologyUniversity of MichiganAnn Arbor, United States*

Viscoelastic Mechanical Behavior of Decorin Knockout Mouse Cervical Tissue SB^{3}C2019-P280

Nicole Lee[1], Charles Jayyosi[1], Shanmugasundaram Nallasamy[2], Mala Mahendroo[2], Kristin Myers[1], *[1]Columbia University, United States, [2]Department of Obstetrics and Gynecology and Green Center for Reproductive Biology Sciences University of Texas Southwestern Medical Center, United States*

Determination of The Active and Passive Mechanical Properties of The Non-Pregnant Murine Cervix SB^{3}C2019-P281

Cassandra Conway[1], Gabrielle Clark[1], Mala Mahendroo[2], Kristin Miller[1], *[1]Tulane University, United States, [2]University of Texas Southwestern Medical Center, United States*

Traction Force Microscopy On Human Aortic Smooth Muscle Cells SB^{3}C2019-P282

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Posters - Cell & Tissue Engineering: Musculoskeletal

Effects of Solvent and Gelatin Concentration Near-Field, Direct-Write Electrospinning of Gelatin SB^{3}C2019-P283

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Victoria Webster-Wood[1], Phillip McClellan[2], Lekha Kesavan[1], Greg Learn[2], Ozan Akkus[2], *[1]Carnegie Mellon University, United States, [2]Case Western Reserve University, United States*

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Paul Warren[1], Zachary Davis[1], Matthew Fisher[1], *[1]North Carolina State University and University of North Carolina - Chapel Hill, United States*

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Brendan Stoeckl[1], Hannah Zlotnick[1], Megan Farrell[1], Liane Miller[1], Josh Baxter[1], Thomas Schaer[1], Michael Hast[1], David Steinberg[1], Robert Mauck[1], *[1]University of Pennsylvania, United States*

Muscle and Tendon Derived Extracellular Matrix Promotes Expression of Myotendinous Junction Specific Integrins In Myoblast Cell Culture SB^{3}C2019-P287

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Posters - Cell & Tissue Engineering: Organs Morphogenesis and Development

Smooth Muscle Differentiation Actively Patterns The Airway Epithelium During Branching Morphogenesis SB^{3}C2019-P288

Katharine Goodwin[1], Andrej Kosmrlj[1], Celeste Nelson[1], *[1]Princeton University, United States*

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Sonya Kouthouridis[1], Julie Goepp[1], Carolina Martini[1], Elizabeth Matthes[1], John Hanrahan[1], Christopher Moraes[1], *[1]McGill University, Canada*

Ectopic Sources of Fibroblast Growth Factor 10 Drive Epithelial Buckling and Supernumerary Bud Formation In Cultured Embryonic Lungs. SB^{3}C2019-P290

Kara Peak[1], Victor Varner[1], *[1]The University of Texas at Dallas, United States*

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Brian Silver[1], Celeste Nelson[1], *[1]Princeton University, United States*

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Kameel Isaac[1], Neda Ghousifam[1], Sean Brocklehurst[1], Mark Van Dyke[2], Marissa Rylander[1], *[1]UT Austin, United States, [2]Virginia Polytechnic Institute and State University, United States*

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Shahensha Shaik[1], Elizabeth Martin[1], Daniel Hayes[2], Jeffrey Gimble[3], Ram Devireddy[1], *[1]Louisiana State University, United States, [2]Pennsylvania State University, United States, [3]LaCell LLC, United States*

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Johane Bracamonte[1], Sarah Saunders[1], Sam Cole[2], Gilbert Annohene[2], Gary Tepper[2], Joao Soares[2], *[1]Virginia Commowealth University, United States, [2]Virginia Commonwealth Universi, United States*

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Optimization of Topographical and Mechanical Properties of Peg-Da Based Hydrogels For Promoting Neurodegeneration SB^{3}C2019-P296

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Coupled Thermal and Ischemic Stress Injury to Soft Tissue

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Supraphysiological and Subzero Temperature Driven Kinetic Processes in Bioheat Transfer

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