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Designing of a Therapeutic Mechanical Horse
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CFD Simulation of Flow Mixing in the Vertobrobasilar System
Matthew D. Bockman, Akash P. Kansagra, Eric C. Wong, and Alison L. Marsden
Combined Rigid-Deformable Modeling of Lumbar Spine Mechanics

James S. Deacy, Milind Rao, Sean Smith, Anthony J. Petrella, Peter J. Laz, and Paul J. Rullkoetter

**STUDENT PAPER COMPETITION (MS LEVEL)**

**Biofluids, Biotransport, Design, Tissue Engineering and Cellular Biomechanics**

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Characterization of Common Carotid Artery Curvature and Its Impact on Velocity Profile Shape

Amir Manbachi, Yiemeng Hoi, and David A. Steinman

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Quasi-Linear Viscoelastic Theory is Insufficient to Comprehensively Describe the Time-Dependent Behavior of Human Cervical Spine Ligaments

Kevin L. Troyer and Christian M. Puttlitz

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Kristin S. Miller, Lena Edelstein, and Louis J. Soslowsky

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Microstructural Modeling of Fiber Kinematics and Biomechanics of the Human Facet Capsular Ligament During Subfailure Loading

Nathan D. Crosby, Kyle P. Quinn, and Beth A. Winkelstein

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Innocuous Intracellular Ice Formation in Adult Stem Cells in the Presence of Polyvinylpyrrolidone

Avishek Guha and Ram V. Devireddy

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Influence of Surrounding Tissues on Biomechanics of Aortic Wall: A Feasibility Study of Mechanical Homeostasis

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Noninvasive Assessment of Diastolic Intraventricular Pressure Gradients in a Large General Population (the Asklepios Study)

Benjamin Van Der Smissen, Tom E. Claessens, Ernst R. Rietzschel, Marc L. De Buyzere, Dirk De Bacquer, Thierry C. Gillebert, Peter Van Ransbeeck, Pascal Verdonck, and Patrick Segers

SBC2010-19408

In Vitro Assessment of Rat Heart Force Generation: A Quantitative Approach for Predicting Outcomes From Pluripotent Stem Cell-Derived Therapy for Myocardial Infarction

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Quantification of the Biomechanical Differences in Wild-Type and Heterozygous TGF Beta2 Knockout Mice

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Elasticity of the Lens Capsule as Measured by Osmotic Swelling

Tracy A. Powell, Rouzbeh Amini, Alina Oltean, Vincent A. Barnett, Kevin D. Dorfman, Yoav Segal, and Victor H. Barocas

The Effects of Angiotensin II Infusion on the Mechanical Response and Microstructural Organization of Mouse Aorta

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Solid Mechanics, Design and Rehabilitation Engineering

Investigation of Fiber Wear in a Woven Composite Using Atomic Force Microscopy

Michael Giordano and Steven Schmid

Synthesis and Characterization of Boundary Lubricant-Functionalized PVA Gels for Biotribological Applications

Michelle M. Blum and Timothy C. Ovaert

Experimental and Probabilistic Finite Element Analysis of Distal Femoral Fractures: A Comparison of Locking Plate Versus Intramedullary Nail Fixation

Christina Salas, Deana Mercer, Thomas A. DeCoster, and Mahmoud M. Reda Taha

Effect of Patellar Component Alignment in Total Knee Arthroplasty on Patellar Tracking During In Vitro Simulated Squat

Mark C. Komosa, Amit M. Mane, and Lorin P. Maletsky

A Pneumatic Artificial Muscle Articulated Knee Prosthesis

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Misinterpretation of the Functional Severity of Coronary Stenosis due to Variability in Arterial Wall Compliance

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Assessment of Bone Quality Associated With Loosely and Tightly Bound Water
  Qingwen Ni and Daniel P. Nicolella

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  Jonathan J. Eisner, Gal Zur, Farshid Guilak, Eran Linder-Ganz, and Avi Shterling

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Testing of the Prototype Low-Durometer Hybrid III Neck for Improved Biofidelity
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Effect of Annular Micro Tear on Lumbar Intervertebral Disc Biomechanics
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Biomechanical Analysis of Cervicothoracic Junction Osteotomy in Cadaveric Model of Ankylosing Spondylitis: Effect of Rod Material and Diameter
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Revision Strategies in Spinal Deformity With Hardware Failure: A Biomechanical Study
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Evaluating Relationship Between Passive Knee Envelope and a Dynamically Simulated Walk
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A Finite Element Analysis of the C2-C7 Sheep Spine
Nicole A. DeVries, Nicole A. Kallemeyn, Kiran H. Shivanna, and Nicole M. Grosland

Comparison of Biomechanics of Lumbar-Pelvis Segment With Posterior Screw-Rod Versus Interspinous Plate Fixation System
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Optimal Position for the Artificial Patella During Resurfacing to Decrease Stress and Avoid Pre-Prosthetic Patellar Fracture
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A Comparison of the Performance of Hexahedral and Tetrahedral Elements in Finite Element Models of the Foot
Srinivas C. Tadepalli, Ahmet Erdemir, and Peter R. Cavanagh

Effect of Implant Shape and Material Properties on Stresses in the Glenoid Components of Total Shoulder Arthroplasties: A Finite Element Analysis
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Flatfoot and Its Surgical Treatments: a Computational Model of Common Procedures
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Estimation of Pose and Medial/Lateral Contact Force Using Multi-Axial Load Measurements From an Instrumented Knee Implant
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Measurement of 3D Vertebral Body Position and Orientation Using Single Plane Fluoroscopy
Bryan P. Conrad and Scott A. Banks

Fatigue Behavior Of Stainless Steel, Titanium, and Cobalt Chromium Molybdenum Spinal Rods
Anthony Paris, Alex Bergeron, Matt Cullin, and Andres Munk
Investigation of Changes in Segmental Kinematics and Load Distribution on Components of Lumbosacral Fixation After Addition of Iliac Screw
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Treatment of Intervertebral Disc With Chondroitinase-ABC Results in Reversible Degeneration in Rat Tail Model

Effect of ACL Reconstruction Graft Material on Joint Force Loss During Cyclic Fatigue Testing Using a 6-DOF Motion
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Three-Dimensional Finite Volume Method of Triphasic Theory in Generalized Coordinates: Application to Human Intervertebral Disc During Compressive Stress Relaxation
Xiangying Chen, Wei Yong Gu, Chun-Yuh Huang, and Gecheng Zha

Determination of In Situ Articular Cartilage Pericellular Matrix Properties via Inverse BEM Analysis of Chondron Deformation
Eunjung Kim, Farshid Guilak, and Mansoor A. Haider

The Strain in the Medial Ulnar Collateral Ligament is Localized in Both the Anterior and Posterior Bands of the Anterior Bundle
Amin Mohaghegh Motlagh, Harold A. Cook, Sunghwan Kim, Laurel Kuxhaus, Mandy Brogdon, Patrick J. DeMeo, and Mark Carl Miller

Complete Solution Sets for Neuromuscular Models Reveal How Mechanical Constraints Limit Neural Control Options
Jason J. Kutch and Francisco J. Valero-Cuevas

Bi-Material Attachment Through a Soft Tissue Interfacial System
Y. X. Liu, S. Thomopoulos, V. Birman, J.-S. Li, and G. M. Genin

A Rat Model for Pressure Induced Deep Tissue Injury
Fang Lin, Mauli Modi, Briana Reprogle, Mike Bajema, Ziyang Wang, Gordon Kaskin, and Mohsen Maksous

A Novel Approach Towards Modeling the Collagen Fibril Network for Use in Nonlinear Anisotropic Polyconvex Mixture Models of Articular Cartilage
Reza Shirazi, Pasquale Vena, Robert L. Sah, and Stephen M. Klisch
The Effect of the Fascia on the Stress Distribution in Skeletal Muscle
Angelica Maria Ramirez, Begoña Calvo Calzada, and Jorge Grasa

STUDENT PAPER COMPETITION (PhD LEVEL)
Biofluids and Biotransport Engineering and Other
SBC2010-19030
Measurement of Pulmonary Impedance in Live Mice and Changes With Chronic Hypoxia
Diana M. Tabima, Rebecca Vanderpool, Timothy A. Hacker, and Naomi C. Chester

SBC2010-19107
Drug Eluting Stents: Modelling the Physics of Mass Transport in the Arterial Wall
W. Denny, B. O’Connell, J. Milroy, and M. Walsh

SBC2010-19135
Modelling Normal Pressure Hydrocephalus as a ‘Two-Hit’ Disease Using Multiple-Network Poroelastic Theory
Brett Tully and Yiannis Ventikos

SBC2010-19173
Thermally Reversible Hydrogel Sheets for Adult Stem Cell Culture
Sreedhar Thirumala and Ram V. Devireddy

SBC2010-19213
From Human Liver Vascular Corrosion Cast to Electrical Analog Model of the Hepatic Blood Flow
Charlotte Debbaut, Diethard Monbaliu, Christophe Casteleyn, Pieter Cornillie, Denis Van Loo, Bert Masschaele, Jacques Pirenne, Paul Simoens, Luc Van Hoorebeke, and Patrick Segers

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The Adaptive Response of Endothelial Transcription to Increased Shear Stress In Vitro
Ji Zhang and Morton H. Friedman

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Parametric Analysis of Eustachian Tube Function Using Fully Coupled Fluid-Structure Interaction Models
Francis J. Sheer and Samir N. Ghadiali

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Detection of Fatigue Microdamage in Whole Rat Femora Using Contrast-Enhanced Micro-Computed Tomography
Travis L. Turnbull and Ryan K. Roeder

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Mass Transfer of LDL Based on Wall Shear Stress From FSI Simulation in an Atherosclerotic Human Carotid Artery
Sungho Kim and Don P. Giddens

SBC2010-19664
Hemodynamic Metrics Correlate With Intracranial Aneurysm Rupture Status Better Than Morphologic Metrics
Jianping Xiang, Sabareesh K. Natarajan, Markus Tremmel, Ding Ma, J. Mocco, Adnan Siddiqui, Elad I. Levy, and Hui Meng
STUDENT PAPER COMPETITION (PhD LEVEL)
Solids, Design and Rehabilitation Engineering

SBC2010-19070 Biceps Tendon Changes Along Its Length and With Altered Loading in the Presence of Rotator Cuff Tears in a Rat Model
   Cathryn D. Peltz, Jason E. Hsu, David L. Glaser, and Louis J. Soslowsky

SBC2010-19112 Effects of Age and Speed on Peak Lower Extremity Joint Torques During Gait When Controlling Speed and Step Length
   Dennis E. Anderson and Michael L. Madigan

SBC2010-19215 Generalized Anisotropic Inverse Mechanics: Mechanical Anisotropy Correlates With Structural Anisotropy in Collagen Based Tissue Equivalents
   Ramesh Raghupathy, Spencer P. Lake, Edward A. Sander, and Victor H. Barocas

SBC2010-19232 Injury During Early Neonatal Development Leads to a Faster Repair Response When Compared to Later Injury in a Mouse Achilles Tendon
   H. L. Ansorge, J. E. Hsu, L. Edelstein, D. E. Birk, and L. J. Soslowsky

SBC2010-19436 Force Deposition in the Drosophila Jump Muscle
   Ryan A. Koppes, Douglas M. Swank, and David T. Corr

SBC2010-19454 Spatial Heterogeneity of Iris Elasticity Measured by Indentation
   Julie E. Whitcomb, Sara Jouzdani, and Victor H. Barocas

SBC2010-19463 Functional Endoluminal Paving (FELP): Thermoforming, Biodegradation, and Mechanical Properties of a Novel Polymer Graft for Abdominal Aortic Aneurysms

SBC2010-19466 The Dominant Mechanical Interaction Between the Brain and Skull In Vivo: Is Sliding Arrested at Key Points of Brain-Skull Tethering?
   Teresa M. Abney, Y. Aaron Feng, Robert Pless, Ruth J. Okamoto, Guy M. Genin, and Philip V. Bayly

SBC2010-19468 The Importance of Posterior Muscle Strength and Facet Contact in Preventing Lumbar Disc Herniation During Forward Bending

SBC2010-19541 Extracting Appropriate Mathematical Expressions Defining Moment Arm Relationships Using Symbolic Regression
   Manish U. Kurse, Michael Schmidt, Hod Lipson, and Francisco J. Valero-Cuevas
A New Scheme for Soft Tissue Artifact Compensation in Human Motion Analysis
Bo Gao, Scott Banks, and Nigel Zheng

Lumbar Degenerative Disc Disease Increases Deformations at Cephalad Adjacent Levels In Vivo
Shaobai Wang, Michal Kozanek, Kirkham B. Wood, and Guoan Li

Mechanical Properties of the Rat Brain: Effect of Age and Anatomical Region
Benjamin S. Elkin and Barclay Morrison, III

Computational Simulation of Articular Cartilage Wear in the Patellofemoral Joint During In Vitro Testing
Lingmin Li, Shantanu Patil, Nick Steklov, Won Bae, Michele Temple-Wong, Darryl D. D’Lima, Robert L. Sah, and Benjamin J. Fregly

Simulating Axonal Stretch During Traumatic Brain Injury Events
Jean-Pierre Dolié, Jeffrey Barminko, Rene Schloss, and Martin L. Yarmush

The Spatio-Temporal Structure of Force Variability in Static Grasp Suggests a Continually Active Neural Controller
Kornelius Racz, Josh M. Inouye, and Francisco J. Valero-Cuevas

Elastic Network Modeling of Actin Filaments
Tamara C. Bidone, Marco A. Deriu, Francesco Mastrangelo, Giacomo Di Benedetto, Monica Soncini, and Umberto Morbiducci

Morpho-Functional Interaction Between Muscle and Tendon in Hypertrophic MLC/MIGF-1 Mice
E. Rizzuto, A. Musarò, A. Catizone, and Z. Del Prete

Moduli and Stress Patterns Determined From Heterogeneous MRI-Based Strains
Kent D. Butz, Deva D. Chan, Eric A. Nauman, and Corey P. Neu

Three-Dimensional Simulation of In Vitro Angiogenesis: Effects of Extracellular Matrix Structure and Density
Lowell Taylor Edgar, James E. Guilkey, Clayton J. Underwood, Brenda Baggett, Urs Utzinger, and Jeffrey A. Weiss
Histology and Trabecular Architecture of the Brain for Modeling of Subarachnoid Space
Parisa Saboori and Ali Sadegh

Quasistatic and Dynamic Compressive Behavior of Gelatin
Jiwoon Kwon and Ghatu Subhash

Tensile and Compression Response of Agarose Gel at Various Strain Rates
Qunli Liu, Ghatu Subhash, and David Moore

Correlation of Biomechanics to Tissue Reaction in Aortic Aneurysm Assessed by Computational Finite Element Analysis and FDG-PET-CT
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