Thursday, June 23, 2005 | 7:30 AM – 9:00 AM | Session 1B

Workshop: MICRO- AND NANOSCALE MECHANICS OF CELLS

Centennial Ballrom ABC

Farshid Guilak
Duke University

Christopher Chen
University of Pennsylvania

Thursday, June 23, 2005 | 7:30 AM – 9:00 AM | Session 1C

Workshop: FUNDING OPPORTUNITIES FOR BIOENGINEERING

Centennial Ballrom D

Sohi Rastegar
National Science Foundation (NSF)

Peter Moy
NIH, National Institute of Biomedical Imaging and Bioengineering (NIBIB)

Thursday, June 23, 2005 | 7:30 AM – 9:00 AM | Session 1D

Workshop: WEB-BASED TEACHING RESOURCES FOR BIOMECHANICS AND BIOMEDICAL ENGINEERING

Centennial Ballrom EF

Jeffrey W. Holmes
Columbia University

James E. Moore Jr.
Texas A&M University

Thursday, June 23, 2005 | 9:15 AM - 10:45 AM | Session 2A

Podium Session:

CELL AND MOLECULAR ENGINEERING: BioMEMs

Cascade Ballroom

CHAIR: Ed Guo

CO-CHAIR: Phillip Leduc

9:15 A High Density Micromachined Electrode Array For Auditory Nerve Implants
Jian Wu, Ryan E. Hainley, William C. Tang
University of California, Irvine

9:30 Microfabricated Arrays Of Thermoelectric Coolers For Highly Localized Control Of Temperature In Biological Systems
Aparna Prabhakar, Elizabeth Podlaha-Murphy, Michale Murphy, Ram Devireddy
Louisiana State University

9:45 A Low Noise Full Customized 32-Channel CMOS Biopotential Sensor Chip For Extracellular Neural Signal Recording
Xin Zhang, James C. Daly, Yong Cao
University of Rhode Island

10:00 Simulation Of The Electrophoretic Process In A T-Cross Microchip
Marco Rasponi, Monica Soncini, Marina Cretich, Marcella Chiari, Franco M Montecuccchi, Alberto Redaelli
Politecnico di Milano

10:15 Magnetic Nanowires In Elastomeric Posts To Manipulate Cellular Forces
Nathan J Sniadecki, John L Tan, Alexandre Angelouch, Daniel H Reich, Christopher S Chen
University of Pennsylvania

10:30 A Microfluidic Wound Dressing And Wound Analysis Tool
Mario Cabodi, Karen L Havenstrite, Valerie Curtis, Suzanne Schwartz, Abraham D Stroock
Cornell University
### Thursday, June 23, 2005  
**Session 2B**

<table>
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<th>Time</th>
<th>Title</th>
<th>Presenters</th>
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<tbody>
<tr>
<td>9:15</td>
<td><strong>Mechanoregulation Of Cell Function</strong></td>
<td>Yang-Kao Wang, Rowena Mcbeath, Nathan J Sniadecki, John L Tan, Dana M Pirone, Christopher S Chen</td>
<td>University of Pennsylvania</td>
</tr>
<tr>
<td>9:30</td>
<td><strong>Effect Of In Vitro Mechanical Stimulation Of An Engineered Tendon Construct On The Repair Biomechanics And Tangent Stiffness</strong></td>
<td>Jason T Shearn, Natalia Juncosa, David L Butler, Greg P Boivin, Marc T Galloway, Wendy Goodwin, Cindi Gooch</td>
<td>University of Cincinnati</td>
</tr>
<tr>
<td>9:45</td>
<td><strong>Mechanical Regulation Of Bone Development And Regeneration</strong></td>
<td>Steve Goldstein</td>
<td>University of Michigan</td>
</tr>
<tr>
<td>10:00</td>
<td><strong>Bi-Axial Biomechanical Behavior Of Carotid Arteries In Culture In Response To Altered Axial Stretch</strong></td>
<td>Rudolph L Gleason, Emily Wilson, Jay D Humphrey</td>
<td>Texas A&amp;M University</td>
</tr>
<tr>
<td>10:15</td>
<td><strong>A Nonlinear Finite Element Model Of Cartilage Growth Under In Vitro Dynamic Compression</strong></td>
<td>Michael S Bingham, Andrew Davol, Robert L Sah, Stephen M Klisch</td>
<td>California Polytechnic State University</td>
</tr>
<tr>
<td>10:30</td>
<td><strong>Computational Modeling Of The Healing Process In Tendon</strong></td>
<td>Chaodi Li, Glen L Niebur</td>
<td>University of Notre Dame</td>
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### Thursday, June 23, 2005  
**Session 2C**

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<tr>
<th>Time</th>
<th>Title</th>
<th>Presenters</th>
<th>Institution</th>
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</thead>
<tbody>
<tr>
<td>9:15</td>
<td><strong>Modeling The Mechanics Of Native And Tissue-Engineered Heart Valve Leaflets</strong></td>
<td>Niels JB Driessen, Anita Mol, Carlijn VC Bouten, Frank PT Baaijens</td>
<td>Eindhoven University of Technology</td>
</tr>
<tr>
<td>9:30</td>
<td><strong>A Sharp-Interface Fluid-Structure Interaction Model For A Bioprosthetic Heart Valve</strong></td>
<td>Sarah C Vigmostad, Saikrishna V Marella, H S Udaykumar, Krishnan B Chandran</td>
<td>The University of Iowa</td>
</tr>
<tr>
<td>9:45</td>
<td><strong>Variations In Chordae Tendineae Force With Papillary Muscle Displacement: An In Vitro Study Of Ischemic Mitral Regurgitation</strong></td>
<td>Jorge Jimenez, Dennis Soerensen, Zhaoming He, Ajit Yoganathan</td>
<td>Georgia Institute of Technology</td>
</tr>
<tr>
<td>10:00</td>
<td><strong>On The Biaxial Mechanical Properties Of The Layers Of The Aortic Valve Leaflet</strong></td>
<td>John A Stella, Michael S Sacks, K B Chandran</td>
<td>University of Pittsburgh</td>
</tr>
<tr>
<td>10:15</td>
<td><strong>Functional Analysis Of Aortic Valve Prostheses: Mechanical Load Assessment Using MRI</strong></td>
<td>Marcel Rutten, Gustav Strijkers, Evelyne van Dam, Klaas Nicolay, Frans van de Vosse</td>
<td>Eindhoven University of Technology</td>
</tr>
<tr>
<td>10:30</td>
<td><strong>Micromechanical Modeling Of The Nonlinear Viscoelastic Behavior Of Mitral Valve Chordae</strong></td>
<td>Murat Surucu, Ivan Vesely</td>
<td>University of Southern California</td>
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<tr>
<td>Time</td>
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<tr>
<td>9:30</td>
<td>2D</td>
<td>MRI-Based Patient-Specific 3D Modeling For Human Right Ventricle - Potential Computer-Aided Cardiac Surgery Applications</td>
<td>Dalin Tang, Chun Yang, Idith Haber, Tal Geva, Pedro J del Nido</td>
</tr>
<tr>
<td>9:45</td>
<td>2D</td>
<td>Numerical Simulation Of Unsteady Flows In TCPC Anatomies On A Cartesian Mesh</td>
<td>Anvar Gilmanov, Chang Wang, Fotis Sotiropoulos, Ajit P Yoganathan</td>
</tr>
<tr>
<td>10:00</td>
<td>2D</td>
<td>Rapid In-Vitro MRV And PIV Measurements In Anatomically Accurate Human Thoracic Aorta Phantoms</td>
<td>Christopher J Elkins, Ananth S Iyengar, Mary T Draney, Michael D Dake, Francisco Medina, Ryan B Wicker</td>
</tr>
<tr>
<td>10:15</td>
<td>2D</td>
<td>Comparison Of Phase Contrast MRI And Particle Image Velocimetry Of The Total Cavopulmonary Extra-Cardiac Connection</td>
<td>Hiroumi Kitajima, Kartik Sundareswaran, Garrett W Astary, W James Parks, Shiva Sharma, Denver Sallee, Kirk R Kanter, Joseph M Forbess, John N Oshinski, Ajit P. Yoganathan</td>
</tr>
<tr>
<td>10:30</td>
<td>2E</td>
<td>Determination Of Shear Stress In Patient-Specific Models Of The Pulmonary Vasculature Through Numerical Simulation With Fluid-Structure Interaction</td>
<td>Kendall S Hunter, Craig J Lanning, Curt G DeGroff, D Dunbar Ivy, Robin Shandas</td>
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**Thursday, June 23, 2005**

**Session 2D**

**Podium**

**Session:** PATIENT-SPECIFIC CARDIOVASCULAR FLUID MECHANICS

**Centennial Ballroom EF**

**CHAIR:** David Steinman

**CO-CHAIR:** Ajit Yoganathan

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<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
<th>Affiliation</th>
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<tbody>
<tr>
<td>9:15</td>
<td>A Mathematical Analysis Of Oxygen, Nitric Oxide And VEGF Transport In The Microcirculation</td>
<td>James W Baish, Swetha Jaini, Dai Fukumara, Rakesh Jain</td>
<td>Bucknell University</td>
</tr>
<tr>
<td>9:30</td>
<td>Predicting Diffusion Coefficients Of Aqueous Trehalose Solutions Using Free Volume Theory</td>
<td>Xiaoming He, Alptekin Aksan, Mehmet Toner</td>
<td>Massachusetts General Hospital, Harvard Medical School</td>
</tr>
<tr>
<td>9:45</td>
<td>A Fluid-Mechanical Study For Solute Transport Across The Endothelial Surface Glycocalyx</td>
<td>Masako Sugihara-Seki, Takeshi Akinaga</td>
<td>Kansai University</td>
</tr>
<tr>
<td>10:00</td>
<td>A General Analytical Derivation Of The Pennes Bioheat Equation</td>
<td>Devashish Shrivastava, Tommy Vaughan</td>
<td>University of Minnesota</td>
</tr>
<tr>
<td>10:15</td>
<td>Coupled Oxygen Transport To The Avascular Wall Of A Pre- And Post- Angioplasty Coronary Artery Stenosis</td>
<td>Vinayak S Vaidya, Lloyd H Back, Rupak K Banerjee</td>
<td>University of Cincinnati</td>
</tr>
<tr>
<td>10:30</td>
<td>Effect Of Simultaneous Application Of Direct Perfusion And Dynamic Loading On The Transport Of Dextran Into Agarose Hydrogels</td>
<td>Nadeen O Chahine, Eric G Lima, Victoria I Wei, Clark T Hung, Gerard A Ateshian</td>
<td>Columbia University</td>
</tr>
</tbody>
</table>
### Thursday, June 23, 2005 9:15 AM - 10:45 AM  
**Session 2F**

**Podium**  
**Session:** COMPUTATIONAL SOFT TISSUE MECHANICS I  
**Room:** Rocky Mountain Ballroom CD

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<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
<th>Institution</th>
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<tbody>
<tr>
<td>9:15</td>
<td>Simulation Of Soft Tissue Failure With The Material Point Method</td>
<td>Irina M Ionescu, James Guilkey, Martin Berzins, Robert M Kirby, Jeffrey A Weiss</td>
<td>University of Utah</td>
</tr>
<tr>
<td>9:30</td>
<td>Finite Element Simulations Of Collagenous Tissues Using An Experimentally Derived Structural Constitutive Model</td>
<td>Ruijie Liu, Michael S Sacks, KB Chandran</td>
<td>University of Pittsburgh</td>
</tr>
<tr>
<td>10:00</td>
<td>Material Parameter Optimization For Three-Dimensional Rabbit Heart</td>
<td>Arun U Nair, David G Taggart, Frederick J Vetter</td>
<td>University of Rhode Island</td>
</tr>
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</table>

### Thursday, June 23, 2005 9:15 AM - 10:45 AM  
**Session 2G**

**Podium**  
**Session:** FORWARD DYNAMIC SIMULATION IN MOTION ANALYSIS  
**Room:** Creekside Room

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
<th>Institution</th>
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<tbody>
<tr>
<td>9:15</td>
<td>Muscle Mechanical Work And Elastic Energy Utilization During Walking And Running Near The Preferred Gait Transition Speed</td>
<td>Kotaro Sasaki, Richard R Neptune</td>
<td>The University of Texas at Austin</td>
</tr>
<tr>
<td>9:30</td>
<td>Simulation Of Hamstring Musculotendon Mechanics During The Swing Phase Of Sprinting</td>
<td>Darryl G Thelen, Elizabeth S Chumanov, Bryan C Heiderscheit</td>
<td>University of Wisconsin-Madison</td>
</tr>
<tr>
<td>9:45</td>
<td>Simulated Tests Of Constraint In Total Knee Replacement</td>
<td>Matthew F Moran, Safia Bhimji, Joseph Racanelli, Stephen J Piazza</td>
<td>Penn State University</td>
</tr>
<tr>
<td>10:00</td>
<td>Knee Ligament Injuries, From Prediction To Prevention</td>
<td>Antonie J. van den Bogert, Scott G. McLean, Xuemei Huang</td>
<td>Cleveland Clinic Foundation</td>
</tr>
<tr>
<td>10:15</td>
<td>Are Maximum Shortening Velocity And The Shape Parameter In A Hill-Type Equation Of Whole Muscle Related To Activation?</td>
<td>Matt J Camilleri, Maury L Hull</td>
<td>University of California, Davis</td>
</tr>
<tr>
<td>10:30</td>
<td>Simulation-Based Treatment Planning For Stiff-Knee Gait</td>
<td>Scott I Delp, May Q Liu, Allison S Arnold, Frank C. Anderson, Sylvia Ounpuu, Darryl G Thelen</td>
<td>Stanford University</td>
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### Thursday, June 23, 2005

**Session 2H**

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<th>Time</th>
<th>Title</th>
<th>Presenters</th>
<th>Institution</th>
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<tr>
<td>9:15 AM</td>
<td><strong>Locked And Unlocked Plating In Internal Fixation Of Bones</strong></td>
<td>Gaffar Gailani, Ali M. Sadegh, Saqib Rahman</td>
<td>The City College of The City University of New York</td>
</tr>
<tr>
<td>9:30 AM</td>
<td><strong>Osteosynthesis By A Semi-Helically Contoured Plate</strong></td>
<td>Ramakrishna Kotlanka, Sridhar Idapalapati, Sivashanker Sathiamoorthy, Khong koksun, Dhanjoo N Ghista</td>
<td>Nanyang Technological University</td>
</tr>
<tr>
<td>9:45 AM</td>
<td><strong>Effects Of Bone Mineral Density On Cementless Acetabular Cup Micromotion After Total Hip Arthroplasty</strong></td>
<td>Ivan Zivkovic, Farid Amirouche, Mark Gonzalez</td>
<td>University of Illinois at Chicago</td>
</tr>
<tr>
<td>10:00 AM</td>
<td><strong>Does Cement Mantle Thickness Affect The Load Transfer In The Resurfaced Femoral Head</strong></td>
<td>Ian A.J Radcliffe, Mark Taylor</td>
<td>University of Southampton</td>
</tr>
<tr>
<td>10:15 AM</td>
<td><strong>Simulating Muscle Strain Due To Hip Arthroplasty</strong></td>
<td>William L Buford, Jr., Michael J Grecula, Clark R Andersen, Jason P Norcross</td>
<td>University of Texas Medical Branch</td>
</tr>
<tr>
<td>10:30 AM</td>
<td><strong>Cement Mantle Fatigue Failure: In Silico Simulation With Experimental Validation</strong></td>
<td>Jonathan RT Jeffers, Martin Browne, Mark Taylor</td>
<td>University Of Southampton</td>
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### Thursday, June 23, 2005

**Session 3A**

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<th>Time</th>
<th>Title</th>
<th>Presenters</th>
<th>Institution</th>
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<tbody>
<tr>
<td>11:00 AM</td>
<td><strong>A Viscoelastic Model For Nucleus Deformation And Mechanics In Atomic Force Microscopy Indentation</strong></td>
<td>Ashkan Vaziri, Hyungsuk Lee, Roger D Kamm, Mohammad R Kaazempur-Mofrad</td>
<td>UC Berkeley</td>
</tr>
<tr>
<td>11:15 AM</td>
<td><strong>A Cell Rotation System For The Observation Of 3D Microstructure Of Cells</strong></td>
<td>Takeo Matsumoto, Hideki Tajima, Norikazu Ito, Kazuaki Nagayama, Masaaki Sato</td>
<td>Nagoya Inst Tech, Omohi College</td>
</tr>
<tr>
<td>11:30 AM</td>
<td><strong>Mechanics And Surface Morphology Of Biologically Relevant Soft Materials With Scanning Force Microscopy</strong></td>
<td>Chao-Min Cheng, Philip R LeDuc</td>
<td>Carnegie Mellon University</td>
</tr>
<tr>
<td>11:45 AM</td>
<td><strong>A Digital Image Based Method For Computational Tissue Fate Mapping During Early Avian Morphogenesis</strong></td>
<td>Evan A Zamir, Andras Czirok, Brenda J Rongish, Charles D Little</td>
<td>The University of Kansas Medical Center</td>
</tr>
<tr>
<td>12:00 AM</td>
<td><strong>Engineering Magnetic Nanoparticle-Based MRI Contrast Agents For Molecular Imaging</strong></td>
<td>Leslie E W LaConte, Nitin Nitin, Omar Zurkiya, Xiaoping Hu, Gang Bao</td>
<td>Georgia Institute of Technology</td>
</tr>
<tr>
<td>12:15 AM</td>
<td><strong>In Vivo Electric Field-Mediated Transport Of Plasmid DNA In Tumor Interstitium</strong></td>
<td>Joshua W Henshaw, David A Zaharoff, Brian J Mossop, Fan Yuan</td>
<td>Duke University</td>
</tr>
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</table>
## Thursday, June 23, 2005
### Session 3B

**Podium**

**Session:** MECHANICS OF GROWTH AND REMODELING IN NATIVE AND ENGINEERED TISSUES II

**Location:** Centennial Ballroom ABC

**Chair:** Frank Baijeens

**Co-Chair:** Michael Sacks

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<tr>
<th>Time</th>
<th>Title</th>
<th>Speaker(s)</th>
<th>Institution</th>
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</thead>
<tbody>
<tr>
<td>11:00</td>
<td>Biomechanics Of Cerebral Vasospasm And Its Resolution</td>
<td>Jay D Humphrey, Rudolf L Gleason, Laura E Niklason</td>
<td>Texas A&amp;M University</td>
</tr>
<tr>
<td>11:15</td>
<td>A Model For In-Vitro Time-Dependent Tissue Formation And Effective Stiffness In Engineered Heart Valve Tissues</td>
<td>Michael S Sacks, George C Engelmayr</td>
<td>University of Pittsburgh</td>
</tr>
<tr>
<td>11:30</td>
<td>Kinematics Framework Optimized For Deformation, Growth, And Remodeling In Vascular Organs</td>
<td>John C Criscione</td>
<td>Texas A&amp;M University</td>
</tr>
<tr>
<td>11:45</td>
<td>A Continuum Treatment Of Coupled Mass Transport And Mechanics In Growing Soft Biological Tissue</td>
<td>Harish Narayanan, Krishna Garikipati, Ellen M Arruda, Karl Grosh, Sarah Calve</td>
<td>University of Michigan</td>
</tr>
<tr>
<td>12:00</td>
<td>A Model Of Arterial Growth And Remodeling Based On Constrained Mixture Theory</td>
<td>Patrick W Alford, Larry A Taber</td>
<td>Washington University in St Louis</td>
</tr>
<tr>
<td>12:15</td>
<td>A Multi-Mechanism Constitutive Equation For Modeling Aneurysm Development Including: Collagen Recruitment, Elastin Failure, Collagen Degradation And Collagen Synthesis</td>
<td>Rachmadian Wulandana, Anne M. Robertson</td>
<td>University of Pittsburgh</td>
</tr>
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</table>

## Thursday, June 23, 2005
### Session 3C

**Podium**

**Session:** TISSUE ENGINEERING - BIOMATERIALS

**Location:** Centennial Ballroom D

**Chair:** Andres Garcia

**Co-Chair:** Robert Tranquillo

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<th>Time</th>
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<tbody>
<tr>
<td>11:00</td>
<td>Analysis And Design Of Novel Electrospun PEUU Scaffolds For Soft Tissue Engineering</td>
<td>Todd D Courtney, Michael S Sacks, John J Stankus, Jianjun Guan, William R Wagner</td>
<td>University of Pittsburgh</td>
</tr>
<tr>
<td>11:15</td>
<td>Determining Molecular Length Scales: Correlating Cell Spreading On Nano-Thin Gels And Films And Tissue Elasticity</td>
<td>Adam J Engler, Adam Eckhardt, Ludovic Richert, Catherine Picart, Dennis E Discher</td>
<td>University of Pennsylvania</td>
</tr>
<tr>
<td>11:30</td>
<td>Predictive Modeling Of Polypeptide Hydrogel Mechanical Properties For Cartilage Repair Using Artificial Neural Networks</td>
<td>Mansoor A Haider, Dana L Nettles, Kimberly Trabbic-Carlson, Ashutosh Chilkoti, Lori A Setton</td>
<td>North Carolina State University</td>
</tr>
<tr>
<td>11:45</td>
<td>Effect Of Fibrin Concentration On Cell-Induced Remodeling And Resulting Mechanical Properties Of Fibrin Gel</td>
<td>Paul S Robinson, Robert T Tranquillo</td>
<td>University of Minnesota</td>
</tr>
<tr>
<td>12:00</td>
<td>Cell Density And Extracellular Matrix (ECM) Microstructure Control Mechanical Behavior Of Engineered Tissue Constructs</td>
<td>Brett J Bell, Alaina M. Pizzo, Beverly Z. Waisner, Sherry L. Voytik-Harbin</td>
<td>Purdue University</td>
</tr>
<tr>
<td>12:15</td>
<td>Protein Forced Unfolding And Its Effects To The Finite Deformation Stress-Strain Behavior Of Biomacromolecular Membrane And Solids</td>
<td>Hang J Qi, Christine Ortiz, Mary C Boyce</td>
<td>University of Colorado</td>
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### Thursday, June 23, 2005  
11:00 AM - 12:30 PM  
Session 3D

<table>
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<tr>
<th>Time</th>
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</table>
| 11:00 | **Comparison Of Micron Size Respiratory Aerosol Deposition Using Branch-Averaged And Microdosimetry Estimates**  
       | P. Worth Longest, Samir Vinchurkar                                    | Virginia Commonwealth University                                      |
| 11:15 | **Inclined Centrifuge Microscope For Measuring Frictional Characteristics Of Red Blood Cells Moving On Glass Plate In Plasma**  
       | Toshiyuki Hayase, Hidekatsu Sugiyama, Takayuki Yamagata, Kosuke Inoue, Atsushi Shirai, Motohiro Takeda | Tohoku University                                  |
| 11:30 | **Three-Dimensional Numerical Analysis Of Plasma Flow Around A Neutrophil In A Microchannel**  
       | Atsushi Shirai, Sunao Masuda, Toshiyuki Hayase                          | Tohoku University                                  |
| 11:45 | **Detecting Microspheres In Venules For Automated Micro-Particle Image Velocimetry Via A Marked Point Process**  
       | Gang Dong, Scott T Acton, Edward R Damiano                            | University of Virginia                               |
| 12:00 | **Magnetic Nano-Particle Interactions In Magnetocarcinotherapy**       | Carl Kumaradas, Marwan Rihaoui, Robert H Kraus Jr., Bradford Wright     | Ryerson University                                |
| 12:15 | **Progress With The Study Of Retinal Hemodynamics In Normotensive And Hypertensive Patients**  
       | Nigel B Wood, Ioanna Exarchou, X Yun Xu, Paresh Mistry, Nicholas Witt, Simon A Thom, Alun D Hughes | Imperial College London                             |

### Thursday, June 23, 2005  
11:00 AM - 12:30 PM  
Session 3E

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<tr>
<th>Time</th>
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<th>Authors</th>
<th>Institution</th>
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</table>
| 11:00 | **Electromagnetic Simulations - Safety Of Active Implantable Devices During MRI Examinations**  
       | Philippe Buechler, Anne Simon, Juergen Burger, Sigbijn Olsen         | University of Bern                                                  |
| 11:15 | **Fluid Mixing In A Planar Sepentine Channel**  
       | Lin Kuo Wei, Yang Jing Tang                                        | National Tsing Hua University                                      |
| 11:30 | **Influence Of Repetition Frequency On Selective Retinal Photocoagulation For Macular Diseases**  
       | Pradeep Gopalakrishnan, Michael J Kazmierczak, Rupak K Banerjee     | University of Cincinnati                                      |
| 11:45 | **Evaluation Of Pharmacokinetics And Retinal Permeability For Ganciclovir In A Rabbit And Human Eye**  
       | Juyoung Park, James J Augsburger, Ronald W Millard, Rupak K Banerjee | University of Cincinnati                                      |
| 12:00 | **Application Of Diffusion Tensor MRI In Finite Element Models Of Interstitial Transport In Spinal Cord White Matter**  
       | Malisa Sarthinoranont, Xiaoming Chen, Paul F Morrison, Russell R Lonser, Thomas H Mareci | University of Florida                                  |
| 12:15 | **Modelling The Concentration Polarisation Of Hyaluronan On The Surface Of The Synovial Lining Of Infused Joints**  
       | Yi Ling Lu, John Rodney Levick, Wen Wang                             | Queen Mary, University of London                           |
Thursday, June 23, 2005 | 11:00 AM - 12:30 PM | Session 3F

Podium | COMPUTATIONAL SOFT TISSUE MECHANICS II | Rocky Mountain Ballroom CD

Session:
CHAIR: Lorin Maletsky | CO-CHAIR: Richard Debski

11:00 | Simulation Of Flow- Extracellular Matrix Interaction Using A Poroelastic Model | Zhi-Yong Li | University of Cambridge
11:15 | Unloading Is Essential For Growth-Plate Development | Rene CC van Donkelaar, Machiel Resink, Julienne E.M. Brouwers, Rik Huiskes | Eindhoven University of Technology
11:30 | Reduced Parameter Model For Nonlinear Anisotropic Viscoelasticity Using Fiber Level QLV | Jeffrey E Bischoff | University of South Carolina
11:45 | Contribution Of the Extracellular Matrix To The Viscoelastic Behavior Of The Urinary Bladder | Jiro Nagatomi, Michael B Chancellor, Michael S Sacks | University of Pittsburgh

12:00 | Finite Element Modeling Of Human Buttock-Thigh Tissue In A Seated Posture | Qunli Sun, Fang Lin, Sam Al-Saeede, Lissette Ruberte, Ellis Nam, Ronald Hendrix, Mohsen Makhsous | Northwestern University
12:15 | A Finite Element Model For The Micro-Indentation Of A Hydrogel Contact Lens | Xiaoming Chen, Alison C. Rennie, W. G. Sawyer, Malisa Sarntinoranont | University of Florida

Thursday, June 23, 2005 | 11:00 AM - 12:30 PM | Session 3G

Podium | MOTION MEASUREMENT IN REHABILITATION | Creekside Room

Session:
CHAIR: Beth Todd | CO-CHAIR: Manish Paliwal

11:00 | Frequency And Extent Of Spontaneous Motion To Relief Tissue Loads In Normal Individuals Seated In A Wheelchair | Eran L Linder-Ganz, Mickey Scheinowitz, Ziva Yizhar, Susan S Margulies, Amit Gefen | Tel Aviv University
11:15 | Reaching Kinematics During Functional Movement In Individuals With Acquired Brain Injury | Taka Nakamura, Neil Huddleston, William L Buford, Beatriz C Abreu, Rita M Patterson | University of Texas Medical Branch
11:30 | Quantitative Assessment Of Upper Extremity Stroke Rehabilitation Following Distal Extremity Botulinum Toxin A Injection | Brooke A Hingtgen, John R McGuire, Mei Wang, Gerald F Harris | Marquette University
11:45 | Fatigue During Gait Among End Stage Osteoarthritis Patients | Danielle Biton, Peter M Quesada, Claudia A Angeli, John Nyland, Robert V Topp, Ann M Swank | University of Louisville

12:00 | Comparative Posture Analysis Of A Reverse Propulsion Technique In Manual Wheelchairs | Diana M Rincon, Manuel Rodriguez, Shusheng Ye, Salim Nasser | Florida International University
12:15 | Differences In Onset Activation Times Between Rotator Cuff, Deltoid And Pectoralis Major Muscles During Goal Directed Movement | J Erik Giphart, Michael R. Torry, Kevin B Shelburne, Takashi Yanagawa, Richard J Hawkins | Steadman-Hawkins Research Foundation
Thursday, June 23, 2005 | 11:00 AM - 12:30 PM | Session 3H

Podium Session: IMPLANT BIOMECHANICS II - KNEE IMPLANTS Gore Range Exhibit Hall

CHAIR: Scott Hazelwood CO-CHAIR: Raghu Natarajan

11:00 Influence Of The Load And Kinematic On The Wear Performances Of A Knee Prosthesis In The Short Period: Experimental Procedure And Preliminary Results
Tomaso Villa, Virginio Quaglini, Manuela Galli, Gabriele Dubini Politecnico di Milano

11:15 Remodelling Response Of An Implant Interface To In Vivo Stimuli
Philippe Buechler, Jorg Krebs, Nikolaus Aebli, Sigbjorn Olsen University of Bern

11:30 The Effects Of Patellar Misalignment On Patello-Femoral Kinematics For Fixed And Mobile Bearing Knees
Amit M Mane, Chadd W Clary, Lorin P Maletsky University of Kansas

11:45 Influence Of The Composition Of Applied Load And The Modeling Of The Interfaces On The Stresses In A Model Of A Proximal Tibia-Total Knee Implant Construct
Partha Kopparti, Gladius Lewis Department of Mechanical Engineering

12:00 Effects Of Frictional Sliding On Stress Transfer For A Long-Stemmed Tibial Implant
Irina M Ionescu, Binu Oommen, Alexandra Schonning, Ted A Conway, David W Nicholson University of Utah

12:15 Ultrasonic Measurement Of Mechanical Properties Of PMMA Bone Cement During Cure For Modelling Of Residual Stresses
Adam Briscoe, Nader Saffari, Andrew New, Martin Browne University of Southampton

Thursday, June 23, 2005 | 7:30 - 9:00 PM | Session 5

Poster Session: B.S./M.S. STUDENT POSTER COMPETITION Rocky Mountain Garden

I-1 Design And Development Of An Arcing Lift System That Allows A Wheelchair User To Access His Home From His Garage Independently
Sonja K. Mikolajczyk, Heather Honeycutt, Justin Durbin, Wesley Cribbs The University of Toledo

I-2 Novel Early Response Genes In MC3T3-E1 Pre-Osteoblasts Exposed To Oscillatory Fluid Flow
Giridhar M Shivaram, Chi Hyun Kim, Nikhil Batra, Christopher R Jacobs Stanford University

I-3 Trunk Co-Contraction Recruitment And Spinal Load During Isometric Pushing And Pulling Tasks
Patrick J Lee, Kevin P Granata, Tim C Franklin Virginia Tech

I-4 Why Does An Intervertebral Disc Herniate In A Period Of Life In Which Tissue Stresses Are Decreasing?
Silvia Wongum, Jacques M Huyghe, Raoul Van Loon, Rene CC Van Donkelaar, Frank PT Baaijens Eindhoven University of Technology

I-5 Inhomogeneity Of Tissue Strain Distributions In Normal And Osteoporotic Individual Trabeculae: Mathematical Model Studies
Idit Diamant, Sigal Portnoy, Amit Gefen Tel Aviv University
I-6  Residual Salbutamol Levels Dominate Jet Nebulizer Performance
    Ben A Filas, Corinne S Lengsfeld
    University of Denver, Department of Engineering

I-7  Heterogeneity Of Haversian Cortical Bone
    Thierry Hoc, Laurent Henry, Marc Verdier, Alain Meunier
    Ecole Centrale Paris

I-8  Defferentiation Of Vascular Diseases By Pulse Wave Propagation Analysis: Fluid-Solid Interaction Study
    Tomohiro Fukui, Shigeo Wada, Ken-ichi Tsubota, Takami Yamaguchi
    Tohoku University

I-10 Simulation Of A Synthetic Nervous System - Development Of A Bioengineered, Touch-Sensitive, Glove Prosthetic
    Robbie R Gosine
    Florida Atlantic University

I-11 Mechanism And Mathematical Model For Producing Closed Head Diffuse Brain Injury In The Rat
    Benjamin M Ellingson, Ronald J Fijalkowski, Frank A Pintar, Narayan Yoganandan, Thomas A Gennarelli
    Medical College of Wisconsin

I-12 Modeling Initial Contact Dynamics During Ambulation With Mathematical Dynamic Modeling (MADYMO) Software
    Andrew R Meyer, Peter A Smith, Gerald F Harris
    Marquette University

I-13 Biophysical Modeling To Extract Tissue Properties From Fluorescence Spectra
    Kimberly M Hsu, Molly A Brewer, Urs Utzinger, Rebekah A Drezek
    Rice University

I-14 Direct Measurements Of Human Trabecular Meshwork Cell Stiffness
    Taras Juzkiw, Darren W H Chan, Weijia Dai, C. Ross Ethier
    University of Toronto

I-15 Effects Of Fibrinolytic Inhibitors On The Chondrogenesis Of Bone Marrow Mesenchymal Stem Cells In Fibrin Gels
    Melissa A Deitzer, Chun Yuh C Huang, Herman S Cheung
    University of Miami

I-16 The Influence Of Age On The Tensile Properties Of The Porcine Collateral Knee Ligaments
    Majid Minary Jolandan, J.A.W. van Dommelen, Johan Ivarsson, Kurosh Darvish, Jeff R Crandall
    University of Virginia

I-17 Lumbar Extensor Fatigue Affects Postural Control By Increasing Ankle Stiffness
    Bradley S Davidson, Michael L Madigan, Maury A Nussbaum
    Virginia Tech

I-18 Reconstruction Of Ductular Structure By Rat Biliary Epithelial Cells
    Wataru Hashimoto, Hiroshi Kohara, Ryo Sudo, Toshihiro Mitaka, Mariko Ikeda, Kazuo Tanishita
    Keio University

I-19 Neural Activity And Local Cerebral Blood Flow In Primary Auditory Cortex
    Hiroshi Kameyama, Tetsuro Ohmura, Kazuto Masamoto, Kazuo Tanishita, Naosada Takizawa, Hirosuke Kobayashi, Takushige Katsura, Atsushi Maki, Hideko Kawaguchi
    Keio University

I-20 Shear Dependence Of Adhesive Force Of Artificial Platelet Measured By Atomic Force Microscopy
    Ami Ogata, Hideki Fujita, Kenichi Suzuki, Shinji Takeoka, Yasuo Ikeda, Kazuo Tanishita
    Keio University

I-21 Towards A New Geometric Approach To Assess The Risk Of Rupture Of Abdominal Aortic Aneurysms Using Patient Specific Modelling
    Ralph D Nyilas, Stephanie M.L Ng, James Leung, Xiao Y Xu
    Imperial College of Science Technology and Medicine

I-22 Computational Modeling Of Actin Networks
I-23  Comparison Of Hemodynamic Parameters Across Species In Normal And Aneurysmal Abdominal Aortas Using Magnetic Resonance Imaging And Computational Fluid Dynamics
Andrea S Les, Joan M Greve, Mary K O’Connell, Nathan M Wilson, Irene E Vignon, Eiketsu Sho, Ronald L Dalman, Charles A Taylor  Stanford University

I-24  One-Dimensional And Three-Dimensional Finite Element Simulations Of Blood Flow For Spinal Cord Injury Patients
Hyun Jin Kim, Irene E Vignon, Janice J Yeung, Ronald L Dalman, Charles A Taylor  Stanford University

I-25  Phase Contrast MRI Measurements And CFD Analysis Of Hemodynamics In The Aorta
Suguru Yokosawa, Shigeo Wada, Masanori Nakamura, Ken-ichi Tsubota, Takami Yamaguchi, Haruo Isoda  Tohoku University

I-26  Cross-Sectional And Whole Bone Structural Properties Of Bear Femurs Are Not Compromised By Annual Periods Of Disuse
Meghan E McGee, Hal L Black, Janene Auger, Seth W Donahue  Michigan Technological University

I-27  Computer Simulation Of Formation Of Primary Thrombus Due To Platelet Aggregation Using Particle Method
Hiroki Kamada, Ken-ichi Tsubota, Shigeo Wada, Takami Yamaguchi  Tohoku University

I-28  Load Vs. Displacement Control Testing Protocols For Evaluating Artificial Disc Mechanics
Sri Vishnubhotla, Aaron J Matyas, Ian Cowgill, Vijay K Goel, Koichi Sairoyo, Ashok Biyani  The University of Toledo

I-29  Compensatory Strategies In Response To Decreased Muscle Strength During Normal Walking
Evan J Goldberg, Richard R Neptune  The University of Texas at Austin

I-30  Theoretical And Practical Issues In The Design Of SMA-Actuated Hand Orthoses
Stefano Viscuso, Matteo Torri, Simone Pittaccio, Stefano Besseghini  Politecnico di Milano

I-31  Complement And Vascular Stiffness In A Murine Model Of Cardiovascular Disease In Systemic Lupus Erythematosus
Sarah J Calano, Linda C Santelices, Joseph M Ahearn  University of Pittsburgh

I-32  Stresses To The Head During Vehicle Collisions In Which Air Bags Are Deployed
Joshua S Baurichter, Beth A Todd  University of Alabama

I-33  A 3-D Dynamic Model Of The Knee Joint Capable Of Controlling Quadriceps Forces Based On Predicted Retropatellar Stresses
Jyothi B Rayaprolu, Trent M Guess  University of Missouri-Kansas City

I-34  Effect Of Whole Body Vibration On Reposition Sense And Dynamic Low Back Stability
Lu Li, Sara E Wilson  University of Kansas

I-35  Annular Phased-Array High Intensity Focused Ultrasound Device For Image-Guided Therapy
Robert T Held, Vesna Zderic, Thuc Nghi Nguyen, Shahram Vaezy  University of Washington

I-36  The Time Course Of Shear Stress Induced Changes In Bone Protein And Transcription Factor mRNA Levels In Osteocyte-Like MLO-Y4 Cells
Lindsay M Godin, Laura R McCabe, Chung-Jui Tsai, Seth W Donahue  Michigan Technological University

I-37  Soft Tissue Elasticity Estimation With Optical Coherence Elastography
Ahmad S Khalil, Raymond C Chan, Brett E Bouma, Mohammad R Kaazempur-Mofrad  Massachusetts Institute of Technology
I-38  Computer Simulation Of Venous Occlusion Induced By Pacing Leads  
    Alex C Pang, Anne M Dubin, Jeffrey A Feinstein, Nathan Wilson, Charles A Taylor  
    Stanford University

I-39  Accuracy Of Tekscan Pressure Sensor Calibration Routines  
    Jill M Brimacombe, Carolyn Anglin, Antony J Hodgson, David R Wilson  
    University of British Columbia

I-40  Finite Element Analysis Of Fixation Plates For Mandibular Fracture Reduction  
    Scott T Lovald, Jon Wagner, Tariq Khraishi, James Kelly, John Wood, Bret Baack  
    University of New Mexico

I-41  Stress Characteristics Of An Ultra-High Molecular Weight Polyethylene Insert In The Acetabular Cup Of A Total Hip Replacement During Normal Gait  
    Matthew R Dimon, Beth A Todd  
    University of Alabama

I-42  Repeatability Study Of The Zetos Ex-Vivo Bone Loading System Using Metallic And Polymeric Specimens  
    Sylvana Garcia, Heidi Ploeg, Everett L Smith  
    University of Wisconsin - Madison

I-43  Nano-Particle Transport And Deposition In Human Tracheobronchial Bifurcating Airways  
    Kellie I. McConnell, Sinjae Hyun  
    Mercer University

I-44  Enhancement Of Cryoinjury To Prostate Tumors By Targeted Delivery Of TNF-alpha Bound Gold Nanoparticles  
    Raghav Goel, Hui Yao, David Swanlund, Emad Ebbini, John Bischof  
    University of Minnesota

I-45  Sensitivity Analysis Of Arrhenius Parameters For Denaturation Of Collagen  
    Patrick L Harrington, Neil T Wright  
    Michigan State University

I-46  Wavelet-Based Characterization Of Small-Scale Turbulent Structures In A Mechanical Heart Valve Flow  
    Vishal Patel, Lakshmi P Dasi, Helene Simon, Ajit P Yoganathan  
    Georgia Institute of Technology

I-47  Methods For Imaging And Quantifying Stent Deformation In The Superficial Femoral Artery  
    Bonita Song, Robert Bennett, Nathan Wilson, Jeffrey W Simons, Donald A Shockey, Charles A Taylor, Rebecca Fahrig  
    Stanford University

I-48  Computational Fluid Particle Dynamics Modeling And Simulation In Tracheobronchial Airways  
    Christopher A. Basciano, Adam A. Land, Emil H. Pham, Sinjae Hyun  
    Mercer University

I-49  Three-Dimensional Reconstruction Of Trabecular Bone Tissue  
    Mindy I Ezra, Michael D Roberts, Richard T Hart  
    Tulane University

I-50  Routine Phase Contrast And Angiographic Magnetic Resonance Imaging For Simulation And Validation Of Blood Flow In The Pediatric Proximal Pulmonary Arteries  
    Craig J Lanning, Kendall S Hunter, Ruchira Garg, Robin Shandas  
    The Children's Hospital

I-51  Development Of Surgical Guidelines For Tibial Stem Components In Revision Total Knee Arthroplasty  
    Jill E Schmidt, Adam Henderson, Heidi Ploeg, Kevin J Deluzio, Michael J Dunbar  
    University of Wisconsin-Madison
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<th>Session</th>
<th>Title</th>
<th>Authors</th>
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<td>I-52</td>
<td>Extracting Young's Modulus Of The Pulmonary Arteries From Color M-Mode Tissue Doppler Data Of Pediatric Patients With Pulmonary Hypertension</td>
<td>Po-Feng Lee, Craig Lanning, Andrew Slifka, Elizabeth S Drexler, D Dunbar Ivy, Robin Shandas</td>
<td>University of Colorado</td>
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<td>I-53</td>
<td>Changes In The Mechanical Properties Of The Rat Urinary Bladder Following Long-Term Spinal Cord Injury</td>
<td>Kevin K Toosi, Jiro Nagatomil, Michael B Chancellor, Michael S Sacks</td>
<td>University of Pittsburgh</td>
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<td>I-54</td>
<td>Comparison Of Pz, Fz And Cz Event Related Potentials For The Early Diagnosis Of Alzheimer's Disease</td>
<td>Nicholas Stepenosky, Apostolos Topalis, Jennifer Frymiare, John Kounios, Christopher Clark, Robi Polikar</td>
<td>Rowan University</td>
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<td>I-55</td>
<td>Site-Specific Porosity And Its Impact On Load-Induced Fluid Movement In Cortical Bone</td>
<td>Hansjoerg W Sidler, Roland Steck, Melissa L Knothe Tate</td>
<td>Case Western Reserve University</td>
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<td>I-56</td>
<td>Manufacturing Patient-Specific Aortic Dissection Flow Phantoms With Compliant Flaps</td>
<td>Ivan Acosta, Manny Gonzales, Francisco Medina, Ananth S Ilyengar, Christopher J Elkins, Ryan B Wicker</td>
<td>University of Texas at El Paso</td>
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<td>I-57</td>
<td>Ligaments Subjected To Cyclic Fatigue Fail Sooner And Strain More Than Those Subjected To Static Creep At High Stress</td>
<td>Timothy D Schwab, Gail M Thornton, Thomas R Oxland</td>
<td>University of British Columbia</td>
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<td>I-58</td>
<td>Determination Of Baseline Loading Levels And Dependent Variables For Use In An Intervertebral Disc Organ Culture System</td>
<td>Casey L Korecki, Jeffrey J MacLean, James C Iatridis</td>
<td>University of Vermont</td>
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<td>I-59</td>
<td>Estimation Of Shoulder Muscle Forces During Abduction And Flexion Using A Musculoskeletal Model</td>
<td>Cheryl J Goodwin, Takashi Yanagawa, Kevin B Shelburne, Richard J Hawkins, Michael R Torry, Mark Frankle, Marcus G Pandy</td>
<td>University of Texas at Austin</td>
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<td>I-60</td>
<td>Spinal Cord Deformation During Burst Fractures Of The Cervical Spine In The Presence Of Physiologic Preload</td>
<td>Amy Saari, Philip Morley, Peter A Cripton</td>
<td>University of British Columbia</td>
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<td>I-61</td>
<td>The Experimental Evaluation Of Ventilation Waveforms Towards The Treatment Of Acute Respiratory Distress Syndrome</td>
<td>Jerina E Pillert, Donald P Gaver</td>
<td>Tulane University</td>
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<td>I-62</td>
<td>How Does Normal Flexion Patellofemoral Contact Area Change Before And After Deep Knee Flexion?</td>
<td>Mariana E Kersh, Heidi L Ploeg</td>
<td>University of Wisconsin - Madison</td>
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<td>I-63</td>
<td>Regional Differences In Modeling And Remodeling Parameters In Skeletally Mature Rabbits</td>
<td>Nicole L Hedgecock, Scott J Hazelwood, Andrew A Chen, Bruce Martin</td>
<td>UC Davis Medical Center</td>
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<td>I-64</td>
<td>The Human Spinal Cord: Preliminary Results For An Improved Physical Model</td>
<td>Shannon G Reed, Lynne E Bilston, Philip L Morley, Peter A Cripton</td>
<td>University Of British Columbia</td>
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<td>I-65</td>
<td>Mechanobiological Regulation Of Molecular Expression And Tissue Differentiation During Bone Healing</td>
<td>Kristy T Salisbury, Thomas A Einhorn, Louis C Gerstenfeld, Elise F Morgan</td>
<td>Boston University</td>
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<tr>
<td>I-66</td>
<td>The Effects Of Osmotic Loading On Bovine Chondrocyte And BMSC Cell Shape Change And Intracellular Calcium Response</td>
<td>Elizabeth S Oswald, Pen-hsiu Grace Chao, Clark T Hung</td>
<td>Columbia University</td>
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Eric J Anderson, Malcolm N Cooke, Joshua Savrin, David Dean, Melissa L Knothe Tate
Case Western Reserve University

I-69 Syringomyelia Hydrodynamics: An In Vitro Study Based On In Vivo Measurements
Bryn A Martin, Wojtek Kalata, Francis Loth, Thomas J Royston, John N Oshinski
University of Illinois at Chicago

I-70 Measurement Of The Anisotropic Material Properties Of Cortical Bone Using Asymmetric Indentation
Guillermo A Vedani, Jing Lu, Jeffrey E Bischoff
University of South Carolina

I-71 Anomalous Strain Rate Softening Behavior Of Soft Tissue As Predicted By Quasi-Linear Viscoelasticity
Julie M Giles, Amanda E Black, Jeffrey E Bischoff
University of South Carolina

I-72 Effect Of Heat Transfer On The Efficacy Of Hypothermic Cold Storage Methods
Bharath K Arunachalam, Ronald W Millard, Horacio R Rilo, Rupak K Banerjee
University of Cincinnati

I-73 Validation Of An MRI-Based Method For In Vivo Joint Contact Mechanics Analyses
Bhaskar R Thoomukuntla, Ravi R Pillai, Terence E McIlff, Mehmet Bilgen, Gerard A Ateshian, Kenneth J Fischer
University of Kansas - Mechanical Engineering

I-74 Heterogeneous Strain Fields And Focal Adhesion Stresses In A 3-D Continuum Elastic Model Of Sheared Endothelial Cells
Michael C Ferko, Brian W Patterson, Peter J Butler
The Pennsylvania State University

I-75 Changes In The Depth-Dependent Mechanical Inhomogeneity Of Human Articular Cartilage With Stiffness
Siddharth R Nileshwar, Carol Muehleman, Markus A Wimmer
Rush University Medical Center

I-76 Mechanical Regulation Of The Chondrogenic Properties Of Periostea
Dannielle L Solomon, Inchan Youn, Jun-Kyo F Suh
Tulane University

I-77 The Presence Of Cellular And Subcellular Structures Dominate Permeability Predictions In The Lacunocanalicular (Pericellular) System Of Bone
Steven M Kreuzer, Eric J Anderson, Melissa L Knothe Tate
Case Western Reserve University

I-78 Seeding Of Human Mesenchymal Stem Cells Onto Poly-L-Lactic Acid (PLLA) Scaffolds In A Flow Perfusion Microfluidic Chamber
Ariel Hanson, Glenn Walker, Ruwan Sumansinghe, Michelle Wall, Elizabeth Lobo
NC State and UNC-Chapel Hill

I-79 Fluid-Structure Interaction In The Aortic Valve: A Tool For Surgical Recontruction
Adrian Ranga, Olivier Bouchot, Raymond Cartier, Rosaire Mongrain
McGill University

I-80 Sensitivity Of B-Spline Surface Fitting Of A Verterbral Endplate Using Least Squares
Yifei Dai, Glen L Niebur
University of Notre Dame

I-81 An In Vitro Model Of The Cerebrospinal Outflow Pathway Through The Arachnoid Granulations
David W Holman, Deborah M Grzybowski, Steven E Katz, Martin Lubow
The Ohio State University
I-82 An Intensity-Based 3D Reconstruction Protocol For Cardiovascular Structures
Daniel H Goldman, Stephanie Y Lum, Christine M Scotti, Ender A Finol, Elena S Di Martino Carnegie Mellon University

I-83 A Low Noise Full Customized 32-Channel CMOS Biopotential Sensor Chip For Extracellular Neural Signal Recording
Xin Zhang, James C. Daly, Yong Cao University of Rhode Island

I-84 Simulation Of Neural Motor Control Of Lumbar Spine Using Multiagent Systems And Reinforcement Learning Method
Vahid Golkhou, Mohamad Parnianpour, Caro Lucas Sharif University of Technology

I-85 Development Of A 2-D Dynamic Modeling Of The Human Knee Joint To Evaluate The Effects Of Velocity Of Movement On Muscle Recruitment And Joint Reaction Forces
Fateme Malekipour, Mohammad Parnianpour, Farzam Farahmand, Hooshang Hemami Sharif University of Technology

I-86 Assessment Of Head Injury In A Low-Floor Citybus In Frontal Crash
Elham Sahraei Esfahani, Kurosh Darvish, Mohamad Parnianpour Sharif University of Technology

I-87 Reliability Test Of A Knee Arthrometer
Damoon Soudbakhsh, Mohammad Parnianpour, Reza Shirazi, Farzam Farahmand, Javad khamsei, Mohamad Naghi Tahmasebi Sharif University of Technology

I-88 Property Matching For In Vitro Cardiovascular Models Using A Diethyl Phthalate/ Ethanol Solution
Paul R Miller, Kurt Danielson, Jean R Hertzberg University of Colorado

I-89 Bioreactor For Application Of Biaxial Mechanical Stimulation To Tissue Engineering Constructs
Karin A Wartella, Jennifer S Wayne Virginia Commonwealth University

Hossein Mokhtarzadeh, Mohammad Parnianpour, Farzam Farahmand, Aboulfazl Shirazi-Adl, Navid Arjmand Sharif University of Technology

I-91 Probabilistic Finite Element Modeling Of TKR Wear
Saikat Pal, Peter J Laz, Lucy A Knight, John C Coleman, Danny L Levine, Mark Taylor, Paul J Rullkoetter University of Denver
### Session 7A: CELL AND MOLECULAR ENGINEERING II

**Cascade Ballroom**

**Chair:** Ed Guo  
**Co-Chair:** Clark Hung

#### 1:45 AM

**AFM Indentation Of Cell Membranes With Probing Of Adhesive Interactions: Experiment And Model**  
Shamik Sen, Shyamsundar Subramanian, Dennis Discher  
*University of Pennsylvania*

#### 2:00 AM

**Small Molecule Stimulators Of Angiogenesis For Bone Tissue Engineering**  
Kristen A Wieghaus, Scott M Capitosti, Milton L Brown, Edward A Botchwey  
*University of Virginia*

#### 2:15 AM

**Integrin Mediated Mechanotransduction In IL-1 Stimulated Bovine Chondrocytes Cultured In Agarose Constructs**  
Tina T Chowdhury  
*Queen Mary, University of London*

#### 2:30 AM

**Influence Of Serum On Adult And Fetal Dermal Fibroblast Migration, Adhesion, And Collagen Expression**  
Hallie E Brink, Simone S Stalling, Steven B Nicoll  
*University of Pennsylvania*

#### 2:45 AM

**Effects Of Constant And Pulsed Direct Current Electric Fields On ACL Fibroblast Migration And Gene Expression**  
Pen-hsiu Grace Chao, Clark T Hung  
*Columbia University*

#### 3:00 AM

**Dynamic Compression Counteracts IL-1-Induced iNOS And COX-2 Activity By Human Chondrocytes Cultured In Agarose Constructs**  
Tina T Chowdhury  
*Queen Mary, University of London*

### Session 7B: TISSUE ENGINEERING - BIOREACTORS

**Centennial Ballroom ABC**

**Chair:** Jiro Nagatomi  
**Co-Chair:** Robert Guldberg

#### 1:45 AM

**Flow And Nutrient Transport In A Rotating Bioreactor**  
Sarah L Waters, Linda J Cummings, Kevin M Shakesheff  
*School of Mathematical Sciences*

#### 2:00 AM

**Perfusion Significantly Increases Mineralized Matrix Production**  
Blaise D Porter, Roger Zauel, Dietmar Hutmacher, David Fyhrie, Robert E Guldberg  
*Georgia Institute of Technology*

#### 2:15 AM

**Magnitude Of Equibiaxial Stretch Modulates Fibroblast Remodeling Of Fibrin Gels**  
Jenna Balestrini, Jacquelyn Yousseff, Kristen Billiar  
*Worcester Polytechnic Institute*

#### 2:30 AM

**Gravity-Induced Changes Of Gene Expression In PC12 Cells**  
Ohwon Kwon, Maureen Sartor, Craig R Tomlinson, Mark E Olah, Ronald W Millard, John M Sankovic, Rupak K Banerjee  
*University of Cincinnati*

#### 2:45 AM

**Stacked Radial Flow Bioartificial Liver Device Using Microfabricated Grooved Substrates**  
Jae-Sung Park, FranÁois Berthiaume, Mehmet Toner, Martin L Yarmush, Arno W Tilles  
*Massachusetts General Hospital/Harvard Medical School*

#### 3:00 AM

**A Novel Lid-Driven Cavity Flow Bioreactor For Cartilage Tissue Engineering**  
Kathleen A Lamkin-Kennard, Michael R. King, Hani A. Awad  
*University of Rochester*
Friday, June 24, 2005  
1:45 PM - 3:15 PM  
Session 7C

Podium  
Session:  
HEMODYNAMICS OF BRAIN ANEURYSMS  
Centennial Ballroom D  

CHAIR: Barry Lieber  
CO-CHAIR: M.L. Raghavan

1:45  
**Computational Study On The Effects Of Hypertensive Blood Pressure On Cerebral Aneurysm**  
Ryo Torii, Marie Oshima, Toshio Kobayashi, Kiyoshi Takagi  
The University of Tokyo

2:00  
**Three Dimensional Numerical Simulation Of Blood Flow In Cerebral Artery With Multiple Aneurysms**  
Kensuke Yokoi, Feng Xiao, Hao Liu, Kazuaki Fukasaku  
University of Tokyo

2:15  
**Flow Changes In A Model Of Elastase-Induced Aneurysm In Rabbit After Place After Placement Of A Flow Divertor Across Its Neck**  
Jaehoon Seong, Baruch B. Lieber, Ajay K. Wakhloo, Matthew J. Gounis, Masanari Onizuka  
University of Miami

2:30  
**Factors That Influence The Hemodynamic Effect Of Segmented Z-Stent When Used To Reduce Flow In Side-Wall Cerebral Aneurysms**  
Luca Augsburger, Edouard Fonck, Makoto Ohta, Daniel A. Rufenacht, Nikos Stergiopulos  
Federal Institute of Technology (EPFL)

2:45  
**A Computational Study Of The Role Of Hemodynamics In Cerebral Aneurysm Coil Compaction**  
Kyung Se Cha, Elias Balaras, Baruch B Lieber  
University of Maryland

3:00  
**Coregistration Of Simulated Aneurysms For Evaluation Of Growth By Finite Element Analysis**  
Gabriel Acevedo-Bolton, Brad Dispensa, David Saloner, Liang-Der Jou  
University of California, San Francisco

Friday, June 24, 2005  
1:45 PM - 3:15 PM  
Session 7D

Podium  
Session:  
FREE-SURFACE FLOWS  
Centennial Ballroom EF  

CHAIR: Samir Ghadiali  
CO-CHAIR: James Grotberg

1:45  
**Dynamic Surface Tension Effects During Pulsatile Airway Reopening**  
Donald P Gaver, Jerina Pillert  
Tulane University

2:00  
**Effect Of Surfactant On Wall Stresses During A Liquid Plug Propagation In Airways**  
Hideki Fujioka, James B Grotberg  
University of Michigan

2:15  
**Epithelial Cell Deformation During Surfactant-Mediated Airway Reopening: A Theoretical Model**  
Oliver E Jensen, Shailesh Naire  
University of Nottingham, UK

2:30  
**Bubble Sticking And Sliding Along The Wall Of A Two Dimensional Channel**  
Brijesh Eshpuniyani, Joseph L Bull  
University of Michigan

2:45  
**Dynamics Of Human Tear Film Deposition**  
Malcolm B Jones, Sean McElwain, Glenn R Fulford, Anthony P Roberts, Michael J Collins  
Queensland University of Technology

3:00  
**Initial Study To Simulate Microbubble Fabrication Using Microfluidics For Application As Ultrasound Contrast Agents**  
Michael W Weber, Alexander Barker, Conrad Stoldt, Robin Shandas  
University of Colorado
## Session 7E

**Podium Session:** BIOHEAT TRANSFER  
**Location:** Rocky Mountain Ballroom AB

**Chair:** Liang Zhu  
**Co-Chair:** Neil Wright, Tom Diller

<table>
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<tr>
<th>Time</th>
<th>Title</th>
<th>Speaker(s)</th>
<th>Institution</th>
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<tr>
<td>1:45</td>
<td>Parametric Analysis Of Intracellular Ice Formation During Cryopreservation Of Co-Cultured Tissue Containing Micropatterned Cell Islands</td>
<td>Shannon L Stott, Jens OM Karlsson</td>
<td>Georgia Institute of Technology</td>
</tr>
<tr>
<td>2:00</td>
<td>Sensitivity Of Trichophyton Rubrum To Heating</td>
<td>Neil T Wright, Patrick L Harrington, A. Leonel Mendoza</td>
<td>Michigan State University</td>
</tr>
<tr>
<td>2:15</td>
<td>Capability Of Cooling Carotid Arterial Blood Using An Interstitial Cooling Cuff</td>
<td>Liang Zhu, Yunjian Wang</td>
<td>Univ. of Maryland Baltimore County</td>
</tr>
<tr>
<td>2:30</td>
<td>Experimental Characteristics And Reaction Kinetic Model Of Cell Damage Due To Hypertonic Electrolyte Solution</td>
<td>Hiroshi Ishiguro, Keisuke Fukuda</td>
<td>Kyushu Institute of Technology</td>
</tr>
<tr>
<td>2:45</td>
<td>A Finite Element Study Of The Effect Of Fibrillation On Radiofrequency Thermal Chondroplasty</td>
<td>Xianglan Bai, Tammy L Haut Donahue, Neil T Wright</td>
<td>Michigan State University</td>
</tr>
<tr>
<td>3:00</td>
<td>Investigation Of Gasous Condition On Non-Heart-Beating Donor Livers During Hypothermic Machine Perfusion Preservation</td>
<td>Lingeng Wang, Georges Ndayizeye, Jaideep Joneja, Shailendra Jain, Jian X Zhang, Mark G Clemens, Charles Y Lee</td>
<td>Univ. of North Carolina at Charlotte</td>
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</tbody>
</table>

## Session 7F

**Podium Session:** TENDON/LIGAMENT MECHANICS I - EFFECTS OF ENVIRONMENTAL STIMULI  
**Location:** Rocky Mountain Ballroom CD

**Chair:** Glen A. Livesay  
**Co-Chair:** Todd C. Doehring

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<tr>
<th>Time</th>
<th>Title</th>
<th>Speaker(s)</th>
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<tbody>
<tr>
<td>1:45</td>
<td>Stress Relaxation And Temperature Variations Decrease Initial Tension And Stiffness Of Hamstring Tendon Grafts</td>
<td>John J Elias, William J Ciccone, Derek R Bratton, David M Weinstein</td>
<td>Medical Education and Research Institute of Colorado</td>
</tr>
<tr>
<td>2:00</td>
<td>Effects Of Growth On Mechanical Properties Of Regenerated And Residual Tissues In The Rabbit Patellar Tendon After Resection Of Its Central One-Third</td>
<td>Eijiro Maeda, Hitoshi Noguchi, Harukazu Tohyama, Kazunori Yasuda, Kozaburo Hayashi</td>
<td>Queen Mary, University of London</td>
</tr>
<tr>
<td>2:15</td>
<td>Cyclic Mechanical Conditioning Of Isolated Tendon Fascicles Results In An Upregulation Of Collagen Production</td>
<td>Hazel RC Screen, Dan L Bader, Julia C Shelton, David A Lee</td>
<td>Queen Mary, University of London</td>
</tr>
<tr>
<td>2:30</td>
<td>Effect Of Hormone Replacement On The Viscoelastic Properties Of The Round Ligament In The Monkey Model</td>
<td>Thomas R Gardner, Mark Cline, Orahn Preiss-Bloom, Richard J Scotti, Magdy S Mikhail, Robert Lindsay, Michael D Vardy</td>
<td>Columbia University</td>
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<tr>
<td>2:45</td>
<td>The Effect Of Denervation On The Heterogeneous Material Properties Of The Tibialis Anterior Tendon</td>
<td>Sarah Calve, Keith Baar, Kevin Mundy, Ellen M Arruda</td>
<td>University of Michigan</td>
</tr>
<tr>
<td>3:00</td>
<td>Evolution Of An MSC-Based Tissue Engineered Construct To Improve Patellar Tendon Repair</td>
<td>David L Butler, Natalia Juncosa-Melvin, Jason Shearn, Marc Galloway, Greg Boivin, Cindi Gooch</td>
<td>University of Cincinnati</td>
</tr>
</tbody>
</table>
## Friday, June 24, 2005

### Session 7G

**Podium**

**Session:** DEVELOPING METHODS IN MOTION ANALYSIS

**Creekside Room**

**CHAIR:** Lars Muendermann  
**CO-CHAIR:** Sarah Wilson

**1:45** Computerized Method To Determine The Location And Orientation Of The Ankle And Subtalar Joint Axes Of Rotation Of The Human Ankle/Foot Complex  
Elizabeth L Lawrence, Vern L Houston  
*NYU School of Medicine*

**2:00** Estimation Of The Accuracy And Precision Of 3D Human Body Kinematics Using Markerless Motion Capture And Articulated ICP  
Lars Muendermann, Stefano Corazza, Dragomir Anguelov, Thomas P Andriacchi  
*Stanford University*

**2:15** Determining Angular Head Accelerations Using An External Array Of Linear Accelerometers: A Preliminary Analysis Of Everyday Activities  
Laura A Wojcik, Peggy A Shibata, James K Sprague  
*Packer Engineering, Inc.*

**2:30** Coronal Head Accelerations During Vigorous Activities Of Daily Living  
Irving Scher, Darrin Richards, Vinod Vijayakumar, Michael Carhart, Catherine Ford Corrigan, David Jaekel  
*Exponent*

**2:45** The Sensorimotor System In Dynamic Feedback Models Of Trunk Dynamics  
Sara E Wilson, Lu Li  
*University of Kansas*

**3:00** A Neural Network Model For Detection Of Balance Impairment And Estimation Of Falls Risk In The Elderly  
Michael E Hahn, Li-Shan Chou  
*Montana State University*

### Session 7H

**Podium**

**Session:** BIOENGINEERING EDUCATION: MODELS FOR CROSS-DISCIPLINARY GRADUATE EDUCATION

**Gore Range Exhibit Hall**

**CHAIR:** Jeffrey W. Holmes  
**CO-CHAIR:**

**1:45** Biomedical Engineering Entrepreneurship: Multi-Disciplinary Teaching At Georgia Tech  
David N Ku  
*Georgia Institute of Technology*

**2:00** A New Paradigm For Graduate Research And Training  
Jay D Humphrey, Gerald L Cote, Jay R Walton, Gerald A Meininger, Glen A Laine  
*Texas A&M University*

**2:15** Promoting Effective Collaboration With Clinicians: Case Studies Of Trainee Pairing During The Doctoral Thesis  
Jeffrey W Holmes, Shunichi Homma, Andrew F Laine  
*Columbia University*

**2:30** Panel Discussion
### Session 8B

#### Podium Session: PH.D. STUDENT PAPER FINALS: SOLIDS, DESIGN, & REHAB ENGINEERING

**CHAIR:** Michele Grimm  
**CO-CHAIR:** Amy Lerner

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<tr>
<th>Time</th>
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<tbody>
<tr>
<td>3:30</td>
<td>Finite Element Modeling Of The Human Pelvis</td>
<td>Zuoping Li, Jong E Kim, James S Davidson, Alan W Eberhardt</td>
<td>University of Alabama, Birmingham</td>
</tr>
<tr>
<td>3:45</td>
<td>Dimorphic Damage Development And Toughness Loss Optimize Bone Fatigue Resistance</td>
<td>Tamim Diab, Deepak Vashishth</td>
<td>Rensselaer Polytechnic Institute</td>
</tr>
<tr>
<td>4:00</td>
<td>Validation Of Finite Element Model Of The Human Lower Limb In Dynamic Lateral Bending</td>
<td>Costin D Untaroiu, Kurosh K Darvish, Jeff R Crandall, Bing Deng, J.T. Wang</td>
<td>University of Virginia</td>
</tr>
<tr>
<td>4:15</td>
<td>Adaptation Of Cancellous Bone Mass And Architecture Following Orchidectomy And Loading</td>
<td>James C Fritton, Elizabeth R Myers, Timothy M Wright, Marjolein C van der Meulen</td>
<td>Cornell University</td>
</tr>
<tr>
<td>4:30</td>
<td>The Effect Of Varying Magnitudes Of Whole-Body Vibration On Various Skeletal Sites In Mice</td>
<td>Blaine A Christiansen, Matthew J Silva</td>
<td>Washington University in St. Louis</td>
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<tr>
<td>4:45</td>
<td>In Vivo Tissue-Level Thresholds For Spinal Cord Injury</td>
<td>Jason T Maikos, Alice W Seneres, Gary A Monteiro, Zhen Qian, Dimitri Metaxas, David I Shreiber</td>
<td>Rutgers University</td>
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### Session 8C

#### Podium Session: PH.D. STUDENT PAPER FINALS: CELL AND TISSUE ENGINEERING

**CHAIR:** Michele Grimm  
**CO-CHAIR:** Amy Lerner

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<tr>
<th>Time</th>
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<tbody>
<tr>
<td>3:30</td>
<td>Leukocyte Rolling On Nanopatterned Surfaces Of P-Selectin</td>
<td>Xiefan Lin, Anthony S. W. Ham, Michael B. Lawrence, Michael L. Reed, Brian P. Helmke</td>
<td>University of Virginia</td>
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<tr>
<td>3:45</td>
<td>Focal Adhesion Kinase Regulates Cell Adhesion Strengthening</td>
<td>Kristin E Michael, Nathan D Gallant, Steven K Hanks, Andres J Garcia</td>
<td>Georgia Institute of Technology</td>
</tr>
<tr>
<td>4:00</td>
<td>Osteopontin Deficient Mice Display Reduced Vascular Response And Altered Bone Properties During Fracture Healing</td>
<td>Craig L Duvall, W Robert Taylor, Robert E Guldberg</td>
<td>Georgia Institute of Technology</td>
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<tr>
<td>4:15</td>
<td>Dead Zone Distributions In Selectin-Mediated Interactions</td>
<td>Krishna K Sarangapani, Bryan T Marshall, Rodger P McEver, Cheng Zhu</td>
<td>Georgia Institute of Technology</td>
</tr>
<tr>
<td>4:30</td>
<td>The Use Of Particle Image Velocimetry To Validate Computational Fluid Dynamics Modeling Of A Wavy-Walled Bioreactor For Cartilage Tissue Engineering</td>
<td>Bahar Bilgen, Philippe Sucosky, Paul G. Neitzel, Gilda A. Barabino</td>
<td>Northeastern University</td>
</tr>
<tr>
<td>4:45</td>
<td>Effect Of Bioreactor Geometry On The Efficiency Of Chondrocyte Attachment To Polymer Scaffolds</td>
<td>Ericka M Bueno, Gilda A Barabino</td>
<td>Northeastern University</td>
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# Session 8D

**Podium Session: PH.D. STUDENT PAPER FINALS:**

**BIOFLUIDS AND HEAT TRANSFER**

**CHAIR:** Michele Grimm  
**CO-CHAIR:** Amy Lerner

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<tr>
<th>Time</th>
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<tr>
<td>3:30</td>
<td>Computational Fluid-Structure Interaction Analyses Applied To A Stented Abdominal Aortic Aneurysm</td>
<td>Zhonghua Li, Clement Kleinstreuer</td>
<td>North Carolina State University</td>
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<tr>
<td>3:45</td>
<td>Characterization Of Thrombosis Caused By Flow Through Various Channels Approximating The Hinge Region Of Mechanical Heart Valves</td>
<td>Anna M Fallon, Nisha P Shah, Ulla M Marzec, Stephen R Hanson, Ajit P Yoganathan</td>
<td>Georgia Institute of Technology</td>
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<tr>
<td>4:00</td>
<td>Conjugation Efficiency Of Functionalized Microbubbles For Targeted Ultrasound-Based Molecular Imaging</td>
<td>Steve R Lammers, Conrad Stoldt, John Hutton, Philip Pratt, Robin Shandas</td>
<td>University of Colorado</td>
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<tr>
<td>4:15</td>
<td>Ex Vivo Multi-Contrast MRI Of Atherosclerotic Plaque Under Simulated In Vivo Conditions</td>
<td>Binjian Sun, John N Oshinski, Robert Long, William R Taylor, Diana Weiss, Don P Giddens</td>
<td>Georgia Institute of Technology</td>
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<tr>
<td>4:30</td>
<td>Development Of Methods To Non-Invasively, Longitudinally Quantify Hemodynamics In A Rat Model Of Abdominal Aortic Aneurysm Using Magnetic Resonance Imaging And Computational Fluid Dynamics</td>
<td>Joan M Greve, Andrea S Les, Mary K O’Connell, Nathan M Wilson, Eiketsu Sho, Ronald L Dalman, Charles A Taylor</td>
<td>Stanford University</td>
</tr>
<tr>
<td>4:45</td>
<td>Optimized Thermomechanics Of A Shape-Memory Polymer Stent To Recover At Body Temperature</td>
<td>Christopher M Yakacki, Ken Gall, Alicia M Ortega, Nick Willett, Robin Shandas</td>
<td>University of Colorado at Boulder</td>
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# Session 9

**Poster Session:**

**PH.D. STUDENT POSTER COMPETITION**

**Rocky Mountain Garden**

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<tr>
<th>Poster II</th>
<th>Title</th>
<th>Authors</th>
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<tr>
<td>II-1</td>
<td>A Numerical Model On The Development Of Intracranial Aneurysms Considering Fluid Mechanics Dependent Solid Wall Mechanical Property Alterations</td>
<td>Yixiang Feng, Shigeo Wada, Ken-ichi Tsubota, Takami Yamaguchi</td>
<td>Tohoku University</td>
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<tr>
<td>II-2</td>
<td>Using Metal Nano Topography To Enhance Calcium And Phosphorus Deposition On Orthopedic Implants</td>
<td>Brian C Ward, Thomas J Webster</td>
<td>Purdue University</td>
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<td>II-3</td>
<td>Effects Of Pregnancy On The Mechanical Properties Of Rat Vagina</td>
<td>Dejun Jing, James A. Ashton-Miller, John O. L. DeLancey</td>
<td>University of Michigan</td>
</tr>
<tr>
<td>II-4</td>
<td>Finite Element Modeling Of The First Ray Of The Foot: A Tool For The Design Of Interventions.</td>
<td>Sachin P Budhabhatti, Ahmet Erdemir, Marc Petre, James J Sferra, Brian G Donley, Peter R Cavanagh</td>
<td>The Cleveland Clinic Foundation</td>
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<tr>
<td>II-5</td>
<td>Factors Influencing Optic Nerve Head Biomechanics - A Finite Element Analysis</td>
<td>Ian A Sigal, John G Flanaganan, C Ross Ethier</td>
<td>University of Toronto</td>
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<tr>
<td>II-6</td>
<td>A Biomechanical Approach To Identifying Mild Traumatic Brain Injuries In Emergency Department</td>
<td>Zhifeng Kou, Mariusz Ziejewski</td>
<td>North Dakota State University</td>
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II-7  **Cell Adhesion To Micropatterned Surfaces: Relationships Among Adhesion Strengthening, Focal Adhesion Assembly, And Contact Area**
Nathan D Gallant, Andres J Garcia  
*Georgia Institute of Technology*

II-8  **Contribution Of Non-Parenchymal Cells To The Performance Of Micropatterned Hepatocytes**
Yekaterina S Zinchenko, Robin N Coger  
*University of North Carolina at Charlotte*

II-9  **A Coarse-Grained Model For Force-Induced Protein Deformation**
Helene Karcher, Mohammad R Kaazempur-Mofrad, Roger D Kamm  
*Massachusetts Institute of Technology*

II-10  **Development Of A Biodegradable Nanofiber Scaffold By Optimization Of Electrospinning Process Parameters**
Ming Chen, Prabir Patra, Steve Warner, Sankha Bhowmick  
*University of Massachusetts Dartmouth*

II-11  **Optical Path Length Modeling Technique For Determining Cell Membrane Water And Solute Mass Transport Parameters**
Chris G Rylander, Thomas E Milner, A J Welch, Kenneth R Diller  
*The University of Texas at Austin*

II-12  **Flow Induced Changes In Cellular Architecture From Inside To Outside**
Rosalind E Mott, Brian P Helmke  
*University of Virginia*

II-13  **Mechanical Deformation Of Neutrophils Into Narrow Channels Induces Pseudopod Projection And Changes In Biomechanical Properties**
Belinda Yap, Roger D Kamm  
*Massachusetts Institute of Technology*

II-14  **Development Of A Novel Dynamic Bioreactor**
Ali Etebari, Akle Barbar, Xingxi He, Donald J Leo, Yong Woo Lee, Pavlos P Vlachos  
*Virginia Tech*

II-15  **A Wave Propagation Model Of Blood Flow In Large Vessels Based On Boundary Layer Theory**
David Bessems, Marcel Rutten, Frans van de Vosse  
*Eindhoven University of Technology*

II-16  **Percutaneous Pulmonary Valve Implantation: An Engineering Approach To Potentially Improve Patient Selection**
Silvia Schievano  
*Institute of Child Health and Great Ormond Street Hospital for Children*

II-17  **Effect Of Cyclic Reversal Flow On Endothelium And Smc Cell Metabolism On Pig Carotid Arteries Perfused In An Ex-Vivo Support System**
Veronica Gambillara  
*LHTC- EPFL*

II-18  **Contribution Of Collagen And Elastin To The Mechanical Properties Of Normal And Aneurysmal Rat Aortas**
Mary K O’Connell, Sushila Murhty, Peter H Feenstra, Ronald L Dalman, Charles A Taylor  
*Stanford University*

II-19  **Development And Nonlinear Acoustic Characterization Of Nanoscale Contrast Agents For Ultrasound Based Molecular Imaging**
Hairong Zheng, Alexander Barker, Lingli Liu, Kendall Waters, Robin Shandas  
*University of Colorado*

II-20  **Experimental And Numerical Study Of Fracture Healing In A Murine Fracture Model**
Liesbet LJ Geris, Alf Gerisch, Christa Maes, Geert Carmeliet, Ruediger Weiner, Hans Van Oosterwyck, Jos Vander Sloten  
*Division of Biomechanics and Engineering Design*
II-21  **Modeling Of Collagen Gels: A Microstructural Approach**  
Triantafyllos - Stylianopoulos, Victor H Barocas  
*University of Minnesota*

II-22  **3D Finite Element Model Of Medial Meniscus Meniscectomy - Changes In Contact Behavior.**  
Barbara Zielinska, Tammy Lynn Haut Donahue  
*Michigan University of Technology*

II-23  **Monitoring Osteogenesis Using High Resolution**  
Huihui Xu, Shadi F Othman, Liu Hong, Richard L Magin  
*University of Illinois*

II-24  **Force Response Of Single Living Fibroblasts Under Large Deformations Studied By MEMS Sensors**  
Shengyuan Yang, Taher Saif  
*University of Illinois at Urbana-Champaign*

II-25  **In Vitro Validation Of An Image-Based CFD Model Of An Anatomically Realistic Cerebral Aneurysm**  
Matthew D Ford, Hristo N Nikolov, Jaques S Milner, Wojciech Kalata, Francis Loth, Stephen P Lownie, David W Holdsworth, David A Steinman  
*Robarts Research Institute*

II-26  **Effects Of Functional Ankle Instability On Lower Leg Muscle Activity During A Lateral Hop Movement**  
Bradley J Monteleone, Janet L Ronsky, Willem H Meeuwisse, Ronald F Zernicke  
*University of Calgary*

II-27  **A One-Dimensional Simulation Of The Human Conduit Arteries Compared To Experimental Data**  
Jordi Alastruey, Kim H Parker, Joaquim Peiro, Spencer J Sherwin  
*Imperial College London*

II-28  **An Experimental System For Investigating Flow-Induced Hemolysis**  
Yangsheng Chen, Michael K Sharp  
*University of Louisville*

II-29  **The Presence Of A Fatigue Microcrack Alters The Fluid Flow Profile In Cortical Bone: The Effects Of Microcrack Size And Orientation**  
Sarah A Galley, Donna J Michalek, Seth W Donahue  
*Micrhigan Technological University*

II-30  **Shear Stress Fluctuations Increase In Vitro Permeability Of Endothelial Monolayer**  
Dana Lorber, Uri Shavit, Gera Neufeld, Eitan Kimmel  
*Technion - Israel Institute of Technology*

II-31  **A Tissue/Bubble Coupled Model For Optimizing Ultrasound Based Molecular Imaging Incorporating Non-Linear Wave Propagation And Nano/Micro-Contrast Agent Backscatter**  
Lingli Liu, Hairong Zheng, Robin Shandas  
*University of Colorado*

II-32  **The Effects Of Oscillatory Fluid Flow On MAPK Phosphorylation In Osteoblasts**  
Amanda M Malone, Danny K Cheng, Joshua J Rodriguez, Padmaja Tummala, Christopher R Jacobs  
*Stanford University*

II-33  **A Numerical Study Of Vortex Flow During Ventricular Filling**  
Rui Wang, Jean Hertzberg, Robin Shandas  
*University of California*

II-34  **Comparison Of Wall Shear Stress In The Human Abdominal Aorta During Resting And Simulated Exercise Conditions: Application To In Vitro Endothelial Cell Gene Expression**  
Beverly T Tang, Mary T Draney, Philip S Tsao, Charles A Taylor  
*Stanford University*

II-35  **Ultrasonic-Measurement-Integrated Simulation For Reproduction Of Three-Dimensional Blood Flow Field In The Aorta With Aneurysm**  
Kenichi Funamoto, Toshiyuki Hayase, Yoshifumi Saijo, Tomoyuki Yambe  
*Tohoku University*
II-36 **Comparison Of Flow Parameters Between Different Geometries Of A Human Aorta With Coarctation And Aneurysm**  
Johan Svensson, Roland Gardhagen, Matts Karlsson  
*Linkoping University*

II-37 **Wall Shear Stress In A Human Aorta With Constriction And Aneurysm - Non-Newtonian Effects For Unsteady Flows**  
Roland Gardhagen, Johan Svensson, Matts Karlsson  
*Linkoping University*

II-38 **Effect Of Hypoxia On Micro-Vessel Fomation In Vitro**  
Akinori Ueda, Ikuko Yoneyama, Mariko Ikeda, Hiroko Kajiwara, Masatoshi Tsuchiya, Susumu Kudo, Kazuo Tanishita  
*Keio University*

II-39 **On Numerical Modelling Of The Human Mitral Valve**  
Victorien Prot, Bjorn Skallerud  
*Institutt for Konstruksjonsteknikk*

II-40 **Model-Free Markerless Motion Capture Through Visual Hull And Laplacian Eigenmaps**  
Stefano Corazza, Lars Muendermann, Thomas P Andriacchi  
*Stanford University*

II-41 **A 3D Numerical Method For Fluid-Structure Interaction In Heart Valves**  
Raoul Van Loon, Marcel CM Rutten, Patrick D Anderson, Frans N Van de Vosse  
*Eindhoven University of Technology*

II-42 **Monitoring Tangent, Chord And Secant Stiffnesses Provides Insight Into Collagen Fibre Mechanics In A Model Of Damage Accumulation In Ligament Tissue**  
Michelle L Zec, Paul A Thistlethwaite, Cyril B Frank, Nigel G Shrive  
*McCaig Centre for Joint Injury and Arthritis Research*

II-43 **Effects Of Uniaxial Cyclic Tensile Strain On Osteogenic Differentiation Of Human Mesenchymal Stem Cells**  
Ruwan D Sumanasinghe, Susan H Bernacki, Elizabeth G Loboa  
*UNC-Chapel Hill and North Carolina State University*

II-44 **Feasibility Evaluation Of A Gravity-Independent Vibration Therapy Device For Musculoskeletal Stimulation**  
Jeffrey M Leismer  
*University of Florida*

II-45 **Composition And Mechanical Properties Of Osteoarthritic Subchondral Human Bone**  
John P Gleeson, Cormac O’Connell, Kevin U O’Kelly  
*Trinity Center for Bioengineering*

II-46 **Biophysics Of Freezing Of Tissue Equivalents**  
Saravana Kumar Balasubramanian, John C Bischof, Allison Hubel  
*University of Minnesota*

II-47 **3-D Finite Element Modeling Of Tissue Equivalents Using A Continuum Approach**  
Michael C Evans, Toshiro K Ohsumi, Victor H Barocas  
*University Of Minnesota*

II-48 **Computational Fluid Dynamics Design Validation Of An Axial Flow Ventricular Assist Device**  
Alexandrina Untaroiu, Amy L Throckmorton, Houston G Wood, Don B Olsen  
*University of Virginia*

II-49 **Active Iris Mechanics And Pupillary Block: Analysis Of Anatomical Risk Factors Of Primary Angle-Closure Glaucoma**  
Eric C Huang, Victor H Barocas  
*University of Minnesota*

II-50 **A Geometrically Accurate Patient-Specific Approach To Finite Element Modeling Of A Lumbar Motion Segment**  
Ferris M Pfeiffer, Doug E Smith, Carol V Ward, Dirk Alander  
*University of Missouri - Columbia*

II-51 **Validation Of Bone Strains And Cartilage Contact Stress In A 3-D Finite Element Model Of The Human Hip**
Andrew E Anderson, Christopher L Peters, Benjamin J Ellis, S Janna Balling, Jeffrey A Weiss  
University of Utah

II-52  The Development Of A Unique Test Rig To Simultaneously Apply Pulsatile And Reversible Shear And Tensile Forces To A Monolayer Of Endothelial Cells  
Liam T Breen, Bruce P Murphy, Peter E McHugh  
NCBES

II-53  High Rate Material Properties Of Infant Cranial Bone And Suture  
Brittany Coats, Susan S Margulies  
University of Pennsylvania

II-55  Texture And Ridge Stimuli Alter The Knee Adduction Moment: Implications For The Progression Of Osteoarthritis  
David S Fisher, Karen Schuyler, Adrian Gale, Peter Jurczynski, Anne Muendermann, Thomas P Andriacchi  
Stanford University

II-56  Three Dimensional Woven Composite Scaffolds For The Functional Tissue Engineering Of Articular Cartilage  
Franklin T Moutos, Rachel N Katz, Farshid Guilak  
Duke University

II-57  Processing And Characterization Of A Nanoscale Contrast Agent For Ultrasound Based Molecular Imaging: Exploration Of Acoustic And Non-Acoustic Synthesis Methods  
Alex Barker, Hairong Zheng, Kendall Waters, Conrad Stoldt, Robin Shandas  
University of Colorado, Boulder

II-58  Geometric Control Of Endothelial Cell Morphology And Migration  
Xiefan Lin, Brian P Helmke  
University of Virginia

II-59  Effect Of Length Of The Engineered Tendon Construct On Its Structure-Function Relationships In Culture  
Victor S Nirmalanandhan, Michael S Sacks, Marepalli Rao, Bala Haridas, David L Butler  
University of Cincinnati

II-60  Modeling Aqueous Humor Flow In The Trabecular Meshwork  
Bradley M Merchant  
Arizona State University

II-61  A CFD-Based Method To Evaluate The Effect Of Shear Stress On Endothelial Gene Expression In Vivo  
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II-66  Nonlinear Geometric Bending Of Porcine Aortic Valve Leaflet Modeled As A Tri-Layered Beam  
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II-67  Design Of Experiments Methodology For Biventricular Pacing Optimization  
T. Alexander Quinn, George Berberian, Santos E Cabreriza, Henry M Spotnitz, Jeffrey W Holmes  
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II-90  **Reducing Motion Artifact In Three-Dimensional Left Ventricular Wall Motion Analysis**  
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II-91  **Nano-Scale Tracking Of Slow And Fast Dynamics Of The Sheared Endothelial Cell Cytoplasm**  
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II-94  **Relating In Vivo And Ex Vivo Mechanics In Healing Myocardial Scar Tissue**  
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II-95  **Mechanical Characterization Of Native And Esophageal Graft In A Dog Model**  
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II-96  **Identification Of Nonlinear Constitutive Law Parameters Of Breast Tissue**  
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II-99  **Anatomic Variation In The Elastic Properties Of Human Cortical Bone**  
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II-100  **Direct Numerical Simulation Of Transition To Turbulent Flow In A Subject-Specific Arteriovenous Graft**  
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*University of Illinois at Chicago*
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II-104  Physiological Relevance Of The Changes In Hemodynamic Stresses For Circulating Blood Cells In Abdominal Aortic Aneurysms  
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II-105  Transient Temperature Distributions During Electrical Pulsing Of Filaments Used For Microporation Of Skin  
Jonathan I Barletta, Zhuomin M Zhang, Jens OM Karlsson  
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II-106  Computational Modeling Of The Foot/Ankle Complex  
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II-107  Tuning Patient-Specific Hemodynamic Simulations Incorporating A Morphometry-Based Model Of The Distal Vessels  
Ryan L Spilker, Jeffrey A Feinstein, Charles A Taylor  
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<td>Prestress-Dependent Propagation Of Forces To The Nucleolus</td>
<td>Ning Wang, Shaohua Hu, James P Butler</td>
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<td>Cell-Extracellular Matrix (ECM) Micro-Mechanical Behavior Depends On ECM Microstructure And Cell Type</td>
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<td>Substrate Stiffness Directs Mesenchymal Stem Cell Differentiation</td>
<td>Adam J Engler, Mark F Berry, H. Lee Sweeney, Dennis E Discher</td>
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<td>Interstitial Flow Induces Pro-Fibrotic Fibroblast Differentiation And Collagen Alignment In Vitro</td>
<td>Chee P Ng, Federica Boschetti, Melody A Swartz</td>
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<td>Heart Valve Interstitial Cell Mechanical Properties: Effects Of Right And Left Side Heart Transvalvular Pressures</td>
<td>W David Merryman, Michael S Sacks, Inchan Youn, Farshid Guilak, Paula M Krueger, Richard A Hopkins</td>
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<td>Functional Characterization Of An Osmotically-Sensitive Ion Channel, TRPV4, In Articular Chondrocytes</td>
<td>Mimi Phan, Scott Pritchard, Bart J Votta, Sanjay Kumar, Wolfgang Liedtke, Farshid Guilak</td>
<td>Duke University Medical Center</td>
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<td>Tissue Engineering Of Cylindrical And Anatomically-Shaped Osteochondral Constructs Using Poly(Propylene Glycol-Co-Fumaric Acid) As A Moldable, Porous Substrate</td>
<td>Eric G Lima, Patricia Setti, Gerard A Ateshian, James L Cook, Cristi R Cook, David D Hile, Clark T Hung</td>
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<td>Cartilage Beneath A Protective Layer With Strain Dependent Permeability: Implications For Tissue Engineering</td>
<td>John R Owen, Jennifer S Wayne</td>
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<td>The Effects Of Hydrostatic Loading On A Bioengineered Cartilage Tissue Equivalent</td>
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<td>Evaluation Of Hyclone Bovine Growth Serum For Use In Cartilage Tissue Engineering.</td>
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<td>On The Ability Of Mesenchymal Stem Cells To Form Functional Cartilaginous Tissues In Three Dimensional Agarose Culture</td>
<td>Robert L Mauck, Xiaoning Yuan, Rocky S Tuan</td>
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<td>Matrix Distribution And The Functional Development Of Tissue Engineered Cartilage</td>
<td>Bram G Sengers, Cees WJ Oomens, Frank PT Baaijens</td>
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**Podium**

**Session:** VASCULAR MECHANICS  
**Chair:** David Vorp  
**Co-Chair:** Ruth Okamoto  
**Location:** Centennial Ballroom D  

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<td>Large Artery Elasticity And Viscoelasticity In A Mouse Model Of Primary Pulmonary Hypertension</td>
<td>Ryan W Kobs, Naomi C Chesler</td>
<td>University of Wisconsin</td>
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<td>Stress-Strain Properties Of Hypoxic Rat Pulmonary Arteries</td>
<td>Elizabeth S Drexler, Andrew J Slifka, Christopher N McCowan, Timothy P Quinn, Dunbar Ivy, Robin Shandas</td>
<td>NIST</td>
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<td>Biomechanical Model Of The Arterial Wall Accounting For Elastic Properties And Structure Of Normal And Decellularized Arteries</td>
<td>Gilles N Prodhom, Sylvain Roy, Nikos Stergiopulos</td>
<td>Swiss Federal Institute of Technology</td>
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<td>Role Of Interaction Between Elastin And Collagen In Arterial Elasticity</td>
<td>Madhavan L Raghavan, Jarin A Kratzberg, Roshni Parikh, Setu Trivedi</td>
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<td>Effect Of Length To Diameter Ratio In Mechanical Testing Of Aorta</td>
<td>Kelly M Brinkley, Joseph C Teply, Ruth J Okamoto</td>
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<td>Simulation Of Fluid Flow In Artery And Tissue Engineered Vascular Graft Walls Under Cyclic Pressure Using ABAQUS</td>
<td>Paul H Rigby, Bruce R Simon, Stuart K Williams</td>
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**Podium**

**Session:** ARTERY WALL DEVICE INTERACTIONS  
**Chair:** Jimmy Moore  
**Co-Chair:** Rosaire Mongrain  
**Location:** Centennial Ballroom EF  

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<td>Multidisciplinary Design Optimization Of Stents</td>
<td>Rosaire Mongrain, Ramses Galaz, Neil Bulman-Fleming, Bilal Ruzzeh, Olivier Bertrand, Jean-Claude Tardif</td>
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<td>Vascular Stress State And Tissue Prolapse In An Atherosclerotic Coronary Artery: Influence Of The Stent Design By Means Of Finite Element Analyses</td>
<td>Francesco Migliavacca, Silvia Schievano, Serena Gilardi, Giovanni Ricciardi, Dario Gastaldi, Lorenza Petrini, Tomaso Villa, Riccardo Pietrabissa, Gabriele Dubini</td>
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<td>Stress Quantification In Stented Hyperelastic Artery Models: Tools For Improving Stent Design And Reducing Restenosis</td>
<td>Julian Bedoya, Clark Meyer, Michael Moreno, James Moore</td>
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<td>In Vivo Deformations Of The Superficial Femoral Artery - Possible Cause Of Stent Fractures?</td>
<td>Christopher P Cheng, Nathan M Wilson, Robert J Herfkens, Charles A Taylor</td>
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<td>A New Approach To Improved Stent Graft Design: Development Of A Nano-Cage Containing Polymer That Is Both Anti-Platelet And Protein Inhibitory But Not Drug Releasing</td>
<td>Henryk J Salacinski, Ruben Y Kannan, Claire B Hillery, Zhong You, Jian R Lu, Alexander M Seifalian</td>
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**Podium:** Rocky Mountain Ballroom AB  
**Session:** COMPUTATIONAL BIOHEAT AND MASS TRANSFER  
**Chair:** Ram Devireddy  
**Co-Chair:** Jens Karlsson

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<td>Computational And In-Vitro Characterization Of Pressure Drop And Oxygenation In Blood Membrane Oxygenators</td>
<td>Juntao Zhang, Timothy DC Nolan, Bartley P Griffith, Zhongjun J Wu</td>
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<td>Computer Modeling Of Tissue Cooling Using A Local Brain Cooling Probe</td>
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<td>Numerical Simulations Of Transcorneal Tranport Of Ethacrynic Acid</td>
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**Podium:** Rocky Mountain Ballroom CD  
**Session:** TENDON/LIGAMENT MECHANICS II - MECHANICAL MEASUREMENTS  
**Chair:** Richard E. Debski  
**Co-Chair:** Michael J. Bey

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<td>Nonlinear Elastic And Mesostructural Properties Of The Achilles Tendon</td>
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<td>Increases In Anterior Knee Laxity And Lengthening Of Soft Tissue Anterior Cruciate Ligament Graft Constructs Using Roentgen Stereophotogrammetry</td>
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<td>The Measurement Of The Variation In The Surface Strains Of Achilles</td>
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<td>Measuring Dynamic, In-Vivo Tendon Strain With Biplane Radiography: Technique And Preliminary Results In A Canine Model</td>
<td>Michael J Bey, Stephanie K Brock, Scott Tashman, Clifford M Les</td>
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<td>Effect Of Pressure On Determining The Nominal Strain State Of The Inferior Glenohumeral Ligament Complex</td>
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<td>Effect Of Compressive Pre Load On Range Of Motion Of The Entire Lumbar Spine</td>
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<td>An Experimental And Theoretical Framework For Manufacturing Prosthetic Sockets For Transtibial Amputees</td>
<td>Mario C Faustini, Richard R Neptune, Richard H Crawford, William E Rogers, Gordon Bosker</td>
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<td>Interface Pressures Between BK Residual Limb And Prosthetic Socket At Three Different Walking Speeds</td>
<td>Pei Lin Yang, Lai Hsing Hsu, Gwo Feng Huang, Shiu Sheng Shi, Gang Sheng Lin</td>
<td>National Cheng Kung University</td>
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<td>A Comprehensive Stress Analysis Of An Indirect Dental Restoration</td>
<td>Estevan B Las Casas</td>
<td>Federal University of Minas Gerais</td>
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<td>Computer Assisted Reconstruction Of Large Mandibular Defects Via Patient-Specific Pre-Bent Implants</td>
<td>Sigbjorn Olsen, Wock Hallermann, Thibaut Bardyn, Wenko Smolka, Tateyuki Iizuka</td>
<td>University of Bern</td>
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<td>8:45</td>
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<td>Orthopedic Implants As Drug-Delivery Systems: A Theoretical Study</td>
<td>Vincent Stadelmann, Dominique Pioletti</td>
<td>Swiss Federal Institute of Technology (EPFL)</td>
</tr>
</tbody>
</table>
### Session 11A: Podium Session: CELL MECHANICS: COMPUTATIONAL

**Chair:** Phillip Leduc  
**Co-Chair:** Jiro Nagatomi

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<th>Time</th>
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<th>Authors</th>
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<tr>
<td>9:15</td>
<td>Do Pseudopodia Have The Mechanical Potential To Drive Morphogenetic Movements In Embryos?</td>
<td>G. Wayne Brodland, Jim H Veldhuis</td>
<td>University of Waterloo</td>
</tr>
<tr>
<td>9:30</td>
<td>Large-Scale Modeling Of The Mechanical Behavior Of Multicellular Constructs</td>
<td>James E Guilkey, James B Hoying, Jeffrey A Weiss</td>
<td>University of Utah</td>
</tr>
<tr>
<td>10:00</td>
<td>Osmotic Loading Of Alginate Gels: A Biomimetic Study Of Hindered Transport In The Cell Cytoplasm</td>
<td>Michael B Albro, Nadeen O Chahine, Kenneth W Ng, Morakot Likhitpanichkul, Clark T Hung, Gerard A Ateshian</td>
<td>Columbia University</td>
</tr>
<tr>
<td>10:15</td>
<td>Non-Hertzian Analysis Of Cell Indentation By Atomic Force Microscopy</td>
<td>Kevin D Costa, Alan J Sim, Frank C-P Yin</td>
<td>Columbia University</td>
</tr>
<tr>
<td>10:30</td>
<td>Finite Element Modeling Of Region-Specific Cell-Matrix Interactions In The Meniscus</td>
<td>Maureen L Upton, Tod A Laursen, Farshid Guilak, Lori A Setton</td>
<td>Duke University</td>
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</tbody>
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### Session 11B: Podium Session: INTERVERTEBRAL DISC MECHANICS

**Chair:** Dawn Elliott  
**Co-Chair:** Adam Hsieh

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<th>Institution</th>
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<tbody>
<tr>
<td>9:15</td>
<td>A Novel Pendulum System For Applying Dynamic Unconstrained Compressive And Bending Loads To Functional Spinal Units</td>
<td>Lindsey Fujita, Joseph Crisco</td>
<td>Brown Medical School/Rhode Island Hospital</td>
</tr>
<tr>
<td>9:30</td>
<td>Anisotropy Index For The Human Annulus Fibrosus</td>
<td>David S Schultz, Jeffrey C Lotz, Karen M Reiser</td>
<td>Orthopaedic Bioengineering Laboratory</td>
</tr>
<tr>
<td>9:45</td>
<td>Effect Of Degeneration On Load-Induced Fiber Reorientation In Human Annulus Fibrosus</td>
<td>Heather Anne L Guerin, Dawn M Elliott</td>
<td>University of Pennsylvania</td>
</tr>
<tr>
<td>10:00</td>
<td>Osmoviscoelastic Finite Element Model Of The Intervertebral Disc</td>
<td>Yvonne Schroeder, Wouter Wilson, Jacques M. Huyghe, Frank P.T. Baaijens</td>
<td>Eindhoven University of Technology</td>
</tr>
<tr>
<td>10:15</td>
<td>Biomechanical Response Of A Lumbar Motion Segment Under Physiological Loading Conditions That Includes Large Shear Loads</td>
<td>Jamie R Williams, Raghu N Natarajan, Gunnar BJ Andersson</td>
<td>Rush University Medical Center</td>
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<tr>
<td>10:30</td>
<td>Rat Tail Intervertebral Disc Mechanical Response With Intact And Excised Nucleus Pulposus</td>
<td>Mandy M Ho, Terri-Ann N Kelly, Gerard A Ateshian, Clark T Hung</td>
<td>Columbia University</td>
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### Saturday, June 25, 2005  9:15 AM - 10:45 AM  
**Session 11C**

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<th>Time</th>
<th>Title</th>
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<tr>
<td>9:15</td>
<td><strong>Prediction Of Aneurysm Stress Based On Deformed Geometry Using Inverse Finite Element Formulation</strong></td>
<td>Jia Lu, Xianlian Zhou, Madhavan L Raghavan, Wenyi Hou, Weixuan Yang</td>
<td><em>University of Iowa</em></td>
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<tr>
<td>9:30</td>
<td><strong>Assessment Of Wall Calcification In Patient-Specific Finite Element Analyses Of Abdominal Aortic Aneurysms</strong></td>
<td>Lambert Speelman, Ajay Bohra, Michel S Makaroun, David A Vorp</td>
<td><em>University of Pittsburgh</em></td>
</tr>
<tr>
<td>9:45</td>
<td><strong>Effects Of Including Calcified Deposits In The Finite Element Modeling Of An Abdominal Aortic Aneurysm</strong></td>
<td>Steven P Marra, David T Chen, Mark F Fillinger, Jeffrey M Dwyer, Francis E Kennedy</td>
<td><em>Dartmouth College</em></td>
</tr>
<tr>
<td>10:00</td>
<td><strong>Estimation Of The Zero-Pressure Geometry Of Abdominal Aortic Aneurysms From Dynamic Magnetic Resonance Imaging</strong></td>
<td>Steven P Marra, Madhavan L Raghavan, David R Whittaker, Mark F Fillinger, David T Chen, Jeffrey M Dwyer, Michael J Tsapakos, Francis E Kennedy</td>
<td><em>Dartmouth College</em></td>
</tr>
<tr>
<td>10:15</td>
<td><strong>Computational Modeling Of Abdominal Aortic Aneurysm: A New Simulation Technique That Demonstrates The Importance Of Including Realistic Fluid Motion, Spinal Column And Internal Organs</strong></td>
<td>Michelle D Gasbarro, Elena S Di Martino, Christine M Scotti, Ender A Finol, Kenji Shimada</td>
<td><em>Carnegie Mellon University</em></td>
</tr>
<tr>
<td>10:30</td>
<td><strong>Biomechanics Of Abdominal Aortic Aneurysms: The Effect Of Asymmetry And Wall Thickness</strong></td>
<td>Christine M Scotti, Aleksandr D Shkolnik, Ender A Finol</td>
<td><em>Carnegie Mellon University</em></td>
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### Saturday, June 25, 2005  9:15 AM - 10:45 AM  
**Session 11D**

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<tr>
<td>9:15</td>
<td><strong>Computational Modelling Of Flow In The Nasal Cavities</strong></td>
<td>Victoria E. Franke, Peter T. J. Franke, Denis J. Doorly, Robert C. Schrøter, Sergio Giordana, Robert Almeyda</td>
<td><em>Imperial College London</em></td>
</tr>
<tr>
<td>9:30</td>
<td><strong>Airflow In The Human Nasal Cavity</strong></td>
<td>Donal J Taylor, Victoria E Franke, Denis J Doorly, Robert C Schrøter</td>
<td><em>Imperial College London</em></td>
</tr>
<tr>
<td>9:45</td>
<td><strong>Wall Shear Stresses In The Human Nasal Cavity</strong></td>
<td>Sara Naftali, Moshe Rosenfeld, Michael Wolf, David Elad</td>
<td><em>Tel Aviv University</em></td>
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<tr>
<td>10:00</td>
<td><strong>Fluid-Structure Analysis Of Convective And Diffusive Particle Transport In Pulmonary Alveoli</strong></td>
<td>Hannah L Dailey, Samir N Ghadiali</td>
<td><em>Lehigh University</em></td>
</tr>
<tr>
<td>10:15</td>
<td><strong>CFD Analysis Of Perfluorocarbon Flow Through Endotracheal Tubes And Central Airways During Neonatal Total Liquid Ventilation</strong></td>
<td>Paola Bagnoli, Enrico Cattaneo, Gianfranco B Fiore, Maria L Costantino</td>
<td><em>Politecnico di Milano</em></td>
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<tr>
<td>10:30</td>
<td><strong>An LRC, Lumped-Parameter-Based Model Lung For In Vitro Tests Of Total Liquid Ventilation</strong></td>
<td>Gianfranco B Fiore, Paola Bagnoli, Riccardo Vismara, Maria L Costantino</td>
<td><em>Politecnico di Milano</em></td>
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### Session 11E

**Podium Session:**

**Chair:** Richard E. Debski  
**Co-chair:** John J. Elias

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<tr>
<td>9:15</td>
<td>An Experimental Study Of Pelvic Strains In The Presence Of Simulated Metastatic Lesions And Cement Fillers</td>
<td>Neha B Butala, Brandon S Etheridge, Herrick J Siegel, Alan W Eberhardt</td>
<td>University of Alabama, Birmingham</td>
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<tr>
<td>9:30</td>
<td>Effects On Knee Kinematics From Variations In Probed Anatomical Points For Defining Coordinate Systems: A Probabilistic Model</td>
<td>Nicholas A Morton, Lorin P Maletsky</td>
<td>The University of Kansas</td>
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<tr>
<td>9:45</td>
<td>Accuracy Of Reproducing The Motion Of Knee And Shoulder Diarthrodial Joints Using Robotic Technology</td>
<td>Susan M Moore, Savio L-Y. Woo, Richard E Debski</td>
<td>University of Pittsburgh</td>
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<tr>
<td>10:00</td>
<td>Application Of A New Parametric Modeling Technique To Study Effect Of Geometric Variability On Femur Strength</td>
<td>Mehran Armand, Liming M. Voo</td>
<td>Johns Hopkins University</td>
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<tr>
<td>10:15</td>
<td>Robustness Of TKR Design To Alignment And Environmental Variability Using Probabilistic Mechanics</td>
<td>Saikat Pal, Peter J Laz, Jason P Halloran, Anthony J Petrella, Paul J Rullkoetter</td>
<td>University of Denver</td>
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<tr>
<td>10:30</td>
<td>Dynamic Analysis Of Lower Limb During Swing Phase In Chronic SCI Patients For Functional Electrical Stimulation</td>
<td>Yong Chul Kim, Brian D Schmit, Youngil Youm</td>
<td>Pohang University of Science and Technology</td>
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### Session 11F

**Podium Session:**

**Chair:** Glen Niebur  
**Co-chair:** Steven D. Abramowitch

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<tr>
<td>9:15</td>
<td>The Prediction Of The Stress-Strain Behavior Of Ligaments And Tendons</td>
<td>Louis E DeFrate, Guoan Li</td>
<td>Massachusetts General Hospital</td>
</tr>
<tr>
<td>9:30</td>
<td>A Mathematical Model Of Cell Mediated Tissue Adaptation To Mechanical Loading</td>
<td>Chaodi Li, Glen L Niebur</td>
<td>University of Notre Dame</td>
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<td>9:45</td>
<td>A Phenomenological Model To Describe The Dynamic Viscoelastic Behavior Of The Rabbit Medial Collateral Ligament</td>
<td>Steven D Abramowitch, Savio L-Y Woo</td>
<td>University of Pittsburgh</td>
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<tr>
<td>10:00</td>
<td>Application Of Acoustoelasticity To Nearly Incompressible Materials</td>
<td>Hirohito Kobayashi, Ray Vanderby</td>
<td>University of Wisconsin-Madison</td>
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<td>10:15</td>
<td>Constitutive Relations For Fibril Reorientation In Embryonic Tendon: Thermodynamic Admissibility And Restrictions</td>
<td>Joseph E Olberding, Krishna Garikipati, Ellen Kuhl, Harish Narayanan, Ellen M Arruda, Karl Grosh, Sarah Calve</td>
<td>University of Michigan</td>
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<tr>
<td>10:30</td>
<td>An Analytical Solution For The Stress Field Along Compressive Regions Of Tendon And Its Role On Proteoglycan Synthesis</td>
<td>Victor Birman, Guy M Genin, Stavros Thomopoulos</td>
<td>Department of Orthopaedic Surgery</td>
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<tr>
<td>Time</td>
<td>Session 11G</td>
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<tr>
<td>9:15</td>
<td><strong>Development Of A Robust Three-Dimensional Mathematical Model Of The Cervical Spine.</strong>&lt;br&gt;Carlos G Lopez-Espina, Farid Amirouche&lt;br&gt;<em>University of Illinois at Chicago</em></td>
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<td>9:30</td>
<td><strong>Probabilistic Analysis Of Lower Cervical Spine For Whiplash Injury</strong>&lt;br&gt;Taek H Jang, Stephen Ekwa&lt;br&gt;<em>Texas Tech University</em></td>
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<td>9:45</td>
<td><strong>In Vitro Biomechanical Analysis Of The IVBF Dual-Blade Plate: An Anterior Spinal Fixation Device</strong>&lt;br&gt;Randal P Morris, Kim J Garges, Jinping Yang, Daniel L L Stahl, William L Buford Jr, Rita M Patterson, Shucheng Rao&lt;br&gt;<em>The University of Texas Medical Branch</em></td>
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<td>10:00</td>
<td><strong>Preparation And Rehydration Effects On Compressive Properties Of Cornerstone ASR Cervical Spine Allografts</strong>&lt;br&gt;Andrew J Rapoff, Katia Genovese, Amy Hsiao, Anna E Tietz, Ronald B Bucinell&lt;br&gt;<em>Union College</em></td>
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<td>10:15</td>
<td><strong>Two-Level Cervical Corpectomy With Rigid Screw-Plate System Produces Larger Increase In Facet Loads At Level Superior To The Fusion Level</strong>&lt;br&gt;Mohamed Hussain, Raghu N Natarajan, Gunnar BJ Andersson, Howard S An&lt;br&gt;<em>Rush University Medical Center</em></td>
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<th>Time</th>
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<tr>
<td>9:15</td>
<td><strong>Skeletal Muscle Modeling: A Cross-Bridge Based Mechanism Of Force Depression</strong>&lt;br&gt;David T Corr, Walter Herzog&lt;br&gt;<em>University of Calgary</em></td>
</tr>
<tr>
<td>9:30</td>
<td><strong>Reversible Strain Softening Behavior In Rabbit Detrusor Smooth Muscle</strong>&lt;br&gt;John E Speich, Lindsey Borgsmiller, Christopher Call, Ryan Mohr, Paul H Ratz&lt;br&gt;<em>Virginia Commonwealth University</em></td>
</tr>
<tr>
<td>9:45</td>
<td><strong>Structured Modeling Of Skeletal Muscle During Contraction</strong>&lt;br&gt;Robson R Lemos, Marcelo Epstein, Walter Herzog&lt;br&gt;<em>Universidade de Caxias do Sul</em></td>
</tr>
<tr>
<td>10:00</td>
<td><strong>In-Vivo Force Measurement Using Intramuscular Pressure</strong>&lt;br&gt;Kenton R Kaufman, Jennifer Davis, Thomas Jenkyn, Peter Huijing, Bart Koopman, Tom Wavering, Duane Morrow, Richard L Lieber&lt;br&gt;<em>Mayo Clinic / Mayo Foundation</em></td>
</tr>
<tr>
<td>10:15</td>
<td><strong>Effects Of Extension Rate On Strain Injury Of Skeletal Muscle</strong>&lt;br&gt;Sota Yamamoto, Daisuke Ito, Yoichi Furuyama, Tatsuya Namikiri, Eiichi Tanaka, Masahito Hitosugi, Shogo Tokudome&lt;br&gt;<em>Nagoya University</em></td>
</tr>
<tr>
<td>10:30</td>
<td><strong>Step Size In Single Filaments And Single Myofibrils Is Equal To The Actin-Monomer Spacing Along The Thin Filament</strong>&lt;br&gt;Katya Nagormyak, Xiumei Liu, Olga Yakovenko, Felix Blyakhman, Gerald H Pollack&lt;br&gt;<em>University of Washington</em></td>
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## Session 12A

**Podium Session:** CELL AND MOLECULAR ENGINEERING: CELL ADHESION  
Cascade Ballroom  

**CHAIR:** Andres Garcia  
**CO-CHAIR:** Kristen Billiar

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<tr>
<td>11:00</td>
<td>Increased Adhesion Of Vascular Cells To Nanophase Titanium</td>
<td>Saba Choudhary, Karen M Haberstroh, Thomas J Webster</td>
<td>Purdue University</td>
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<tr>
<td>11:15</td>
<td>Dynamic Substrates To Investigate Cell Migration</td>
<td>Srivatsan Raghavan, Youngeun Kwon, Milan Mrksich, Christopher S Chen</td>
<td>University of Pennsylvania</td>
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<tr>
<td>11:30</td>
<td>Synthesis Of An Artificial Glycocalyx For Studies Of Leukocyte Adhesion</td>
<td>Herbert H Lipowsky, Courtney A Haynes</td>
<td>Pennsylvania State University</td>
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<tr>
<td>12:00</td>
<td>A Model System To Assess And Predict The Key Vascular Cell Responses To Biomaterials</td>
<td>Eugene A Sprague, Julio C Palmaz, Jian Luo</td>
<td>University of Texas Health Science Center</td>
</tr>
<tr>
<td>12:15</td>
<td>Human Mesenchymal Stem Cells Express Palladin</td>
<td>Michelle E Wall, Carol A Otey, Elizabeth G Loboa</td>
<td>North Carolina State University</td>
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## Session 12B

**Podium Session:** CARTILAGE MECHANICS I: MODELING  
Centennial Ballroom ABC  

**CHAIR:** John R. Owen  
**CO-CHAIR:** Nadine O. Chahine

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<tr>
<td>11:00</td>
<td>The Contribution Of Osmotic Pressure To The Effective Compressive Aggregate Modulus Of Bovine Articular Cartilage</td>
<td>Nadeen O Chahine, Faye H Chen, Clark T Hung, Gerard A Ateshian</td>
<td>Columbia University</td>
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<tr>
<td>11:30</td>
<td>Confined And Unconfined Compression Response Of A Poroelastic Octantwise Model For Articular Cartilage</td>
<td>Daniel H Cortes, Jose J Garcia</td>
<td>Universidad del Valle</td>
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<tr>
<td>11:45</td>
<td>Tensorial Electrokinetics In Articular Cartilage</td>
<td>Boris Q Reynaud, Thomas M Quinn</td>
<td>Cartilage Biomechanics Group</td>
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<tr>
<td>12:00</td>
<td>The Cause And Nature Of Collagen Damage After Mechanical Overloading</td>
<td>Wouter Wilson, Rene van Donkelaar, Pieter Buma, Bert van Rietbergen, Rik Huiskes</td>
<td>Eindhoven University of Technology</td>
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<tr>
<td>12:15</td>
<td>A Mechano-Chemical Model For Osmotic Loading Of An Isolated Chondron</td>
<td>Mansoor A Haider, Richard C Schugart, Lori A Setton, Farshid Guilak</td>
<td>North Carolina State University</td>
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### Session 12C

**Podium**

**Session:** CARDIOVASCULAR MECHANICS

**Location:** Centennial Ballroom D

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<tr>
<td>11:00</td>
<td>Reduction In Monocyte Adhesion To Elastic Laminae By Lactose-Impregnation</td>
<td>Christopher R Tieche, Paul K Alkema, Shu Q Liu</td>
<td>Northwestern University</td>
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<tr>
<td>11:15</td>
<td>A Computational Plaque Vulnerability Index Based On Stress/Strain Local Maximal Values For Human Atherosclerotic Plaque Vulnerability Assessment</td>
<td>Chun Yang, Dalin Tang, Jie Zheng, Pamela K Woodard, Jeffrey E Saffitz, Luis A Sanchez, Gregorio A Sicard</td>
<td>Worcester Polytechnic Institute</td>
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<tr>
<td>11:30</td>
<td>Strain Mapping Of LVAD Unloading And Post MI Remodeling</td>
<td>Zhongjun J Wu, Deyannira Prastlein, Ahmet Kilic, Sina Moainie, Michele Egerton, Jennifer R Nash, Michael S Sacks, Bartley P Griffith</td>
<td>University of Maryland</td>
</tr>
<tr>
<td>12:00</td>
<td>A Computational Model For The Initial Stages Of Cardiac Looping</td>
<td>Ashok Ramasubramanian, Kimberly S Latacha, Larry A Taber</td>
<td>Washington University in St. Louis</td>
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<tr>
<td>12:15</td>
<td>Design And Fabrication Of Mechanics-Matching Arterial Graft</td>
<td>Alexander I Rachev, Luc Felden, David N Ku</td>
<td>Georgia Institute of Technology</td>
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### Session 12D

**Podium**

**Session:** VASCULAR HEMODYNAMICS AND PATHOLOGY

**Location:** Centennial Ballroom EF

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<tr>
<td>11:00</td>
<td>MRI-Based Multiscale Models For The Haemodynamic And Structural Evaluation Of Surgically Reconstructed Aortic Arches</td>
<td>Simone Pittaccio, Francesco Migliavacca, Gabriele Dubini, Erik Morre-Pedersen, Ernst-Torben Fruend, Vibeke Hjortdal, Morten Smerup, Marc R de Leval</td>
<td>Consiglio Nazionale delle Ricerche - Istituto per l'Energetica e le Interfasi</td>
</tr>
<tr>
<td>11:30</td>
<td>Correlation Between Haemodynamic Wall Parameters And Intima-Media Thickness In The Carotid Arteries</td>
<td>Alexander D Augst, Xiao Y Xu, Ben Ariff, Simon A Thom, Alun D Hughes</td>
<td>Imperial College London</td>
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<tr>
<td>11:45</td>
<td>In Vivo Assessment Of The Relationship Between Shear Stress And Parameters Of Plaque Vulnerability In Human Coronary Arteries</td>
<td>Frank JH Gijsen, Attila Thury, Jolanda J Wentzel, Johan CH Schuurbeers, Johannes A Schaar, Frits Mastik, Anton FW van der Steen, Patrick W Serruys, Cornelis J Slager</td>
<td>Erasmus MC</td>
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<tr>
<td>12:15</td>
<td>Pulmonary Vascular Resistance And Impedance Changes With Hypertension-Induced Vascular Remodeling In A Mouse Model</td>
<td>Holly A Tuchscherer, Rebecca Vanderpool, Naomi C Chesler</td>
<td>University of Wisconsin</td>
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### Saturday, June 25, 2005  
**11:00 AM - 12:30 PM**  
**Session 12E**

#### Podium: COMPUTATIONAL JOINT BIOMECHANICS  
**Rocky Mountain Ballroom AB**  
**CHAIR:** Lorin P. Maletsky  
**CO-CHAIR:** Paul Rullkoetter

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<tr>
<td>11:00</td>
<td>Effects Of Childhood Obesity On The Distribution Of Mechanical Stresses In The Proximal Tibia</td>
<td>Sarah L Lancianese, David L Gushue, Jiang Yao, Amy L Lerner</td>
<td>University of Rochester</td>
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<td>11:15</td>
<td>Calculation Of Glenohumeral Joint Reaction Force Based On 3D Bone Movements Obtained In Vivo</td>
<td>Takashi Yanagawa, Cheryl J Goodwin, Kevin B Shelburne, Richard J Hawkins, John Tokish, Michael R Torry, Marcus G Pandy</td>
<td>Steadman Hawkins Research Foundation</td>
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<tr>
<td>11:30</td>
<td>Validation And Optimization Of A Single-Specimen Model Of Muscle-Tendon Moment Arms About The Index MCP Joint</td>
<td>Clark R Andersen, William L Buford, Shukuki Koh</td>
<td>University of Texas Medical Branch</td>
</tr>
<tr>
<td>11:45</td>
<td>Subject-Specific Finite Element Modeling Of MCL Mechanics In The ACL-Deficient Knee</td>
<td>Benjamin J Ellis, Michelle S Dalton, Trevor J Lujan, Jeffrey A Weiss</td>
<td>University of Utah</td>
</tr>
<tr>
<td>12:00</td>
<td>Computational Characterization Of The Influence Of MPFL Reconstruction On Medial Patellofemoral Cartilage</td>
<td>John J Elias, Andrew J Cosgarea</td>
<td>Medical Education and Research Institute of Colorado</td>
</tr>
<tr>
<td>12:15</td>
<td>Effects Of Femoral Component And Tibial Insert Alignment On Patellar Kinematics In TKR During Deep Squat: An Explicit Finite Element Analysis</td>
<td>Cathay KT Yeung, David S Barrett, Mark Taylor</td>
<td>University of Southampton</td>
</tr>
</tbody>
</table>

### Saturday, June 25, 2005  
**11:00 AM - 12:30 PM**  
**Session 12F**

#### Podium: BONE MECHANICS I: MICROMECHANICS  
**Rocky Mountain Ballroom CD**  
**CHAIR:** Liming Voo  
**CO-CHAIR:** Iwona Jasiuk

<table>
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<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:00</td>
<td>Three-Dimensional Imaging Of Microdamage In Bone Using Micro-CT</td>
<td>Xiang Wang, Huijie Leng, Ryan K Roeder, Glen L Niebur</td>
<td>University of Notre Dame</td>
</tr>
<tr>
<td>11:30</td>
<td>Anatomical Variation In The Elastic Anisotropy Of Human Cortical Bone Tissue Depends On The Orientation Distribution Of Bone Mineral</td>
<td>Weimin Yue, Alejandro A Espinoza Orłas, John E Renaud, Ryan K Roeder</td>
<td>University of Notre Dame</td>
</tr>
<tr>
<td>11:45</td>
<td>Effects Of Fatigue Microdamage On Local Bone Tissue Properties</td>
<td>Tamim Diab, Deepak Vashishth</td>
<td>Rensselaer Polytechnic Institute</td>
</tr>
<tr>
<td>12:00</td>
<td>Osteon Pushout Microtesting Of Human Cortical Bone</td>
<td>Henry X Zhang, Edward X Guo</td>
<td>Columbia University</td>
</tr>
<tr>
<td>12:15</td>
<td>A Shear Lag Model Of Micrdamage Formation In Bone</td>
<td>Xiaodu Wang, Chunjiang Qian</td>
<td>MEB/UTSA</td>
</tr>
</tbody>
</table>
### Session 12G: Injury Biomechanics I

**Podium:** Creekside Room  
**CHAIR:** Brian Stemper  
**CO-CHAIR:** Narayan Yoganandan  

**11:00 AM - 12:30 PM**

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<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:00</td>
<td>Temporary Cavity Pulsation And Pressure Change In Brain Simulant Due To Penetrating Impact</td>
<td>Jiangyue Zhang, Yabo Guan, Narayan Yoganandan, Frank A Pintar</td>
<td>Medical College of Wisconsin</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pintar, Thomas A Gennarelli</td>
<td></td>
</tr>
<tr>
<td>11:15</td>
<td>The Development Of A Preliminary Finite Element Model Of The Human Lumbar Sacral Spine</td>
<td>Yabo Guan, Jason Moore, Jiangyue Zhang, Frank A Pintar, Narayan Yoganandan, Joseph F Cusick, Dennis J Maiman</td>
<td>VA Medical Center, Milwaukee, WI</td>
</tr>
<tr>
<td>11:30</td>
<td>Gender-Dependent Cervical Spine Anatomy May Affect Whiplash Kinematics</td>
<td>John J DeRosia, Brian D Stemper, Narayan Yoganandan, Frank A Pintar</td>
<td>Medical College of Wisconsin</td>
</tr>
<tr>
<td>11:45</td>
<td>Biomechanical Analysis Of Headform Impacts Into Automobile Side Glazing</td>
<td>Stephen A Batzer, Kerry A Allen, Mark R Martin, Jeffrey L Evans, Donald R Phillips</td>
<td>Rentrof Engineering, Inc.</td>
</tr>
<tr>
<td>12:00</td>
<td>Dynamic Bending Stiffness Of Thoracic Motion Segments</td>
<td>Brian D Stemper, Derek Board, Narayan Yoganandan, Frank A Pintar</td>
<td>Medical College of Wisconsin</td>
</tr>
<tr>
<td>12:15</td>
<td>The Influence Of Roof Crush On Glazing Retention And Occupant Containment In Rollovers</td>
<td>Stephen Forrest, Tia Orton, Brian Herbst, Steven Meyer, Anthony Sances, Srirangam Kumaresan</td>
<td>Safety Analysis and Forensic Engineering (SAFE) L.L.C.</td>
</tr>
</tbody>
</table>

### Session 12H: Brain Mechanics

**Podium:** Exhibit Hall  
**CHAIR:** Ali Sadegh  
**CO-CHAIR:** Liying Zhang  

**11:00 AM - 12:30 PM**

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<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
<th>Institution</th>
</tr>
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<tbody>
<tr>
<td>11:00</td>
<td>On The Role Of The Brain’s Geometry In Closed Head Injuries</td>
<td>Martin Burtscher, Igor Szczurba</td>
<td>University of Northern Colorado</td>
</tr>
<tr>
<td>11:15</td>
<td>Strain Distribution In Brain Tissue Of Rats Subjected To Closed Head Injury Is Age-Dependent</td>
<td>Amit Gefen, Anna Levchakov, Eran Linder-Ganz, Susan S Margulies, Ramesh Raghupathi</td>
<td>Tel Aviv University</td>
</tr>
<tr>
<td>11:30</td>
<td>Material Characterization Of Low Density Polyurethane Foam Used For Traumatic Brain Injury Modeling</td>
<td>Liying Zhang</td>
<td>Wayne State University</td>
</tr>
<tr>
<td>11:45</td>
<td>Damping Characteristic Of Subarachnoid Trabeculae In Rotational Head Impact</td>
<td>Mohamad Zoghi-Moghadam, Ali M. Sadegh</td>
<td>The City College of The City University of New York</td>
</tr>
<tr>
<td>12:00</td>
<td>Acute Increases In Neuronal Membrane Permeability In The Rat Brain Following Mechanical Trauma Positively Correlate With Strain</td>
<td>Gustavo R Prado, Liying Zhang, Albert I King, King H Yang, Michelle C LaPlaca</td>
<td>Georgia Institute of Technology</td>
</tr>
<tr>
<td>12:15</td>
<td>Impact Mechanics And Histopathological Characterization Of Closed Brain Injury In The Rat Induced By A New Mechanism</td>
<td>Ronald J Fijalkowski, Benjamin M Ellingson, Frank A Pintar, Narayan Yoganandan, Thomas A. Gennarelli</td>
<td>VA Medical Hospital</td>
</tr>
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Saturday, June 25, 2005
12:30 - 2:00 PM
Session 13

Poster Session:  

**POSTER III:** General Poster Session

**Rocky Mountain Garden**

III-1  Wireless Electrocardiograph Based On Bluetooth
Juan C Tejero, Miguel A Lopez, Antonio Bernal, Carmen Lopez  
University of Malaga

III-2  Wireless Electrocardiograph Based On IEEE 802.11
Juan C Tejero, Miguel A Lopez, Antonio Bernal, Carmen Lopez  
University of Malaga

III-3  Magnetic Particle Suspension Flows Under External Magnetic Guidance
Kenneth E. Kasza, Fon-Chieh Chang  
Argonne National Laboratory

III-4  Identification And Characterization Of Deposited Fibronectin On Biocompatible Materials: Comparison Of Electrospray And Wetting Methods
Meng-Jiy Wang, Hannah K. Heywood, Dan L. Bader, Mark D. Paine, John P.W. Stark, David A. Lee  
Queen Mary University of London

III-5  Preliminary Study Of Hands-Free Interface For Wearable Computer Using Ocular Potential
Fumio Mizuno, Tomoaki Hayasaka, Ken-ichi Tsubota, Shigeo Wada, Takami Yamaguchi  
Tohoku University

III-6  Snoring Source Identification Using Structure Intensity Method
Z.S. Liu, X.Y. Luo, H.P. Lee, C. Lu  
University of Glasgow

III-7  Recent Progress In The Development And Chronic Animal Testing Of The National Cardiovascular Center Heparinless Ecmo System
Eisuke Tatsumi, Yoshiyuki Taenaka, Nobumasa Katagiri, Toshihide Mizuno, Kei Ota, Masaki Sato, Hidenori Tanaka, Kazunari Sakai, Toshiaki Matsuda  
National Cardiovascular Center Research Institute

III-8  Performance Comaparison Of Different Methods For Heart Sounds Localization
Azadeh Yadollahi, Mohammad B. Shamsollahi, Zahra Moussavi, Zahra Ahmadianjed  
Sharif University of Technology

III-9  Pressure-Flow Characteristics During Persitaltic Transport Of Bingham Fluid In Distensible Tube With Different Wave Forms
Prasanna Hariharan, Seshadri V, Rupak K Banerjee  
University of Cincinnati

III-10  Paretic Leg Contributions To Walking Speed In Persons With Post-Stroke Hemiparesis
Steven A Kautz, Chitralakshmi K Balasubramanian, Mark G Bowden, Richard R Neptune  
Malcom Randall VA Medical Center

III-11  2D Computational Model Of Blood Circulation In Organs Coupled With The Net Model Of Large Vessels
Dmitry I. Isaikin, Alexey V. Evdokimov, Alexander S. Kholodov, Sergey S. Simakov  
Moscow Institute of Physics and Technology

III-12  Systematic Exploration Into The Hemodynamic Effect Of An Out-Of-Plane Internal Carotid Artery
Neil W Bressloff, Clif P Shearman  
University of Southampton

III-13  Myocardial Tissue Velocity Measured By Magnetic Resonance Phase Velocity Mapping
John N Oshinski, Jana G Delfino, Mohit Bhasin, Robert L Eisner, Angel R Leon  
Emory University/Georgia Institute of Technology

III-14  Inlet Conditions In Hemodynamics - Effects Of Secondary Flow On Modeled Wall Shear Stress At The Carotid Bifurcation
Keri R Moyle, Luca Antiga, David A Steinman  
Robarts Research Institute
III-16 Increased Capillary Transport May Cause Postflight Orthostatic Intolerance
M Keith Sharp
University of Louisville

III-17 A Compact, Three-Element Simulator Bench Of The Systemic Circulation Suitable For Use With Particle Suspensions
Riccardo Vismara, Gianfranco B. Fiore, Roberto Fumero
Politecnico di Milano

III-18 Hemodynamics And Plaque Formation In A CT-Scan Based Model Of The Femoral Artery Bifurcation
Rohan A More, Brigitta C Brott, Alan M Shih, Yasushi Ito, Gilberto Russo, Andreas S Anayiotos
University of Alabama at Birmingham

III-19 Adenoviral Delivery Of VEGF Promotes Short Term Angiogenic Effect
Matthew J Gounis, Baruch B Lieber, Keith A Webster, Maria G Spiga, Nanette H Bishopric, Ajay K Wakhloo
University of Miami

III-20 In-Vitro Investigation Of Vortex Formation Past Mechanical And Biological Bileaflet Heart Valve Prostheses
Olga Pierrakos, Pavlos P Vlachos
Virginia Tech

III-21 A Study Of The Thermophysical Properties And Moisture Sorption Characteristics Of Trehalose-PBS Glasses
Ranjian Sitaula, Sankha Bhowmick
University of Massachusetts Dartmouth

III-22 Analysis Of The Unsteady Flow And Forces In AAA Endovascular Stent Graft Patient And A Healthy Patient
Harry A Dwyer, Tom Kim, Ben Howell, Angela Cheer, David Saloner, Tim Chuter
University of California, Davis

III-23 Relevance Of Modeling Non-Newtonian Blood Properties When Computing Wall Stresses Of Aortic Aneurysms
Khalil Khanafer, Prateek Gadhoke, Ramon Berguer, Joseph L. Bull
The University of Michigan

III-24 Numerical Evaluation Of The Viscous Dissipation Method To Assess The Energetic Performance Of The Total Cavopulmonary Connection
Suresh R Balasubramanian, George P Chatzimavroudis
Cleveland State University

III-25 A Multiscale Computational Study Of Blood Flow In Human Renal Arteries
Liang Fuyou, Liu Hao
Chiba University

III-26 Flow Structures In The Human Cystic Duct
Renn C Ooi, Xiao-Yu Luo, S B Chin, Alan G Johnson, Nigel C Bird
University of Glasgow

III-27 Towards The Direct Numerical Simulation Of Flow In A Diseased Carotid Artery
Bassam A Younis, Sebastian Spring, Olaf Neumann, Bernhard Weigand
University of California, Davis

III-28 Pre-Fontan Surgery Computational Fluid Dynamic Analysis Of Three Glenn Stage Anatomies
Kerem Pekkan, Dennis D Soerensen, James W Parks, Hiroumi Kitajima, Denver Sallee, Mark Fogel, Ajit P Yoganathan
Georgia Institute of Technology
III-29 Numerical Prediction Of Shear Stress Induced Hemolysis
Juntao Zhang, Timothy DC Nolan, Michele A Egerton, Bartley P Griffith, Zhongjun J Wu
University of Maryland School of Medicine

Shigeo Wada, Masatoshi Sato, Ken-ichi Tsubota, Takami Yamaguchi
Tohoku University

III-31 The Influence Of Surgical Technique On Mass Transport Disturbances In Downstream Bypass Graft/Artery Junctions
Paul D Devereux, Siobhan M O'Callaghan, Thomas O'Brien, Michael Walsh, Tim McGloughlin
University of Limerick

III-32 Computational Study Of Blood Flow In The Cerebral Arterial Circle Of Willis
Marie Y Oshima, Ryo Torii, Masayuki Hoshina
The University of Tokyo

III-33 Parametric Characterization Of The FSI In The Lateral Semicircular Canal During The Caloric Test
Mohammad Kassemi, Dimitri Deserranno, John Oas
NASA Glenn Research Center

III-34 Modeling Pressure Drop In The Human Biliary System
University of Glasgow

III-35 The Effect Of Ureteric Stents On Urine Flow
Jennifer H Siggers, Linda J Cummings, Sarah L Waters, Jonathan AD Wattis
University of Nottingham

III-36 Assessment Of MR Angiography Using In-Vitro Models And Computer Simulation
Adrian KL Lee, David F Firmin, Denis J Doorly
Imperial College, London

III-37 Bileaflet Mechanical Heart Valve Hinge Region Flows
Josie Carberry, Helene Simon, Hwa Liang Leo, Ajit Yoganathan
Georgia Institute of Technology

III-38 Quantifying 3-D Anisotropic Inhomogeneous Turbulence Dissipation In Left Ventricular Flows Using An Large Eddy PIV Method
Olga Pierrakos
Virginia Tech

III-39 Flow Evaluation Of Stents In A 180 Degree Curved Tube With Filters
Dieter W Liepsch
Munich University of Applied Sciences

III-40 Right Ventricular-Pulmonary Vascular Coupling In Mice
Naomi C Chesler, Timothy A Hacker
University of Wisconsin

III-41 Representing CFD Results In A Realistic Diagnostic Ultrasound Format: Improving Predictive And Remote Diagnostics For Space Medicine
Jerry G Myers, Theresa Guo, John P Kizito, Michael Phelan
NASA Glenn Research Center

III-42 Investigation Of The Onset Of Flow Limitation And Oscillation In Laminar Aqueous Flow Through A Collapsing Tube Segment
Christopher D Bertram, Joe Tscherry
University of New South Wales

III-43 Comparison Of Linear Theory With Wave Propagation Experiments In Flexible Vessels With Wall Thickness Variation And Geometric Tapering
Christina G Giannopapa, Marcel C. M Rutten, George Papadakis, Frans N. van de Vosse, Arris S. Tijseling
Eindhoven University of Technology

III-44 Phase Averaging Of Arterial Pulse Waves
Clifton R Johnston, Matthew J Schaefer, Robert J Martinuzzi
University of Calgary

Michael T Capozzi, J. Douglas Swarts, Samir N Ghadiali  
Lehigh University

III-46 Utility Of A Simple Harmonic Oscillator Model For Non-Invasively Evaluating Vascular Reactivity In Children With Pulmonary Hypertension  
Osama M Mukdadi, Craig Lanning, Karrie Dyer, Dunbar Ivy, Robin Shandas  
The Children's Hospital

III-47 Theoretical Prediction Of Optimal Cooling Rates For Human Adipose Derived Adult Stem (ADAS) Cells.  
Sreedhar Thirumala, Sanjin Zvonic, Elizabeth Floyd, Jeffrey Gimble, Ram Devireddy  
Louisiana State University

III-48 Design Of Tissue Phantom For Blood Perfusion Measurements  
Caroline M Comas, Ashvinikumar Mudaliar, Thomas E Diller, Elaine P Scott  
Virginia Tech

III-49 Numerically Predicted Thermal Distortions Due To Nucleation Of Cells Embedded In An Extracellular Suspension  
Deepak Kandra, Devireddy Ram  
Louisiana State University

III-50 Individual Muscular Lower Limb Force Assessment During Sprint Cycling From Physiological Cross-Section Area Criteria  
Ines Benkhemis, William Bertucci, Redha Taiar  
Universite de Poitiers

III-51 Impact Characteristics Of Soccer Balls  
Brandon M Chaffin, Joe M Guerricabeitia, Anthony J Paris  
Boise State University

III-52 The Effect Of Swimmer’s Hand/Forearm Acceleration On Propulsive Forces Generation Using Fluid Dynamics  
Luis J Leal, Rouboa Abel  
University of Tras-os-Montes e Alto Douro

III-53 Determining Foam Parameters For Complex Biomechanical Loading Simulations  
Marc T Petre, Erdemir E Ahmet, Cavanagh R Peter  
Cleveland Clinic Foundation

III-54 Thermodynamics Of Osmosis  
Larry D Howlett  
HTMD Engineering

III-55 Changes In The Cytoskeleton Of Endothelial Cells Exposed To Therapeutic Ultrasound Sonication  
Dalit Raz, Uri Zaretsky, Shmuel Einar, David Elad  
Tel Aviv University

III-56 A Newly Designed Micro Tensile Tester With Feed Back Control For Viscoelastic Analysis Of Single Isolated Smooth Muscle Cells  
Kazuaki Nagayama, Shinichiro Yanagihara, Takeo Matsumoto  
Nagoya Institute of Technology

III-57 Osmotic Swelling As A Means To Tense The Membrane And Stress Adhesions  
Shamik Sen, Manorama Tewari, Dennis Discher  
University of Pennsylvania

III-58 A System For Measurement Of The Electrical Response Of Animal Cells To Mechanical Stimuli  
Miller Santiago Hung, Alba Avila, Juan Carlos Briceno  
Universidad de los Andes

III-59 Biomaterial Particles Stimulate Glial Cell Response In Vitro  
Roche C de Guzman, Pamela J VandeVord  
Wayne State University

III-60 Decorin Core Protein As A Reinforcing Mechanism In Type I Collagen Molecule  
Simone P Vesentini, Franco M Montevecchi, Alberto Redaelli  
Politecnico di Milano
III-61 The Effect Of Waveform Frequency And Amplitude On Vascular Endothelial Cell Gene Expression
Heather A Himburg, Morton H Friedman Duke University

III-62 Adhesive Property Of Leukocytes To Endothelial Cells In Cocultured Model Exposed To Fluid Shear Stress
Naoya Sakamoto, Masaki Oi, Yosuke Ueki, Toshiro Ohashi, Masaaki Sato Tohoku University

III-63 Biomechanics Experimental Design Laboratory For Undergraduates
Amit Gefen Tel Aviv University

III-64 Design, Construction And Impact Testing Of A Hip Surrogate: An Undergraduate Biomechanics Design Project
Alan W Eberhardt, Brandon S Etheridge, Zoe EB Dwyer University of Alabama at Birmingham

III-65 Strength Of Suture-Tendon Interface Increased By Eyelet Modification
Chunfeng Zhao, Yu-Long Sun, Chao Yang, Mark E Zobitz, Peter C Amadio, Kai-Nan An Mayo Clinic

III-66 Fracture Toughness And Fracture Crack Propagation Rate Of Short Fiber Reinforced Epoxy Composites For Analogue Cortical Bone
Alexander Chong, Elizabeth Friis University of Kansas

III-67 Fatigue Performance Of Composite Analogue Femur Constructs
Alexander C M Chong, Elizabeth A Friis, Gregory P Ballard, Peter J Czuwala, Francis W Cooke University of Kansas

III-68 Influence Of Tip Size On The Indentation Equilibrium Elastic Modulus Of Articular Cartilage
Narendra K Simha, Melanie L Hall, Sidharth S Chiravarambath, Hui Jin, Jack L Lewis University of Minnesota

III-69 Finite Element Modelling And Stress Analysis Of A Spinal Titanium Alloy Implant
Yi Jia, Christopher Ramos Garcia, Jiman Han University of Puerto Rico at Mayaguez

III-70 The Biomechanical Behavior Of Spinal-Pelvic Fixation Assemblies With Stainless Steel And Titanium Rods In A Vertebrectomy Model
Anthony J Paris, Michelle B Sabick, Joseph C Guarino, Howard King Boise State University

III-71 Bidirectional Implantable Microsystems For Retinal Prosthesis
Mohammad I Talukder, Pepe Siy, Gregory Auner Wayne State University

III-72 Regional Characterization Of Porcine Mandibular Condyle Cartilage
Gregory J Miller, Jack Kent, Cindy Chung, Steven B Nicoll University of Pennsylvania

III-74 Histology Of Pulmonary Arteries In Pulmonary Hypertension: Monocrotaline-Treated And Hypoxic Long-Evans Rats
Chris N McCowan, C Cool, D Ivy, R Shandas NIST, Materials Reliability Division

III-75 A Robust Fuzzy Control Design Of Yeast Cultures In Continuous Bioreactors
Yung Yue Albert Chen Industrial Technology Research Institute

III-76 Optimal Hyperthermia Protocol Design Through Inverse Modeling For Prostate Cancer Treatment By Controlling HSP Expression
Marissa N Rylander, Yusheng Feng, Kenneth R Diller, Jason Stafford, John Hazle, John Bass University of Texas at Austin
III-78 **Electrospun Polyesterurethane Membranes Provide A Substrate For Skeletal Muscle Cell Differentiation**
Duncan ET Shepherd, Alan J Johnstone
University of Birmingham

III-79 **Commercial Extracellular Matrices For Rotator Cuff Tendon Repair Or Reinforcement**
Andrew R Baker, Michael J DeFranco, Joseph P Iannotti, Kathleen A Derwin
Cleveland Clinic Foundation

III-80 **Spinal Fusion With Bioabsorbable Cages: The Influence Of Material Composition**
Theo H Smit, Matthijs R Krijnen, Vincent Everts, Paul I Wuisman
Vrije Universiteit Medical Center

III-81 **Multi-Scale In Silico Modeling Of Angiogenesis**
Charles W Patrick Jr, Shuyu Sun, Mandri Obeyesekere, Mary Wheeler
University of Texas M.D. Anderson Cancer Center

III-82 **Endothelialization And Flow Conditioning Of Fibrin-Based Media-Equivalents**
Brett C Isenberg, Chrysanthi Williams, Robert T Tranquillo
University of Minnesota

III-83 **Gene Expression In A 3-Dimensional Model Of Angiogenesis: Relation To Matrix Mechanical Properties**
Laxminarayanan Krishnan, Hoa Nguyen, Helen Song, James B Hoying, Jeffrey A Weiss
University of Utah

III-84 **Quantitative Analysis Of A Candidate Porosity Reference Scaffold: Type 1**
Joy P Dunkers, John A Tesk, David Dean, Malcolm N Cooke, Richard A Ketcham, Marcus T Cicerone
National Institute of Standards and Technology

III-85 **The Characterization Of Human Cortical Bone Quality By Nuclear Magnetic Resonance**
Qingwen Ni, Daniel P Nicolella, Juffry S Nyman
Southwest Research Institute

III-86 **Runx2-Genetically Engineered Cells For Bone Tissue Engineering**
Charles A Gersbach, Jennifer E Phillips, Robert E Guldberg, Andres J Garcia
Georgia Institute of Technology

III-87 **Osteogenic Differentiation Of Human Adipose-Derived Stem Cells: The Effects Of Initial Cell Plating Density**
Caren E Petrie, Lauren S Sefcik, Sunil Tholpady, Adam Katz, Roy Ogle, Edward Botchwey
University of Virginia

III-88 **Dose-Dependent Effects Of Pro-Inflammatory Cytokines IL-1 And TNF On Tissue-Engineered Cartilage**
Benjamin A Byers, Robert L Mauck, Rocky S Tuan
National Institutes of Health

III-89 **Effects Of Plane Shock Waves On Endthelial Cells In Vitro**
Masaaki Tamagawa, Masanobu Kitayama
Kyushu Institute of Technology

III-90 **Tissue-Engineered Model For Evaluating Skeletal Muscle Damage**
Debby Gawlitta, Kristel JM Boonen, Cees WJ Oomens, Frank PT Baaijens, Carlijn VC Bouten
Eindhoven University of Technology

III-91 **Bile Canalicular Formation In 3D Stacked-Up Culture Of Rat Small Hepatocytes And Nonparenchymal Cells**
Ryo Sudo, Toshihiro Mitaka, Mariko Ikeda, Kazuo Tanishita
Keio University

III-92 **Tissue-Engineered Heart Valves With Circumferential Fiber Alignment And Anisotropic Mechanical Properties From Cell-Remodeled Fibrin**
Paul S Robinson, Robert T Tranquillo
University of Minnesota

III-93 **Tubular Constructs For Studying The Mechanical And Functional Properties Of Engineered Cardiac Tissue**
III-94 Functional Tissue Engineering Using Small Intestinal Submucosa Improves The Mechanical Properties Of The Healing Medial Collateral Ligament In Rabbits
Daniel K. Moon, Yoshiyuki Takakura, Steven D. Abramowitch, Savio L.-Y. Woo
University of Pittsburgh

III-95 Contraction In Collagen-Fibroblast Gels: Strain Measurements Using Digital Image Correlation
Sarah C Baxter, Timothy G Rekers, Edie C Goldsmith
University of South Carolina

III-96 Mechanical Characterization Of Growth In Fibrin-Based Tendon Constructs
Sarah Calve, Fatima N Syed, Robert G Dennis, Karl Grosh, Krishna Garikipati, Ellen M Arruda
University of Michigan

Sreedhar Thirumala, Sanjin Zvonic, Elizabeth Floyd, Jeffrey Gimble, Ram Devireddy
Louisiana State University

III-98 A New Method For In-Situ Harvesting Of A Target Cell
Hiroshi Takamatsu, Hiroyuki Okano, Yuko Fukuda, Takehisa Matsuda
Kyushu University

III-99 The Influence Of Cell Density And The RhoA Pathway On The Differentiation Of Adipose-Derived Mesenchymal Cells
Diane R Wagner, Yue Xu, Dennis R Carter, Michael T Longaker
Stanford University

III-101 Human Hepatic Stem Cell Expansion And Specificity Cell Labeling For Micro-MRI And Micro-PET Tracking
Randall E McClelland, Eliane Wauthier, Eva Schmelzer, Edward Hsu, Lola Reid
University of North Carolina - Chapel Hill

III-102 Enhanced Chondrogenesis And Development Of Mechanical Properties Of Human Mesenchymal Stem Cells Seeded In A Self-Assembling Peptide Hydrogel
Robert L Mauck, Jeannine M Helm, Rocky S Tuan
National Institutes of Health

III-103 Tools And Concepts For Controlling Transport For In Vitro Engineering Of Cartilage
Abraham D Stroock, Mario Cabodi, Christopher S Lee, Nak Won Choi, Jason P Gleichorn, Jamie Manos, Lawrence J Bonassar
Cornell University

III-104 Mechanical Behaviour Of A Mathematical Model Of An Abdominal Aortic Aneurysm Subject To A Propagating Pulse Wave
Paul N Watton, Nicholas A Hill, Simon Dodds
University of Glasgow

III-105 Effect Of Frequency Of Cyclic Tensile Strain On Expression Of Alpha-Actin In Vascular Smooth Muscle Cells Of Rats
Zonglai Jiang, Ming-juan Qu, Bo Liu, Han-qin Wang, Yu-lan Bian, Zhi-qiang Yan
Shanghai Jio Tong University

III-106 In Vivo And Ex Vivo Measurement Of Mouse Pulmonary Artery Length Using Contrast-Enhanced Microcomputed Tomography
Ryan W Kobs, Jamey P Weichert, Naomi C Chesler
University of Wisconsin

III-107 Investigation On Residual Stress Effects In FE Simulations Of Balloon Angioplasty
Simona Celi, Francesca Di Puccio, Paola Forte, Loris Spadoni
Dipartimento Ingegneria Meccanica, Nucleare e della Produzione

III-108 Biomechanical Proprieties Of Decellularised Porcine Common Carotid Arteries
Sylvain Roy, Paolo Silacci, Nikos Stergiopulos
Swiss Federal Institute for Technology
III-109  **Contribution Of Individual Structural Components To The Biomechanical Properties Of Carotid Arteries**  
Edouard E Fonck, Luca Augsburger, Makoto Ohta, Paolo Silacci,  
Daniel Rufenacht, Nikos Stergiopulos  
*EPFL / SV-LHTC*

III-110  **Modeling Of Pulmonary Artery Mechanics In Children With Pulmonary Hypertension**  
Yanhang Zhang  
*University of Colorado at Boulder*

III-111  **Utilization Of True Grid In Building A Hexahedral Femur Mesh**  
Alexandra Schonning, Binu Oommen, Irina Ionescu, Ted Conway  
*University of North Florida*

III-112  **Effects Of Immobilization On In Vivo Strains In The Rabbit Femur: Long-Time Measurement With A Telemetric System**  
Ei Yamamoto, Nobuhiko Kusumoto  
*Kinki University*

III-113  **Decalcification Of Coral As A Possible Model Of Osteoporosis In Trabecular Bone**  
Allen H Hoffman, Alexander J Curry, Sean M Baril, Christopher Drost  
*Worcester Polytechnic Institute*

III-114  **Image-Based Interpolation Of Anisotropic Elastic Constants**  
Andrew J Rapoff, Raphael T Haftka  
*Union College*

III-115  **A Three-Layer Orthotropic Model For Swelling And Curling Of Articular Cartilage**  
Leo Q Wan, Chester Miller, X E Guo, Van C Mow  
*Columbia University*

Francesca Gervaso, Giancarlo Pennati, Federica Boschetti  
*Politecnico di Milano*

III-117  **Experimental Measurement Of The Three-Dimensional Strain Field And Molecule Diffusion Coefficient In Articular Cartilage Under Static Compression Loading**  
Greg J Wolos, John E Novotny  
*University of Delaware*

III-118  **Identification Of The Testing Parameters In High Frequency Dynamic Shear Measurement Of Agarose Gels**  
Qingshan Chen, Stacie I Ringleb, Kai-Nan An  
*Mayo Clinic*

III-119  **The Effect Of Boundary Conditions On Dispersive And Non-Dispersive Systems Using Magnetic Resonance Elastography And Finite Element Analysis**  
Qingshan Chen, Stacie I Ringleb, Armando Manduca, Richard L Ehman, Kai-Nan An  
*Mayo Clinic*

III-120  **Analysis Of Cervical Dynamics During Pregnancy**  
Osnat Eytan, Yariv Eisenberg, Ariel J Jaffa, David Elad  
*Tel-Aviv Sourasky Medical Center*

III-121  **Aortic Root Surgery: 3-D Computational Model For The Simulation Of The Valve Sparing Corrections**  
Monica S Soncini, Emiliano Votta, Silvia Zinicchino, Valeria Burrone, Andrea Mangini, Massimo Lemma, Alberto Redaelli  
*Politecnico di Milano*

III-122  **Analysis Of The Geoform Prosthetic Ring Through Computational Modelling: A Preliminary Study**  
Emiliano Votta, Monica Soncini, Francesco Maisano, Ottavio Alfieri, Franco Maria Montevecchi, Alberto Redaelli  
*Politecnico di Milano*

III-123  **Dynamic Behaviour Of Aortic And Chorded Mitral Prostheses**  
Paul N Watton, Xiao Y Luo  
*University of Glasgow*

III-124  **Mimicking Physiological Cardiac Function In An In-Vitro Set-Up For Testing Heart Valves**  
Lars van Gerven, Marcel Rutten, Rene van de Molengraft, Peter Bovendeerd, Frans van de Vosse  
*Eindhoven University of Technology*
2005 Summer Bioengineering Conference – Final Technical Program

Zhaoming He, Michael Sacks, Shasan Liou, Jorge Jimenez, Ajit Yoganathan  
Georgia Institute of Technology

III-126  
**Synthetic Intervertebral Disc For Medical Education**  
Nicolas Vincent Jaumard, Elizabeth Friis, Susan Michelle Williams, Robert Richards  
University of Kansas

III-127  
**Computational Model Of Aqueous Humor - Iris Dynamics**  
Eric C Huang, Victor H Barocas  
University of Minnesota

III-128  
**Numerical Study Of Flow Through Cancerous-Type Network Structures**  
C. S. Konig, Q. Long  
Brunel University
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<th>Time</th>
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<tbody>
<tr>
<td>8:00</td>
<td>Integrating Gene Expression And Metabolic Profiles To Infer Pathways And Networks That Confer Palmitate Induced Cytotoxicity In HEPG2 Cells</td>
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<td>Zheng Li, Shireesh Srivastava, Christina Chan</td>
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<td>8:15</td>
<td>Dynamic Compression Activates Chondrocyte Calcium Signaling In A Cycle Dependent Manner Involving The Release Of ATP</td>
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<td>Belinda Pingguan, David A Lee, Dan L Bader, Martin M Knight</td>
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<td>8:30</td>
<td>Effects Of Dynamic Osmotic Loading On Chondrocyte Calcium Response And Gene Expression</td>
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<td>Pen-hsiu Grace Chao, Clark T Hung</td>
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<td>8:45</td>
<td>Analysis Of Cytoplasmic And Nuclear RNA In Living Cells Using Peptide-Linked Molecular Beacons</td>
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<td>Nitin Nitin, Charles Glaus, Gang Bao</td>
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<td>9:00</td>
<td>Live Cell Imaging Of Messenger RNA Co-Localization With Mitochondria</td>
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<td>Philip J. Santangelo, Nitin Nitin, Gang Bao</td>
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<td>9:15</td>
<td>Understanding The Underlying Mechanisms Leading To Pressure Ulcers</td>
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<td>Anke Stekelenburg, Cees WJ Oomens, Gustav J Strijkers, Klaas Nicolay, Dan L Bader</td>
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<tr>
<th>Time</th>
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<tr>
<td>8:00</td>
<td>Osteochondral Matrix Response To Severe Joint Trauma</td>
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<td>Dejan Milentijevic, Koosha Aslani, Hollis G Potter, Peter A Torzilli</td>
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<td>8:15</td>
<td>Mechanical And Cellular Response Of Osteochondral Tissue During Impaction Grafting</td>
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<td>Markus A Wimmer, Sascha Mueller, Tamara Pylawka, Uwe-Jens Goerke, Brian J Cole, James M Williams</td>
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<td>8:30</td>
<td>Biphasic Micro-Indentation Testing Of Mouse Articular Cartilage Reveals Functional Changes In A Type IX Collagen Knockout Model Of Osteoarthritis</td>
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<td>Li Cao, Inchan Youn, Yefu Li, Farshid Guilak, Bjorn R Olsen, Lori A Setton</td>
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<td>8:45</td>
<td>Mineralization And Nanomechanical Properties In Articular Calcified Cartilage</td>
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<td>Virginia L Ferguson, Michelle L Oyen, Alan Boyd, Andrew J Bushby</td>
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<td>9:00</td>
<td>Optical Measurement Of In Situ Strain Fields Within Bovine Humeral Head Articular Layer</td>
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<td>Clare E Canal, Nadeem O Chahine, Elizabeth T Chorney, Gerard A Ateshian</td>
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<td>9:15</td>
<td>Durability Testing Of Articular Cartilage Replacements</td>
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<td>Rebecca J Covert Brown, David N Ku</td>
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<td>Time</td>
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<tr>
<td>8:00</td>
<td><strong>Hemodynamics Assessment Of Three Polymeric Heart Valves Using Three-Dimensional Particle Image</strong></td>
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<td>Velocimetry</td>
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<td>Hwa Liang Leo, Lakshmi Prasad Dasi, Josie Carberry, Ajit Yoganathan</td>
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<td><strong>Georgia Institute of Technology</strong></td>
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<td>8:15</td>
<td><strong>Flow Performance Of Mechanical Heart Valves As Pulmonary Valves</strong></td>
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<td>Richard Figliola, Jeremy Losaw, Jeffrey Goheen, Timothy Conover, Tim McQuinn, Donald Beasley</td>
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<td><strong>Clemson University</strong></td>
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<td>8:30</td>
<td><strong>Mechanical Heart Valve Closure Dynamics</strong></td>
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<td>Keefe B Manning, Luke H Herbertson, Arnold A Fontaine, John M Tarbell, Steven Deutsch</td>
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<td><strong>The Pennsylvania State University</strong></td>
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<td>8:45</td>
<td><strong>Flow Induced Platelet Activation In Prosthetic Heart Valves - In Vitro And Numerical Studies</strong></td>
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<td>Danny Bluestein, Wei Yin, Yared Alemu, Min Zhou, Foluso Ladeinde, Richard Schoephoerster, Jolyon Jesty</td>
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<td><strong>Stony Brook University</strong></td>
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<td>9:00</td>
<td><strong>The Bileaflet Valve Opening Process: A Fluid-Structure Interaction Study</strong></td>
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<td>Alberto C Redaelli, Monica Soncini, Gianfranco B Fiore, Matteo Nobili, Emiliano Votta, Umberto Morbiducci, Costantino Del Gaudio, Antonio Balducci, Mauro Grigioni</td>
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<td><strong>Politecnico di Milano</strong></td>
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<td>9:15</td>
<td><strong>Numerical Simulation Of Flow In Mechanical Bileaflet Heart Valves</strong></td>
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<td>Liang Ge, Chang Wang, Hwa-Liang Leo, Fotis Sotiropoulos, Ajit Yoganathan</td>
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<th>Time</th>
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<tr>
<td>8:00</td>
<td><strong>Computational Modeling Of Fluid Dynamics And Stress Pattern In Thoracic Aortic Aneurysms</strong></td>
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<td>Alessandro Borghi, Nigel B Wood, Raad H Mohiaddin, Xiao Y Xu</td>
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<td><strong>Imperial College London</strong></td>
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<td>8:15</td>
<td><strong>Computational Simulation Of Velocity Distribution On Patient Based Abdominal Aortic Aneurysm</strong></td>
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<td>Chengyan Peng, Elham Aslani, Robert A Peattie</td>
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<td><strong>Oregon State University</strong></td>
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<td>8:30</td>
<td><strong>A De-Coupled Fluid Structure Approach In Estimating Wall Stress In Abdominal Aortic Aneurysms</strong></td>
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<td>Yannis Papaharilaou, John Ekaterinaris, Eirini Manousaki, Asterios Katsamouris</td>
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<td><strong>Foundation for Research and Technology- Hellas, Greece</strong></td>
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<tr>
<td>8:45</td>
<td><strong>Novel Polyurethane-Coated Origami Stentgraft For Treatment Of AAA</strong></td>
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<td>Claire B Hillery, Kaori Kuribayashi, Henryk Salacinski, Alexander M Seifalian, Zhong You</td>
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<td><strong>University of Oxford</strong></td>
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<td>9:00</td>
<td><strong>A Comparative Study Of The Unsteady Flow And Forces With Four AAA Endovascular Stent Graft Patient</strong></td>
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<td>Harry A Dwyer, Tom Kim, Ben Howell, Angela Y Cheer, David Saloner, Tim Chuter</td>
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<td><strong>University of California, Davis</strong></td>
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<td>9:15</td>
<td><strong>Hemodynamic Factors Associated With Endovascular Stent Graft Devices And Its Influence On Stent</strong></td>
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<td>Liam G Morris, Fintan Wallis, Pierce A Grace, Ajay Bohra, David A Vorp, Tim M McGloughlin</td>
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### Session 15E

**Podium**

**Session:** HAND MECHANICS

**CHAIR:** Zong-Ming Li  
**CO-CHAIR:** Mark Gonzalez

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<tr>
<td>8:00</td>
<td>Biomechanical Comparison Of Different Distal Radius Fracture Volar Fixation Plates</td>
<td>Randal P Morris, Shukuki Koh, Rita M Patterson, Steven F Viegas</td>
<td>University of Texas Medical Branch</td>
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<td>8:15</td>
<td>Evaluation Of In Vivo Radiocarpal Contact Mechanics During Grasp</td>
<td>Ravi R Pillai, Gerard A Ateshian, Kenneth J Fischer</td>
<td>University of Kansas</td>
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<td>8:30</td>
<td>Finger Dynamics And Stability Before And After MCP Joint Arthroplasty</td>
<td>Farid Amirouche, Mark Gonzalez</td>
<td>University of Illinois at Chicago</td>
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<td>8:45</td>
<td>Stiffness Regulation Of The Proximal Interphalangeal Joint By The Metacarpophalangeal Joint</td>
<td>Zong-Ming Li, Gregg Davis, Shouchen Dun</td>
<td>University of Pittsburgh</td>
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<tr>
<td>9:00</td>
<td>Three-Dimensional In Vivo Radiocarpal Kinematics And The “Dart Thrower’s” Wrist Motion</td>
<td>Joseph J Crisco</td>
<td>Brown Medical School/Rhode Island Hospital</td>
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<td>9:15</td>
<td>Radial Head Travel And The Effect Of Transection Of The Annular Ligament In Pronation-Supination Of The Forearm</td>
<td>Karol Galik, Mark Carl Miller, Derek Dazen, Patrick J DeMeo, Mark S Cohen, Mark E Baratz</td>
<td>Allegheny General Hospital</td>
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### Session 15F

**Podium**

**Session:** BONE MECHANICS II: ADAPTATION

**CHAIR:** Melissa Knothe Tate  
**CO-CHAIR:** Liming Voo

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<tr>
<td>8:00</td>
<td>Mechanically Induced Osteocyte Signalling Can Explain Modeling Of Trabecular Structure And Osteoclast And Osteoblast Activity In BMU'S</td>
<td>Ronald Ruimerman, Rene van Oers, Bert van Rietbergen, Peter Hilbers, Rik Huiskes</td>
<td>Eindhoven University of Technology</td>
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<td>8:15</td>
<td>Bone Fluid Flow Enhanced By Skeletal Muscle Dynamics And Its Potential Role In Fluid Perfusion And Adaptation</td>
<td>Yixian Qin, Lukasz Orzechowski, Yi Xia, Hoyan Lam</td>
<td>SUNY Stony Brook</td>
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<td>8:30</td>
<td>Increased Post-Yield Properties Induced When Exercise Is Superimposed On Growth Are Maintained After 2 Weeks With The Addition Of Strength</td>
<td>Joseph M Wallace, Michael S Ron, David H Kohn</td>
<td>The University of Michigan</td>
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<td>8:45</td>
<td>Age-Dependent Trabecular Bone Response To Damage-Inducing Loads Using A Novel Animal Model</td>
<td>Erik I Waldorff, Steven A Goldstein, Barbara R McCreadle</td>
<td>University of Michigan</td>
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<td>9:00</td>
<td>Variation In Remodeling Cavity Surface Size And Cancellous Bone Microarchitecture, Stiffness And Strength</td>
<td>Christopher J Hernandez, Atul Gupta, Tony M Keaveny</td>
<td>University of California</td>
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<td>9:15</td>
<td>A Contour-Based Bone Shape Adaptation Method Using FEMLAB With MATLAB And Simulink</td>
<td>Xia Liu, Michael D Roberts, Richard T Hart</td>
<td>Tulane University</td>
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## Sunday, June 26, 2005  
### 8:00 AM - 9:30 AM  
#### Session 15G

**Podium**  
**Session:** INJURY BIOMECHANICS II  
**Creekside Room**  
**CHAIR:** Srirangam Kumaresan  
**CO-CHAIR:** Brian Stemper  

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<tr>
<td>8:00</td>
<td>Can Quasi-Static Pressure Distribution Be Used To Predict The Efficacy Of Chest Protectors In Reducing Sudden Deaths (Commotio Cordis) From Ball Impacts?</td>
<td>Joseph J Crisco</td>
<td>Brown Medical School/Rhode Island Hospital</td>
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<tr>
<td>8:15</td>
<td>Biomechanical Response Of The Abdomen To Impacts From Less-Lethal Munitions</td>
<td>Jerome V Eck, Cynthia A Bir</td>
<td>Eck Engineering, LLC</td>
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<td>8:30</td>
<td>Repeatable, Dynamic Rollover Testing</td>
<td>Jack Bish, Acen Jordan, Tom A La Rovere, Rex Romero, Terence C Honikman</td>
<td>Xprts, LLC</td>
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<td>8:45</td>
<td>Falling Objects: Is There Really A Potential For Head Injury?</td>
<td>Irving Scher, Doris Trachtman, Douglas Young, Aditi Dubey</td>
<td>Exponent</td>
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<tr>
<td>9:00</td>
<td>Determination Of Human Vertebral Force Response To +GZ Impact From Exterior Accelerations</td>
<td>Zhiqing Cheng, Joseph A Pellettiere</td>
<td>AIES, General Dynamics</td>
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<td>9:15</td>
<td>Age-Related Spine Injury Based On The Investigation Of The Disc Degeneration, And Osteoporosis</td>
<td>Taek H. Jang, Stephen Ekwaro-Osire</td>
<td>Texas Tech University</td>
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## Sunday, June 26, 2006  
### 8:00 AM - 9:30 AM  
#### Session 15H

**Podium**  
**Session:** BLOOD AND THROMBOSIS IN CARDIOVASCULAR PATHOLOGIES  
**Gore Range Exhibit Hall**  
**CHAIR:** Danny Bluestein  
**CO-CHAIR:** Shmuel Einav  

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<tr>
<td>8:00</td>
<td>Observations Of General Intimal Thickening At Sites Of Collocated Low WSS And High Near-Wall Residence Times Of Critical Blood Particles</td>
<td>P. Worth Longest</td>
<td>Virginia Commonwealth University</td>
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<td>8:15</td>
<td>Revisiting Giersiepen-Wurzinger Blood Damage Relation</td>
<td>Garon Andre, Marie-Isabelle Farinas, Donatien N'Dri</td>
<td>Ecole Polytechnique Montreal</td>
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<td>8:30</td>
<td>Simulation Study On Effects Of Hematocrit On Blood Flow Using Particle Method</td>
<td>Ken-ichi Tsubota, Shigeo Wada, Takami Yamaguchi</td>
<td>Tohoku University</td>
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<td>8:45</td>
<td>Occlusive Thrombosis In Stenoses Under High Shear</td>
<td>Conor J Flannery, David N Ku</td>
<td>Georgia Institute of Technology</td>
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<td>9:00</td>
<td>Effect Of Stenosis Severity And Blood Viscosity On Platelet Activation Index: A Computational Study On A 2D Carotid Bifurcation</td>
<td>Julian A Arias, Elsa M Nieto, Marcela Hernandez, Luis F Uriza, Juan C Briceno</td>
<td>Universidad de los Andes</td>
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<td>9:15</td>
<td>Mutual Effects Of Multi-Focal Atherosclerotic Plaques</td>
<td>Ze'ev Aronis, Sagi Raz, Jean-Pierre E Martinez, Eran Linder-Ganz, Shmuel Einav</td>
<td>Tel-Aviv University</td>
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### Session 16A

**Podium Session:**

**Date:** Sunday, June 26, 2005  
**Time:** 9:45 AM - 11:15 AM

**CHAIR:** Morton Friedman  
**CO-CHAIR:** Jiro Nagatomi

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<tr>
<td>9:45</td>
<td>Sialic Acids And Heparan Sulfate Proteoglycans Are Mechanosensory Components Of The Endothelial Glycocalyx.</td>
<td>Manolis Y Pahakis, Jason R Kosky, Randal O Dull, John M Tarbell</td>
<td>City College of New York</td>
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<td>10:00</td>
<td>Interactive Effects Of Spatial Shear Stress Gradient And Shear Stress Magnitude On Endothelial Cell Behavior In Vivo And In Vitro</td>
<td>Jeffrey A LaMack, Morton H Friedman</td>
<td>Duke University</td>
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<td>10:30</td>
<td>Applying Physiological Coronary Wall Shear Stresses To In Vitro Endothelial Cells</td>
<td>Lucy M O'Keeffe, Enda Gibney, Gordon Muir, Brendan McCormack, Jerry Bird, Tim McGloughlin</td>
<td>University of Limerick</td>
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<td>10:45</td>
<td>The Fluid Shear Response In Circulating Leukocytes: A Requirement For Erythrocytes</td>
<td>Yutaka Komai, Geert W Schmid-Schoenbein</td>
<td>University of California San Diego</td>
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<td>11:00</td>
<td>Functionalized Poly(Ethylene Glycol) Contour Length Modulates Receptor-Ligand Interactions Of Microparticles In Shear Flow: Analogy To Leukocyte Microvilli</td>
<td>Anthony S. W. Ham, Doug J. Goetz, Alexander L. Kilbanov, Michael B. Lawrence</td>
<td>University of Virginia</td>
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### Session 16B

**Podium Session:**

**Date:** Sunday, June 26, 2005  
**Time:** 9:45 AM - 11:15 AM

**CHAIR:** Victor Barocas  
**CO-CHAIR:** Chih-Tung C Chen

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<tr>
<td>9:45</td>
<td>Preventing Matrix Degradation And Maintaining Cell Population In Load-Induced Cartilage Using TIMP-1 And A Synthetic MMP Inhibitor</td>
<td>Chih-Tung C Chen, Xiaohua Deng, Maria Nikmanesh, Peter A Torzilli</td>
<td>Hospital For Special Surgery, New York</td>
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<td>10:00</td>
<td>Daily Cyclic Compression Increases Collagen Cleavage In Load-Injured Cartilage</td>
<td>Sowmita Narayanan, Mihae Song, Peter A Torzilli, Chih-Tung C Chen</td>
<td>Hospital For Special Surgery, New York</td>
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<td>10:15</td>
<td>Single-Scale And Multiscale Models Of Tissue-Equivalent Mechanics</td>
<td>Preethi L Chandran, Triantafyllos H Stylianopoulos, Michael C Evans, Toshiro K Ohsumi, Joseph E Flaherty, Victor H Barocas</td>
<td>University of Minnesota</td>
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<td>10:30</td>
<td>In Vitro Prefailure Mechanics Of Placental Membranes</td>
<td>Michelle L Oyen, Triantafyllos Stylianopoulos, Steven E Calvin, Daniel V Landers, Victor H Barocas</td>
<td>University of Minnesota</td>
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<td>10:45</td>
<td>An Expanded Network Model For The Characterization Of Vocal Fold Deformation</td>
<td>Kai Zhang, Thomas Siegmund, Roger Chan</td>
<td>Purdue University</td>
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<tr>
<td>9:45</td>
<td>Modeling Internal Filtration And Back Filtration In High-Flux Hemodialyzers</td>
<td>Gianfranco B Fiore, Gualtiero Guadagni, Roberto Fumero</td>
<td>Politecnico di Milano</td>
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<td>10:00</td>
<td>Local Hemodynamics Of Native And Synthetic Arteriovenous (AV) Fistulae For Hemodialysis</td>
<td>Grainne T Carroll, Liam Morris, Michael Walsh, T. McGloughlin</td>
<td>University of Limerick</td>
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<td>10:15</td>
<td>Turbulent Flow Evaluation Of The Venous Needle During Hemodialysis</td>
<td>Sunil Unnikrishnan, Thanh N Huynh, Brigitta C Brott, Michael Allon, Andreas S Anayiotos</td>
<td>University of Alabama, Birmingham</td>
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<td>10:45</td>
<td>Numerical Study Of The Flow Characteristics Of Kyoto-NTN Magnetically Suspended Centrifugal Blood Pump</td>
<td>Leok Poh Chua, Guoliang Song, Simon Ching Man Yu, Tau Meng Lim</td>
<td>Nanyang Technological University</td>
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<td>11:00</td>
<td>A Novel Wall Shear Stress Sensor For Cardiovascular Applications</td>
<td>Ali Etebari, Karri S Babu, Barbar Akle, Matthew D Bennett, Don J Leo, Pavlos P Viachos</td>
<td>Virginia Polytechnic Institute and State University</td>
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### Session 16D

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<th>Time</th>
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<tr>
<td>10:00</td>
<td>Transverse Flows In Rapidly Oscillating Cylindrical Vessels</td>
<td>Matthias Heil, Sarah L Waters</td>
<td>The University of Manchester</td>
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<tr>
<td>10:15</td>
<td>Flow Patterns And Wall Shear Stress In The Proximal Segments Of Human Coronary Arteries With And Without The Aorta</td>
<td>Jin Suo, John Oshinski, Don Giddens</td>
<td>Georgia Institute of Technology</td>
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<tr>
<td>10:30</td>
<td>Pulsatile Flow And Deformation In Curved Stenosis Models Of Arterial Disease - Influence Of Cyclic Change Of Curvature On Flow And Deformation</td>
<td>Shunichi Kobayashi, Yutaka Fukuzawa, Yuuki Ayama, Hirohisa Morikawa, Dalin Tang, David N Ku</td>
<td>Shinshu University</td>
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<tr>
<td>10:45</td>
<td>Mathematical Modeling Of Blood Flow In Curved Arteries</td>
<td>Jennifer H Siggers, Sarah L Waters</td>
<td>School of Mathematical Sciences</td>
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<tr>
<td>11:00</td>
<td>3D Plaque Distribution And Its Relationship To Shear Stress In A Human Coronary Artery Bifurcation In Vivo</td>
<td>Frank JH Gijsen, Attila Thury, Bram Lamers, Jolanda J Wentzel, Johan CH Schuurbers, Patrick W Serruys, Cornelis J Slager</td>
<td>Department of Biomedical Engineering, Erasmus MC</td>
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### Session 16E: Imaging and Biomechanics

**Podium:** Rocky Mountain Ballroom AB  
**Chair:** Guoan Li  
**Co-Chair:** Amy Lerner

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<th>Time</th>
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<tr>
<td>9:45 AM</td>
<td>Comparison Of Two Methods : Three-Dimensional Reconstruction Of Bone By MRI And 3-D Laser Scanner</td>
<td>Guillaume Agnesina, William Bertucci, Redha Tairar, Alain Lodini</td>
<td>Universite de Reims</td>
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<tr>
<td>10:00 AM</td>
<td>Validation Of A New Markerless Tracking Technique For Measuring Three-Dimensional In-Vivo Glenohumeral Joint Motion During Dynamic Activities</td>
<td>Michael J Bey, Roger Zauel, Stephanie K Brock, Scott Tashman</td>
<td>Henry Ford Hospital</td>
</tr>
<tr>
<td>10:15 AM</td>
<td>CT-Based Patient-Specific 3D Modeling And Mechanical Analysis For Human Abdominal Aortic Aneurysm</td>
<td>Chun Yang, Dalin Tang, David Chen, Steven P Marra, Mark F Fillinger</td>
<td>Worcester Polytechnic Institute</td>
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<tr>
<td>10:30 AM</td>
<td>Low-Intensity Pulsed Ultrasound (LIPUS) And Longitudinal Cortical Allograft Perforation (LAP): In Vivo Effects On Allograft Incorporation And Remodeling</td>
<td>Brandon G Santoni, Nicole Ehrhart, A. Simon Turner, Donna L Wheeler</td>
<td>Colorado State University</td>
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<tr>
<td>10:45 AM</td>
<td>In Vivo Knee Kinematics Measured In Weight-Bearing Flexion Using Standing Magnetic Resonance Imaging</td>
<td>Peter J Barrance, Thomas M Pepe, Thomas S Buchanan</td>
<td>University of Delaware</td>
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<tr>
<td>11:00 AM</td>
<td>The Development Of An Orthogonal Fluoroscopic And MR Imaging Technique For Accurately Measuring In-Vivo Knee Joint Kinematics</td>
<td>Guoan Li, Louis E DeFrate, Jeremy F Suggs, George R Hanson, Ramprasad Papannagari, Harry E Rubash</td>
<td>Massachusetts General Hospital</td>
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### Session 16F: Bone Mechanics III: Computation

**Podium:** Rocky Mountain Ballroom CD  
**Chair:** Iwona Jasiuk  
**Co-Chair:** Alexandra Schonning

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<tr>
<td>9:45 AM</td>
<td>Trabecular Bone As A Hierarchical Material: Elasticity And Fracture</td>
<td>Iwona M Jasiuk</td>
<td>Concordia University</td>
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<tr>
<td>10:00 AM</td>
<td>Lower Stiffness Detected In Finite Element Analysis Of Virtual Bone Biopsy From Hypogondal Male Patients</td>
<td>ML Chan, XW Liu, B Vasilic, FW Wehrli, M Benito, PJ Snyder, X Guo</td>
<td>Columbia University</td>
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<tr>
<td>10:15 AM</td>
<td>A FEM-Based Cohesive Model Of Age-Related Toughness Loss In Human Cortical Bone</td>
<td>Ani Ural, Deepak Vashishth</td>
<td>Rensselaer Polytechnic Institute</td>
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<tr>
<td>10:30 AM</td>
<td>Comparison Of Micro-Level And Continuum-Level Voxel Models For Strength Predictions Of The Proximal Femur</td>
<td>Eelco Verhulp, Bert van Rietbergen, Rik Huiskes</td>
<td>Eindhoven University of Technology</td>
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<td>10:45 AM</td>
<td>Damage Accumulation In Vertebral Body Models With Simulated Bone Loss And The Effects Of BMD Error On Response Predictions</td>
<td>Todd L Bredbenner, Daniel P Nicolella, Dwight T Davy</td>
<td>Case Western Reserve University</td>
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<tr>
<td>11:00 AM</td>
<td>Vertebral Body Failure Load Is Better Predicted By A Sampling Micro-FEA Approach Than By BMD</td>
<td>Marlies A Terlouw, Bert Van Rietbergen, Eva-Maria Lochmueller, Felix Eckstein, Rik Huiskes</td>
<td>Eindhoven University of Technology</td>
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# Session 16G

**Podium Session:** 
**TRAUMA AND VEHICULAR BIOMECHANICS**

**CHAIR:** Anthony Sances, Jr.  
**CO-CHAIR:** Srirangam Kumaresan

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<tr>
<td>10:00</td>
<td>Effect Of Inertial Release Levels On Seat Belt Buckles At Various Angles</td>
<td>Richard Clarke, Anthony Sances, Srirangam Kumaresan, Steve Syson, Clarke Automotive</td>
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<tr>
<td>10:15</td>
<td>Rollover Cases With Roof Crush In NASS</td>
<td>Carl E. Nash, Allan Paskin, Xprs, LLC</td>
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<td>10:30</td>
<td>Biomechanical Effects Of Buckling Induced Increases</td>
<td>Keith Friedman, D Mohira, J Hutchinson, A Sances, S Kumaresan, Friedman Research Corporation</td>
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<td>10:45</td>
<td>Late-Phase Occupant Rebound After Rear-End Impact</td>
<td>Jacob L Fisher, William N Newberry, Ramaswamy Krishnan, Janine Pierce, Tara L. A. Moore, Exponent, Inc.</td>
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<tr>
<td>11:00</td>
<td>Evaluation Of Mouthguard Use In Relation To Strain In Middle Cranial Fossa</td>
<td>Cynthia A Bir, Timothy J Wallliko, Scott Tashman, Wayne State University</td>
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# Session 16H

**Podium Session:** 
**MOLECULAR MECHANICS**

**CHAIR:** Gang Bao  
**CO-CHAIR:** Mark Bathe

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<tr>
<td>9:45</td>
<td>Liquid Crystal Pre-Patterning In Mitosis</td>
<td>Dmitri Miroshnychenko, Nicholas A Hill, Nigel J Mottram, John E Lydon, University of Glasgow</td>
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<tr>
<td>10:00</td>
<td>Calculation Of The Mechanical Moduli Of A Self-Assembled Peptide Nanofiber Using Computer Simulations</td>
<td>Jiyong Park, Byungnam Kahng, Roger D Kamm, Wonmuk Hwang, Texas A&amp;M University</td>
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<td>10:15</td>
<td>AFM Pulling Simulation Of Alpha-Actinin Substructures</td>
<td>Simone Vesentini, Monica Soncini, Mario Orsi, Davide Ruffoni, Franco M Monteverchi, Alberto Redaelli, Politecnico di Milano</td>
</tr>
<tr>
<td>10:30</td>
<td>Controlling Single Molecule Deformation Using Surface Ligation And Microfluidic Systems</td>
<td>Jui-Ming Yang, Sanford H Leuba, Philip R LeDuc, Carnegie Mellon University</td>
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<tr>
<td>10:45</td>
<td>Effects Of Chemical Composition On Chondroitin Sulfate Osmotic Pressure And Aggrecan Conformation</td>
<td>Mark Bathe, Gregory C Rutledge, Alan J Grodzinsky, Bruce Tidor, Ludwig Maximilian University</td>
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