

Thursday, June 23, 2005	7:30 AM – 9:00 AM	Session 1B
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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
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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
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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
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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 Montevicchi, 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	9:15 AM - 10:45 AM	Session 2B
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Podium Session: **MECHANICS OF GROWTH AND REMODELING IN NATIVE AND ENGINEERED TISSUES I** **Centennial Ballroom ABC**

CHAIR: Michael Sacks

CO-CHAIR: John Criscione

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

Thursday, June 23, 2005	9:15 AM - 10:45 AM	Session 2C
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Podium Session: **HEART VALVE MECHANICS** **Centennial Ballroom D**

CHAIR: Michael Sacks

CO-CHAIR: Niels Driessen

- 9:15 **Modeling The Mechanics Of Native And Tissue-Engineered Heart Valve Leaflets**
 Niels JB Driessen, Anita Mol, Carlijn VC Bouten, Frank PT Baaijens *Eindhoven University of Technology*
- 9:30 **A Sharp-Interface Fluid-Structure Interaction Model For A Bioprosthetic Heart Valve**
 Sarah C Vigmostad, Saikrishna V Marella, H S Udaykumar, Krishnan B Chandran *The University of Iowa*
- 9:45 **Variations In Chordae Tendineae Force With Papillary Muscle Displacement: An In Vitro Study Of Ischemic Mitral Regurgitation**
 Jorge Jimenez, Dennis Soerensen, Zhaoming He, Ajit Yoganathan *Georgia Institute of Technology*
- 10:00 **On The Biaxial Mechanical Properties Of The Layers Of The Aortic Valve Leaflet**
 John A Stella, Michael S Sacks, K B Chandran *University of Pittsburgh*
- 10:15 **Functional Analysis Of Aortic Valve Prostheses: Mechanical Load Assessment Using MRI**
 Marcel Rutten, Gustav Strijkers, Evelyne van Dam, Klaas Nicolay, Frans van de Vosse *Eindhoven University of Technology*
- 10:30 **Micromechanical Modeling Of The Nonlinear Viscoelastic Behavior Of Mitral Valve Chordae**
 Murat Surucu, Ivan Vesely *University of Southern California*

Thursday, June 23, 2005		9:15 AM - 10:45 AM	Session 2D
Podium Session:	PATIENT-SPECIFIC CARDIOVASCULAR FLUID MECHANICS		Centennial Ballroom EF
	CHAIR: David Steinman	CO-CHAIR: Ajit Yoganathan	
9:15	Sensitivity Study On By-Pass Graft Reconstruction With Emphasis On Flow Solutions Alberto M Gambaruto, Alessandro Radaelli, Denis J Doorly, Spencer J Sherwin, Joaquim Peiro	<i>Imperial College London</i>	
9:30	MRI-Based Patient-Specific 3D Modeling For Human Right Ventricle - Potential Computer-Aided Cardiac Surgery Applications Dalín Tang, Chun Yang, Idith Haber, Tal Geva, Pedro J del Nido	<i>Worcester Polytechnic Institute</i>	
9:45	Numerical Simulation Of Unsteady Flows In TCPC Anatomies On A Cartesian Mesh Anvar Gilmanov, Chang Wang, Fotis Sotiropoulos, Ajit P Yoganathan	<i>Georgia Institute of Technology</i>	
10:00	Rapid In-Vitro MRV And PIV Measurements In Anatomically Accurate Human Thoracic Aorta Phantoms Christopher J Elkins, Ananth S Iyengar, Mary T Draney, Michael D Dake, Francisco Medina, Ryan B Wicker	<i>University of Texas at El Paso</i>	
10:15	Comparison Of Phase Contrast MRI And Particle Image Velocimetry Of The Total Cavopulmonary Extra-Cardiac Connection Hiroumi Kitajima, Kartik Sundareswaran, Garrett W Astarý, W James Parks, Shiva Sharma, Denver Sallee, Kirk R Kanter, Joseph M Forbess, John N Oshinski, Ajit P. Yoganathan	<i>Georgia Institute of Technology</i>	
10:30	Determination Of Shear Stress In Patient-Specific Models Of The Pulmonary Vasculature Through Numerical Simulation With Fluid-Structure Interaction Kendall S Hunter, Craig J Lanning, Curt G DeGroff, D Dunbar Ivy, Robin Shandas	<i>University of Colorado Health Sciences Center</i>	

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

Thursday, June 23, 2005	9:15 AM - 10:45 AM	Session 2F
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Podium Session: **COMPUTATIONAL SOFT TISSUE MECHANICS I** **Rocky Mountain Ballroom CD**

CHAIR: Richard Debski

CO-CHAIR: Lorin Maletsky

- 9:15 **Simulation Of Soft Tissue Failure With The Material Point Method**
Irina M Ionescu, James Guilkey, Martin Berzins, Robert M Kirby, Jeffrey A Weiss *University of Utah*
- 9:30 **Finite Element Simulations Of Collagenous Tissues Using An Experimentally Derived Structural Constitutive Model**
Ruijie Liu, Michael S Sacks, KB Chandran *University of Pittsburgh*
- 9:45 **A Polyconvex Strain Energy Function. Application To Soft Tissue Mechanics**
Georges Limbert, John Middleton *University of Wales*
- 10:00 **Material Parameter Optimization For Three-Dimensional Rabbit Heart**
Arun U Nair, David G Taggart, Frederick J Vetter *University of Rhode Island*
- 10:15 **Validation Of The Material Properties Of Human Lower Limb Muscle In Dynamic Lateral Bending**
Costin D Untaroiu, Kurosh K Darvish, Sang-Hyun Lee, Jae-Ho Shin, Jeff R Crandall, Bing Deng, J.T. Wang *University of Virginia*
- 10:30 **Estimation Of Regional Lung Respiratory Deformation Using X-Ray Computed Tomography And Continuum Mechanics**
Arkadiusz Sitek, Mizuki Nishino, Grant T Gullberg, Bryan W Reutter, Ronald H Huesman, Hiroto Hatabu *E.O. Lawrence Berkeley National Laboratory*

Thursday, June 23, 2005	9:15 AM - 10:45 AM	Session 2G
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Podium Session: **FORWARD DYNAMIC SIMULATION IN MOTION ANALYSIS** **Creekside Room**

CHAIR: Richard Neptune

CO-CHAIR: Ton van den Bogert

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

Thursday, June 23, 2005	9:15 AM - 10:45 AM	Session 2H
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Podium Session: **IMPLANT BIOMECHANICS I - FEMORAL IMPLANTS** **Gore Range Exhibit Hall**

CHAIR: Raghu Natarajan

CO-CHAIR: Vijay Goel

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

Thursday, June 23, 2005	11:00 AM - 12:30 PM	Session 3A
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Podium Session: **CELL AND MOLECULAR ENGINEERING I** **Cascade Ballroom**

CHAIR: Gang Bao

CO-CHAIR: Kristen Billiar

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

Thursday, June 23, 2005	11:00 AM - 12:30 PM	Session 3B
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Podium Session: **MECHANICS OF GROWTH AND REMODELING IN NATIVE AND ENGINEERED TISSUES II** **Centennial Ballroom ABC**

CHAIR: Frank Baijeens

CO-CHAIR: Michael Sacks

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

Thursday, June 23, 2005	11:00 AM - 12:30 PM	Session 3C
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Podium Session: **TISSUE ENGINEERING - BIOMATERIALS** **Centennial Ballroom D**

CHAIR: Andres Garcia

CO-CHAIR: Robert Tranquillo

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

Thursday, June 23, 2005	11:00 AM - 12:30 PM	Session 3D
Podium Session:	MICROFLOWS	Centennial Ballroom EF
CHAIR: Keith Sharp		CO-CHAIR: Danny Bluestein
11:00	Comparison Of Micron Size Respiratory Aerosol Deposition Using Branch-Averaged And Microdosimetry Estimates P. Worth Longest, Samir Vinchurkar	<i>Virginia Commonwealth University</i>
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	<i>Tohoku University</i>
11:30	Three-Dimensional Numerical Analysis Of Plasma Flow Around A Neutrophil In A Microchannel Atsushi Shirai, Sunao Masuda, Toshiyuki Hayase	<i>Tohoku University</i>
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	<i>University of Virginia</i>
12:00	Magnetic Nano-Particle Interactions In Magnetocarcinotherapy Carl Kumaradas, Marwan Rihaoui, Robert H Kraus Jr., Bradford Wright	<i>Ryerson University</i>
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	<i>Imperial College London</i>

Thursday, June 23, 2005	11:00 AM - 12:30 PM	Session 3E
Podium Session:	BIOTRANSPORT II	Rocky Mountain Ballroom AB
CHAIR: Devashish Shrivastava		CO-CHAIR: Xioming He
11:00	Electromagnetic Simulations - Safety Of Active Implantable Devices During MRI Examinations Philippe Buechler, Anne Simon, Juergen Burger, Sigbjorn Olsen	<i>University of Bern</i>
11:15	Fluid Mixing In A Planar Sepentine Channel Lin Kuo Wei, Yang Jing Tang	<i>Nation Tsing Hua University</i>
11:30	Influence Of Repetition Frequency On Selective Retinal Photocoagulation For Macular Diseases Pradeep Gopalakrishnan, Michael J Kazmierczak, Rupak K Banerjee	<i>University of Cincinnati</i>
11:45	Evaluation Of Pharmacokinetics And Retinal Permeability For Ganciclovir In A Rabbit And Human Eye Juyoung Park, James J Augsburg, Ronald W Millard, Rupak K Banerjee	<i>University of Cincinnati</i>
12:00	Application Of Diffusion Tensor MRI In Finite Element Models Of Interstitial Transport In Spinal Cord White Matter Malisa Sarntinoranont, Xiaoming Chen, Paul F Morrison, Russell R Lonser, Thomas H Mareci	<i>University of Florida</i>
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	<i>Queen Mary, University of London</i>

Thursday, June 23, 2005	11:00 AM - 12:30 PM	Session 3F
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Podium Session: **COMPUTATIONAL SOFT TISSUE MECHANICS II** **Rocky Mountain Ballroom CD**

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
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Podium Session: **MOTION MEASUREMENT IN REHABILITATION** **Creekside Room**

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
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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
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Poster Session: **POSTER I: 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*

2005 Summer Bioengineering Conference – Final Technical Program

- 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, Hideo 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 Modelina 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, *Stanford University*
Irene E Vignon, Eiketsu Sho, Ronald L Dalman, Charles A Taylor
- 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, *Stanford University*
Charles A Taylor
- I-25 **Phase Contrast MRI Measurements And CFD Analysis Of Hemodynamics In The Aorta**
Suguru Yokosawa, Shigeo Wada, Masanori Nakamura, Ken-ichi *Tohoku University*
Tsubota, Takami Yamaguchi, Haruo Isoda
- 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 *Tohoku University*
Yamaguchi
- I-28 **Load Vs. Displacement Control Testing Protocols For Evaluating Artificial Disc Mechanics**
Sri Vishnubhotla, Aaron J Matyas, Ian Cowgill, Vijay K Goel, Koichi *The University of Toledo*
Sairyo, Ashok Biyani
- 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 *Politecnico di Milano*
Besseghini
- 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 *Michigan Technological University*
Donahue
- I-37 **Soft Tissue Elasticity Estimation With Optical Coherence Elastography**
Ahmad S Khalil, Raymond C Chan, Brett E Bouma, Mohammad R *Massachusetts Institute of Technology*
Kaazempur-Mofrad

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- 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*

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

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- Kristen L Moffat, Nadeen O Chahine, Clark T Hung, Gerard A Ateshian, Helen H Lu *Columbia Univeristy*
- I-68 **Performance Evaluation Of Tissue Engineering Scaffolds - Development Of A Novel Tool For Optimization Of Fluid Flow & Permeability**
Eric J Anderson, Malcolm N Cooke, Joshua Savrin, David Dean, Melissa L Knothe Tate *Case Western Reserve University*
- I-69 **Syringomyelia Hydrodyanmics: 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 Asymetric 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 Mclff, 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 Periosteum**
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 Loba *NC State and UNC-Chapel Hill*
- I-79 **Fluid-Structure Interaction In The Aortic Valve: A Tool For Surgical Reconstruction**
Adrian Ranga, Olivier Bouchot, Raymond Cartier, Rosaire Mongrain *McGill University*
- I-80 **Sensitivity Of B-Spline Surface Fitting Of A Vertebral 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**
Fatemeh 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**
Damooun Soudbakhsh, Mohamad Parnianpour, Reza Shirazi, Farzam Farahmand, Javad khamsei, Mohamd 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*
- I-90 **Effect Of Intra Abdominal Pressure (IAP) And Muscle Fiber Direction On The Stability Of Spine Using Finite Element Method**
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*

Friday, June 24, 2005	1:45 PM - 3:15 PM	Session 7A
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Podium Session: **CELL AND MOLECULAR ENGINEERING II** **Cascade Ballroom**

CHAIR: Ed Guo

CO-CHAIR: Clark Hung

- 1:45 **AFM Indentation Of Cell Membranes With Probing Of Adhesive Interactions: Experiment And Model**
Shamik Sen, Shyamsundar Subramanian, Dennis Discher *University of Pennsylvania*
- 2:00 **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 **Integrin Mediated Mechanotransduction In IL-1 Stimulated Bovine Chondrocytes Cultured In Agarose Constructs**
Tina T Chowdhury *Queen Mary, University of London*
- 2:30 **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 **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 **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*

Friday, June 24, 2005	1:45 PM - 3:15 PM	Session 7B
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Podium Session: **TISSUE ENGINEERING - BIOREACTORS** **Centennial Ballroom ABC**

CHAIR: Jiro Nagatomi

CO-CHAIR: Robert Guldberg

- 1:45 **Flow And Nutrient Transport In A Rotating Bioreactor**
Sarah L Waters, Linda J Cummings, Kevin M Shakesheff *School of Mathematical Sciences*
- 2:00 **Perfusion Significantly Increases Mineralized Matrix Production**
Blaise D Porter, Roger Zael, Dietmar Hutmacher, David Fyhrie, Robert E Guldberg *Georgia Institute of Technology*
- 2:15 **Magnitude Of Equibiaxial Stretch Modulates Fibroblast Remodeling Of Fibrin Gels**
Jenna Balestrini, Jacquelyn Yousseff, Kristen Billiar *Worcester Polytechnic Institute*
- 2:30 **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 **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 **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
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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 Stergiopoulos *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
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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*

Friday, June 24, 2005	1:45 PM - 3:15 PM	Session 7E
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Podium Session: **BIOHEAT TRANSFER** **Rocky Mountain Ballroom AB**

CHAIR: Liang Zhu

CO-CHAIR: Neil Wright, Tom Diller

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

Friday, June 24, 2005	1:45 PM - 3:15 PM	Session 7F
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Podium Session: **TENDON/LIGAMENT MECHANICS I - EFFECTS OF ENVIRONMENTAL STIMULI** **Rocky Mountain Ballroom CD**

CHAIR: Glen A. Livesay

CO-CHAIR: Todd C. Doehring

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

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

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

Friday, June 24, 2005	3:30 PM - 5:00 PM	Session 8B
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Podium Session: **PH.D. STUDENT PAPER FINALS: SOLIDS, DESIGN, & REHAB ENGINEERING** **Centennial Ballroom ABC**

CHAIR: Michele Grimm

CO-CHAIR: Amy Lerner

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

Friday, June 24, 2005	3:30 PM - 5:00 PM	Session 8C
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Podium Session: **PH.D. STUDENT PAPER FINALS: CELL AND TISSUE ENGINEERING** **Centennial Ballroom D**

CHAIR: Michele Grimm

CO-CHAIR: Amy Lerner

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

Friday, June 24, 2005	3:30 PM - 5:00 PM	Session 8D
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Podium Session: **PH.D. STUDENT PAPER FINALS: BIOFLUIDS AND HEAT TRANSFER** **Centennial Ballroom EF**

CHAIR: Michele Grimm

CO-CHAIR: Amy Lerner

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

Friday, June 24, 2005	5:00 PM - 6:30 PM	Session 9
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Poster Session: **POSTER II: PH.D. STUDENT POSTER COMPETITION** **Rocky Mountain Garden**

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

- 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 Murthy, 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*

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- 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 *Michigan 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 Colorado*
- 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-Chapell 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**

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- 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**
Heather A Himburg, Jeffrey A LaMack, Morton H Friedman *Duke University*
- II-62 **The Use Of A MADYMO Model To Evaluate Clinician Maneuvers Applied In The Management Of Shoulder Dystocia**
Richard E Costello, Bernard Gonik, Michele J Grimm *Wayne State University*
- II-63 **Investigation Of Specific Energy And Bone Mineral Density In Drilling Bone**
Marilyn J. Powers, Neil A. Duncan *University of Calgary*
- II-64 **A New Formulation To Model Blood Flow And Vessel Motion In Large, Patient-Specific Models Of The Cardiovascular System**
Alberto Figueroa, Irene E Vignon-Clementel, Kenneth E Jansen,
Thomas JR Hughes, Charles A Taylor *Stanford University*
- II-65 **Sensitivities Of Medial Meniscal Motion And Deformation To Material Properties Of Cartilage, Meniscus And Meniscal Attachments**
Jiang Yao, Amy L Lerner *University of Rochester*
- II-66 **Nonlinear Geometric Bending Of Porcine Aortic Valve Leaflet Modeled As A Tri-Layered Beam**
Devesh M Amatya, Victor H Barocas *University of Minnesota*
- II-67 **Design Of Experiments Methodology For Biventricular Pacing Optimization**
T. Alexander Quinn, George Berberian, Santos E Cabreriza, Henry
M Spotnitz, Jeffrey W Holmes *Columbia University*

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- II-68 **Normalizing Left Ventricular End-Systolic Elastance: A Finite Element Model Study**
Christopher M Ingrassia, Daniel Burkhoff, Kevin D Costa *Columbia University*
- II-69 **Bony Ingrowth Into A Porous Coated Implant Predicted By A Mechano-Regulatory Tissue Differentiation Algorithm**
Xiangyi Liu, Glen L Niebur *University of Notre Dame*
- II-70 **A Potential Mechanism For Premature Osteoarthritis At The Knee Following ACL Injury**
Paul L Briant, Scott L Bevill, Seungbum Koo, Thomas P Andriacchi *Stanford University*
- II-71 **A Novel Constitutive Model For Arterial Elastin**
Namrata Gundiah, Mark B Ratcliffe, Lisa A Pruitt *University of California, Berkeley*
- II-72 **Micromechanical Model For The Anisotropic Elastic Properties Of Hydroxyapatite Whisker Reinforced Polymers And Bone Tissue**
Weimin Yue, Ryan K Roeder *University of Notre Dame*
- II-73 **Impedance Outflow Boundary Conditions For Three-Dimensional Patient Specific Modeling Of Blood Flow**
Irene E Vignon-Clementel, C. Alberto Figueroa, John LaDisa, Jeffrey A Feinstein, Kenneth E Jansen, Charles A Taylor *Stanford University*
- II-74 **Bioconjugate Nano-Labeling Of Intracellular Proteins Within Fixed And Living Cells**
Kelly B Emerton, Maribel Vazquez *The City College of the City University of New York*
- II-75 **Fluid-Structure Interaction In Patient Specific Models Of The Abdominal Aortic Aneurysm**
James H Leung, Andrew Wright, Nick Cheshire, Simon A Thom, Alun Hughes, Jeremy Crane, Yun X. Xu *Imperial College London*
- II-76 **Mechanical And Biochemical Characteristics Of Human Cervical Tissue**
Kristin M Myers, Simona Socrate, Michael House *Massachusetts Institute of Technology*
- II-77 **Computational Simulation Of Velocity Distribution On Patient Based Abdominal Aortic Aneurysm Models**
Chengyan Peng, Elham Aslani, Robert A Peattie *Oregon State University*
- II-78 **Biomechanics Of Cervical Funneling: Case Of Cervical Incompetence**
Anastassia P Paskaleva, Simona Socrate, Michael D House *Massachusetts Institute of Technology*
- II-79 **Modeling Blood Flow In The Carotid Bifurcation Using Patient-Specific Velocity Boundary Conditions**
Amanda K Wake, John Oshinski, Allen Tannenbaum, Don P Giddens *Georgia Institute of Technology*
- II-80 **Patterns Of Cartilage Degeneration For ACL Deficient Patients Are Influenced By Gait Mechanics**
Seungbum Koo, Chris O Dyrby, Anne Muendermann, Thomas P Andriacchi *Stanford University*
- II-81 **Design Of A Multi-Axis Programmable Spine Robot For The Study Of Multi-Body Spinal Biomechanics**
Brian P Kelly, Denis J DiAngelo *The University of Tennessee Health Science Center*
- II-82 **A New Device For Producing Different Mechanisms Of Spinal Cord Injury**
Anthony M Choo, Jie Liu, Clarrie Lam, Marcel Dvorak, Wolfram Tetzlaff, Thomas R Oxland *The University of British Columbia*
- II-83 **Comparison Of Semi-Automated Mesh Generation Methods For Finite Element Analysis Of Canine Radius**
T Wayne Pfeiler, Charles C Finley, David S Lalush, Elizabeth G Lobo *NC State University & UNC-Chapel Hill*

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- II-84 **A Finite Element Model Of Acupuncture Needling**
Alice W Seneres, Margaret Julias, Natasha Patel, David I Shreiber, Helen M Buettner *Rutgers University*
- II-85 **The Contribution Of Intracortical Bone Turnover To Bone Quality In Osteoporosis**
Oran D Kennedy *RCSI & TCD Research Group*
- II-86 **Tension-Compression Nonlinearity In Chondrocyte-Seeded Agarose Hydrogels**
Terri-Ann N Kelly, Nadeen O Chahine, Matthew B Fisher, Kenneth W Ng, Timon Tai, Gerard A Ateshian, Clark T Hung *Columbia University*
- II-87 **Characterization Of Genipin-Crosslinked Collagen Gels**
Harini G Sundararaghavan, Jennifer R Miksan, David I Shreiber *Rutgers University*
- II-88 **Potassium Swelling Current Effects Volume Regulation In Canine Articular Chondrocytes**
Jim R Wilson, Neil A Duncan, Robert B Clark *University of Calgary*
- II-89 **Valgus Moments Increase ACL Strain In A Simulation Model: Implications For Gender Differences In ACL Injury**
Choongsoo S Shin, Ajit M Chaudhari, Thomas P Andriacchi *Stanford University*
- II-90 **Reducing Motion Artifact In Three-Dimensional Left Ventricular Wall Motion Analysis**
Susan L Herz, Christopher M Ingrassia, Kevin D Costa, Jeffrey W Holmes *Columbia University*
- II-91 **Nano-Scale Tracking Of Slow And Fast Dynamics Of The Sheared Endothelial Cell Cytoplasm**
Jhanvi H Dangaria, Peter J Butler *The Pennsylvania State University*
- II-92 **Novel Progenitor Cells For Use In Bone Tissue Repair**
Caren E Petrie, Becca Ogle, Roy Ogle, Edward Botchwey *University of Virginia*
- II-93 **A Physical Basis For A Two Time Constant Constitutive Model For Liver**
Amy E Kerdok, Robert D Howe *Harvard University*
- II-94 **Relating In Vivo And Ex Vivo Mechanics In Healing Myocardial Scar Tissue**
Gregory M Fomovsky, Jeffrey W Holmes *Columbia University*
- II-95 **Mechanical Characterization Of Native And Esophageal Graft In A Dog Model**
Donald O Freytes, Jonathan Vande Geest, Anil Thapa, David A. Vorp, Stephen F. Badylak *University of Pittsburgh*
- II-96 **Identification Of Nonlinear Constitutive Law Parameters Of Breast Tissue**
Amy E Kerdok, Petr Jordan, Yi Liu, Paris Wellman, Simona Socrate, Robert D Howe *Harvard University*
- II-97 **A New Correspondence Principle For Triphasic Materials: Determination Of Fixed Charge Density And Porosity Of Articular Cartilage By Indentation**
Xin Lux Lu, Chester Miller, X. Edward Guo, Van C. Mow *Columbia University*
- II-98 **The Effect Of Static And No Load On The Remodeling Of Cultured Tendon Fascicles**
Eduardo L Abreu, Kathleen A Derwin *The Cleveland Clinic Foundation*
- II-99 **Anatomic Variation In The Elastic Properties Of Human Cortical Bone**
Alejandro A Espinoza Orías, John E Renaud, Ryan K Roeder *University of Notre Dame*
- II-100 **Direct Numerical Simulation Of Transition To Turbulent Flow In A Subject-Specific Arteriovenous Graft**
Sang-Wook Lee, David S Smith, Francis Loth, Paul F Fischer, Jennifer K Grogan, Hisham S Bassiouny *University of Illinois at Chicago*

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- Dragomir D Anguelov, Lars Muendermann, Stefano Corazza *Stanford University*
- II-102 **A Structural Model For Predicting The Effective Stiffness Of Engineered Heart Valve Tissues Based On Nonwoven Scaffolds**
George C Engelmayr, Elena Rabkin-Aikawa, Frederick J Schoen, *University of Pittsburgh*
John E Mayer, Michael S Sacks
- II-103 **Pressure-Volume And Stress-Strain Relationships In Engineered Cardiac Tissue Chambers**
Eun Jung Lee, Do Eun Kim, Cristina Alexandrescu, Kevin D. Costa *Columbia University*
- II-104 **Physiological Relevance Of The Changes In Hemodynamic Stresses For Circulating Blood Cells In Abdominal Aortic Aneurysms**
Anne-Virginie LB Salsac, Steven R Sparks, Jean-Marc Chomaz, *University of California San Diego*
Juan C Lasheras
- II-105 **Transient Temperature Distributions During Electrical Pulsing Of Filaments Used For Microporation Of Skin**
Jonathan I Barletta, Zhuomin M Zhang, Jens OM Karlsson *Georgia Institute of Technology*
- II-106 **Computational Modeling Of The Foot/Ankle Complex**
Peter C Liacouras, Jennifer S Wayne *Virginia Commonwealth University*
- 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 *Stanford University*

Saturday, June 25, 2005	7:30 AM - 9:00 AM	Session 10A
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Podium Session: **CELL MECHANICS: EXPERIMENTAL** **Cascade Ballroom**

CHAIR: Phillip Leduc

CO-CHAIR: Jiro Nagatomi

- 7:30 **Prestress-Dependent Propagation Of Forces To The Nucleolus**
Ning Wang, Shaohua Hu, James P Butler *Harvard School of Public Health*
- 7:45 **Cell-Extracellular Matrix (ECM) Micro-Mechanical Behavior Depends On ECM Microstructure And Cell Type**
Alaina M Pizzo, Klod Kokini, Beverly Z Waisner, Sherry L Voytik-Harbin *Purdue University*
- 8:00 **Substrate Stiffness Directs Mesenchymal Stem Cell Differentiation**
Adam J Engler, Mark F Berry, H. Lee Sweeney, Dennis E Discher *University Of Pennsylvania*
- 8:15 **Interstitial Flow Induces Pro-Fibrotic Fibroblast Differentiation And Collagen Alignment In Vitro**
Chee P Ng, Federica Boschetti, Melody A Swartz *Swiss Federal Inst. of Tech. (EPFL)*
- 8:30 **Heart Valve Interstitial Cell Mechanical Properties: Effects Of Right And Left Side Heart Transvalvular Pressures**
W David Merryman, Michael S Sacks, Inchan Youn, Farshid Guilak, Paula M Krueger, Richard A Hopkins *University of Pittsburgh*
- 8:45 **Functional Characterization Of An Osmotically-Sensitive Ion Channel, TRPV4, In Articular Chondrocytes**
Mimi Phan, Scott Pritchard, Bart J Votta, Sanjay Kumar, Wolfgang Liedtke, Farshid Guilak *Duke University Medical Center*

Saturday, June 25, 2005	7:30 AM - 9:00 AM	Session 10B
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Podium Session: **TISSUE ENGINEERING - CARTILAGE** **Centennial Ballroom ABC**

CHAIR: Clark Hung

CO-CHAIR: Andres Garcia

- 7:30 **Tissue Engineering Of Cylindrical And Anatomically-Shaped Osteochondral Constructs Using Poly(Propylene Glycol-Co-Fumaric Acid) As A Moldable, Porous Substrate**
Eric G Lima, Patricia Setti, Gerard A Ateshian, James L Cook, Cristi R Cook, David D Hile, Clark T Hung *Columbia University*
- 7:45 **Cartilage Beneath A Protective Layer With Strain Dependent Permeability: Implications For Tissue Engineering**
John R Owen, Jennifer S Wayne *Virginia Commonwealth University*
- 8:00 **The Effects Of Hydrostatic Loading On A Bioengineered Cartilage Tissue Equivalent**
Christina M Turka, John E Novotny, Changhoon Jeong, Dean W Richardson, George R Dodge *University of Delaware*
- 8:15 **Evaluation Of Hyclone Bovine Growth Serum For Use In Cartilage Tissue Engineering.**
Kenneth W Ng, Lauren Y Statman, Gerard A Ateshian, Clark T Hung *Columbia University*
- 8:30 **On The Ability Of Mesenchymal Stem Cells To Form Functional Cartilaginous Tissues In Three Dimensional Agarose Culture**
Robert L Mauck, Xiaoning Yuan, Rocky S Tuan *National Institutes of Health*
- 8:45 **Matrix Distribution And The Functional Development Of Tissue Engineered Cartilage**
Bram G Sengers, Cees WJ Oomens, Frank PT Baaijens *Eindhoven University of Technology*

Saturday, June 25, 2005	7:30 AM - 9:00 AM	Session 10C
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Podium Session: **VASCULAR MECHANICS** **Centennial Ballroom D**

CHAIR: David Vorp

CO-CHAIR: Ruth Okamoto

- 7:30 **Large Artery Elasticity And Viscoelasticity In A Mouse Model Of Primary Pulmonary Hypertension**
Ryan W Kobs, Naomi C Chesler *University of Wisconsin*
- 7:45 **Stress-Strain Properties Of Hypoxic Rat Pulmonary Arteries**
Elizabeth S Drexler, Andrew J Slifka, Christopher N McCowan, Timothy P Quinn, Dunbar Ivy, Robin Shandas *NIST*
- 8:00 **Biomechanical Model Of The Arterial Wall Accounting For Elastic Properties And Structure Of Normal And Decellularized Arteries**
Gilles N Prodhom, Sylvain Roy, Nikos Stergiopoulos *Swiss Federal Institute of Technology*
- 8:15 **Role Of Interaction Between Elastin And Collagen In Arterial Elasticity**
Madhavan L Raghavan, Jarin A Kratzberg, Roshni Parikh, Setu Trivedi *University of Iowa*
- 8:30 **Effect Of Length To Diameter Ratio In Mechanical Testing Of Aorta**
Kelly M Brinkley, Joseph C Teply, Ruth J Okamoto *Washington University*
- 8:45 **Simulation Of Fluid Flow In Artery And Tissue Engineered Vascular Graft Walls Under Cyclic Pressure Using ABAQUS**
Paul H Rigby, Bruce R Simon, Stuart K Williams *University of Arizona*

Saturday, June 25, 2005	7:30 AM - 9:00 AM	Session 10D
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Podium Session: **ARTERY WALL DEVICE INTERACTIONS** **Centennial Ballroom EF**

CHAIR: Jimmy Moore

CO-CHAIR: Rosaire Mongrain

- 7:30 **Multidisciplinary Design Optimization Of Stents**
Rosaire Mongrain, Ramses Galaz, Neil Bulman-Fleming, Bilal Ruzzeh, Olivier Bertrand, Jean-Claude Tardif *McGill University*
- 7:45 **Vascular Stress State And Tissue Prolapse In An Atherosclerotic Coronary Artery: Influence Of The Stent Design By Means Of Finite Element Analyses**
Francesco Migliavacca, Silvia Schievano, Serena Gilardi, Giovanni Ricciardi, Dario Gastaldi, Lorenza Petrini, Tomaso Villa, Riccardo Pietrabissa, Gabriele Dubini *Politecnico di Milano*
- 8:00 **Stress Quantification In Stented Hyperelastic Artery Models: Tools For Improving Stent Design And Reducing Restenosis**
Julian Bedoya, Clark Meyer, Michael Moreno, James Moore *Texas A&M University*
- 8:15 **In Vivo Deformations Of The Superficial Femoral Artery - Possible Cause Of Stent Fractures?**
Christopher P Cheng, Nathan M Wilson, Robert J Herfkens, Charles A Taylor *Stanford University*
- 8:30 **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**
Henryk J Salacinski, Ruben Y Kannan, Claire B Hillery, Zhong You, Jian R Lu, Alexander M Seifalian *University College London*
- 8:45 **On The Effectiveness Of Distal Protection Devices In Carotid Artery Stenting**
Ender A Finol, Christine M Scotti, Isabella Verdinelli, Mark H Wholey *Carnegie Mellon University*

Saturday, June 25, 2005	7:30 AM - 9:00 AM	Session 10E
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Podium Session: **COMPUTATIONAL BIOHEAT AND MASS TRANSFER** **Rocky Mountain Ballroom AB**

CHAIR: Ram Devireddy

CO-CHAIR: Jens Karlsson

7:30 **Computational And In-Vitro Characterization Of Pressure Drop And Oxygenation In Blood Membrane Oxygenators**

Juntao Zhang, Timothy DC Nolan, Bartley P Griffith, Zhongjun J Wu *University of Maryland School of Medicine*

7:45 **Computer Modeling Of Tissue Cooling Using A Local Brain Cooling Probe**

Fon-Chieh Chang, Kenneth E. Kasza *Argonne National Laboratory*

8:00 **Numerical Simulations Of Transcorneal Transport Of Ethacrynic Acid**

Cheng-Wen Lin, Fan Yuan *Duke University*

Saturday, June 25, 2005	7:30 AM - 9:00 AM	Session 10F
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Podium Session: **TENDON/LIGAMENT MECHANICS II - MECHANICAL MEASUREMENTS** **Rocky Mountain Ballroom CD**

CHAIR: Richard E. Debski

CO-CHAIR: Michael J. Bey

7:30 **Nonlinear Elastic And Mesostructural Properties Of The Achilles Tendon**

Todd C Doehring, Ahmet Erdemir, Peter R Cavanagh *Cleveland Clinic Lerner College of Medicine*

7:45 **Increases In Anterior Knee Laxity And Lengthening Of Soft Tissue Anterior Cruciate Ligament Graft Constructs Using Roentgen Stereophotogrammetry**

Conrad K. Smith, Phillip J. Roos, Maury L. Hull, Stephen M. Howell *University of California*

8:00 **The Measurement Of The Variation In The Surface Strains Of Achilles**

Louis E DeFrate, Alex van der Ven, Patrick J Boyer, Thomas J Gill, Guoan Li *Massachusetts General Hospital*

8:15 **Measuring Dynamic, In-Vivo Tendon Strain With Biplane Radiography: Technique And Preliminary Results In A Canine Model**

Michael J Bey, Stephanie K Brock, Scott Tashman, Clifford M Les *Henry Ford Hospital*

8:30 **Effect Of Pressure On Determining The Nominal Strain State Of The Inferior Glenohumeral Ligament Complex**

Eric J Rainis, Susan M Moore, Jens Stehle, Patrick J McMahon, Richard E Debski *University of Pittsburgh*

8:45 **Non-Uniform Finite Strain Fields In The Supraspinatus During Shoulder Elevation**

Hehe Zhou, John E Novotny *University of Delaware*

Saturday, June 25, 2005	7:30 AM - 9:00 AM	Session 10G
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Podium Session: **LUMBAR SPINE MECHANICS** **Creekside Room**

CHAIR: Jamie Williams

CO-CHAIR: Carlos Lopez

- 7:30 **Predicting Apparent Elastic Moduli Of Vertebral Cancellous Bone Based On Apparent Morphology: Toward Patient-Specific Spine Models**
Idit S Diamant, Ron Shahar, Amit Gefen *Tel Aviv University*
- 7:45 **Finite Element Analysis Of Nitinol Interspinous Implant For Dynamamic Stabilization**
Pasquale Vena, Dario Gastaldi, Giampaolo Franzoso, Roberto Contro *Politecnico di Milano*
- 8:00 **Effect Of Compressive Pre Load On Range Of Motion Of The Entire Lumbar Spine**
Susan M Renner, Raghu N Natarajan, Gunnar BJ Andersson, Avinash G Patwardhan, Howard S An *Rush University Medical Center*
- 8:15 **Biomechanical Comparison Between Normal And Artificial Intervertebral Disc**
Guilhem Denoziere, David N Ku *Georgia Institute of Technology*
- 8:30 **Is Disc Degeneration In The Rabbit Stab Model Initiated By Mechanical Phenomena?**
Ian A Cowgill, Koichi Sairyo, Vijay K Goel, Ashok Biyani *University of Toledo*
- 8:45 **RhGDF-5 Partially Restores Loss Of Disc Height Induced By Chondroitinase-ABC Chemonucleolysis - A Rabbit Investigation**
Ashok Biyani, Ian A Cowgill, Koichi Sairyo, Vijay K Goel, Mohamed Attawia *University of Toledo*

Saturday, June 25, 2005	7:30 AM - 9:00 AM	Session 10H
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Podium Session: **IMPLANT BIOMECHANICS III - GENERAL** **Gore Range Exhibit Hall**

CHAIR: Farid Amirouche

CO-CHAIR: Ivan Zirkovic

- 7:30 **An Experimental And Theoretical Framework For Manufacturing Prosthetic Sockets For Transtibial Amputees**
Mario C Faustini, Richard R Neptune, Richard H Crawford, William E Rogers, Gordon Bosker *The University of Texas at Austin*
- 7:45 **Finite Element Analysis Of Porous Coating Design For Soft Tissue Attachment**
Xiangyi Liu, Chaodi Li, Glen L Niebur *University of Notre Dame*
- 8:00 **Interface Pressures Between BK Residual Limb And Prosthetic Socket At Three Defferent Walking Speeds**
Pei Lin Yang, Lai Hsing Hsu, Gwo Feng Huang, Shih Sheng Shi, Gang Sheng Lin *National Cheng Kung University*
- 8:15 **A Comprehensive Stress Analysis Of An Indirect Dental Restoration**
Estevam B Las Casas *Federal University of Minas Gerais*
- 8:30 **Computer Assisted Reconstruction Of Large Mandibular Defects Via Patient-Specific Pre-Bent Implants**
Sigbjorn Olsen, Wock Hallermann, Thibaut Bardyn, Wenko Smolka, Tateyuki Iizuka *University of Bern*
- 8:45 **Orthopedic Implants As Drug-Delivery Systems: A Theoretical Study**
Vincent Stadelmann, Dominique Pioletti *Swiss Federal Institute of Technology (EPFL)*

Saturday, June 25, 2005	9:15 AM - 10:45 AM	Session 11A
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**Podium
Session:**

CELL MECHANICS: COMPUTATIONAL

**Cascade
Ballroom**

CHAIR: Phillip Leduc

CO-CHAIR: Jiro Nagatomi

- 9:15 **Do Pseudopodia Have The Mechanical Potential To Drive Morphogenetic Movements In Embryos?**
G. Wayne Brodland, Jim H Veldhuis *University of Waterloo*
- 9:30 **Large-Scale Modeling Of The Mechanical Behavior Of Multicellular Constructs**
James E Guilkey, James B Hoying, Jeffrey A Weiss *University of Utah*
- 9:45 **A Triphasic Model Of Cell Under Micropipette Aspiration: The Osmotic Effect On Cell Mechanical Properties**
Morakot Likhitpanichkul, Chester Miller, X Lux Lu, X Edward Guo, Van C Mow *Columbia University*
- 10:00 **Osmotic Loading Of Alginate Gels: A Biomimetic Study Of Hindered Transport In The Cell Cytoplasm**
Michael B Albro, Nadeen O Chahine, Kenneth W Ng, Morakot Likhitpanichkul, Clark T Hung, Gerard A Ateshian *Columbia University*
- 10:15 **Non-Hertzian Analysis Of Cell Indentation By Atomic Force Microscopy**
Kevin D Costa, Alan J Sim, Frank C-P Yin *Columbia University*
- 10:30 **Finite Element Modeling Of Region-Specific Cell-Matrix Interactions In The Meniscus**
Maureen L Upton, Tod A Laursen, Farshid Guilak, Lori A Setton *Duke University*

Saturday, June 25, 2005	9:15 AM - 10:45 AM	Session 11B
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**Podium
Session:**

INTERVERTEBRAL DISC MECHANICS

**Centennial
Ballroom ABC**

CHAIR: Dawn Elliott

CO-CHAIR: Adam Hsieh

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

Saturday, June 25, 2005	9:15 AM - 10:45 AM	Session 11C
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Podium Session: **ANEURYSM MECHANICS** **Centennial Ballroom D**

CHAIR: David Vorp

CO-CHAIR: M.L. Raghavan

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

Saturday, June 25, 2005	9:15 AM - 10:45 AM	Session 11D
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Podium Session: **RESPIRATORY FLUID MECHANICS** **Centennial Ballroom EF**

CHAIR: Samir Ghadiali

CO-CHAIR: David Elad

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

Saturday, June 25, 2005	9:15 AM - 10:45 AM	Session 11E
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Podium Session: **JOINT BIOMECHANICS** **Rocky Mountain Ballroom AB**

CHAIR: Richard E. Debski

CO-CHAIR: John J. Elias

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

Saturday, June 25, 2005	9:15 AM - 10:45 AM	Session 11F
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Podium Session: **TENDON/LIGAMENT MECHANICS III - MATHEMATICAL MODELS** **Rocky Mountain Ballroom CD**

CHAIR: Glen Niebur

CO-CHAIR: Steven D. Abramowitch

- 9:15 **The Prediction Of The Stress-Strain Behavior Of Ligaments And Tendons**
 Louis E DeFrate, Guoan Li *Massachusetts General Hospital*
- 9:30 **A Mathematical Model Of Cell Mediated Tissue Adaptation To Mechanical Loading**
 Chaodi Li, Glen L Niebur *University of Notre Dame*
- 9:45 **A Phenomenological Model To Describe The Dynamic Viscoelastic Behavior Of The Rabbit Medial Collateral Ligament**
 Steven D Abramowitch, Savio L-Y Woo *University of Pittsburgh*
- 10:00 **Application Of Acoustoelasticity To Nearly Incompressible Materials**
 Hirohito Kobayashi, Ray Vanderby *University of Wisconsin-Madison*
- 10:15 **Constitutive Relations For Fibril Reorientation In Embryonic Tendon: Thermodynamic Admissibility And Restrictions**
 Joseph E Olberding, Krishna Garikipati, Ellen Kuhl, Harish Narayanan, Ellen M Arruda, Karl Grosh, Sarah Calve *University of Michigan*
- 10:30 **An Analytical Solution For The Stress Field Along Compressive Regions Of Tendon And Its Role On Proteoglycan Synthesis**
 Victor Birman, Guy M Genin, Stavros Thomopoulos *Department of Orthopaedic Surgery*

Saturday, June 25, 2005	9:15 AM - 10:45 AM	Session 11G
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**Podium
Session:**

CERVICAL SPINE MECHANICS

**Creekside
Room**

CHAIR: Lars Gilbertson

CO-CHAIR: Susan Renner

- 9:15 **Development Of A Robust Three-Dimensional Mathematical Model Of The Cervical Spine.**
Carlos G Lopez-Espina, Farid Amirouche *University of Illinois at Chicago*
- 9:30 **Probabilistic Analysis Of Lower Cervical Spine For Whiplash Injury**
Taek H Jang, Stephen Ekwa *Texas Tech University*
- 9:45 **In Vitro Biomechanical Analysis Of The IVBF Dual-Blade Plate: An Anterior Spinal Fixation Device**
Randal P Morris, Kim J Garges, Jinping Yang, Daniel L L Stahl, William L Buford Jr, Rita M Patterson, Shucheng Rao *The University of Texas Medical Branch*
- 10:00 **Preparation And Rehydration Effects On Compressive Properties Of Cornerstone ASR Cervical Spine Allografts**
Andrew J Rapoff, Katia Genovese, Amy Hsiao, Anna E Tietz, Ronald B Bucinell *Union College*
- 10:15 **Two-Level Cervical Corpectomy With Rigid Screw-Plate System Produces Larger Increase In Facet Loads At Level Superior To The Fusion Level**
Mohamed Hussain, Raghu N Natarajan, Gunnar BJ Andersson, Howard S An *Rush University Medical Center*

Saturday, June 25, 2005	9:15 AM - 10:45 AM	Session 11H
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**Podium
Session:**

MUSCLE MECHANICS/MODELING

**Gore Range
Exhibit Hall**

CHAIR: David Corr

CO-CHAIR: Kenton Kaufman

- 9:15 **Skeletal Muscle Modeling: A Cross-Bridge Based Mechanism Of Force Depression**
David T Corr, Walter Herzog *University of Calgary*
- 9:30 **Reversible Strain Softening Behavior In Rabbit Detrusor Smooth Muscle**
John E Speich, Lindsey Borgsmiller, Christopher Call, Ryan Mohr, Paul H Ratz *Virginia Commonwealth University*
- 9:45 **Structured Modeling Of Skeletal Muscle During Contraction**
Robson R Lemos, Marcelo Epstein, Walter Herzog *Universidade de Caxias do Sul*
- 10:00 **In-Vivo Force Measurement Using Intramuscular Pressure**
Kenton R Kaufman, Jennifer Davis, Thomas Jenkyn, Peter Huijing, Bart Koopman, Tom Wavering, Duane Morrow, Richard L Lieber *Mayo Clinic / Mayo Foundation*
- 10:15 **Effects Of Extension Rate On Strain Injury Of Skeletal Muscle**
Sota Yamamoto, Daisuke Ito, Yoichi Furuyama, Tatsuya Namikiri, Eiichi Tanaka, Masahito Hitosugi, Shogo Tokudome *Nagoya University*
- 10:30 **Step Size In Single Filaments And Single Myofibrils Is Equal To The Actin-Monomer Spacing Along The Thin Filament**
Katya Nagormyak, Xiumei Liu, Olga Yakovenko, Felix Blyakhman, Gerald H Pollack *University of Washington*

Saturday, June 25, 2005	11:00 AM - 12:30 PM	Session 12A
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Podium Session: **CELL AND MOLECULAR ENGINEERING: CELL ADHESION** **Cascade Ballroom**

CHAIR: Andres Garcia

CO-CHAIR: Kristen Billiar

- 11:00 **Increased Adhesion Of Vascular Cells To Nanophase Titanium**
Saba Choudhary, Karen M Haberstroh, Thomas J Webster *Purdue University*
- 11:15 **Dynamic Substrates To Investigate Cell Migration**
Srivatsan Raghavan, Youngeun Kwon, Milan Mrksich, Christopher S Chen *University of Pennsylvania*
- 11:30 **Synthesis Of An Artificial Glycocalyx For Studies Of Leukocyte Adhesion**
Herbert H Lipowsky, Courtney A Haynes *Pennsylvania State University*
- 11:45 **Triphasic Force Dependence Of Dissociation Kinetics Of E-Selectin/Ligand Interaction**
Annica M. Wayman, Rodger P. McEver, Cheng Zhu *Georgia Institute of Technology*
- 12:00 **A Model System To Assess And Predict The Key Vascular Cell Responses To Biomaterials**
Eugene A Sprague, Julio C Palmaz, Jian Luo *University of Texas Health Science Center*
- 12:15 **Human Mesenchymal Stem Cells Express Palladin**
Michelle E Wall, Carol A Otey, Elizabeth G Lobo *North Carolina State University*

Saturday, June 25, 2005	11:00 AM - 12:30 PM	Session 12B
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Podium Session: **CARTILAGE MECHANICS I: MODELING** **Centennial Ballroom ABC**

CHAIR: John R. Owen

CO-CHAIR: Nadine O. Chahine

- 11:00 **The Contribution Of Osmotic Pressure To The Effective Compressive Aggregate Modulus Of Bovine Articular Cartilage**
Nadeen O Chahine, Faye H Chen, Clark T Hung, Gerard A Ateshian *Columbia University*
- 11:15 **The Influence Of The Fixed Negative Charges On Mechanical Behavior Of Articular Cartilage Under Indentation**
Lux X. Lu, Chester Miller, Edward X. Guo, Van C. Mow *Columbia University*
- 11:30 **Confined And Unconfined Compression Response Of A Poroelastic Octantwise Model For Articular Cartilage**
Daniel H Cortes, Jose J Garcia *Universidad del Valle*
- 11:45 **Tensorial Electrokinetics In Articular Cartilage**
Boris Q Reynaud, Thomas M Quinn *Cartilage Biomechanics Group*
- 12:00 **The Cause And Nature Of Collagen Damage After Mechanical Overloading**
Wouter Wilson, Rene van Donkelaar, Pieter Buma, Bert van Rietbergen, Rik Huiskes *Eindhoven University of Technology*
- 12:15 **A Mechano-Chemical Model For Osmotic Loading Of An Isolated Chondron**
Mansoor A Haider, Richard C Schugart, Lori A Setton, Farshid Guilak *North Carolina State University*

Saturday, June 25, 2005	11:00 AM - 12:30 PM	Session 12C
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**Podium
Session:**

CARDIOVASCULAR MECHANICS

**Centennial
Ballroom D**

CHAIR: Jeffrey W. Holmes

CO-CHAIR: Naomi Chesler

- 11:00 **Reduction In Monocyte Adhesion To Elastic Laminae By Lactose-Impregnation**
Christopher R Tieche, Paul K Alkema, Shu Q Liu *Northwestern University*
- 11:15 **A Computational Plaque Vulnerability Index Based On Stress/Strain Local Maximal Values For Human Atherosclerotic Plaque Vulnerability Assessment**
Chun Yang, Dalin Tang, Jie Zheng, Pamela K Woodard, Jeffrey E Saffitz, Luis A Sanchez, Gregorio A Sicard *Worcester Polytechnic Institute*
- 11:30 **Strain Mapping Of LVAD Unloading And Post MI Remodeling**
Zhongjun J Wu, Deyannira Prastein, Ahmet Kilic, Sina Moainie, Michele Egerton, Jennifer R Nash, Michael S Sacks, Bartley P Griffith *University of Maryland*
- 11:45 **Structural Mechanics Model Of The Heart Ventricles Using A Nonlinear Transversely Isotropic Fiber Splay Model.**
Dimitri Deserranno, Mohammad Kassemi, James D Thomas *National Center for Microgravity Res.*
- 12:00 **A Computational Model For The Initial Stages Of Cardiac Looping**
Ashok Ramasubramanian, Kimberly S Latacha, Larry A Taber *Washington University in St. Louis*
- 12:15 **Design And Fabrication Of Mechanics-Matching Arterial Graft**
Alexander I Rachev, Luc Felden, David N Ku *Georgia Institute of Technology*

Saturday, June 25, 2005	11:00 AM - 12:30 PM	Session 12D
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**Podium
Session:**

VASCULAR HEMODYNAMICS AND PATHOLOGY

**Centennial
Ballroom EF**

CHAIR: Naomi Chesler

CO-CHAIR: Pavlos Vlachos

- 11:00 **MRI-Based Multiscale Models For The Haemodynamic And Structural Evaluation Of Surgically Reconstructed Aortic Arches**
Simone Pittaccio, Francesco Migliavacca, Gabriele Dubini, Erik Morre-Pedersen, Ernst-Torben Freund, Vibeke Hjortdal, Morten Smerup, Marc R de Leval *Consiglio Nazionale delle Ricerche - Istituto per l'Energetica e le Interfasi*
- 11:15 **Hemodynamic Studies Of Aortic Dissection In Patient-Specific Phantoms**
Christopher J Elkins, Ivan Acosta, Manny Gonzales, Francisco Medina, Ananth S Iyengar, Michael D Dake, Ryan B Wicker *UTEP*
- 11:30 **Correlation Between Haemodynamic Wall Parameters And Intima-Media Thickness In The Carotid Arteries**
Alexander D Augst, Xiao Y Xu, Ben Ariff, Simon A Thom, Alun D Hughes *Imperial College London*
- 11:45 **In Vivo Assessment Of The Relationship Between Shear Stress And Parameters Of Plaque Vulnerability In Human Coronary Arteries**
Frank JH Gijzen, Attila Thury, Jolanda J Wentzel, Johan CH Schuurbiens, Johannes A Schaar, Frits Mastik, Anton FW van der Steen, Patrick W Serruys, Cornelis J Slager *Erasmus MC*
- 12:00 **Characterization Of Diseased Coronary Blood Flow Using DPIV**
Karri S Babu, Ali Etebari, Pavlos Vlachos *Virginia Polytechnic and State Univ.*
- 12:15 **Pulmonary Vascular Resistance And Impedance Changes With Hypertension-Induced Vascular Remodeling In A Mouse Model**
Holly A Tuchscherer, Rebecca Vanderpool, Naomi C Chesler *University of Wisconsin*

Saturday, June 25, 2005	11:00 AM - 12:30 PM	Session 12E
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Podium Session: **COMPUTATIONAL JOINT BIOMECHANICS** **Rocky Mountain Ballroom AB**

CHAIR: Lorin P. Maletsky

CO-CHAIR: Paul Rullkoetter

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

Saturday, June 25, 2005	11:00 AM - 12:30 PM	Session 12F
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Podium Session: **BONE MECHANICS I: MICROMECHANICS** **Rocky Mountain Ballroom CD**

CHAIR: Liming Voo

CO-CHAIR: Iwona Jasiuk

- 11:00 **Three-Dimensional Imaging Of Microdamage In Bone Using Micro-CT**
Xiang Wang, Huijie Leng, Ryan K Roeder, Glen L Niebur *University of Notre Dame*
- 11:15 **Structural Measurements Of Osteocyte Lacunae And Canaliculi Using Confocal Microscopy**
Thoma Beno, Cesare Ciani, Stephen B Doty, Susannah P Fritton *City College of New York*
- 11:30 **Anatomical Variation In The Elastic Anisotropy Of Human Cortical Bone Tissue Depends On The Orientation Distribution Of Bone Mineral**
Weimin Yue, Alejandro A Espinoza Orlas, John E Renaud, Ryan K Roeder *University of Notre Dame*
- 11:45 **Effects Of Fatigue Microdamage On Local Bone Tissue Properties**
Tamim Diab, Deepak Vashishth *Rensselaer Polytechnic Institute*
- 12:00 **Osteon Pushout Microtesting Of Human Cortical Bone**
Henry X Zhang, Edward X Guo *Columbia University*
- 12:15 **A Shear Lag Model Of Microdamage Formation In Bone**
Xiaodu Wang, Chunjiang Qian *MEB/UTSA*

Saturday, June 25, 2005	11:00 AM - 12:30 PM	Session 12G
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Podium Session: **INJURY BIOMECHANICS I** **Creekside Room**

CHAIR: Brian Stemper

CO-CHAIR: Narayan Yoganandan

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

Saturday, June 25, 2005	11:00 AM - 12:30 PM	Session 12H
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Podium Session: **BRAIN MECHANICS** **Gore Range Exhibit Hall**

CHAIR: Ali Sadegh

CO-CHAIR: Liying Zhang

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

Saturday, June 25, 2005	12:30 - 2:00 PM	Session 13
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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 Comparison Of Different Methods For Heart Sounds Localization**
Azadeh Yadollahi, Mohammad B. Shamsollahi, Zahra Moussavi, Zahra Ahmadinejad *Sharif University of Technology*
- III-9 **Pressure-Flow Characteristics During Peristaltic 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, Cliff 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*

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- Giancarlo Pennati, Laura Socci, Francesca Geravso, Francesco
Migliavacca, Simona Boito, Serena Rigano, Enrico Ferrazzi, Giorgio
Pardi, Frederick Battaglia *Politecnico di Milano*
- 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**
Ranjan 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*

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- 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*
- III-30 **Computer Simulation Of Elastic Red Blood Cell Flow In A Bifurcation**
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**
W. G. Li, X. Y. Luo, S. B. Chin, N. Bird, A. G. Johnson, N. A. Hill *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. Tjsseling *Eindhoven University of Technology*
- III-44 **Phase Averaging Of Arterial Pulse Waves**
Clifton R Johnston, Matthew J Schaefer, Robert J Martinuzzi *University of Calgary*
- III-45 **Influence Of Molecular Adhesion On Flow Phenomena In A Collapsed Respiratory Airway: A Multi-Scale**

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- 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 Einav, 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 Chiravambath, 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 Garcla, 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 Vertebroctomy 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*

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- Duncan ET Shepherd, Alan J Johnstone *University of Birmingham*
- III-78 **Electrospun Polyesterurethane Membranes Provide A Substrate For Skeletal Muscle Cell Differentiation**
Sara Mantero, Stefania A Riboldi, Paolo AA Mognol, Maurilio *Politecnico di Milano*
Sampaolesi, Marc Simonet, Peter Neuenschwander, Giulio Cossu
- III-79 **Commercial Extracellular Matrices For Rotator Cuff Tendon Repair Or Reinforcement**
Andrew R Baker, Michael J DeFranco, Joseph P Iannotti, Kathleen *Cleveland Clinic Foundation*
A Derwin
- 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 *University of Texas M.D. Anderson*
Wheeler *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 *University of Utah*
Hoying, Jeffrey A Weiss
- III-84 **Quantitative Analysis Of A Candidate Porosity Reference Scaffold: Type 1**
Joy P Dunkers, John A Tesk, David Dean, Malcolm N Cooke, *National Institute of Standards and*
Richard A Ketcham, Marcus T Cicerone *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 *Georgia Institute of Technology*
J Garcia
- 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 *University of Virginia*
Ogle, Edward Botchwey
- 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 *Eindhoven University of Technology*
Baaijens, Carlijn VC Bouten
- 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**

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- Jeremiah J Wille, Tetsuro Wakatsuki, Elliot L Elson, Ruth J Okamoto *Washington University*
- 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*
- III-97 **Effect Of Imposed Thermal History On Post Thaw Survival Of Adipose Derived Adult Stem (ADAS) Cells: A Parametric Study.**
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 Gleghorn, 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 Jiao 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 Properties Of Decellularised Porcine Common Carotid Arteries**
Sylvain Roy, Paolo Silacci, Nikos Stergiopoulos *Swiss Federal Institute for Technology*

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- III-109 **Contribution Of Individual Structural Components To The Biomechanical Properties Of Carotid Arteries**
Edouard E Fonck, Luca Augsburgger, Makoto Ohta, Paolo Silacci, *EPFL / SV-LHTC*
Daniel Rufenacht, Nikos Stergiopoulos
- III-110 **Modeling Of Pulmonary Artery Mechancis 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*
- III-116 **A Critical Evaluation Of The Traditional Experimental Tests On Articular Cartilage Using A Finite Element Approach**
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 Sparring Corrections**
Monica S Soncini, Emiliano Votta, Silvia Zinicchino, Valeria Burrone, *Politecnico di Milano*
Andrea Mangini, Massimo Lemma, Alberto Redaelli
- III-122 **Analysis Of The Geoform Prosthetic Ring Through Computational Modelling: A Preliminary Study**
Emiliano Votta, Monica Soncini, Francesco Maisano, Ottavio Alfieri, *Politecnico di Milano*
Franco Maria Montevocchi, Alberto Redaelli
- 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*

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- 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*

Sunday, June 26, 2005	8:00 AM - 9:30 AM	Session 15A
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Podium Session: **CELL AND MOLECULAR ENGINEERING III** **Cascade Ballroom**

CHAIR: Andres Garcia

CO-CHAIR: Clark Hung

- 8:00 **Integrating Gene Expression And Metabolic Profiles To Infer Pathways And Networks That Confer Palmitate Induced Cytotoxicity In HEPG2 Cells**
Zheng Li, Shireesh Srivastava, Christina Chan *Michigan State University*
- 8:15 **Dynamic Compression Activates Chondrocyte Calcium Signaling In A Cycle Dependent Manner Involving The Release Of ATP**
Belinda Pinguan, David A Lee, Dan L Bader, Martin M Knight *Queen Mary University of London*
- 8:30 **Effects Of Dynamic Osmotic Loading On Chondrocyte Calcium Response And Gene Expression**
Pen-hsiu Grace Chao, Clark T Hung *Columbia University*
- 8:45 **Analysis Of Cytoplasmic And Nuclear RNA In Living Cells Using Peptide-Linked Molecular Beacons**
Nitin Nitin, Charles Glaus, Gang Bao *Georgia Tech. and Emory University*
- 9:00 **Live Cell Imaging Of Messenger RNA Co-Localization With Mitochondria**
Philip J. Santangelo, Nitin Nitin, Gang Bao *Georgia Tech. and Emory University*
- 9:15 **Understanding The Underlying Mechanisms Leading To Pressure Ulcers**
Anke Stekelenburg, Cees WJ Oomens, Gustav J Strijkers, Klaas Nicolay, Dan L Bader *Eindhoven University of Technology*

Sunday, June 26, 2005	8:00 AM - 9:30 AM	Session 15B
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Podium Session: **CARTILAGE MECHANICS II: EXPERIMENTAL INVESTIGATIONS** **Centennial Ballroom ABC**

CHAIR: John R. Owen

CO-CHAIR: Dejan Milentijevic

- 8:00 **Osteochondral Matrix Response To Severe Joint Trauma**
Dejan Milentijevic, Koosha Aslani, Hollis G Potter, Peter A Torzilli *Hospital for Special Surgery*
- 8:15 **Mechanical And Cellular Response Of Osteochondral Tissue During Impaction Grafting**
Markus A Wimmer, Sascha Mueller, Tamara Pylawka, Uwe-Jens Goerke, Brian J Cole, James M Williams *Rush University Medical Center*
- 8:30 **Biphasic Micro-Indentation Testing Of Mouse Articular Cartilage Reveals Functional Changes In A Type IX Collagen Knockout Model Of Osteoarthritis**
Li Cao, Inchan Youn, Yefu Li, Farshid Guilak, Bjorn R Olsen, Lori A Setton *Duke University*
- 8:45 **Mineralization And Nanomechanical Properties In Articular Calcified Cartilage**
Virginia L Ferguson, Michelle L Oyen, Alan Boyde, Andrew J Bushby *University of Colorado*
- 9:00 **Optical Measurement Of In Situ Strain Fields Within Bovine Humeral Head Articular Layer**
Clare E Canal, Nadeen O Chahine, Elizabeth T Chorney, Gerard A Ateshian *Columbia University*
- 9:15 **Durability Testing Of Articular Cartilage Replacements**
Rebecca J Covert Brown, David N Ku *Georgia Institute of Technology*

Sunday, June 26, 2005		8:00 AM - 9:30 AM	Session 15C
Podium Session:	FLUID MECHANICS OF PROSTHETIC HEART VALVES		Centennial Ballroom D
	CHAIR: Keefe Manning	CO-CHAIR: KB Chandran	
8:00	Hemodynamics Assessment Of Three Polymeric Heart Valves Using Three-Dimensional Particle Image Velocimetry Hwa Liang Leo, Lakshmi Prasad Dasi, Josie Carberry, Ajit Yoganathan	<i>Georgia Institute of Technology</i>	
8:15	Flow Performance Of Mechanical Heart Valves As Pulmonary Valves Richard Figliola, Jeremy Losaw, Jeffrey Goheen, Timothy Conover, Tim McQuinn, Donald Beasley	<i>Clemson University</i>	
8:30	Mechanical Heart Valve Closure Dynamics Keefe B Manning, Luke H Herbertson, Arnold A Fontaine, John M Tarbell, Steven Deutsch	<i>The Pennsylvania State University</i>	
8:45	Flow Induced Platelet Activation In Prosthetic Heart Valves - In Vitro And Numerical Studies Danny Bluestein, Wei Yin, Yared Alemu, Min Zhou, Foluso Ladeinde, Richard Schoepfoerster, Jolyon Jesty	<i>Stony Brook University</i>	
9:00	The Bileaflet Valve Opening Process: A Fluid-Structure Interaction Study Alberto C Redaelli, Monica Soncini, Gianfranco B Fiore, Matteo Nobili, Emiliano Votta, Umberto Morbiducci, Costantino Del Gaudio, Antonio Balducci, Mauro Grigioni	<i>Politecnico di Milano</i>	
9:15	Numerical Simulation Of Flow In Mechanical Bileaflet Heart Valves Liang Ge, Chang Wang, Hwa-Liang Leo, Fotis Sotiropoulos, Ajit Yoganathan	<i>Georgia Institute of Technology</i>	

Sunday, June 26, 2005		8:00 AM - 9:30 AM	Session 15D
Podium Session:	AORTIC ANEURYSM AND EVAR		Centennial Ballroom EF
	CHAIR: David Vorp	CO-CHAIR: Tim McGloughlin	
8:00	Computational Modeling Of Fluid Dynamics And Stress Pattern In Thoracic Aortic Aneurysms Alessandro Borghi, Nigel B Wood, Raad H Mohiaddin, Xiao Y Xu	<i>Imperial College London</i>	
8:15	Computational Simulation Of Velocity Distribution On Patient Based Abdominal Aortic Aneurysm Models Chengyan Peng, Elham Aslani, Robert A Peattie	<i>Oregon State University</i>	
8:30	A De-Coupled Fluid Structure Approach In Estimating Wall Stress In Abdominal Aortic Aneurysms Yannis Papaharilaou, John Ekaterinaris, Eirini Manousaki, Asterios Katsamouris	<i>Foundation for Research and Technology- Hellas, Greece</i>	
8:45	Novel Polyurethane-Coated Origami Stentgraft For Treatment Of AAA Claire B Hillery, Kaori Kuribayashi, Henryk Salacinski, Alexander M Seifalian, Zhong You	<i>University of Oxford</i>	
9:00	A Comparative Study Of The Unsteady Flow And Forces With Four AAA Endovascular Stent Graft Patient Harry A Dwyer, Tom Kim, Ben Howell, Angela Y Cheer, David Saloner, Tim Chuter	<i>University of California, Davis</i>	
9:15	Hemodynamic Factors Associated With Endovascular Stent Graft Devices And Its Influence On Stent Graft Failures Liam G Morris, Fintan Wallis, Pierce A Grace, Ajay Bohra, David A Vorp, Tim M McGloughlin	<i>University of Limerick</i>	

Sunday, June 26, 2005	8:00 AM - 9:30 AM	Session 15E
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**Podium
Session:**

HAND MECHANICS

**Rocky Mountain
Ballroom AB**

CHAIR: Zong-Ming Li

CO-CHAIR: Mark Gonzalez

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

Sunday, June 26, 2005	8:00 AM - 9:30 AM	Session 15F
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**Podium
Session:**

BONE MECHANICS II: ADAPTATION

**Rocky Mountain
Ballroom CD**

CHAIR: Melissa Knothe Tate

CO-CHAIR: Liming Voo

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

Sunday, June 26, 2005	8:00 AM - 9:30 AM	Session 15G
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Podium Session: **INJURY BIOMECHANICS II** **Creekside Room**

CHAIR: Srirangam Kumaresan

CO-CHAIR: Brian Stemper

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

Sunday, June 26, 2006	8:00 AM - 9:30 AM	Session 15H
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Podium Session: **BLOOD AND THROMBOSIS IN CARDIOVASCULAR PATHOLOGIES** **Gore Range Exhibit Hall**

CHAIR: Danny Bluestein

CO-CHAIR: Shmuel Einav

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

Sunday, June 26, 2005		9:45 AM - 11:15 AM	Session 16A
Podium Session:	SHEAR STRESS EFFECTS ON CELLS		Cascade Ballroom
	CHAIR: Morton Freidman	CO-CHAIR: Jiro Nagatomi	
9:45	Sialic Acids And Heparan Sulfate Proteoglycans Are Mechanosensory Components Of The Endothelial Glycocalyx. Manolis Y Pahakis, Jason R Kosky, Randal O Dull, John M Tarbell	<i>City College of New York</i>	
10:00	Interactive Effects Of Spatial Shear Stress Gradient And Shear Stress Magnitude On Endothelial Cell Behavior In Vivo And In Vitro Jeffrey A LaMack, Morton H Friedman	<i>Duke University</i>	
10:15	Arterial Stiffness Effect On The Deformability Of Red Blood Cells Sung S Lee, Nahn J Kim, Sun Kyung, Johannes G Dobbe, Max R Hardeman, James F Antaki, Kyung H Ahn, Seung J Lee	<i>Seoul National University</i>	
10:30	Applying Physiological Coronary Wall Shear Stresses To In Vitro Endothelial Cells Lucy M O'Keefe, Enda Gibney, Gordon Muir, Brendan McCormack, Jerry Bird, Tim McGloughlin	<i>University of Limerick</i>	
10:45	The Fluid Shear Response In Circulating Leukocytes: A Requirement For Erythrocytes Yutaka Komai, Geert W Schmid-Schoenbein	<i>University of California San Diego</i>	
11:00	Functionalized Poly(Ethylene Glycol) Contour Length Modulates Rreceptor-Ligand Interactions Of Microparticles In Shear Flow: Analogy To Leukocyte Microvilli Anthony S. W. Ham, Doug J. Goetz, Alexander L. Klibanov, Michael B. Lawrence	<i>University of Virginia</i>	

Sunday, June 26, 2005		9:45 AM - 11:15 AM	Session 16B
Podium Session:	MECHANICS OF NATIVE AND ENGINEERED TISSUES		Centennial Ballroom ABC
	CHAIR: Victor Barocas	CO-CHAIR: Chih-Tung C Chen	
9:45	Preventing Matrix Degradation And Maintaining Cell Population In Load-Induced Cartilage Using TIMP-1 And A Synthetic MMP Inhibitor Chih-Tung C Chen, Xiaohua Deng, Maria Nikmanesh, Peter A Torzilli	<i>Hospital For Special Surgery, New York</i>	
10:00	Daily Cyclic Compression Increases Collagen Cleavage In Load-Injured Cartilage Sowmita Narayanan, Mihae Song, Peter A Torzilli, Chih-Tung C Chen	<i>Hospital For Special Surgery, New York</i>	
10:15	Single-Scale And Multiscale Models Of Tissue-Equivalent Mechanics Preethi L Chandran, Triantafyllos H Stylianopoulos, Michael C Evans, Toshiro K Ohsumi, Joseph E Flaherty, Victor H Barocas	<i>University of Minnesota</i>	
10:30	In Vitro Prefailure Mechanics Of Placental Membranes Michelle L Oyen, Triantafyllos Stylianopoulos, Steven E Calvin, Daniel V Landers, Victor H Barocas	<i>University of Minnesota</i>	
10:45	An Expanded Network Model For The Characterization Of Vocal Fold Deformation Kai Zhang, Thomas Siegmund, Roger Chan	<i>Purdue University</i>	
11:00	Continuum Level Modeling Of The Optic Nerve Head Using Histologic Data: The Effect Of Material Description On Mechanical Response Anthony J Bellezza, James C Downs, Michael D Roberts, Claude F Burgoyne, Richard T Hart	<i>Exponent Failure Analysis Associates</i>	

Sunday, June 26, 2005		9:45 AM - 11:15 AM	Session 16C
Podium Session:	FLUID MECHANICS OF CARDIOVASCULAR DEVICES		Centennial Ballroom D
	CHAIR: Keefe Manning	CO-CHAIR: Andreas Anayiotos	
9:45	Modeling Internal Filtration And Back Filtration In High-Flux Hemodialyzers Gianfranco B Fiore, Gualtiero Guadagni, Roberto Fumero	<i>Politecnico di Milano</i>	
10:00	Local Hemodynamics Of Native And Synthetic Arteriovenous (AV) Fistulae For Hemodialysis Grainne T Carroll, Liam Morris, Michael Walsh, T. McGloughlin	<i>University of Limerick</i>	
10:15	Turbulent Flow Evaluation Of The Venous Needle During Hemodialysis Sunil Unnikrishnan, Thanh N Huynh, Brigitta C Brott, Michael Allon, Andreas S Anayiotos	<i>University of Alabama, Birmingham</i>	
10:30	In-Vitro Evaluation Of Guidewire Flow Obstruction In Diagnosis Of Coronary Lesion Severity Using Pulsatile Hemodynamics Koustubh Ashtekar, Abhijit S Roy, Rupak K Banerjee, Lloyd H Back, Ronald W Millard, Saeb Khoury	<i>University of Cincinnati</i>	
10:45	Numerical Study Of The Flow Characteristics Of Kyoto-NTN Magnetically Suspended Centrifugal Blood Pump Leok Poh Chua, Guoliang Song, Simon Ching Man Yu, Tau Meng Lim	<i>Nanyang Technological University</i>	
11:00	A Novel Wall Shear Stress Sensor For Cardiovascular Applications Ali Etebari, Karri S Babu, Barbar Akle, Matthew D Bennett, Don J Leo, Pavlos P Vlachos	<i>Virginia Polytechnic Institute and State University</i>	

Sunday, June 26, 2005		9:45 AM - 11:15 AM	Session 16D
Podium Session:	CORONARY HEMODYNAMICS		Centennial Ballroom EF
	CHAIR: Frank Gijsen	CO-CHAIR: C. Ross Ethier	
9:45	Blood Flow In An Out-Of-Plane Aorto-Left Coronary Artery Bypass-Graft Model Meena Sankaranarayanan, Dhanjoo N Ghista, Leok Poh Chua, Tan Yong Seng	<i>Nanyang Technological University</i>	
10:00	Transverse Flows In Rapidly Oscillating Cylindrical Vessels Matthias Heil, Sarah L Waters	<i>The University of Manchester</i>	
10:15	Flow Patterns And Wall Shear Stress In The Proximal Segments Of Human Coronary Arteries With And Without The Aorta Jin Suo, John Oshinski, Don Giddens	<i>Georgia Institute of Technology</i>	
10:30	Pulsatile Flow And Deformation In Curved Stenosis Models Of Arterial Disease - Influence Of Cyclic Change Of Curvature On Flow And Deformation Shunichi Kobayashi, Yutaka Fukuzawa, Yuuki Ayama, Hirohisa Morikawa, Dalin Tang, David N Ku	<i>Shinshu University</i>	
10:45	Mathematical Modeling Of Blood Flow In Curved Arteries Jennifer H Siggers, Sarah L Waters	<i>School of Mathematical Sciences</i>	
11:00	3D Plaque Distribution And Its Relationship To Shear Stress In A Human Coronary Artery Bifurcation In Vivo Frank JH Gijsen, Attila Thury, Bram Lamers, Jolanda J Wentzel, Johan CH Schuurbijs, Patrick W Serruys, Cornelis J Slager	<i>Department of Biomedical Engineering, Erasmus MC</i>	

Sunday, June 26, 2005	9:45 AM - 11:15 AM	Session 16E
Podium Session:	IMAGING AND BIOMECHANICS	Rocky Mountain Ballroom AB
	CHAIR: Guoan Li	CO-CHAIR: Amy Lerner
9:45	Comparison Of Two Methods : Three-Dimensional Reconstruction Of Bone By MRI And 3-D Laser Scanner. Guillaume Agnesina, William Bertucci, Redha Tair, Alain Lodini	<i>Universite de Reims</i>
10:00	Validation Of A New Markerless Tracking Technique For Measuring Three-Dimensional In-Vivo Glenohumeral Joint Motion During Dynamic Activities Michael J Bey, Roger Zuel, Stephanie K Brock, Scott Tashman	<i>Henry Ford Hospital</i>
10:15	CT-Based Patient-Specific 3D Modeling And Mechanical Analysis For Human Abdominal Aortic Aneurysm Chun Yang, Dalin Tang, David Chen, Steven P Marra, Mark F Fillinger	<i>Worcester Polytechnic Institute</i>
10:30	Low-Intensity Pulsed Ultrasound (LIPUS) And Longitudinal Cortical Allograft Perforation (LAP): In Vivo Effects On Allograft Incorporation And Remodeling Brandon G Santoni, Nicole Ehrhart, A. Simon Turner, Donna L Wheeler	<i>Colorado State University</i>
10:45	In Vivo Knee Kinematics Measured In Weight-Bearing Flexion Using Standing Magnetic Resonance Imaging Peter J Barrance, Thomas M Pepe, Thomas S Buchanan	<i>University of Delaware</i>
11:00	The Development Of An Orthogonal Fluoroscopic And MR Imaging Technique For Accurately Measuring In-Vivo Knee Joint Kinematics Guoan Li, Louis E DeFrate, Jeremy F Suggs, George R Hanson, Ramprasad Papannagari, Harry E Rubash	<i>Massachusetts General Hospital</i>

Sunday, June 26, 2005	9:45 AM - 11:15 AM	Session 16F
Podium Session:	BONE MECHANICS III: COMPUTATION	Rocky Mountain Ballroom CD
	CHAIR: Iwona Jasiuk	CO-CHAIR: Alexandra Schonning
9:45	Trabecular Bone As A Hierarchical Material: Elasticity And Fracture Iwona M Jasiuk	<i>Concordia University</i>
10:00	Lower Stiffness Detected In Finite Element Analysis Of Virtual Bone Biopsy From Hypogondal Male Patients ML Chan, XW Liu, B Vasilic, FW Wehrli, M Benito, PJ Snyder, X Ed Guo	<i>Columbia University,</i>
10:15	A FEM-Based Cohesive Model Of Age-Related Toughness Loss In Human Cortical Bone Ani Ural, Deepak Vashishth	<i>Rennselaer Polytechnic Institute</i>
10:30	Comparison Of Micro-Level And Continuum-Level Voxel Models For Strength Predictions Of The Proximal Femur Eelco Verhulp, Bert van Rietbergen, Rik Huiskes	<i>Eindhoven University of Technology</i>
10:45	Damage Accumulation In Vertebral Body Models With Simulated Bone Loss And The Effects Of BMD Error On Response Predictions Todd L Bredbenner, Daniel P Nicolella, Dwight T Davy	<i>Case Western Reserve University</i>
11:00	Vertebral Body Failure Load Is Better Predicted By A Sampling Micro-FEA Approach Than By BMD Marlies A Terlouw, Bert Van Rietbergen, Eva-Maria Lochmueller, Felix Eckstein, Rik Huiskes	<i>Eindhoven University of Technology</i>

Sunday, June 26, 2005	9:45 AM - 11:15 AM	Session 16G
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Podium Session: **TRAUMA AND VEHICULAR BIOMECHANICS** **Creekside Room**

CHAIR: Anthony Sances, Jr.

CO-CHAIR: Srirangam Kumaresan

- 9:45 **Effects Of Helmet Inertial Properties On Hybrid III Neck Injury Risk**
Andrew C Merkle, Michael Kleinberger, Liming Voo *The Johns Hopkins University*
- 10:00 **Effect Of Inertial Release Levels On Seat Belt Buckles At Various Angles**
Richard Clarke, Anthony Sances, Srirangam Kumaresan, Steve Syson *Clarke Automotive*
- 10:15 **Rollover Cases With Roof Crush In NASS**
Carl E. Nash, Allan Paskin *Xprts, LLC*
- 10:30 **Biomechanical Effects Of Buckling Induced Increases**
Keith Friedman, D Mohira, J Hutchinson, A Sances, S Kumaresan *Friedman Research Corporation*
- 10:45 **Late-Phase Occupant Rebound After Rear-End Impact**
Jacob L Fisher, William N Newberry, Ramaswamy Krishnan, Janine Pierce, Tara L. A. Moore *Exponent, Inc.*
- 11:00 **Evaluation Of Mouthguard Use In Relation To Strain In Middle Cranial Fossa**
Cynthia A Bir, Timothy J Walilko, Scott Tashman *Wayne State University*

Sunday, June 26, 2005	9:45 AM - 11:15 AM	Session 16H
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Podium Session: **MOLECULAR MECHANICS** **Gore Range Exhibit Hall**

CHAIR: Gang Bao

CO-CHAIR: Mark Bathe

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