WEDNESDAY, June 21, 2006

	A: Amelia 1	B: Amelia 2/3	C: Cumberland A	D: Cumberland BC	E: Ossabaw AB	F: Talbot AB
7:00 PM -9:00 PM	**Opening reception in Beach Club, Poolside (Amelia Foyer, weather not permitting)**					

THURSDAY, June 22, 2006

	A: Amelia 1	B: Amelia 2/3	C: Cumberland A	D: Cumberland BC	E: Ossabaw AB	F: Talbot AB
6:45 AM - 7:30 AM	Breakfast in Amelia Foyer and 8 Flags Patio					
7:30 AM - 9:15 AM	WS: Engineering and Stem Cell- I	WS: Early Bioengr Training		Knee Mechanics	Biothermal Therapy	Design of Prosthetics and Orthotics
9.15-9.30 AM	Break					
9:30 AM - 11:15 AM	WS: Engineering and Stem Cell- II	Arterial Fluid Mechanics		Muscle Mechanics	Modeling in Biothermal Therapy	Analysis and Ctl of Human Movement
11.15 AM - 11.45 AM	Break					
11:45 AM - 12:45 PM	**Plenary: Harvey Lodish in Amelia Ballroom 1/2/3**					
12:45 PM - 2:15 PM	Poster Session in Amelia 4, with Lunch - Ph.D. Student Paper Competition - - B.S. Student Paper Competition -					

FRIDAY, June 23, 2006

	A: Amelia 1	B: Amelia 2/3	C: Cumberland A	D: Cumberland BC	E: Ossabaw AB	F: Talbot AB
1:00 PM - 2:30 PM	Cell Eng/Biomech I. Tech App Cell Eng	Bone Mechanics	Therm/Chem Processes	Spine Mechanics	Aneurysm - I	Heart Valve Mechanics
2.30 PM - 2.45 PM	Break					
2:45 PM- 4:15 PM	PhD Student Competition I: Tissue Eng and Cell Biomech	PhD Student Competition II: Solid Mech, Des, & Rehab	PhD Student Competition III: Biofluids and Imaging			
4:15 PM - 4:45 PM	Coffee Break					
4:45 PM - 6:15 PM	Cell Eng/Biomech II	Cardiovascular Mechanopath	Biofluid mechanics	Disc Mechanics	Injury Biomechanics	Anterior Cruciate Ligament
6:15 PM - 6:35 PM	Break					
6:35 PM- 7:45 PM	**Plenary: Lissner lecture in Amelia Ballroom 1/2/3**					
7:45 PM - 9:00 PM	Poster Session and Lissner Reception in Amelia 4, with Dinner Buffet - MS Student Paper Competition - - Cardiovascular Solid Mechanics - Biofluid Mechanics - - Design and Rehabilitation - Cellular and Biomechanical Engineering - - Tissue Engineering and Biomechanics - Implants - - Modeling and Computational Biomechanics					K-17 Pre-Poster Presentations (Talbot AB)

SATURDAY, June 24, 2006

	A: Amelia 1	B: Amelia 2/3	C: Cumberland A	D: Cumberland BC	E: Ossabaw AB	F: Talbot AB
12:30 PM -2:00 PM	WS: Tech Transfer	WS: Prob Based Learning	WS: Disc Replacement-I	Design of Cardiovasc. Devices	Cartilage Modeling	
2:00 PM - 2:15 PM	Break					
2:15 PM - 3:45 PM	Tissue Eng I. Bioreactors	Cardiovascular Solid Mechanics	WS: Disc Replacement-II	Design of Medical Devices	Mass Transfer in Cells and Organs	
3:45 PM - 4:00 PM	Break					
4:00 PM - 5:30 PM	Tissue Eng II. Orthopaedic Apps	FEM in Biomechanics	Drug Delivery and Biotherapeutics	Micro and Nano Biofluid Mechanics	Ligaments, tendons and capsule	
5:30 PM - 6:30 PM	Break					
6:30 PM - 7:00 PM	**R E C E P T I O N in Amelia Foyer and 8 Flags Patio**					
7:00 PM - 9:30 PM	**B A N Q U E T in Amelia Ballroom**					

SUNDAY, June 25, 2006

	A: Amelia 1	B: Amelia 2/3	C: Cumberland A	D: Cumberland BC	E: Ossabaw AB	F: Talbot AB
6:45 AM - 7:30 AM	Breakfast					
7:30 AM - 8:30 AM	**Plenary: Shuvo Roy in Amelia Ballroom 1/2/3**					
8:30 AM - 8:45 AM	Break					
8:45 AM - 10:15 AM	Tissue Eng III. Modeling	Experimental Behavior of Cartilage	Cardiovascular Fluid Mechanics	Imaging in Biomechanics	Biological Flows and Biopreservation	
10:15 AM - 10:30 AM	Break					
10:30 AM - 12:00 PM	Tissue Eng IV. Soft Tissues	Brain Biomechanics	Fluid Mech. of Cardiovasc. Devices	MEMS	Aneurysm - II	

TABLE OF CONTENTS

SOCIAL PROGRAM

	Wednesday, June 21, 2006	
Welcome Reception	Beach Club, Poolside (Amelia Foyer, weather not permitting)	7:00 pm – 9:00 pm
	Thursday, June 22, 2006	
Breakfast (Continental)	Amelia Foyer and 8 Flags Patio	6:45 am – 7:30 am
Free Time		2:15 pm – Night
	Friday, June 23, 2006	
Free Time		Morning – 1:00 pm
Lissner Lecture	Amelia Ballroom	6:35 pm – 7:45 pm
Lissner Reception & Dinner	Amelia Foyer and 8 Flags Patio	7:45 pm – 9:00 pm
	Saturday, June 24, 2006	
Free Time		Morning – 12:30 pm
Reception	Amelia Foyer and Ballroom	6:30 pm – 7:00 pm
Banquet	Amelia Foyer and Ballroom	7:00 pm – 9:30 pm
	Sunday, June 25, 2006	
Breakfast (Buffet)	Amelia Foyer and 8 Flags Patio	6:45 am – 7:30 am

CONFERENCE REGISTRATION

Wednesday, June 21, 2006	The Amelia Foyer	2:00 pm – 10:00 pm
Thursday, June 22, 2006	The Amelia Foyer	6:30 am – 2:30 pm
Friday, June 23, 2006	The Amelia Foyer	12:00 pm – 7:00 pm
Saturday, June 24, 2006	The Amelia Foyer	12:00 pm – 4:00 pm
Sunday, June 25, 2006	The Amelia Foyer	7:00 am – 9:00 am

SPEAKER READY ROOMS

Wednesday, June 21, 2006	Sapelo A & B	3:00 pm – 9:00 pm
Thursday, June 22, 2006	Sapelo A & B	7:00 am – 7:00 pm
Friday, June 23, 2006	Sapelo A & B	7:00 am – 9:00 pm
Saturday, June 24, 2006	Sapelo A & B	7:00 am – 7:00 pm

COMMITTEE MEETINGS

Note: All committee meetings may be attended by all interested persons, except those indicated by an asterisk (*).

Wednesday, June 21, 2006

SBC Organizing (06-08)	Sapelo A	8:00 am – 9:30
BED Executive (closed)*	Sapelo B	9:30 am – 12:00 pm
SBC Program (06-08)	Sapelo A	12:00 pm – 1:30 pm
Design & Rehab	Ossabaw AB	1:30 pm – 2:30 pm
Fluids	Talbot AB	1:30 pm – 2:30 pm
Finance*	Conference 1	1:30 pm – 2:30 pm
Solids	Ossabaw AB	2:30 pm – 3:30 pm
Heat Transfer/K17	Talbot AB	2:30 pm – 3:30 pm
Cell & Tissue	Ossabaw AB	3:30 pm – 4:30 pm
Education	Conference 2	4:30 pm – 5:30 pm
Industry Advisory	Conference 1	4:30 pm – 5:30 pm
Membership Development	Sapelo B	4:30 pm – 5:30 pm
Honors*	Sapelo A	4:30 pm – 5:30 pm
USNCB	Talbot AB	4:30 pm – 6:00 pm
New Directions	Conference 2	6:00 pm – 7:00 pm
SBC Oversight*	Conference 1	6:00 pm – 7:00 pm
BED Executive (open)	Talbot AB	9:30 pm – 11:30 pm

Thursday, June 22, 2006

JBME Editors (w/lunch)*	Conference 1	12:45 pm – 2:15 pm

PLENARY SESSIONS AND WORKSHOPS AT THE CONFERENCE

Thursday, June 22, 2006	7:30 AM – 9:15 AM	Session 1A & B

Workshop 1: **STEM CELL - I** **Amelia 1**

Robert M. Nerem, *Georgia Institute of Technology*
Taby Ahsan, *Georgia Institute of Technology*

Workshop 2: **EARLY TRAINING IN BIOENGINEERING** **Amelia 2/3**

Jeffrey Bischoff, *University of South Carolina*
Jeffrey Holmes, *Columbia University*

Thursday, June 22, 2006	9:30 AM – 11:15 AM	Session 2A

Workshop 3: **STEM CELL - II** **Amelia 1**

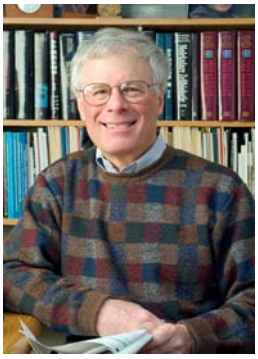
Robert M. Nerem, *Georgia Institute of Technology*
Taby Ahsan, *Georgia Institute of Technology*

Thursday, June 22, 2006	11:45 AM – 12:45 PM	Session 3

Plenary Session: **CHALLENGES AND OPPORTUNITIES IN STEM CELL BIOENGINEERING** **Amelia 1/2/3**

Dr. Harvey F. Lodish

Whitehead Institute for Biomedical Research and Department of Biology, Massachusetts Institute of Technology, Cambridge, MA



Successful *ex vivo* expansion of hematopoietic stem cells (HSCs) would greatly benefit the treatment of disease and the understanding of stem cell biology. We uncovered a novel fetal liver CD3+Ter119- cell population that supports *ex vivo* expansion of HSCs. DNA array experiments showed that insulin-like growth factor 2 (IGF-2) is specifically expressed in these cells. IGF-2 binds to the IGF type I receptor on HSCs and supports their expansion in culture, as judged by long-term competitive repopulation experiments. Microarray studies also showed that the HSC supportive mouse fetal liver CD3+ cells specifically expressed angiopoietin-like 2 (Angptl2) and angiopoietin-like 3 (Angptl3). When highly enriched HSCs were cultured in the presence of Angptl2 or Angptl3 together with other growth factors, a > 25-fold net expansion of long-term HSCs was observed. In search for novel HSC surface markers we noted that the GPI-anchored prion protein is expressed on fetal liver CD3+ cells. Although the prion is abundant and widely expressed, its physiological function(s) remains unknown, and despite intense scrutiny, PrP knockout mice exhibit no overt, undisputed phenotype. In collaboration with Susan Lindquist's laboratory we showed that PrP is a novel marker for HSCs and regulates their self-renewal. Ongoing studies will define the role PrP plays in HSC biology.

Dr. Lodish is a Member of the National Academy of Sciences. He is Fellow of the American Association for the Advancement of Science, the American Academy of Arts and Sciences, and the American Academy of Microbiology. He was a founder and scientific advisory board member of Genzyme, Inc., and Millennium Pharmaceuticals, Inc. Dr. Lodish served as President of the American Society for Cell Biology (2004). Current efforts of his lab focus on the erythropoietin receptor, hematopoietic stem cells, micro RNAs, and the adiponectin hormone and its homologs.

Friday, June 23, 2006	6:45 PM - 7:45 PM	Session 4

Plenary Session: **LISSNER AWARD LECTURE** **Amelia Ballroom 1/2/3**

Saturday, June 24, 2006	12:30 PM – 2:00 PM	Sessions 1A, B & C

Workshop 1: **TECHNOLOGY TRANSFER** **Amelia 1**

Richard Swaja, *Oak Ridge National Laboratory*
Stephen Dahms, *Alfred Mann Foundation*

Workshop 2: **PROBLEM BASED LEARNING** **Amelia 2/3**

Jeffrey W. Holmes
Columbia University

Workshop 3: **DISC REPLACEMENT - I** **Cumberland A**

Lars Gilbertson, *University of Pittsburgh*
Vijay Goel, *University of Toledo*
Patrick Smolinski, PhD, *University of Pittsburgh*

Saturday, June 24, 2006	2:15 PM – 3:45 PM	Sessions 2C

Workshop 4: **DISC REPLACEMENT - II** **Cumberland A**

Lars Gilbertson, *University of Pittsburgh*
Vijay Goel, *University of Toledo*
Patrick Smolinski, PhD, *University of Pittsburgh*

Sunday, June 25, 2006	7:30 AM – 8:30 AM	Session 1

Plenary Session: **CLINICAL BIOMEMS - MAKING AN IMPACT ON MEDICINE** **Amelia 1/2/3**

Dr. Shuvo Roy
BioMEMS Laboratory, Department of Biomedical Engineering
The Cleveland Clinic, Cleveland, OH

The application of MEMS technology to biomedical problems (bioMEMS) has attracted great attention over the last decade. This awareness in the potential of bioMEMS has resulted in a flurry of research activities, which have culminated in some commercialization successes such as microarrays and lab-on-chip *in vitro* diagnostics. The feasibility of implantable bioMEMS devices for drug delivery, physiological monitoring and tissue engineering has been demonstrated within a research context. Unfortunately, their translation into the clinical environment has been limited due to technical, cultural, and economic challenges. The talk will present the state of clinical bioMEMS and will provide examples of on-going research projects at the Cleveland Clinic, including the development of microtextured scaffolds for bone regeneration, nanoporous membranes for ultrafiltration, wireless in vivo pressure sensors, and microtransducers for intravascular ultrasound (IVUS) imaging.

Dr. Shuvo Roy joined CCF in 1998 to develop MEMS technology for biomedical applications. The resulting BioMEMS Laboratory has a focus on *in vivo* MEMS for high impact applications in biomedical imaging, tissue engineering, surgical instruments, implantable sensors, and portable diagnostics. Media coverage of the BioMEMS Laboratory work include reports in the New York Times, PBS Newshour with Jim Lehrer, NBC Wall Street Journal Report, Science, and Small Times. Dr. Roy is the recipient of a Top 40 under 40 award by Crain's Cleveland Business, Clinical Translation Award at the 2nd BioMEMS and Biomedical Nanotechnology World meeting.

TECHNICAL SESSIONS

Thursday, Jun 22 2006	7:30 AM - 9:15 AM	Session 1A

Workshop — Engineering and Stem Cell I — Amelia 1

CHAIR: Robert M. Nerem **CO-CHAIR:** Taby Ahsan

7:30 **Engineering The Microenvironment Of Embryonic Stem Cells**

Taby Ahsan, Robert Nerem — *Georgia Institute of Technology*

7:45 **Primate Embryonic Stem Cell Differentiation Is Determined By Physical And Chemical Properties Of The Microenvironment**

Leonid Margolis — *National Institute of Health*

8:15 **Controlling Human Stem Cell Self-Renewal And Fate Determination Via Biomimetic Polymers**

Kevin Healy — *University of California, Berkeley*

8:45 **Hydrogels And Human Embryonic Stem Cell Differentiation For Engineering Musculoskeletal Tissues**

Jennifer Elisseeff, Shyni Varghese, Michael Shamblott, John Gearhart, Nathanial Hwang — *Johns Hopkins University*

Thursday, Jun 22 2006	7:30 AM - 9:15 AM	Session 1B

Workshop — Early Bioengineering Training — Amelia 2/3

CHAIR: Jeffrey Bischoff **CO-CHAIR:** Jeffrey Holmes

7:30 **Biomems Summer Bioengineering Institute: A 'Micro' Research Experience For Undergraduates With 'Big Twists'**

William Hunter, Dentcho Ivanov, Bruno Mantilla, Joel Schesser — *New Jersey Institute of Technology*

7:50 **The Penn State Biomaterials And Bionanotechnology Summer Institute**

Peter Butler, Cheng Dong, Alan Snyder, A. Jones — *Pennsylvania State University*

8:10 **BBSI: Summer Institute For Quantitative And Integrative Bioengineering (SQIB)**

Elaine Scott, Reinhard Laubenbacher, Susan Faulkner — *Virginia Polytechnic Institute and State University*

8:30 **Translation Of Biomedical Engineering Research To Undergraduate And Graduate Level Education**

Olga Pierrakos, Michael Alley, Pavlos Vlachos — *Virginia Polytechnic Institute and State University*

Thursday, Jun 22 2006	7:30 AM - 9:15 AM	Session 1D

Podium — Knee Mechanics — Cumberland BC

CHAIR: Richard Debski **CO-CHAIR:** Ajit Chaudhari

7:30 **Predicting Ankle And Knee Joint Moments Using A Hybrid-Emg Driven Model On Each Joint Individually And Combined**
Daniel Bassett, Qi Shao, Kurt Manal, Thomax Buchanan — *University of Delaware*

7:45 **Influence Of Muscle Activation In Modelling Kneee Response**
Sudipto Mukherjee, Anoop Chawla, Anurag Soni — *Indian Institute of Technology, Delhi*

8:00 **Contact Locations In The Knee During Deep Squatting**
Gokce Yildirim, Jonathan Sussman-Fort, Peter Walker, Gaurav Aggarwal, Brian White, Gregg Klein — *New York University*

8:15 **Use Of Principal Component Models For The Assessment Of The Factors Affecting Knee Kinematics**
Amitkumar Mane, Jeffrey Murphy, Nathaniel Lenz, Lorin Maletsky — *University of Kansas*

8:30 **Relative Positions Of The Contacts On The Cartilage Surfaces Of The Knee Joint**
Gokce Yildirim, Jonathan Sussman-Fort, Peter Walker, Gregg R. Klein — *New York University*

8:45 **The Relationship Between The Knee Adduction Torque And Medial Contact Force During Gait**
Dong Zhao, Scott Banks, Kim Mitchell, Darryl D'Lima, Clifford Colwell, Benjamin Fregly — *University of Florida*

Thursday, Jun 22 2006	7:30 AM - 9:15 AM	Session 1E

Podium — Biothermal Therapy — Ossabaw AB

CHAIR: Carl Kumaradas **CO-CHAIR:** Rachana Visaria

7:30 **Investigation On The Complex 3-D Heat Transfer Problems For The Combined Cryosurgery And Hyperthermia Therapy With Multiple Freeze-Heating Cycles**
Zhong-Shan Deng, Jing Liu — *Chinese Academy of Sciences*

7:45 **Optimization Of Transducer Gain During Focused Ultrasound Surgery In The Presence Of Large Blood Vessels**
Prasanna Hariharan, Matthew Myers, Rupak Banerjee — *University of Cincinnati*

8:00 **Analysis Of Subsurface Tumor Ablation On Animal Model Using Focused Short Pulse Laser Beam**
Ashim Dutta, Gopalendu Pal, Sudhir Kulkarni, Kunal Mitra, Michael Grace — *Florida Institute of Technology*

8:15 **Study On The Enhancement Of Rf Ablation By Introducing Adjuvants Of Saline Solution Or Magnetic Micro/Nano Particles**
Zhong-Shan Deng, Jing Liu — *Chinese Academy of Sciences*

8:30 **Nano Thermal Hydrodynamics In The Gap Of A Cell Membrane**
Yang Yang, Jing Liu — *The Chinese Academy of Sciences*

Thursday, Jun 22 2006	7:30 AM - 9:15 AM	Session 1F

Podium — Design of Prosthetics and Orthotics — Talbot AB

CHAIR: Mike Murphy **CO-CHAIR:**

7:30 **Can Pin-On-Plate Tests Be Used To Predict?**

Dong Zhao, Hideyuki Sakoda, W. Gregory Sawyer, Scott Banks, Benjamin Fregly — *University of Florida*

7:45 **Adjuvant-Like Activity Of Silicone Breast Implants Against Extracellular Matrix Molecules**

Roche de Guzman, Paul Wooley, Pamela Vandevord — *Wayne State University*

8:00 **Medical Device Deformation In Vivo: An Implanted Force Transducer**

Walt Baxter, David Sigler, Byron Johnson — *Medtronic, Inc.*

8:15 **Kinematic Requirements For An Upper-Arm Orthosis Based On Activities Of Daily Living (ADL)**

Rungun Nathan — *Villanova University*

8:30 **Finite Element Analysis Of A Magnetorheological Prosthetic Knee**

Eggert Thorarinsson, Fjola Jonsdottir, Halldor Palsson — *University of Iceland, Reykjavik*

Thursday, Jun 22 2006	9:30 AM - 11:15 AM	Session 2A

Workshop — Engineering and Stem Cell II — Amelia 1

CHAIR: Robert M. Nerem **CO-CHAIR:** Taby Ahsan

9:30 **Physical Modulation Of Embryonic Stem Cells**

Taby Ahsan, Robert Nerem — *Georgia Institute of Technology*

10:00 **Engineering Culture Systems For Human Embryonic Stem Cells**

Sean Palecek — *University of Wisconsin-Madison*

10:30 **Panel Discussion: Issues In Engineering The Microenvironment Of Embryonic Stem Cells**

Thursday, Jun 22 2006	9:30 AM - 11:15 AM	Session 2B

Podium — Arterial Fluid Mechanics — Amelia 2/3

CHAIR: Charley Taylor **CO-CHAIR:** M. Keith Sharp

9:30 **Flow Pattern Variablility In Individual Human Carotid Artery Models With Velocity Boundary Conditions Measured In Vivo**
Amanda Wake, John Oshinski, Allen Tannenbaum, Don Giddens — *Georgia Institute of Technology*

9:45 **Mathematical Modeling Of Cerebral Autoregulation As A Feedback Mechanism**
Chander Sadasivan, Amir Raz, Baruch Lieber — *University of Miami*

10:00 **Transitional Flows In Arterial Fluid Dynamics**
Stanley Berger, Vitaliy Rayz — *University of California, Berkeley*

10:15 **A Parametric Model For Studies Of Flow In Arterial Bifurcations**
Hasballah Zakaria, Anne M Robertson, Charles Kerber — *University of Pittsburgh*

10:30 **Reynolds Number Scaling Effects On Hemodynamics In The Mouse Aortic Arch**
C. Ethier, Akiva Feintuch, Permyos Ruengsakulrach, Amy Lin, Yu-Qing Zhou, Jonathon Bishop, Lori Davidson, Stephen Fremes, Stuart Foster, David Courtman, Mark Henkelman — *University of Toronto*

10:45 **Characterization Of Near-Wall Flow Over Endothelial Cell Monolayers**
Ali Etebari, Sungkwon Kang, YongWoo Lee, Pavlos Vlachos — *Virginia Polytechnic Institute and State University*

11:00 **Hemodynamics Mediate Mechanically-Induced Elongation In Engineered Arteries Through Mmp-2 And Mmp-9 Expression**
Jason W. Nichol, Keith J. Gooch — *MIT*

Thursday, Jun 22 2006	9:30 AM - 11:15 AM	Session 2D

Podium — Muscle Mechanics — Cumberland BC

CHAIR: David Corr **CO-CHAIR:**

9:30 **Development Of A New Cardiac Muscle Model To Study The Influence Of Muscle Mass**
Gong Cheng, Jean Zu, Ming Zhong — *University of Toronto*

9:45 **A Myofiber Adaptation Algorithm To Describe Changes In Passive Myotendinous Mechanics Following Tendon Detachment**
Joseph Sarver, Samuel Ward, Carola Wuergler-Hauri, Jonathan Gimbel, Gerald Williams, Richard Lieber, Louis Soslowsky — *University of Pennsylvania*

10:00 **Non-Uniform Lagrangian Strain Fields In The Biceps Brachii Measured By Cine Phase Contrast MRI**
Hehe Zhou, John Novotny — *University of Delaware*

10:15 **Finite Principal Strains And Strain Directions To Describe Biceps Brachii Muscle Morphology With Cpc-MRI In Vivo And Dynamically**
Hehe Zhou, John Novotny — *University of Delaware*

10:30 **Muscle Contraction Induced Bone Fluid Flow And Strain, And Its Role In Adaptation**
Yi-Xian Qin, Hoyan Lam, Lukasz Orzechowski, Meng Zhang — *State University of New York at Stony Brook*

10:45 **Effects Of Combined Heat Treatment And Rest-Inserted Exercise On The Emg Activity Of The Lower Limb Muscles**
Chi Hyun Kim, Jae Kyun Bang, Sung Jae Hwang — *Yonsei University*

11:00 **Dynamic Shifting Of The Passive Length-Tension Curve For Rabbit Detrusor Smooth Muscle**
John Speich, Chris Dosier, Kevin Quintero, Paul Ratz — *Virginia Commonwealth University*

Thursday, Jun 22 2006	9:30 AM - 11:15 AM	Session 2E

Podium **Modeling in Biothermal Therapy** **Ossabaw AB**

CHAIR: Liang Zhu **CO-CHAIR:** Obdulia Ley

9:30 **Modeling Of Brain Cooling Probes For Arresting Epileptic Seizures**

Fon-Chieh Chang, Ken Kasza, Nachappa Gopalsami, Naresh Bhavaraju, Ivan Osorio — *Argonne National Laboratory*

9:45 **Temperature Distribution During Dye-Enhanced Laser Photocoagulation Of Choroidal Feeder Vessels In Treatment Of Amd-Related Choroidal Neovascularization (Cnv)**

Liang Zhu, Rupak Banerjee, Robert Flower — *University of Maryland Baltimore County*

10:15 **Computational Modeling And Simulations Of Cerebral Hypothermia Using Selective Brain Cooling Mechanism**

Amanda Chappell, Robert Vines, Sinjae Hyun — *Mercer University*

10:30 **Brain Temperature Calculation During Stroke**

Obdulia Ley, Yildiz Bayazitoglu — *Texas A&M University*

10:45 **Modeling Of Kidney Cooling Using Ice Slurry During Laparoscopic Surgery**

Ken Kasza, Fon-Chieh Chang, John Oras, Brandon Fisher, Russ Mills, Arieh Shalhav, Brett Laven, Marcelo Orvieto — *Argonne National Laboratory*

Thursday, Jun 22 2006	9:30 AM - 11:15 AM	Session 2F

Podium **Analysis and Control of Human Movement** **Talbot AB**

CHAIR: Sarah Wilson **CO-CHAIR:**

9:30 **Age Effects On Lower Extremity Force Control**

Gregory King, Carl Luchies, Rebecca Maletsky, Laura Zahner, Antonis Stylianou, Molly McVey — *University of Kansas*

9:45 **Postural Sway Analysis In Parkinson'S Disease: Visual Feedback**

Antonis Stylianou, Carl Luchies, Rebecca Maletsky, Kelly Lyons, Rajesh Pahwa, Jonathan Mahnken — *University of Kansas*

10:00 **Foot Type As A Determinant Of Jogging Kinematics**

Michelle Heller, Neil Sharkey — *Exponent Failure Analysis Associates*

10:15 **Sloped Excitation Waveforms Improve The Accuracy Of Forward Dynamic Simulations**

Matt Camilleri, Maury Hull — *University of California, Davis*

10:30 **Hand Grasping Kinematics**

Rita Patterson, Archana Sangole, Beatriz Abreu, William Buford, Steven Viegas, Ken Ottenbacher — *University of Texas Medical Branch at Galveston*

10:45 **Effect Of Anatomical Landmark Uncertainty On Description Of Shoulder Kinematics: A Probabilistic Study**

Joseph Langenderfer, Paul J. Rullkoetter, Peter Laz — *University of Denver*

Thursday, Jun 22 2006	12:45PM - 2:15PM	Session 4

Poster **Ph.D. Student Paper Competition** **Amelia 4**

CHAIR: Beth Winkelstein **CO-CHAIR:**

4-1 **Multiscale Vessel Filtering In Assisting The Generation Of Patient-Specific Cfd Models For Coronary Arteries**

Yan Yang, Allen Tannenbaum, Don Giddens — *Georgia Institute of Technology*

4-2 **Arterial Wall Temperature In The Presence Of Inflamed Atherosclerotic Plaque: Straight Stenotic Case**

Taehong Kim, Obdulia Ley — *Texas A&M University*

4-3 **The Effect Of Preservation On Multi-Contrast MRI-Based Coronary Atherosclerotic Plaque Characterization**

Binjian Sun, John Oshinski, Robert Long, Robert Taylor, Diana Weiss, Giji Joseph, David Vega, Don Giddens — *Georgia Institute of Technology*

4-4 **Numerical Simulation Of In-Vitro Pulsatile Jet Flow Model And Its Application In Studying Brisk - A Rapid Phase Contrast MRI Sampling Technique**

Longchuan Li, Mark Doyle, Geetha Rayorao, Andreas Anayiotos — *University of Alabama at Birmingham*

4-5 **Conjugation And Spin-Spin Relaxation Of A Nanocrystal Magnetic Resonance Imaging Contrast Agent**

Alex Barker, Craig Lanning, Robin Shandas, Conrad Stoldt — *University of Colorado at Boulder*

4-6 **Analysis And Research Of The Pacemaker Pulse Parameters**

Milan Tannenberg, Milan Sepsi — *Brno University of Technology*

4-7 **Non-Invasive Multi-Component Blood Flow Velocimetry: A Novel Imaging Method For Direct Measurement Of Velocity Vectors And Shear Stress Around Carotid Plaques**

Hairong Zheng, Robin Shandas — *University of Colorado at Boulder*

4-8 **In Vitro Evaluation Of Alteration To Flow In A Model Of Elastase-Induced Saccular Aneurysm In Rabbit By Flow-Diverting Devices**

Jaehoon Seong, Ajay Wakhloo, Baruch Lieber — *University of Miami*

4-9 **Myocardial Tissue Velocity Measured By MR Phase Velocity Mapping And Tissue Doppler Imaging**

Jana Delfino, Mohit Bhasin, Robert Cole, Robert Eisner, John Merlino, Angel Leon, John Oshinski — *Georgia Institute of Technology/Emory University*

4-10 **Computational Investigation Of A Multilayer Impedance Pump To Serve As An Intra-Aortic Pump**

Laurence Loumes, Idit Avrahami, Morteza Gharib — *California Institute of Technology*

4-11 **Fundamental Study Of Transient Characteristics Of Ultrasonic-Measurement-Integrated Simulation Toward Reproduction Of Unsteady Blood Flows**

Kenichi Funamoto, Toshiyuki Hayase, Yoshifumi Saijo, Tomoyuki Yambe — *Tohoku University*

4-12 **Numerical Simulations Of Blood Flow In Fusi-Type Cerebral Aneurysm**

Yong Kim, Joon Lee — *Wayne State University*

4-13 **A Novel, Efficient Fluid-Structure Interaction Algorithm For Dynamic Bioprosthetic Heart Valve Simulations**

Sarah Vigmostad, Brian Jeffrey, Sreedevi Krishnan, H. Udaykumar, Krishnan Chandran — *University of Iowa*

4-14 **Bioengineered Nanoscale Contrast Agents For Detection And Imaging Of Ovarian Cancer Cells**

Brian Larsen — *University of Colorado at Boulder*

4-15 **Coupled And Decoupled Fluid And Solid Dynamics In Abdominal Aortic Aneurysm Biomechanics**

Christine Scotti, David Vorp, Ender Finol — *Carnegie Mellon University*

4-16 **A Numerical Investigation Into Atherosclerosis Examining The Deformation Profiles In Healthy And Diseased Mock Arteries**

Niamh Quinn, Alojz Ivankovic, Aleksandar Karac — *University College Dublin*

4-17 **Coronary Flow Measurement Using Magnetic Resonance Phase Velocity Mapping At 3.0T**

Kevin Johnson, Puneet Sharma, Jana Delfino, John Oshinski — *Georgia Institute of Technology*

4-18 **Towards Hybrid Swimming Microrobots: Bacteria Assisted Propulsion Of Polystyrene Beads**

Bahareh Behkam, Metin Sitti — *Carnegie Mellon University*

4-19 **Designing Bioartificial Liver Devices For Oxygen Transport And Scale-Up**

Mei Niu, Mark Clemens, Robin Coger — *University of North Carolina at Charlotte*

4-20 **Quantifying Adhesion Forces Of Tight Junction Proteins**

Tong Seng Lim, Chwee Teck Lim, Vedula Sri Ram Krishna, Gunaretnam Rajagopal, Walter Hunziker, Jaya P.kausalya — *BioInformatics Institute, Singapore*

4-21 **Three-Dimensional Numerical Modeling Of Oxygen Availability In The Amc Bioartificial Liver**

Guy Mareels, Paul Poyck, Sunny Eloot, Robert Chamuleau, Pascal Verdonck — *Ghent University*

4-22 **Differentiation Of Mesenchymal Stem Cells Along The Chondrogenic And Osteogenic Lineages In A Collagen-Gag Scaffold Under Static And Dynamic Conditions**

Louise McMahon, Patrick J Prendergast, Veronica A. Campbell — *University of Dublin, Trinity College*

4-23 **Mechanical Stimulation Of Tissue Engineered Tendon Constructs; Effect Of Scaffold Materials**

Victor Nirmalanandhan, Jason Shearn, Marepalli Rao, Natalia Juncosa-Melvin, Cindi Gooch, Gino Bradica, David Butler — *University of Cincinnati*

4-24 **A Uni-Axial Biomems Device For Quantifying Force Response Of A Single Cell Under Stretch**

David Serrell, Andrew Slifka, Roop Mahajan, Tammy Oreskovic, Dudley Finch — *University of Colorado at Boulder*

4-25 **Proteoglycan (Pg) Breakdown And Prostaglandin E2 (Pge2) Release Following Physiological Dynamic Compression In Meniscal Explants**

Barbara Zielinska, Tammy Haut Donahue — *Michigan Technological University*

4-26 **Prediction Of Fiber Alignment In Reconstituted Collagen Flaps Using The Anisotropic Biphasic Theory**

Michael Evans, Victor Barocas — *University of Minnesota*

4-27 **A Novel Approach To Image-Based Constitutive Modeling Of The Cytoskeleton**

Ron Kwon, Christopher Jacobs, Adrian Lew — *Stanford University*

4-28 **Topological Variations In Chondrocyte Morphology: A Consideration In The Initiation Of Osteoarthritis Following Acl Injury**

Scott Bevill, Paul Briant, Peter Torzilli, Thomas Andriacchi — *Stanford University*

4-29 **An Enhanced Micropipette Aspiration Technique And Its Application To Membrane Extension And Tether Extraction**

Yong Chen, Jin-Yu Shao — *Washington University in St. Louis*

4-30 **The Role Of Shear Stress In The Pathogenesis Of Pulmonary Arterial Hypertension**

Beverly Tang, Tim Fonte, Jeffrey Feinstein, Charles Taylor, Philip Tsao — *Stanford University*

4-31 **An Efficient Numerical Technique For Computerized Planning Of Cryosurgery**

Yoed Rabin, Michael Rossi — *Carnegie Mellon University*

4-32 **Thermal Expansion Of Blood Vessels In Cryogenic Temperatures In The Presence Of Cryoprotectants**

Yoed Rabin, Jorge Jimenez-Rios — *Carnegie Mellon University*

4-33 **A New Model For The Determination Of Solute Diffusivities In Tissue Samples**

Onyi Irrechukwu, Marc Levenston — *Georgia Institute of Technology*

4-34 **Multipotent Characteristics Of Periosteal Cells And Fibroblasts**

Emily Clowes — *Stanford University*

4-35 **Nanohydroxyapatite Incorporated Polyphosphazene Nanofibers For Bone Tissue Engineering**

Subhabrata Bhattacharyya, Lakshmi Nair, Anurima Singh, Nick R. Krogman, Paul Brown, Harry Allcock, Cato Laurencin — *University of Virginia*

4-36 **Changes In The Structure And Function Of Arterial Elastic Lamellae As A Result Of Pulmonary Hypertension: Studies Using Scanning Electron Microscopy, Mass Spectroscopy, And X-Ray Diffraction**

Steven Lammers, Davor Balzar, Robin Shandas, Hyun Ja Kwon — *University of Colorado at Boulder*

4-37 **Thermobiomechanics Of Arteries: Alterations In Biomechanics Due To Heat And Cold Treatments**

Ramji Venkatasubramanian, John Bischof — *University of Minnesota*

4-38 **Effect Of Applying Underwater Shockwave To Plants Seeds**

Asuka Oda, Toshiaki Watanabe, Shigeru Itoh — *Kumamoto University*

4-39 **Extracellular Matrix Alignment Using Micromechanical Needle Manipulation**

Margaret Julias, David Shreiber, Helen Buettner — *Rutgers, The State University of New Jersey*

4-40 **Heparin Modified Chitosan-Poly(Ester) Matrices For Bone Tissue Engineering**

Tao Jiang, Cato Laurencin — *University of Virginia*

4-41 **Tribological Study Of A Potential Joint Replacement Composite**

Rahul Ribeiro, Wonsook Choi, Donald Darensbourg, Meitin Usta, Hikmet Ucisik, Hong Liang — *Texas A&M University*

4-42 **Inhibition Of Beta-1 Integrin Signaling In Bone Cells Decreases Mechanosensitivity**

Julie Litzenberger, Padmaja Tummala, Carmin Powell, Chris Jacobs — *Stanford University*

4-43 **Changes In Axon Mechanics With Development**

Hailing Hao — *Rutgers, The State University of New Jersey*

4-44 **An Intravitreal Controlled-Release Microneedle Implant To Treat Intraocular Lymphoma With 2-Methoxyestraiol**

Juyoung Park, James Augsburger, Robert Franco, Chong Ahn, Pankaj Desai, Rupak Banerjee — *University of Cincinnati*

4-45 **The Mechanics Of Skin And Other Natural Fibrous Networks**

Naomi Romijn, Norman Fleck — *University of Cambridge*

4-46 **Assessment Of Pressure Sore Risk During Wheelchair Sitting By Real-Time Finite Element Analysis Of The Buttock: Initial Human Studies**

Eran Linder-Ganz, Ziva Yizhar, Amit Gefen — *Tel Aviv University*

4-47 **Computational Model Of The Lower Extremity To Simulate Mechanical Function: Ankle Inversion Stability Study**

Peter Liacouras, Jennifer Wayne — *Virginia Commonwealth University*

4-48 **Separating Brain Motion Into Rigid Body Displacement And Deformation Under Low-Severity Impacts**

Hong Zou, James Schmiedeler, Warren Hardy — *Ohio State University*

4-49 **The Calculation Of Mechanical Stresses In The Growing Avian Embryonic Limb Using Optical Projection Tomography**

Niamh Nowlan, Paula Murphy, Patrick Prendergast — *University of Dublin, Trinity College*

4-50 **In-Vitro Recovery Of Shape-Memory Polymer Stents**

Christopher Yakacki, Ken Gall, Craig Lanning, Robin Shandas — *University of Colorado at Boulder*

4-51 **A Comparison Of Registration Techniques For Computer And Image Assisted Elbow Surgery**

Colin McDonald, James Brownhill, Graham King, Terry Peters, James Johnson — *University of Western Ontario*

4-52 **Emg-Triggered Fes-Assisted Ambulation After Spinal Cord Injury**

Anirban Dutta, Ronald Triolo — *Case Western Reserve University*

4-53 **Correlation Of Anatomic Variation In The Elastic Anisotropy Of Human Cortical Bone With The Bone Mineral Orientation Distribution**

Weimin Yue, Alejandro Espinoza, John Renaud, Ryan Roeder — *University of Notre Dame*

4-54 **Estimation Of Corrective Changes In Muscle Activation Patterns For Post-Stroke Patients**

Qi Shao, Thomas S. Buchanan — *University of Delaware*

4-55 **In-Vivo Screw Force Monitoring Sensor For Osteosynthesis**

Christian Peters, Martin Behmueller, Achim Trautmann, Yiannos Manoli — *University of Freiburg*

4-56 **Dynamic Simulation Of Bioprosthetic Heart Valves Using A New Finite Element Shell Model Based On Experimental Data**

Hyunggun Kim, Jia Lu, Michael Sacks, Krishnan Chandran — *University of Iowa*

4-57 **Does Ossification Of Apophyseal Ring Contribute To Its Fracture In Pediatric Spines?**

Ahmed Faizan, Koichi Sairyo, Vijay Goel, Ashok Biyani, Nabil Ebraheim — *Spine Research Center, Department of Bioengineering, University of Toledo, & Department of Orthopedic Surgery, Medical University of Ohio.*

4-58 **Development, Verification, And Validation Of A Parametric Cervical Spine Injury Prediction Model**

Amber Bonivtch, William Francis, Don Moravits, Glenn Paskoff, Barry Shender, Ben Thacker, Daniel Nicollela — *Southwest Research Institute*

4-59 **Structural Mechanisms For Nonlinearity And Anisotropy In The Human Annulus Fibrosus: A Strain Energy Model Analysis**

Heather L. Guerin, Dawn Elliott — *University of Pennsylvania*

4-60 **Effects Of Early And Late Zoledronate Treatment On Bone Microstructure In Ovariectomized Rats Assessed By In Vivo Micro-CT**

Julienne Brouwers, Bert Van Rietbergen, Rik Huiskes — *Technical University of Eindhoven*

4-61 **Finite Element Model Of The Free Expansion Of A 3-Folded Angioplasty Balloon**

Matthieu De Beule, Peter Mortier, Benedict Verhegghe, Patrick Segers, Rudy Van Impe, Verdonck Pascal — *Ghent University*

4-62 **Probabilistic Response Of A Validated And Verified Parametric Cervical Spine Finite Element Model**

William Francis, Amber Bonivtch, Donald Moravits, Glenn Paskoff, Barry Shender, Ben Thacker, Dan Nicolella — *Southwest Research Institute*

4-63 **A Comparison Of Approaches To Account For Friction In No-Slip Uniaxial Compression Experiments On Soft Tissue**

Esra Roan, Kumar Vemaganti — *University of Cincinnati*

4-64 **Arterial Nanostructure Of The Healthy Rat Abdominal Aorta Studied By Serial Block-Face Scanning Electron Microscopy**

Mary O'Connell, Bong-Soo Sohn, Chengpei Xu, JoAnn Buchanan, Winfried Denk, Zarins Christopher, Charles Taylor — *Stanford University*

4-65 **An Ldv Study Of The Closure Dynamics For The St. Jude Medical Mechanical Heart Valve**

Luke Herbertson — *Pennsylvania State University*

4-66 **Surface Morphology Of The Capitellum: Implications For Computer-Assisted Surgery**

Colin McDonald, Louis Ferreira, James Brownhill, Graham King, Terry Peters, James Johnson — *University of Western Ontario*

4-67 **Collagen Organization In The Superficial Layer Of Articular Cartilage Relative To The Mechanical Environment Within The Joint**

Paul Briant, Scott Bevill, Peter Torzilli, Thomas Andriacchi — *Stanford University*

4-68 **Realistic Simulation Of 3D Architectural And Mechanical Alterations In Human Trabecular Bone During Menopause**

Xiaowei Liu, Angela Huang, Paul Sajda, X. Guo — *Columbia University*

4-69 **Myokinetic Vs. Emg Analysis Of Muscular Activity**

Don Yungher, Michael Wininger, A. Threlkeld, J.B. Barr, William Craelius — *Rutgers, The State University of New Jersey*

4-70 **Response Of The Human Mandible To Chin Impact Loading**

Matthew Craig — *Wayne State University*

4-71 **Local Stresses, Architecture, And Mineralization Initiating Trabecular Bone Microdamage**

Srinidhi Nagaraja, Robert Guldberg — *Georgia Institute of Technology*

4-72 **Quantitative Outcome Measures For Upper-Limb Motor Control In Stroke Patient Rehabilitation**

Michael Wininger, Nam-Hun Kim, Tiffany Morris, Steven Escaldi, Kathryn De Laurentis, William Craelius — *Rutgers, The State University of New Jersey*

4-73 **A Spatial Linkage System To Model The Ankle And Subtalar Joints**

Dragomir Marinkovich — *Marquette University*

Thursday, Jun 22 2006	12:45PM - 2:15PM	Session 4

Poster — B.S. Student Paper Competition — Amelia 4

CHAIR: Michele Grimm **CO-CHAIR:**

4-74 **Application Of A Three Dimensional Image-Based Modeling Technique To The Circle Of Willis**

Chase Yarbrough, Erik Bekkers, Nathan Wilson, Charles Taylor — *Stanford University*

4-75 **Automatic Determination Of Elbow Angle Of A Bowler During Ball Release From Video Sequences Using Photogrammetry**

Arun Manohar, Varun A V — *Indian Institute of Technology, Madras*

4-76 **The Effect Of Branch Arteries On The Wall Stresses Of A 3D Abdominal Aortic Aneurysm (Aaa) Model**

Laura Reed, Scott Lovald, Tariq Khraishi — *University of New Mexico*

4-77 **A Study Of The Histological Makeup Of Bovine Anterior And Posterior Medial Meniscal Horn Attachments**

Tara Hansen, Dong Liu, Tammy Haut Donahue — *Michigan Technological University*

4-78 **Development Of An Experimental Protocol To Measure Anisotropic Material Properties Of Bovine Articular Cartilage**

Timothy Ficklin, Gregory Thomas, Anna Asanbaeva, Albert Chen, Robert Sah, Andrew Davol, Stephen Klisch — *California Polytechnic State University, San Luis Obispo*

4-79 **Design, Implementation, And Testing Of The Heartlander Force (HLF) Prototype**

Harsha Tummala, Nicholas Patronik, Cameron Riviere — *University of California, Berkeley*

4-80 **Coordinated Planar Mechanisms To Approximate The Three Dimensional Motion Of The Knee**

Nicholas Pardo, Loren Blocker, Daniel Nielsen — *University of Minnesota*

4-81 **Quantification Of Genipin Crosslinking With Free Amino Residues**

An Nguyen, Sounok Sen, Wade Johannessen, Charles Clark, Dawn Elliott — *University of Pennsylvania*

4-82 **A Novel Prosthetic Design Incorporating A Modified Hydraulic System**

Narayanan Ramachandran, Prakash Viswanathan, Prakash Elumalai — *St. Joseph's College of Engineering*

4-83 **Basement Membrane Permeability And Its Relation To The Underlying Matrix Microstructure**

Thomas Suszynski, Victor Barocas, Yoav Segal — *University of Minnesota*

4-84 **Differential Mechanical Performance Of The Q3 And Hybrid Iii Three Year Old Dummy Necks**

Alana DeSimone, Jami Saffioti, Jennifer Kadlowec — *Rowan University*

4-85 **Computer Model Of Transscleral Drug Delivery To The Posterior Eye**

Philip Bransford, Victor Barocas — *University of Minnesota*

4-86 **Rotator Cuff Muscle Forces Are Inversely Related To The Value Of The Glenohumeral Joint Constriant Angle**

Michael Anderson, Jens Stehle, Patrick McMahon, Richard Debski — *University of Pittsburgh*

4-87 **Interspecies Comparison Of Particle Transport And Deposition In Tracheobronchial Lung Airways Of Human And Rat**

Kellie McConnell, Bryan Solomon, Imshaan Somani, Sinjae Hyun — *Mercer University*

4-88 **Controlled Fibroblast, Smooth Muscle Cell, And Endothelial Cell Adhesion On Carbon Nanofibers Aligned On Polymers**

Piyush Bajaj, Dongwoo Khang, Thomas Webster — *Purdue University*

4-89 **Comparison Of Effects Of Cyclic Hydrostatic Pressure On Chondrogenesis Of Human Mesenchymal Stem Cells From Age-Matched Normal And Osteoarthritic Donors**

Allison Finger, Susan Bernacki, Elizabeth Loboa — *North Carolina State University*

4-90 **An In-Vitro Model Of Thrombosis Using Highly Stenotic Tubing**

Andrea Para, David Ku — *Georgia Institute of Technology*

4-91 **Coronary Blood Flow In An Asymmetricly Stenosed Vessel**

Sam Raben — *Virginia Polytechnic Institute and State University*

Friday, Jun 23 2006	**1:00 PM - 2:30 pm**	**Session 5A**

Podium — Cell Eng/Biomech I - Technological Applications in Cell Eng — Amelia 1

CHAIR: Edward Guo — **CO-CHAIR:** Philip LeDuc

13:00 **Probing Directional Cell Motility Through Using Microfluidic And Quantum Dot Technology**

Lam Mays, Phillip LeDuc — *Carnegie Mellon University*

13:15 **Biophotonic Factors Affecting Cellular Uva Photoactivation**

Julianne Forman, Todd Monroe — *Louisiana State University*

13:30 **Mapping The Nanomechanics Of Single Actin Filaments Using Atomic Force Microscopy**

Chao-Min Cheng, Philip LeDuc, Mon-Shu Ho — *Carnegie Mellon University*

13:45 **Mechanotransduction Through Transmembrane Syndecan Proteins**

James Kubicek, Hillary Barnes, Luke Duncan, Andrew Kamien, Robert Bellin, Phillip LeDuc — *Carnegie Mellon University*

14:00 **Live-Cell Detection And Analysis Of Viral Infection Using Nanoprobes**

Philip Santangelo, Gang Bao — *Georgia Institute of Technology and Emory University*

14:15 **An Experimental And Theoretical Investigation Of A Symmetry-Breaking Mechanism For Cell Polarization**

James Oliver, John King, Christian Engel, Colin Scotchford, David Grant — *University of Nottingham*

Friday, Jun 23 2006	1:00 PM - 2:30 pm	Session 5B

Podium **Bone Mechanics** **Amelia 2/3**

CHAIR: Voo Liming **CO-CHAIR:** Glen Niebur

13:00 **The Density And Length Of In Vivo Microcracks In Cortical Bone As Viewed From The Longitudinal Direction**
Nicholas Wasserman, Ozan Akkus *Purdue University*

13:15 **Micromechanical Analyses Of Human Vertebral Trabecular Bone At Individual Trabeculae Level**
Xiaowei Liu, Atul Gupta, Grant Bevill, Paul Sajda, Tony Keaveny, X. Edward Guo *Columbia University*

13:30 **Accuracy And Precision Of Digital Image Correlation In Quantifying Local 3-D Displacements And Strains In Trabecular Bone**
Li Liu, Elise Morgan *Boston University*

13:45 **Morphology Of A Trabecula In Cancellous Bone From Different Species: Are There Universal Characteristics?**
Idit Diamant, Ron Shahar, Amit Gefen *Tel Aviv University*

14:00 **Effect Of Microwave Drilling On Mechanical Properties Of Bone In Vitro**
Ronit Mann, Yael Eshet, Abby Anaton, Tomer Yacoby, Amit Gefen, Eli Jerby *Tel Aviv University*

14:15 **A Novel Nanoscratching Approach For Measuring In Situ Toughness Of Human Bone**
Young June Yoon, Hongbing Ji, Jeffry Nyman, Xiaodu Wang *University of Texas at San Antonio*

Friday, Jun 23 2006	1:00 PM - 2:30 PM	Session 5C

Podium **Thermal/Chemical Processes and Mass Transport in Biosystems** **Cumberland A**

CHAIR: Guillermo Aguilar **CO-CHAIR:** Zhongping Huang

13:00 **Atherosclerotic Plaque Temperature: The Effect Of Blood Flow And Plaque Geometry**
Obdulia Ley, Taehong Kim *Texas A&M University*

13:15 **Limitations Of The Electronic Sizing Technique For Measurement Of Cellular Osmotic Properties**
Adam Higgins, Lauren Yeung, Jens Karlsson *Georgia Institute of Technology*

13:30 **Effect Of Low Intensity Laser Irradiation On Subcellular Organnelles Of Human Fibroblast Cells Using Fiber Optic Nano-Probes**
Gopalendu Pal, Ashim Dutta, Kunal Mitra, Michael Grace *Florida Institute of Technology*

13:45 **Cause-And-Effect Relationships Between Hydrodynamic Environment In Bioreactors And Cell Spatial Distribution In Engineered Cartilage**
Bahar Bilgen, Ericka Bueno, Gilda Barabino *Northeastern University*

14:00 **Multiscale Modeling Of Blood Flow And Thrombus Formation**
Danny Bluestein, Sebastian Okser, Kris Dumont, Peter Rissland, Yuefan Deng *State University of New York at Stony Brook*

14:15 **Incorporation Of Fiber Tortuosity Effects In A Constitutive Model For Electrospun Scaffolds**
Todd Courtney, Michael Sacks, Jun Liao, John Stankus, Jianjun Guan, William Wagner *Biomedical Engineering Society*

Friday, Jun 23 2006	1:00 PM - 2:30 PM	Session 5D

Podium — Spine Mechanics — Cumberland BC

CHAIR: Lars Gilbertson **CO-CHAIR:** Farid Amirouche

13:00 **Finite Element Study Of Fused Plus Single Vs. Bi-Level Charite Disc Replacement In The Lumbar Spine**
Vijay Goel, Ahmad Faizan, Ali Kiapour, Alex Ivanov, Ashok Biyani, Nabil Ebraheim, Hassan Serhan — *University of Toledo*

13:15 **Stabilization Of Isthmic Spondylolisthesis: A Combined Experimental And Finite Element Study**
Susan Renner, Raghu Natarajan, Gunnar Andersson, Leonard Voronov, Robert Havey, Howard An, Avinash Patwardhan — *Hines VA Hospital*

13:30 **Accuracy Of Three-Dimensional In Vivo Lumbar Spine Kinematic Measurement Method**
Ruth Ochia, Howard S. An, Eric Lorenz, Michael Jung, Gunnar Andersson, Nozomu Inoue — *Rush University Medical Center*

13:45 **The Effect Of Instrumentation With Different Mechanical Properties On The Pig Spine During Growth**
Robert Rizza, Xue-Cheng Liu, Evelyn Hunter, John Thometz — *Milwaukee School of Engineering*

14:00 **A Comparative Biomechanics Study Of Titanium Implants Versus Allograft In Stabilizing Spine After Lumbar Corpectomy**
N. Sarigul-Klijn, Phil Huang, Scott Hazelwood, Munish Gupta — *University of California, Davis*

14:15 **Evaluation Of Biomechanical Test Sensitivity To Gradations In Lumbar Interbody Fusion Using Cadaveric Ovine Spine Fusion Models**
Susan Yonemura, Donna Wheeler — *Colorado State University*

Friday, Jun 23 2006	1:00 PM - 2:30 pm	Session 5E

Podium — Aneurysm - I — Ossabaw AB

CHAIR: Madhavan Raghavan **CO-CHAIR:** Ender Finol

13:00 **A Fluid-Structure Interaction Investigation Into Fluid Flow And Material Deformation Within And Abdominal Aortic Aneurysm**
Sinead Kelly, James McCullough, Malachy O'Rourke — *University College Dublin*

13:15 **Assessment Of Endoleak Significance After Endovascular Repair Of Abdominal Aortic Aneurysms: A Lumped Parameter Model**
Lambert Speelman, Berent Wolters, Marcia Emmer, Marielle Bosboom, Geert Willem Schurink, Frans van de Vosse — *Technische Universiteit Eindhoven*

13:30 **The Effect Of Patient-Specific Features In Predicting Abdominal Aortic Aneurysm Flow Dynamics**
Christine Scotti, Aric Anderson, Ender Finol — *Carnegie Mellon University*

13:45 **Multi Contrast Magnetic Resonance Imaging Of Abdominal Aortic Aneurysm Tissue**
Evelyne van Dam, Marcel Rutten, Frans van de Vosse — *Technische Universiteit Eindhoven*

14:00 **Effects Of Strut Pattern On Hemodynamics Of Stented Cerebral Aneurysm: A 3D Direct Stent Simulation**
Hui Meng, Minsuok Kim, Yiemeng Hoi, Dale Taulbee, Scott Woodward, Lee Guterman, L.Nelson Hopkins — *University at Buffalo*

14:15 **Vascular Response To Complex Hemodynamics In The Apex Of A Created Arterial Bifurcation Indicating Aneurysm Development**
Hui Meng, Daniel Swartz, Zhijie Wang, Yiemeng Hoi, John Kolega, Eleni Metaxa, Michael Szymanski, Ling Gao, Ann Marie Paciorek, Junichi Yamamoto, Eric Sauvageau, Elad Levy, L. Hopkins — *University at Buffalo*

Friday, Jun 23 2006	1:00 PM - 2:30 PM	Session 5F

Podium **Heart Valve Mechanics** **Talbot AB**

CHAIR: Michael Sacks **CO-CHAIR:** Ajit Yoganathan

13:00 **Grid-Free Les Of Bileaflet Mechanical Heart Valve Motion**
Adrin Gharakhani — *Applied Scientific Research*

13:15 **An In Vitro Contracting Annulus Model To Investigate The Effect Of Mitral Annular Area Changes On Valve Hemodynamics**
Muralidhar Padala, Rachmadian Wulandana, Jorge Jimenez, Ajit Yoganathan — *Georgia Institute of Technology*

13:30 **Ex Vivo Study Of The Biological Response Of Porcine Aortic Valves To Hypertensive Pressure**
Kartik Balachandran, Zhaoming He, Mark Baglia, Tonatiuh Rios-Alba, Christina Duden, Anthal Smits, Philippe Sucosky, Ajit Yoganathan — *Georgia Institute of Technology*

13:45 **A Structural Constitutive Model For Mitral Valve Leaflets**
Jun Liao, Michael Sacks — *University of Pittsburgh*

14:00 **Direct Dynamic Wall Shear Stress Measurements In Cardiovascular Flows: Applications To Mechanical Heart Valves**
Olga Pierrakos, Ali Etebari, Sam Raben, Satya Prakash Karri, Pavlos Vlachos — *Virginia Polytechnic Institute and State University*

14:15 **Computational Model For Growth And Remodeling Of A Thick Walled Artery**
Patrick Alford, Larry Taber — *Washington University in St. Louis*

Friday, Jun 23 2006	2:45 PM - 4:15 PM	Session 6A

Podium **Ph.D. Student Competition I: Tissue Eng and Cell Biomech** **Amelia 1**

CHAIR: Beth Winkelstein **CO-CHAIR:** Pamela VandeVord

14:45 **A Multiscale, Structural Model For The Elastic Behavior Of Arterial Walls**
Triantafyllos Stylianopoulos, Victor Barocas — *University of Minnesota*

15:00 **Primary Cilia: Mechanosensory Organelles In Bone?**
Charles Anderson, Malone Amanda, Padmaja Tummala, Tim Stearns, Christopher Jacobs — *Stanford University*

15:15 **Aortic Valve Interstitial Cell Phenotype And Biosynthesis: Synergistic Effects Of Cyclic Tension And Tgf-B1**
W. David Merryman, Howard D. Lukoff, Richard A. Hopkins, Michael Sacks — *Biomedical Engineering Society*

15:30 **Dose-Dependent Effects Of BMP-2 And TGF-beta 3 Co-Delivery On Functional Repair Of Segmental Bone Defects**
Megan Oest, Kenneth Dupont, Hyun Joon Kong, David Mooney, Robert Guldberg — *Georgia Institute of Technology*

15:45 **Two Dimensional Arrays Of Cells Using Ultrasound**
Stefano Oberti, Adrian Neild, Gerald Radziwill, Jürg Dual — *Swiss Federal Institute of Technology, Zurich*

16:00 **Inhibition Of Mmps, But Not Of Adamts-4 And -5, Reduces Il-1-Stimulated Fibrocartilage Degradation**
Christopher Wilson, John Sandy, Marc Levenston — *Georgia Institute of Technology*

Friday, Jun 23 2006	2:45 PM - 4:15 PM	Session 6B

Podium — Ph.D. Student Competition II: Solid Mec, Des & Rehab — Amelia 2/3

CHAIR: Michele Grimm **CO-CHAIR:**

14:45 **A Novel Technique For Examination And Modeling Of Trabecular Bone Microdamage**
Simon Tang, Deepak Vashishth — *Rensselaer Polytechnic Institute*

15:00 **Osteopontin Deficient Mice Display Altered Torsional Mechanical Properties And Callus Formation And Remodeling During Fracture Healing**
Craig Duvall, W. Robert Taylor, Robert Guldberg — *Georgia Institute of Technology*

15:15 **Rat Ambulation Alterations Due To Supraspinatus Tendon Detachment**
Stephanie Perry, Benjamin Reidich, Cathryn Peltz, Joseph Sarver, Gerald Williams, Louis Soslowsky — *University of Pennsylvania*

15:30 **Cervical Nerve Root Compression Elicits Behavioral Hypersensitivity Dependent On The Magnitude Of Applied Load**
Raymond Hubbard, Beth Winkelstein — *University of Pennsylvania*

15:45 **Defining The Flexion-Extension Axis Of The Ulna: Implications For Computer-Assisted Intraoperative Elbow Alignment**
James Brownhill, Louis Ferreira, James Pichora, Graham King, James Johnson — *University of Western Ontario*

16:00 **Characterization Of The Mechanical Environment At An Implant Interface: An In Vitro Study**
Jennifer Currey, John Brunski, Dan Nicolella — *Rensselaer Polytechnic Institute*

Friday, Jun 23 2006	2:45 PM - 4:15 PM	Session 6C

Podium — Ph.D. Student Competition III: Biofluids and Imaging — Cumberland A

CHAIR: Matthew Gounis **CO-CHAIR:**

14:45 **Design And Computational Studies Of A Novel Miniature Venous Assist Device For The Fontan Circulation**
rui wang, Jean Hertzberg, Francois G. Lacour-Gayet, Robin Shandas — *University of Colorado at Boulder*

15:00 **Quantification Of Blood Flow And Pressure In The Abdominal Aorta Of Spinal Cord Injury Patients Using A Three-Dimensional Fluid-Solid Interaction Finite Element Method**
Hyun Jin Kim, Irene E. Vignon, C. Alberto Figueroa, Janice J. Yeung, Ronald Dalman, Charles Taylor — *Stanford University*

15:15 **Investigation Of Device-Associated Platelet Margination Using Micro Flow Visualization**
Rui Zhao, Marina Kameneva, James Antaki — *Carnegie Mellon University*

15:30 **Implementation Of A Viscoelastic Constitutive Model For Solving The One-Dimensional Equations Of Blood Flow Using A Finite Element Method**
Rashmi Raghu, Irene Vignon-Clementel, Alberto Figueroa, Charles Taylor — *Stanford University*

15:45 **Real Time Blood Velocity And Vorticity Measurements Using A Custom-Designed Non-Invasive Echo Particle Image Velocimetry System: Initial In Vitro Experiments**
Lingli Liu, Hairong Zheng, Jean Hertzberg, Robin Shandas — *University of Colorado at Boulder*

16:00 **Pressure Drop Versus Flow Rate Relationships For Deformable Orifice Diaphragms Used As Heart Valve Analogues**
Devesh Amatya, Ellen Longmire, Victor Barocas — *University of Minnesota*

Friday, Jun 23 2006	4:45 PM - 6:15 PM	Session 7A

Podium **Cell Eng/Biomech II** **Amelia 1**

CHAIR: Clark Hung **CO-CHAIR:** Peter Butler

16:45 **Aortic And Pulmonary Valve Interstitial Cells: Cell Stiffness And Tissue Remodeling Capabilities**

W. Merryman, Jun Liao, Aron Parekh, Hai Lin, Michael Sacks — *University of Pittsburgh*

17:00 **Stress Analysis And Mutiphysics Of Sheared And Focally-Adhered Endothelial Cells**

Peter Butler, Michael Ferko — *Pennsylvania State University*

17:15 **Decreased Leptin Production By Mechanically Responsive Adipocytes**

Nefertiti Patrick, Mona Wood, Joshua Miller, Blake Roessler, Kurt Hankenson — *University of Michigan*

17:30 **Hydrogel Formulation For Enhanced Regeneration In Cell Transplantation**

Mahwish Ahmed, Eric Crumpler — *Florida International University*

17:45 **Neural Cell Engineering Using A Polyacrylamide Hydrogel: A Preliminary Study**

Xue Jiang, Yangzhou Du, Bonnie Firestein, David Shreiber, Rene S. Rosenson-Schloss, Bernard Yurke, Uday Chippada, Lulu Li, Noshir Langrana — *Rutgers, The State University of New Jersey*

18:00 **Kinematic Analysis Of The Effects Of Finite Morphogenetic Tissue Deformations On Mesodermal Cell Migration And Patterning During Early Avian Gastrulation**

Evan Zamir, András Czirók, Cheng Cui, Charles Little, Brenda Rongish — *The University of Kansas Medical Center*

Friday, Jun 23 2006	4:45 PM - 6:15 PM	Session 7B

Podium **Cardiovascular Mechanopathobiology** **Amelia 2/3**

CHAIR: David Vorp **CO-CHAIR:** Morton Friedman

16:45 **Morphogenetic Adaptation Of The Embryonic Heart To Perturbed Loading**

Nandan Nerurkar, Ashok Ramasubramanian, Larry Taber — *Washington University in St. Louis*

17:00 **Atherogenesis And Wall Shear Stress In The Mouse Aorta Using Quantum Dots, Micro-CT And Numerical Simulation**

Jin Suo, Dardo Ferrara, Robert Taylor, Robert Guldberg, Dan Sorescu, John Oshinski, Don Giddens — *Georgia Institute of Technology*

17:15 **The Effect Of Abnormally Low And High Shear Stresses On Gene Expression In The In Vivo Porcine Iliac Artery**

Jeffrey LaMack, Heather Himburg, Morton Friedman — *Duke University*

17:30 **Distinct Expression Sensitivities Of Shear-Responsive Genes In Porcine Aortic Endothelial Cells To Shear Stress Magnitude And Spatial Gradient**

Jeffrey LaMack, Morton Friedman — *Duke University*

17:45 **Modelling The Stress Condition Dependant Anisotropy And Rupture Mechanics Of Atherosclerotic Plaques**

Ramses Galaz, Rosaire Mongrain, Valerie Pazos, Richard Leask, Jean Claude Tardif — *McGill University*

18:00 **Endothelial Cell Proliferation Under High Wall Shear Stress**

Eleni Metaxa, John Kolega, Michael Szymanski, Zhijie Wang, Ling Gao, Yiemeng Hoi, Scott Woodward, Daniel Swartz, Hui Meng — *University at Buffalo*

Friday, Jun 23 2006	4:45 PM - 6:15 PM	Session 7C

Podium — Biofluid Mechanics — Cumberland A

CHAIR: Samir Ghadiali **CO-CHAIR:** C. Ross Ethier

16:45 **Influence Of Three-Dimensional Muscle Morphology On The Opening Of A Collapsible Airway**
Samir Ghadiali, John Swarts — *Lehigh University*

17:00 **Free-Surface Coating Flows Of Non-Newtonian Vaginal Gels: Numerical And Experimental Simulations Of Gravity-Induced Flow**
Sarah L Kieweg, Thomas P Witelski, David F Katz — *University of Kansas*

17:15 **Turbulent Flow Modeling In The Upper Airway Of Racehorses**
Vineet Rakesh, Ashim Datta, Norm Ducharme, Joy Tomlinson — *Cornell University*

17:30 **Flow Measurement In An In-Vitro Oscillatory Model Of A Single Human Alveolus**
Sudhaker Chhabra, Ajay K. Prasad — *University of Delaware*

17:45 **Modeling Liquid-Mediated Adhesion Between The Human Vocal Folds**
Gifford Decker, Scott Thomson — *Brigham Young University*

18:00 **Curvature And The Circumflex Branch Significantly Influence The Hemodynamics Of The Common Femoral Artery Bifurcation**
Rohan More, Roy Koomullil, Gilberto Russo, Alan Shih, Yasushi Ito, Andreas Anayiotos — *University of Alabama at Birmingham*

Friday, Jun 23 2006	4:45 PM - 6:15 PM	Session 7D

Podium — Disc Mechanics — Cumberland BC

CHAIR: Dawn Elliott **CO-CHAIR:** Beth Winkelstein

16:45 **Modified Specimen Preparation And Testing Methods Restore Fluid In-Flow To In Vitro Intervertebral Discs**
Jamie Williams, Ruth Ochia, Gunnar Andersson — *Rush University Medical Center*

17:00 **Changes In Biomechanical Response Due To Disc Degeneration: A Poroelastic C5-C6 Motion Segment Model Study**
Mozammil Hussain, Raghu Natarajan, Gunnar Andersson, Howard S. An — *Rush University Medical Center*

17:15 **Changes In Biomechanics Following Disc Degeneration As Compared An Intact Segment: A Finite Element Study**
Leonora Felon, Ahmed Faizan, Vijay Goel, Koichi Sairyo, Ashok Biyani, Nabil Ebraheim — *University of Toledo*

17:30 **A New In Vivo Model Of Disc Degeneration In The Rat Lumbar Spine**
John Boxberger, Joshua Auerbach, Sounok Sen, Dawn Elliott — *University of Pennsylvania*

17:45 **Increase In The Water Content Of Degenerated Disc Tissue Does Not Restore Mechanical Response To That Of A Normal Disc**
Jamie Williams, Raghu Natarajan, Gunnar Andersson — *Rush University Medical Center*

Friday, Jun 23 2006	4:45 PM - 6:15 PM	Session 7E

Podium — Injury Biomechanics — Ossabaw AB

CHAIR: Brian Stemper **CO-CHAIR:** Jiangyue Zhang

16:45 **Brain Injuries And Airbags: The Effect Of A Seatbelt**

Alyssa DeMarco, Dennis Chimich, Gunter Siegmund — *MEA Forensic Engineers & Scientists*

17:00 **Buckle Stalk Acceleration Amplification Observed In Automotive Seatbelts**

Craig Good, Richard Clarke, David Renfroe — *Collision Analysis (Calgary) Ltd.*

17:15 **The Effects Of The Extraocular Muscles On The Loading Response Of The Human Eye Under Static Loading Conditions**

Amber Bonivtch, Eric Kennedy, Sarah Manoogian, Joel Stitzel, Ian Herring, Stefan Duma — *Southwest Research Institute*

17:30 **Risk Factors For Deep Pressure Sores Revealed Through Finite Element Simulations Coupled With An Injury Threshold And A Damage Law For Muscle Tissue**

Eran Linder-Ganz, Amit Gefen — *Tel Aviv University*

17:45 **Chest Injuries And Occupant Positioing In Lateral Impacts With Side Airbags**

Narayan Yoganandan, Frank A. Pintar — *Medical College of Wisconsin*

18:00 **Finite Element (Fe) Analysis For Evaluation Of Pressure Ulcer On The Buttock: Part I: Development And Validation**

Fang Lin, Dohyung Lim, Ronald Hendrix, James Bankard, Mohsen Makhsous — *Northwestern University*

Friday, Jun 23 2006	4:45 PM - 6:15 PM	Session 7F

Podium — Anterior Cruciate Ligament — Talbot AB

CHAIR: Steven Abramowitch **CO-CHAIR:** Ajit Chaudhari

16:45 **The Effect Of Lateral Tibial Tunnel Movement Of Single Bundle Acl Reconstruction & The Effect Of Doubel Bundle Reconstruction On The Internal Rotation During Dynamic Single-Leg Landing**

Choongsoo Shin, Ajit Chaudhari, Thomas Andriacchi — *Stanford University*

17:00 **Acl Reconstruction Does Not Fully Restore Knee Kinematics During Walking**

Ajit Chaudhari, Sean Scanlan, Thomas Andriacchi — *Stanford University*

17:15 **Development Of A Cutting Maneuver To Generate A Realistic Acl Injury In Vitro**

Nathaniel Lenz, Nicholas Morton, Trent Guess, Lorin Maletksy — *University of Kansas*

17:30 **Gene Expression Of Collagen I, Collagen Iii, Mmp-1 And Alpha Smooth Muscle Actin In A Rabbit Acl Partial Transection Model**

Erik Attia, Ross Henshaw, Madhu Bhargava, Jo Hannafin — *Hospital for Special Surgery*

17:45 **Acl Graft Sagittal Plane Orientation Influences Anterior-Posterior Tibial Translation During Walking**

Ajit Chaudhari, Seungbum Koo, Sean Scanlan, Thomas Andriacchi — *Stanford University*

18:00 **Acl Injury Causes Impingement Of The Medial Tibial Spine On The Femoral Condyle**

Guoan Li, Louis DeFrate, Jeremy Moses, Ramprasad Papannagari, Neil Pathare, Thomas Gill — *Massachusetts General Hospital*

Friday, Jun 23 2006	7:45PM - 9:00PM	Session 9

Poster **M.S. Student Paper Competition** **Amelia 4**

CHAIR: Matthew Gounis **CO-CHAIR:**

9-1 **Comparative Effects Of Individual And Combined Growth Factors On The Cultivation Of Tissue Engineered Cartilage**
Dilek Tansoy, Gilda Barabino — *Northeastern University*

9-2 **A Propulsion System For Swimming Micro-Robots**
Michael Wybenga, John McPhee, Eric Kubica — *University of Waterloo*

9-3 **Head Injury Risk Associated With Feet-First Free Falls In Children And Influence Of Impact Surface Type**
Angela Knight, Gina Bertocci, Mary Clyde Pierce, Kyle Bialczak — *University of Louisville*

9-4 **A Novel Respiratory Gating Design For Motion Tracking In Pet/Ct**
Jiali Wang, Anthony McGoron — *Florida International University*

9-5 **Fatigue Behaviour Of Cement Augmented Synthetic Vertebrae**
Amy Johnson, Tony Keller — *University of Vermont*

9-6 **An MRI Based Analysis Of Correlations Between Bony And Cruciate Ligament Anthropometrics**
Jackie Moulton, David FitzPatrick, Aoife Connolly, Jordan Lee, Lerner Amy — *University College Dublin*

9-7 **Femoral Cartilage Thickness Distribution And Its Correlation With Anthropometric Variables**
Aoife Connolly, David FitzPatrick, Jackie Moulton, Jordan Lee, Amy Lerner — *University College Dublin*

9-8 **Whole Body Vibration And Neuromuscular Response**
Pradeep Abraham, Sara Wilson — *University of Kansas*

9-9 **Pediatric Bed Fall Simulation Model Development And Validation**
Kyle Bialczak, Gina Bertocci, Mary Clyde Pierce, Angela Knight — *University of Louisville*

9-10 **Simulating The Contact Phase Of Gait In The Cadaveric Lower Extremity**
Joseph Iaquinto, Jennifer Wayne — *Virginia Commonwealth University*

9-11 **Improved Diagnosis Of Coronary Stenosis Under Clinical Setting Using Analytical Approach**
Koustubh Ashtekar, Lloyd Back, Rupak Banerjee — *University of Cincinnati*

9-12 **The Effect Of Reflex On Stability And Metabolic Costs: A Modelling Example In The Lumbar Spine**
Timothy Franklin, Kevin Granata — *Virginia Polytechnic Institute and State University*

9-13 **Real-Time Monitoring And Control Of Retraction Forces During Median Sternotomy**
Nicholas Jardine, Gregory Buckner, Gil Bolotin, Masha Kocherginsky — *North Carolina State University*

9-14 **Fabrication And Characterization Of Nanoporous Ceramic Film And Tube**
Amit Belwalkar, Zhongping Huang — *Widener University*

9-15 **Effect Of Orifice Shape On Bubble Formation In Microfluidic Devices:A Computational Fluid Dynamic Simulation Study**
Justin Gross, Michael Weber, Kendall Hunter, Robin Shandas — *University of Colorado at Boulder*

9-16 **Development Of An Inverse Dynamic Model Of The Elbow Joint**
Vega Lee, Thomas Jenkyn, Cynthia Dunning — *University of Western Ontario*

9-17 **Kinematics Of The Shoulder Following Rotator Cuff Injury: An In-Vitro Biomechanical Study**

Angela Kedgley, Geoffrey Mackenzie, Louis Ferreira, Darren Drosdowech, Graham King, Kenneth Faber, James Johnson — *University of Western Ontario*

9-18 **A Novel Technique For Measuring Passive Shoulder Mechanics In A Rat**

Cathryn Peltz, Joseph Sarver, Gerald Williams, Louis Soslowsky — *University of Pennsylvania*

9-19 **The Effects Of Oxygen Plasma Treatment On Adipose-Derived Adult Stem Cell Adherence To Poly-L-Lactic Acid Scaffolds**

Ariel Hanson, Elizabeth Loboa — *North Carolina State University*

9-20 **Design Of A Novel Prosthetic Vein Valve**

Rahul Sathe, David Ku — *Georgia Institute of Technology*

9-21 **The Role Of An Anterior Flange On Load Transfer Through The Distal Humerus Following Total Elbow Arthroplasty**

Cheryl Dunham, Rebecca Austman, Graham King, James Johnson, Cynthia Dunning — *University of Western Ontario*

9-22 **Effects Of Venous Needle Turbulence During Hemodialysis On Endothelial Morphology And Nitric Oxide Formation**

Thanh Huynh, Balu Chacko, Xinjun Teng, Rakesh Patel, Michael Allon, Brigitta Brott, Andreas Anayiotos — *University of Alabama at Birmingham*

Friday, Jun 23 2006	**7:45PM - 9:00PM**	**Session 9**

Poster — Design and Rehabilitation — Amelia 4

CHAIR: Michael C. Murphy **CO-CHAIR:**

9-23 **Real-Time Patient-Specific Analysis Of Residual Limb Stresses In Transtibial Amputees During Ergometer Exercise**

Sigal Portnoy, Adi Toledano, Anat Kristal, Itzhak Siev-Ner, Amit Gefen — *Tel Aviv University*

9-24 **Upper Extremity Computational Muscle Forces In Comparison With Subject Electromyography**

Sarah Sullivan, Noshir Langrana, Sue Ann Sisto — *Rutgers, The State University of New Jersey*

9-25 **A Resonator Device For Tissue Viscoelasticity Measurement**

Jean Zu, Parag Dhar — *University of Toronto*

9-26 **A Fuzzy Inference System For The Ordering Of Laparoscopic Tools In Minimally Invasive Surgery**

David Miller, Carl Nelson, Dmitry Oleynikov, David Jones — *University of Nebraska-Lincoln*

9-27 **Preoperative Evaluation Of Implant Stability: In Vitro Validation Of A Fem-Enhanced Planning Software**

Thibaut Bardyn, Sigbjörn Olsen — *University of Bern*

9-28 **A Microrobotic Needling Machine For An In Vitro Acupuncture Model**

Alice Seneres, Abhijit Tamba, Julias Margaret, David Shreiber, Helen Buettner, Mourad Bouzit — *Rutgers, The State University of New Jersey*

Friday, Jun 23 2006	7:45PM - 9:00PM	Session 9

Poster — Cardiovascular Solid Mechanics — Amelia 4

CHAIR: David Vorp **CO-CHAIR:**

9-29 **Numerical Analysis Of The External Acoustical Impacts To The Lungs**
Alexander Kholodov, Sergey Simakov — *Moscow Institute of Physics and Technology*

9-30 **A Non-Destructive Approach For Predicting Residual Stress In Arteries**
Jia Lu, Xuefeng Zhao, Madhavan Raghavan — *University of Iowa*

9-31 **Evaluation On Laser Beam Assisted Infrared Thermal Diagnosis Of Superrficial Circulation Disease**
Zhong-Shan Deng, Jing Liu — *The Chinese Academy of Sciences*

9-32 **Biomechanical Effect Of Common Experimental Storage Techniques On Arterial Vessels**
Brian Stemper, Michael R. Stineman, Narayan Yoganandan, Frank A. Pintar — *Medical College of Wisconsin*

9-33 **Phase Averaging And Variance Characterization Of The Aortic Pressure Pulse**
Matthew Schaefer, Clifton Johnston, Robert Martinuzzi — *University of Calgary*

9-34 **Reduced Axial Strain Disrupts Normal Arterial Homeostasis, Mechanoresponsiveness And Vasoactivity**
Amanda Lawrence, Keith Gooch — *University of Pennsylvania*

Friday, Jun 23 2006	7:45PM - 9:00PM	Session 9

Poster — Biofluid Mechanics — Amelia 4

CHAIR: David Vorp **CO-CHAIR:**

9-35 **Ehd Modeling Of A Novel Carbon Fiber Emitter For Electrospray Ionization-Mass Spectrometry Applications**
Ashis Sen, Jeff Darabi, Daniel Knapp — *University of South Carolina*

9-36 **Ultrasonic Positioning Of Cells For Handling With A Microgripper**
Adrian Neild, Stefano Oberti, Felix Beyeler, Jürg Dual, Bradley Nelson — *Swiss Federal Institute of Technology, Zurich*

9-37 **Simulation Of Iris Compliance During Angle Closure Glaucoma**
Sumanta Acharya — *Louisiana State University*

9-38 **Simulation Of Particulate Deposition In The Conductive And In The Respiratory Part Of Human Airways**
Daniela Fontana, Marco Vanni, Giancarlo Baldi — *Politecnico di Torino*

9-39 **Computational Study Of A Bubble Sticking And Sliding Along A Wall In A Two Dimensional Bifurcating Channel**
Brijesh Eshpuniyani, Joseph Bull — *University of Michigan*

9-40 **Neurological Deficits After Elastase Induced Aneurysm Model In Rabbits**
Liliana Cesar, Laszlo Miskolczi, Matthew Gounis, Chander Sadasivan, Ajay Wakhloo, Baruch Lieber — *University of Miami*

9-41 **Aneurysm Flow Modification By An Asymmetric Stent Patch Designed For A Patient Specific Intracranial Aneurysm**
Minsuok Kim — *University at Buffalo*

9-42 **Toward A High Fidelity Biophysical Model Of Vocal Fold Vibration And Glottal Aerodynamics**
Xudong Zheng, Haoxiang Luo, Rajat Mittal, Haibo Dong, Steven Bielamowicz, Raymond Walsh, James Hahn — *George Washington University*

9-43 **Structural And Fluid-Dynamic Computational Analysis Of The Mechanical Behavior Of Preterm Lamb Central Airways During Total Liquid Ventilation**
Federico Ghioni, Paola Bagnoli, Fabio Acocella, Mauro Di Giancamillo, Roberto Fumero, Maria Laura Costantino — *Politecnico di Milano, Milan, Italy*

Friday, Jun 23 2006	7:45PM - 9:00PM	Session 9

Poster — Cellular and Biomechanical Engineering — Amelia 4

CHAIR: Clark T. Hung **CO-CHAIR: Lorin Maletsky**

9-44 **Effects Of Mechanical Vibration On Cultured Osteoblasts**

Mototoshi Kumaoka, Toshihiko Shiraishi, Shin Morishita — *Yokohama National University*

9-45 **Mechanical Properties Of A Cultured Osteoblast Under Adhesive Condition**

Takafumi Onishi, Toshihiko Shiraishi, Shin Morishita — *Yokohama National University*

9-46 **Osteogenic Differentiation Alters Palladin Expression In Human Adipose-Derived Adult Stem Cells**

Michelle Wall, Andrew Rachlin, Carol Otey, Elizabeth Loboa — *North Carolina State University/University of North Carolina at Chapel Hill*

9-47 **In Situ Strain Measurments Of Chondrocyte Deformation Under Transient Loading**

Nadeen Chahine, Clark Hung, Gerard Ateshian — *Columbia University*

9-48 **Effects Of Hydroxyapatite Whiskers On The Mechanical And Biological Behavior Of Reinforced Polymers**

Ryan Roeder, Micah Rogel, Robert Kane, Gabriel Converse, Carmen Narvaez, JoEllen Welsh — *University of Notre Dame*

9-49 **Novel Microfluidic Design For Analyzing Fluid Shear Stress Induced Viability And Proliferation Of Human Mesenchymal Stem Cells**

Ariel Hanson, Jeffrey Soo Hoo, Glenn Walker, Elizabeth Loboa — *North Carolina State University*

9-50 **Effects Of High Frequency Loading On Rankl And Opg Expression**

Chi Hyun Kim, Christopher Jacobs — *Yonsei University*

9-51 **Water Loss By Moderate Drying Affects The Toughness Of Middle-Aged Bone But Not Elderly Bone**

Jeffry Nyman, Jerrod Tyler, Xiaodu Wang — *University of Texas at San Antonio*

9-52 **Can An Isotropic Constitutive Model Be Utilized For The Glenohumeral Capsule?**

Eric Rainis, Susan Moore, Jeffrey Weiss, Heath Henninger, Richard Debski — *University of Pittsburgh*

9-53 **Experimental Measurement And Finite Element Prediction Of Cartilage Contact Pressures In The Human Hip**

Andrew Anderson, Benjamin Ellis, Steve Maas, Christopher Peters, Gerard Ateshian, Jeffrey Weiss — *University of Utah*

9-54 **Ex Vivo Alterations Of The Biomechanical Properties Of The Whole Mount Female Rat Urethra In A Model Of Birth Trauma**

Rachelle Prantil, Ronald Jankowski, Yasuhiro Kaiho, De Groat William, Chancellor Michael, Naoki Yoshimura, David Vorp — *University of Pittsburgh*

9-55 **The Effects Of Contact Guidance And Mechanical Stretch On Bladder Smooth Muscle Cell Alignment**

Rebecca Long, Michael Sacks — *University of Pittsburgh*

9-56 **State Space Analysis Of Ac Nerve Conduction Block Using Hodgkin-Huxley Model**

Anirban Dutta, Ronald Triolo — *Case Western Reserve University*

9-57 **Effects Of Stretching On Skin Optical Properties**

Michael Childers, Walfre Franco, Stuart Nelson, Guillermo Aguilar — *University of California, Riverside*

9-58 **Experimental Determination Of Porohyperelastic Material Properties For Porcine Scleral Tissue**

Jonathan Vande Geest, Bruce Simon, Ariane Mortazavi, Robert Park, Sreeni Basavanthappa, Paul Rigby — *University of Arizona*

Friday, Jun 23 2006	7:45PM - 9:00PM	Session 9

Poster — Tissue Engineering/Biomechanics — Amelia 4

CHAIR: Clark T. Hung **CO-CHAIR:**

9-59 **Interactive, Quantitative Analysis Of Scaffold Structure Using Immersive Visualization**
Joy Dunkers, John Hagedorn, Adele Peskin, John Kelso, Judith Terrill, Lori Henderson — *National Institute of Standards and Technology*

9-60 **Investigation Into The Tissue Scaffold Fabrication Process**
Xiongbiao Chen, Hui Ke — *University of Saskatchewan*

9-61 **Obtaining The Local Properties Of Soft Hydrogels Using Non-Intrusive Methods**
Uday Chippada, Noshir Langrana, Bernard Yurke, David Shreiber, Rene Schloss, Frank (Xue) Jiang, Lulu Li — *Rutgers, The State University of New Jersey*

9-62 **A Novel Nanotechnology Fabrication Method For Scaffolds In Biomimetic And Tissue Engineering Applications**
Chao-Min Cheng, Philip LeDuc — *Carnegie Mellon University*

9-63 **Carbon Nanofiber Composite Biomaterials For Use In Tissue Engineering: Mechanical And Biological Considerations And Development Of Computational Models**
Shawn Hunter, Nilesh Billade, Prasanna Muralidharan, Kumar Vemaganti — *University of Cincinnati*

9-64 **Removal Of The Coracoacromial Arch Causes Alterations In Apparent Strain In The Superior Region Of The Supraspinatus Tendon**
Nelly Andarawis, Jane Asmuth, Joseph Sarver, Nicholas Tustison, Brian Avants, Felix Wehrli, Hee Kwon Song, James Gee, Louis Soslowsky — *University of Pennsylvania*

9-65 **Dynamic Mechanical Analysis Of Electrospun Polydioxanone And Elastin Blends For Cardiovascular Tissue Engineering Applications**
Scott Sell, Catherine Barnes, Danielle Knapp, Beat Walpoth, Thomas Haas, Gary Bowlin — *Virginia Commonwealth University*

9-66 **About In Vivo Mechanical Tests On Human Skin**
Emmanuelle Jacquet — *University of Franche-Comte*

9-67 **Differentiation Of Embryonic Stem Cells On Dynamic Polyacrylamide Gels**
Lulu Li, Frank (Xue) Jiang, Uday Chippada, Rene Schloss, Bernard Yurke, Noshir Langrana — *Rutgers, The State University of New Jersey*

9-68 **Comparative Study On Scaffold Mateerials For Neural Tissue Engineering Applications**
Xiongbiao Chen — *University of Saskatchewan*

9-69 **Prediction Of Biomechanical And Biochemical Properties Of Tissue-Engineered Cartilage Using Gadolinium-Enhanced MRI**
Shogo Miyata, Kazuhiro Homma, Tomokazu Numano, Katsuko Furukawa, Testuya Tateishi, Takashi Ushida — *Kyushu Institute of Technology*

9-70 **Computational Optimization Of The Mechanical Properties For A Scaffold Used In Osteochondral Defect Repair**
Daniel Kelly, Patrick Prendergast — *University of Dublin, Trinity College*

9-71 **Matrix Stiffness Regulates Formation Of Tissue-Engineered Microvascular Networks: Role Of Cell-Cell And Cell-Substrate Interactions**
Fitzroy Byfield, Keith Gooch — *Ohio State University*

9-72 **Melt-Processable Hyaluronan Ester Scaffolds For Articular Cartilage Tissue Engineering**
Rachael Kurkowski, Cody Cranson, Jeffrey Harris, John Kisiday, Susan James — *Colorado State University*

9-73 **Strategies For Automated Extraction Of Young'S Moduli Of Soft Materials From Afm Force Curves: Application To Cartilage**
David Lin, Emilios Dimitriadis, Ferenc Horkay — *National Institutes of Health*

9-74 **Adhesion Of Chondrocytes To Poly(Vinyl Alcohol) Hydrogel**
Devon Charlton, Erik Attia, Margaret Peterson, Peter A. Torzilli, Suzanne A Maher — *Hospital for Special Surgery*

Friday, Jun 23 2006	7:45PM - 9:00PM	Session 9

Poster **Implants** **Amelia 4**

CHAIR: Raghu Natarajan **CO-CHAIR:**

9-75 **Effects Of Load Locations, Periarticular Shape And Unsecured Plate Lengths On Stresses In A Distal Radial Volar Locking Plate**

Mehul Dharia, Roger Kenyon, Danny Levine, Bradley Durcholz, Lisa Schroder — *Zimmer, Inc.*

9-76 **Comparison Of Plating Configurations For Fixation Of A Parasymphyseal Mandible Fracture Using The Finite Element Method**

Scott Lovald, Tariq Khraishi, Jon Wagner, John Wood, James Kelly, Bret Baack — *University of New Mexico*

9-77 **Predicting Revision Risk In A Group Of Total Hip Replacement Patients Using Finite Element Analysis**

Alex Lennon, John Britton, Ruairi Mac Niocaill, Damien Byrne, Patrick Kenny, Patrick Prendergast — *University of Dublin, Trinity College*

9-78 **Preliminary Stress Analysis Of A New Surface Hip Replacement**

Cassidy Fitzpatrick, Karim Muci-Kuchler — *South Dakota School of Mines & Technology*

9-79 **The Effect Of Cross-Sectional Shape On Torsional Stability Of Cemented Implant Components Under Cyclic Loading**

Angela Kedgley, Sarah Takaki, Pencilla Lang, Cynthia Dunning — *University of Western Ontario*

9-80 **A Finite Element Investigation Of Periacetabular Defects And Cement Filling**

Zuoping Li, Neha Butala, Brandon Etheridge, Herrick Siegel, Alan Eberhardt — *University of Alabama at Birmingham*

9-81 **Effects Of Anterior Post Impingement On Articular Surface Components Of Fixed And Mobile Bearing Knee Designs**

Mehul Dharia, Todd Johnson — *Zimmer, Inc.*

9-82 **The Influence Of Sagittal And Coronal Conformity On Predicted Wear Volume In A Total Knee Replacement Design**

Carlos Marquez-Barrientos, Scott Banks, BJ Fregly — *University of Florida*

9-83 **Numeric Modeling Of Wear In Total Knee Arthroplasty**

Thorsten Schwenke, Erich Schneider, Markus Wimmer — *Rush University Medical Center*

9-84 **Determination Of In-Vivo Tka Contact Area Using Dual Fluoroscopic Imaging**

Jeremy Suggs, George Hanson, Andrew Freiberg, Harry Rubash, Guoan Li — *Massachusetts General Hospital*

9-85 **Are Existing Polyethylene Tibial Insert Selections For Tka Adequate? An Experimental Study Evaluating Sensitivity Of Soft Tissue Tension To Insert Thickness**

Geoff Mackenzie, Shreeram Deshpande, Angela Kedgley, David Chess, James Johnson — *University of Western Ontario*

Friday, Jun 23 2006	7:45PM - 9:00PM	Session 9

Poster — Modeling and Computational Biomechanics — Amelia 4

CHAIR: Richard Debski **CO-CHAIR:**

9-86 **Mechanoregulation Of Collagen Orientation In Articular Cartilage**

Wouter Wilson, Niels Driessen, Corrinus Van Donkelaar, Keita Ito — *Eindhoven University of Technology*

9-87 **Numerical Model To Predict The Failure Progression In A Lumbar Disc Due To Cyclic Loading**

Raghu Natarajan, Jamie Williams, Steven Lavender, Gunnar Andersson — *Rush University Medical Center*

9-88 **Composition Of The Pericellular Matrix Influences Chondrocyte Deformation In Articular Cartilage**

Petro Julkunen, Wouter Wilson, Jukka Jurvelin, Rami Korhonen — *Eindhoven University of Technology*

9-89 **Benifits Of Automatic Differentiation For Biomechanical Optimizations**

Jeffrey Reinbolt, Benjamin Fregly — *University of Florida*

9-90 **Evaluation Of A New Sitting Concept Designed For Prevention Of Pressure Ulcer On The Buttock: Part Ii: Finite Element Analysis**

Dohyung Lim, Fang Lin, Ronald Hendrix, James Bankard, Mohsen Makhsous *Northwestern University*

9-91 **Effect Of Uncertainty In Lower-Extremity Body Segment Parameters On Joint Loading Calculation Using Inverse Dynamics**

Joseph Langenderfer, Paul J. Rullkoetter, Anthony J. Petrella, Peter Laz — *University of Denver*

9-92 **A Generalized Surrogate Contact Model For Dynamic Simulations With Anatomic Joints**

Yi-Chung Lin, Raphael Haftka, Nestor Queipo, Benjamin J. Fregly — *University of Florida*

9-93 **An Initial Investigation For Estimating Subject Specific Body Segment Parameters Using 2D Work And Energy Principles**

James Doane, Peter Quesada — *University of Louisville*

9-94 **Effects Of Variability In Muscle Origin And Insertion, And Kinematics On Predicted Knee Flexor Moment Arms**

Saikat Pal, Tyler Richardson, Joseph Langenderfer, Anthony Petrella, Peter Laz, Paul J. Rullkoetter — *University of Denver*

9-95 **Identifying Constitutive Law Parameters From Inflation Tests Of Tissues**

Timothy Quinn, Elizabeth Drexler, Andrew Slifka, Chris McCowan — *National Institute of Standards and Technology*

9-96 **Electric Fields Inside Articular Cartilage**

Xin Lu, X. Edward Guo, Chester Miller, Van C. Mow — *Columbia University*

9-97 **3-D Numerical Simulation Of Flow Of A Neutrophil For The Retention Time In A Moderate Constriction Of A Rectangular Microchannel**

Atsushi Shirai, Sunao Masuda, Toshiyuki Hayase — *Institute of Fluid Science, Tohoku University, Japan*

9-98 **Development Of An On-Line Module For Efficient Exploration And Utilization Of Biomechanical Models**

Jeffrey Bischoff — *University of South Carolina*

9-99 **A New Theoretical Model Of Force Depression In Skeletal Muscle**

David Corr — *University of Calgary*

Friday, Jun 23 2006	7:45PM - 9:00PM	Session 9

Poster — K-17 Pre-Poster Presentations — Talbot AB

CHAIR: Devashish Shrivastava **CO-CHAIR:**

9-100 **A Comparison Of The Freezing Response Of Hela Cells In The Presence Of Nanogold Particles And Dimethylsulfoxide.**
Sreedhar Thirumala, Julianne Forman, Todd Monroe, Ram Devireddy *Louisiana State University*

9-101 **Theoretical Predictions Of Optimal Cooling Rates For Cryopreservation Of Caprine Sperm.**
Dinesh Pinisetty, Jesse Saenz, Robert Godke, Ram Devireddy *Louisiana State University*

9-102 **Oxygen Transport To The Avascular Wall Of A Coronary Artery Stenosis For Varying Blood Viscosity**
Ohwon Kwon, Young Cho, Lloyd Back, Rupak Banerjee *University of Cincinnati*

9-103 **Atomistic Investigation Of Dimethylsulfoxide Interacting With Dppc, Dmpc And Popc Lipid Bilayers.**
Dinesh Pinisetty, Dorel Moldovan, Ram Devireddy *Louisiana State University*

9-104 **Distribution Of [3H]Dexamethasone In Rat Subcutaneous Tissue After Delivery From Osmotic Pumps**
Yvonne Moussy, Lawrence Hersh, Paul Dungel *University of South Florida*

9-105 **Novel Paclitaxel-Eluting Fibers For Vascular Stents**
Amir Kraitzer, Meital Zilberman *Tel Aviv University*

9-106 **Gentamicin-Loaded Bioresorbable Films For Prevention Of Bacterial Infections Associated With Orthopaedic Implants**
Meital Zilberman, Moran Aviv, Israela Berdicevsky *Tel Aviv University*

9-107 **Microsphere-Based Bioresorbable Structures Loaded With Proteins For Tissue Regeneration Applications**
Meital Zilberman, Inbal Shraga *Tel Aviv University*

9-108 **Protein–Loaded Pdlga Microspheres: Effects Of Copolymer Composition And Molecular Weight On Microstructure And Release Profile**
Meital Zilberman, Orly Yehezkel *Tel Aviv University*

Saturday, Jun 24 2006	12:30 PM - 2:00 PM	Session 10A

Workshop — Technology Transfer — Amelia 1

CHAIR: Richard Swaja **CO-CHAIR:** Stephen Dahms

12:30 **Technology Transfer And Translational Research**
Richard Swaja, A. Stephen Dahms *Oak Ridge National Laboratory*

12:35 **Broad Cultural Shift Needed To Maximize The Potential Of Translational Research**
Martha Gray *Massachusetts Institute of Technology)*

12:55 **Lost In Translation: Moving Bioengineering Research To Application For The Benefit Of Public Health**
Christine Kelley *(National Institute of Biomedical Imaging and Bioengineering)*

13:15 **Technology Transfer In The Biomedical Sciences – A National Laboratory Perspective**
Russell Miller *Oak Ridge National Laboratory*

13:35 **Acceleration Of Intellectual Property Capture And Commercialization In U. S. Universities: A New Model**
Stephen Dahms *Alfred Mann Foundation for Biomedical Engineering*

Saturday, Jun 24 2006	12:30 PM - 2:00 PM	Session 10B

Workshop — Problem Based Learning — Amelia 2/3

CHAIR: Jeffrey Holmes **CO-CHAIR:**

12:30 **Promoting Integrative Thinking In Biomedical Engineering**
Wendy Newstetter, Ajit Yoganathan — *Georgia Institute of Technology*

Saturday, Jun 24 2007	12:30 PM - 2:00 PM	Session 10C

Workshop — Disc Replacement - I — Cumberland A

CHAIR: Lars G. Gilbertson **CO-CHAIR:** Vijay K. Goel, Patrick J. Smolinski

12:30 **Motion Preservation And Functional Restoration Technologies For Intervertebral Disc Prosthesis**
Casey Lee — *New Jersey Medical School*

12:45 **Nucleus Replacement**
Hansen Yuan — *SUNY*

13:00 **Clinical Considerations In The Application Of Disc Replacement Devices**
Serena Hu — *U.C. San Francisco*

13:15 **Basic Clinical And Biomechanical Considerations For Motion Preservation Technologies Including Drugs, Growth Factors And Other Biological Repair Approaches**
Hassan Serhan — *DePuy Spine, Johnson & Johnson*

13:30 **Lessons Learned From Total Joint Arthroplasty**
Vijay Goel — *University of Toledo*

Saturday, Jun 24 2006	12:30 PM - 2:00 PM	Session 10D

Podium — Design of Cardiovascular Devices — Cumberland BC

CHAIR: Mike Murphy **CO-CHAIR:**

12:30 **Flow Induced Platelet Activation And Damage Accumulation In Mechanical Heart Valves – Numerical Studies**
Yared Alemu, Danny Bluestein — *State University of New York at Stony Brook*

12:45 **Feasibility Analysis Of The Safety And Durability Of A Polymer Trileaflet Heart Valve**
Siobhain Gallocher, Qiang Wang, Megumi Mathison, Yasushi Kato, Leonard Pinchuk, Richard Schoephoerster — *Florida International University*

13:00 **Analysis And Optimization Of Pvad Impeller**
Paul Witherell, Sundar Krishnamurty, Ian Grosse, James Antaki — *University of Massachusetts Amherst*

13:15 **Cfd Numerical Evaluation Of Blood Damage In An Axial Flow Ventricular Assist Device**
Alexandrina Untaroiu, Houston G. Wood — *University of Virginia*

13:30 **A Particle Image Velocimetry Study Of A Pulsatile Pediatric Ventricular Assist Device**
Keefe Manning, Brandon Wivholm, Jennifer Long, Arnold Fontaine, William Weiss, Steven Deutsch — *Pennsylvania State University*

13:45 **Theoretical Modeling Of Cyclically Loaded, Biodegradable Cylinders**
Joao Soares, James Moore, Kumbakonam Rajagopal — *Texas A&M University*

Saturday, Jun 24 2006	12:30 PM - 2:00 PM	Session 10E

Podium **Cartilage Modeling** **Ossabaw AB**

CHAIR: Jennifer Wayne **CO-CHAIR:**

12:30 **Chondrocyte Hypertrophy Requires Matrix Turnover**

Corrinus van Donkelaar, Wouter Wilson *Eindhoven University of Technology*

12:45 **Equivalence Between Instantaneous Biphasic And Incompressible Elastic Material Response**

Gerard Ateshian, Benjamin Ellis, Jeffrey Weiss *Columbia University*

13:00 **Influence Of The Superficial Tangential Zone In Cartilage Under Contact Loading: Implications For Tissue Engineering Efforts**

John Owen, Jennifer Wayne *Virginia Commonwealth University*

13:15 **An Algorithm For Triphasic Indentation Of Articular Cartilage For Simultaneous Determination Of Proteoglycan And Mechanical Property**

Xin Lu, Chester Miller, X. Edward Guo, Van C. Mow *Columbia University*

13:30 **The Role Of The Superficial Layer In The Curling And Residual Stress Behaviors Of Articular Cartilage**

Qun Wan, Janine Boumans, Chester Miller, X. Guo, Van C. Mow *Columbia University*

13:45 **A Three-Dimensional Poroelastic Boundary Element Method Applied To Modeling Biphasic Cell-Matrix Interactions In Articular Cartilage**

Mansoor Haider, Farshid Guilak *North Carolina State University*

Saturday, Jun 24 2006	2:15 PM - 3:45 PM	Session 11A

Podium **Tissue Eng./Biomechanics I: Bioreactors** **Amelia 1**

CHAIR: Marc Levenston **CO-CHAIR:** Michael Sacks

14:15 **Computer Simulation Of Cell Cultures Using A Perfused Biorector**

Chih-Ang Chung, Chia-Po Chen *National Central University*

14:30 **Dynamic Culture Conditions Modulate Mineralized Matrix Deposition, Growth Rate, And Particle Size Within Large 3-D Constructs In Vitro**

Blaise Porter, Alexandra Peister, Dietmar Hutmacher, Robert Guldberg *Georgia Institute of Technology*

14:45 **Hydrodynamic Parameters Affect Functional Properties Of Engineered Cartilage**

Ericka Bueno, Bahar Bilgen, Jeffrey Ruberti, Gilda Barabino *Northeastern University*

15:00 **Effect Of Direct Perfusion And Dynamic Loading On Solute Transport In Patellar Shaped Constructs**

Nadeen Chahine, Eric Lima, Victoria Wei, Michael Albro, Clark Hung, Gerard Ateshian *Columbia University*

15:15 **Mechanics Of Aortic Smooth Muscle Cells During Continuous Cyclic Stretch**

Jeremiah Wille, Wei Du, Elliot Elson, Ruth Okamoto *Washington University in St. Louis*

15:30 **Effect Of Mechanical Stretch And Growth Factor On Skeletal Muscle In Vitro**

Sheela George, Upinder Fotadar, Wentao Yan, Michael Yost, Louis Terracio *New York University*

Saturday, Jun 24 2006	2:15 PM - 3:45 PM	Session 11B

Podium **Cardiovascular Solid Mechanics** **Amelia 2/3**

CHAIR: Hai Chao Han **CO-CHAIR:** Naomi Chesler

14:15 **Mechanical Properties And Structure Of Carotid Arteries In Hypervitaminosis D3 And Nicotine Treated Rats.**

David Jegger, Rafaela Da Silva, Caroline Di Gilio, Gilles Prod'hom, Isabelle Lartaud, Virginie Gaillard, Hendrik Tevaearai, Ludwig Karl Von Segesser, Jeffrey Atkinson, Nikos Stergiopulos — *Swiss Federal Institute of Technology, Lausanne*

14:30 **Surgem: Next Generation Cad Tools Targeting Anatomical Complexity For Patient-Specific Surgical Planning**

Jarek Rossignac, Kerem Pekkan, Brian Whited, Kirk Kanter, Ajit Yoganathan — *Georgia Institute of Technology*

14:45 **Clinical And Numerical Studies Supporting Pulmonary Vascular Input Impedance As A Determinant Of Global Vascular Stiffness In Pediatric Pulmonary Hypertension**

Kendall Hunter, Yanhang Zhang, Craig Lanning, David Ivy, Robin Shandas — *University of Colorado Health Sciences Center*

15:00 **A Study On Cardiac Muscle Isometric And Isotonic Contraction By A New Multi- Segment Hill'S Three-Element Model**

Ming Zhong, Jean W. Zu, Gong Cheng — *University of Toronto*

15:15 **One Dimensional Models For Arterial Flow Based On Parameter Identification Using Benchmark Problems**

Anne Robertson, Hasballah Zakaria — *University of Pittsburgh*

15:30 **Wave Intesnity Analysis Of Left Ventricular Filling Dynamics: Correcting For The Effects Of Compliance**

Jacqueline Flewitt, JJ Wang, Clifton Johnston, Nigel Shrive, John Tyberg — *University of Calgary*

Saturday, Jun 24 2006	2:15 PM - 3:45 PM	Session 11C

Workshop **Disc Replacement - II** **Cumberland A**

CHAIR: Lars G. Gilbertson **CO-CHAIR:** Vijay K. Goel, Patrick J. Smolinski

17:00 **Failure Analysis Applied To Disc Replacement Devices**

Steve Kurtz — *Exponent*

14:30 **Contact Area Characteristics Across The Charite Artificial Disc In Flexion-Extension – A Finite Element Investigation**

Ramy Zaki, Ahmed Faizan, Vijay Goel, Tarun Goswami, Ashok Biyani, Nabil Ebraheim, Hassan Serhan — *University of Toledo*

14:45 **Basic Scientific Considerations In Total Disc Arthroplasty**

Brian Cunningham, — *Johns Hopkins*

15:00 **Synthetic Lumbar Spine Model For In-Vitro Experimentation**

Lisa Friis — *University of Kansas*

15:15 **Technologies For Kinematic Assessment**

Lars Gilbertson — *University of Pittsburgh*

15:30 **Can We Arrest The Progression Of Degenerative Disc Disease: Strategies To Salvage The Intervertebral Disc**

Marcolongo Michelle — *Drexel University*

Saturday, Jun 24 2006	2:15 PM - 3:45 PM	Session 11D

Podium — Design of Medical Devices — Cumberland BC

CHAIR: Art Erdman **CO-CHAIR:**

14:15 **A Method To Measure Local Tissue Water And Its Application To Evaluate Breast Cancer Treatment-Related Lymphedema**

Harvey Mayrovitz — *Nova Southeastern University*

14:30 **Noninvasive Blood Perfusion Measurements On The Kidney Of An Anesthetized Rat**

Ashvinikumar Mudaliar, Brent Ellis, Otto Lanz, Elaine Scott, Thomas Diller, Patricia Ricketts — *Virginia Polytechnic Institute and State University*

14:45 **3-D Microwire Electrode Arrays For High-Density Interfaces To Neural Tissue**

Perry Skeath, Nicholas Fernandez, Lucienne Wasserman, Ryan Schoonmaker, F. Keith Perkins, John Peele, Lee Johnson, Barbara Wright, Dean Scribner, E. Joseph Friebele — *SFA, Inc.*

15:00 **Performance Assessment Of A Cerebral Protection Device By In Vitro Testing And Computational Fluid Dynamics**

Sanna Gaspard, Gail Siewiorek, Ender Finol — *Carnegie Mellon University*

15:15 **A Novel Algorithm For Respiratory Gating Of Pet/CT Lung Tumor Imaging**

Jiali Wang, Anthony McGoron — *Florida International University*

15:30 **Biomechanical Performance Of A Duo-Polymer Motion Preservation Device For The Cervical Spine**

Boyle C. Cheng, Ray Vanderby, William C. Welch — *University of Pittsburgh*

Saturday, Jun 24 2006	2:15 PM - 3:45 PM	Session 11E

Podium — Mass Transfer in Cells and Organs — Ossabaw AB

CHAIR: Tom Diller **CO-CHAIR:** Bumsoo Han

14:15 **Effect Of Tension-Compression Nonlinearity On Solute Transport In Articular Cartilage**

Chun-Yuh Huang, Wei Yong Gu — *University of Miami*

14:30 **Nutrient Transport And Metabolism During Intracorneal Lens Wear: A Parametric Finite Element Study**

Xabier Larrea, Philippe Büchler, Sigbjorn Olsen — *University of Bern*

14:45 **A Mechanism For Epidermal Differentiation, Based On The Calcium Concentration**

Lisette Cornelissen, Cees Oomens, Jacques Huyghe, Frank Baaijens — *University of Technology, Eindhoven, The Netherlands*

15:00 **Characterization Of Cellular Uptake, Viability And Visualization Of Iron Oxide Magnetic Nanoparticles For Biomedical Applications**

Venkat Kalambur, John Bischof — *University of Minnesota*

15:15 **Computational Modeling Of Intravitreal Drug Delivery In Vitrectomised Eyes**

Sumanta Acharya, Jyoti Kathawate — *Louisiana State University*

15:30 **Anisotropy Transport In A Hydrogel Implanted With Glass Fibers**

Malisa Sarntinoranont, Sung Lee, Daisy Evans, Gregory Pishko — *University of Florida*

Saturday, Jun 24 2006	4:00 PM - 5:30 PM	Session 12A

Podium — Tissue Eng./Biomechanics II: Orthopaedic Apps. — Amelia 1

CHAIR: Robert L. Mauck **CO-CHAIR:** Clark T. Hung

16:00 **The Effect Of IL-10 Overexpression On The Biomechanical And Histological Properties Of Healing Tendon**
Eric T. Ricchetti, Miltiadis H. Zgonis, Heather L. Ansorge, Sudheer C. Reddy, Kenneth W. Liechty, Pedro K. Beredjiklian, Louis J. Soslowsky — *University of Pennsylvania*

16:15 **Effect Of Hormone Replacement On The Viscoelastic Properties Of The Uterosacral Ligament In The Monkey Model**
Thomas Gardner, J. Mark Cline, Michael Brodman, William Levine, Orahn Preiss-Bloom, Madgy Mikhail, Robert Lindsay, Michael Vardy — *Columbia University*

16:30 **Acl Fibroblasts Respond To Mechanical Load By Activation Of Stress-Activated Protein Kinases And Specific Transcription Factors**
Vonda Wright, Erik Attia, Mahdu Bhargava, Jo Hannafin — *Hospital for Special Surgery, New York*

16:45 **Enzymatic Removal Of Agarose Scaffold For Tissue Engineered Cartilage**
Kenneth Ng, Lindsay Kugler, Terri-Ann Kelly, Jason DeFrancis, Gerard Ateshian, Clark Hung — *Columbia University*

17:00 **Fabrication And Biocompatibility Of Polyphosphazene Tubular Electrospun Nanofiber Scaffolds For Bone Tissue Engineering**
Subhabrata Bhattacharyya, Sangamesh Kumbar, Yusuf Khan, Nair Lakshmi, Laurencin Cato — *University of Virginia*

17:15 **Maturation Of MFC- And MSC-Laden Nanofibrous Scaffolds For Meniscus Tissue Engineering**
Brendon Baker, Robert Mauck, Neil Sheth — *University of Pennsylvania*

Saturday, Jun 24 2006	4:00 PM - 5:30 PM	Session 12B

Podium — FEM in Biomechanics — Amelia 2/3

CHAIR: Lorin Maletsky **CO-CHAIR:** Kenneth Fischer

16:00 **Experimental Validation Of Strains In A Finite Element Femur Model**
Liming Voo, Andrew Merkle, Mehran Armand, Emily Ward — *Johns Hopkins University*

16:15 **Improvements Of The Human Torso Finite Element Model For Impact Applications**
Emily Ward, Jack Roberts — *Johns Hopkins University Applied Physics Laboratory*

16:30 **A Biomechanical Study Of Lumbosacral Spine Interbody Fusion Using A Three-Dimensional Nonlinear Finite Element Method**
Yabo Guan, Jiangyue Zhang, Frank A. Pintar, Narayan Yoganandan, Dennis J. Maiman — *Medical College of Wisconsin*

16:45 **Three-Dimensional Finite Element Analysis To Investigate The Frictional Mechanics Of The Fingertip**
Hiroaki Yoshida, Mitsunori Tada, Masaaki Mochimaru — *National Institute of Advanced Industrial Science and Technology*

17:00 **Probabilistic Shape-Based Finite Element Modeling Of Baboon Femurs**
Todd Bredbenner, Keith Bartels, Lorena Havill, Dan Nicolella — *Southwest Research Institute*

17:15 **Parameter Identification And Sensitivity Analysis Of Cortical Bone Material Models Using Finite Element Optimization Techniques**
Costin Untaroiu, Jeff Crandall — *University of Virginia*

Saturday, Jun 24 2006	4:00 PM - 5:30 PM	Session 12C

Podium — Drug Delivery and Biotherapeutics — Cumberland A

CHAIR: Malisa Sarntinoranont **CO-CHAIR:** Ruben Diaz

16:00 **Gold Nanoparticles: Drug Delivery And Biodistribution In Thermal Therapy**
Rachana Visaria — *University of Minnesota*

16:12 **Production Of Biodegradable Nano And Micro Particles Via Ultrasonic Atomization For Biopharmaceutical Delivery**
Gareth Forde, James Friend — *Monash University*

16:24 **Novel Bioresorbable Composite Fiber Structures Loaded With Proteins For Medical Implants And Tissue Regeneration Applications**
Meital Zilberman, Yair Levy — *Tel Aviv University*

16:36 **Effect Of Heterogenous Vasculature On The Interstitial Transport Within Solid Tumors**
Jianbing Zhao, Malisa Sarntinoranont — *University of Florida*

16:48 **Effect Of Retinal Permeability On Drug Distribution In The Rabbit Eye**
Mahesh Krishnamoorthy, Juyoung Park, Rupak Banerjee — *University of Cincinnati*

17:00 **An Experimental Investigation Of Mixing Phenomena In Intrathecal Drug Delivery (ITDD)**
Radboud Nelissen, Navid Borhani, Peter Monkewitz — *Swiss Federal Institute of Technology, Lausanne*

17:12 **Design Of A Piezoelectric Microjet For Needleless Drug Delivery: Impact Of Fluid Viscosity**
Jeanne Stachowiak, Julia Rasooly, Daniel Fletcher — *University of California, Berkeley*

Saturday, Jun 24 2006	4:00 PM - 5:30 PM	Session 12D

Podium — Micro and Nano Biofluid Mechanics — Cumberland BC

CHAIR: Samir Ghadiali **CO-CHAIR:** Rupak Banerjee

16:00 **A Novel Multi-Wafer Microfluidic System Architecture For Biomedical Applications**
Mark Boysel, Nancy C. Stoffel, Almon Fisher — *Infotonics Technology Center, Inc.*

16:15 **A Microfluidic Perfusion Chamber For Neuronal Cultures**
Jelena Vukasinovic, Ari Glezer — *Georgia Institute of Technology*

16:30 **Influence Of Microchannel Geometry On Cellular Injury During Microbubble Flows**
Huseyin Yalcin, Samir Ghadiali — *Lehigh University*

16:45 **Bubble Splitting And Sticking In A Multiple Bifurcation Model**
Joseph Bull, Brijesh Eshpuniyani, Andres Calderon, James Stephen, Jeffrey Fowlkes — *University of Michigan*

17:00 **Estimation Of Filling Time Of Blood And Water In Microchannels**
Ming Liu, Michael Rust, Surendra Devarakonda, Rupak Banerjee, Chong Ahn — *University of Cincinnati*

17:15 **Initial Study To Produce Microbubbles For Ultrasound Contrast Agents Via Microfluidic Flow-Focusing Devices**
Michael Weber, Robin Shandas — *University of Colorado at Boulder*

Saturday, Jun 24 2006	4:00 PM - 5:30 PM	Session 12E

Podium — Ligaments, Tendons and Capsule — Ossabaw AB

CHAIR: Lou Soslowsky **CO-CHAIR:** Alan W. Eberhardt

16:00 **Anatomy And Function Of The Inferior Glenohumeral Ligament Of The Shoulder: Is Our Description Correct?**
Susan Moore, Nichole Bailey, Patrick McMahon, Richard Debski — *University of Pittsburgh*

16:15 **Distribution And Mechanical Implications Of Dermatan Sulfate In Human Medial Collateral Ligament**
Heath Henninger, Trevor Lujan, Clayton Underwood, Jeffrey Weiss — *University of Utah*

16:30 **The Effects Of Assuming A Negligible Preload On The Viscoelastic Properties Of The Normal And Healing Rabbit Patellar Tendon**
Matthew Fisher, Steven Abramowitch, Savio Woo — *University of Pittsburgh*

16:45 **Decreased Loading Delays The Development Of A Fibrocartilaginous Tendon To Bone Insertion In A Mouse Model**
Stavros Thomopoulos, Hyun-Min Kim, Rosalina Das, Rothermich Stefan, Leesa Galatz — *Washington University in St. Louis*

17:00 **Repeatability Of A Methodology To Determine The Strain Distribution Across The Glenohumeral Capsule: Implications For Future Studies**
Nichole Bailey, Susan Moore, Eric Rainis, Jens Stehle, Patrick McMahon, Richard Debski — *University of Pittsburgh*

Sunday, Jun 25 2006	8:45 AM - 10:15 AM	Session 14A

Podium — Tissue Eng/Biomechanics III. Modeling — Amelia 1

CHAIR: Michael Sacks **CO-CHAIR:** Marc Levenston

8:45 **A Biphasic Viscohyperelastic Fibril-Reinforced Model For Articular Cartilage**
Jose García, Daniel Cortes — *Universidad del Valle*

9:00 **Determination Of BPVE Coefficients For Agarose Gels At Various Concentrations From Unconfined Compression**
Morakot Likhitpanichkul, Christina C Chow, X. Edward Guo, Van C. Mow — *Columbia University*

9:15 **Continuum Approach For Tissue Remodeling Mediated By Matrix Stiffness**
Jeffrey Bischoff — *University of South Carolina*

9:30 **Analytical Modeling Of The Elastic Bone Behavour**
Dominique Perreux, William Johnson — *University of Franche-Comté*

9:45 **A Nonlinear Viscoelastic Model For The Tensile Behavior Of Bovine Cornea**
Thao Nguyen, Reese Jones, Brad Boyce — *Sandia National Laboratories*

10:00 **Bimodular-Orthotropic-Polyconvex Strain Energy Functions For The Collagen-Proteoglycan Solid Matrix Of Articular Cartilage**
Stephen Klisch, Robert Sah, Andrew Davol — *California Polytechnic State University, San Luis Obispo*

Sunday, Jun 25 2006	8:45 AM - 10:15 AM	Session 14B

Podium — Experimental Behavior of Cartilage — Amelia 2/3

CHAIR: John Owen **CO-CHAIR:** Nadine Chahine

8:45 **Indentation Mechanics Of Soft Tissue With A Secondary Sensing Device**

Asha Balakrishnan, Simona Socrate — *Massachusetts Institute of Technology*

9:00 **Chondroitin Sulfate Reduces The Friction Coefficient Of Articular Cartilage**

Ines Basalo, Nadeen Chahine, Michael Kaplun, Faye Chen, Clark Hung, Gerard Ateshian — *Columbia University*

9:15 **Time Dependent Deformational Behavior Of Cyclically Loaded Articular Cartilage In A Meniscectomized Knee Joint**

Yongnam Song, Joan Greve, Dennis Carter, Nicholas Giori — *Stanford University*

9:30 **Regulation Of Inos By Fibrochondrocytes In Response To Unconfined Compression**

Tumul Gupta, Tammy Haut Donahue — *Michigan Technological University*

9:45 **Damage Mechanics Measures For Cartilage Fatigue**

Ravi Namani, Narendra Simha, Jack Lewis — *University of Miami*

10:00 **Increased Joint Loading Over Time Can Increase The Rate Of Cartilage Thinning In Patients Following Acl Injury**

Seungbum Koo, Chris Dyrby, Thomas Andriacchi — *Stanford University*

Sunday, Jun 25 2006	8:45 AM - 10:15 AM	Session 14C

Podium — Cardiovascular Fluid Mechanics — Cumberland A

CHAIR: James E. Moore **CO-CHAIR:** Joel Berry

8:45 **Characterization Of Impedance Pumps For Biomedical Applications**

Idit Avrahami, Morteza Gharib — *California Institute of Technology*

9:00 **Effects Of Stents In Curved Coronary Arteries**

Satya Prakash Karri, Sam Raben, Ali Etebari, Pavlos Vlachos — *Virginia Polytechnic Institute and State University*

9:15 **Comparative Cfd Study Of Hemi-Fontan And Glenn Anastomosis: Idealized And Anatomical Models With Free-Form Deformed Variations**

Vasu Yerneni, Kerem Pekkan, Paymon Nourparvar, Diane De Zelicourt, Jarek Rossignac, Fotis Sotiropoulos, Ajit Yoganathan, Lakshmi Dasi — *Georgia Institute of Technology*

9:30 **Influence Of Microcalcifications In Thin-Cap Fibroatheroma Of A Vulnerable Plaque Using A Fem-Fsi Model**

Idit Avrahami, Kris Dumont, Morteza Gharib, John Ricotta, Danny Bluestein — *California Institute of Technology*

9:45 **The Mixability Of Angiographic Contrast With Arterial Blood**

Baruch Lieber, Qing Hao — *University of Miami*

10:00 **Time Resolved Analysis Of Stented Coronary Arteries**

Satya Prakash Karri, Sam Raben, Ali Etebari, Pavlos Vlachos — *Virginia Polytechnic Institute and State University*

Sunday, Jun 25 2006	8:45 AM - 10:15 AM	Session 14D

Podium **Imaging in Biomechanics** **Cumberland BC**

CHAIR: Li Guan **CO-CHAIR:** Peter Barrance

8:45 **An Automated Method For Geometric Reconstruction Of Verterbrae From Clinical CT Scans**

Yifei Dai, Glen Niebur — *University of Notre Dame*

9:00 **Strain And Stress Distributions In The Gluteus Muscle And Enveloping Fat During Sitting: An Open-MRI Coupled With Subject-Specific Finite Element Analysis**

Eran Linder-Ganz, Noga Shabshin, Yacov Itzchak, Amit Gefen — *Tel Aviv University*

9:15 **Validation Of A Model-Based Tracking Technique For Measuring Three-Dimensional In-Vivo Patellofemoral Joint Motion During Dynamic Activities**

Michael Bey, Stephanie Brock, Christopher Wybo, Scott Tashman, Roger Zauel — *Henry Ford Hospital Detroit*

9:30 **Knee Cartilage Contact Determination Using Weightbearing MRI**

Peter Barrance, Thomas Buchanan — *University of Delaware*

9:45 **Development Of Quantum Dot Mediated Thermometry For Intraoperative Monitoring Of Minimally Invasive Thermal Surgery**

Willard Hanson, Ming-Long Wang, Bumsoo Han — *University of Texas at Arlington*

10:00 **Preliminary Validation Of MRI-Based Contact Modeling For Analysis Of In Vivo Joint Mechanics**

Bhaskar Thoomukuntla, Terence McIff, Mehmet Bilgen, Bruce Toby, Kenneth Fischer — *University of Kansas*

Sunday, Jun 25 2006	8:45 AM - 10:15 AM	Session 14E

Podium **Biological Flows and Biopreservation** **Ossabaw AB**

CHAIR: Ram Devireddy **CO-CHAIR:** Alptekin Aksan

8:45 **Flow-Modulated ATP/ADP Concentration At The Endothelial Surface: Effects Of Flow Disturbance**

Hyo Won Choi, Abdul Barakat — *University of California, Davis*

9:00 **Measurement Of The Desiccation Kinetics Of Biopreservation Solutions By MEMS**

Alptekin Aksan, Daniel Irimia, Xiaoming He, Mehmet Toner — *University of Minnesota*

9:15 **Interaction Of Freezing-Induced Water Transport With Extracellular Matrix Of Biological Tissues**

Bumsoo Han — *University of Texas at Arlington*

9:30 **Mitigating The Effect Of Suprazero Cooling Conditions On The Subzero Freezing Response Of Equine And Macaque Ovarian Tissue.**

Ajay Kardak, Stanley Leibo, Ram Devireddy — *Louisiana State University*

Sunday, Jun 25 2006	10:30 AM - 12:00 PM	Session 15A

Podium — Tissue Eng/Biomechanics IV. Soft Tissues — Amelia 1

CHAIR: David Schreiber **CO-CHAIR:** Robert Mauck

10:30 **Compression-Induced Damage In An Engineered Skeletal Muscle Model**

Debby Gawlitta, Cees Oomens, Frank Baaijens, Carlijn Bouten — *Technical University Eindhoven*

10:45 **Effect Of Extracellular Matrix Composition And Structure On Tropoelastin Synthesis By Versican V3 Overexpressing Sommoth Muscle Cells**

JoSette Broiles, Thomas Wight, Robert Nerem — *Georgia Institute of Technology*

11:00 **Fluorescent Protein Indication Of Type I Collagen Gene Expression In Mesenchymal Stem Cells: Influence Of 3-D Culture And Tensile Stimulation**

Kumar Chokalingam, Shawn Hunter, Cynthia Gooch, Chris Frede, Jane Florer, Gino Bradica, David Butler, Richard Wenstrup — *University of Cincinnati*

11:15 **Tension Experiments On Human Cervical Tissue Using Digital Image Correlation**

Kristin Myers, Simona Socrate, Anastassia Paskaleva, Michael House — *Massachusetts Institute of Technology*

11:30 **Towards A Structural Model Of The Urinary Bladder Wall**

Silvia Wognum, Michael Sacks, Kevin Toosi — *University of Pittsburgh*

11:45 **Modulating The Adhesive Properties Of Collagen Tissue Equivalents**

Vikram Munikoti, David Shreiber, Gary Monteiro, Minjung Song, Kathryn Uhrich — *Rutgers, The State University of New Jersey*

Sunday, Jun 25 2006	10:30 AM - 12:00 PM	Session 15B

Podium — Brain Biomechanics — Amelia 2/3

CHAIR: Kurosh Darvish **CO-CHAIR:** Ali Sadegh

10:30 **Self-Deploying Shape Memory Polymer Neuronal Electrode Arrays**

Andrew Sharp, Hrishikesh V. Panchawagh, Alicia Ortega, Ken Gall, Diego Restrepo — *Georgia Institute of Technology*

10:45 **In Vivo And In Situ Material Properties Of Brain Tissue**

Mehdi Shafieian, Kurosh Darvish, Jeff Crandall, James Stone, David Okonkwo — *Temple University*

11:00 **Heterogeneous Mechanial Properties Of Brain Tissue Contribute To Local Variations In Mechanical Response In The Rat Hippocampus**

Liying Zhang, Haojie Mao, King Yang, Albert King — *Wayne State University*

11:15 **A New Fluid Model Representing Damping Characteristics Of Csf And Sas Trabeculae In Head Impacts**

Mohamad Zoghi-Moghadam, Ali Sadegh — *The City College of the City University of New York*

11:30 **Preliminary Finite Element Study Of Blast Traumatic Brain Injury**

Jiangyue Zhang, Yabo Guan, Narayan Yoganandan, Frank A. Pintar, Thomas Gennarelli — *Medical College of Wisconsin*

Sunday, Jun 25 2006	10:30 AM - 12:00 PM	Session 15C

Podium — Fluid Mechanics of Cardiovascular Devices — Cumberland A

CHAIR: Andreas S Anayiotos **CO-CHAIR:** Keefe Manning

10:30 **In Vitro Measurements Of Flow Obstruction Effect Due To Guidewire Insertion In Coronary Stenoses Models**
Koustubh Ashtekar, Rupak Banerjee, Lloyd Back — *University of Cincinnati*

10:45 **Mrv Flow Studies In End-To-Side Anastomosis Bypass Graft Phantoms**
Christopher Elkins, Marcus Alley, Angela Yamauchi, Ryan Wicker — *University of Texas at El Paso*

11:00 **The Effect Of Cannula Inertance And Actuation Timing On Valve Dynamics In A Pulsatile Pediatric Ventricular Assist Device**
William Weiss, Branka Lukic, Conrad Zapanta, Keefe Manning, Steve Deutsch, Gerson Rosenberg — *Pennsylvania State University*

11:15 **The Characterization Of Impedance Pump Based Ventricle Assist Device**
Lea Waisman, Moshe Rosenfeld, Shmuel Einav — *Tel Aviv University*

11:30 **Vorticity Dynamics Of Bileaflet Mechanical Heart Valves**
Lakshmi Dasi, Helene Simon, Liang Ge, Fotis Sotiropoulos, Ajit Yoganathan — *Georgia Institute of Technology*

11:45 **Importance Of Flow Division On The Transitional Flow Environment Within A Subject-Specific Arteriovenous Graft**
Sang-Wook Lee, David Smith, Francis Loth, Paul Fischer, Hisham Bassiouny — *University of Illinois at Chicago*

Sunday, Jun 25 2006	10:30 AM - 12:00 PM	Session 15D

Podium — MEMS — Cumberland BC

CHAIR: Shuvo Roy **CO-CHAIR:** Vijay Goel

10:30 **Performance Of Laser Bonded Microjoints Between Titanium And Polyimide In Cerebrospinal Fluid**
Ahsan Mian, Jesse Law, Golam Newaz — *Montana State University*

10:45 **Seperation Of Rbc From Plasma And Non-Newtonian Viscosity Effect Using Micro-Channels**
Surendra Devarakonda, Jungyoup Han, Juyoung Park, Rupak Banerjee, Chong Ahn — *University of Cincinnati*

11:00 **Micro-Structured Biodegradable Polymers Embedded With Cells And Drugs For Tissue Engineering And Drug Delivery**
WonHyoung Ryu, Rainer Fasching, Kyle Hammerick, Sung Woo Min, Friedrich Prinz — *Stanford University*

11:15 **Microfluidic Detection Of Circulating Tumor Cells**
Sunitha Nagrath, Daphne Bell, Lecia Sequest, Thomas Lynch, Daniel Haber, Mehmet Toner — *Massachusetts General Hospital*

11:30 **Direct, Dynamic Wall Shear Stress Measurements In Cardiovascular Flows: Application To Stenotic Vessels**
Ali Etebari, Olga Pierrakos, Sam Raben, Satya Prakash Karri, Pavlos Vlachos — *Virginia Polytechnic Institute and State University*

Sunday, Jun 25 2006	10:30 AM - 12:00 PM	Session 15E

Podium — Aneurysm II — Ossabaw AB

CHAIR: Jonathan Vande Geest **CO-CHAIR: Danny Bluestein**

10:30 **In Vitro And Computational Evaluation Of Drag Force On Aortic Stentgrafts**

Ravi Shankar Rontala, Rupak Banerjee, Abhijit Sinha Roy, Karl West, Greenberg Roy — *University of Cincinnati*

10:45 **Failure Properties Of Abdominal Aortic Aneurysms: Posterior Versus Anterior Wall**

Madhavan Raghavan, Jarin Kratzberg, Mauro Hanaoka, Maria Higuchi, Erasmo Da Silva — *University of Iowa*

11:00 **The Role Of Porous Media In Finite-Element Modeling Of Coil Compaction In The Treatment Of Cerebral Aneurysms**

Khalil Khanafer, Marty Schlicht, Joseph Bull, Ramon Berguer — *University of Michigan*

11:15 **Experimental Analysis Of Flow Through Patient Based Models Of Abdominal Aortic Aneurysms**

James McCullough, Malachy O'Rourke — *University College Dublin*

11:30 **Determination Of Linear Visco-Elastic Properties Of Abdominal Aortic Aneurysm Thrombus**

Evelyne van Dam, Susanne Dams, Gerrit Peters, Marcel Rutten, Frans van de Vosse — *Technische Universiteit Eindhoven*

11:45 **Flow Divertors To Treat Cerebral Aneurysms: Preliminary Results In The Rabbit Elastase-Induced Aneurysm Model**

Baruch Lieber, Chander Sadasivan, Laszlo Miskolczi, Liliana Cesar, Jaehoon Seong, Ajay Wakhloo — *University of Miami*