BRIDGING THE GAPS
IN BIOMEDICAL ENGINEERING
THROUGH INTERDISCIPLINARY COLLABORATION

4th Annual Mountain West Biomedical Engineering Conference

September 5 - 6, 2008
Grand Summit Hotel, The Canyons Resort
Park City, Utah

Department of
BIOENGINEERING
THE UNIVERSITY OF UTAH

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5 September, 2008

Welcome to the 2008 Mountain West Biomedical Engineering Conference at The Canyons, Utah. In this Program, you will find:

- Program Agenda
- Biographies of Keynote Speakers
- List of Podium Presentations
- List of Poster Presentations

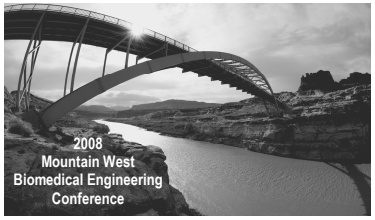
The conference is designed to highlight outstanding examples of biomedical engineering and science research at major academic institutions in Utah and the Mountain West, to provide a forum for undergraduate and graduate students and postdoctoral fellows to report their results, and to strengthen the network of bioengineers, scientists, and entrepreneurs in our region.

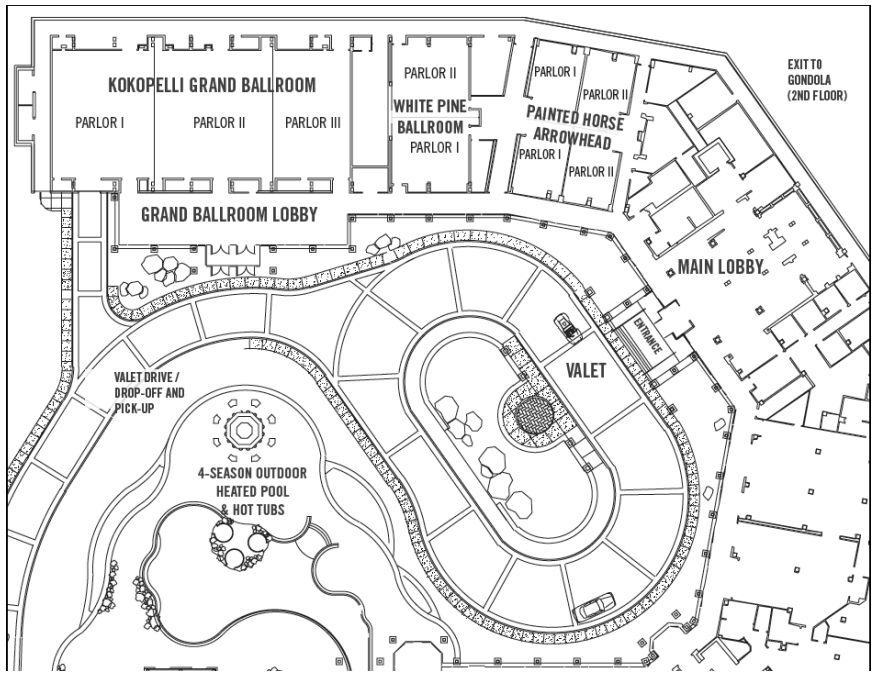
I would like to thank Dr. Gabriele Niederauer and Dr. Vicki Colvin for traveling to Utah to share some of their research and medical product insights. I would also like to extend special thanks to the conference sponsors, and to the conference organizing committee, led by Dolly Holt.

Enjoy the events,

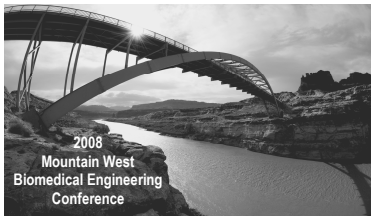
Richard Rabbitt
Professor and Chair
Department of Bioengineering
University of Utah

The on-line version of this program can be found at http://www.bioen.utah.edu/conference/canyons2008





Map of the Grand Summit Hotel, The Canyons Resort Park City, Utah



Thank you to the Conference Committee!

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Giridhar Thiagarajan—Student Vice-Chair
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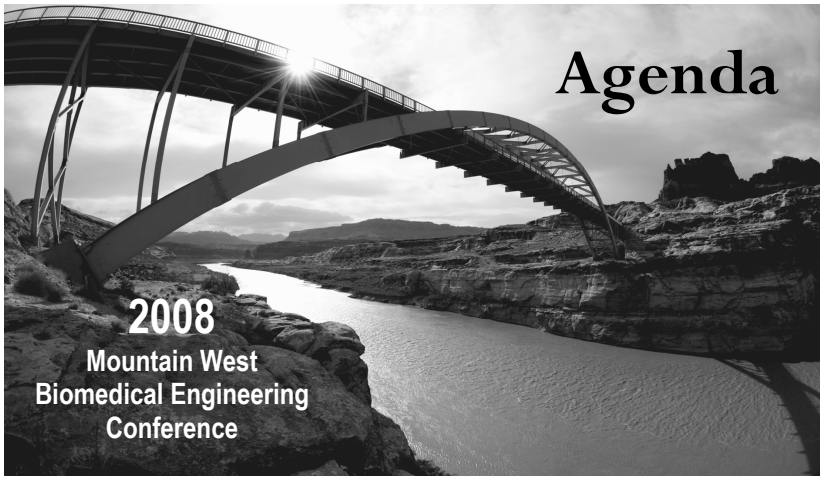
Azadeh Poursaid
Dan Pike
Joshua Gustafson
Justin Baker
Lindsey Corum
Monir Parikh
Carolyn Black
Devatha Nair
Li Tian
Ben Christensen
Kyle E. Thomson
Lisa MacFadden
Russle Condie
Brad Isaccson
Kristina Giantsos
Jack Dong
Kavita Madanlal Gupta
Kian Torab
Sameera Dharia
Sai Veerarghavan
Mike MacFadden
Corinne Adams
Shawn Reese
Alexandra Buffington

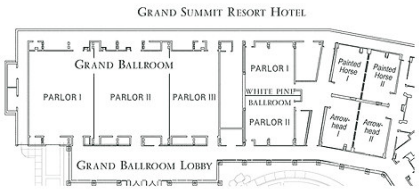
Faculty

Patrick Tresco
Hamid Ghandaheri
Yan-Ting Shiu
John White
Heather Palmer
Susan Bock
Rob Macleod
Kelly Broadhead
Robert Hitchcock
Doug Christensen
Greg Clark
Vladimir Hlady



Day 1: Friday 09/05

4:00-7:00 pm	Registration Grand Ballroom Lobby
5:30-6:30 pm	GSAC Elections Arrowhead I
4:00-7:00 pm	Poster and Exhibit Setup Parlors I and III and Grand Ballroom Lobby
7:00-8:00 pm	**Keynote Address** "Bringing Products to Market: *Things You Don't Learn in Textbooks*" Gabriele Niederauer, Ph.D. ENTrigue Surgical, Inc. Parlor II
8:00-11:00 pm	Opening Reception Featuring *Libby Linton* and *The Blue Wailers* Grand Ballroom Lobby



Day 2: Saturday 09/06

8:00-9:00 am	Breakfast Buffet Outdoor Pavilion
9:00-10:00 pm	**Distinguished Lecture** "How to Make, Assess and Evaluate Nanomaterials for Medicine" Vicki Colvin, Ph.D. Rice University Parlor II
10:00-10:15 am	Refreshment Break Ballroom Lobby
10:15-12:00 am	Podium Session I Parlor II
12:00-2:00 pm	Lunch Red Pine via Gondola
2:00-3:30 pm	**Poster Session** Parlors I and III **New USTAR Buildings Discussion** Session 1: 2:00 - 2:45 pm Session 2: 2:45 - 3:30 pm White Pine, Parlor II
3:30-5:00 pm	Podium Session II Parlor II
5:00-5:30 pm	Awards Poster & Exhibit Takedown

Speaker Biographies

Gabriele Niederauer, Ph.D.

Since May 2007, Dr. Niederauer has been serving as Vice President of Research and Development at ENTrigue Surgical, Inc. At ENTrigue Surgical, Inc., she is directing biomaterials and instrument product design to develop novel, yet sensible solutions for the ENT operating room and office. Initial focus is on enhancing surgical access for increased functionality and precision. In addition, the ENTrigue Surgical team is developing a unique class of proven bioabsorbable and biologic implants designed to simplify surgical procedures and improve healing. Dr. Niederauer has more than 20 years of experience in the study, development and commercialization of biomaterials for orthopedic, dental and ENT tissue repair.

Previously, Dr. Niederauer was Vice President of Research and Development at C2M (Concept to Market) Medical, a consultant group to medical device companies and investors. From 1995 to 2006, Dr. Niederauer was with OsteoBiologics, Inc. (OBI), where she served as Director of Research and Development from 1999 until 2006. Her responsibilities included coordination of experimental, preclinical, and clinical studies, planning and submission of regulatory filings, and management of OBI's intellectual property portfolio. She also led development of 12 new
products / product line extensions and worked with key opinion leading surgeons in arthroscopy and cartilage repair to gain exposure and assure constant flow of new product ideas. Dr. Niederauer was also engaged in new business expansion to leverage the OBI technologies into other medical specialties and assisted in raising $20 million of venture capital (three rounds) to fund development, manufacture and commercialization of novel implants and instruments to fuel the company's growth. OBI was acquired by Smith&Nephew, Inc. in July 2006 for $72.3 million, following 2005 revenues of $3.3 million.

Dr. Niederauer completed a Post-Doctoral Fellowship at the Orthopaedic Biomechanics Laboratory at the University of Texas Health Science Center at San Antonio. Dr. Niederauer earned a Doctor of Philosophy degree in Biomedical Engineering from Iowa State University and a Bachelor of Science degree in Ceramic Engineering from Clemson University. Her research has led to an

Vicki Colvin, Ph.D.

Dr. Vicki Colvin received her Bachelor's degree in chemistry and physics from Stanford University in 1988, and in 1994 obtained her Ph.D. in chemistry from the University of California, Berkeley, where she worked under the guidance of Dr. Paul Alivisatos. During her time at the University of California, Berkely, Colvin was awarded the American Chemical Society's Victor K. LaMer Award for her work in colloid and surface chemistry. Colvin completed her postdoctoral work at AT&T Bell Labs.

In 1996, Colvin was recruited by Rice University to expand its nanotechnology program. Today, she serves as Professor of Chemistry at Rice University as well as Director of its Center for Biological and Environmental Nanotechnology (CBEN). CBEN is one of the nation's six Nanoscience and Engineering Centers funded by the National Science Foundation. One of CBEN's primary areas of interest is the application of nanotechnology to the environment.

Colvin has received numerous accolades for her teaching abilities, including Phi Beta Kappa's Teaching Prize for 1998-1999 and the Camille Dreyfus Teacher Scholar Award in 2002. In 2002, she was also named one of Discover Magazine's "Top 20 Scientists to Watch" and received an Alfred P. Sloan Fellowship.

Colvin is also a frequent contributor to Advanced Materials, Physical Review Letters and other peer-reviewed journals, and holds patents to four inventions.

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UTAH TECHNOLOGY COUNCIL

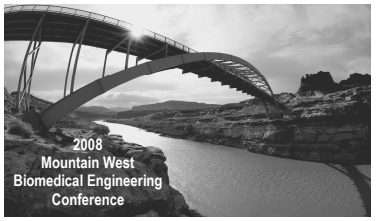
93. In Vitro Cytotoxicity and Cellular Uptake of Silica Nanotubes
T Yu, A Malugin, X Bai, SB Lee, A Nan, H Ghandehari
Departments of Pharmaceutics & Pharmaceutical Chemistry and Bioengineering, University of Utah; Department of Chemistry & Biochemistry, University of Maryland College Park; Center for Nanomedicine and Cellular Delivery and Department of Pharmaceutica

94. Smart Hydrogels Containing Adenylate Kinase: Translating Substrate Recognition into Macroscopic Motion
W Yuan, J Yang, P Kopeckova, and J Kopecek
Departments of Pharmaceutics and Pharmaceutical Chemistry, and of Bioengineering, University of Utah

95. Blood Velocity and Wall Shear Stress Measurement in a Patient Specific Carotid Bifurcation Model Using the Echo Particle Image Velocimetry Technique: Application and Validation
F Zhang, C Lanning, L Mazzaro, B Rech, J Chen, SJ Chen, R Shandas
Department of Mechanical Engineering, University of Colorado, Boulder, CO, 80309, Center for Bioengineering, University of Colorado, Denver, CO, 80045, Division of Cardiology, University of Colorado, Denver, CO, 80045

Presentations

Podium Session I



Saturday 9:00-10:45 AM

9:00 AM A Principal Components Analysis Based Decode of Individuated Finger Flexions Recorded Wirelessly with Implantable Myoelectric Sensors
J Baker, D Yatsenko, J Schorsch, G DeMichele, P Troyk, D Hutchinson, R Weir, G Clark, B Greger
University of Utah, Rehabilitation Institute of Chicago, Illinois Institute of Technology, Sigenics Inc.

9:15 AM Vaginally Implantable Pressure Sensor for Monitoring Loadings on the Female Pelvic Floor
P Johnson, E Rosenbluth, I Nygaard, R Hitchcock
University of Utah

9:30 AM Edema Increases Conduction Anisotropy Heterogeneously Between the Left and Right Ventricles
R Veeraraghavan, S Poelzing
NEH-CVRTI, University of Utah

9:45 AM Examining Strength and Interference in the Geometry Design of a Surgical Bone Screw
A Sanders
Ortho Development Corp., Draper, UT

10:00 AM Effects of Fiber-Reinforcements on the Thermomechanical and Mechanical Properties of Shape
DP Nair, NB Cramer, CN Bowman, MB Lyons, BA Rech, R Shandas
University of Colorado, University of Colorado Health Sciences Center, Center for Bioengineering-University of Colorado Health Sciences

10:15 AM Modeling the 3D Structures and Relative Stabilities of Coralyne-poly(dA) Complexes by Molecular Dynamics Simulations
IS Joung, TE Cheatham III
University of Utah

10:30 AM How to Market your BME Skills to Industry
G Williamson
W.L.Gore & Associates

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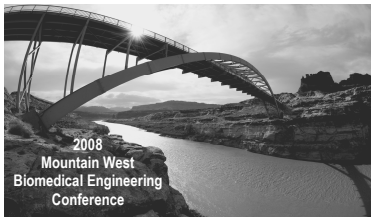
Presentations

Podium Session II



Saturday 3:00-4:30 PM

3:00 PM **Development and Validation of a Musculoskeletal Model of the Feline Hindlimb**
L MacFadden, N Brown
Department of Bioengineering University of Utah, Australian Institute of Sport in Canberra Australia

3:15 PM **Characterization of NMDA Receptor Subtypes in the Cortical and Thalamic Afferents to the Striatum**
R Smeal, K Keefe, K Wilcox
University of Utah

3:30 PM **Platelet Adhesion on Spatially Controlled Charge Gradients**
L Corum, YX Ding, V Hlady
University of Utah

3:45 PM **Visualizing Protein Domains on Single Cells Using Micro-Electric Impedance Tomography**
S Dharia, HE Ayliffe, C King, G Dittami, J Wyrick, A Pungor, RD Rabbitt
Department of Bioengineering, University of Utah

4:00 PM **A Water-borne Adhesive for Bone Repair Modeled on P. Californica Bioadhesive**
H Shao, R Stewart
Bioengineering Department, University of Utah, College of Engineering, University of Utah

4:15 PM **Concept to Clinical Feasibility of a Next-Generation Implantable Mechanical Blood Pump, the LevacorTM VAD**
P Khanwilkar, PhD, MBA
World Heart Corporation

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83. **Biocompatible Piezoelectric Materials**
J Stoker, A Tiwari
University of Utah

84. **Mapping Luminance Thresholds Across the Visual Field of Nonhuman Primates in Preparation for Micro-stimulation of Primary Visual Cortex**
K Torab,TS Davis, RA Normann, B Greger
University of Utah

85. **Extension of Angular Spectrum to Curved Surfaces**
U Vyas, D Christensen
University of Utah

86. **Inhibiting Osteoclast Formation and Resorption Using Small Interfering RNAs Targeting RANK**
Y Wang, D Grainger
University of Utah

87. **Magnetization Transfer Effect in Arterial Spin Labeling**
Y Wang, SE Kim, D Parker
University of Utah

88. **Optimal Linear Filter Control of a Virtual Prosthetic Hand Via Wirelessly Recorded Myoelectric Signals**
DJ Warren[1], JJ Baker[1], DT Hutchinson[2], J Schorsch[3], PR Troyk[4], RF Weir[3], G DeMichele[5], GA Clark[1], and B Greger[1]
[1]Bioengineering Dept., Univ. of Utah, Salt Lake City, UT, USA, 84112; [2]Dept. of Orthopaedic Surgery, Univ. of Utah, Salt Lake City, UT, USA, 84112; [3]Rehabilitation Institute of Chicago, Chicago, IL, USA, 60611; [4]Biomedical Engineering. Illin

89. **Recent Advances in Multi-Electrode Intrafascicular Functional Neuromuscular Stimulation**

90. **Characterization of Bacterial Isolates Collected From a Sheep Model of Osseointegration**
RD Bloebaum, JP Beck, CA Petti
University of Utah, University of Utah, University of Utah and ARUP Laboratories

91. **The Influence of Device Geometry on the Foreign Body Response to Implanted Microelectrode Arrays and Array Assemblies**
MB Christensen, PA Tresco
University of Utah

92. **A Novel Method to Grow and Extract a Cell Derived ECM from an Open Celled Foam**
J Wolchok, P Tresco
Department of Bioengineering, University of Utah

72. Biocompatible Piezoelectric Materials
J Stoker, A Tiwari
University of Utah

73. Spinning Disc Platform for Digital PCR
SO Sundberg, CT Wittwer, BK Gale
Bioengineering, Pathology and Mechanical Engineering Departments at the University of Utah

74. Creation of Subject Specific Geometric Models of the Heart
D Swenson, R MacLeod, J Stinstra, M Callahan, M Cole, D Brayford, B Burton
Department of Bioengineering, Scientific Computing and Imaging Institute, Nora Eccles Harison Cardiovascular Research and Training Institute, University of Utah

75. Study of Nano-Composite Hydroxyapatite Coatings
M Sygnatowicz, A Tiwari
University of Utah

76. Noninvasive and Nonpharmacological Method to Prevent Neointimal Hyperplasia in e-PTFE Grafts
C Tagge, M Briton, R Stewart, D Christensen, YT Shiu
University of Utah

77. Minimizing post-surgery wake up time while providing adequate analgesia
C Tams, N Syroid, D Westenskow
University of Utah

78. Novel Microfluidic Device for the Fractionation of Magnetic Nanoparticles
O Tasci
University of Utah

79. Comparison of MRI versus CT for Visualization of the Esophagus and its Anatomical Relationship with the Left Atrium
SB Tate, NS Burgon, RS Oakes, E Kholmovski, NF Marrouche, RS MacCleod, and EVR DiBella
Division of Cardiology, University of Utah School of Medicine. Utah Center for Advanced Imaging Research, University of Utah. Scientific Computing Institute, University of Utah

80. Comparision of Multi-Scale Electrophysiological Recordings of Penetrating and Non-Penatrating Devices in Human Cortex
KE Thomson, PA House, B Greger
University of Utah

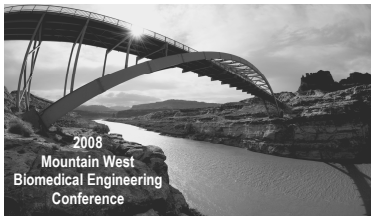
81. In-Vivo Wireless Neural Interfaces for Recording and Stimulation
BK Thurgood[1], DJ Warren[2], NM Ledbetter[2], RJ Kier[1], S Kim[1], L Rieth[1], F Solzbacher[1], RR Harrison[1], and GA Clark[2]
[1]Electrical and Computer Engineering Dept., and [2]Bioengineering Dept., Univ. of Utah

82. Role of collagen in the mechanical properties of proximal pulmonary arteries in hypertensive calves
L Tian, S Lammers, P Kao, C Lanning, KS Hunter, HJ Qi, KR Stenmark, R Shandas
University of Colorado at Boulder, University of Colorado Health Sciences Center

Presentations

Posters

Saturday 1:30-3:00 PM



1. Utilizing Biomedical Simulation and Animation in Building a Diabetes Information Portal based on the State-of-the-Art Biomedical Informatics Concepts and Technologies
YT AL-sheikh, A Wong, J Millington, S Khelfa, J Andrade
Department of Bioengineering, University of Utah, Department of Biomedical Informatics, University of Utah, Mountain Ridge Junior High School

2. Computer Modeling of Thromboembolism in Blood-Contacting Devices
J Ashton, D Lattin, N Reuel, K Solen
Brigham Young University

3. Macrophage Adhesion to Teflon®AF Coated Surfaces in Culture is Mediated by Adsorbed Serum Albumin
A Astashkina, DW Grainger
Department of Pharmaceutical Chemistry, Department of Biomedical Engineering, University of Utah

4. Artery Dilatation in Pediatric Pulmonary Hypertension Patients: Functional Implications and Outcomes
AJ Barker[1], C Lanning[2,3], D Ivy[3], K Hunter[2,3], R Shandas[1,2,3]
[1]Dept of Mechanical Engineering - University of Colorado at Boulder, [2]Center for Bioengineering - University of Colorado at Denver and Health Science Center Aurora, [3]Dept. of Pediatrics Division of Cardiology - The Children's Hospital Denver

5. Disulfide Sensitive Methods in Reducing Adhesion on Ventricular Catheters
CA Black[1,2] and JP McAllister II[1,2]
[1]Department of Bioengineering, University of Utah; [2]Department of Neurosurgery, Primary Children's Medical Center

6. MRI Assessment and Quantification of Left Atrial Lesions Following Pulmonary Vein Isolation For Atrial Fibrillation
RS Oakes, NM Burgon, CJ McGann, TJ Badger, S Vijayakumar, EG Kholmovski, EVR DiBella, NF Marrouche, RS MacLeod
Biomedical Engineering, Scientific Computing and Imaging Institute, Division of Cardiology, Utah Center for Advanced Imaging Research

7. Epidermal Growth Factor and Laminin Rich Extracellular Matrix Play an Important Role in Normal Phenotypes of Human Breast Epithelial Cells
R Booth, S Kwon
Utah Sate University

8. Stereocilia: Flexoelectric Motors of The Inner Ear
KD Breneman[1] , WE Brownell[2], RD Rabbitt[1,3]
University of Utah

9. **Mathematical Model Describing the Clustering Effects of Major Ampullate Silk Mechanical Properties**
AE Brooks, BD Brooks, MS Creager, RV Lewis
University of Wyoming

10. **Study of Molecular Weight and Branching Effects of Poly(TETA/CBA), an SS-PAEI, to Generate a Corresponding Poly(ethylene glycol) Copolymer for Systemic Nucleic Acid Delivery**
JH Brumbach[1], J Yockman[1], WJ Kim[1], SW Kim[1], C Lin[2] , JFJ Engbersen[2], and J Feijen[2]
[1]University of Utah, [2]University of Twente

11. **Observer Variability of the Extent of Delayed Enhancement MRI in Patients with Atrial Fibrillation**
NS Burgon, RS Oakes, EG Kholmovski, S Vijayakumar, EN Fish, JJE Blauer, RS MacLeod, NF Marrouche, and EVR DiBella
Division of Cardiology University of Utah School of Medicine, Scientific Computing Institute University of Utah, Utah Center for Advanced Imaging Research University of Utah

12. **Temporal Dynamics of Cellular Infiltration and Cytokine Expression During the Foreign Body Response are Material Dependant**
LM Chamberlain[1,2], D Higgins[2], M Gonzales-Juarrero[2], DW Grainger[1]
[1]University of Utah, [2]Colorado State University

13. **Measuring pH at the Nanoscale**
YC Chen, KB Han, A Ostafin
University of Utah

14. **MRI Reconstruction From Undersampled Radial Acquisition**
L Chen, E DiBella
University of Utah

15. **Characterization of the Foreign Body Response to Penetrating Microelectrode Arrays in Cat Sciatic Nerves**
MB Christensen, SM Pearce, PA Tresco
Department of Bioengineering, University of Utah, Salt Lake City, UT

16. **A Finite Elements Model for Perivascular Drug Transport at the Venous Anastamosis of an Arteriovenous Hemodialysis Graft**
RJ Christopherson, RM Kirby, CM Terry, AK Cheung, YT Shiu
Department of Bioengineering University of Utah, Department of Computer Science and the Scientific Computing &Imaging Institute University of Utah, Division of Nephrology University of Utah

17. **Development of a Stable Artificial Oxygen Carrier for Tissue Engineering**
RM Condie, NY Rapoport, HW Hopf, BK Mann, GD Prestwich
University of Utah

18. **A Less Invasive Approach to Long-term Head Fixation in Behaving Non-human Primates**
TS Davis, K Torab, B Greger
University of Utah

61. **Micro-electrode Functionality Inversely Correlated with Markers of Inflammation and Not with Markers of Neuronal Cell Viability**
RA Parker, MB Christensen, P House, PA Tresco, B Greger
University of Utah

62. **Conformation Imprinting of Bovine Serum Albumin in Fluoroalkyl Modified Silica Sol-gels**
Y Peng, H Dhruv, B Tuft, D Britt
Department of Biological Engineering, Utah State University, 4105 Old Main Hill, Logan, Utah 84322

63. **Development of Vaginal Ring for Delivery of Tenofovir**
K Gupta, A Poursaid, M Kaur, P Kiser
Department of Bioengineering, University of Utah, Salt Lake City, UT-84112

64. **Encapsulated Mesenchymal Stem Cells Alter the Expression of TNF-α and IL-6 by Macrophages**
M Quetant, R Hitchcock
University of Utah

65. **Opening IKATP Mitigates Interventricular Heterogeneities and Arrhythmia Inducibility During Loss of Inward Rectifier Potassium Channel Function**
R Veeraraghavan, S Poelzing
University of Utah

66. **The Effect of Fiber Microstructure on the Effective Poissonâs Ratio of Tendon and Ligament Tissue**
SP Reese, SA Maas, JA Weiss
Universtiy of Utah Department of Bioengineering, Universtity of Utah Scientific Computing and Imaging Institute

67. **Repeatability of Foot Anatomical Landmark Identification methods**
P Saraswat, B MacWilliams, R Davis, G Jameson
University of Utah, Shriners Hospital for Children- Salt Lake City, Greenville

68. **A Discrete Mathematical Model Simulates In Vitro Angiogenesis**
SC Sibole, CJ Underwood, JE Guilkey, JA Weiss
University of Utah Bioengineering Department, University of Utah Mechanical Engineering Department

69. **Extracel-Coated Microbeads for Cell Cluster Culture and Recovery**
A Skardal, GD Prestwich
University of Utah

70. **A Biomimetic, Nanochemical Strategy for Reducing Device-Associated Inflammation in the Central Nervous System**
JL Skousen, FW Meng, PA Tresco
University of Utah

71. **Effects of Ischemia on Magnitude of Minimum Time Derivative of Extracellular Potential; A Computational Study**
K Sohn, BB Punske, FB Sachse
University of Utah

51. Selective Activation of Motor and Sensory Nerve Fibers Via Utah Slanted Electrode Arrays Implanted In Arm Nerves Of Non-Human Primates
NM Ledbetter, C Ethier, ER Oby, SD Hiatt, AM Wilder, JH Ko, LE Miller, GA Clark
University of Utah, Feinberg School of Medicine, Northwestern University

52. pH Sensitive and Reversible Fluorescent Gold Nanoparticles for Possible Nano-pH Sensor Application
CW Lee, A Elongovan, C Takagi, A Ostafin
University of Utah

53. Impact of Current Dipole Models on EEG Source Analysis with a Finite Element Model
S Lew[1,2], C Wolters[3] , T Dierkes[3], C Roer[3], R MacLeod[1,2]
[1]Scientific Computing and Imaging Institute, University of Utah, Salt Lake City, [2]Department of Bioengineering, University of Utah, Salt Lake City, [3]Institute for Biomagnetism and Biosignalanalysis, University of Muenster, Germany

54. iBioSim: A Tool for the Analysis and Design of Genetic Circuits
C Madsen, N Barker, H Kuwahara, CJ Myers, NPD Nguyen
University of Utah, Southern Utah University, Microsoft Research - U. of Trento Centre for Computational and Systems Biology, University of Utah, University of Utah

55. Effects of Strain on Capacitance of Myocytes: Experimental Setup and Preliminary Results
TG McNary[1,2], KW Spitzer[2,3], FB Sachse[1,2]
[1]Bioengineering Department, [2]Nora Eccles Harrison Cardiovascular Research and Training Institute, [3]Physiology Department, University of Utah, Salt Lake City, Utah, USA

56. Lower Limb Biomechanics on Aggregate Surfaces
A Merryweather, B MacWilliams, D Bloswick
University of Utah, Shriners Hospital for Children, University of Utah

57. Visualizing Multi-Analytical Data Generated from Biomedical Diagnostic and Monitoring Devices via Simple Iconic Patterns
J Millington, YT AL-sheikh, J Andrade
Department of Bioengineering, University of Utah

58. Exendin-4/Polymer Conjugate Prolongs Insulin Output from Encapsulated Pancreatic Islets
D Mishra, V Nadithe, YH Bae
University of Utah

59. Novel Anti-Oxidants Conjugated to Hemoglobin for Protecting Pancreatic Beta Cells from Oxidative Stresses
V Nadithe[1], D Mishra[2], YH Bae[1]
[1]Department of Pharmaceutics and Pharmaceutical Chemistry, University of Utah, [2]Department of Bioengineering, University of Utah

60. A Reactive Oxygen Sensor for Studying the Host Response to Biomaterials
M Parikh, R Hitchcock
University of Utah

19. Plasma Protein Adsorption To Surfaces With Negative-To-Positive Surface Charge Gradient
Y Ding, L Potekhina, P Kiser, and V Hlady
Department of Bioengineering, University of Utah, Salt Lake City, UT 84112

20. Stimulus-Controlled Neurotransmitter Release and Quantal Detection on a Microchip
GM Dittami, SS Dharia, JJ Wyrick, RD Rabbitt
University of Utah

21. PEG Silane Modification of PDMS for Improved Hydrophilicity
A Dixon[1], RB Israelsen[2] , DW Odell[3], A Heredia[1], DW Britt[1]
[1]Utah State University, [2]University of Utah, [3]Medical College of Wisconsin

22. Electrode-To-Muscle Mapping Using 3-D Ground Reaction Force Vectors
BR Dowden, AM Wilder, RA Normann, GA Clark
University of Utah

23. Evaluation of Subchondral Bone Density in Areas of Contact in the Equine Metacarpophanlangeal Joint
KL Easton, CE Kawcak
Colorado State University

24. Effects of Joint Congruency on the Response of a Tension-Compression Nonlinear Constitutive Model for Cartilage
Ellis, Ateshian, Anderson, Canal, Maas, Weiss
University of Utah, Columbia University

25. Reduction of Spike After Depolarization by Increased Leak Conductance Alters Interspike Interval Variability in Layer III Pyramidal Cells of the Medial Entorhinal Cortex
FR Fernandez, JA White
University of Utah

26. Model-based Blind Estimation of Kinetic Parameters
J Fluckiger, M Schabel, and E DiBella
University of Utah

27. Wound Healing Migration Speed Response to Oscillatory Fluid Motion and Hyperglycemic Conditions
J France, LC Sun, YT Shiu
University of Utah

28. Closed-loop Isometric Force Control of the Feline Gastrocnemius Muscle
MA Frankel, RA Normann, SJ Elmer, SG Meek, DJ Warren, GA Clark
University of Utah

29. Engineered Nanoparticles in the Environment
P Gajjar[1], D Britt[1], A Anderson[1], W Huang[2], WP Johnson[2]
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30. **Toxicity and Cellular Uptake of Gold Nanoparticles in Human Prostate and Colon Carcinoma Cells**
A Anwar, A Gormley, A Malugin, H Ghandehari
University of Utah

31. **Silk-elastin Like Polymers for Spatial and Temporal Control of Solid Tumor Gene Therapy**
JA Gustafson[1], K Greish[2], JC Gifford[2], H Ghandehari[1,2]
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32. **The Balanced Spine: A Passive Mechanism for Maintaining Erect Posture**
P Halverson, A Bowden, E Stratton, L Howell
Brigham Young University

33. **Reach Tasks in Micro-ECOG recordings of Human Motor Cortex**
R Harrell-Madsen, KE Thomson, PA House, B Greger
University of Utah

34. **Protein Repellant PDMS Surfaces by Non-Covalent Immobilization of Poly(ethylene oxide): Effect of PDMS Cross-Linking Density and PEO Concentration**
H Dhruv, D Britt
Utah State University

35. **Incorporation of Motion into the Stereotactic Body Radiation Therapy Treatment Process**
J Hinkle, S Geneser, B Wang, B Salter, S Joshi
University of Utah

36. **The Development of a Porous Polyurethane Combination Device: Promoting Rapid Tissue Integration through Controlled Release and Directed Healing**
P Hogrebe, K Bachus, D Grainger
University of Utah

37. **Evaluating Molecular-Level Changes During Co-Culture of Macrophages and Fibroblasts from Different Sources**
DJ Holt[1] and DW Grainger[1,2]
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38. **Identification and Parameterization of a Markov Model Applied to Stretch-Activated Ion Channels**
FB Sachse, JP Keener
University of Utah

39. **Enhancement of Osseointegration Using Electrical Stimulation**
B Isaacson, JP Beck, J Webster, J Stinstra, R MacLeod, R Bloebaum
University of Utah

40. **Utilizing Porous Metal Dermal Barriers to Prevent Infection of Percutaneous Implants**
D Isackson, B Bailey, NAT Brown, C Petty, KN Bachus
University of Utah

41. **Tubulogenesis of Different Endothelial Cell Types Under Cyclic Stretch**
M Iwamoto, V Chernyshev, RJ Welch, and YT Shiu
University of Utah

42. **Biomechanical Characterization of the Glycocalyx of Lung Microvascular Endothelial Cells**
KM Job, R O'Callaghan, M Lindsey, V Hlady, RO Dull
University of Utah

43. **Intravaginal Rings for the Sustained Combined Delivery of Antiretroviral Agents Tenofovir and Dapivirine**
T Johnson, K Gupta, J Fabian, P Kiser
University of Utah

44. **Surface-Borne Toxicity of Nanomaterials**
C Jones, C Li, D Grainger
University of Utah

45. **Polyurethane Vaginal Ring for Delivery of Dapivirine, a Potent Non-nucleoside Reverse Transcriptase Inhibitor of HIV-1**
M Kaur[1], K Gupta[1], A Poursaid[1], S Pearce[1], H Aliyar[1], P Kiser[1,2]
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46. **Three Dimensional Biomolecular Microspots on Nanoporous Substrate**
J Kim, A Miles, BK Gale
University of Utah

47. **The Role of Kv7 Mediated Potassium Currents and Recurrent Excitation in Stellate Cells of the Entorhinal Cortex in a Dynamic Clamp Based Model of Temporal Lobe Epilepsy**
T Kispersky, JA White, H Rotstein
Boston Universiy, University of Utah, New Jersey Institute of Technology

48. **Hypoxia-Induced Pulmonary Hypertension Increases Proximal Artery Stiffness Through Changes in the Structure-Function Relationship of Elastin**
S Lammers[1], P Kao[1], HJ Qi[1], K Hunter[2], C Lanning[2], J Albietz[2], KR Stenmark[2], R Shandas[2]
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49. **Superparamagnetic Iron-Oxide Nanoparticles as a Vaccine Delivery Agent: Improved In Vitro Antigen Uptake and Cross-Presentation by Antigen Presenting Cells**
BA Larsen, JC Hutton, CR Stoldt
University of Colorado - Boulder, University of Colorado - Denver Health Science Center

50. **A Novel In Vivo Method for Local Dye Delivery with Application in Confocal Microscopy of Cardiac Tissue**
RA Lasher, RW Hitchcock, FB Sachse
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