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Con-current Oral Abstract Presentations Session 1

Advances in Ophthalmic Biomaterials

1 **Decellularized retinal matrix based biomaterials as novel cell delivery platforms**
J. KUNDU, Northeastern University, Boston, MA
A. Michaelson, Northeastern University, Boston, MA
P. Baranov, Schepens Eye Research Institute, Boston, MA
M. Young, Schepens Eye Research Institute, Boston, MA
R. Carrier, Northeastern University, Boston, MA

2 **Cell Delivery System Using Micropatterned Polymeric Nanosheets**
H. Kaji, Tohoku University, Sendai, Japan
T. Fujie, Waseda University, Tokyo, Japan
Y. Mori, Tohoku University, Sendai, Japan
N. Nagai, Tohoku University, Sendai, Japan
A. Khademhosseini, Harvard Medical School, Cambridge, MA
T. Abe, Tohoku University, Sendai, Japan

3 **Endogenous Monoethanolamide Lipids for Successful Ocular Drug Delivery**
F. J. R. Lasowski, McMaster University,
K. M. Ingram, McMaster University,
M. Moghaddam, CSIRO, North Ryde, New South Wales, Australia
H. Sheardown, McMaster University,

4 **UV-Vis Transmission and Haze Study of Silicone Fluids**
C. B. Hu, Abbott Medical Optics, Santa Ana, CA
D. Urbaniak, Abbott Medical Optics, Santa Ana, CA

5 **Prophylactic Treatment of Optimized Retinylamine Loaded PLA Particles in a Macular Degeneration Mouse Model**
A. Puntel, Case Western Reserve University, South Euclid, OH

6 **Inhibition of Pathogenic Angiogenesis in Diabetic Retinopathy with a Hyaluronic Acid based Multivalent VEGF Antagonist**
E. Altiok, UC Berkeley, Berkeley, CA
D. Bhatnagar, UC Berkeley, Berkeley, CA
J. Santiago, UC Berkeley, Berkeley, CA
W. Jackson, UC Berkeley, Berkeley, CA
D. Schaffer, UC Berkeley, Berkeley, CA
K. Healy, UC Berkeley, Berkeley, CA

Engineering Cell-Cell Interactions within Biomaterials

8 **Synergistic effect of dynamic flow and mesenchymal stem cell coculture on endothelial progenitor cell angiogenesis**
B. B. Nguyen, University of Maryland, College Park, MD
J. P. Fisher, University of Maryland, College Park, MD

9 **Reactive Oxygen Species-cleavable Proline Oligomer-crosslinking of Polycaprolactone for Pro-angiogenic Host Response**
S. Lee, Vanderbilt University, Nashville, TN
T. Boire, Vanderbilt University, Nashville, TN
A. Zachman, Vanderbilt University, Nashville, TN
M. Gupta, Vanderbilt University, Nashville, TN
H. Sung, Vanderbilt University, Nashville, TN

10 **Tissue Engineered Blood Vessels by Combining Cell Sheet Engineering and Electrospinning Technology**
S. Lee, Wake Forest Institute for Regenerative Medicine, Winston-Salem, NC

11 **Improving Cell Survival and Proliferation in Novel Degradable PVA-Tyramine Hydrogels**
P. J. Martens, University of New South Wales, Sydney, Australia
K. Lim, University of New South Wales, Sydney, Australia
M. Alves, University of New South Wales, Sydney, Australia
L. A. Poole-Warren, University of New South Wales, Sydney, Australia

Microfabrication Techniques for Vascularization of Tissue Engineered Constructs

12 **Vascularization and Characterization of Perfused 3D Hydrogel Constructs**
L. Marshall, University of Alabama at Birmingham, Birmingham, AL
K. Goliwas, University of Alabama at Birmingham, Birmingham, AL
A. Frost, University of Alabama at Birmingham, Birmingham, AL
A. Penman, Southern Research Institute, Birmingham, AL
J. Murphy-Ullrich, University of Alabama at Birmingham, Birmingham, AL
T. Wick, University of Alabama at Birmingham, Birmingham, AL
J. Berry, University of Alabama at Birmingham, Birmingham, AL

13 **Three Dimensional Photolithographic Patterning of Proteins in Hydrogels for Fabrication of Gradient Biomaterials to Direct Cell and Vessel Growth**
S. Ali, Duke University, Sugar Land, TX
J. L. West, Duke University, Durham, NC

14 **Cell-sheet-engineered periosteum-like membrane promotes vascularization and osteogenesis of a β-TCP scaffold**
Y. Kang, Stanford University, Stanford, CA
L. Ren, Lanzhou University, Lanzhou, China
Y. P. Yang, Stanford University, Stanford, CA

15 **Fabrication of Perfusable 3D-Blood Capillary Models for In Vitro Drug Permeability Assays**
D. Hikimoto, Graduate School of Engineering, Osaka University, Suita, Osaka, Japan
A. Nishiguchi, Graduate School of Engineering, Osaka University, Suita, Osaka, Japan
M. Matsusaki, Graduate School of Engineering, Osaka University, Suita, Osaka, Japan
M. Akashi, Graduate School of Engineering, Osaka University, Suita, Osaka, Japan

16 **Accelerating Cellular Spheroid Fusion Using Magnetic Forces to Fabricate a Vascular Tissue**
T. R. Olsen, Clemson University, Clemson, SC
B. Mattix, Clemson University, Clemson, SC
M. Casco, Clemson University, Clemson, SC
A. Herbst, Clemson University, Clemson, SC

C. Williams, Clemson University, Clemson, SC
A. Tarasidis, Clemson University, Clemson, SC
D. Simionescu, Clemson University, Clemson, SC
R. P. Visconti, Medical University of South Carolina, Charleston, SC
F. Alexis, Clemson University, Clemson, SC

17 **Hydrogels with Fully Interconnected and Tunable Pores Prepared from Co-Continuous Polymer Blends**
A. Esquirol, École Polytechnique de Montréal,
P. Sarazin, Trampoline Innovations,
N. Virgilio, École Polytechnique de Montréal,

Pioneering Biomaterial Strategies for Traumatic Craniomaxillofacial Injuries

19 **Promoting Mineralization and Mesenchymal Stem Cell Differentiation in Injectable, Physically and Chemically Gelling Hydrogels for Craniofacial Tissue Engineering**
T. N. Vo, Rice University, Houston, TX
T. Roh, Rice University, Houston, TX
A. K. Ekenseair, Rice University, Houston, TX
F. K. Kasper, Rice University, Houston, TX
A. G. Mikos, Rice University, Houston, TX

20 **Fabrication of Collagen Based 3-D Complex Topologies via Electrochemical Compaction**
M. Younesi, Case Western Reserve University, Cleveland, OH
V. Kishore, Florida Institute of Technology, Cleveland, OH
A. Islam, Case Western Reserve Univeristy, Cleveland, OH
O. Akkus, Case Western Reserve University, Cleveland, OH

21 **Development of Mucoadhesive Films for Treatment of Oral Mucosal Wounds**
D. Puleo, University of Kentucky, Lexington, KY
L. Cunningham, University of Kentucky, Lexington, KY

Recent Developments in Heart Valve Technology

23 **The Power of Disruptive Technological Innovation: Transcatheter Aortic Valve Implantation (TAVI)**
D. Berlin, Covidien, Niwot, CO
M. J. Davidson, Brigham and Women's Hospital, Boston, MA
F. J. Schoen, Brigham and Women's Hospital and Harvard Medical School, Boston, MA

24 **Novel polymer based Trans Catheter Aortic Valve Implant (TAVI)**
A. Perera, Direct Flow Medical, Santa Rosa, CA

25 **A novel experimental/numerical method to assess BHV biomaterial fatigue response in-vivo**
K. R. Feaver, University of Texas at Austin, Austin, TX
W. Zhang, University of Texas at Austin, Austin, TX
C. Lee, University of Texas at Austin, Austin, TX
H. Tam, University of Clemson, Clemson, SC
J. McGarvey, University of Pennsylvania, Philadelphia, PA

N. Kondo, University of Pennsylvania, Glenolden, PA
R. C. Gorman, University of Pennsylvania, Philadelphia, PA
J. H. Gorman, III, University of Pennsylvania, Philadelphia, PA
N. Vyavahare, University of Clemson, Clemson, SC
M. S. Sacks, University of Texas at Austin, Austin, TX

26 **Textile Heart Valve Prosthesis: Long Term Fatigue Performances**
A. VAESKEN, Universite de Haute Alsace, Mulhouse, France
F. KHOFFI, Universite de Haute Alsace, Mulhouse, France
F. HEIM, Universite de Haute Alsace, Mulhouse, France

27 **Isolation and Characterization of Primary VIC Subpopulations Based on Adhesion Strength**
K. E. Coombs, University of New Mexico, Albuqerque, NM
M. N. Rush, University of New Mexico, Albuquerque, NM
E. Hedberg-Dirk, University of New Mexico, Albuquerque, NM

28 **Hemocompatibility of Various Heart Valve Materials**
J. Emch, Colorado State University, Fort Collins, CO
J. Cavicchia, Colorado State University, Fort Collins, CO
P. Dasi, Colorado State University, Fort Collins, CO
S. James, Colorado State University, Fort Collins, CO
K. Popat, Colorado State University, Fort Collins, CO

Surgical Meshes

29 **Complexity Science Applied to Hernias and Hernia Mesh**
B. Ramshaw, Advanced Hernia Solutions at Transformative Care Institute, Daytona Beach, FL

30 **ECM Hydrogel Coating Mitigates the Foreign Body Response to Polypropylene Mesh**
D. M. Faulk, University of Pittsburgh, Pittsburgh, PA
R. Londono, University of Pittsburgh, Pittsburgh, PA
M. Wolf, University of Pittsburgh, Pittsburgh, PA
C. Ranallo, University of Pittsburgh, Pittsburgh, PA
C. Carruthers, University of Pittsburgh, Pittsburgh, PA
J. Wildemann, University of Pittsburgh, Pittsburgh, PA
C. L. Dearth, University of Pittsburgh, Pittsburgh, PA
S. F. Badylak, University of Pittsburgh, Pittsburgh, PA

31 **In Vivo Comparison of Marketed Biologically Augmented Hernia Grafts**
E. J. Rodenberg, Cook Biotech Incorporated, West Lafayette, IN
W. R. Wolter, University of Notre Dame, Notre Dame, IN
P. S. Lane, Cook Biotech Incorporated, West Lafayette, IN
M. A. Suckow, University of Notre Dame, Notre Dame, IN
C. E. Johnson, Cook Biotech Incorporated, West Lafayette, IN

32 **Differentiation Potential of Human Adipose Derived Stem Cells as a Function of Electrospun Silk Fibroin Mesh Alignment**
R. McMahon, M.D. Anderson Cancer Center, Houston, TX
T. Iyyanki, M.D. Anderson Cancer Center, Houston, TX
C. E. Butler, M.D. Anderson Cancer Center, Houston, TX
A. B. Mathur, M.D. Anderson Cancer Center, Houston, TX

33 **Multi-Functional Molecule Release for Hernia Repair**

S. McCullen, Poly-Med, Inc., Anderson, SC
G. Hilas, Poly-Med, Inc., Anderson, SC
M. S. Taylor, Poly-Med, Inc., Anderson, SC
J. Corbett, Poly-Med, Inc., Anderson, SC

Con-current Oral Abstract Presentations Session 2

Assessment and Development of Biomaterials Outreach Activities

35 **The Helpful Hydrogel: Hands-On Biomaterials Property Manipulations for Tissue Engineering and Drug Delivery**
A. H. Van Hove, University of Rochester, Rochester, NY
M. D. Hoffman, University of Rochester, Rochester, NY
M. P. Baranello, University of Rochester, Rochester, NY
K. Vats, University of Rochester, Rochester, NY
D. S. W. Benoit, University of Rochester, Rochester, NY

36 **Developing a Biomaterials Course for Health Science and Human Performance Undergraduate Students**
K. A. Brossard Stoos, Ithaca College, Ithaca, NY

37 **Nova Engineers to the Rescue: Bone fixation example for classroom or outreach activity**
N. Comolli, Villanova University, Villanova, PA
G. Clayton, Villanova University, Villanova, PA
T. Wojcik, Villanova, Villanova, PA

38 **Biomaterial Applications Database for Primary and Secondary Education**
A. Kishan, Texas A&M University, College Station, TX
J. Robinson, Texas A&M University, College Station, TX
M. Browning, Texas A&M University System Health Science Center, Houston, TX
R. Moglia, Texas A&M University, College Station, TX
E. Cosgriff-Hernandez, Texas A&M University, College Station, TX

39 **Macromolecules to nanofibrous biomaterial: An outreach module developed for middle school science teachers**
N. Bhattarai, North Carolina A&T State University, Greensboro, NC
D. Pai, North Carolina A&T State University, Greensboro, NC

Bio-Inspired Cellular Microenvironments

41 **Engineering Pseudo-Islets of Defined Sizes from Primary Murine Islets**
K. M. T. Shekiro, University of Colorado - Boulder, Boulder, CO
T. H. Hraha, University of Colorado - Anschutz Medical Campus, Aurora, CO
A. B. Bernard, University of Colorado - Boulder, Boulder, CO
R. K. P. Benninger, University of Colorado - Anschutz Medical Campus, Aurora, CO
K. S. Anseth, University of Colorado/HHMI, Boulder, CO

42 **Macromolecular Crowding Meets Cell-Sheet Tissue Engineering: New Concepts in Regenerative Medicine**
d. zeugolis, NUI Galway, Galway, Ireland

43 **Biofunctional Hydrogels for Skeletal Muscle Constructs**
A. S. Salimath, Georgia Institute of Technology, Atlanta, GA

A. J. Garcia, Georgia Institute of Technology, Atlanta, GA

44 **Oxygen Modulates Endothelial Tubule Formation Kinetics in Bio-functionalized Poly (ethylene glycol) Hydrogels**
B. A. Nsiah, Duke University, Durham, Nc, NC
J. L. West, Duke University, Durham, NC

45 **Development of in vitro brain tumor analogs to investigate glioma cell malignancy**
S. Pedron, University of Illinois at Urbana-Champaign, Urbana, IL
E. Becka, University of Illinois at Urbana-Champaign, Urbana, IL
M. A. Schroeder, Mayo Clinic, Rochester, MN
J. N. Sarkaria, Mayo Clinic, Rochester, MN
B. A. Harley, University of Illinois at Urbana-Champaign, Urbana, IL

46 **An artificial desmoplasia-mimetic microenvironment for studying EMT in pancreatic ductal adenocarcinoma**
C. Ki, Indiana University-Purdue University, Indianapolis, Indianapolis, IN
C. Lin, Indiana University-Purdue University, Indianapolis, Indianapolis, IN

Biomaterial Strategies for Innervation, Nerve Repair and Integration

47 **Development of an Injectable Hyaluronic Acid Based Hydrogel to Facilitate Stretch Growth of Axons**
P. Varde, Syracuse University, Syracuse, NY
J. Hasenwinkel, Syracuse University, Syracuse, NY

48 **Physical and Chemical Guidance of Axons Using Aligned Conducting Polymer Nanotubes**
M. Abidian, Pennsylvania State University, State College, PA

49 **Dynamic Nerve Growth Factor Delivery for Directed Neurite Outgrowth**
H. G. Sundararaghavan, Wayne State University, Detroit, MI
T. J. Whitehead, Wayne State University, Detroit, MI
M. R. Wrobel, Wayne State University, Detroit, MI

50 **Enhancing Therapeutic Potential of Human Neural Stem Cells**
S. Tzeng, Johns Hopkins University, Baltimore, MD
H. Mao, Johns Hopkins University, Baltimore, MD

51 **In Vivo Evaluation Of Novel Biphasic Conducting Tubes For Peripheral Nerve Repair**
T. N. Rosenbalm, Wake Forest University/Wake Forest Baptist Health, Winston-Salem, NC
A. J. Brown, Wake Forest University/Wake Forest Baptist Health, Winston-Salem, NC
N. H. Levi-Polyachenko, Wake Forest University/Wake Forest Baptist Health, Winston-Salem, NC
L. Argenta, Wake Forest University/Wake Forest Baptist Health, Winston-Salem, NC
M. Morykwas, Wake Forest University/Wake Forest Baptist Health, Winston-Salem, NC

52 **Sponge-mediated Lentivirus Delivery to the Chronically Injured Spinal Cord**
A. M. Thomas, Northwestern University, Evanston, IL
L. D. Shea, Northwestern University, Evanston, IL

53 **Facile use of Cationic Hydrogel Particles for Surface Modification to Improve Neuronal Cell Adhesion and Differentiation: an In vitro Investigation**

E. A. Morin, University of Tennessee Knoxville, Knoxville, TN
S. Tang, University of Tennessee Knoxville, Knoxville, TN
K. L. Rogers, University of Tennessee Knoxville, Knoxville, TN
L. Huang, University of Tennessee Knoxville, Knoxville, TN
W. He, University of Tennessee Knoxville, Knoxville, TN

54 **Disruption of Endogenous Damage Receptor Signaling to Improve Performance of Intracortical Microelectrodes**
J. K. Hermann, Case Western Reserve University, Westlake, OH
M. Ravikumar, Case Western Reserve University, Cleveland, OH
J. K. Nguyen, Case Western Reserve University, Cleveland, OH
S. Sudhakar, Case Western Reserve University, Cleveland, OH
P. Srivastava, Case Western Reserve University, Cleveland, OH
J. R. Capadona, Case Western Reserve University/ L. Stokes Cleveland VA Medical Center, Cleveland, OH

Biomaterials in the Fourth Dimension - Controlling Temporal Properties

56 **Hydrogels preserve native phenotypes of valvular fibroblasts through an elasticity-regulated PI3K/AKT pathway**
H. Wang, University of Colorado Boulder, Boulder, CO
M. W. Tibbitt, University of Colorado Boulder, Boulder, CO
S. J. Langer, University of Colorado Boulder, Boulder, CO
L. A. Leinwand, University of Colorado Boulder, Boulder, CO
K. S. Anseth, University of Colorado/HHMI, Boulder, CO

57 **Temporal Control of 3D Hydrogel Stiffness**
R. S. Stowers, University of Texas at Austin, Austin, TX
L. J. Suggs, University of Texas at Austin, Austin, TX

58 **Photoreversible Protein Patterning to Guide Dynamic 3D Cell Fate**
C. A. DeForest, University of Washington, Seattle, WA
D. A. Tirrell, California Institute of Technology, Pasadena, CA

59 **Retention and sequential release of gold nanoparticles from ultrasonically responsive polymeric capsules**
S. Kennedy, Harvard University, Cambridge, MA
J. Hu, Harvard University, Cambridge, MA
C. Kearney, Harvard University, Cambridge, MA
M. Gentili, Harvard University, Cambridge, MA
A. Mao, Harvard University, Cambridge, MA
K. Ku, Harvard University, Cambridge, MA
L. Gu, Harvard University, Cambridge, MA
D. Mooney, Harvard University, Cambridge, MA

60 **A Programmable Biomaterial System for the Study of Cell Migration in Dynamic Microenvironments**
J. H. Henderson, Syracuse University, Syracuse, NY

61 **Temporally Programmable Biomaterials for Healing Chronic Wounds**
B. D. Almquist, Massachusetts Institute of Technology, Cambridge, MA
P. T. Hammond, Massachusetts Institute of Technology, Cambridge, MA

Cardiovascular Drug Delivery

62 **ROS-Responsive Microspheres for Local, On Demand Delivery of Antioxidant Curcumin to Ischemic Tissues**

C. E. Nelson, Vanderbilt University, Nashville, TN
R. Joshi, Vanderbilt University, Nashville, TN
S. C. Haws, Vanderbilt University, Nashville, TN
K. M. Poole, Vanderbilt University, Nashville, TN
M. K. Gupta, Vanderbilt University, Nashville, TN
M. C. Skala, Vanderbilt University, Nashville, TN
C. L. Duvall, Vanderbilt University, Nashville, TN

63 **On-demand Delivery of TIMP-3 from Injectable and MMP Degradable Hydrogels for Infarct Repair**

B. Purcell, University of Pennsylvania, Philadelphia, PA
D. Lobb, University of South Carolina, Columbia, SC
F. Spinale, University of South Carolina, Columbia, SC
J. Burdick, University of Pennsylvania, Philadelphia, PA

64 **Controlled Delivery of Sonic Hedgehog Morphogen for Cardiac Repair**

N. Johnson, University of Pittsburgh, Pittsburgh, PA
M. Kruger, University of Cape Town, Cape Town, South Africa
N. Davies, University of Cape Town, Cape Town, South Africa
Y. Wang, University of Pittsburgh, Pittsburgh, PA

65 **An Injectable and Thermosensitive Hydrogel Capable of Delivering TGF-β Receptor II Inhibitor to Control Cardiac Fibrosis**

Z. Fan, Ohio State University, Columbus, OH
Z. Li, Ohio State University, Columbus, OH
X. Li, Ohio State University, Columbus, OH
Y. Xu, Ohio State University, Columbus, OH
J. Guan, Ohio State University, Columbus, OH

66 **A Novel Platform for Enhanced Intracellular Delivery of Therapeutic Peptides to Promote Tissue Vasorelaxation**

B. C. Evans, Vanderbilt University, Nashville, TN
K. M. Hocking, Vanderbilt University, Nashville, TN
C. M. Brophy, Vanderbilt University Medical Center, Nashville, TN
C. L. Duvall, Vanderbilt University, Nashville, TN

67 **In Vitro and In Vivo Release of Doxycycline from In Situ Cured, Biodegradable Polymer to Treat Aortic Aneurysms**

D. L. Safranski, MedShape, Inc., Atlanta, GA
D. Weiss, Emory University, Atlanta, GA
K. M. Dupont, MedShape, Inc., Atlanta, GA
K. Beatty, Georgia Institute of Technology, Atlanta, GA
W. R. Taylor, Emory University, Atlanta, GA
M. Thoresen, University of Georgia, Athens, GA
J. F. Peroni, University of Georgia, Athens, GA
J. C. Griffis, MedShape, Inc., Atlanta, GA

68 **Controlled Fibrinolysis via Localized Nanotherapeutic Delivery in Abdominal Aortic Aneurysms (AAAs)**
B. Sivaraman, Cleveland Clinic Foundation, Cleveland, OH
A. Sylvester, Cleveland Clinic and Case Western Reserve University, Cleveland, OH
A. Ramamurthi, Cleveland Clinc Foundation, Cleveland, OH

69 **Nanoporous Metal Surface via Selective Plasma Etching for Application of Polymer-Free Drug Eluting Stent**
S. Kim, Department of Materials Science and Engineering, Seoul National University, Seoul, Korea, Republic of
T. Jang, Department of Materials Science and Engineering, Seoul National University, Seoul, Korea, Republic of
J. Song, Department of Materials Science and Engineering, Seoul National University, Seoul, Korea, Republic of
H. Kim, Department of Materials Science and Engineering, Seoul National University, Seoul, Korea, Republic of

Orthopaedic Polymers

70 **Tailoring Polymer Degradation though Engineering of the Chemical Structure**
K. N. Cicotte, University of New Mexico, Albuquerque, NM
S. M. Dirk, Sandia National Laboratories, Albuquerque, NM
E. L. Hedberg-Dirk, University of New Mexico, Albuquerque, NM

71 **Comparison of Water Absorption and Shore Hardness for Novel Polyurethanes to Bionate(R)**
K. D. Gray, Jr., Poly-Med, Inc., Anderson, SC
J. T. Corbett, Poly-Med, Inc., Anderson, SC

72 **Self-Propagating High-Temperature Synthesis (SHS) of Porous Calcium Phosphate (CaP) Scaffolds Substituted with Magnesium or Strontium**
N. L. Vollmer, Colorado School of Mines, Golden, CO

73 **Antibiotic Delivering Phosphatidylserine Coatings for Allograft Bone**
D. Tait, Colorado State University, Fort Collins, CO
D. A. Prawel, Colorado State University, Fort Collins, CO
N. Ehrhart, Colorado State University, Fort Collins, CO
S. P. James, Colorado State University, Fort Collins, CO

74 **Osseointegration of Novel Porous Sulfonated Poly (aryl ether ketone) – In vivo study**
N. Raghavan, CSIR- CLRI, Chennai, India
N. Somanathan, CSIR-CLRI, Chennai, India
T. Sastry, CSIR-CLRI, Chennai, India

75 **Enhanced bone cell adhesion and proliferation on BMP-7 peptide functionalized self-assembled rosette nanotubes**
L. Sun, Northeastern University, Boston, MA
G. Mi, Northeastern University, Boston, MA
U. D. Hemraz, University of Albert,
H. Fenniri, National Institute for Nanotechnology and University of Alberta,
T. J. Webster, Northeastern University, Boston, MA

76 **Controlled Growth Factor Delivery Using Enzymatically Degradable Hydrogels For Improved Bone Formation**

J. L. Holloway, University of Pennsylvania, Philadelphia, PA
R. Rai, University of Pennsylvania, Philadelphia, PA
B. P. Purcell, University of Pennsylvania, Philadelphia, PA
J. A. Burdick, University of Pennsylvania, Philadelphia, PA

77 **Fibre-reinforced injectable orthopedic composites with improved toughness and cell compatibility**

M. khan, UCL Eastman Dental Institute, University College London, London, United Kingdom
N. J. Walters, UCL Eastman Dental Institute, London, United Kingdom

Con-current Oral Abstract Presentations Session 3

Biomaterials Microenvironment for Stem Cells and Tissue Regeneration I

79 **Mesenchymal Stem Cell and Gelatin Microparticle Encapsulation in Thermally and Chemically Gelling Injectable Hydrogels for Tissue Engineering**
S. N. Tzouanas, Rice University, Houston, TX
A. K. Ekenseair, Northeastern University, Boston, MA
K. Kasper, Rice University, Houston, TX
A. G. Mikos, Rice University, Houston, TX

80 **In Situ Cross-linkable Gelatin Hydrogels for Vasculogenic Delivery of Mesenchymal Stem Cells**
S. Lee, Vanderbilt University, Nashville, TN
Y. Chun, Vanderbilt University, Nashville, TN
Y. Lee, Ajou University, Suwon, Korea, Republic of
D. Deskins, Vanderbilt University Medical Center, Nashville, TN
P. Young, Vanderbilt University Medical Center, Nashville, TN
K. Park, Ajou University, Suwon, Korea, Republic of
H. Sung, Vanderbilt University, Nashville, TN

81 **Identifying targets for peptide-based osteogenic induction for osteochondral tissue engineering**
A. H. Aziz, University of Colorado at Boulder, Boulder, CO
S. J. Bryant, University of Colorado at Boulder, Boulder, CO

82 **Design and Surface-Modification of Poly(Propylene Fumarate) Scaffolds for Mesenchymal Stem Cell Attachment and Differentiation**
K. M. Ferlin, University of Maryland - College Park, College Park, MD
M. E. Prendergast, University of Maryland - College Park, College Park, MD
M. L. Miller, University of Maryland - College Park, College Park, MD
D. S. Kaplan, Food and Drug Administration, Silver Spring, MD
J. P. Fisher, University of Maryland - College Park, College Park, MD

83 **Micropatterned films of conducting polymers with entrapped biomolecules for neuronal cell adhesion**
S. Park, Pennsylvania State University, University Park, PA
D. R. Nocera, Pennsylvania State University, University Park, PA
M. R. Abidian, Pennsylvania State University, University Park, PA
S. Majd, Pennsylvania State University, University Park, PA

84 **Reversible and irreversible activations of YAP/TAZ in hMSCs on phototunable hydrogels**
C. Yang, BioFrontiers Institute, University of Colorado Boulder, Boulder, CO
M. W. Tibbitt, BioFrontiers Institute, University of Colorado Boulder, Boulder, CO
L. Basta, University of Colorado, Boulder, CO
K. S. Anseth, Howard Hughes Medical Institute, BioFrontiers Institute, University of Colorado Boulder, Boulder, CO

Engineering Stimuli-Responsive Cues into Biomaterials

85 **Nanoparticles for targeted, pH-responsive delivery of anti-biofilm drugs**
B. Horev, University of Rochester, Rochester, NY
D. Benoit, University of Rochester, Rochester, NY
H. Koo, University of Pennsylvania, Philadelphia, PA
M. Klein, University of Rochester, Rochester, NY

86 **Flexible control over the rate and timing of drug delivery from magnetically responsive hydrogels**
S. Kennedy, Harvard University, Cambridge, MA
P. Spoerri, Harvard University, Cambridge, MA
A. Deleris, Harvard University, Cambridge, MA
C. Cezar, Harvard University, Cambridge, MA
P. Hedrick, Harvard University, Cambridge, MA
D. Mooney, Harvard University, Cambridge, MA

87 **Tuning of Stiffness Anisotropy in Collagen Sheets by Planar Stretch**
A. Islam, Case Western Reserve University, Cleveland, OH
S. Cotey, Case Western Reserve University, Cleveland, OH
M. Younesi, Case Western Reserve University, Cleveland, OH
O. Akkus, Case Western Reserve University, Cleveland, OH

88 **Hybrid Photopatterned Enzymatic Reaction (HyPER) for in Situ Cell Manipulation**
T. Segura, University of California, Los Angeles, Los Angeles, CA

89 **Polypeptide-Gold Nanorod Solders for Laser Tissue Repair**
J. M. Ramos, Arizona State University, Tempe, AZ
H. Huang, Massachusetts General Hospital and Harvard Medical School, Boston, MA
K. Subramaniam, Arizona State University, Tempe, AZ
K. Rege, Arizona State University, Tempe, AZ

90 **Characterization of a Fluorescent Liposome-Based Multiplexing Biosensor System**
C. J. Wright, Furman University, Greenville, SC
M. A. Evans, Furman University, Greenville, SC
D. E. Ebzery, Furman University, Greenville, SC
C. E. Hansen, Furman University, Greenville, SC
T. W. Hanks, Furman University, Greenville, SC

91 **Functionalization of hydrogels with a matrix metalloproteinase-sensitive fluorogenic substrate to measure cellular response to drug treatment**
J. L. Leight, University of Colorado / HHMI, Boulder, CO
E. Y. Tokuda, University of Colorado, Boulder, CO
K. S. Anseth, University of Colorado/HHMI, Boulder, CO

92 **Cytocompatible Covalently Adaptable Networks to Probe Biophysical Behavior of Encapsulated Cells**
D. D. McKinnon, University of Colorado, Boulder, CO
D. W. Domaille, University of Colorado, Boulder, CO
B. Sridhar, University of Colorado, Boulder, CO
K. A. Kyburz, University of Colorado, Boulder, CO
J. N. Cha, University of Colorado, Boulder, CO
K. S. Anseth, University of Colorado/HHMI, Boulder, CO

Mechanobiology for Biomaterials Design

93 **Beyond Elastic Modulus: The Role of Interfacial Mechanics in Cell Behavior**
M. A. Calhoun, The Ohio State University, Columbus, OH
S. Rao, The Ohio State University, Columbus, OH
S. Bentil, The Ohio State University, Columbus, OH
A. Short, The Ohio State University, Columbuso, OH
T. Nelson, The Ohio State University, Columbus, OH
A. Sarkar, Geisinger Healthcare Systems, Danville, PA
J. Lannutti, The Ohio State University, Columbus, OH
R. Dupaix, The Ohio State University, Columbus, OH
J. O. Winter, The Ohio State University, Columbus, OH

94 **Hydrogels with Differential and Patterned Mechanics to Study Stiffness-Mediated Myofibroblastic Differentiation of Hepatic Stellate Cells**
M. Guvendiren, University of Pennsylvania, Philadelphia, PA
S. Caliari, University of Pennsylvania, Philadelphia, PA
M. Perepelyuk, University of Pennsylvania, Philadelphia, PA
R. G. Wells, University of Pennsylvania, Philadelphia, PA
J. A. Burdick, University of Pennsylvania, Philadelphia, PA

95 **Matrix Elasticity Regulates Melanoma Cell Survival**
E. Y. Tokuda, University of Colorado, Boulder, CO
J. L. Leight, University of Colorado/HHMI, Boulder, CO
K. S. Anseth, University of Colorado/HHMI, Boulder, CO

96 **Valvular Interstitial Cell Response to Elasticity in Three-Dimensional Microenvironments**
K. M. Mabry, University of Colorado at Boulder, Boulder, CO
K. S. Anseth, University of Colorado/HHMI, Boulder, CO

98 **Fibronectin and Type I Collagen Dysregulations Drive Tumor Progression**
K. C. Wang, Cornell University, Ithaca, NY
V. Benson, Cornell University, Ithaca, NY
M. Quien, Cornell Univerisity, Ithaca, NY
L. Hsu, Cornell University, Ithaca, NY
C. Fischbach, Cornell University, Ithaca, NY
D. Gourdon, Cornell University, Ithaca, NY

99 **The Application of Decellularized Tendon Biomaterial and RNA-Interference to Study Integrin-mediated Mechanotransduction in Tenocytes**
C. Schnatwinkel, University of Colorado at Boulder, Boulder, CO
S. J. Bryant, University of Colorado at Boulder, Boulder, CO

100 **Mechano-sensing of laterally mobile viscoelastic films induced biphasic cell spreading response**
A. Kourouklis, University of Massachusetts-Amherst, Amherst, MA
H. Bermudez, University of Massachusetts-Amherst, Amherst, MA

Nanostructured Biomaterial Surfaces for Cellular and Tissue Engineering

101 **Transitioning from Nanomedicine to Picomedicine: What's on the Horizon ?**
T. J. Webster, Northeastern, Boston, MA

102 **Advanced Antibacterial Wound Dressing Produced with Natural-origin Materials**
N. Monteiro, 3B´s Research Group – Biomaterials, Biodegradables and Biomimetics; Department of Polymer Engineering, University of Minho, Guimarães, Portugal
M. Martins, 3B´s Research Group – Biomaterials, Biodegradables and Biomimetics; Department of Polymer Engineering, University of Minho, Guimarães, Portugal
A. Martins, 3B´s Research Group – Biomaterials, Biodegradables and Biomimetics; Department of Polymer Engineering, University of Minho, Guimarães, Portugal
N. Fonseca, Center for Neurosciences and Cell Biology, University of Coimbra, Coimbra, Portugal
J. Moreira, Center for Neurosciences and Cell Biology, University of Coimbra, Coimbra, Portugal
R. Reis, University of Minho - 3B's Research Group, Guimarães, Portugal
N. Neves, 3B´s Research Group – Biomaterials, Biodegradables and Biomimetics; Department of Polymer Engineering, University of Minho, Guimarães, Portugal

103 **Bioactive Silicate Nanoplatelets for Osteogenic Differentiation of Human Mesenchymal Stem Cells**
A. K. Gaharwar, Texas A&M University, College Station, TX
S. M. Mihaila, Harvard medical School, Boston, MA
A. Swami, Harvard medical School, Boston, MA
A. Patel, Harvard medical School, Boston, MA
S. Sant, Harvard Medical School, Boston, MA
R. L. Reis, University of Minho, Guimarães, Portugal
A. P. Marques, University of Minho, Guimarães, Portugal
M. E. Gomes, University of Minho, Guimarães, Portugal
A. Khademhosseini, Harvard medical School, Boston, MA

104 **Drug-Loaded Nanoparticles Induce Gene Expression In Human Pluripotent Stem Cell Derivatives**
T. Harkness, University of Wisconsin-Madison, Madison, WI
V. Gajbhiye, University of Wisconsin-Madison, Madison, WI
L. Escalante, University of Wisconsin-Madison, Madison, WI
G. Chen, University of Wisconsin-Madison, Madison, WI
A. Laperle, University of Wisconsin-Madison, Madison, WI
Q. Zheng, University of Wisconsin-Madison, Madison, WI
B. Steyer, University of Wisconsin-Madison, Madison, WI
S. Gong, University of Wisconsin-Madison, Madison, WI
K. Saha, University of Wisconsin-Madison, Madison, WI

105 **Covalent layer-by-layer Antioxidant Films for Cellular Encapsulation**
M. Valdes, University of Miami, Miami, FL
K. M. Gattas-Asfura, University of Miami, Miami, FL
J. D. Weaver, University of Miami, Miami, FL
C. L. Stabler, University of Miami, Miami, FL

106 **Effects of polycaprolactone nanowire surfaces on adipogenic and chondrogenic differentiation of adipose-derived stem cells**
N. A. Trujillo, Colorado State University, Fort Collins, CO
K. C. Popat, Colorado State University, Fort Collins, CO

108 **Imprinted nanotextured scaffolds for cell guiding and migration**
M. Su, Worcester Polytechnic Institute, Worcester, MA

Sustainable Approaches to Biomaterials for Drug Delivery

109 **Reactive Oxygen Species Degradable Thermo-Responsive Hydrogels for In Situ Drug Delivery to Cell Therapies**
M. K. Gupta, Vanderbilt University, Nashville, TN
J. R. Martin, Vanderbilt University, Nashville, TN
T. Shen, Vanderbilt University, Nashville, TN
C. L. Duvall, Vanderbilt University, Nashville, TN

110 **Multivalent Manganese Complexes Decorated Amphiphilic Dextran Micelles as Sensitive MRI Probes**
C. Wu, National Engineering Research Center for Biomaterials, Sichuan University, PR China,
D. Li, National Engineering Research Center for Biomaterials, Sichuan University, PR China,
B. Lin, National Engineering Research Center for Biomaterials, Sichuan University, PR China,
C. Xia, Department of Radiology, West China Hospital, Sichuan University, PR China,
Q. Gong, Department of Radiology, West China Hospital, Sichuan University, PR China,
B. Song, Department of Radiology, West China Hospital, Sichuan University, PR China,
H. Ai, National Engineering Research Center for Biomaterials, Sichuan University, PR China,

111 **Lipid-Enveloped Polymeric Nanoparticles For Delivery of Hydrophobic Drug**
C. Kuo, Penn State University, University Park, PA
A. Leber, Penn State University, University Park, PA
S. Majd, Penn State University, University Park, PA

112 **Tracking and Unraveling the Mechanism of Nanostructured Porous Si Carriers Erosion in Neoplastic State**
A. Tzur-Balter, Technion – Israel Institute of Technology, Haifa, Israel
M. Beckerman, Massachusetts Institute of Technology, Cambridge, MA
Z. Shatsberg, Massachusetts Institute of Technology, Cambridge, MA
E. Segal, Technion – Israel Institute of Technology, Haifa, Israel
N. Artzi, Massachusetts Institute of Technology, Cambridge, MA

113 **Sustained Release Behavior of Drug-Loaded Calcium Phosphate Microspheres**
J. Baek, Seoul National University, Seoul, Korea, Republic of
H. Jung, Seoul National University, Seoul, Korea, Republic of
T. Jang, Seoul National University, Seoul, Korea, Republic of
S. Kim, Seoul National University, Seoul, Korea, Republic of
M. Kang, Seoul National University, Seoul, Korea, Republic of
J. Song, Seoul National University, Seoul, Korea, Republic of
H. Kim, Seoul National University, Seoul, Korea, Republic of

114 **Design of Drug Delivery Nanoparticles Using 3D-Human Vascular Wall Models for Atherosclerosis Treatment**
P. Chetprayoon, Osaka University, Osaka, Japan
M. Akashi, Osaka University, Osaka, Japan

115 **Effects of Ascorbic Acid on Available Ferrous Iron from the Non-Hormonal Contraceptive Ovaprene® Ring**
M. A. Vaughn, Poly-Med, Inc., Anderson, SC
K. J. Garcia, Poly-Med, Inc., Anderson, SC
G. T. Hilas, Poly-Med, Inc., Anderson, SC

J. T. Corbett, Poly-Med, Inc., Anderson, SC

116 **An injectable and settable cell delivery system for tissue repair derived from in situ chemical polymerization**

R. Guo, Vanderbilt University, Nashville, TN
C. Ward, National Research Council, United States Army Institute of Surgical Research, Houston, TX
J. Wenke, National Research Council, United States Army Institute of Surgical Research, Houston, TX
S. Guelcher, Vanderbilt University, Nashville, TN

Con-current Oral Abstract Presentations Session 4

Biomaterials for Immunomodulation

117 **Biologic Scaffolds Composed of Mammalian Extracellular Matrix Promote a Constructive Macrophage Phenotype**

B. M. Sicari, University of Pittsburgh, Pittsburgh, PA
J. L. Dziki, University of Pittsburgh, Pittsburgh, PA
M. Wolf, University of Pittsburgh, Pittsburgh, PA
B. Siu, University of Pittsburgh, Pittsburgh, PA
C. Dearth, University of Pittsburgh, Pittsburgh, PA
N. Turner, University of Pittsburgh, Pittsburgh, PA
S. F. Badylak, University of Pittsburgh, Pittsburgh, PA

118 **A microparticle-based vaccine for the amelioration of Type 1 Diabetes**

J. S. Lewis, University of Florida, Gainesville, FL
M. Carstens, University of Florida, Gainesville, FL
N. Dolgova, University of Florida, Gainesville, FL
C. Q. Xia, University of Florida, Gainesville, FL
M. Clare-Salzler, University of Florida, Gainesville, FL
B. G. Keselowsky, University of Florida, Gainesville, FL

119 **Cytokine-modulating self-assembling peptide materials**

C. Mora Solano, University of Chicago, Chicago, IL
R. R. Pompano, University of Chicago, Chicago, IL
J. H. Collier, University of Chicago, Chicago, IL

120 **A Biodegradable Antigen-Encapsulating Particle Platform for the Treatment of Immune Dysfunction and the Promotion of Transplant Engraftment**

W. Yap, Northwestern University, Chicago, IL
D. P. McCarthy, Northwestern University, Chicago, IL
C. T. Harp, Northwestern University, Chicago, IL
C. B. Smarr, Northwestern University, Chicago, IL
K. A. Hlavaty, Northwestern University, Chicago, IL
W. K. Song, Northwestern University, Chicago, IL
T. J. Kazanova, Northwestern University, Chicago, IL
M. T. Simon, Northwestern University, Chicago, IL
L. Gu, Northwestern University, Chicago, IL
J. Chen, Northwestern University, Chicago, IL
N. Chauhan, Northwestern University, Chicago, IL
A. M. Thomas, Northwestern University, Chicago, IL
S. Ravindran, Northwestern University, Chicago, IL
S. T. Rajan, Northwestern University, Chicago, IL
R. Agarwal, Northwestern University, Chicago, IL
P. N. Scalise, Northwestern University, Chicago, IL
Z. G. Bannon, Northwestern University, Chicago, IL
M. A. Silliman, 0, Northwestern University, Chicago, IL
S. D. Miller, Northwestern University, Chicago, IL
L. D. Shea, Northwestern University, Chicago, IL

121 **Assessment of CL075-loaded polymersomes for neonatal vaccination: biodistribution and benchmarking against conventional vaccine formulations**
E. Scott, Northwestern University, Evanston, IL
D. Dowling, Boston Children's Hospital and Harvard Medical School, Boston, MA
A. Scheid, Boston Children's Hospital and Harvard Medical School, Boston, MA
I. Bergelson, Boston Children's Hospital and Harvard Medical School, Boston, MA
J. Ninkovik, Boston Children's Hospital and Harvard Medical School, Boston, MA
G. Sanchez-Schmitz, Boston Children's Hospital and Harvard Medical School, Boston, MA
O. Levy, Boston Children's Hospital and Harvard Medical School, Boston, MA
J. Hubbell, EPFL, Lausanne, Switzerland

122 **Investigation of pathogen-mimicking particles for delivery of vaccine components in murine tumor models: Comparison of micro vs nano**
J. Leleux, Georgia Institute of Technology, Atlanta, GA
P. Pradhan, Georgia Institute of Technology, Atlanta, GA
K. Roy, Georgia Institute of Technology, Atlanta, GA

123 **Systems Biology Analysis of Dendritic Cell Responses to Biomaterials**
V. Fesenkova, Georgia Institute of Technology, Atlanta, GA
M. Kemp, Georgia Institute of Technology, Atlanta, GA
J. Babensee, Georgia Institute of Technology, Atlanta, GA

124 **Polyanhydride nanovaccine and cyclic dinucleotide based formulations stimulate innate immunity and modulate immune response**
S. L. Haughney, Iowa State University, Ames, IA
P. Lueth, Iowa State University, Ames, IA
D. Wagner, Iowa State University, Ames, IA
T. W. Dubensky, Aduro Biotech, Inc, Berkeley, CA
B. Bellaire, Iowa State University, Ames, IA
M. J. Wannemuehler, Iowa State University, Ames, IA
B. Narasimhan, Iowa State University, Ames, IA

Ceramics and Composites in Bone Tissue Engineering and Drug Delivery I

125 **Hyperelastic Osteogenic Bone Substitute Scaffolds Enabled Through 3D Printing**
R. N. Shah, Northwestern University, Chicago, IL
A. E. Jakus, Northwestern University, Chicago, IL
A. L. Rutz, Northwestern University, Chicago, IL
S. Yoo, Northwestern University, Chicago, IL

126 **Effect of particulate and putty-like tricalcium phosphate-based bone grafting materials on bone formation, volume stability and osteogenic marker expression after bilateral sinus floor augmentation in humans**
C. Knabe, Philipps-University Marburg, Marburg, Germany
E. Kluk, Philipps-University Marburg, Marburg, Germany
M. Bohner, Robert Mathys Foundation, Bettlach, Switzerland
M. Lopez Heredia, Philipps-University Marburg, Marburg, Germany
M. Stiller, Philipps-University Marburg, Marburg, Germany

127 **Fabrication and Perfusion Culture of Anatomically Shaped Artificial Bone**
D. Du, Harbin Medical University, Brookline, MA
K. Furukawa, University of Tokyo, Bunkyo-Ku, Tokyo, Japan

Y. Anbai, Tokyo Denki University, Tokyo, Japan
T. Asaoka, Tokyo Denki University, Tokyo, Japan
T. Ushida, University of Tokyo, Tokyo, Japan

128 **3D Printed Tricalcium Phosphate Scaffolds: MgO and SiO2 Doping for Enhanced Osteogenesis and Angiogenesis**
S. Tarafder, Washington State University, Pullman, WA
A. Bandyopadhyay, Washington State University, Pullman, WA
S. Bose, Washington State University, Pullman, WA

129 **Biomimetic approaches to engineer bioactive glass-based nanosystems**
G. A. M. Luz, Jr., Minho University, Guimarães, Portugal
J. F. Mano, Sr., Minho University, Guimarães, Portugal

130 **Amorphous Tri-Magnesium Phosphate (ATMP) as a Novel Bone Scaffolding Material**
B. Lee, University of Pittsburgh, Pittsburgh, PA
P. Enick, University of Pittsburgh, Pittsburgh, PA
A. Roy, University of Pittsburgh, Pittsburgh, PA
P. Kumta, University of Pittsburgh, Pittsburgh, PA

131 **In Vivo Evaluation of STRUCSURE(TM) CP for Augmentation of Segmental Defect Healing**
J. A. Jennings, University of Memphis, Memphis, TN
B. T. Reves, University of Memphis, Memphis, TN
R. Smith, University of Tennessee Health Science Center, Memphis, TN
J. Rose, Smith and Nephew, Memphis, TN
J. D. Bumgardner, University of Memphis, Memphis, TN
W. O. Haggard, University of Memphis, Memphis, TN

132 **In vivo Performance of Combinations of Autograft, Demineralized Bone Matrix, and Tricalcium Phosphate in a Rabbit Femoral Defect Model**
J. Kim, Hongik University, Sejong, Korea, Republic of

Material/Tissue Interfacial Phenomena: Lessons Learned from Dental/Craniofacial Reconstructions

134 **Clinical and Histological Evaluations of Tantalum Porous Dental Implants in a Canine Model**
J. Lee, Zimmer Dental Inc./Zimmer Holdings, Carlsbad, CA
S. Battula, Zimmer Dental Inc./Zimmer Holdings, Carlsbad, CA
H. Wen, Zimmer Dental Inc./Zimmer Holdings, Carlsbad, CA
M. Collins, Zimmer Dental Inc./Zimmer Holdings, Carlsbad, CA

135 **Development of methodologies to investigate the effect of bacterial biofilm and micro-motion on the corrosion of dental implants**
S. Sridhar, University of Texas at Dallas, Richardson, TX
D. C. Rodrigues, University of Texas at Dallas, Richardson, TX
A. Thomas, University of Texas at Dallas, Richardson, TX
A. Adapalli, University of Texas at Dallas, Richardson, TX
K. Palmer, University of Texas at Dallas, Richardson, TX
P. Valderrama, Texas A&M University, Baylor College of Dentistry, Dallas, TX
T. G. Wilson, Jr., Private practice of Periodontics, Dallas, TX

136 **Antimicrobial and Mechanical Properties of Bioactive Glass Reinforced Dental Composites**

D. Khvostenko, Oregon State University, Corvallis, OR
J. Kruzic, Oregon State University, Corvallis, OR
J. Ferracane, Oregon Health and Science University, Portland, OR
J. Mitchell, Midwestern University, Glendale, AZ

137 **Hydrophilic-rich Phase Mimic in Dental Adhesive: Polymerization- and Solvent-Induced Phase Separation**
Q. Ye, University of Kansas, Lawrence, KS
F. Abedin, University of Kansas, Lawrence, KS
H. Good, University of Kansas, Lawrence, KS
P. Spencer, University of Kansas, Lawrence, KS
R. Parthasarathy, University of Kansas, Lawrence, KS
C. B. Tamerler, University of Kansas, Lawrence, KS
A. Misra, University of Kansas, Lawrence, KS
J. S. Laurence, University of Kansas, Lawrence, KS
C. L. Berrie, University of Kansas, Lawrence, KS

138 **Interfacial Design of Dentin Adhesive with a branched Carboxylic Acid Monomer**
P. Spencer, University of Kansas, Lawrence, KS
Q. Ye, University of Kansas, Lawrence, KS
L. Song, University of Kansas, Lawrence, KS
X. Ge, University of Kansas, Lawrence, KS
A. Misra, University of Kansas, Lawrence, KS
C. B. Tamerler, University of Kansas, Lawrence, KS
C. L. Berrie, University of Kansas, Lawrence, KS
J. S. Laurence, University of Kansas, Lawrence, KS

New Frontiers in Polymers and Fibers for Biomedical Applications

140 **High Tenacity Polyester Yarns: the New Generation of High Performance Biomaterials**
M. W. King, North Carolina State University, Raleigh, NC
C. M. Pastore, Philadelphia University, Philadelphia, PA
R. Torgerson, RxFiber LLC, Windsor, CA

142 **Cationic nanofibers as anti-inflammatory scaffolds for chronic wound healing.**
H. Juwarker, Duke University, Durham, NC
J. Gamboa, Duke University, Durham, NC
K. Leong, Duke University, Durham, NC
B. Sullenger, Duke University, Durham, NC

143 **Proteoglycan Mimetic Graft Copolymers for Growth Factor Stabilization and Delivery**
L. W. Place, Colorado State University, Fort Collins, CO
S. Kelly, Colorado State University, Fort Collins, CO
M. J. Kipper, Colorado State University, Fort Collins, CO

144 **Smart Hyperthermia Nanofibers with 'On-Off' Drug Release**
M. Ebara, National Institute for Materials Science, Tsukuba, Japan
Y. Kim, National Institute for Materials Science, Tsukuba, Japan
K. Uto, National Institute for Materials Science, Tsukuba, Japan
T. Aoyagi, National Institute for Materials Science, Tsukuba, Japan

145 **Novel Conductive Polymer-based Biomaterials for Pro-Vascularization under Electrical**

Stimulation
G. M. Xiong, Nanyang Technological University, Singapore, Singapore
C. Choong, Nanyang Technological University, Singapore, Singapore

146 **Effect of Melt-blowing Processing on Shape-Memory Polyurethane Microfiber Fabrics**
D. L. Safranski, MedShape, Inc, Atlanta, GA
K. Beatty, Georgia Institute of Technology, Atlanta, GA
J. Boothby, Georgia Institute of Technology, Atlanta, GA
K. M. Dupont, MedShape, Inc., Atlanta, GA
C. P. Frick, University of Wyoming, Laramie, WY
J. C. Griffis, MedShape, Inc., Atlanta, GA

147 **Elastomeric Electrospun Poly(glycerol sebacate) via a Water-Soluble Carrier Polymer**
E. M. Jeffries, University of Pittsburgh, Pittsburgh, PA
R. Allen, University of Pittsburgh, Pittsburgh, PA
S. Nakamura, Kyushu University, Fukuoka, Japan
C. Stowell, University of Pittsburgh, Pittsburgh, PA
Y. Wang, University of Pittsburgh, Pittsburgh, PA

Nucleic Acid Delivery

148 **A Layer-by-layer Gene Therapy Approach for Promoting Exogenous and Inhibiting Endogenous Protein Expression**
C. J. Bishop, Johns Hopkins University School of Medicine, Baltimore, MD
S. Y. Tzeng, Johns Hopkins University School of Medicine, Baltimore, MD
J. J. Green, Johns Hopkins University School of Medicine, Baltimore, MD

149 **Sustained gene delivery from micro-fibrous, elastomeric polymer scaffolds**
X. Gu, McGowan Institute for Regenerative Medicine, University of Pittsburgh, Pittsburgh, PA
B. Wang, Department of Orthopaedic Surgery, University of Pittsburgh, Pittsburgh, PA
Y. Tang, Department of Orthopaedic Surgery, University of Pittsburgh, Pittsburgh, PA
W. R. Wagner, McGowan Institute for Regenerative Medicine, University of Pittsburgh, Pittsburgh, PA

150 **Release of Stabilized Diblock Copolymer/Plasmid DNA Polyplexes from Injectable Scaffolds**
E. J. Adolph, Vanderbilt University, Nashville, TN
C. E. Nelson, Vanderbilt University, Nashville, TN
C. L. Duvall, Vanderbilt University, Nasvhille, TN
S. A. Guelcher, Vanderbilt University, Nashville, TN

151 **Non-viral oral gene delivery for treatment of Hemophilia B.**
J. Gamboa, Duke University, Durham, NC
S. Suryaprakash, Duke University, Durham, NC
K. Leong, Duke University, Durham, NC

152 **Immunomodulation of Cystic Fibrosis Epithelial Cells via NF-κB Decoy Oligonucleotide Coated Polysaccharide Nanoparticles**
P. R. Wardwell, Syracuse University, Syracuse, NY
R. A. Bader, Syracuse University, Syracuse, NY

153 **Scalable Synthesis of Functional Polyesters that Enable Effective siRNA Delivery to Cancer**

Cells
D. J. Siegwart, University of Texas Southwestern Medical Center, Dallas, TX
Y. Yan, University of Texas Southwestern Medical Center, Dallas, TX
J. B. Miller, University of Texas Southwestern Medical Center, Dallas, TX

154 **Identifying Effective siRNAs for Polymer-Mediated Combinatorial Delivery to Drug Sensitive and Resistant Breast Cancer Cells**
H. Uludag, University of Alberta,
H. M. Aliabadi, University of Alberta,
P. Aliabadi, University of Alberta,

155 **In Vivo Gene Delivery and Multimodal Imaging of Multifunctional Degradable Nanoparticles after Delivery to Lung**
K. C. L. Black, Washington University School of Medicine, St. Louis, MO

Trends in Surface Modification of Bulk- and Nano-Biomaterials I

156 **Hydrogel Coatings for High-Speed Cell Sorting**
B. J. Berron, University of Kentucky, Lexington, KY
G. Romero, University of Kentucky, Lexington, KY
J. L. Lilly, University of Kentucky, Lexington, KY
V. Balasubramaniam, University of Colorado-Denver, Aurora, CO

157 **Characterization of Mammalian Cell Interactions on Coatings Based on Plant Polyphenols**
D. G. Barrett, Northwestern University, Evanston, IL
T. S. Sileika, Northwestern University, Evanston, IL
P. B. Messersmith, Northwestern University, Evanston, IL

158 **Quantification of the Charge Density on Surfaces Under Identical Solution Conditions Using Analytical Techniques that Probe Different Regions of the Solid-Liquid Interface**
A. A. Thyparambil, Clemson University, Clemson, SC
Y. Wei, Clemson University, Clemson, SC
G. Hickman, Nottingham Trent University, Nottingham, United Kingdom
D. Belton, Nottingham Trent University, Nottingham, United Kingdom
C. C. Perry, Nottingham Trent University, Nottingham, United Kingdom
R. A. Latour, Clemson University, Clemson, SC

159 **Single step immobilization of REDV peptide onto a variety of biomaterial substrates by tyrosine oxidation**
S. Kakinoki, National Cerebral and Cardiovascular Center Research Institute, Suita, Osaka, Japan
T. Yamaoka, National Cerebral and Cardiovascular Center Research Institute, Suita, Osaka, Japan

160 **Surface hydrolysis mediated PEGylation for the passivation of PNIPAAm Nanogels**
J. T. Peters, The University of Texas at Austin, Austin, TX
S. Verghese, The University of Texas at Austin, Austin, TX
N. A. Peppas, The University of Texas at Austin, Austin, TX

161 **Enhanced Capture of Cancer cells on Aptamer-Modified Topographical Surfaces**
X. Liu, Soochow University, Suzhou, China
Y. Wang, Soochow University, Suzhou, China
H. Chen, Soochow University, Suzhou, China

162 **Glycosylated polypeptide nanofibers as polyvalent lectin inhibitors with enzymatically-tunable binding specificity**

G. Hudalla, University of Florida, Gainesville, FL
Y. Tian, Illinois Institute of Technology, Chicago, IL
J. Collier, University of Chicago, Chicago, IL

163 **Tuning Polymeric Micelle Stability with Selective Polyethylene Glycol Density**

J. Logie, University of Toronto,
C. K. McLaughlin, University of Toronto,
S. C. Owen, University of Toronto,
M. S. Shoichet, University of Toronto,

Con-current Oral Abstract Presentations Session 5

Advances in Three Dimensional Scaffolds for Tissue Regeneration I

164 **Woven Electrochemically Aligned Collagen Scaffold Guides Tenogenesis of Mesenchymal Stem Cells**
M. Younesi, Case Western Reserve University, Cleveland, OH
A. Islam, Case Western Reserve Univeristy, Cleveland, OH
V. Kishore, Florida Institute of Technology, Cleveland, OH
J. M. Anderson, Case Western Reserve University, Cleveland, OH
O. Akkus, Case Western Reserve University, Cleveland, OH

165 **Design and Evaluation of a Multi-Phased Scaffold for Functional Ligament Tissue Engineering**
S. D. Subramony, Columbia University, New York, NY

166 **Mechanoregulation of Stem Cell Activity across an Osteotendinous Insertion Biomaterial**
L. C. Mozdzen, University of Illinois- Champaign-Urbana, Urbana, IL
O. E. Armitage, Cambridge University, Cambridge, United Kingdom
C. T. Thorpe, Queen Mary University of London, London, United Kingdom
M. L. Oyen, Cambridge University, Cambridge, United Kingdom
H. R. C. Screen, Queen Mary University of London, London, United Kingdom
B. A. Harley, University of Illinois- Champaign-Urbana, Urbana, IL

167 **Three-Dimensionally Printed b-Tri-Calcium Phosphate/Hydroxyapatite Scaffolds for Long Bone Regeneration**
N. Tovar, NYUCD, New York, NY
M. Sobieraj, NYU Langone Medical Center, New York, NY
L. Witek, Oklahoma State University, Stillwater, OK
J. Smay, Oklahoma State University, Stillwater, OK
P. Coelho, NYUCD, New York, NY

169 **Microribbon-based Scaffolds Accelerate Bone Regeneration in a Cranial Defect Model**
L. Han, Stanford University School of Medicine, Stanford, CA
M. T. Chung, Stanford University School of Medicine, Stanford, CA
B. Conrad, Stanford University, Stanford, CA
L. Deveza, Stanford University School of Medicine, Stanford, CA
X. Jiang, Stanford University School of Medicine, Stanford, CA
M. T. Longaker, Stanford University School of Medicine, Stanford, CA
F. Yang, Stanford University, Stanford, CA

170 **Osteoinductive Modification of Injectable, PolyHIPE Bone Grafts**
M. A. P. McEnery, Texas A&M University, College Station, TX
J. L. Robinson, Texas A&M University, College Station, TX
M. C. Stuebben, Texas A&M University, College Station, TX
E. E. Cosgriff-Hernandez, Texas A&M University, College Station, TX

171 **Hierarchical Macro/Microporous 3D Scaffolds Support the Growth of MC3T3-E1 Osteoblastic Cells**
A. M. Yousefi, Miami University, Oxford, OH

R. Akbarzadeh, Miami University, Oxford, OH
J. A. Minton, Miami University, Oxford, OH
D. R. Ferriell, Miami University, Oxford, OH
C. A. Focke, Miami University, Oxford, OH
C. T. Flavin, Miami University, Oxford, OH
P. F. James, Miami University, Oxford, OH

Biomolecule Delivery for Regenerative Medicine I

172 **Degradable hydrogels for directing mesenchymal stem cell differentiation towards enhanced ligament regeneration**
A. M. Kloxin, University of Delaware, Newark, DE
M. S. Rehmann, University of Delaware, Newark, DE
P. M. Kharkar, University of Delaware, Newark, DE

173 **Directing Human Mesenchymal Stem Cell Migration Through Gradient Presentation of Chemokines**
K. A. Kyburz, University of Colorado, Boulder, CO
E. A. Kiyotake, University of Colorado, Boulder, CO
K. S. Anseth, University of Colorado/HHMI, Boulder, CO

174 **Injectable chitosan hydrogels with tailored degradation and release properties for localized biomolecule delivery**
S. V. Gohil, UConn Health Center, Farmington, CT
K. R. Bagshaw, University of Connecticut, Storrs, South Windsor, CT
D. W. R. Rowe, UConn Health Center, Farmington, CT
L. S. Nair, UConn Health Center, Farmington, CT

175 **Incorporation of Sulfated Hyaluronic Acid Macromers into Fibrous Hydrogels for Sustained Molecule Delivery**
I. L. Kim, University of Pennsylvania, Philadelphia, PA
B. P. Purcell, University of Pennsylvania, Philadelphia, PA
V. Chuo, University of Pennsylvania, Philadelphia, PA
T. Guenin, University of Pennsylvania, Philadelphia, PA
S. M. Dorsey, University of Pennsylvania, Philadelphia, PA
J. A. Burdick, University of Pennsylvania, Philadelphia, PA

176 **Enzymatically-Responsive Delivery of Pro-Angiogenic Peptides from Poly(ethylene glycol) Hydrogels**
A. H. Van Hove, University of Rochester, Rochester, NY
D. S. W. Benoit, University of Rochester, Rochester, NY

177 **Alginate-graft-Poly(Ethylene Glycol) Microspheres for Intracellular Growth Factor Delivery**
T. Miao, University of Vermont, Burlington, VT
K. S. Rao, University of Vermont, Colchester, VT
J. L. Spees, University of Vermont, Colchester, VT
R. A. Oldinski, University of Vermont, Burlington, VT

178 **Peptide-functionalized polymers for bone targeted drug delivery systems**
C. Schmitt, University of Rochester, Rochester, NY
I. Marozas, University of Rochester, Rochester, NY
M. R. Newman, University of Rochester, Rochester, NY

T. Sheu, University of Rochester Medical Center, Rochester, NY
J. E. Puzas, University of Rochester Medical Center, Rochester, NY
D. S. W. Benoit, University of Rochester, Rochester, NY

Cardiovascular Tissue Engineering: Regenerative Approaches for Ischemic Diseases

179 **Syndecan-4 Proteoliposomes Enhance Cutaneous Wound Healing and Induce Neovascularization in Ischemic Limb in a Diabetic Hyperlipidemic Mouse**
S. Das, University of Texas, Austin, Austin, TX
G. Singh, University of Texas, Austin, Austin, TX
M. E. Martinez, University of Texas, Austin, Austin, TX
A. B. Baker, University of Texas, Austin, Austin, TX

180 **Using MRI to Evaluate Injectable Hyaluronic Acid Hydrogel Therapy for Myocardial Infarct Repair**
S. M. Dorsey, University of Pennsylvania, Philadelphia, PA
J. R. McGarvey, University of Pennsylvania, Philadelphia, PA
J. F. Wenk, University of Kentucky, Lexington, KY
L. Arama, University of Pennsylvania, Philadelphia, PA
J. H. Gorman, III, University of Pennsylvania, Philadelphia, PA
R. C. Gorman, University of Pennsylvania, Philadelphia, PA
J. A. Burdick, University of Pennsylvania, Philadelphia, PA

181 **Ultra-rapid Manufacturing of Engineered Epicardial Substitute to Repair Ischemic Heart Tissue**
V. Serpooshan, Stanford School of Medicine, Stanford, CA
K. Wei, Sanford-Burnham Medical Research Institute, La Jolla, CA
M. Zhao, Stanford School of Medicine, Stanford, CA
S. Metzler, Stanford School of Medicine, Stanford, CA
P. Shah, Stanford School of Medicine, Stanford, CA
Y. Matsura, Stanford, Stanford, CA
W. Cai, Sanford-Burnham Medical Research Institute, La Jolla, CA
A. Wang, Stanford, Stanford, CA
W. Zhu, Sanford-Burnham Medical Research Institute, La Jolla, CA
M. Mahmoudi, Stanford School of Medicine, Stanford, CA
M. J. Butte, Stanford, Stanford, CA
P. C. Yang, Stanford, Stanford, CA
D. Bernstein, Stanford, Stanford, CA
M. Mercola, Sanford-Burnham Medical Research Institute, La Jolla, CA
P. Ruiz-Lozano, Stanford, Stanford, CA

182 **Tailoring the Degradation Rates of Thermally Responsive Hydrogels Designed for Injection into the Ventricular Wall after Myocardial Infarction**
Y. Zhu, McGowan Institute for Regenerative Medicine, University of Pittsburgh, Pittsburgh, PA
T. Yoshizumi, McGowan Institute for Regenerative Medicine, Pittsburgh, PA
H. Jiang, McGowan Institute for Regenerative Medicine, Pittsburgh, PA
S. Ye, McGowan Institute for Regenerative Medicine,, Pittsburgh, PA
W. R. Wagner, McGowan Institute for Regenerative Medicine, University of Pittsburgh, Pittsburgh, PA

183 **Enhanced Cardiomyocyte Proliferation and Maturation on Fractionated Cardiac Extracellular**

Matrix Derived from Decellularized Native Ventricular Tissue
K. J. Edmunds, Tufts University, Medford, MA

184 **Dual Growth Factor loaded Bioactive Nanofibrous Patches for Cardiac Tissue Engineering**
R. Lakshmanan, SASTRA University, Thanjavur, India
U. Krishnan, SASTRA University, Thanjavur, India
S. Sethuraman, SASTRA University, Thanjavur, India

185 **Engineering Functional Cardiac Tissues Using Micropatterned Hydrogels**
K. Tang, Harvard-MIT Division of Health Sciences and Technology, Cambridge, MA
S. M. Mithieux, The university of Sydney, Sydney, Australia
M. Nikkhah, Harvard-MIT Division of Health Sciences and Technology, Cambridge, MA
A. Ameri, Harvard-MIT Division of Health Sciences and Technology, Cambridge, MA
A. S. Weiss, The University of Sydney, Sydney, MA
A. Khademhosseini, Harvard-MIT Division of Health Sciences and Technology, Cambridge, MA

186 **Hydrogels incorporating single walled carbon nanotubes for cardiac cell tissue engineering**
S. Pok, Rice University, Houston, TX
F. Vitale, Rice University, Houston, TX
M. Pasquali, Rice University, Houston, TX
J. G. Jacot, Rice University, Houston, TX

High-throughput Approaches to Modulate Cellular Behavior

187 **Cell-based microarrays: A platform to facilitate patient-specific therapy**
B. G. Keselowsky, University of Florida, Gainesville, FL

188 **Peptide microarrays for the combinatorial discovery of bioactive surfaces that guide cellular processes**
D. Zhang, University of Illinois at Urbana-Champaign, Urbana, IL
K. A. Kilian, University of Illinois at Urbana-Champaign, Urbana, IL

189 **A patterned superhydrophobic surface array using nanoparticle coating for screening collective cell migration**
Y. Pang, Massachusetts General Hospital, Boston, MA
J. Yang, Massachusetts General Hospital, Boston, MA
B. Grottkau, Massachusetts General Hospital, Boston, MA

190 **Differential adhesion strength as a molecular signature for rapid separation of partially reprogrammed cells from human stem cell reprogramming cultures**
A. Singh, Cornell University, Ithaca, NY
S. Suri, Georgia Tech, Atlanta, GA
J. M. Chilton, ArunA Biomedical, Inc, Athens, GA
S. L. Stice, ArunA Biomedical, Inc, Athens, GA
H. Lu, Georgia Tech, Atlanta, GA
T. C. McDevitt, Georgia Tech, Atlanta, GA
A. J. Garcia, Georgia Tech, Atlanta, GA

191 **Design of Bone Microenvironment Mimicking Antibiotic-based Hydrogels for High-throughput Generation of Three Dimensional Tumor Models of Dormancy and Relapse**
T. Grandhi, Arizona State University, Tempe, AZ
T. Potta, Arizona State University, Tempe, AZ

J. Faust, Arizona State University, Tempe, AZ
K. Rege, Arizona State University, Tempe, AZ

192 **TopoChip Screening of Designed Surfaces to Instruct Cell Fate**
N. Fekete, Materiomics B.V, Enschede, Netherlands

193 **High-throughput analysis of cells-3D biomaterials interactions using superhydrophobic patterned surfaces as chips**
M. B. Oliveira, 3B's Research Group - University of Minho, Guimarães, Portugal
J. F. Mano, 3B's Research Group - University of Minho, Guimarães, Portugal

728 **Fabrication of Three-dimensional Human Tissue Chips by Combination of Inkjet Cell Printingand Hierarchical Cell Manipulation**
Y. Takamura, Graduate School of Engineering, Osaka University, Suita, Osaka, Japan
M. Matusaki, Graduate School of Engineering, Osaka University, Suita, Osaka, Japan
M. Akashi, Graduate School of Engineering, Osaka University, Suita, Osaka, Japan

SFB Business Plan Competition

195 **OsteoMag: Novel Biodegradable Metal Alloys for Bone Fixation Plates and Screws**
D. Chou, University of Pittsburgh, Pittsburgh, PA
A. Chaya, University of Pittsburgh, Pittsburgh, PA
S. Yoshizawa, University of Pittsburgh, Pittsburgh, PA
D. Hong, University of Pittsburgh, Pittsburgh, PA
S. Pal, University of Pittsburgh, Pittsburgh, PA
S. Maiti, University of Pittsburgh, Pittsburgh, PA
H. A. Kuhn, University of Pittsburgh, Pittsburgh, PA
P. N. Kumta, University of Pittsburgh, Pittsburgh, PA
C. Sfeir, University of Pittsburgh, Pittsburgh, PA

196 **GrafDefense: Nano-polyplexes for Improving Saphenous Vein Graft Patency**
B. C. Evans, Vanderbilt University, Nashville, TN
C. E. Nelson, Vanderbilt University, Nashville, TN
K. M. Hocking, Vanderbilt University, Nashville, TN
C. M. Brophy, Vanderbilt University, Nashville, TN
C. L. Duvall, Vanderbilt University, Nashville, TN

197 **RecoveryOne: Post-Heart Attack Growth Factor Therapy**
N. Johnson, University of Pittsburgh, Pittsburgh, PA
E. Jeffries, University of Pittsburgh, Pittsburgh, PA
Y. Wang, University of Pittsburgh, Pittsburgh, PA

198 **Mem|Mesh: Development of a novel shape memory functional surgical mesh**
R. Shandas, University of Colorado Denver Anschutz Medical Campus, Aurora, CO
M. Zimkowski, University of Colorado Denver Anschutz Medical Campus, Aurora, CO

199 **TRI™ Valves: A Superior Alternative to Glutaraldehyde**
H. Tam, Clemson University, Clemson, SC
N. Vyavahare, Clemson University, Clemson, SC

200 **MetastaticPrecision - Rapid Cancer Diagnostic**
L. Perpall, Clemson University, Clemson, SC

Translatory Research (Including Theranostics) in Nanomedicine

201 **A “turn-off” fluorescent substrate for horseradish peroxidase detects anti-chlamydia in mouse serum by enhancing accuracy of ELISA kits by 10 fold**
A. P. Acharya, University of California, Berkeley, Berkeley, CA

202 **Multi-functional Sr-Phosphate (Sr-P) Nanocomposites for Caries Treatment**
S. B. Bhaduri, The University of Toledo, Toledo, OH
H. Zhou, The University of Toledo, Toledo, OH
E. Knierim, The University of Toledo, Toledo, OH

203 **Optimization of Gold Nanoplate Synthesis for Theranostic Applications**
K. T. James, University of Louisville, Louisville, KY
R. S. Keynton, University of Louisville, Louisville, KY
D. N. Patel, Energy Delivery Solutions, Louisville, KY
M. G. O'Toole, University of Louisville, Louisville, KY

204 **Heat Stable Polymer for Hemostatic Nanoparticles**
M. Lashof-Sullivan, Case Western Reserve University, Cleveland, OH
N. Schindler, Case Western Reserve University, Cleveland, OH
A. Spencer, Case Western Reserve University, Cleveland, OH
A. Yau, Case Western Reserve University, Cleveland, OH
E. Lavik, Case Western Reserve University, Cleveland, OH

205 **Liposomal Probes for Enhanced Vascular Imaging and Diagnosis via a Polymeric Fastener**
C. E. Smith, University of Illinois at Urbana-Champaign, Urbana, IL
S. Misra, Mayo Clinic, Rochester, MN
S. C. Zimmerman, University of Illinois at Urbana-Champaign, Urbana, IL
H. Kong, University of Illinois at Urbana-Champaign, Urbana, IL

206 **Osteotropic therapy via Layer-by-Layer Nanoparticles**
S. W. Morton, MIT, Cambridge, MA
N. J. Shah, MIT, Cambridge, MA
M. A. Quadir, MIT, Cambridge, MA
Z. J. Deng, MIT, Cambridge, MA
Z. Poon, MIT, Cambridge, MA
P. T. Hammond, MIT, Cambridge, MA

207 **Platelet Inspired Liposomes for Delivery of Doxorubicin to Metastatic Breast Cancer**
V. Pan, Case Western Reserve University, Liberty Township, OH
C. Modery-Pawlowski, Case Western Reserve University, Cleveland, OH
G. P. Howard, University of Akron, Cleveland, OH
P. Siva, Case Western Reserve University, Cleveland, OH
A. Master, Case Western Reserve University, Cleveland, OH
A. Sen Gupta, Case Western Reserve University, Cleveland, OH

208 **Fabrication of intelligent, protein-recognitive polymers on the surface of biodegradable nano particles**
H. Culver, The University of Texas at Austin, Austin, TX
A. Sitabkhan, The University of Texas at Austin, Austin, TX
C. Koepke, The University of Texas at Austin, Austin, TX

N. A. Peppas, The University of Texas at Austin, Austin, TX

Con-current Oral Abstract Presentations Session 6

Absorbable Polymers for Medical Devices: Current Status and Future Perspectives

209 **In Vitro Degradation of 3D Printed Poly(Propylene Fumarate) Scaffolds**
M. O. Wang, University of Maryland College Park, College Park, MD
C. Piard, Les Arts et Métier (ENSAM), à Paris Tech, College Park, MD
M. L. Dreher, Food and Drug Administration, Silver Spring, MD
A. Melchiorri, University of Maryland, College Park, MD
J. P. Fisher, University of Maryland, College Park, MD

210 **PLGA Microsphere Spray System for Wound Coverage**
Y. Zou, University of Kentucky, Lexington, KY
T. Milbrandt, University of Kentucky, Lexington, KY
D. Puleo, University of Kentucky, Lexington, KY

211 **Thin, elastic polymer films for preventing unwanted soft tissue attachments**
S. Mayes, Alafair Biosciences, Austin, TX

212 **Visible light cured thiol-acrylate hydrogels with tunable degradation for controlled protein delivery**
Y. Hao, Indiana University-Purdue University at Indianapolis, Indianapolis, IN
C. Lin, Indian University-Purdue University at Indianapolis, Indianapolis, IN

213 **Absorbable, Injectable, Thermogelling Hydrogels of PCL-g-PEG**
B. J. Tarasevich, Pacific Northwest National Laboratory, Richland, WA
L. Cosimbescu, Pacific Northwest Laboratory, Richland, WA
G. Lin, WSP Chemicals and Technology LLC, Leetsdale, PA
R. Jacob, Pacific Northwest National Laboratory, Richland, WA

214 **Biodegradable Photoluminescent Polylactide and Polylacide-co-glycolide**
Z. Xie, Pennsylvania State University, University Park, PA
J. Hu, South China University of Technology, Guangzhou, China
Q. Cai, Beijing University of Chemical Technology, Beijing, China
J. Yang, Pennsylvania State University, University Park, PA

215 **Design of Experiments Approach to Identify Dominant Formulation Factors for Vancomycin-Loaded PLGA Microspheres**
D. Puleo, University of Kentucky, Lexington, KY

216 **In Vitro Degradation of Poly(p-dioxanone) Fibers: Effects of Size, Temperature and pH**
E. Vailhe, Ethicon, a Johnson & Johnson Company, Somerville, NJ
M. Deng, Ethicon, a Johnson & Johnson Company, Somerville, NJ
D. Burkley, Ethicon, a Johnson & Johnson Company, Somerville, NJ
Y. Xu, Ethicon, a Johnson & Johnson Company, Somerville, NJ
L. Vailhe, Ethicon, a Johnson & Johnson Company, Somerville, NJ
V. Zhou, Ethicon, a Johnson & Johnson Company, Somerville, NJ

Advances in Programmable Biomaterials

217 **Novel phase transition peptide polymers with LCST and UCST behavior**
F. García Quiroz, Duke University, Durham, NC
A. Chilkoti, Duke University, Durham, NC

218 **Shear-Thinning Hydrogels with Secondary Michael-type Crosslinking to Modulate Properties In Situ**
C. B. Rodell, University of Pennsylvania, Philadelphia, PA
S. M. Dorsey, University of Pennsylvania, Philadelphia, PA
W. M. Gramlich, University of Pennsylvania, Philadelphia, PA
J. A. Burdick, University of Pennsylvania, Philadelphia, PA

219 **Reversibly Stiffening Hydrogels to Probe Myofibroblast Activation**
A. M. Rosales, University of Colorado/HHMI, Boulder, CO
E. M. Nehls, University of Colorado, Boulder, CO
K. S. Anseth, University of Colorado/HHMI, Boulder, CO

220 **Sequential and Site-Specific Delivery of Dual Anticancer Therapeutics Using Programmed Nanodepots**
T. Jiang, North Carolina State University, Raleigh, NC

221 **Dual acid-sensitive micelle-forming polymeric anticancer prodrug**
D. Lee, Chonbuk National University, Jeonju, Korea, Republic of
B. Kwon, Chonbuk National Univeristy, Jeonju, Korea, Republic of
E. Han, Chonbuk National Univeristy, Jeonju, Korea, Republic of
G. Khang, Chonbuk National Univeristy, Jeonju, Korea, Republic of

222 **Functionalized Gellan Gum Hydrogels Potentiate Endothelial Cell Performance**
L. P. da Silva, 3B's Research Group - Biomaterials, Biodegradables and Biomimetics, University of Minho, Guimarães, Portugal; ICVS/3B's - PT Government Associate Laboratory, Braga/Guimarães, Portugal; Department of Bioengineering, University of California at Berkeley, Be,

223 **Designing Cell-Mediated Degrading PEG Hydrogels for Personalizing Cartilage Tissue Engineering**
S. C. Skaalure, University of Colorado Boulder, Boulder, CO
S. J. Bryant, University of Colorado Boulder, Boulder, CO

224 **Programmable Hydrogels for Drug Delivery and Regenerative Medicine**
Y. Wang, The Pennsylvania State University, University Park, PA

Biologically Derived Materials from Natural Resources I

226 **Naturally Occurring Nanoparticles from Fungi for Tumor Immunochemotherapy**
Y. Wang, The Ohio State University, Columbus, OH
S. Yi, The University of Tennessee, Knoxville, TN
L. Sun, The University of Tennessee, Knoxville, TN
Y. Huang, The University of Tennessee, Knoxville, TN
M. Zhang, The Ohio State University, Columbus, OH

227 **Comparison of different decellularization methods on adipose tissue: the advantage of**

physical method
S. S. Shanbhag, Nanyang Technological University, Singapore, Singapore
B. Luo, Nanyang Technological University, Singapore, Singapore
S. Foo, Nanyang Technological University, Singapore, Singapore
N. Tan, Nanyang Technological University, Singapore, Singapore
M. T. C. Wong, Tan Tock Seng Hospital, Singapore, Singapore
C. Choong, Nanyang technological University, Singapore, Singapore

228 **Porous Silk Fibroin Hydrogels with Tunable Stiffness for Vascular Tissue Engineering**
M. Floren, University of Colorado Boulder, Boulder, CO
W. Bonani, University of Trento, Boulder, CO
N. Tseng, University of Colorado Denver, Denver, CO
C. Migliaresi, University of Trento, Boulder, CO
W. Tan, University of Colorado Boulder, Boulder, CO

229 **A Crucial Process: Organic Matrix and Magnesium Ion Control Amorphous Calcium Carbonate Crystallization on ß-Chitin Film**
Y. Ma, Tsinghua University, Beijing, China
Q. Feng, Tsinghua University, Beijing, China

230 **Synthesis and characterization of new pectin derivative with antitumor property**
E. A. M. S. ALMEIDA, UNIVERSIDADE ESTADUAL DE MARINGA, Maringa, Brazil
A. F. MARTINS, UNIVERSIDADE ESTADUAL DE MARINGA, Maringa, Brazil
C. V. NAKAMURA, UNIVERSIDADE ESTADUAL DE MARINGA, Maringa, Brazil
A. F. RUBIRA, UNIVERSIDADE ESTADUAL DE MARINGA, Maringa, Brazil
E. C. MUNIZ, UNIVERSIDADE ESTADUAL DE MARINGA, Maringa, Brazil

231 **Development of multifunctional platelet lysate membranes for tissue engineering applications**
P. S. Babo, 3B's Research Group – Biomaterials, Biodegradables and Biomimetics, University of Minho, Taipas, Guimarães, Portugal
V. E. Santo, 3B's Research Group – Biomaterials, Biodegradables and Biomimetics, University of Minho, Taipas, Guimarães, Portugal
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A. C. Duarte, 3B's Research Group – Biomaterials, Biodegradables and Biomimetics, University of Minho, Taipas, Guimarães, Portugal
C. Correia, iBET, Instituto de Biologia Experimental e Tecnológica, Oeiras, Portugal
M. H. G. Costa, MIT Portugal Program, Bioengineering Systems, Lisboa, Portugal
J. F. Mano, 3B's Research Group – Biomaterials, Biodegradables and Biomimetics, University of Minho, Taipas, Guimarães, Portugal
R. L. Reis, 3B's Research Group – Biomaterials, Biodegradables and Biomimetics, University of Minho, Taipas, Guimarães, Portugal
M. E. Gomes, 3B's Research Group – Biomaterials, Biodegradables and Biomimetics, University of Minho, Taipas, Guimarães, Portugal

Cardiovascular Biomaterials and Blood Compatibility I

233 **S-Nitroso-N-acetylpenicillamine (SNAP)-doped Elast-eon Catheters Reduce Thrombosis and Bacterial Adhesion**
E. J. Brisbois, University of Michigan, Ann Arbor, MI
H. Handa, University of Michigan, Ann Arbor, MI

R. Davis, University of Michigan, Ann Arbor, MI
A. Jones, University of Michigan, Ann Arbor, MI
R. Bartlett, University of Michigan, Ann Arbor, MI
M. E. Meyerhoff, University of Michigan, Ann Arbor, MI

234 **Antioxidant citric-acid based polymers inhibit intimal hyperplasia**
R. van Lith, Northwestern University, Evanston, IL
E. Gregory, Northwestern University, Chicago, IL
M. Kibbe, Northwestern University, Chicago, IL
G. Ameer, Northwestern University, Evanston, IL

235 **Novel TRI™ Heart Valve Biomaterial Resists Calcification and Structural Degradation In-vivo**
H. Tam, Clemson University, Clemson, SC
W. Zhang, University of Austin, Texas, Austin, TX
K. Feaver, University of Austin, Texas, Austin, TX
M. Sacks, University of Austin, Texas, Austin, TX
N. Vyavahare, Clemson University, Clemson, SC

236 **Development of a Small Caliber Vascular Graft with Decellularized Arteries**
B. Jiang, Northwestern University, Evanston, IL
B. Akgun, Northwestern University, Chicago, IL
R. Lam, Northwestern University, Evanston, IL
G. Ameer, Northwestern University, Evanston, IL
J. Wertheim, Northwestern University, Chicago, IL

237 **Fabrication and evaluation of elastomeric hollow fiber membranes as small diameter vascular graft substitutes**
A. E. Mercado-Pagan, Stanford University, Stanford, CA
Y. Kang, Stanford University, Stanford, CA
M. W. Findlay, Stanford University, Stanford, CA
G. C. Gurtner, Stanford University, Stanford, CA
Y. Yang, Stanford University, Stanford, CA

238 **Non-covalent Surface Modification of Erythrocytes: Study of Binding Strength and Effect on Membrane Integrity**
S. G. Pandya, University of Texas at San Antonio, San Antonio, TX
C. M. Agrawal, University of Texas at San Antonio, San Antonio, TX

Ceramics and Composites in Bone Tissue Engineering and Drug Delivery III

239 **Space Maintenance and New Bone Formation with Polyurethane Biocomposites in a Canine Saddle Defect**
A. D. Talley, Vanderbilt University, Nashvile, TN
K. A. Kalpaci, Medtronic, Inc, Memphis, TN
K. J. Zienkiewicz, Vanderbilt University, Nashville, TN
J. C. Wenke, US Army Institute of Surgical Research, Fort Sam Houston, TX
S. A. Guelcher, Vanderbilt University, Nashville, TN

240 **Collagen Films on Hydroxyapatite Scaffolds Enhance rhBMP-2 Based Regeneration in Large Bone Defects**
T. Guda, University of Texas at San Antonio, San Antonio, TX

S. M. Shiels, US Army Institute of Surgical Research, Ft Sam Houston, TX
S. Karajgar, University of Texas at San Antonio, San Antonio, TX
M. R. Appleford, University of Texas at San Antonio, San Antonio, TX
J. C. Wenke, US Army Institute of Surgical Research, Ft. Sam Houston, TX
J. L. Ong, University of Texas at San Antonio, San Antonio, TX

242 **Fabrication of High Strength Calcium Phosphate Scaffolds for Bone Repair Using Naturally Derived Silk Material**

S. L. McNamara, Tufts University, Medford, MA
T. Lo, Tufts University, Medford, MA
J. Rnjak-Kovacina, Tufts University, Medford, MA
D. Kaplan, Tufts University, Medford, MA

243 **Tuning the Degradation Rate of Calcium Phosphate Cement via Addition of PLGA Porogen Content to Accelerate Bone Regeneration**

C. I. van Houdt, Radboud University Medical Centre, Nijmegen, Netherlands
R. S. Preethanath, King Saud University, Riyadh, Saudi Arabia
B. A. van Oirschot, Radboud University Medical Centre, Nijmegen, Netherlands
J. A. Jansen, Radboud University Medical Centre, Nijmegen, Netherlands
J. J. van den Beucken, Radboud University Medical Centre, Nijmegen, Netherlands

244 **Characterization and Release Kinetics of Calcium Silicate Cement as a Risedronate Delivery System**

T. Gong, the University of British Columbia,
Y. Zhang, Shenyang Agriculture University, Shenyang, China
Z. Wang, Safety Evaluation Center of Shenyang Research Institute of Chemical Industry Ltd, Shenyang, China
C. Chen, Safety Evaluation Center of Shenyang Research Institute of Chemical Industry Ltd, Shenyang, China
Y. Zhang, Rescue Center of Severe Wound and Trauma of Chinese PLA, Shenyang, China
X. Yang, Shanghai CP Guojian Pharmaceutical Co. Ltd.,, Shanghai, China
X. Liu, General Hospital of Shenyang Military Area Command of Chinese PLA, Shenyang, China
Y. Wang, General Hospital of Shenyang Military Area Command of Chinese PLA, Shenyang, China
T. Troczynski, the University of British Columbia,
Q. Yang, the University of British Columbia,
U. O. Häfeli, the University of British Columbia,

245 **Adsorption and Desorption of FGF-2 from Carbonate Apatite Granular**

K. Ishikawa, Kyushu University, Fukuoka, Japan
T. Yoshida, Kyushu University, Fukuoka, Japan
R. Toita, Kyushu University, Fukuoka, Japan
K. Tsuru, Kyushu University, Fukuoka, Japan

246 **I-Optimal Design and Topology Control of 3D Scaffolds Produced by Fused Deposition Modeling**

A. M. Yousefi, Miami University, Oxford, OH
C. A. Focke, Miami University, Oxford, OH
C. S. Janney, Miami University, Oxford, OH
A. J. Naber, Miami University, Oxford, OH
K. Reichenbach, Miami University, Oxford, OH
C. Shaw, Miami University, Oxford, OH
S. E. Szekely, Miami University, Oxford, OH
L. P. Taylor, Miami University, Oxford, OH

B. Smucker, Miami University, Oxford, OH

Effect of Scaffold Properties on 3D Cell Shape

248 **Microenvironment Dimensionality and Cells of the Nervous System: Significant Effects on Cell Shape and Signaling**
S. Balasubramanian, UMBC, Baltimore, MD
H. Gaifem, UMBC, Baltimore, MD
J. B. Leach, UMBC, Baltimore, MD

249 **Collagen-Matrix Guided Vasculogenesis: Cell Shape and Cytomechanics Drive Vessel Morphogenesis**
S. L. Voytik-Harbin, Purdue University, West Lafayette, IN
T. Kim, Purdue University, West Lafayette, IN
C. F. Whittington, Purdue University, West Lafayette, IN
P. Critser, Indiana University School of Medicine, Indianapolis, IN
K. Buno, Purdue University, West Lafayette, IN
M. Yoder, Indiana University School of Medicine, Indianapolis, IN

250 **Harnessing Cell:Materials Interactions to Develop Innovative Strategy for the Recruitment of Progenitor Cells**
L. Indolfi, Massachusetts Institute of Technology, Cambridge, MA
C. Iaconetti, Magna Graecia University, Catanzaro, Italy
###A. Monteforte, University of Texas at Austin,
###A. Dunn, University of Texas at Austin,
###A. Baker, University of Texas at Austin,
C. Indolfi, Magna Graecia University, Catanzaro, Italy
E. Edelman, Massachusetts Institute of Technology, Cambridge, MA

251 **Machine Learning Analysis for Identification of Cell Shape Metrics Associated with Stem Cell Differentiation in Nanofiber Scaffolds**
D. Chen, University of Maryland, College Park, College Park, MD
S. Sarkar, National Institute of Standards and Technology, Gaithersburg, MD
J. Candia, University of Maryland, College Park, College Park, MD
S. J. Florczyk, National Institute of Standards and Technology, Gaithersburg, MD
S. Bodhak, National Institute of Standards and Technology, Gaithersburg, MD
M. K. Driscoll, University of Maryland, College Park, College Park, MD
C. G. Simon, Jr., National Institute of Standards and Technology, Gaithersburg, MD
J. P. Dunkers, National Institute of Standards and Technology, Gaithersburg, MD
W. Losert, University of Maryland, College Park, College Park, MD

252 **Substrate Stiffness Affects Cell Responsiveness to Cytotoxic Compounds**
S. P. Zustiak, Saint Louis University, St Louis, MO
K. Kalinowski, Saint Louis University, St Louis, MO
J. Schober, Southern Illinois University Edwardsville, Edwardsville, IL
K. Ramamoorthi, Santa Clara University, Santa Clara, CA
P. Asuri, Santa Clara University, Santa Clara, CA

253 **Harnessing the Relaxation of Fibrin-microgel Assemblies for Control of Cell Spreading and Motility**
A. M. Douglas, Georgia Institute of Technology, Atlanta, GA
B. Menn, Georgia Institute of Technology, Atlanta, GA

J. S. Hyatt, Georgia Institute of Technology, Atlanta, GA
A. Fernandez-Nieves, Georgia Institute of Technology, Atlanta, GA
L. A. Lyon, Georgia Institute of Technology, Atlanta, GA
T. H. Barker, Georgia Institute of Technology, Atlanta, GA

Trends in Surface Modification of Bulk- and Nano-Biomaterials II

107 **Nano-sized Magnetic Stirring Device for Intracellular Control of Cell Functions**

K. Yoshie, The University of Tokyo, Tokyo, Japan
Y. Inoue, The University of Tokyo, Tokyo, Japan
K. Ishihara, The University of Tokyo, Tokyo, Japan

254 **Use of Ce Valence States in Cerium Oxide Nanoparticles to Control Cell Proliferation on Scaffold Surfaces**
T. Naganuma, National Institute for Materials Science (NIMS), Tsukuba, Japan

255 **MgF2 Coating on Porous Magnesium with High Strength and Corrosion Resistance for Biomedical Application**
H. Jung, Materials Science and Engineering, Seoul National University, Seoul, Korea, Republic of
M. Kang, Materials Science and Engineering, Seoul National University, Seoul, Korea, Republic of
H. Kim, Materials Science and Engineering, Seoul National University, Seoul, Korea, Republic of
Y. Estrin, Centre for Advanced Hybrid Materials, Department of Materials Engineering, Monash University, Clayton, Australia

256 **Polymeric Nanostructure Layer-by-Layer Networks: Structural and Bio-functional relevance as Synthetic Mucus**
S. P. Authimoolam, University of Kentucky, Lexington, KY
N. M. Shah, University of Kentucky, Lexington, KY
D. A. Puleo, University of Kentucky, Lexington, KY
T. D. Dziubla, University of Kentucky, Lexington, KY

257 **PEI-Silica Hybrid Coating for Controlling Biodegradation Rate of Magnesium**
M. Kang, Department of Materials Science and Engineering, Seoul National University, Seoul, Republic of Korea,
T. Jang, Department of Materials Science and Engineering, Seoul National University, Seoul, Republic of Korea,
H. Jung, Department of Materials Science and Engineering, Seoul National University, Seoul, Republic of Korea,
S. Kim, Department of Materials Science and Engineering, Seoul National University, Seoul, Republic of Korea,
S. Jung, Department of Materials Science and Engineering, Seoul National University, Seoul, Republic of Korea,
H. Kim, Department of Materials Science and Engineering, Seoul National University, Seoul, Republic of Korea,

258 **Plasma-treated substrates reduces protein adsorption as studied by electron spectroscopy for chemical analysis**
B. D. Ratner, University of Washington, Seattle, WA

259 **SNEP - Silver Nanoparticles Embedded in Polymers: A New Class of Implant Coatings to**

Prevent Biofilm Formation

L. Actis, University of Texas at San Antonio, San Antonio, TX
A. Srinivasan, University of Texas at San Antonio, San Antonio, TX
A. Ramasubramanian, University of Texas at San Antonio, San Antonio, TX
J. L. Ong, University of Texas at San Antonio, San Antonio, TX

260 **Protein Adsorption and Affects on Platelet Adhesion and Bacterial Adhesion on Submicron Textured Biomaterial Surfaces**

L. Xu, The Pennsylvania State University, College of Medicine, Hershey, PA
C. Siedlecki, The Pennsylvania State University, College of Medicine, Hershey, PA

261 **Interactions of Lipoproteins with a Polyurethane and PEO-Modified Polyurethane**

R. M. Cornelius, McMaster University,
J. Macri, McMaster University,
K. M. Cornelius, McMaster University,
J. L. Brash, McMaster University,

Con-current Oral Abstract Presentations Session 7

Advances and Challenges in Biomaterial-Associated Infection and Pathogenesis

263 **Antimicrobial Performance of Surface Modifications Inspired by Plant Polyphenols**
T. S. Sileika, Northwestern University, Evanston, IL
D. G. Barrett, Northwestern University, Evanston, IL
P. B. Messersmith, Northwestern University, Evanston, IL

264 **Selenium Nanoparticle Coated Paper Towels Prevent Various Bacterial Growth**
Q. Wang, Northeastern University, Boston, MA
T. Webster, Northeastern University, Boston, MA

265 **Effect of LL-37 Peptide in Disrupting Biofilms**
B. Li, West Virginia University School of Medicine, Morgantown, WV
J. Noore, West Virginia University School of Medicine, Morgantown, WV
W. Artrip, West Virginia University School of Medicine, Morgantown, WV
S. McHenry, West Virginia University, Morgantown, WV

266 **Mitigation of Biofilm Formation with an Elastomeric Barrier Membrane System**
A. M. Tatara, Rice University, Houston, TX
S. R. Shah, Rice University, Houston, TX
D. S. Puperi, Rice University, Houston, TX
B. M. Watson, Rice University, Houston, TX
K. J. Grande-Allen, Rice University, Houston, TX
M. E. Wong, University of Texas Health Science Center at Houston, Houston, TX
A. G. Mikos, Rice University, Houston, TX
F. K. Kasper, Rice University, Houston, TX

267 **PNDJ Delivering Gentamicin Controls Orthopaedic Infection in a Rabbit Model**
R. Y. McLemore, Banner Good Samaritan Medical Center, Phoenix, AZ
D. J. Overstreet, Sonoran Biosciences, Phoenix, AZ
A. C. McLaren, Banner Good Samaritan Medical Center, Phoenix, AZ
B. L. Vernon, Arizona State University, Tempe, AZ

268 **In vitro and in vivo biocompatibility of D-amino acid/polyurethane polymeric biocomposites for bacterial biofilm prevention in bone defects**
A. J. Harmata, Vanderbilt University, Nashville, TN
C. J. Sanchez, U.S. Institute of Surgical Research, Jbsa Fort Sam Houtson, TX
A. D. Talley, Vanderbilt University, Nashville, TN
K. J. Zienkiewicz, Vanderbilt University, Nashville, TN
J. C. Wenke, U.S. Institute of Surgical Research, Jbsa Fort Sam Houtson, TX
S. A. Guelcher, Vanderbilt University, Nashville, TN

Advances in Three Dimensional Scaffolds for Tissue Regeneration II

269 **Collagen Fiber Matrix Coating on Cell Surfaces for Development of Cell-Density Controllable 3D-Thick TIssues**

C. Liu, Osaka University, Osaka, Japan
M. Akashi, Osaka University, Osaka, Japan

270 **Sequential Click Reactions for Polymerizing and Functionalizing Hydrogel Biomaterials**
D. L. Alge, University of Colorado, Boulder, CO
K. S. Anseth, University of Colorado, Boulder, CO

271 **Hyaluronic Acid – Calcium Phosphate Nano Composite via in-situ Precipitation**
S. Jeong, Department of Materials Science and Engineering, Seoul National University, Seoul, Korea, Republic of
T. Jang, Department of Materials Science and Engineering, Seoul National University, Seoul, Korea, Republic of
H. Jeong, Department of Materials Science and Engineering, Seoul National University, Seoul, Korea, Republic of
M. Kang, Department of Materials Science and Engineering, Seoul National University, Seoul, Korea, Republic of
H. Kim, Demartment of Materials Science and Engineering, Seoul National University, Seoul, Korea, Republic of

272 **3D Printing of Complex Scaffolds Using Freeform Reversible Embedding of Suspended Hydrogels (FRESH)**
T. J. Hinton, Carnegie Mellon University, Pittsburgh, PA
A. W. Feinberg, Carnegie Mellon University, Pittsburgh, PA

273 **Optimization of Injectable Anisotropic Chitosan-based Hydrogels and in vivo Evaluation**
K. J. Walker, Oklahoma State University, Stillwater, OK
S. V. Madihally., Oklahoma State University, Stillwater, OK

274 **Reduced Graphene Oxide Incorporated Myocardial Matrix as a Functional Scaffold for Cardiac Tissue Engineering**
J. H. Tsui, University of Washington, Seattle, WA
J. Jang, POSTECH, Pohang, Korea, Republic of
N. Neal, University of Washington, Seattle, WA
D. Cho, POSTECH, Pohang, Korea, Republic of
D. Kim, University of Washington, Seattle, WA

275 **Optimization of Endothelial Cell (HUVEC)-Gingival Fibroblasts Co-cultures in Perfused Degradable/Polar/Hydrophobic/Ionic Polyurethane (D-PHI) Scaffolds**
J. Cheung, University of Toronto,
C. A. G. McCulloch, University of Toronto,
J. P. Santerre, University of Toronto,

276 **Rapid Assembly of Perfusable and Vascularizable Modular Constructs for Hepatic Tissue Engineering**
R. T. Annamalai, Wayne State University, Detroit, MI
H. W. T. Matthew, Wayne State University, Detroit, MI

Alternative Bearing Surfaces

277 **Comparison Between Surface Roughness and Wettability on Retrieved Metal and Ceramic Femoral Heads**
A. W. Wusylko, Clemson University, Clemson, Sc, SC

R. Freed, Clemson University, Clemson Sc, SC
J. Brandt, Concordia Joint Replacement Group,
T. Turgeon, Concordia Hip & Knee Institute,
K. Kornev, Clemson University, Clemson, SC
M. Harman, Clemson University, Clemson, SC

278 **Metal-on-Metal Hip Wear Measurement of Retrievals, Methodology and Validation**
J. Vincelli, Dartmouth College, North Kingstown, RI

279 **Adverse Local Tissue Response in Metal-On-Metal Surface Replacement Compared to Metal-On-Polyethylene Bearings with Corroded Modular Junctions**
D. J. Hall, Rush University Medical Center, Chicago, IL
R. M. Urban, Rush University Medical Center, Chicago, IL
C. J. Della Valle, Rush University Medical Center, Chicago, IL
H. J. Cooper, Rush University Medical Center, Chicago, IL
J. O. Galante, Rush University Medical Center, Chicago, IL
J. J. Jacobs, Rush University Medical Center, Chicago, IL

280 **The Effect of Methane Concentration on Micro-textured Ti6Al4V-carbide Hardness and Specimen Weight Gain**
S. J. L. Sullivan, University of Maryland, Baltimore County, Mount Airy, MD
L. D. T. Topoleski, University of Maryland, Baltimore County, Baltimore, MD

281 **Fretting Corrosion Analysis of 316L Stainless Steel (316LSS) under 240 Grit, 320 Grit and 600 Grit Surface Roughness**
A. Shenoy, Syracuse Biomaterials Institute, Syracuse, NY
J. Gilbert, Syracuse Biomaterials Institute, Syracuse, NY

282 **Particles from vitamin-E-diffused highly cross-linked UHMWPE induce less osteolysis compared to highly cross-linked virgin UHMWPE in a murine calvarial bone model**
D. A. Bichara, Harris Orthopaedic Laboratory, Massachusetts General Hospital, Boston, MA
E. Malchau, Harris Orthopaedic Laboratory, Massachusetts General Hospital, Boston, MA
N. Hylleholt, Harris Orthopaedic Laboratory, Massachusetts General Hospital, Boston, MA
S. Cakmak, Harris Orthopaedic Laboratory, Massachusetts General Hospital, Boston, MA
O. K. Muratoglu, Harris Orthopaedic Laboratory, Massachusetts General Hospital, Boston, MA
E. Oral, Massachusetts General Hospital, Boston, MA

283 **Metal-on-Metal Hip Wear Patterns of Explanted Components Do Not Match Simulator Results**
J. Vincelli, Dartmouth College, North Kingstown, RI

284 **Developing Loading Conditions for Experimental and Computational Knee Simulators**
C. Fitzpatrick, University of Denver, Denver, CO

Biomaterials Microenvironment for Stem Cells and Tissue Regeneration III

285 **Heparin Coating for Controlled Biomolecule Presentation to Mesenchymal Stem Cell Spheroids**
J. Lei, Georgia Institute of Technology, Atlanta, GA
L. McLane, Georgia Institute of Technology, Atlanta, GA
J. Curtis, Georgia Institute of Technology, Atlanta, GA
J. S. Temenoff, Georgia Institute of Technology, Atlanta, GA

286 **Plasma-based hydrogels for the treatment of deep-partial thickness burns**
D. M. Burmeister, US Army Institute of Surgical Research, Fort Sam Houston, TX
D. C. Roy, US Army Institute of Surgical Research, Fort Sam Houston, TX
B. M. Ford, US Army Institute of Surgical Research, Fort Sam Houston, TX
R. E. Coronado, US Army Institute of Surgical Research, Fort Sam Houston, TX
S. Natesan, US Army Institute of Surgical Research, Fort Sam Houston, TX
R. J. Christy, US Army Institute of Surgical Research, Fort Sam Houston, TX

287 **Enzymatically degradable poly (ethylene glycol) hydrogels for long term maintenance and differentiation of human embryonic stem cell derived pancreatic precursor cells.**
L. D. Amer, University of Colorado Boulder, Boulder, CO
M. J. Mahoney, University of Colorado Boulder, Boulder, CO
S. J. Bryant, University of Colorado Boulder, Boulder, CO

288 **In Vitro Tumor Invasion and Metastasis Assays Using 3D-Human Tumor Models with Blood- and Lymph-Capillary Networks**
A. Nishiguchi, Graduate School of Engineering, Osaka University, Suita, Osaka, Japan
M. Matsusaki, Graduate School of Engineering, Osaka University, Suita, Osaka, Japan
M. Akashi, Graduate School of Engineering, Osaka University, Suita, Osaka, Japan

289 **Infected Apical Papillae of Immature Permanent Teeth Retain the Regenerative Capacity**
J. Oh, Seoul National University, Seoul, Korea, Republic of
Y. Yoo, Seoul National University, Seoul, Korea, Republic of
W. Lee, Seoul Nationa University, Seoul, Korea, Republic of
K. Woo, Seoul National University, Seoul, Korea, Republic of

290 **Integrin-Specific Hydrogels for the Delivery of Human Mesenchymal Stem Cells in Bone Repair**
A. Y. Clark, Georgia Institute of Technology, Atlanta, GA
A. J. Garcia, Georgia Institute of Technology, Atlanta, GA

291 **Engineered Hyaluronic acid based Hydrogels for Survival and Transplantation of Stem Cells**
A. K. Jha, University of California, Berkeley, Berkeley, CA
K. M. Tharp, University of California, Berkeley, Berkeley, CA
J. Ye, University of California, San Francisco, Sanfrancisco, CA
J. L. Santiago-Ortiz, University of California, Berkeley, Berkeley, CA
W. M. Jackson, University of California, Berkeley, Berkeley, CA
D. V. Schaffer, University of California, Berkeley, Berkeley, CA
Y. Yeghiazarians, University of California, SanFrancisco, Sanfrancisco, CA
K. E. Healy, University of California, Berkeley, Berkeley, CA

292 **Protein stabilized and sustained deliverable nanofiber 'smart scaffold' for multiphase tissue regeneration**
J. Giri, Indian Institute of Technology, Hyderabad, Hyderabad, India
B. Chandra, American Dental Association Foundation, Gaithersburg, MD
N. Kumar, American Dental Association Foundation, Gaithersburg, MD
M. T. Cicerone, National Institute of Standards and Technology, Gaithersburg, MD

Implantable Drug Delivery Systems for Medical Devices and Cancer Therapy

293 **Hydrogel Dopped with Nanoparticles for Local Sustained Release of siRNA in Breast Cancer**

N. Segovia, IQS, Barcelona, Spain
V. Ramos, IQS, Barcelona, Spain
S. Borros, IQS, Barcelona, Spain
N. Artzi, MIT, Cambridge, MA

294 **Development of a Novel Release Phantom for Improved In Vitro-In Vivo Correlation of Drug Release From In Situ Forming Polymer Implants**
C. Hernandez, Case Western Reserve University, Cleveland Heights, OH
L. Solorio, Case Western Reserve University, Cleveland, OH
H. Zhou, Case Western Reserve University, Cleveland, OH
A. A. Exner, Case Western Reserve University, Cleveland, OH

295 **Functional Denture Materials for Rechargeable, Long-term Antifungal Drug Delivery**
Y. Sun, UMass Lowell, Lowell, MA

296 **Noninvasive Characterization of Polymer Degradation and Erosion using Ultrasound Elastography (UE)**
H. Zhou, Case Western Reserve University, Cleveland, OH
M. Goss, Case Western Reserve University, Cleveland, OH
A. Gawlik, Case Western Reserve University, Cleveland, OH
C. Hernandez, Case Western Reserve University, Cleveland, OH
A. Exner, Case Western Reserve University, Cleveland, OH

297 **In vivo Evaluation of Porous Dexamethasone Releasing Coatings for Glucose Biosensors in Diabetic Rat Animal Model**
S. G. Vallejo-Heligon, Duke University, Durham, NC
B. Klitzman, Duke University, Durham, NC
W. M. Reichert, Duke University, Durham, NC

298 **Fabrication and characterization of PLGA-loaded BCNU microcapsules produced via electrojetting for drug delivery to brain tumors**
P. Fattahi, The Pennsylvania State University, State College, PA
A. Borhan, The Pennsylvania State University, University Park, PA
M. R. Abidian, The Pennsylvania State University, University Park, PA

299 **Dual Antibiotic Delivery from Chitosan Sponges Prevents In Vivo Polymicrobial Biofilm Infections**
J. K. Smith, University of Memphis, Memphis, TN
A. C. Parker, University of Memphis, Memphis, TN
J. A. Jennings, University of Memphis, Memphis, TN
K. E. Beenken, University of Arkansas for Medical Sciences, Little Rock, AR
M. S. Smeltzer, University of Arkansas for Medical Sciences, Little Rock, AR
W. Haggard, University of Memphis, Memphis, TN

300 **Mesenchymal Stromal Cells as a Cellular Delivery Platform of Prostate Cancer Prodrugs**
O. Levy, Brigham and Women's Hospital/Harvard Medical School, Cambridge, MA
N. Brennen, Johns Hopkins Sidney Kimmel Comprehensive Cancer Center, Baltimore, MD
E. Han, BWH/HMS, Cambridge, MA
S. Ranganath, BWH/HMS, Cambridge, MA
J. Ngai, BWH/HMS, Cambridge, MA
D. Rosen, Johns Hopkins Sidney Kimmel Comprehensive Cancer Center, Baltimore, MD
S. Billet, Cedars Sinai, Los Angeles, CA
N. Bhowmick, Cedars Sinai, Los Angeles, CA

S. Denmeade, Johns Hopkins, Baltimore, MD
J. Isaacs, Johns Hopkins, Baltimore, MD
J. Karp, BWH/HMS, Cambridge, MA

Microenvironments for Osteogenesis and Vasculogenesis - Physical, Chemical, and Biological Perspectives

301 **Tuning Poly(Ethylene Glycol) Hydrogel Mechanics Independent of Density via Peptide Sequence**
R. M. Schweller, Duke University, Durham, NC
J. L. West, Duke University, Durham, NC

302 **Osteoblast Response and Osseointegration of Direct Metal Laser Sintered Titanium Implants**
S. L. Hyzy, Virginia Commonwealth University, Richmond, VA
D. J. Cohen, Virginia Commonwealth University, Richmond, VA
A. Cheng, Georgia Institute of Technology, Emory University, Peking University, Richmond, VA
B. D. Boyan, Virginia Commonwealth University, Georgia Institute of Technology, Richmond, VA
Z. Schwartz, Virginia Commonwealth University, University of Texas Health Science Center, Richmond, VA

303 **PEG Hydrogels Functionalized with a Collagen-mimetic Peptide and Vascular Endothelial Growth Factor Promote Enhanced Network Formation of HUVECs and Therapeutic Value in Bone Defects**
J. Garcia, Georgia Institute of Technology, Atlanta, GA
A. J. Garcia, Georgia Institute of Technology, Atlanta, GA

304 **Roles of Nanofiber Structure and Chemistry in Directing Stem Cell Morphology, Osteogenic Differentiation and Gene Expression**
S. Sarkar, National Institute of Standards and Technology, Gaithersburg, MD
B. A. Baker, National Institute of Standards and Technology, Gaithersburg, MD
D. Chen, University of Maryland, College Park, MD
P. Pine, National Institute of Standards and Technology, Gaithersburg, MD
J. H. McDaniel, National Institute of Standards and Technology, Gaithersburg, MD
W. Losert, University of Maryland, College Park, MD
M. Salit, National Institute of Standards and Technology, Gaithersburg, MD
C. G. Simon, Jr., National Institute of Standards and Technlogy, Gaithersburg, MD
J. Dunkers, National Institute of Standards and Technology, Gaithersburg, MD

305 **Combinatorial Cassette for Screening of Osteogenesis by Transplanted Human Bone Marrow Stromal Cells**
S. Bodhak, National Institute of Standards & Technology (NIST) / National Institutes of Health (NIH), Gaithersburg, MD
L. Fernandez de Castro Diaz, National Institutes of Health/NIDCR, Bethesda, MD
S. A. Kuznetsov, National Institutes of Health/NIDCR, Bethesda, MD
T. Kilts, National Institutes of Health/NIDCR, Bethesda, MD
M. F. Young, National Institutes of Health/NIDCR, Bethesda, MD
S. Lin-Gibson, National Institute of Standards and Technology, Gaithersburg, MD
P. G. Robey, National Institutes of Health/NIDCR, Bethesda, MD
C. G. Simon, Jr., National Institute of Standards and Technology, Gaithersburg, MD

306 **Osteogenesis in Encapsulated Cultures of Mesenchymal Stem Cells: A Modular Platform for**

Improved Bone Regeneration

K. B. Miles, Wayne State University, Detroit, MI
H. W. T. Matthew, Wayne State University, Detroit, MI

308 **Regulation of HIF1 pathway enhanced osteogenic differentiation of mMSCs in MCNP scaffold**

D. S. Oh, Columbia University, New York, NY
J. Back, Columbia University, New York, NY
M. Hong, Columbia University, New York, NY
D. Shim, Duke University, New York, NY
J. Ko, Vassar College, New York, NY
F. Lee, Columbia University, New York, NY
H. Tawfeek, Columbia University, New York, NY

Con-current Oral Abstract Presentations Session 8

Advanced Engineered Metal-Based Biomaterials

309 **The Covalently Grafting of Chitosan onto Titanium Surface Stimulate Initial Osteogenesis of Osteoblast**

Y. Deng, The University of South Dakota, Sioux Falls, SD
Y. Sun, The University of Massachusetts, Lowell, MA

310 **Viability, Adhesion, and Morphology of Bone Marrow Stromal Cells on Four Magnesium-Zinc-Calcium Alloys**

A. F. Cipriano, University of California, Riverside, Riverside, CA
A. Sallee, California State University, San Bernardino, San Bernardino, CA
J. Sanchez, University of California, Riverside, Riverside, CA
H. Liu, University of California, Riverside, Riverside, CA

311 **Nanopost Fence A Novel Strategy of Preventing Smooth Muscle Cells Topographic Migration**

P. Tran, University of Arizona, Tucson, AZ
D. A. Martin, University of Arizona, Tucson, AZ
J. R. Gamboa, University of Arizona, Tucson, AZ
J. Yoon, University of Arizona, Tucson, AZ
M. J. Slepian, University of Arizona, Tucson, AZ

312 **OsseoTi™ - Porous Titanium Alloy For Enhanced Bone Integration**

G. Gupta, Biomet Inc., Warsaw, IN

313 **Enhanced bone formation on newly fabricated Cu-bearing stainless steel**

L. Ren, Institute of Metal Research, Chinese Academy of Sciences, Shenyang, China
K. Wong, The University of Hong Kong, Hong Kong, Hong Kong
K. Yang, Institute of Metal Research, Chinese Academy of Sciences, Shenyang, China
K. Yeung, The University of Hong Kong, Hong Kong, Hong Kong

314 **In vitro and in vivo assessments of pure Zn and Zn-1Mg alloy as biodegradable metals**

Y. F. Zheng, Peking University, Beijing, China
H. F. Li, Peking University, Beijing, China
X. H. Xie, The Chinese University of Hong Kong, Hong Kong, China
L. Qin, The Chinese University of Hong Kong, Hong Kong, China

316 **Control of Biodegradation Rate of Magnesium with PEI-Silica Hybrid Coating**

M. Kang, Department of Materials Science and Engineering, Seoul National University, Seoul, Republic of Korea,
T. Jang, Department of Materials Science and Engineering, Seoul National University, Seoul, Republic of Korea,
H. Jung, Department of Materials Science and Engineering, Seoul National University, Seoul, Republic of Korea,
S. Kim, Department of Materials Science and Engineering, Seoul National University, Seoul, Republic of Korea,
S. Jeong, Department of Materials Science and Engineering, Seoul National University, Seoul, Republic of Korea,

H. Kim, Department of Materials Science and Engineering, Seoul National University, Seoul, Republic of Korea,

Advances in Three Dimensional Scaffolds for Tissue Regeneration III

318 **Fluid Shear Calculation and non-Destructive Histology in Cell/Scaffold Constructs Cultured under Flow Perfusion**
V. I. Sikavitsas, University of Oklahoma, Norman, OK
R. S. Voronov, New Jersey Institute of Technology, Newark, NJ
S. B. van Gordon, University of Oklahoma Health Sciences Center, Oklahoma City, OK
D. V. Papavassiliou, University of Oklahoma, Norman, OK

319 **Engineering Anatomically Shaped Vascularized Bone Grafts with Adipose-Derived Stem Cells and 3D-Printed Polycaprolactone Scaffolds**
J. P. Temple, Johns Hopkins University, Baltimore, MD
D. L. Hutton, Johns Hopkins University, Baltimore, MD
B. P. Hung, Johns Hopkins University, Baltimore, MD
P. Huri, Johns Hopkins University, Baltimore, MD
C. Cook, Johns Hopkins University, Baltimore, MD
R. Kondragunta, Johns Hopkins University, Baltimore, MD
X. Jia, Johns Hopkins University, Baltimore, MD
W. L. Grayson, Johns Hopkins University, Baltimore, MD

320 **Development and Investigation of a New Generation Matrix for Osteochondral Tissue Engineering**
D. L. Dorcemus, University of Connecticut, Danbury, CT
S. P. Nukavarapu, University of Connecticut Health Center, Farmington, CT

321 **Biopolymer Hydrogel Microfibers with Internal Alignment via Electrospinning**
B. Ginn, Johns Hopkins University, Baltimore, MD

322 **Cellularly Degradable PEG Hydrogels with Tethered TGF-β1 for Improved Cartilage Engineering**
B. V. Sridhar, University of Colorado, Boulder, CO
M. A. Randolph, Massachusetts General Hospital, Boston, MA
K. S. Anseth, University of Colorado/HHMI, Boulder, CO

323 **Airbrushed Amorphous CaP-Polymer Nanofiber Scaffolds with Enhanced Cell Penetration for Bone Tissue Regeneration**
W. Tutak, American Dental Association Foundation, Gaithersburg, MD
K. Hoffman, American Dental Association Foundation, Gaithersburg, MD
D. Skrtic, American Dental Association Foundation, Gaithersburg, MD

324 **Development of Co-Electrospun Scaffolds with Tunable Mechanical Properties and Bioactivity**
C. Radzicki, Texas A&M University, College Station, TX
R. Nezarati, Texas A&M University, College Station, TX
E. Cosgriff-Hernandez, Texas A&M University, College Station, TX

Benchtop Models to Support Medical Device and Pharmaceutical Development

325 **Disease Specific Cardiac Tissue Models for Drug Discovery and Toxicology**

A. Mathur, University of California, Berkeley, Berkeley, CA
P. Loskill, University of California, Berkeley, Berkeley, CA
S. Hong, University of California, Berkeley, Berkeley, CA
Z. Ma, University of California, Berkeley, Berkeley, CA
N. Huebsch, Gladstone Institutes, San Francisco, CA
M. Finnegan, University of California, Berkeley, Berkeley, CA
S. G. Marcus, University of California, Berkeley, CA
N. C. Marks, University of California, Berkeley, Berkeley, CA
B. R. Conklin, Gladstone Institutes, San Francisco, CA
L. P. Lee, University of California, Berkeley, CA
K. E. Healy, University of California, Berkeley, Berkeley, CA

326 **Compound Action Potential Propagation in Microengineered Peripheral Neural Tissues**

M. J. Moore, Tulane University, New Orleans, LA
R. M. Huval, Tulane University, New Orleans, LA
O. H. Miller, Tulane University, New Orleans, LA
Y. Fan, Tulane University, New Orleans, LA
B. J. Hall, Tulane University, New Orleans, LA

327 **Wicking Fiber Approach for Cell Separation and Isolation**

K. J. K. Burg, Clemson University, Clemson, SC

328 **Quantifying Performance of a Bi-functional Tissue Adhesive for Internal Wound Repair**

L. Sanders, Clemson University, Clemson, SC
R. Stone, Clemson University, Anderson, SC
K. Webb, Clemson University, Clemson, SC
T. Mefford, Clemson University, Anderson, SC
J. Nagatomi, Clemson University, Clemson, SC

329 **Design, fabrication and characterization of microphysiological systems to study drug toxicity in cardiac and adipose tissue**

P. Loskill, University of California at Berkeley, Berkeley, CA
A. Mathur, University of California at Berkeley, Berkeley, CA
S. Hong, University of California at Berkeley, Berkeley, CA
B. R. Conklin, Gladstone Institute of Cardiovascular Disease, San Francisco, CA
L. P. Lee, University of California at Berkeley, Berkeley, CA
A. Stahl, University of California at Berkeley, Berkeley, CA
K. E. Healy, University of California at Berkeley, Berkeley, CA

330 **Superhydrophobic patterned chips as platforms for high-content drug screening in 3D tissues produced in vitro**

M. B. Oliveira, 3B's Research Group - University of Minho, Guimarães, Portugal
A. I. Neto, 3B's Research Group - University of Minho, Guimarães, Portugal
C. R. Correia, 3B's Research Group - University of Minho, Guimarães, Portugal
M. Rial-Hermida, Universidad de Santiago de Compostela, Santiago De Compostela, Spain
C. Alvarez-Lorenzo, Universidad de Santiago de Compostela, Santiago De Compostela, Spain
J. F. Mano, 3B's Research Group - University of Minho, Guimarães, Portugal

331 **Macrophage Embedded Fibrin Gels as a Novel In Vitro Platform for Assessing Implantable Glucose Sensor Performance**

M. T. Novak, Duke University, Durham, NC
W. M. Reichert, Duke University, Durham, NC

332 **A Benchtop Model for Comparison of Abrasiveness between Surgical Devices**

T. Ebner, Covidien, North Haven, CT
D. Jermine, Covidien, North Haven, CT
A. Throm, Covidien, North Haven, CT
D. Bronson, Covidien, North Haven, CT

Biologically Derived Materials from Natural Resources II

333 **Green solvents extraction of sponge-origin collagen/gelatin for biomedical applications**

A. Barros, 3B's Research Group – Biomaterials, Biodegradables and Biomimetics, University of Minho, Headquarters of the European Institute of Excellence on Tissue Engineering and Regenerative Medicine, AvePark, 4806-909 Taipas, Guimarães, Portugal,
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334 **Injectable Adipose ECM Hydrogels Stimulate Neovascularization and Subsequent Adipose Regeneration**

A. Young, UC San Diego, La Jolla, CA
V. Bajaj, UC San Diego, La Jolla, CA
K. Christman, UC San Diego, La Jolla, CA

335 **Preparation of Raspberry Ketone Modified Chitosan Microspheres and Effect on Macrophage Activation**

A. P. Hoban, University of Memphis, Memphis, TN
D. Abebe, University of Memphis, Memphis, TN
A. Jennings, University of Memphis, Memphis, TN
T. Fujiwara, University of Memphis, Memphis, TN
W. O. Haggard, University of Memphis, Memphis, TN
J. D. Bumgardner, University of Memphis, Memphis, TN

336 **Biologically Derived Nano-Scaffolds from Sundew Adhesive for Tissue Engineering**

Y. Huang, The University of Tennessee, Knoxville, Knoxville, TN

337 **Preparation and characterization of a decellularized dermis-polymer complex for the use in percutaneous devices**

K. Nam, Institute of Biomaterials and Bioengineering, Tokyo Medical and Dental University, Tokyo, Japan
T. Kimura, Institute of Biomaterials and Bioengineering, Tokyo Medical and Dental University, Tokyo, Japan
A. Kishida, Institute of Biomaterials and Bioengineering, Tokyo Medical and Dental University, Tokyo, Japan

338 **Decellularized Adipose Tissue-Derived Extracellular Matrix as a Bioactive Coating Material**
B. Luo, Nanyang Technological University, Singapore, Singapore
T. Wong, Tan Tock Seng Hospital, Singapore, Singapore
T. Tan, Nanyang Technological University, Singapore, Singapore
N. Tan, Nanyang Technological University, Singapore, Singapore
C. Choong, Nanyang Technological University, Singapore, Singapore

339 **Radioprotection of Bone Allograft using Vitamin E Derivatives**
E. Oral, Massachusetts General Hospital, Harvard Medical School, Boston, MA
J. Suhardi, Massachusetts General Hospital, Boston, MA
O. Muratoglu, Massachusetts General Hospital, Boston, MA

340 **Aqueous stable chitosan electrspun nanofibers for tissue engineering**
C. Wu, Department of biomedical engineering, Jinan University; Department of biomedical engineering, University of Memphis, Memphis, TN
H. Su, Department of Biomedical Engineering, University of Memphis, Memphis, TN
S. Tang, Department of Biomedical Engineering, Jinan University, Guangzhou, China
W. O. Haggard, Department of Biomedical Engineering, University of Memphis, Memphis, TN
J. D. Bumgardner, Department of Biomedical Engineering, University of Memphis, Memphis, TN

Biomaterials Microenvironment for Stem Cells and Tissue Regeneration II

341 **Enhancement of Nonviral Direct Conversion to Neurons Using Substrate Topography**
C. L. Grigsby, Duke University, Durham, NC
A. F. Adler, Duke University, Durham, NC
K. Kulangara, Duke University, Durham, NC
B. K. K. Teo, National University of Singapore, Singapore, Singapore
C. Lim, National University of Singapore, Singapore, Singapore
E. K. F. Yim, National University of Singapore, Singapore, Singapore
K. W. Leong, Duke University, Durham, NC

342 **Encapsulation and Cardiac Differentiation of hiPSCs in 3D PEG-Fibrinogen Hydrogels**
P. Kerscher, Auburn University, Auburn, AL
A. J. Hodge, Auburn University, Auburn, AL
J. Kim, Auburn University, Auburn, AL
I. C. Turnbull, Icahn School of Medicine at Mount Sinai, New York, NY
B. S. Bussie, Auburn University, Auburn, AL
D. Seliktar, Technion-Israel Institute of Technology, Haifa, Israel
C. J. Easley, Auburn University, Auburn, AL
K. D. Costa, Icahn School of Medicine at Mount Sinai, New York, NY
E. A. Lipke, Auburn University, Auburn, AL

343 **Adhesive Signature Technology for iPSC-Derived Neuronal Cells in Regenerative Medicine**
E. A. Cermeño, Georgia Institute of Technology, Atlanta, GA
B. Culp, ArunA Biomedical, Inc., Athens, GA
J. Chilton, ArunA Biomedical, Inc., Athens, GA
A. Majumder, ArunA Biomedical, Inc., Athens, GA
A. Singh, Georgia Institute of Technology, Atlanta, GA
S. Stice, ArunA Biomedical, Inc., Athens, GA
T. C. McDevitt, Georgia Institute of Technology, Atlanta, GA
A. J. García, Georgia Institute of Technology, Atlanta, GA

344 **A hypoxic environment modulates mesenchymal stem cell function and the exerted effects on macrophages**
L. M. Ricles, The University of Texas at Austin, Austin, TX
E. Chung, The University of Texas at Austin, Austin, TX
L. J. Suggs, The University of Texas at Austin, Austin, TX

345 **Degradable Hydrogels to Control MSC Localization and Persistence at Decellularized Bone Allografts**
M. D. Hoffman, University of Rochester, Rochester, NY
A. H. Van Hove, University of Rochester, Rochester, NY
D. S. W. Benoit, University of Rochester, Rochester, NY

346 **A Controlled Delivery Method to Localize Stem Cells in Vivo**
S. Leslie, Virginia Commonwealth University, Richmond, VA
Z. Schwartz, Virginia Commonwealth University, Richmond, VA
B. Boyan, Virginia Commonwealth University, Richmond, VA

347 **Matrix Modulus-induced Myogenic Differentiation of Rat Mesenchymal Stem Cells in Thermosensitive Hydrogels**
Y. Xu, The Ohio State University, Columbus, OH
Z. Li, The Ohio State University, Columbus, OH
H. Li, The Ohio State University, Columbus, OH
Z. Li, The Ohio State University, Columbus, OH
Z. Fan, The Ohio State University, Columbus, OH
X. Li, The Ohio State University, Columbus, OH
P. Duann, The Ohio State University, Columbus, OH
P. Anderson, The Ohio State University, Columbus, OH
J. Guan, The Ohio State University, Columbus, OH

348 **Assessing Influences of Vascular Cells on the Behavior of Lung Adenocarcinoma in a Three-dimensional Biomimetic Tumor Angiogenesis Model**
L. C. Roudsari, Duke University, Durham, NC
J. L. West, Duke University, Durham, NC

In-Situ Formed Biomaterials Translating to the Clinic and Marketplace

349 **An In Situ Self-Expanding Polyurethane Foam for the Treatment of Noncompressible Abdominal Hemorrhage**
U. Sharma, Arsenal Medical, Watertown, MA
A. Rago, Arsenal Medical, Watertown, MA
G. Zugates, Arsenal Medical, Watertown, MA
R. Busold, Arsenal Medical, Watertown, MA
M. Duggan, MGH, Boston, MA
D. King, MGH, Boston, MA

350 **Intrusion Characteristics of Two Bone Cements for Tibial Component of Total Knee Arthroplasty in a Cadaveric Bone Model**
J. K. Walden, University of Kansas School of Medicine-Wichita, Wichita, KS
A. C. M. Chong, The University of Kansas School of Medicine- Wichita, Wichita, KS
N. L. Dinh, The University of Kansas School of Medicine- Wichita, Wichita, KS
R. Cusick, The University of Kansas School of Medicine- Wichita, Wichita, KS
S. Adrian, The University of Kansas School of Medicine- Wichita, Wichita, KS

P. H. Wooley, The University of Kansas School of Medicine- Wichita, Wichita, KS

351 **Visualization of In Situ Forming Hydrogels in the Myocardium using CEST MRI**
S. M. Dorsey, University of Pennsylvania, Philadelphia, PA
F. Kogan, University of Pennsylvania, Philadelphia, PA
M. Haris, University of Pennsylvania, Philadelphia, PA
R. Reddy, University of Pennsylvania, Philadelphia, PA
J. A. Burdick, University of Pennsylvania, Philadelphia, PA

352 **Interfacial thiol-ene photochemistry for forming orthogonal immuno-isolation coating on pancreatic islets**
H. Shih, Purdue University, Indianapolis, IN
C. Lin, Indiana University-Purdue University Indianapolis, Indianapolis, IN

353 **The Effects of Pulsatile Fatigue on in Situ Fenestrated Endovascular Stent Grafts Deployed inside a Phantom of an Aortic Aneurysm**
T. YAO, North Carolina State University, Raleigh, NC

354 **Intramedullary Bone Stabilization Device Using a Light-Curable Monomer**
B. G. Zani, CBSET, Inc., Lexington, MA
R. Baird, CBSET, Inc., Lexington, MA
J. R. L. Stanley, CBSET, Inc., Lexington, MA
P. M. Markham, CBSET, Inc., Lexington, MA
M. Wilke, AO Foundation, Davos, Switzerland
S. Zeiter, AO Foundation, Davos, Switzerland
A. Beck, AO Foundation, Davos, Switzerland
D. Nehrbass, AO Foundation, Davos, Switzerland
G. A. Kopia, Kopia Consulting, Hillsborough, NJ
E. R. Edelman, Massachusetts Institute of Technology, Cambridge, MA
R. Rabiner, IlluminOss Medical Inc., East Providence, RI

355 **Skin Hydration with a Novel In-Situ Crosslinked Silicone Film: A Pilot Skin Conductance Study**
A. Patel, Living Proof, Inc., Cambridge, MA

Con-current Oral Abstract Presentations Session 9

Cardiovascular Biomaterials and Blood Compatibility II

356 **Partial Thromboplastin Time and Prothrombin Time for the Hemocompatibility Evaluation of Biomaterials**
Q. Lu, U.S. Food and Drug Administration, Silver Spring, MD
M. A. Shamsie, U.S. Food and Drug Administration, Silver Spring, MD
J. M. Nehrer, U.S. Food and Drug Administration, Silver Spring, MD
R. A. Malinauskas, U.S. Food and Drug Administration, Silver Spring, MD

357 **Development of a Model Surface for Bioprosthetic Heart Valves**
M. M. Fahrenholtz, Rice University, Houston, TX
N. Dixit, University of California, Berkeley, Berkeley, CA
K. J. Grande-Allen, Rice University, Houston, TX

358 **Hemocompatibility evaluation of elastomeric hollow fiber membranes as vascular grafts**
A. E. Mercado-Pagan, Stanford University, Stanford, CA
D. Ker, Stanford University, Stanford, CA
Y. Yang, Stanford University, Stanford, CA

359 **Modifying Venous Valve Biomaterial for Protein C Activation**
J. J. Glynn, Oregon Health & Science University, Portland, OR
E. G. Polsin, University of Portland, Portland, OR
M. T. Hinds, Oregon Health & Science University, Portland, OR

360 **Elastic/adhesive double-layered PLA-PEG multiblock copolymer membranes for prevention of cecum and cardiac adhesions**
T. Yamaoka, Department of Biomedical Engineering, National Cerebral and Cardiovascular Center Research Institute, Suita, Japan
E. Njatawidjaja, Department of Biomedical Engineering, National Cerebral and Cardiovascular Center Research Institute, Suita, Japan
C. Agudelo, Department of Biomedical Engineering, National Cerebral and Cardiovascular Center Research Institute, Suita, Japan
S. Kakinoki, Department of Biomedical Engineering, National Cerebral and Cardiovascular Center Research Institute, Suita, Japan
A. Mahara, Department of Biomedical Engineering, National Cerebral and Cardiovascular Center Research Institute, Suita, Japan

361 **Bio-Inspired, Engineered Microtopographies Reduce Platelet Adhesion and Activation on Blood-Contacting Materials**
C. M. Kirschner, Sharklet Technologies, Inc., Aurora, CO
R. M. May, Sharklet Technologies, Inc., Aurora, CO
E. E. Mann, Sharklet Technologies, Inc., Aurora, CO
J. Fraser, Sharklet Technologies, Inc., Aurora, CO
C. A. Siedlecki, The Pennsylvania State University, Hershey, PA
A. B. Brennan, University of Florida, Gainesville, FL
S. T. Reddy, Sharklet Technologies, Inc., Aurora, CO

362 **In Vitro and In Vivo Investigation of Nanostructured Vascular Patches**

S. Grant, University of Missouri, Columbia, MO
A. Ostdiek, University of Missouri, Columbia, MO
D. Grant, University of Missouri, Columbia, MO
R. Gopaldas, University of Missouri, Columbia, MO

363 **The Effects of Activated Non-Aggregated Platelets on Blood Plasma Coagulation**
L. Xu, The Pennsylvania State University, College of Medicine, Hershey, PA
D. Grosz, Washington and Jefferson College, Washington, PA
E. A. Vogler, The Pennsylvania State University, University Park, PA
C. A. Siedlecki, The Pennsylvania State University College of Medicine, Hershey, PA

Cellular and Molecular Responses of Biomaterials at the Biomaterial-Tissue Interface I

365 **Cell-Biomaterial Interface Cues Reinstate Declining Stemness in Aging Adult Stem Cells**
S. W. Crowder, Vanderbilt University, Nashville, TN
D. A. Balikov, Vanderbilt University, Nashville, TN
H. N. Lewis, Vanderbilt University, Nashville, TN
C. M. Ambrose, Vanderbilt University, Nashville, TN
S. Lee, Vanderbilt University, Nashville, TN
H. Sung, Vanderbilt University, Nashville, TN

366 **Photo-crosslinked Polymer Nanowires for Regulating Smooth Muscle Cells**
X. Liu, University of Tennessee, Knoxville, TN
S. Wang, University of Tennessee, Knoxville, TN

367 **Development of a Novel Optical Probe for In Vivo Detection of Biomaterial-Associated Apoptosis**
l. tang, university of texas at arlington, Arlington, TX
J. ZHOU, UNIVERSITY OF TEXAS AT ARLINGTON, Arlington, TX
H. WENG, UNIVERSITY OF TEXAS AT ARLINGTON, Arlington, TX
Y. Tsai, University of Texas at Arlington, Arlington, TX

368 **In vivo assessment of guided neural stem cell differentiation in growth factor immobilized hydrogel scaffolds**
H. Li, The University of Akron, Akron, OH
P. Sloan, Akron General Medical Center, Akron, OH
K. Bondor, Akron General Medical Center, Akron, OH
A. Koenig, The University of Akron, Akron, OH
N. Leipzig, The University of Akron, Akron, OH

369 **Interaction of Electrically Stimulated Fibroblasts with Keratinocytes promotes Better Skin Equivalent Production**
H. Park, Université Laval,
D. Rouabhia, Université Laval,
Z. Zhang, Saint-François d'Assise Hospital Research Center,
D. Lavertu, Saint-François d'Assise Hospital Research Center,
M. Rouabhia, Université Laval,

370 **Wnt-BMP Cross-Talk Regulates Osteoblastic Differentiation of Human MSCs on Microstructured Surfaces**
R. Olivares-Navarrete, Virginia Commonwealth University, Richmond, VA
S. L. Hyzy, Virginia Commonwealth University, Richmond, VA

C. A. Cundiff, Georgia Institute of Technology, Atlanta, GA
D. Haithcock, Georgia Institute of Technology, Atlanta, GA
C. Wasilewski, Georgia Institute of Technology, Atlanta, GA
Z. Schwartz, Virginia Commonwealth University, Richmond, VA
B. D. Boyan, Virginia Commonwealth University, Richmond, VA

Ceramics and Composites in Bone Tissue Engineering and Drug Delivery II

371 **Functionalization of scaffolds with chimeric anti-BMP-2 monoclonal antibodies for osseous regeneration**
S. Ansari, Ostrow School of Dentistry of USC, Los Angeles, CA
A. Moshaverinia, Ostrow School of Dentistry of USC, Los Angeles, CA
H. H. Zadeh, Ostrow School of Dentistry of USC, Los Angeles, CA

372 **Engineered Microstructure Granules for Tailored Drug Release Rate**
M. Hong, Columbia University Medical Center, New York, NY
D. S. Oh, Columbia University Medical Center, New York, NY

373 **Drug Release and Mechanical Effects of Poly(β-Amino Ester) and Hydroxyapatite on In Situ Forming PLGA Systems**
P. D. Fisher, University of Kentucky, Lexington, KY
T. Milbrandt, University of Kentucky, Lexington, KY
Z. Hilt, University of Kentucky, Lexington, KY
D. A. Puleo, University of Kentucky, Lexington, KY

374 **Tailored Properties of Bilayered Calcium Sulfate and Calcium Phosphate Bone Graft Substitutes**
B. Orellana, University of Kentucky, Lexington, KY
M. McQuinn, University of Kentucky, Lexington, KY
D. Puleo, University of Kentucky, Lexington, KY

375 **Self-healing Colloidal Gels are formed by Cohesive Interactions between Gelatin and Hydroxyapatite Nanoparticles**
S. C. G. Leeuwenburgh, Radboud University Medical Center, Nijmegen, Netherlands
M. Bongio, Radboud University Medical Center, Nijmegen, Netherlands
K. Farbod, Radboud University Medical Center, Nijmegen, Netherlands
J. J. J. van den Beucken, Radboud University Medical Center, Nijmegen, Netherlands
J. A. Jansen, Radboud University Medical Center, Nijmegen, Netherlands

376 **Surface Adsorption of rhBMP-2 to Hydroxyapatite Reinforced PEEK Scaffolds**
M. J. Meagher, University of Notre Dame, Notre Dame, IN
C. H. Merrill, University of Notre Dame, Notre Dame, IN
R. K. Roeder, University of Notre Dame, Notre Dame, IN

377 **SrO and SiO2 Doped Tricalcium Phosphate bone tissue engineering Scaffolds with improved mechanical and biological properties**
D. Ke, Washington State University, Pullman, WA

378 **Multifunctional Neodymium Doped Hydroxyapatite Supramolecular Complexes as Luminescent Drug Carriers**
S. P. Victor, Sree Chitra Tirunal Institute for Medical Science and Technology, Trivandrum, India

M. Jayabalan, Sree Chitra Tirunal Institute for Medical Science and Technology, Trivandrum, India
C. P. Sharma, Sree Chitra Tirunal Institute for Medical Science and Technology, Trivandrum, India

Engineering Biomaterial Surface Topography for Tissue Repair

380 **Bone Bioactive Ceramic Coatings: The Synergistic Effects of Surface Roughness and Material Chemistry**
. Aniket, Duke University, Durham, NC
R. Reid, University of North Carolina at Charlotte, Kannapolis, NC
I. Marriott, University of North Carolina at Charlotte, Charlotte, NC
A. El-Ghannam, University of North Carolina at Charlotte, Charlotte, NC

381 **Mass Spectral Imaging for Analysis of Tissue Scaffolds**
L. J. Gamble, University of Washington, Seattle, WA
D. Graham, University of Washington, Seattle, WA

382 **Antibacterial Polyhydroxybutyrate (PHB) Membranes for Guided Bone Regeneration**
B. Ercan, Northeastern University, Boston, MA
Z. Karahaliloglu, Northeastern University, Ankara, Turkey
T. Webster, Northeastern University,

383 **Enhanced Osteoblastic Differentiation and Maturation by Titanium and Titanium-Zirconium Nanostructured and Hydrophilic Surface Modifications**
E. Lotz, Virginia Commonwealth University, Richmond, VA
R. Olivares-Navarrete, Virginia Commonwealth University, Richmond, VA
S. Hyzy, Virginia Commonwealth University, Richmond, VA
S. Berner, Institut Straumann AG, Basel, Switzerland
Z. Schwartz, Virginia Commonwealth University, Richmond, VA
B. Boyan, Virginia Commonwealth University, Richmond, VA

384 **Nanotopography-mediated Cell Filopodial Extension on Stiff Materials**
L. Yang, Soochow University, Suzhou, China
Y. Lin, Department of Mechanical Engineering, The University of Hong Kong, Hong Kong, Hong Kong
B. W. Sheldon, School of Engineering, Brown University, Providence, RI

385 **Effect of Titanium Dioxide Nanotubes Dimensions on Prolonged Release of Drug Molecules**
T. Shokuhfar, Michigan Technological University, Houghton, MI
A. Hamlekhan, Michigan Technological University, Chicago, IL
C. Sukotjo, University of Illinois at Chicago, Chicago, IL
A. Yarin, University of Illinois at Chicago, Chicago, IL
S. S. Ray, University of Illinois at Chicago, Chicago, IL
M. T. Mathew, Rush University, Chicago, IL

Molecular Mechanisms Governing Protein-Surface and Cell-Surface Interactions

386 **A Strategy for Determining the Structure of Surface Bound Proteins**
D. G. Castner, University of Washington, Seattle, WA
T. Weidner, Max Planck Institute for Polymer Research, Mainz, Germany
L. J. Gamble, University of Washington, Seattle, WA

387 **Comparative Factor XII Contact Activation at Hydrophilic and Hydrophobic Surfaces and Interactions with Prekallikrein and Factor XI**
L. Xu, The Pennsylvania State University College of Medicine, Hershey, PA
S. Herron, Milligan College, Milligan College, TN
Y. Xu, Hershey High School, Hershey, PA
E. A. Vogler, Pennsylvania State University, University Park, PA
C. A. Siedlecki, Pennsylvania State University College of Medicine, Hershey, PA

388 **A degradable polar hydrophobic ionic polyurethane attenuates IgG-Fab site-induced monocyte activation**
K. Battiston, University of Toronto,
B. Ouyang, University of Toronto,
E. Honarparvar, University of Toronto,
R. Labow, University of Ottawa,
C. Simmons, University of Toronto,
P. Santerre, University of Toronto,

389 **Determination of Orientation and Adsorption-Induced Changes in Tertiary Structure of Proteins on Material Surfaces by Chemical Modification and Peptide Mapping**
A. A. Thyparambil, Clemson University, Clemson, SC
Y. Wei, Clemson University, Clemson, SC
R. A. Latour, Clemson University, Clemson, SC

390 **Effect of materials properties of hydroxyapatite nanocrystals on fibronectin conformation**
F. Wu, Cornell University, Ithaca, NY
D. D. W. Lin, Cornell University, Ithaca, NY
L. Estroff, Cornell University, Ithaca, NY
D. Gourdon, Cornell University, Ithaca, NY

391 **Investigating the Role(s) of Cell Adhesion Molecules in Maintaining Human Pluripotent Stem Cells**
J. W. Lambshead, CSIRO, Clayton, Victoria, Australia
C. O'Brien, CSIRO, Clayton, Victoria, Australia
L. Meagher, CSIRO, Clayton, Victoria, Australia
A. L. Laslett, CSIRO, Clayton, Victoria, Australia

392 **Bio-Smart Surfaces Prepared by SET-LRP and Host-Guest Interaction**
G. Chen, Soochow Unversity, Suzhou, China
X. Shi, Soochow University, Suzhou, China
H. Chen, Soochow University, Suzhou, China

393 **An FVIII-derived Peptide Enables VWF-binding of an Artificial Platelet Substitute without Interfering with Natural Platelet Adhesion to VWF**
C. L. Modery-Pawlowski, Case Western Reserve University, Cleveland, OH
H. Haji-Valizadeh, Case Western Reserve University, Cleveland, OH
A. Sen Gupta, Case Western Reserve University, Cleveland, OH

Targeting to Cellular and Pathological Microenvironments

395 **Targeting Astrocyte Phenotypic Switch after Neural Injury**
W. Marsh, Arizona State University, Tempe, AZ
S. E. Stabenfeldt, Arizona State University, Tempe, AZ

396 **Fibrin-Binding, Peptide Amphiphile Micelles for Targeting Glioblastoma**
E. Chung, The University of Chicago, Chicago, IL
Y. Cheng, The University of Chicago, Chicago, IL
R. Morshed, The University of Chicago, Chicago, IL
K. Nord, The University of Chicago, Chicago, IL
Y. Han, The University of Chicago, Chicago, IL
M. Wegscheid, The University of Chicago, Chicago, IL
B. Auffinger, The University of Chicago, Chicago, IL
D. Wainwright, The University of Chicago, Chicago, IL
M. S. Lesniak, The University of Chicago, Chicago, IL
M. Tirrell, The University of Chicago, Chicago, IL

397 **Nanoengineered particles for enhanced intra-articular retention and delivery of therapeutic proteins**
A. Singh, Cornell University, Ithaca, NY
R. Agarwal, Georgia Tech, Atlanta, GA
C. Diaz, Georgia Tech, Atlanta, GA
N. Willett, Georgia Tech, Atlanta, GA
P. Wang, USC, Columbia, SC
L. A. Lee, 4A&Q NanoDesigns, LLC, Columbia, SC
Q. Wang, USC, Columbia, SC
R. E. Guldberg, Georgia Tech, Atlanta, GA
A. J. Garcia, Georgia Tech, Atlanta, GA

398 **Degradable Nanoparticles for pH-dependent Cytosolic Drug Delivery**
J. M. Page, Vanderbilt University, Nashville, TN
B. Evans, Vanderbilt University, Nashville, TN
M. Gupta, Vanderbilt University, Nashville, TN
S. Guelcher, Vanderbilt University, Nashville, TN
C. Duvall, Vanderbilt University, Nashville, TN

399 **Unnatural Killer Cells: TRAIL-Coated Leukocytes that Kill Cancer Cells in the Circulation**
M. J. Mitchell, Cornell University, Ithaca, NY
E. C. Wayne, Cornell University, Ithaca, NY
K. Rana, Cornell University, Ithaca, NY
C. B. Schaffer, Cornell University, Ithaca, NY
M. R. King, Cornell University, Ithaca, NY

400 **Ortho-hydroxy phenyl boronic acids rescue mice from lactic acidosis by increasing lactate metabolism**
A. P. Acharya, University of California, Berkeley, Berkeley, CA

Posters

Absorbable Polymers for Medical Devices: Current Status and Future Perspectives

401 **3D Printed Biodegradable Polymer Vascular Grafts**
A. J. Melchiorri, University of Maryland, College Park, MD
N. Hibino, Nationwide Children's Hospital, Columbus, OH
C. A. Kraynak, University of Maryland, College Park, MD
J. P. Fisher, University of Maryland, College Park, MD

402 **In Vitro and In Vivo Degradation of a Fully-Absorbable Poly(glycolide-co-lactide) Mesh**
M. Deng, Ethicon, Johnson & Johnson, Somerville, NJ
S. Savidge, Ethicon, Johnson & Johnson, Somerville, NJ
W. Kong, Ethicon, Johnson & Johnson, Somerville, NJ
T. Muench, Ethicon, Johnson & Johnson, Somerville, NJ

403 **Instant Preparation of Biodegradable Injectable Polymer Formulation Exhibiting Temperature-responsive Sol-gel Transition**
Y. Ohya, Kansai University, Suita, Japan
Y. Yoshida, Kansai University, Suita, Japan
A. Takahashi, Kansai University, Suita, Japan
A. Kuzuya, Kansai University, Suita, Japan

404 **Novel Biodegradable Devices Forming Bioadhesive Hydrogels for Hemostatics and Adhesion Barriers (1): Preparation of Transparent Water-Swellable Film and Clinical Applications**
T. Ito, Japan Anti-tuberculosis Association, Shin-Yamanote Hospital, Tokyo, Japan
K. Ueda, Japan Anti-tuberculosis Association, Shin-Yamanote Hospital, Tokyo, Japan
M. Eriguchi, Japan Anti-tuberculosis Association, Shin-Yamanote Hospital, Tokyo, Japan
Y. Koyama, Japan Anti-tuberculosis Association, Shin-Yamanote Hospital, Tokyo, Japan

405 **Novel Biodegradable Devices Forming Bioadhesive Hydrogels for Hemostatics and Adhesion Barriers (2): Preparation of Hemostatic Sponges and Clinical Application in Dental Surgery**
Y. Koyama, Otsuma Women's University, Tokyo, Japan
T. Ito, Japan Anti-tuberculosis Association, Shin-Yamanote Hospital, Tokyo, Japan
S. Yamaguchi, Japan Anti-tuberculosis Association, Shin-Yamanote Hospital, Tokyo, Japan
Y. Kurachi, Japan Anti-tuberculosis Association, Shin-Yamanote Hospital, Tokyo, Japan
M. Eriguchi, Japan Anti-tuberculosis Association, Shin-Yamanote Hospital, Tokyo, Japan

406 **Remodeling of an Injectable/Settable Bone Graft in a Sheep Femoral Defect Model**
K. N. Kalpakci, Medtronic Spinal, Memphis, TN
A. D. Talley, Vanderbilt University, Nashville, TN
S. A. Guelcher, Vanderbilt University, Nashville, TN
D. A. Shimko, Medtronic Spinal, Memphis, TN

407 **Molecular Dynamics Simulation of Thermal Degradation of Bioresorbable Polymers**
C. R. Gajjar, North Carolina State University, Raleigh, NC
M. Pasquinelli, North Carolina State University, Raleigh, NC
M. W. King, North Carolina State University, Raleigh, NC

408 **Rheology of poly(glycerol sebacate)**

B. Nicholson, Secant Medical, Inc., Perkasie, PA
C. Smoot, Secant Medical, Inc., Perkasie, PA

Advanced Engineered Metal-Based Biomaterials

315 **Development of Polyelectrolyte Multilayer Coatings for Degradable Magnesium Alloys**
S. Kunjukunju, University of Pittsburgh, Pittsburgh, PA
A. Roy, University of Pittsburgh, Pittsburgh, PA
M. Ramanathan, University of Pittsburgh, Pittsburgh, PA
B. Lee, University of Pittsburgh, Pittsburgh, PA
P. Kumta, University of Pittsburgh, Pittsburgh, PA

410 **Surface modification of titanium substrate by a novel copolymer containing sulfobetain and phosphonic acid functionalities: synthesis, characterization and platelet compatibility evaluation**
Y. Cho, National Cheng Kung University, Tainan, Taiwan
J. Lin, National Cheng Kung University, Tainan, Taiwan
T. Lee, National Cheng Kung University, Tainan, Taiwan
Y. Lin, Fooyin University, Kaohsiung, Taiwan
W. Chuang, National Cheng Kung University, Tainan, Taiwan

411 **Calcium Phosphate Coatings on Magnesium Alloy**
A. Mahapatro, Wichita State University, Wichita, KS
S. A. Arshanapalli, Wichita State University, Wichita, KS

412 **Role of Zinc in Mg-based alloys for Orthopedic Applications**
C. Lai, The Hong Kong Polytechnic University, Kowloon, Hong Kong
W. Ip, The University of Hong Kong, Hong Kong, Hong Kong
L. C. Chan, The Hong Kong Polytechnic Unviersity, Kowloon, Hong Kong

413 **Microarc Oxidized TiO2 coating on Porous Titanium for Improved Biological Performance**
H. Jung, Materials Science and Engineering, Seoul National University, Seoul, Korea, Republic of
T. Jang, Materials Science and Engineering, Seoul National University, Seoul, Korea, Republic of
H. Kim, Materials Science and Engineering, Seoul National University, Seoul, Korea, Republic of
Y. Estrin, Centre for Advanced Hybrid Materials, Department of Materials Engineering, Monash University, Clayton, Australia

414 **Mechanical Disassembly of Retrieved Long-Stem Total Knee Replacements with Taper Modularity**
K. Snethen, Clemson University, Clemson, SC
K. Henson, Clemson University, Clemson, SC
J. Luetzner, University Hospital Carl Gustav Carus Dresden, Dresden, Germany
S. Kirschner, University Hospital Carl Gustav Carus Dresden, Dresden, Germany
M. Harman, Clemson University, Clemson, SC

415 **Release Profile Characterization of a Biphasic Implant Porous Metal Enhanced Coating**
R. L. Delgado-Rivera, Pipeline Biotechnology, LLC., Newark, NJ
P. A. Krijger, Pipeline Biotechnology, LLC., Parsippany, NJ
R. C. Cohen, Pipeline Biotechnology, LLC., Parsippany, NJ

416 **Structural and Mechanical Properties of Titanium Niobium Alloys**

H. H. S. Sato, Universidade Federal do Paraná, Curitiba, Brazil

417 **A New Test Method for UKR Tibial Tray Fatigue Testing**
G. Yildirim, Mako Surgical Corp., Cedar Knolls, NJ
J. Parker, Mako Surical Corp., Cedar Knolls, NJ

418 **Development of Biodegradable Magnesium-Yttrium Based Alloys for Craniofacial and Orthopedic Applications**
D. Chou, University of Pittsburgh, Pittsburgh, PA
D. Hong, University of Pittsburgh, Pittsburgh, PA
P. Saha, University of Pittsburgh, Pittsburgh, PA
P. N. Kumta, University of Pittsburgh, Pittsburgh, PA

419 **Enhanced degradation properties of biodegradable Fe-Mn solid solutions containing divalent elements**
D. Hong, University of Pittsburgh, Pittsburgh, PA
D. Chou, University of Pittsburgh, Pittsburgh, PA
O. I. Velikokhatnyi, University of Pittsburgh, Pittsburgh, PA
P. N. Kumta, University of Pittsburgh, Pittsburgh, PA

420 **Static Properties of Direct Metal Laser Sintered (DMLS) Titanium Alloy (Ti6Al4V) and the Influence of Machining and Hot Isostatic Pressure (HIP) treatment**
B. S. Mitchell, MAKO Surgical Corp., Cedar Knolls, NJ
D. F. Swarts, MAKO Surgical Corp, Cedar Knolls, NJ

421 **Microstructure Evolution in Co-Base Alloys Solidified in Wedge Shaped Cu-Mold**
J. A. JUAREZ-ISLAS, II, UNIVERSIDAD NACIONAL AUTONOMA DE MEXICO, Distrito Federal, Mexico
A. L. RAMIREZ-LEDESMA, II, UNIVESIDAD NACIONAL AUTONOMA DE MEXICO, Distrito Federal, Mexico

422 **Inhalable Magnetic Nanocomposite Microparticles (MnMs) for Targeted Pulmonary Delivery**
N. A. Stocke, University of Kentukcy, Lexington, KY
S. M. Arnold, University of Kentucky, Lexington, KY
H. M. Mansour, University of Arizona-Tuscon, Tucson, AZ
J. Z. Hilt, University of Kentucky, Lexington, KY

423 **Mechanism of action of a Peptide-Coating with Sustained Antimicrobial Effect**
X. Chen, University of Minnesota, Minneapolis, MN
H. Hirt, University of Minnesota, Minenapolis, MN
Y. Li, University of Minnesota, Minneapolis, MN
P. Sevilla, Technical University of Catalonia, Barcelona, Spain
S. Gorr, University of Minnesota, Minneapolis, MN
C. Aparicio, University of MInnesota, Minneapolis, MN

424 **24-Month In Vivo Evaluation of a Percutaneous Osseointegrated Prosthetic System in a Translational Sheep Amputation Model**
S. Jeyapalina, University of Utah, Salt Lake City, UT
K. N. Bachus, University of Utah, Salt Lake City, UT
J. P. Beck, University of Utah, Salt Lake City, UT

425 **Effect of hydrogen peroxide and pH on corrosion behavior of Co-Cr-Mo alloy in phosphate buffered saline**
Y. Liu, Department of BIomedical and Chemical Engineering ,Syracuse Biomaterials

Institute,Syracuse University, Syracuse, NY

426 **Effect of Polymer Characteristics on the Degradation Behavior of Magnesium Alloy**
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427 **Enhanced Corrosion Resistance via Hybridized PEI / Silica and Hydroxyapatite Dual Coating on Porous Magnesium**
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428 **Atomic Layer Deposition on Active Pharmaceutical Ingredient Particles**
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429 **A novel in vivo model to screen degradable magnesium alloys for bone fixation devices**
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D. Chou, University of Pittsburgh, Pittsburgh, PA
P. Kumta, University of Pittsburgh, Pittsburgh, PA
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430 **A Novel Biomedical b-type Ti alloy TLM materials Used in Teeth Implants**
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Y. Zhao, Northwest Institute for Nonferrous Metal Research, Xi'An, China
X. Ma, Northwest Institute for Nonferrous Metal Research, Xi'An, China
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431 **Hierachical architecture on the surface of NiTi shape memory alloy for antibacterial implants**
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k. W. K. Yueng, The university of Hong Kong, Hong Kong, Hong Kong
P. Chu, City University of Hong Kong, Hong Kong, Hong Kong

432 **Time Depended Strain Response of Biomedical Alloys used in Spinal Surgery**
R. Ayers, Colorado School of Mines & University of Colorado School of Medicine, Golden, CO

Advances and Challenges in Biomaterial-Associated Infection and Pathogenesis

433 **Application of 3,6-O-sulfated chitosan modified surface as recyclable antibacterial material**
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Y. Wang, Soochow University, Suzhou, China
G. Chen, Soochow University, Suzhou, China
H. Chen, Soochow University, Suzhou, China
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434 **The Effect of Pathophysiologic Glucose Concentration on Biofilm Growth In Vitro**
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F. Calara, Banner Good Samaritan Medical Center, Phoenix, AZ
A. McLaren, Banner Good Samaritan Medical Center, Phoenix, AZ
R. McLemore, Banner Good Samaritan Medical Center, Phoenix, AZ

435 **Depth and Duration of Antimicrobial Tissue Penetration Depends on Dose: A Pilot Study with Gadolinium**
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A. McLaren, Banner Good Samaritan Medical Center, Phoenix, AZ
M. R. Caplan, Arizona State University, Tempe, AZ
R. McLemore, Banner Good Samaritan medical Center, Phoenix, AZ

436 **Bone Healing Is Unaffected by PNDJ at the Implant Inferface**
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D. Overstreet, Sonoran Biosciences, Phoenix, AZ
A. McLaren, Banner Good Samaritan Medical Center, Phoenix, AZ
B. Vernon, Arizona State University, Tempe, AZ

437 **Encapsulated mesenchymal stromal/stem cell and leukocyte immunomodulation had nominal impact on the elimination of established Staphylococcus aureus biofilms**
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W. E. Rose, University of Wisconsin-Madison, Madison, WI
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438 **Antimicrobial Agent Evaluation Using Planktonic, Biofilm-Forming and Preformed Biofilm Cell States**
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N. J. Lin, NIST, Gaithersburg, MD
S. Lin-Gibson, NIST, Gaithersburg, MD

439 **Effect of spacer length on the antimicrobial activity of the bound peptide, chrysopsin-1**
T. E. Alexander, Worcester Polytechnic Institute, Foxboro, MA
L. D. Lozeau, Worcester Polytechnic Institute, Worcester, MA
T. A. Camesano, Worcester Polytechnic Institute, Worcester, MA

440 **Utilization of iron oxide nanoparticles coupled with nitric oxide (NO) as antibacterial treatment**
M. Talantikit, École Polytechnique de Montréal,
T. Javanbakht, École Polytechnique de Montréal,
S. Laurent, École Polytechnique de Montréal, Mons, Belgium

L. Yahia, Ecole Polytechnique de Montréal,

441 **Decreased bacteria growth on TiO2 nanotubes grown on Ti alloys**
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B. G. Geilich, Northeastern University, Boston, MA
R. C. J. Junior, UNICAMP, Campinas, Brazil
T. J. W. Webster, Northeastern University, Boston, MA

Advances in Ophthalmic Biomaterials

444 **Biodegradable Beta-Cyclodextrin-based Nanoparticles for Drug Delivery to Retina**
L. Wu, University of Tennessee Health Science Center, Memphis, TN
D. R. Janagam, University of Tennessee Health Science Center, Memphis, TN
T. L. Lowe, University of Tennessee Health Science Center, Memphis, TN

445 **Comparative study of the influences of surface functionality and corona protein adsorption on the hemocompatibility of magnetite nanoparticles**
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E. Sacher, École Polytechnique de Montréal,
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Advances in Programmable Biomaterials

446 **Programmable Nucleic Acid Polymerization for Nanoparticle-Mediated Imaging of the ECM**
N. Chen, Pennsylvania State University, University Park, PA
S. Li, Pennsylvania State University, University Park, PA
M. R. Battig, Pennsylvania State University, University Park, PA

447 **Fabrication of adipose tissue-derived cell sheets using charged thermoresponsive cell culture surfaces**
J. Kobayashi, Tokyo Women's Medical University, Tokyo, Japan
T. Ohno, Olympus Corporation, Tokyo, Japan
H. Kakidachi, Olympus Corporation, Tokyo, Japan
Y. Akiyama, Tokyo Women’s Medical University, Tokyo, Japan
M. Yamato, Tokyo Women’s Medical University, Tokyo, Japan
A. Horii, Olympus Corporation, Tokyo, Japan
T. Okano, Tokyo Women’s Medical University, Tokyo, Japan

448 **Synthesis and Engineering of Polymersomes for Treatment of Lysosomal Storage Disease**
J. M. Larsen, Auburn University, Auburn, AL
D. R. Martin, Auburn University, Auburn, AL
M. E. Byrne, Auburn University, Auburn, AL

449 **Focused Ultrasound – Mediated Insulin Delivery Through Nano-network**
J. Di, North Carolina State University | University of North Carolina at Chapel Hill, Raleigh, NC

450 **Elucidating the Particle-Particle Interaction under Dielectrophoresis for Developing a Rapid Patterning Technique**
G. Zhang, Clemson University, Clemson, SC

451 **Characterization and Evaluation of Electrospun Tropoelastin and Collagen Bioscaffolds in support of Closing Full-Thickness Wounds**
R. Diller, Northern Arizona University, Flagstaff, AZ
H. Machula, Northern Arizona University, Flagstaff, AZ
J. Watson, Northern Arizona University, Flagstaff, AZ
A. Ford, Noerthern Arizona University, Flagstaff, AZ
B. Nelson, Northern Arizona University, Flagstaff, AZ
R. S. Kellar, Northern Arizona University, Flagstaff, AZ

Advances in Three Dimensional Scaffolds for Tissue Regeneration

168 **Development of a Tissue Engineered Neoligament for Intra-Articular Ligament Regeneration**
E. Wagner, Mayo Clinic, Rochester, MN
P. Kok, Mayo Clinic, Rochester, MN
Y. Su, Mayo Clinic, Rochester, MN
M. Dadestan, Mayo Clinic, Rochester, MN
S. Chase, Mayo Clinic, Rochester, MN
S. Riester, Mayo Clinic, Rochester, MN
M. Yaszemski, Mayo Clinic, Rochester, MN
A. Van Wijnen, Mayo Clinic, Rochester, MN
S. Kakar, Mayo Clinic, Rochester, MN

317 **Hybrid-type bone substitute composed by porous hydroxyapatite and hBM-MSCs**
T. Sugimoto, Kitasato University School of Medicine, Sagamihara, Japan
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K. Kumazawa, Kitasato University School of Medicine, Sagamihara, Japan
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A. Takeda, Kitasato University School of Medicine, Sagamihara, Japan
E. Uchinuma, Kitasato University School of Medicine, Sagamihara, Japan

453 **Highly Moldable “Clay”-Like Fluffy Biodegradable Nanofibrous Scaffolds for 3D Tissue Engineering**
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S. Cho, Yonsei University, Seoul, Korea, Republic of
M. Kim, Yonsei University, Seoul, Korea, Republic of
G. Jin, Yonsei University, Seoul, Korea, Republic of
U. Jeong, Yonsei University, Seoul, Korea, Republic of
J. Jang, Yonsei University, Seoul, Korea, Republic of

454 **Cortical Bone Fixation with Highly Porous, Rougher Porous Coatings of Titanium and CoCrMo**
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C. Beckett, Michigan State University, East Lansing, MI
R. Haut, Michigan State University, East Lansing, MI

455 **Electrospun silk fibroin/gelatin composite tubular matrices as scaffolds for small diameter blood vessels regeneration**

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S. Bertoldi, Politecnico di Milano, Milan, Italy
S. Fare', Politecnico di Milano, Milan, Italy
M. Tanzi, Politecnico di Milano, Milan, Italy

456 **Application of PCUU Scaffolds in Urinary Bladder Tissue Engineering**

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W. Wagner, University of pittsburgh, Pittsburgh, PA
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457 **Microparticle-Mediated Adhesion of a Thermogelling Scaffold for Intervertebral Disc (IVD) Tissue Engineering**

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J. Sheehan, Rowan University, Glassboro, NJ
K. Toomer, Rowan University, Glassboro, NJ
C. Iftode, Rowan University, Glassboro, NJ
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458 **Hybridized PEI/Silica and Hydroxyapatite Dual Coating on Porous Magnesium for Enhanced Corrosion Resistance**

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J. Song, Department of Materials Science and Engineering, Seoul National University, Seoul, Republic of Korea,
H. Kim, Department of Materials Science and Engineering, Seoul National University, Seoul, Republic of Korea,

459 **Human Mesenchymal Stem Cell Response to Dynamic Loading of Poly(Vinyl Alcohol) Cryogels**

M. E. Koch, University of Vermont, Burlington, VT
R. A. Oldinski, University of Vermont, Burlington, VT

460 **Autologously Enriched Human Bone Marrow Aspirate for Bone Tissue Engineering**

P. E. Mikael, University of Connecticut, Farmington, CT
S. P. Nukavarapu, University of Connecticut, Farmington, CT

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461 **Mimicry of Vascular Structure with Multi-Cellular Layers using Tissue Transfer Printing Technique**

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M. Sajeesh Kumar, Hanyang university, Seoul, Korea, Republic of
H. Shin, Hanyang university, Seoul, Korea, Republic of

462 **Tissue adhesive gelatin hydrogels formed in situ via dual enzymatic crosslinking**

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J. Bae, Ajou University, Suwon, Korea, Republic of
D. Nguyen, Ajou University, Suwon, Korea, Republic of
K. Park, Ajou University, Suwon, Korea, Republic of

463 **Preparation and characterization of in situ forming hybrid hydrogels composed of gelatin and poly(ethylene glycol)**

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Y. Lee, Ajou University, Suwon, Korea, Republic of
J. Bae, Ajou University, Suwon, Korea, Republic of
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464 **Deciphering hydrodynamic shear stress in bioreactor configurations used for mechanical stimulus**

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K. Singarupu, Oklahoma State University, Stillwater, OK
A. Khalf, Oklahoma State University, Stillwater, OK
S. Madihally, Oklahoma State University, Stillwater, OK

465 **Three-Dimensional Macroscopic All-Carbon Scaffolds: Fabrication, Characterization, and Cytocompatibility**

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B. Sitharaman, Stony Brook University, Stony Brook, NY

466 **Multilayered Chitosan and Hyaluronan Hydrogels**

R. T. Pace, Clemson University, Clemson, SC
K. J. L. Burg, Clemson University, Clemson, SC

467 **Effect of molecular weight and degree of methacrylation on hyaluronan hydrogel mechanical properties**

S. L. Fenn, University of Vermont, Burlington, VT

468 **Platelet-Derived Growth Factor-Stimulated Migration of Bone Marrow Mesenchymal Stem Cells into Injectable Gelatin- Hyaluronan Hydrogels**

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889 **The Use of Three-Dimensionally Printed β-Tricalcium Phosphate/Hydroxyapatite to Understand the Regulation of Adenosine Receptors in Osteoclast Formation and Promotion in Bone Regeneration**
Stephanie Ishack, New York University - Langone Medical Center and College of Dentistry, New York, NY
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John Ricci, New York University - College of Dentistry, New York, NY
Bruce Cronstein, New York University - Langone Medical Center, New York, NY

Benchtop Models to Support Medical Device and Pharmaceutical Development

471 **Development of a Compliant Cell Culture System for Improved Correlation Between in vivo and in vitro Testing**
J. McMasters, Purdue University, West Lafayette, IN
J. Brugnano, Purdue University, West Lafayette, IN
A. Panitch, Purdue University, West Lafayette, IN

472 **Carbon nanotube multi-electrode array chips for noninvasive real-time measurement of dopamine, actionpotentials, and postsynaptic potentials.**
M. Gotoh, Tokyo University of Technology, Tokyo, Japan

473 **Photodegradable Hydrogels for Selective Capture and Release of Rare Mammalian Cell**
P. Fischer, University of Wyoming, Laramie, WY
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J. Oakey, University of Wyoming, Laramie, WY

Biodegradable Stents and Stents with Biodegradable Coatings

476 **Degradation Mechanisms of Absorbable Polymers used in Drug Eluting Stents (DES)**
J. Guo, U.S. Food and Drug Administration, Silver Spring, MD
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P. Nemes, George Washington University, Washington, Dc, DC

477 **Absorbable Polyurethanes from Functionalized Phenylalanine**
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478 **Hydroxyapatite/poly(lactide-co-glycolide) micro-patterning on magnesium for biomedical applications**
S. Kim, Seoul National University, Seoul, Korea, Republic of
H. Kim, Seoul National University, Seoul, Korea, Republic of

479 **A Comparative Study of in Vitro Degradation of a Biodegradable Ureteral Stent in Human and Artificial Urine**

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Bio-Inspired Cellular Microenvironments

481 **A Heterotypic Model of the Pancreatic Ductal Adenocarcinoma Microenvironment for Investigating Stroma-Tumor Interactions and Therapeutic Strategies**
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482 **Promoting Chondrogenesis and Maintaining the Bioactivity of TGF-beta using a Biomimetic Material**
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N. Tran, New Jersey Institute of Technology, Newark, NJ
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483 **Breast tumor cell behaviors on in vitro models mimicking extracellular matrix at different malignant stages**
T. Hoshiba, Graduate School of Science and Engineering, Yamagata University, Yonezawa, Japan
M. Tanaka, Graduate School of Science and Engineering, Yamagata University, Yonezawa, Japan

484 **Role of Matrix Fiber Alignment, Diameter, and Spacing in Regulating Adult Cardiomyocyte Phenotype**
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T. Tran, Vanderbilt University, Nashville, TN
D. B. Sawyer, Vanderbilt University, Nashville, TN
H. Sung, Vanderbilt University, Nashville, TN

485 **Development of a Graft for Volumetric Muscle Loss using Bioreactor Technology**
B. E. Pollot, University of Texas at San Antonio, San Antonio, TX
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T. Guda, University of Texas at San Antonio, San Antonio, TX

486 **Decorin Mimic Inhibits PDGF-Stimulated Smooth Muscle Cell Proliferation and Migration**
R. A. Scott, Purdue University, West Lafayette, IN
A. Panitch, Purdue University, West Lafayette, IN

487 **Characterization of Resilin-based Biomaterials with Tunable Mechanical Properties for Cartilage Engineering**
R. S. C. Su, Purdue University, West Lafayette, IN
J. C. Liu, Purdue University, West Lafayette, IN

488 **Biologically-Inspired Hydroxyapatite-Collagen Scaffolds Support Osteogenesis in an Ectopic**

Murine Model
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H. E. Weiss-Bilka, University of Notre Dame, Notre Dame, In, IN
D. R. Wagner, University of Notre Dame, Notre Dame, IN
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489 **Material Properties and Osteogenic Potential of CaP Mineralized Collagen-Glycosaminoglycan Scaffolds**
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490 **Sandwich culture using bio-functional hydrogels as a three-dimensional culture model for mesenchymal stem cells**
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Y. Tabata, Institute for Frontier Medical Sciences, Kyoto University, Kyoto, Japan

491 **Using endometrial-inspired cues to drive angiogenic processes in collagen-glycosaminoglycan scaffolds**
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B. A. Harley, University of Illinois, Urbana, IL
K. B. H. Clancy, University of Illinois, Urbana, IL

492 **Controlling Cellular Orientation Using Microcontact Printing and Mechanical Conditioning to Modulate Contractile Protein Expression**
E. L. Lee, Boston University, Boston, MA
H. H. Bendre, Boston University, Boston, MA
M. K. Robinson, Boston University, Boston, MA
J. Y. Wong, Boston University, Boston, MA

493 **Monodispersed double emulsions as programmable microenvironment for cellular studies**
Y. Zhang, Biomedical Engineering Department, Duke University, Durham, NC
H. Chan, Biomedical Engineering Department, Duke University, Durham, NC
Y. Ho, Interdisciplinary Nanoscience Center (iNANO), Aarhus University, Aarhus, Denmark
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L. You, Biomedical Engineering Department, Duke University, Durham, NC
K. W. Leong, Biomedical Engineering Department, Duke University, Durham, NC

494 **Novel fabrication methods for tissue-engineered spheroid models of human breast cancer to mimic native tumor microenvironment**
S. Pradhan, Auburn University, Auburn, AL
J. M. Clary, Auburn University, Auburn, AL
C. S. Chaudhury, Auburn University, Atlanta, GA
D. Seliktar, Technion-Israel Institute of Technology, Haifa, Israel
E. A. Lipke, Auburn University, Auburn, AL

495 **Engineered Cellular Hydrogels for Zonal Regeneration of Articular Cartilage**
T. Karimi, University of South Carolina, Columbia, SC
D. Barati, University of South Carolina, Columbia, SC
E. Jabbari, University of South Carolina, Columbia, SC

496 **Magnetic Attraction Works in Concert with Biochemical Supplementation to Influence**

Mouse Embryonic Stem Cell Lineage Determination
L. Geuss, The University of Texas at Austin, Austin, TX

Biologically Derived Materials from Natural Resources

500 **Cell-laden gelatin hydrogels formed by orthogonal thiol-ene photo-crosslinking**
Z. Munoz, Indiana University-Purdue University Indianapolis, Indianapolis, IN
H. Shih, Indiana University-Purdue University Indianapolis, Indianapolis, IN
C. Lin, Indiana University-Purdue University Indianapolis, Indianapolis, IN

501 **Smart hydrogel beads with potential therapeutic target in colon cancer cells**
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A. F. RUBIRA, UNIVERSIDADE ESTADUAL DE MARINGA, Maringa, Brazil
E. C. MUNIZ, UNIVERSIDADE ESTADUAL DE MARINGÁ, Maringa, Brazil

502 **Pressure ulcer treatment: Elevation on injectable cell-loaded hydrogels for regeneration of soft tissue**
Y. Lui, The University of Hong Kong, Hong Kong, Hong Kong
W. Ip, The University of Hong Kong, Hong Kong, Hong Kong
S. Wong, The University of Hong Kong, Hong Kong, Hong Kong

503 **Synthesis and Optimization of Alginate-Polypyrrole Composites for Neural Implants**
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B. Zhang, University of Wollongong, Wollongong Nsw, Australia
C. Yore, Furman University, Greenville, SC
T. Pannell, Furman University, Greenville, SC
T. W. Hanks, Furman University, Greenville, SC

504 **Cell-Derived Matrix as Biomimetic Substrate for Cardiomyoblast Differentiation**
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K. Park, Korea Institute of Science and Technology, Seoul, Korea, Republic of

505 **Enzymatic treatment to improve the permeability of cartilage**
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B. Chen, Exactech Taiwan, Hsinchu, Taiwan
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L. Krengel, Exactech Inc., Gainesville, FL
C. Chapman, Exactech Inc, Gainesville, FL
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506 **Fabrication of Cross-linked Gelatin Microfibers by Photochemical Reactive Electrospinning**
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X. Xu, Louisiana State University - Health Sciences Center - New Orleans, New Orleans, LA

507 **An injectable porcine cartilage-derived hydrogel for cartilage repair and regeneration**

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D. Truong, University of Texas at Arlington, Arlington, TX
H. Weng, University of Texas at Arlington, Arlington, TX
L. Tang, University of Texas at Arlington, Arlington, TX
Y. Hong, University of Texas at Arlington, Arlington, TX

508 **Chemical modification of chitosan electrospun membranes for Guided Tissue Regeneration**
H. Su, The University of Memphis, Memphis, TN
D. Abebe, The University of Memphis, Memphis, TN
K. Liu, The University of Memphis, Memphis, TN
C. Wu, The University of Memphis, Memphis, TN
G. Mcgraw, The University of Memphis, Memphis, TN
T. Fujiwara, The University of Memphis, Memphis, TN
W. Haggard, The University of Memphis, Memphis, TN
J. Bumgardner, The University of Memphis, Memphis, TN

509 **Cellular response of kidney cells on chitosan based scaffolds**
N. Bhattarai, North Carolina A&T State University, Greensboro, NC

510 **Enzymatic Treatment and Cryopreservation of Minced Porcine Cartilage**
A. McNally, Exactech, Inc., Gainesville, FL
C. Chapman, Exactech, Inc., Gainesville, FL
K. Sly, Exactech, Inc., Gainesville, FL
S. Lin, Exactech, Inc., Gainesville, FL

511 **Fabrication of Novel Cellulosic-Based Scaffolds for Articular Cartilage Tissue Engineering by Unidirectional Freeze Drying Method**
A. G. Nandgaonkar, North Carolina State University, Raleigh, NC
W. E. Krause, North Carolina State University, Raleigh, NC
L. A. Lucia, North Carolina State University, Raleigh, NC

Biomaterial Strategies for Innervation, Nerve Repair and Integration

513 **Extracellular Matrix Hydrogels Derived from Optimized Acellular Peripheral Nerve**
R. C. Cornelison, University of Texas at Austin, Gainesville, FL
C. E. Schmidt, University of Florida, Gainesville, FL

514 **Multifunctional, degradable scaffolds with linear microchannels for spinal cord repair**
D. Shahriari, Michigan State University, East Lansing, MI
K. Felger, Michigan State University, East Lansing, MI
Y. Koffler, University of California, San Diego, La Jolla, CA
D. Lynam, Michigan State University, East Lansing, MI
M. Tuszynski, University of California, San Diego, La Jolla, CA
J. Sakamoto, Michigan State University, East Lansing, MI

515 **Double Layer Nerve Conduit for Peripheral Nerve Regeneration Using Grooved & Conductive Yarns**
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J. Liang, NCSU, Raleigh, NC
R. Jindani, NCSU, Raleigh, NC
M. King, NCSU, Raleigh, NC

J. Lim, 2College of Veterinary Medicine, Raleigh, NC

516 **Reducing Inflammation to Implanted Neural Electrodes**
S. M. Gutowski, Georgia Institute of Technology, Atlanta, GA
K. Templeman, Georgia Institute of Technology, Atlanta, GA
Y. Wei, Clemson University, Clemson, SC
R. Latour, Clemson University, Clemson, SC
A. García, Georgia Institute of Technology, Atlanta, GA

517 **Neural Stem Cell Interaction with Titania Nanotube Surfaces**
J. A. Sorkin, Colorado State University, Littleton, CO
S. Hughes, Colorado State University, Fort Collins, CO
K. C. Popat, Colorado State University, Fort Collins, CO

518 **Oriented growth of transdifferentiated mesenchymal stem cells on micropatterned polymeric substrates for neuroregeneration strategies**
A. D. Sharma, Iowa State University, Ames, IA
S. Zbarska, Iowa State University, Ames, IA
E. M. Petersen, Iowa State University, Ames, IA
M. E. Marti, Iowa State University, Ames, IA
D. S. Sakaguchi, Iowa State University, Ames, IA
S. K. Mallapragada, Iowa State University, Ames, IA

519 **The Effect of Chronic Resveratrol Administration on Neurodegeneration and Blood Brain Barrier Stability Surrounding Intracortical Microelectrodes**
K. A. Potter, Case Western Reserve University, Cleveland, OH
W. D. Meador, Case Western Reserve University, Cleveland, OH
W. G. Stewart, Case Western Reserve University, Cleveland, OH
M. M. Gitomer, Case Western Reserve University, Cleveland, OH
J. R. Capadona, Case Western Reserve University, Cleveland, OH

520 **Development of Biomaterials for Sustained Delivery of Bioactive Molecules in Spinal Cord Injury**
T. S. Wilems, Washington University in St. Louis, St. Louis, MO
C. C. Ingram, Washington University in St. Louis, St. Louis, MO
S. E. Sakiyama-Elbert, Washington University in St. Louis, St. Louis, MO

521 **Photoreactive Interpenetrating Networks as Tunable Scaffolds for Neurite Growth**
P. Khoshakhlagh, Tulane University, New Orleans, LA
E. Horn-Ranney, Tulane University, New Orleans, LA
M. J. Moore, Tulane University, New Orleans, LA

522 **Control of porosity of braided nerve conduits for peripheral nerve regeneration**
D. Bhatnagar, New Jersey Center of Biomaterials, Piscataway, NJ
J. Bushman, New jersey center of biomaterials, Piscataway, NJ
B. A. Clements, New Jersey Center of Biomaterials, Piscataway, NJ
S. Murthy, New Jersey Center of Biomaterials, Piscataway, NJ
J. Kohn, New Jersey Center of Biomaterials, Piscataway, NJ

523 **Stromal Derived Factor-1α Release from Poly(Lactic-co-Glycolic) Acid Nanoparticles Induces Neural Stem Cell Migration**
D. Dutta, Arizona State University, Tempe, AZ
C. Fauer, Arizona State University, Tempe, AZ

R. W. Sirianni, Arizona State University, Tempe, AZ
S. E. Stabenfeldt, Arizona State University, Tempe, AZ

524 **Poly(lactic-co-glycolic acid) (PLGA) Composites with Magnesium Wires Enhanced Networking of Primary Neurons**
C. Augello, UC Riverside, Riverside, CA
A. Zahedi, UC Riverside, Riverside, CA
I. Ethell, UC Riverside, Riverside, CA
H. Liu, UC Riverside, Riverside, CA

525 **Aminopropyl silica-based hybrid films: an approach to improve neuronal cell adhesion and differentiation**
L. B. Capeletti, Federal University of Rio Grande do Sul / Brazilian Synchrotron Light Laboratory / The University of Tennessee, Knoxville, TN

Biomaterials Education

526 **Role of Multidisciplinary & Interinstitutional Research in Informing and Enriching Bioengineering Degree Programs**
D. M. Pai, North Carolina A&T State University, Greensboro, NC
J. Sankar, North Carolina A&T State University, Greensboro, NC

Biomaterials for Immunomodulation

527a **Transplant tolerance to minor antigen mismatched bone marrow grafts using PLG particles**
K. A. Hlavaty, Northwestern University, Chicago, IL
D. P. McCarthy, Northwestern University, Chicago, IL
W. Yap, Northwestern University, Chicago, IL
W. W. Song, Northwestern University, Chicago, IL
S. D. Miller, Northwestern University, Chicago, IL
L. D. Shea, Northwestern University, Evanston, IL

527b **S-nitrosation of poly(propylene sulfide) nanoparticles for nitric oxide delivery**
Susan N. Thomas, Georgia Institute of Technology, Atlanta, GA
Alex Schudel, Georgia Institute of Technology, Atlanta, GA

528 **Selective Dendritic Cell Activation by Non-inflammatory Peptide Assemblies**
R. R. Pompano, University of Chicago, Chicago, IL
J. Chen, University of Chicago, Chicago, IL
A. S. Chong, University of Chicago, Chicago, IL
J. H. Collier, University of Chicago, Chicago, IL

529 **Poly(ethylene glycol)-Containing Hydrogels Promote the Release of Primary Granules from Human Blood-Derived Polymorphonuclear Leukocytes**
H. C. Cohen, University of Wisconsin-Madison, Madison, WI
T. J. Lieberthal, University of Wisconsin-Madison, Madison, WI
W. J. Kao, University of Wisconsin-Madison, Madison, WI

530 **Anti-Inflammatory Capacity of Polymers Modified with a Synthetic Peptide Sequence of the CD47 Ig Domain**

J. B. Slee, The Children's Hospital of Philadelphia and The University of Pennsylvania, Philadelphia, PA
R. J. Levy, The Children's Hospital of Philadelphia and The University of Pennsylvania, Philadelphia, PA
S. J. Stachelek, The Children's Hospital of Philadelphia and The University of Pennsylvania, Philadelphia, PA

531 **TiO2 nano-dimensioned surfaces modulate host inflammation via mediating macrophage M1/M2 polarization**
q. ma, Department of Prosthetic Dentistry, School of Stomatology, Fourth Military Medical University, Xi'An, China

532 **Microfluidic Encapsulation of Human Pancreatic Islets in Synthetic Polymer Hydrogel Microspheres**
D. M. Headen, Georgia Tech, Atlanta, GA
A. J. García, Georgia Tech, Atlanta, GA

533 **Control over Macrophage Behavior to Promote Scaffold Vascularization for Bone Regeneration**
K. L. Spiller, Drexel University, Philadelphia, PA
G. Vunjak-Novakovic, Columbia University, New York, NY

534 **Combining cyclic mechanical strain and monocyte co-culture enhances collagen production and vascular smooth muscle cell infiltration into a porous degradable polyurethane scaffold**
K. Battiston, University of Toronto,
R. Labow, University of Ottawa,
C. Simmons, University of Toronto,
P. Santerre, University of Toronto,

535 **Modeling of Macrophage-Mediated Controlled Release System for the Treatment of Diabetic Wounds**
S. Nassiri, Drexel University, Philadelphia, PA
K. L. Spiller, Drexel University, Philadelphia, PA

536 **Continuous Interleukin-4 Delivery by Osmotic Pumps Modulates Macrophage Polarization in vitro**
J. Pajarinen, Stanford University School of Medicine, Stanford, CA
Y. Tamaki, Yamagata University School of Medicine, Stanford, CA
J. K. Antonios, Stanford University School of Medicine, Stanford, CA
T. Lin, Stanford University School of Medicine, Stanford, CA
Z. Yao, Stanford University School of Medicine, Stanford, CA
M. Takagi, Yamagata University School of Medicine, Yamagata, Japan
Y. Konttinen, University of Helsinki, Helsinki, Finland
S. Goodman, Stanford University School of Medicine, Redwood City, CA

537 **In vivo Evaluation of Safety and Biocompatibility of Carbohydrate-Functionalized Polyanhydride Nanoparticles**
J. E. Vela Ramirez, Iowa State University, Ames, IA
J. T. Goodman, Iowa State University, Ames, IA
R. Roychoudhury, Indiana University, Bloomington, IN
P. Boggiatto, Iowa State University, Ames, IA
N. Pohl, Indiana University, Bloomington, IN
M. J. Wannemuehler, Iowa State University, Ames, IA

B. Narasimhan, Iowa State University, Ames, IA

538 **Polyanhydride Nanovaccines Elicit Protective Virus Neutralizing Titers and Cell-mediated Immunity Against Influenza**

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H. Loyd, Iowa State University, Ames, IA
W. Wu, Iowa State University, Ames, IA
L. Huntimer, Iowa State University, Ames, IA
S. Ahmed, University of Nebraska Medical Center, Omaha, NE
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S. Hinrichs, University of Nebraska Medical Center, Omaha, NE
T. Bronich, University of Nebraska Medical Center, Omaha, NE
S. Mallapragada, Iowa State University, Ames, IA
M. J. Wannemuehler, Iowa State University, Ames, IA
S. Carpenter, Iowa State University, Ames, IA
B. Narasimhan, Iowa State University, Ames, IA

539 **MR Tracking of Dendritic Cells Homing to the Draining Lymph Nodes in Mice**

Y. Xu, National Engineering Research Center for Biomaterials, Sichuan University, Chengdu, China
D. Wang, Sichuan University, Chengdu, China
Y. Liu, Sichuan University, Chengdu, China
C. Xia, Sichuan University, Chengdu, China
Q. Gong, Sichuan University, Chengdu, China
B. Song, Sichuan University, Chengdu, China
C. Wu, Sichuan University, Chengdu, China
H. Ai, Sichuan University, Chengdu, China

540 **Delivery of Tolerance Inducing Agents to Dendritic Cells**

J. S. Lewis, University of Florida, Gainesville, FL
B. G. Keselowsky, University of Florida, Gainesville, FL

541 **Modulation of cardiac macrophages via hydrogel mediated IL-4 delivery as a strategy for infarct healing**

S. L. Carroll, Georgia Institute of Technology, Atlanta, GA
M. E. Brown, Emory University, Atlanta, GA
M. E. Davis, Georgia Institute of Technology, Atlanta, GA
A. J. Garcia, Georgia Institute of Technology, Atlanta, GA

542 **Pollen grains: a novel natural material for oral vaccination**

H. S. Gill, Texas Tech University, Lubbock, TX
S. Atwe, Texas Tech University, Lubbock, TX
Y. Ma, Texas Tech University, Lubbock, TX

Biomaterials in the Fourth Dimension - Controlling Temporal Properties

544 **Enhancement of Cell Differentiation by Phospholipid Polymer Hydrogels with Tunable Physical Properties**

H. Oda, The University of Tokyo, Tokyo, Japan
T. Konno, The University of Tokyo, Tokyo, Japan
K. Ishihara, The University of Tokyo, Tokyo, Japan

545 **The Use of Anisotropic Cell Sheets for Controlling Orientation during the Self-organization of 3D Tissue Construct**
H. Takahashi, Tokyo Women's Medical University, Tokyo, Japan

546 **Designing exogenously degradable poly (ethylene glycol) hydrogels for cartilage tissue engineering applications**
A. J. Neumann, University of Colorado, Boulder, CO
S. C. Skaalure, University of Colorado, Boulder, CO
S. J. Bryant, University of Colorado, Boulder, CO

547 **Impact of functionalized Gelatin-Methacrylate hydrogels on hematopoietic stem cell biology**
B. Mahadik, University of Illinois at Urbana-Champaign, Urbana, IL
L. Skertich, University of Illinois a tUrbana-Champaign, Urbana, IL
B. Harley, University of Illinois at Urbana-Champaign, Urbana, IL

548 **Smart Supramolecular Hydrogels for Long-term Bioengineered Stem Cell Therapy**
S. Hahn, Pohang University of Science and Technology, Pohang, Korea, Republic of
J. Yeom, Pohang University of Science and Technology, Pohang, Korea, Republic of
K. Kim, Pohang University of Science and Technology, Pohang, Korea, Republic of
Y. Sung, Pohang University of Science and Technology, Pohang, Korea, Republic of

549 **In Vitro and In Vivo Comparison of Sequential Drug Release**
S. Sundararaj, University of Kentucky, Lexington, KY

Biomaterials Microenvironment for Stem Cells and Tissue Regeneration

551 **Osteogenic Differentiation of Encapsulated Mesenchymal Stem Cells in Dexamethasone-Functionalized Semi-IPN Hydrogels**
S. Bae, Clemson University, Clemson, SC
H. Lee, Clemson University, Clemson, SC
J. Lee, Clemson University, Clemson, SC
K. Webb, Clemson University, Clemson, SC

552 **Tissue Engineered Human Anterior Cruciate Ligament Derived Cellular Patch for Partial ACL Repair**
A. Gupta, Southern Illinois University School of Medicine, Springfield, IL
M. A. Walters, Southern Illinois University School of Medicine, Springfield, IL
K. Sharif, Southern Illinois University School of Medicine, Springfield, IL
M. D. Woods, Southern Illinois University School of Medicine, Springfield, IL
A. Potty, Southern Illinois University School of Medicine, Springfield, IL
S. El-Amin, Southern Illinois University School of Medicine, Springfield, IL

553 **The Effects of Cell Density on Viability within PEGDA Hydrogel Microspheres**
D. Perera, Rutgers University, Piscataway, NJ
D. Seethamraju, Rutgers University, Piscataway, NJ
R. Olabisi, Rutgers University, Piscataway, NJ

554 **Preparation of a decellularized tumor using high hydrostatic pressure (HHP) technology**
T. Kimura, Tokyo Medical and Dental Univeristy, Tokyo, Japan
M. Ueki, Tokyo Medical and Dental Univeristy, Tokyo, Japan

N. Nakamura, Tokyo Medical and Dental Univeristy, Tokyo, Japan
K. Nam, Tokyo Medical and Dental Univerisry, Tokyo, Japan
T. Fujisato, Osaka Institute of Technology, Tokyo, Japan
A. Kishida, Tokyo Medical and Dental University, Tokkyo, Japan

555 **Optimizing Hydrogels in vitro for Transplantation of iPS-NPC in vivo After Stroke**
J. Lam, University of California, Los Angeles, Los Angeles, CA
B. Lowry, University of California, Los Angeles, Los Angeles, CA
S. T. Carmichael, University of California, Los Angeles, Los Angeles, CA
T. Segura, University of California, Los Angeles, Los Angeles, CA

556 **Human BMSC Specific Attachment on Apatite Surfaces Using Phage-Derived Peptide Sequences**
H. Ramaraju, University of Michigan, Ann Arbor, MI
S. S. Miller, University of Michigan, Aurora, IL
D. Kohn, University of Michigan, Ann Arbor, MI

557 **Osteogenic differentiation of hMSC in PEG diacrylate/hyaluronic acid semi-IPNs**
H. Lee, Clemson University, Clemson, SC
S. Bae, Clemson University, Clemson, SC
J. Lee, Clemson University, Clemson, SC
K. Webb, Clemson University, Clemson, SC

558 **Biosynthetic hydrogel poly(mannitol fumarate-co-sebacate)-co-alginate forms favorable micro niche for the differentiation of mesenchymal stem cells to cardiac lineage**
F. G.T, SCTIMST, Trivandrum, India
J. MUTHU, SCTIMST, Trivandrum, India

559 **A Cartilage-Like PEG Hydrogel Directs Chondrogenesis of hMSCs Under Mechanical Stimulation**
E. Aisenbrey, University of Colorado Boulder, Boulder, CO

560 **Engineering a Biomimetic Periosteum for Cortical Bone Allografts: Incorporation of Heparin-Binding Growth Factors into Chitosan-Based Tissue Engineering Scaffolds**
R. Romero, Colorado State University, Fort Collins, CO
Z. Menard, Colorado State University, Fort Collins, CO
L. S. Chubb, Colorado State University, Fort Collins, CO
N. P. Ehrhart, Colorado State University, Fort Collins, CO
M. J. Kipper, Colorado State University, Fort Collins, CO

561 **Incorporating Decellularized Cartilage in Injectable Colloidal Gel Pastes: Evaluation of Cellular Response**
E. Beck, University of Kansas, Lawrence, KS
S. Kieweg, University of Kansas, Lawrence, KS
C. Berkland, University of Kansas, Lawrence, KS
G. Converse, Children's Mercy Hospital, Kansas City, MO
R. Hopkins, Children's Mercy Hospital, Kansas City, MO
M. Detamore, University of Kansas, Lawrence, KS

562 **Effect of X-Ray Radiation on Adult Stem Cell Differentiation**
M. Rusin, Clemson University, Central, SC
D. Dean, Clemson University, Clemson, SC

563 **Controllable Effects of Mechanical Moduli on Osteoblast Differentiation of Mesenchymal Stem Cells on Polyurethane Substrates**
R. Guo, Vanderbilt University, Nashville, TN
S. Lu, Vanderbilt University, Nashville, TN
J. Page, Vanderbilt University, Nashville, TN
S. Guelcher, Vanderbilt University, Nashville, TN

564 **Factors on the Cell Viability of Hydrogel Induced Human Mesenchymal Stromal Cell Therapy**
X. Chen, University of Wisconsin-Madison, Madison, WI
S. Thibeault, University of Wisconsin-Madison, Madison, WI

565 **Fiber-based microcarriers for enhanced proliferation of hydrogel-encapsulated cells**
A. Sen, Clemson University, Clemson, SC
K. Webb, Clemson University, Clemson, SC
H. Lee, Clemson University, Clemson, SC
K. Stevens, Clemson University, Clemson, SC
J. Lee, Clemson University, Clemson, SC

566 **Adipose-Derived Stem Cell Proliferation & Migration on Two-Dimensional and Three-Dimensional Substrates**
V. M. Merkle, The University of Arizona, Tucson, AZ
P. L. Tran, The University of Arizona, Tucson, AZ
S. Hossainy, University of California, Berkeley, Berkeley, CA
D. Harris, The University of Arizona, Tucson, AZ
X. Wu, The University of Arizona, Tucson, AZ
M. J. Slepian, The University of Arizona, Tucson, AZ

567 **Poly(Vinyl Alcohol)-Gelatin Interpenetrating Network Hydrogels for Tissue Engineering Applications**
E. J. Miller, University of Vermont, Burlington, VT
R. A. Oldinski, University of Vermont, Burlington, VT

568 **Synergy of Three-dimensional Soft Matrices with ECM Proteins Augments Stem Cell Differentiation towards Vascular Phenotypes**
M. Floren, University of Colorado Boulder, Boulder, CO
N. Tseng, University of Colorado Denver, Boulder, CO
S. Bryant, University of Colorado Boulder, Boulder, CO
W. Tan, University of Colorado Boulder, Boulder, CO

Biomaterials Microenvironment for Stem Cells and Tissue Regeneration IV

574 **Enhancing Bone Regeneration by Functional Microenvironment of Bone-Like Scaffold**
D. S. Oh, Columbia University, New York, NY
J. Kim, Chungbuk National University, Cheongju, Korea, Republic of
S. Choi, Chungbuk National University, Cheongju, Korea, Republic of
J. Back, Columbia University, New York, NY
M. Hong, Columbia University, New York, NY
F. Y. Lee, Columbia University, New York, NY
H. Tawfeek, Columbia University, New York, NY

575 **Cell-Cell Contacts Mediated by Microsphere Formation Promotes Viability of Hydrogel-Encapsulated Submandibular Gland Cells**

A. D. Shubin, University of Rochester, Rochester, NY
E. O. Maruyama, University of Rochester, Rochester, NY
D. Graunke, University of Rochester, Rochester, NY
T. Felong, University of Rochester, Rochester, NY
C. E. Ovitt, University of Rochester, Rochester, NY
D. S. W. Benoit, University of Rochester, Rochester, NY

576 **Osteogenic Differentiation of Human Adipose Stromal Vascular Cells in BMP-2 Presenting Gelatin Hydrogels**
J. E. Samorezov, Case Western Reserve University, Cleveland, OH
E. B. Headley, Case Western Reserve University, Cleveland, OH
C. R. Everett, Case Western Reserve University, Cleveland, OH
E. Alsberg, Case Western Reserve University, Cleveland, OH

577 **Engineering Interpenetrating Network Hydrogels as Biomimetic Cell Niche with Independently Tunable Biochemical and Mechanical Properties**
X. Tong, Stanford University, Stanford, CA
F. Yang, Stanford University, Stanford, CA

578 **Ascorbic Acid Promotes Valve Interstitial Cell-mediated Extracellular Matrix Deposition in Hydrogel Scaffolds**
Y. Wu, Duke University, Durham, NC
D. S. Puperi, Rice University, Houston, TX
K. J. Grande-Allen, Rice University, Houston, TX
J. L. West, Duke University, Durham, NC

579 **Matrix microenvironment regulates neural stem cell differentiation into neural and glial lineages**
K. Farrell, Cleveland State University, Cleveland, OH
C. Kothapalli, Cleveland State University, Cleveland, OH

580 **Response of DPSCs to PEG-Melanic Hydrogels**
C. T. Drinnan, Temple University, Philadelphia, PA

Biomaterials Microenvironment for Stem Cells and Tissue Regeneration V

581 **NF-κB Decoy Oligo-deoxynucleotide Decreases Polyethylene Particle-induced Suppression of Osteogenesis in Bone Marrow Derived Mesenchymal Stem Cells**
T. Lin, Stanford University, Palo Alto, CA
Z. Yao, Stanford University, Palo Alto, CA
K. R. Barcay, Stanford University, Palo Alto, CA
H. Waters, Stanford University, Palo Alto, CA
T. Sato, Stanford University, Palo Alto, CA
F. Yang, Stanford University, Palo Alto, CA
S. B. Goodman, Stanford University, Palo Alto, CA

582 **Preparation of Microenvironment for HSPC homing using HHP Decellularization Method**
N. Nakamura, Tokyo Medical and Dental University, Tokyo, Japan
K. Nam, Tokyo Medical and Dental University, Tokyo, Japan
T. Kimura, Tokyo Medical and Dental University, Tokyo, Japan
T. Fujisato, Osaka Institute of Technology, Osaka, Japan
T. Tsuji, Tokyo University of Science, Chiba, Japan

H. Iwata, Kyoto University, Kyoto, Japan
A. Kishida, Tokyo Medical and Dental University, Tokyo, Japan

583 **Evaluation of the Effect of Donor Variability on Stem Cell Response to Biomaterials**
S. J. Florczyk, NIST, Gaithersburg, MD
B. A. Baker, NIST, Gaithersburg, MD
S. Sarkar, NIST, Gaithersburg, MD
J. H. McDaniel, NIST, Gaithersburg, MD
P. Pine, NIST, Gaithersburg, MD
M. L. Salit, NIST, Gaithersburg, MD
C. G. Simon, Jr., NIST, Gaithersburg, MD

584 **Stem Cell Differentiation on Adipocyte-Based Protein Micropatterns**
A. Shukla, Brown University, Providence, RI
J. L. West, Duke University, Durham, NC

585 **PEG-PDMS-BMP-2 Hydrogels for Directed Osteogenic Differentiation of MSCs from Alternative Sources**
T. Gharat, Rensselaer Polytechnic Institute, Troy, NY
C. Jimenez-Vergara, Rensselaer Polytechnic Institute, Troy, NY
D. Munoz-Pinto, Rensselaer Polytechnic Institute, Troy, NY
M. Grunlan, Texas A&M University, College Station, TX
M. Hahn, Rensselaer Polytechnic Institute, Troy, NY

586 **Hyaluronan-Fibrin Gel System for Cartilage-Mediated Bone Regeneration**
P. E. Mikael, University of Connecticut, Farmington, CT
S. P. Nukavarapu, University of Connecticut, Farmington, CT

587 **High Temporal Resolution of ERK Activity in Response to Mechano-chemical Stimuli**
A. Dharmarajan, University of Colorado at Boulder, Boulder, CO
M. Floren, University of Colorado at Boulder, Boulder, CO
W. Tan, University of Colorado at Boulder, Boulder, CO

588 **PEGPDMSBMP2Hydrogels for Directed Osteogenic Differentiation of MSCs from Alternative Sources**
T. Gharat, Rensselaer Polytechnic Institute, Troy, NY

Biomaterials:Endothelial Cells Interaction and Its Role in the Treatment of Cancer and Cardiovascular Disease

589 **Tissue Engineered Blood Vessels Lined with Late-Outgrowth EPCs from Coronary Artery Disease Patients**
C. E. Fernandez, Duke University, Durham, NC
G. A. Truskey, Duke University, Durham, NC
W. M. Reichert, Duke University, Durham, NC

590 **Study about a Progenitor Cell Capturing Polyester Vascular Prosthesis**
Z. Zhang, Laval University,
B. Li, Laval University,
X. Xie, Sichuan University, Chengdu, China
Y. Douville, Laval University,
O. Bondarenko, Laval University,

P. Rhéaume, Université Laval,
Y. Xu, Sichuan University, Chengdu, China
R. Guidoin, Laval University,
Y. Zhong, Sichuan University, Chengdu, China
Q. Fu, Sichuan University, Chengdu, China

Biomolecule Delivery for Regenerative Medicine

591 **Diffusion of Surrogate Biomolecules in Photopolymerizable Hydrogels**
A. E. Donius, University of Pittsburgh, Pittsburgh, PA
A. Z. Pena, University of Pittsburgh, Pittsburgh, PA
J. M. Taboas, University of Pittsburgh, Pittsburgh, PA

592 **A Preliminary Evaluation of Electrospun Amelogenin for Various Tissue Engineering Applications**
I. A. Rodriguez, The University of Memphis, Memphis, TN
J. M. McCool, Virginia Commonwealth University, Richmond, VA
Y. Han, Virginia Commonwealth University, Richmond, VA
S. A. Sell, Saint Louis University, St. Louis, MO
G. L. Bowlin, The University of Memphis, Memphis, TN

593 **A Composite Methylcellulose Hydrogel for Controlled Release of Multiple Therapeutics to the Injured Spinal Cord**
M. Pakulska, University of Toronto,
K. Vulic, University of Toronto,
P. Poon, University of Toronto,
M. Shoichet, University of Toronto,

594 **Minimally Invasive Delivery of Brain-Derived Neurotrophic Factor to the Brain**
J. M. Obermeyer, University of Toronto,
M. J. Cooke, University of Toronto,
M. S. Shoichet, University of Toronto,

595 **An injectable gelatin derivative hydrogel for controlled release of growth factors**
Z. Li, Texas A&M University Baylor College of Dentistry, Dallas, TX
T. Qu, Texas A&M University Baylor College of Dentistry, Dallas, TX
C. Ding, Texas A&M University Baylor College of Dentistry, Dallas, TX
X. Liu, Texas A&M University Baylor College of Dentistry, Dallas, TX

596 **Light Wavelengths to Regulate the Release of Multiple Growth Factors**
M. A. Azagarsamy, University of Colorado/HHMI, Boulder, CO
K. S. Anseth, University of Colorado/HHMI, Boulder, CO

597 **Incorporation of Alginate Microparticles Encapsulating Basic-Fibroblast Growth Factor in Elastomeric Micro-Fibrous Scaffolds to Encourage Cell Infiltration and Proliferation**
H. Sakaguchi, Toray Industries Inc., Otsu, Japan
S. Ye, University of Pittsburgh, Pittsburgh, PA
W. R. Wagner, University of Pittsburgh, Pittsburgh, PA

598 **Development of tunable polyHIPE microspheres for controlled drug release**
M. Brooks, Texas A&M University, College Station, TX
R. Moglia, Texas A&M University, College Station, TX

M. Whitely, Texas A&M University, College Station, TX
J. Robinson, Texas A&M University, College Station, TX
E. Cosgriff-Hernandez, Texas A&M University, College Station, TX

599 **Immobilization of Vascular Endothelial Growth Factor onto Fibroblast-derived Matrix and the Effect on ECs Behaviors and Angiogenesis in vivo**
P. Du, Korea Institute of Science and Technology, Seoul, Korea, Republic of
R. Subbiah, Korea Institute of Science and Technology, Seoul, Korea, Republic of
I. Kim, Korea Institute of Science and Technology, Seoul, Korea, Republic of
Y. Noh, Korea Institute of Science and Technology, Seoul, Korea, Republic of
K. Park, Korea Institute of Science and Technology, Seoul, Korea, Republic of

600 **Hybrid polymer-mesoporous silica nanoparticles for simultaneous controlled release of proteins and antibiotics**
S. Bhattacharyya, University Of Pennsylvania, Philadelphia, PA
R. Han, University Of Pennsylvania, Philadelphia, PA
P. Ducheyne, University Of Pennsylvania, Philadelphia, PA

601 **In-Vivo Analysis of Lipid Impact on Intestinal Mucosa Barrier**
L. Speciner, Northeastern University, Boston, MA
R. L. Carrier, Northeastern University, Boston, MA

602 **Synthesis and Characterization of Oxime-Crosslinked Photodegradable Microspheres for On-Demand Delivery of Biomolecules**
M. Q. Fleming, University of Colorado, Boulder, CO
D. D. McKinnon, University of Colorado, Boulder, CO
D. L. Alge, University of Colorado, Boulder, CO
L. R. Simon, University of Colorado, Boulder, CO
K. S. Anseth, University of Colorado/HHMI, Boulder, CO

603 **A bioinspired, self-folding hydrogel controls the direction and rate of the growth factor release**
K. Baek, University of Illinois at Urbana Champaign, Urbana, IL
R. Bashir, University of Illinois at Urbana Chamapign, Urbana, IL
H. Kong, University of Illinois at Urbana Chamapign, Urbana, IL

604 **Interactions of Complexes of Heparin and a Positively-Charged Protein with GAG-based Hydrogels**
S. P. Seto, Georgia Institute of Technology and Emory University, Atlanta, GA
J. S. Temenoff, Georgia Institute of Technology and Emory University, Atlanta, GA

605 **Multilayered Nanofibrous Scaffolds With Spatiotemporally-Controlled Molecule Signals**
W. Tan, University of Colorado, Boulder, CO
n. nagiah, university of colorado, Boulder, CO
W. Elloitt, university of colorado, Boulder, CO

606 **Controlling Degradation and Protein Release in Heparin-containing Hydrogels with Varying Levels of Sulfation**
T. Miller, Georgia Institute of Technology, Atlanta, GA

Biomolecule Delivery for Regenerative Medicine II

241 **Functionalizing Intact Allografts to Enhance Allograft Remodeling and New Bone Formation**
F. Sharmin, University of Connecticut, Mansfield, CT
S. Strecker, University of Connecticut Health Center, Farmington, CT
J. Lieberman, University of Southern California, Los Angeles, CA
P. Maye, University of Connecticut Health Center, Farmington, CT
Y. Khan, University of Connecticut Health Center, Farmington, CT

610 **Tissue Engineered Muscle-Tendon Junction 3D Scaffold Development and Evaluation**
T. He, North Carolina State University, Raleigh, NC
S. Lee, Wake Forest University, Winston-Salem, NC
M. W. King, North Carolina State University, Raleigh, NC

611 **Growth Factor Delivery via a Keratin Biomaterial for Volumetric Muscle Loss Therapy**
S. Tomblyn, KeraNetics, LLC, Winston-Salem, NC
H. B. Baker, Wake Forest Institute for Regenerative Medicine, Winston-Salem, NC
J. A. Passipieri, Wake Forest Institute of Regenerative Medicine, Winston-Salem, NC
M. Siriwardane, Wake Forest Institute of Regenerative Medicine, Winston-Salem, NC
C. E. Stewart, University of Virginia, Charlottesville, VA
C. Okoukoni, Wake Forest Institute for Regenerative Medicine, Winston-Salem, NC
M. Ellenburg, KeraNetics, LLC, Winston-Salem, NC
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612 **Microparticle-Incorporated Human Mesenchymal Stem Cell Aggregates for Facilitating Endochondral Ossification**
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613 **Localized Therapeutic Delivery From Multifunctional Magnetic Nanoparticles for Elastic Matrix Stabilization and Repair**
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614 **3-D PEM Coatings to Deliver FGF-2 and Promote In vitro and In vivo Osteoprogenitor Cell Proliferation**
E. E. Jacobs, University of Connecticut Health Center, Farmington, CT
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J. Woodman, University of Connecticut Health Center, Farmington, CT
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Cardiovascular Biomaterials

615 **Performance of Cardiac Lead Insulation Siloxane-Based Multiblock Polyurethanes under Various Mechanical Stresses up to 2 Years in Rabbit**

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A. Karicherla, St Jude Medical Inc, Sylmar, CA

616 **STRUCTURAL ANALYSIS OF THE POLYMERS USED AS INSULATION IN CARDIAC LEADS AFTER IMPLANTATION IN HUMAN**
E. Tkatchouk, St.Jude Medical, Sylmar, CA
A. Padsalgikar, St.Jude Medical, Rogers, MN
J. Runt, The Pennsylvania State University, University Park, PA
A. Chakravartula, Exponent, Menlo Park, CA

617 **Creation of nanoporous surface onto Co-Cr by selective plasma etching method for vascular stent application**
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618 **Nuclease-resistant Aptamers for the Affinity Capture of Endothelial Progenitor Cells**
M. Nichols, Duke University, Durham, NC
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W. M. Reichert, Duke University, Durham, NC

619 **Hyaluronic Acid Enhancement of Polyethylene Terephthalate for Blood Contacting Applications**
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620 **Preparation and evaluation of small diameter blood vessels with different woven structures fabricated from biopolymer yarns**
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621 **PPF Enforced Pericardium for Use in Cardiovascular Applications**
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622 **Multilayered Chitosan – Alginate Hollow tubes for cardiovascular tissue engineering**
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623 **Comparative Analysis of In Vitro Oxidative Degradation of Poly(carbonate urethanes) for Biostability Prediction**
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J. Eoh, Texas A&M University, College Station, TX
S. Cereceres, Texas A&M University, College Station, TX
E. Cosgriff-Hernandez, Texas A&M University, College Station, TX

624 **Preliminary study of inhibition effect of Copper-bearing stainless steel on inflammation**
L. Ren, Institute of Metal Research Chinese Academy of Sciences, Shenyang, China

890 **Study on the Physical Properties of Intima-media of Decellularized Porcine Aorta**
Pingli Wu, Institute of Biomaterials and Bioengineering, Tokyo Medical and Dental University, Tokyo, Japan
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Kwangwoo Nam, Institute of Biomaterials and Bioengineering, Tokyo Medical and Dental University, Tokyo, Japan
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Cardiovascular Drug Delivery

626 **Engineering Erythrocytes to Improve Hemostatic Properties of Platelets**
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627 **Impact of Artificial Plaque Composition on Drug Transport**
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628 **Drug Delivery from Coated Balloons: Drug Loading Density and Transfer Rate Determine Peak Tissue Content, Binding Determines Sustained Tissue Retention**
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E. R. Edelman, MIT, Cambridge, MA

Cardiovascular Tissue Engineering: Regenerative Approaches for Ischemic Diseases

629 **Development of Tissue Engineered Small Diameter Vascular Grafts Employing Autologous Progenitor Cells**

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630 **Construction of iPSC-Derived 3D-Cardiac Muscle Tissues Using Cell-Accumulation Technique for Pharmaceutical Applications.**

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631 **Polyurethane Scaffolds for the Regeneration of the Infarcted Myocardium.**

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632 **Coacervate-based Growth Factor Delivery to Promote Therapeutic Angiogenesis**

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N. Johnson, University of Pittsburgh, Pittsburgh, PA
Y. Wang, University of Pittsburgh, Pittsburgh, PA

633 **Altering the nutrient supplement and stability of hydrogel for cardiac therapy**

S. V. Madihally, Oklahoma State University, Stillwater, OK

634 **An injectable hydrogel with oxygen release to augment cardiosphere-derived cell survival under ischemic conditions**

X. Li, Ohio State University, Columbus, OH
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635 **PEGylated fibrin gel films enhance spontaneous contractile activity of cardiomyocytes**

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636 **Development of Human Induced Pluripotent Stem Cell Derived Co-Cultures of Cardiomyocytes and Endothelial Cells**

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Cellular and Molecular Responses of Biomaterials at the Biomaterial-Tissue Interface

638 **Particulate and Ion Forms of Cobalt-Chromium Alloys Result in Different Biological Responses on Preosteoblasts**
S. Yang, Wichita State University, Wichita, KS
T. Jia, Shandong University School of Medicine, Jinan, China
P. H. Wooley, Via Christi Wichita Hospitals, Wichita, KS
S. Yang, Wichita State University, Wichita, KS

639 **Noncollagenous Matrix Proteins in Bone Healing After Local Delivery of Controlled-Release Simvastatin/Poly Lactic Glycolic Acid Microspheres**
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V. E. A. Arana-Chavez, Sr., University of Sao Paulo, Sao Paulo, Brazil

640 **How voltage and wear debris from Ti-6Al-4V interact to affect cell viability during in-vitro fretting corrosion**
T. Hui, Syracuse University, Syracuse, NY

641 **Ratiometric Dual pH and Oxygen Sensors**
Y. Tian, Arizona State University, Tempe, AZ
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S. Buizer, Arizona State University, Tempe, AZ
K. Day, Arizona State University, Tempe, AZ
J. Messner, Arizona State University, Tempe, AZ
D. R. Meldrum, Arizona State University, Tempe, AZ

642 **Extracellular and Intracellular Glucose Sensors for Monitoring Glucose Metabolism**
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Y. Tian, Arizona State University, Tempe, AZ
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643 **Different Biocompatibility Results for Antimicrobial Silver Coatings Based on Assay Format**
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644 **Preclinical evaluation of neural interfacing electrode materials for bionic devices**
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L. Poole-Warren, Graduate School of Biomedical Engineering, University of New South Wales, Sydney, Australia

645 **Sonic Hedgehog Pathway Activation in Non-Diabetic Wounds Treated with Poly(Methacrylic Acid-co-Methyl Methacrylate) Beads**
A. Lisovsky, University of Toronto,
M. V. Sefton, University of Toronto,

646 **A Novel Method to Encapsulate Insulin-secreting cells**
A. Aijaz, Rutgers University, Piscataway, NJ
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647 **Investigation of the Neuroinflammatory Response to Antioxidant Releasing Mechanically-Adaptive Polymer Implants**
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648 **Keratin-based Biomaterial Significantly Attenuates Cellular Injury Responses Following UVB Exposure**
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649 **Role of Macrophages, Chemokines and Metabolism in Controlling Continuous Glucose Monitoring in Vivo**
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650 **Identifying Contributions from Scaffolds, Cells and Extracellular Matrix in MRI of Polymer-Hydrogel-based Engineered Cartilage**
P. Pothirajan, University of Illinois at Chicago, Lombard, IL

651 **Osteogenic Medium Affects Wnt and BMP Signaling Molecules in MSCs**
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C. A. Cundiff, Georgia Institute of Technology, Atlanta, GA
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652 **Driving Macrophage Polarization towards M2 Phenotype: in vitro and in vivo Studies**
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653 **Local Interleukin-4 Treatment Supports Osteoblast Function in a Murine Model of Particle Induced Osteolysis**

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654 **Forensic Analysis of Retrieved Utah Electrode Arrays Following Implantation into Rat Cortex**

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N. F. Nolta, University of Utah, Salt Lake City, UT
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655 **Studies of the Foreign Body Response to Chronically Implanted Utah Electrode Arrays in Rat Cortex**

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656 **BBB Leakiness is Associated with Recording Changes in Chronically Implanted UEAs**

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657 **Subpopulation Identification During Cell-Material Interactions Via Neural Network Clustering of Motility Metrics**

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R. M. Baker, Syracuse University, Syracuse, NY
L. M. Manning, Syracuse University, Syracuse, NY
J. H. Henderson, Syracuse University, Syracuse, NY

658 **Material Composition Gradients and Protein-Loaded Electrospun Scaffolds: An Animal Model Study for Repair of Tracheal Defects**

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K. Fox, Kansas State University, Manhattan, KS
M. Weiss, Kansas State University, Manhattan, KS
R. Weatherly, Children's Mercy Hospital, Kansas City, MO
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659 **The Foreign Body Response to Headstage Components adds to the Neuroinflammatory Burden of Indwelling Microelectrode Arrays**

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660 **Cytokine Response to Local Delivery of Dexamethasone-21-Phosphate at an Implant Site**
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J. A. Stenken, University of Arkansas, Fayetteville, AR

661 **The use of Extracellular Matrix Coatings to Immunomodulate the FBR in Rat Brain**
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J. L. Skousen, University of Utah, Salt Lake City, UT
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662 **Synthetic Small RNA Delivery for In Situ Muscle Tissue Regeneration**
S. Lee, Wake Forest Institute for Regenerative Medicine, Winston-Salem, NC

663 **Development of an Angiogenesis-Promoting Biomaterial Sleeve for Subcutaneously Implanted Glucose Sensors**
V. Vernekar, Duke University, Durham, NC

664 **MC3T3-E1 Cell Responses to PCL/PEG Interfaces with Air or Different Substrates**
J. Dou, University of Tennessee, Knoxville, TN

Cellular and Molecular Responses of Biomaterials at the Biomaterial-Tissue Interface II

669 **Manipulation of Designer Collagen Sequence to Enhance Cell Interactions with Bioactive Hydrogels**
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670 **Understanding the Immunomodulatory Effects of MSCs in Hydrogels on Macrophages and the Foreign Body Reaction**
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T. R. Kyriakides, Yale University, New Haven, CT
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671 **Screening of the Biological Interactions of Methacrylic Acid Polymers**
L. A. Wells, University of Toronto,
H. Guo, University of Toronto,
A. Emili, University of Toronto,
M. V. Sefton, University of Toronto,

672 **Involvement of N-cadherin/β-catenin interaction in the micro/nanotopography induced indirect mechanotransduction**
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673 **Smooth Muscle Interaction with Collagen Immobilized Nanowire Surfaces**
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674 **UHMWPE but not PMMA Particles Induce Interferon-γ Expression in Natural Killer T cells**
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T. Sato, Stanford University, Palo Alto, CA
S. B. Goodman, Stanford University, Palo Alto, CA
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Ceramics and Composites in Bone Tissue Engineering and Drug Delivery

675 **Osteoconductive Evaluation of Alumina Hydrothermally Treated in CaCl2 Aqueous Solution**
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A. A. Tarique, Kyushu University, Fukuoka, Japan
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K. Ishikawa, Kyushu University, Fukuoka, Japan

676 **Rapid Formation of Porous β-CPP pellet by Microwave Sintering of DCPA Powders**
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677 **Bioactive bone cement microspheres by rapid hydroxyapatite (HA) coating**
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H. Kim, Seoul National University, Seoul National University, Korea, Republic of

678 **Perfusion flow culture improves growth of osteogenic cells in a gradient calcium polyphosphate scaffold**
L. Chen, Wayne State University, Detroit, MI

679 **Cellular responses to particles of calcium polyphosphate composite scaffolds both in vitro and in vivo**
W. Song, Wayne State University, Detroit, MI
A. Jawad, Wayne State University, Detroit, MI
D. Markel, Providence Hospital and Detroit Medical Centers, Southfield, MI

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680 **Marine-based bioactive ceramics for tissue engineering approaches**
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681 **Osteoconductive Bone Cements for Spinal Augmentation**
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682 **Dual Growth Factor Delivery from Injectable P(PF-co-CL) Copolymers for Bone Regeneration**
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M. J. Yaszemski, Mayo Clinic at Rochester, MN, Rochester, MN
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683 **Effect of Strontium Additions on Crystalline Phases and Chemical Solubility of Fluorapatite Glass-Ceramics**
I. Denry, University of Iowa, Iowa City, IA
J. A. Holloway, University of Iowa, Iowa City, IA

684 **Cell Maturity Modulates Osteogenic Differentiation Responses to Ca Releasing Biomaterials through Ca Channels**
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685 **Laser Processed CoCrMo-Calcium Phosphate Composites for Articulating Surfaces**
H. Sahasrabudhe, Washington State University, Pullman, WA

686 **Alveolar Bone Augmentation Using a Resorbable Silica-Calcium Phosphate Nano Composite**
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N. Mahmoud, Alexandria University, Alexanderia, Egypt
F. Ramzi, Alexandria University, Alexanderia, Egypt
T. Saad El-din, Faculty of Dentistry, Alexandria, Egypt

A. El-Ghannam, University Of North Carolina at Charlotte,

687 **Improvement on Flexural Strength of Zirconia via Three-Step Sintering Process**
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J. Song, Department of Materials Science and Engineering, Seoul National University, Seoul, Korea, Republic of
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688 **Cytocompatibility of Hydroxyapatite and Magnesium Oxide Nanoparticles Dispersed in Poly(lactic-co-glycolic acid) (PLGA) Scaffolds for Bone Tissue Engineering**
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H. Liu, University of California, Riverside, Riverside, CA

689 **Human Mesenchymal Stem Cell Osteogenic Differentiation on Cationic Substituted B-Tricalcium Phosphate Scaffolds**
S. S. Singh, University of Pittsburgh, Pittsburgh, PA
B. Lee, University of Pittsburgh, Pittsburgh, PA
A. Roy, University of Pittsburgh, Pittsburgh, PA
P. N. Kumta, University of Pittsburgh, Pittsburgh, PA

690 **Exploring Surface Mediated Polymer Electrolyte and Nanostructured Calcium Phosphate Composite (NanoCaPs) Layers for Non-Viral Gene Delivery**
S. Shekhar, University of Pittsburgh, Pittsburgh, PA
A. Roy, University of Pittsburgh, Pittsburgh, PA
P. Kumta, University of Pittsburgh, Pittsburgh, PA

691 **Novel Acrylic-Based Composite Bone Cement for Craniotomy Defect Filler**
L. C. Rodriguez, University of Texas at Dallas, Richardson, TX
D. C. Rodrigues, University of Texas at Dallas, Richardson, TX

692 **Osteoblast Differentiation in SrO and MgO Doped Tricalcium Phosphate; Gene Expression Study**
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S. Tarafder, Washington State University, Pullman, WA
S. Bose, Washington State University, Pullman, WA

693 **Fabrication of Bioactive Porous TiO2 Nanotubes/PLGA Composite Scaffolds for Tissue Engineering Applications**
S. Wu, Hubei University, Wuhan, China

Challenges with Non-Injectable Drug Delivery Designs

697 **Role of Microarchitecture in Co-delivery of Drug Combinations from Electrospun Fabrics**
A. Blakney, University of Washington, Seattle, WA
E. Krogstad, University of Washington, Seattle, WA
Y. Jiang, University of Washington, Seattle, WA
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698 **Bioimaging and Pulmonary Applications of Flt1 peptide – Hyaluronate Conjugate Nanoparticles**

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699 **Evaluation of Surface Modified P(MAA-co-NVP) Hydrogels for Oral Protein Delivery**
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700 **Size and Chemistry Affect Cellular Distribution after Intranasal Administration of Nanoparticles**
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701 **Design of a Polyanhydride-Releasing Oral MicroParticle Technology (PROMPT) for Oral Vaccine Delivery**
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702 **Evaluation of a Hydrogel-based Antibiotic Release System for Endodontic Therapy**

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Drug Delivery

703 **Sequential Release of Two Drugs from Flexible Drug Delivery Films**
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D. A. Puleo, University of Kentucky, Lexington, KY

704 **Amino Acid-Based Redox-Responsive Nanocapsules for Intracellular Protein Delivery**
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Effect of Scaffold Properties on 3D Cell Shape

705 **A three-dimensional neuronal culture technique that controls the direction of neurite elongation and the position of soma to mimic the layered struure of the brain.**
M. Gotoh, Tokyo University of Technology, Tokyo, Japan
I. Suzuki, Tokyo University of Technology, Tokyo, Japan

706 **Effect of Nanofiber Scaffolds on 3D Shape of Stem Cells**

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707 **The influence of PEG molecular weight on apparent hydrogel microsphere size as measured by the Coulter principle**
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M. Medini, Rutgers University, Piscataway, NJ
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Engineering Biomaterial Surface Topography for Tissue Repair

709 **Enhancing Biological Properties of Porous Coatings on Tantalum Through the Incorporation of Strontium**
T. Lee, National Cheng Kung University, Tainan, Taiwan
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Y. Li, National Cheng Kung University, Tainan, Taiwan
Y. Liu, National Cheng Kung University, Tainan, Taiwan
Y. Lee, National Cheng Kung University, Tainan, Taiwan
K. Kung, National Cheng Kung University, Tainan, Taiwan

710 **Fabrication of Freestanding Alginate Microfibers and Microstructures for Tissue Engineering Applications**
J. M. Szymanski, Carnegie Mellon University, Pittsburgh, PA
A. W. Feinberg, Carnegie Mellon University, Pittsburgh, PA

711 **Microtextured Surface to Deter Biofilm Related Orthopedic Implant Infections - A Preliminary Study**
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S. Jeyapalina, University of Utah, Salt Lake City, UT
R. Bloebaum, University of Utah, Salt Lake City, UT
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712 **Novel Biomaterial for Suppression of MMPs: Synthesis and Evaluations**
T. Shih, Industrial Technology Research Institute, Hsinchu, Taiwan

Engineering Cell-Cell Interactions within Biomaterials

713 **Tunable Hyaluronic Acid Based Hydrogels for the Study of Breast Cancer Cell Invasion**
S. A. Fisher, University of Toronto,
S. C. Owen, University of Toronto,
M. S. Shoichet, University of Toronto,

714 **Graft Vascularization for Skeletal Muscle Regeneration**

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715 **Driving Cell Rotation Using Conventional Dielectrophoresis**
G. Zhang, Clemson University, Clemson, SC

716 **Smooth Muscle Cells Interaction with Titania Nanotube Arrays**
S. E. Kelley, Colorado State University, Fort Collins, CO
M. Ruff, Colorado State University, Fort Collins, CO
K. Popat, Colorado State University, Fort Collins, CO

717 **A high throughput, time-efficient method of generating single cells/cell cluster array by polymer on polymer stamping**
P. Zhang, Worcester Polytechnic Institute, Worcester, MA

718 **In Vitro Model Alveoli From Photodegradable Templates And Primary Lung Epithelial Cells**
K. J. R. Lewis, University of Colorado, Boulder, CO
K. S. Anseth, University of Colorado/HHMI, Boulder, CO

Engineering Stimuli-Responsive Cues into Biomaterials

720 **pH-Responsive Nanocarriers for Delivery of HIV Antiviral Drugs**
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721 **Preliminary Biocompatibility Assessment of Stimuli-responsive Magnetic Nanoparticle-loaded Chitosan Microbeads**
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A. Hoban, University of Memphis, Memphis, TN
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722 **The Human Umbilical Vein as a Scaffold for Tendon Tissue Engineering**
B. W. Engebretson, University of Oklahoma, Norman, OK
V. I. Sikavitsas, University of Oklahoma, Norman, OK

723 **Preliminary Results for the Addition of Fe3O4 Nanoparticle Impregnated Chitosan Microspheres to the Chitosan Sponge for Stimuli Responsive Antibiotic Delivery**
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724 **Biomimetic Vesicles for Glucose-Mediated Insulin Delivery**

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725 **Convenient preparation of patterned temperature-responsive cell culture surface by using thioxanthone based photo-initiator modified polystyrene surfaces**

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M. YAMATO, Tokyo Women's Medical University, Tokyo, Japan
T. OKANO, Tokyo Women's Medical University, Tokyo, Japan

High-throughput Approaches to Modulate Cellular Behavior

194 **Investigating mechanisms of glioma cell migration within 3D biomimetic microenvironment**

A. Powell, Cleveland State University, Cleveland, OH
C. Kothapalli, Cleveland State University, Cleveland, OH

727 **Engineering Hydrogels with Dual Gradients of Mechanical and Biochemical Cues to Decipher Stem Cell-Niche Interactions**

X. Tong, Stanford University, Stanford, CA
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D. Zhu, Stanford University, Stanford, CA
F. Yang, Stanford University, Stanford, CA

729 **On-chip high-throughput analysis of biomaterials viscoelastic properties using patterned suprhydrophobic surfaces**

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730 **Development of High Throughput Printer for Combinatorial Screening of Biomaterials for Tissue Engineering Applications**

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731 **3D Rapid Assays to Detect Differences in Morphology and Migration for Combinatorial Screening of Biomaterials: Proof of Concept**

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732 **Filling the Gap: The Relative Role of Proliferation versus Migration in the Response to Injury of Vascular Smooth Muscle Cells**
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K. DeCook, University of Arizona, Tucson, AZ
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How to Create Cost-Effective Sustainable Biomaterials Laboratories

734 **Physicomechanical properties of films based on agroindustry residues: orange and lemon peel**
K. A. N. Arevalo, Universidad Autonoma de Nuevo Leon,
L. Galan, Universidad Autonoma de Nuevo Leon,
S. Flores, Universidad Autonoma de Nuevo Leon,
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735 **Undergraduate Design and Structure-Property Characterization of Biomaterials**
J. Vernengo, Rowan University, Glassboro, NJ
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S. Farrell, Rowan University, Glassboro, NJ

736 **An Easy Lab Exercise to Teach Fickian Diffusion, Mathematical Modeling, and Drug Delivery**
K. L. Spiller, Drexel University, Philadelphia, PA

737 **Cost-Effective, Inquiry-guided Introductory Biomaterials Laboratory for Undergraduates**
S. E. Stabenfeldt, Arizona State University, Tempe, AZ
C. J. Ankeny, Arizona State University, Tempe, AZ

Implantable Drug Delivery Systems for Medical Devices and Cancer Therapy

738 **Prolonged delivery of siRNA from cathodic electrodeposited chitosan/siRNA complex on titania nanotube array**
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739 **Charged Hydrogels for the Controlled Elution of Vancomycin**
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M. J. Yaszemski, Mayo Graduate School, Rochester, MN

740 **Robust Hyaluronic Acid Nanoparticles with Bioreducible Core for Intracellular Drug Delivery**
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741 **Bone morphogenetic protein release from polyelectrolyte multilayers for orthopedic**

applications: Effect of multilayer deposition conditions
A. M. Peterson, Worcester Polytechnic Institute, Worcester, MA
D. Shchukin, University of Liverpool, Liverpool, United Kingdom
H. Möhwald, Max Planck Institute of Colloids and Interfaces, Potsdam, Germany

742 **A Sol-Gel Model for Protein Delivery from the Surface Microelectrodes**
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K. J. Otto, Purdue University, West Lafayette, IN

743 **Reducing-environment Sensitive Hydrogels For Controlled Drug Delivery**
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744 **Preliminary Evaluation of In Vivo Degradation and Biocompatibility of Chitosan Sponges**
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745 **Drug Encapsulated Aerosolized Microspheres as a Biodegradable, Intelligent Glioma Therapy**
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746 **A novel all trans retinoic acid controlled release system for cancer therapy**
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G. Ameer, Northwestern University, Evanston, IL
I. Szleifer, Northwestern University, Evanston, IL

747 **Development of a Local, Sustained Delivery Vehicle for Zoledronic Acid to Curtail Bone Resorption**
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D. A. Puleo, University of Kentucky, Lexington, KY
P. W. O'Donnell, University of Kentucky, Lexington, KY

748 **Novel Stabilization of Calcium Phosphate Nanoparticles for Drug Delivery**
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G. D. Prestwich, University of Utah, Salt Lake City, UT
L. T. Kuhn, University of Connecticut Health Center, Farmington, CT
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749 **Time-Dependent Development of Porosity in a Hybrid Polymeric Scaffold**
D. Puleo, University of kentucky, Lexington, KY

750 **Bioceramic drug delivery systems: what carrier for what drug?**
H. J. Pacheco, IV, UNC Charlotte, Charlotte, NC

Material/Tissue Interfacial Phenomena: Lessons Learned from Dental/Craniofacial Reconstructions

139 **Antibacterial and Osteogenesis Properties of TiO2 Nanotubes Incorporated with Zn**
W. Liu, 1.Department of Prosthodontics, School of Stomatology, Capital Medical University. 2.Chemical Engineering Department, Northeastern University, Boston, MA
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Mechanobiology for Biomaterials Design

97 **A Dynamic Platform for Recapitulating Healthy and Diseased Cardiovascular Microenvironments**
W. Wan, University of Colorado, Boulder, CO
K. S. Anseth, University of Colorado/HHMI, Boulder, CO
L. A. Leinwand, University of Colorado, Boulder, CO

756 **Dynamically Softening Hydrogels for Probing Hepatic Stellate Cell Response in Fibrosis and Regression**
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R. G. Wells, University of Pennsylvania, Philadelphia, PA
J. A. Burdick, University of Pennsylvania, Philadelphia, PA

757 **Development of a Tissue Engineered Poly(Caprolactone Fumurate) (PCLF) Scaffold for Ligament Regeneration**
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758 **Mechanically Tunable PEG-Collagen Composite Hydrogels for Probing Stiffness-Dependent Effects**
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759 **Fibronectin Fibrillogenesis Allows for Cells to Overcome Mechanical Cues**
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760 **Electrospun Elastomeric Scaffolds: A Biomimetic Approach to Prevent Hypertrophic Scar Contraction**
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M. Medina, Duke University Medical Center, Durham, NC
A. Selim, Duke University Medical Center, Durham, NC
H. Levinson, Duke University Medical Center, Durham, NC
K. Leong, Duke University, Durham, NC

761 **Photo-crosslinked Polymer Micro-pillar Arrays to Control Smooth Muscle Cells**
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762 **Substrate Topography-Mediated Endocytosis of Nanoparticles**
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S. Zhang, The Pennsylvania State University, University Park, PA
J. L. Brown, The Pennsylvania State University, University Park, PA

Microenvironments for Osteogenesis and Vasculogenesis - Physical, Chemical, and Biological Perspectives

307 **Measuring Organelle Shape in 3D in Stem Cells Cultured on Nanofiber Scaffolds**
W. Tutak, American Dental Association Foundation, Gaithersburg, MD
G. Jyotsnendu, American Dental Association Foundation, Gaithersburg, MD
P. Bajcsy, NIST, Gaithersburg, MD
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765 **Effects of Pore Structure on Osteogenesis of Porous Titanium for Hard Tissue Engineering**
H. Jung, Materials Science and Engineering, Seoul National University, Seoul, Korea, Republic of

Molecular Mechanisms Governing Protein-Surface and Cell-Surface Interactions

766 **Surface Interaction Forces Governing Protein Adsorption Analyzed by Direct Force Measurement**
S. Sakata, The University of Tokyo, Tokyo, Japan
Y. Inoue, The University of Tokyo, Tokyo, Japan
K. Ishihara, The University of Tokyo, Tokyo, Japan

767 **Nanofiber-Induced Wnt5a Modulates Cellular Reorganization of Dental Pulp Cells**
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H. Ryoo, Seoul National University, Seoul, Korea, Republic of
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768 **Cancer cell attachment on a blood compatible polymer, poly (2-methoxyethyl acrylate) (PMEA)**
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769 **Preparation of Cell Membrane-Mimicking Liposomes with Controlled Size and Composition**
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S. Majd, Pennsylvania State University, University Park, PA

770 **Lipid Coated Gold Nanoprisms as Sensors for Proteins-Lipid Interactions**
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771 **End-functional Poly(N-isopropylacrylamide) Brushes for Efficiently Promoting Cell Adhesion and Detachment**
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A. Kikuchi, Tokyo University of Science, Tokyo, Japan
M. Yamoto, Tokyo Women's Medical University, Tokyo, Japan
T. Okano, Tokyo Women's Medical University, Tokyo, Japan

772 **Substrate Surface Chemistry Directs Valvular Interstitial Cell Phenotypic Expression**
M. N. Rush, University of New Mexico, Albuquerque, NM
E. L. Hedberg-Dirk, University of New Mexico, Albuquerque, NM

773 **Recombinant production of FRET-based mechanical sensor to visualize cell–material interaction**
Y. Kambe, National Institute of Agrobiological Sciences, Tsukuba, Japan

Morphogenic Peptides and Biomaterials in Tissue Regeneration

775 **Fabrication of multi-layer hydrogel microenvironments to control the spatial presentation of biochemical cues**
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H. Zhang, University of Wyoming, Laramie, WY
J. S. Oakey, University of Wyoming, Laramie, WY
K. S. Anseth, University of Colorado/HHMI, Boulder, CO

776 **Experimental and Computational Investigation of BMP-2 Peptide Activity in Amphiphilic Hydrogels**
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Nanostructured Biomaterial Surfaces for Cellular and Tissue Engineering

778 **Effect of injectable nanostructured lidocaine hydrogel in a rat model of surgical incisional pain**

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B. L. Bass, Houston Methodist Research Institute, Houston, TX
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779 **A new composition of polyetheramine-based cationic hydrogel particle: reduced charge density and cytotoxicity**
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L. Huang, University of Tennessee, Knoxville, TN
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780 **Greater Fibroblast Proliferation on an Ultrasonicated ZnO/PVC Nanocomposite Material**
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781 **Electromagnetic Stimulation of a Nanoparticle-Tissue Scaffold**
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782 **Characterizing Ferrofluid Permeability Across the Blood-Brain Barrier Model**
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783 **Titanium implant with PCL(Col)/PVA(HA) coaxial nanofiber coating enhanced implant osseointegration in a rat model**
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784 **Selective immobilization of PRP-derived growth factors at the surface of nanofibrous substrates for Tissue Engineering and Regenerative Medicine**
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785 **Modification of PLLA Nanotopography and Surface Chemistry with Selenium Nanoclusters for Reducing Cancer Cell Interactions**
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786 **Magnesium Oxide Nanocomposites for Improving Orthopedic Tissue Regeneration**
D. J. Hickey, Northeastern University, Boston, MA
B. Ercan, Northeastern University, Boston, MA
L. Sun, Northeastern University, Boston, MA
T. Webster, Northeastern University, Boston, MA

787 **Double Layer Nerve Conduit for Peripheral Nerve Regeneration Using Grooved & Conductive Fibers**
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788 **Electrospinning Silk with Selenium for Antibacterial Skin Applications**
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B. Ercan, Northeastern University, Boston, MA
T. Webster, Northeastern University, Boston, MA

789 **Directed Irradiation Synthesis for Bioinspired Ti-based Nanostructured Surfaces**
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790 **Preparation of a Nanopatterned Polymer Replica for Reduced Catheter Inflammation and Infection**
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791 **Anti-bacterial Silk Membrane for Wound Healing Applications**
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792 **Comparative cell behavior on titania nanotubes filled with HAP**
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793 **Engineering Mechanically Stiff and Elastomeric Nanocomposites by Covalently Crosslinking Poly(glycerol sebacate) and Silicate Nanoplatelets**
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794 **Enhanced Attachment and Proliferation of Fibroblasts on Anodized 316L Stainless Steel with Nano-pit Arrays**
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New Frontiers in Polymers and Fibers for Biomedical Applications

141 **Self-healing hydrogels formed by reversible interactions between calcium ions and bisphosphonate-functionalized polymers**
P. M. Lopez-Perez, Radboud University Medical center, Nijmegen, The Netherlands, Netherlands
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796 **Click chemistry played a Janus-faced role in biodegradable polymer design**
J. Guo, The Pennsyvalnia State University, University Park,, PA
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797 **Nanogels as Macromolecular Precursors to Polymer Network Development and Modification**
E. Dailing, University of Colorado, Boulder, Boulder, CO
J. Stansbury, University of Colorado School of Dental Medicine, Aurora, CO

798 **Stable Carbonic Anhydrase Hollow Fiber Membrane Coating Used in Conjunction with Dilute SO2 Acidic Sweep Gas Increases Efficiency in Low Flow CO2 Removal Devices**
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J. Kimmel, University of Pittsburgh, Pittsburgh, PA
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799 **Tunable Fibrous Hyaluronic Acid Scaffolds for Cartilage Tissue Engineering**
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M. B. Fisher, University of Pennsylvania, Philadelphia, PA
B. M. Baker, University of Pennsylvania, Philadelphia, PA
R. L. Mauck, University of Pennsylvania, Philadelphia, PA
J. A. Burdick, University of Pennsylvania, Philadelphia, PA

800 **The Effects of Molecular Weight on Viability within PEGDA Hydrogel Microspheres**
R. A. Falkowski, III, Rutgers University, New Brunswick, NJ
M. Medini, Rutgers University, Colonia, NJ
R. Olabisi, Rutgers University, Piscataway, NJ

801 **Photoinduced Surface Modification of PEEK with Biocompatible Phospholipid Polymers**
K. Ishihara, The University of Tokyo, Tokyo, Japan
M. Kyomoto, The University of Tokyo, Tokyo, Japan
S. Yamane, The University of Tokyo, Tokyo, Japan
T. Moro, The University of Tokyo, Tokyo, Japan

802 **Effect of a stabilizing absorbable fiber population on electrospun PGLA**
S. McCullen, Poly-Med, Inc., Anderson, SC
J. Corbett, Poly-Med, Inc., Anderson, SC
M. S. Taylor, Poly-Med, Inc., Anderson, SC

803 **Limitations of Predicting In Vivo Biostability of Polydimethylsiloxane Based Polyurethanes using Time Temperature Superposition**
G. Gallagher, St. Jude Medical, Rogers, MN
A. Padsalgikar, St. Jude Medical, Rogers, MN
E. Cosgriff-Hernandez, Texas A&M University, College Station, TX
T. Touchet, Texas A&M University, College Station, TX
C. Iacob, Penn State University, University Park, PA
L. Mellin, St. Jude Medical, Uppsala, Sweden
A. Norlin-Weissenrieder, St. Jude Medical, Uppsala, Sweden
J. Runt, Penn State University, University Park, PA

804 **Engineered Block Copolymer Surface Scaffolds for High Avidity, Lectin-Based Microbe Capture**
R. R. Hansen, Oak Ridge National Lab, Oak Ridge, TN
K. Shubert, Oak Ridge National Lab, Oak Ridge, TN
J. L. Morrell-Falvey, Oak Ridge National Lab, Oak Ridge, TN
B. S. Lokitz, Oak Ridge National Lab, Oak Ridge, TN
S. T. Retterer, Oak Ridge National Lab, Oak Ridge, TN

805 **Biologically Inspired Engineering of Self-assembling Underwater Adhesives with Synthetic Biology**
C. Zhong, Massachusetts Institute of Technology, Cambridge, MA
T. Gurry, Massachusetts Institute of Technology, Cambridge, MA
A. Cheng, Massachusetts Institute of Technology, Cambridge, MA
J. Downey, Massachusetts Institute of Technology, Cambridge, MA
C. M. Stultz, Massachusetts Institute of Technology, Cambridge, MA
T. K. Lu, Massachusetts Institute of Technology, Cambridge, MA

806 **Needle and Wire Electrospinning of a Shear-Thinning Polysaccharide for Biomedical Applications**
D. Hathi, University of Washington, Seattle, WA
K. Woodrow, University of Washington, Seattle, WA

807 **Preparation and characterization of a decellularized dermis-polymer complex for the use in percutaneous devices**
K. Nam, nstitute of Biomaterials and Bioengineering, Tokyo Medical and Dental University, Tokyo, Japan
R. Matsushima, Institute of Biomaterials and Bioengineering, Tokyo Medical and Dental University, Tokyo, Japan
Y. Shimatsu, Institute of Biomaterials and Bioengineering, Tokyo Medical and Dental University, Tokyo, Japan
T. Kimura, Institute of Biomaterials and Bioengineering, Tokyo Medical and Dental University, Tokyo, Japan
A. Kishida, Institute of Biomaterials and Bioengineering, Tokyo Medical and Dental University, Tokyo, Japan

808 **Fabrication of zeolite-polymer composite nanofibers for removal of uremic toxins from kidney failure patients**

K. Namekawa, National Institute for Materials Science, Tsukuba, Japan
M. Tokoro Schreiber, National Institute for Materials Science, Tsukuba, Japan
M. Ebara, National Institute for Materials Science, Tsukuba, Japan
T. Aoyagi, National Institute for Materials Science, Tsukuba, Japan

809 **Evaluation of a Novel Absorbable Copolymer for Tissue Separation Film application**
J. A. Lilley, Poly-Med, Inc, Anderson, SC
J. T. Corbett, Poly-Med, Inc, Anderson, Sc, SC
T. A. Pruitt, Godley-Snell Research Center, Clemson, SC
J. H. Parrish, Godley-Snell Research Center, Clemson, SC
M. S. Taylor, Poly-Med, Inc, Anderson, SC

810 **Degradation of Carbon Fiber Composites by Repeated Sterilization**
A. C. Meyer, Center of Innovation for Biomaterials in Orthopaedic Research, Wichita, KS
T. A. Chavez, TCMK Enterprises, Wichita, KS

811 **Cell Separating Surface using Hydrophobized Thermoresponsive Copolymer Brush**
K. Nagase, Tokyo Women's Medical University, Tokyo, Japan
Y. Hatakeyama, Waseda University, Tokyo, Japan
T. Shimizu, Tokyo Women's Medical University, Tokyo, Japan
K. Matsuura, Tokyo Women's Medical University, Tokyo, Japan
M. Yamato, Tokyo Women's Medical University, Tokyo, Japan
N. Takeda, Waseda University, Tokyo, Japan
T. Okano, Tokyo Women's Medical University, Tokyo, Japan

812 **Self-Assembled Complexes Derived From Bioinspired Tannins**
H. A. Cheng, Temple University, Philadelphia, PA
M. MacPherson, Temple University, Philadelphia, PA
O. Z. Fisher, Temple University, Philadelphia, PA

813 **Surface Activation to Improve Adhesion between Nitinol Wire and Polyurethane Film.**
S. Navada, North Carolina State University, Knightdale, NC
E. Johnson, Volcano Corporation, San Diego, CA

814 **Methacrylated Alginate for Use as an Adherent Pulmonary Pleura**
S. L. Fenn, University of Vermont, Burlington, VT
D. E. Wagner, University of Vermont, Burlington, Vt, VT
D. J. Weiss, University of Vermont, Burlington, VT
R. A. Oldinski, University of Vermont, Burlington, VT

815 **Heparin-immobilized Electrospun Nanofibers for Vascular Sutures**
M. DiBalsi, Clemson University, Clemson, SC
S. Bae, Clemson University, Clemson, SC
G. Korneva, Clemson University, Clemson, SC
K. G. Kornev, Clemson University, Clemson, SC
J. Lee, Clemson University, Clemson, SC

816 **Novel Biomimetic Aggrecan for Treatment of Urinary Incontinence**
K. Prudnikova, Drexel University, Philadelphia, PA
A. Kriete, Drexel University, Philadelphia, PA
J. Parellada, Drexel University, Philadelphia, PA
E. Vresilovic, Pennsylvania State College of Medicine, Hershey, PA
M. Marcolongo, Drexel University, Philadelphia, PA

817 **Flower Microchannel Device for Cancer Cell Migration Study**
L. Bui, University of Texas at Arlington, Arlington, TX

818 **Quantitative Comparison of Metastasizing and Non-metastasizing Breast Cancer Cell Migration via Various Dimension Microchannels**
B. Sayles, University of Texas at Arlington, Burleson, TX

819 **Novel Polyoxetane Hydrogel for Drug Delivery**
H. Yang, Virginia Commonwealth University, Richmond, VA

Nucleic Acid Delivery

823 **Target Specific Gene silencing of Hyaluronic Acid – siRNA Conjugates Using Cationic Solid Lipid Nanoparticles**
M. Lee, POSTECH, Pohang, Korea, Republic of
W. Kong, POSTECH, Pohang, Korea, Republic of
S. Hahn, POSTECH,

824 **Lipid-Modified Polymers to Undertake siRNA Delivery to Suspension-Growing Chronic Myeloid Leukemia Cells**
J. Valencia-Serna, University of Alberta, Edmonton, Canada
B. Landry, University of Alberta, Edmonton, Canada
H. Gul-Uludag, University of Alberta, Edmonton, Canada
X. Jiang, University of British Columbia, Vancouver, Canada
H. Uludag, University of Alberta,

825 **Optimizing PEG Length for Enhanced In Vivo Pharmacokinetics of a Micellar siRNA Carrier**
M. Miteva, Vanderbilt University, Nashville, TN
H. Li, Vanderbilt University, Nashville, TN
C. E. Nelson, Vanderbilt University, Nashville, TN
K. C. Kirkbride, Vanderbilt University, Nashville, TN
T. D. Giorgio, Vanderbilt University, Nashville, TN
C. L. Duvall, Vanderbilt University, Nashville, TN

826 **Lipid modified aminoglycoside based polymers as efficient transgender expression agents**
B. Miryala, Arizona State University, Tempe, AZ
T. Potta, Marlyn Nutraceuticals, Pheonix, AZ
K. Rege, Arizona State University, Tempe, AZ

827 **Multi-functional Polymeric Micelle Delivery System for Drug Resistant Cancer Treatment**
G. M. Temples, Clemson University, Clemson, SC
J. Nice, Clemson University, Clemson, SC
B. Green, Clemson University, Clemson, SC
J. Lee, Clemson University, Clemson, SC

828 **Reactive Oxygen Species-responsive polyplex micelles as a PEG-detachable platform for plasmid DNA delivery**
M. K. Gupta, Vanderbilt University, Nashville, TN
S. H. Lee, Vanderbilt University, Nashville, TN
S. W. Crowder, Vanderbilt University, Nashville, TN
C. E. Nelson, Vanderbilt University, Nashville, TN

C. L. Duvall, Vanderbilt University, Nashville, TN
H. Sung, Vanderbilt University, Nashville, TN

829 **Polymeric Micelle Delivery System for Neural Regeneration**
J. B. Nice, Clemson University, Seneca, SC
G. Temples, Clemson University, Clemson, SC
K. Webb, Clemson University, Clemson, SC
J. Lee, Clemson University, Clemson, SC

830 **Intracellular Delivery of Chemical Modified Proteins using Lipid-based Nanoparticles**
Q. Xu, Tufts University, Medford, MA
M. Wang, Tufts University, Medford, MA

Orthopaedic Polymers

831 **Povidone-Iodine Does not Affect the Polymerization of PMMA Under Clinical Conditions**
R. McLemore, Banner Good Samaritan Medical Center, Phoenix, AZ
J. Bingham, Banner Good Samaritan Medical Center, Phoenix, AZ
A. McLaren, Banner Good Samartian Medical Center, Phoenix, AZ
H. Clarke, Mayo Clinic, Phoenix, AZ

832 **X-irradiated PEEK: Thermoluminescence observations with DSC correlation**
D. Adikari, University of Memphis, Memphis, TN
R. Gnawli, University of Memphis, Memphis, TN
T. Riahinasab, University of Memphis, Memphis, TN
H. Trieu, University of Memphis, Memphis, TN
B. Walters, University of Memphis, Memphis, TN
M. S. Jahan, University of Memphis, Memphis, TN

833 **Biomimetic Charged Hydrogel Construct for Cartilage Regeneration**
M. Dadsetan, Mayo Clinic, Rochester, MN
A. Zhu, Mayo Clinic, Rochester, MN
M. Esmaeili Rad, Mayo Clinic, Rochester, MN
F. Babaei, Mayo Clinic, Rochester, MN
A. B. Dietz, Mayo Clinic, Rochester, MN
M. J. Yaszemski, Mayo Clinic, Rochester, MN

834 **Self-Reinforced Composites for Prevention of Fretting Corrosion of Biomedical Alloys: Electrochemistry and Surface Characterization**
E. S. Ouellette, Syracuse University, Syracuse, NY
J. L. Gilbert, Syracuse University, Syracuse, NY

835 **Oxidation is Induced by Compressive Cyclic Loading in Conventional UHMWPE**
Z. B. Konsin, Massachusetts General Hospital, Boston, MA
K. K. Wannomae, Massachusetts General Hospital, Boston, MA
O. K. Muratoglu, Massachusetts General Hospital, Boston, MA

836 **Oxidative Stability of First and Second Generation Highly Cross-linked UHMWPE retrievals**
S. Rowell, Harris Orthopaedic Laboratory, Massachusetts General Hospital, Boston, MA
C. Reyes, Harris Orthopaedic Laboratory, Massachusetts General Hospital, Boston, MA
K. Wannomae, Harris Orthopaedic Laboratory, Massachusetts General Hospital, Boston, MA
H. Malchau, Harris Orthopaedic Laboratory, Massachusetts General Hospital, Boston, MA

O. Muratoglu, Harris Orthopaedic Laboratory, Massachusetts General Hospital, Boston, MA

837 **Phospholipid Coatings on PEEK For Enhanced Osseointegration**
D. A. Prawel, Colorado State University, Fort Collins, CO
D. Williams, Colorado State University, Fort Collins, CO
S. P. James, Colorado State University, Fort Collins, CO

838 **Performance of an Antioxidant-Stabilized XL-UHMWPE in Wear, Fatigue, and Acetabular Lock Detail Strength**
N. Webb, Wright Medical Technology, Arlington, TN
M. Szymanski, Wright Medical Technology, Arlington, TN
D. Linton, Wright Medical Technology, Arlington, TN
J. Moseley, Wright Medical Technology, Arlington, TN

839 **Wear Rate Comparison of Textured Versus Untextured Ultra High Molecular Weight Polyethylene with Hydroxyapatite Particles Simulating Third Body Wear Debris using a 1N HCl Cleaning Solution**
E. Hippensteel, DePuy Synthes, Warsaw, IN

840 **X ray- and UV-induced Free Radicals in Polycarbonate Urethane (PCU)**
R. Gnawli, University of Memphis, Memphis, TN
D. Adikari, University of Memphis, Memphis, TN
T. Riahinasab, University of Memphis, Memphis, TN
H. Trieu, University of Memphis, Memphis, TN
B. Walters, University of Memphis, Memphis, TN
M. S. Jahan, University of Memphis, Memphis, TN

841 **Degradation Study of Raw Material Encapsulated Microsphere-Based Scaffolds for Osteochondral Tissue Engineering**
B. Sridharan, University of Kansas, Lawrence, KS
S. Lin, University of Kansas, Lawrence, KS
C. J. Berkland, University of Kansas, Lawrence, KS
M. S. Detamore, University of Kansas, Lawrence, KS

842 **Effect of Fiber Volume Fraction, Load, and Test Frequency on Piezoelectric Composite Power Generation**
J. P. Domann, University of Kansas, Lawrence, KS
E. J. Tobaben, University of Kansas, Lawrence, KS
N. C. Goetzinger, University of Kansas, Lawrence, KS
P. M. Arnold, Kansas University Medical Center, Kansas City, KS
E. A. Friis, University of Kansas, Lawrence, KS

843 **The effect of oxidation on the impact toughness of clinically relevant UHMWPEs**
E. Oral, Massachusetts General Hospital, Boston, MA
J. Suhardi, Massachusetts General Hospital, Boston, MA
M. Fung, Massachusetts General Hospital, Boston, MA
O. Muratoglu, Massachusetts General Hospital, Boston, MA

844 **High temperature melting of radiation cross-linked UHMWPE**
B. Doshi, Massachusetts General Hospital, Boston, MA
J. Fu, Massachusetts General Hospital, Boston, MA
E. Oral, Massachusetts General Hospital, Boston, MA
O. Muratoglu, Massachusetts General Hospital, Boston, MA

845 **Optimized wear resistance and tougness of vitamin E blended, high temperature melted, radiation cross-linked and annealed UHMWPE**
B. Doshi, Massachusetts General Hospital, Boston, MA
E. Oral, Massachusetts General Hospital, Boston, MA
O. Muratoglu, Massachusetts General Hospital, Boston, MA

846 **In vitro and in vivo study to determine the influence of bone morphogenetic protein-7 incorporated chitosan microparticles on bone regeneration**
V. P. R. Mantripragada, University of Toledo, Toledo, OH
C. A. Jayasuriya, University of Toledo, Toledo, OH

847 **Effect of surface electrical charge on chondrogenic differentiation of ADSCs**
F. Babaei, Department of Orthopedic Surgery, Mayo Clinic, College of Medicine, Rochester, MN, USA and dapartment of Biology and Chemistry, City University of Hong Kong, Hong Kong SAR, China,

Orthopedic Biomaterials

849 **Fabrication of Amorphous Magnesium-Calcium Phosphate Powder Via Ethanol induced formation for Tissue Engineering Applications**
E. Babaie, University of Toledo, Toledo, OH

Pioneering Biomaterial Strategies for Traumatic Craniomaxillofacial Injuries

22 **Availability of Hybrid-type Bone Substitute by Cryopreserved Human Bone tissue Derived Mesenchymal Cells**
Y. Yamazaki, Kitasato University, School of Medicine, Sagamihara, Kanagawa, Japan
T. Sugimoto, Kitasato University, School of Medicine, Kanagawa, Japan
K. Kumazawa, Kitasato University, School of Medicine, Kanagawa, Japan
M. Ishiguro, Kitasato University, School of Medicine, Kanagawa, Japan
K. Baba, Kitasato University, School of Medicine, Kanagawa, Japan
A. Takeda, Kitasato University, School of Medicine, Kanagawa, Japan
E. Uchinuma, Kitasato University, School of Medicine, Kanagawa, Japan

SFB Business Plan Competition

850 **Executive Summary – Cellanyx Diagnostics**
A. Mathur, University of California, Berkeley, Berkeley, CA

851 **Poraderm: A Fully Degradable Synthetic Cutaneous Wound Treatment**
J. M. Page, Vanderbilt University, Nashville, TN
A. Harmata, Vanderbilt University, Nashville, TN
S. Guelcher, Vanderbilt University, Nashville, TN

Surface Characterization and Modification

852 **Microarc Oxidized TiO2 coating on Macroporous Titanium for Improved Osteoconductivity**

H. Jung, Materials Science and Engineering, Seoul National University, Seoul, Korea, Republic of
M. Kang, Materials Science and Engineering, Seoul National University, Seoul, Korea, Republic of
H. Kim, Materials Science and Engineering, Seoul National University, Seoul, Korea, Republic of
Y. Estrin, Centre for Advanced Hybrid Materials, Department of Materials Engineering, Monash University, Clayton, Australia

Surgical Meshes

853 **Evaluation of Host Response to Polypropylene Mesh in Primate Model of Abdominal Sacrocolpopexy**
B. Brown, University of Pittsburgh, Pittsburgh, PA
D. Mani, University of Pittsburgh, Pittsburgh, PA
A. Nolfi, University of Pittsburgh, Pittsburgh, PA
P. Moalli, University of Pittsburgh, Pittsburgh, PA

Sustainable Approaches to Biomaterials for Drug Delivery

857 **Thailandepsin A-loaded Unimolecular Micelles for Targeted Carcinoid Therapy**
S. Gong, University of Wisconsin-Madison, Madison, WI
R. Jaskula-Sztul, University of Wisconsin-Madison, Madison, WI
W. Xu, University of Wisconsin-Madison, Madison, WI
G. Chen, University of Wisconsin-Madison, Madison, WI
A. Dammalapati, University of Wisconsin-Madison, Madison, WI
O. Sadak, University of Wisconsin-Madison, Madison, WI
A. Harrison, University of Wisconsin-Madison, Madison, WI
Q. Zheng, University of Wisconsin-Madison, Madison, WI
R. Nair, University of Wisconsin-Madison, Madison, WI
C. Korlesky, University of Wisconsin-Madison, Madison, WI
Y. Cheng, University of North Texas System, Fort Worth, TX
H. Chen, University of Wisconsin-Madison, Madison, WI

858 **Injectable Alginate Hydrogels with Embedded Chitosan Microspheres for Controlled, Localized Protein Release**
M. S. Riederer, Colorado School of Mines, Golden, CO
K. Sweeney, Colorado School of Mines, Golden, CO
V. A. Mackley, University of Maryland, Baltimore County, Baltimore, MD
R. S. Mason, Colorado School of Mines, Golden, CO
M. D. Krebs, Colorado School of Mines, Golden, CO

859 **Diffusion and cellular uptake delivery routes of active agents using multilayer microcapsules**
J. F. Mano, 3B's Research Group – Biomaterials, Biodegradables and Biomimetics, University of Minho, Caldas Das Taipas – Guimarães, Portugal
R. R. Costa, 3B's Research Group – Biomaterials, Biodegradables and Biomimetics, University of Minho, Caldas Das Taipas - Guimarães, Portugal
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F. Arias, G.I.R. Bioforge, University of Valladolid, Valladolid, Spain
J. Rodríguez-Cabello, G.I.R. Bioforge, University of Valladolid, Valladolid, Spain

860 **Preparation of starch/cellulose acetate structures as drug delivery system using green technology**
M. Martins, 3B's Research Group- Biomaterials, Biodegradables and Biomimetics, University of Minho, Taipas, Guimarães, Portugal
S. Silva, 3B's Research Group- Biomaterials, Biodegradables and Biomimetics, University of Minho, Taipas, Guimarães, Portugal
A. Paiva, REQUIMTE/CQFB, Departamento de Química, Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa, Caparica, Portugal
R. L. Reis, 3B's Research Group- Biomaterials, Biodegradables and Biomimetics, University of Minho, Taipas, Guimarães, Portugal

861 **Biodegradable Nanoparticles Fabricated from Amino Acid-based Poly(ester amide)s for Drug Release**
D. Wu, Jr., Donghua University, Shanghai, China
X. Qin, Sr., Donghua University, Shanghai, China

862 **Poly (aspartic acid) hydrogel nanofibers from electrospun polysuccinimide membranes for controlled release**
X. Qin, Sr., Donghua University, Shanghai, China
C. Zhang, Donghua University, Shanghai, China
D. Wu, Donghua University, Shanghai, China

Targeting to Cellular and Pathological Microenvironments

863 **Suppression of UHMWPE Wear Particle- induced Pro-Inflammatory Cytokine and Chemokine Production by Macrophages using an NF-κB Decoy Oligodeoxynucleotide**
T. Lin, Stanford University, Palo Alto, CA
Z. Yao, Stanford University, Palo Alto, CA
T. Sato, Stanford University, Palo Alto, CA
D. K. Woo, Stanford University, Palo Alto, CA
J. Pajarinen, Stanford University, Palo Alto, CA
S. B. Goodman, Stanford University, Palo Alto, CA

864 **Polymeric nanoparticles for hypoxia-triggered drug delivery**
T. Thavasyappan, III, Sungkyunkwan University, Suwon, Korea, Republic of

865 **Peptide Nanofiber-Calcium Carbonate Composite Microparticles for Mucosal Vaccine Delivery**
J. D. Snook, University of Texas Medical Branch, Galveston, TX
S. M. Dann, University of Texas Medical Branch, Galveston, TX

Translatory Research (Including Theranostics) in Nanomedicine

866 **In-vitro Evaluation of Three Dimensional Single Walled Carbon Nanotube Composites for Bone Tissue Engineering**
A. Gupta, Southern Illinois University, School of Medicine, Springfield, IL
B. J. Main, University of Illinois at Springfield, Springfield, IL

B. L. Taylor, Rutgers University, Piscataway, NJ
M. Gupta, Manipal University, Delhi, India
C. A. Whitworth, Southern Illinois University, School of Medicine, Springfield, IL
C. Cady, Bradley University, Peoria, IL
J. W. Freeman, Rutgers University, Piscataway, NJ
S. F. El-AmIn, III, Southern Illinois University, School of Medicine, Springfield, IL

867 **In-vivo biocompatibility and toxicity of Single Walled Carbon Nanotube Composites for Bone Tissue Engineering**
A. Gupta, Southern Illinois University, School of Medicine, Springfield, IL
B. J. Main, University of Illinois at Springfield, Springfield, IL
T. A. Liberati, Southern Illinois University, School of Medicine, Springfield, IL
M. H. Roberts, Southern Illinois University, School of Medicine, Springfield, IL
A. G. R. Potty, Southern Illinois University, School of Medicine, Springfield, IL
S. F. El-Amin, III, Southern Illinois University, School of Medicine, Springfield, IL

868 **Combined PDT and PTT by Methylene Blue Loaded Graphene Oxide**
A. Sahu, GIST, Gwangju, Korea, Republic of
W. Choi, GIST, Gwangju, Korea, Republic of
J. Lee, GIST, Gwangju, Korea, Republic of

869 **Ultrasonic Delivery of Doxorubicin to the Cell Cytosol**
W. G. Pitt, Brigham Young University, Provo, UT
C. Lin, Chang Gung Memorial Hospital, Taipei, Taiwan
E. Handly, Brigham Young University, Provo, UT
M. Javadi, Brigham Young University, Provo, UT

870 **Formation of Nanostructured Fluorapatite via Microwave Assisted Solution Combustion Synthesis**
M. Nabiyouni, University of Toledo, Toledo, OH
H. Zhou, University of Toledo, Toledo, OH
S. B. Bhaduri, University of Toledo, Toledo, OH

871 **Engineering and Evaluation of a Fully Synthetic Universal Influenza-A Vaccine Based on M2e-Conjugated Gold Nanoparticles**
W. Tao, Texas Tech University, Lubbock, TX
H. S. Gill, Texas Tech University, Lubbock, TX

872 **Orthogonal Approaches to Enhance Polymersome Adhesion to Targeting Tissue: Controlling Polymersome Shape and Permeabilty**
M. Lai, University of Illinois at Urbana-Champaign, Urbana, IL
S. Lee, Korea Institute of Science and Technology (KIST), Seoul, Korea, Republic of
C. E. Smith, University of Illinois at Urbana- Champaign, Urbana, IL
K. Kim, KoreaInstitute of Science and Technology (KIST), Seoul, Korea, Republic of
H. Kong, University of Illinois at Urbana- Champaign, Urbana, IL

873 **Synthesis and Characterization of CREKA-conjugated Iron Oxide Nanoparticles for Hyperthermia Applications**
A. Kruse, University of Kentucky, Lexington, KY
J. Z. Hilt, University of Kentucky, Lexington, KY
K. Anderson, University of Kentucky, Lexington, KY

874 **Magnetized Bacterial Nano-Cellulose (MBNC) for Neuroendovascular Reconstruction of**

Brain Aneurysms
J. Allain, University of illinois at Urbana Champaign, Urbana, IL
M. Echeverry-Rendon, University of Illinois at Urbana-Champaign, Urbana, IL
S. L. Arias, University of Illinois at Urbana-Champaign, Urbana, IL
J. Pavon, University of Illinois at Urbana-Champaign, Urbana, IL
H. Pastrana, Purdue University, West Lafayette, IN
L. M. Reece, Purdue University, West Lafayette, IN
T. A. Tigno, Jr, Walter Reed National Military Medical Center, Bethesda, MD, USA, Bethesda, MD

875 **Contrast-Enhanced Radiographic Imaging of Breast Microcalcifications In Vivo using Bisphosphonate-Functionalized Gold Nanoparticles**
L. E. Cole, University of Notre Dame, Notre Dame, IN
T. C. Vargo-Gogola, Indiana University School of Medicine - South Bend, South Bend, IN
R. K. Roeder, University of Notre Dame, Notre Dame, IN

876 **Synthesis and Characterization of Doxorubicin-bearing Cetuximab-PAMAM Dendrimer Bioconjugates**
H. Yang, Virginia Commonwealth University, Richmond, VA

Trends in Surface Modification of Bulk- and Nano-Biomaterials

878 **Antimicrobial Silver/Titania Nanotube Surfaces (TiO2-Nt-Ag) for Dental Implants**
T. Shokuhfar, Michigan Technological University, Houghton, MI

879 **One-step Preparation of Vinyl-Functionalized Material Surfaces for Surface Modification**
Z. Wu, Soochow University, Suzhou, China

880 **Regulation of fibrinolytic protein adsorption on lysine-containing surfaces**
D. Li, Soochow University, Suzhou, China
Z. Tang, Soochow University, Suzhou, China
H. Chen, Soochow University, Suzhou, China

881 **Small Molecule-Modification of Mixed Calcium Aluminate:Hydroxyapatite Reduces Bacteria Growth**
E. S. Gawalt, Duquesne University, Pittsburgh, PA
G. Buckholtz, Duquesne University, Pittsburgh, PA

882 **Soft and Conductive Hydrogel Nanofibers for Electrode-Tissue Interfaces**
P. Fattahi, Pennsylvania State University, University Park, PA
R. E. Johns, Pennsylvania State University, University Park, PA
M. Abidian, Pennsylvania State University, University Park, PA

883 **Development of Combinatorial Peptide Screening to Identify Novel Nonfouling Sequences**
A. K. Nowinski, University of Washington, Seattle, WA
A. J. Keefe, University of Washington, Seattle, WA
A. D. White, University of Chicago, Chicago, IL
S. Jiang, University of Washington, Seattle, WA

884 **Development of carbon nanotube-based bio-impedimetric bone marker sensors**
M. S. Patil, University of Pittsburgh, Pittsburgh, PA
M. Ramananthan, University of Pittsburgh, Pittsburgh, PA
V. Shanov, University of Cincinnati, Cincinnati, OH

P. Kumta, University of Pittsburgh, Pittsburgh, PA

885 **Comparative analysis of chemical surface modification methods for improved hydrophilicity of nano-patterned PDMS substrates**

V. Guneta, Nanyang Technological University, Singapore, Singapore
W. Wang, Singapore Institute of Manufacturing Technology, SIMTech, Singapore, Singapore
C. Choong, Nanyang Technological University, Singapore, Singapore

886 **Antibacterial and Anti-biofouling Nanofibrous Membranes**

Y. Mei, Southeast University, Nanjing, China