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J. L. Eiseman, University of Pittsburgh Medical Center, Pittsburgh, Pennsylvania
A. Sen Gupta, Case Western Reserve University, Cleveland, Ohio

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C. J. Needham, Rice University, Houston, TX
S. Shah, Rice University, Houston, Texas
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Y. Wang, University of North Carolina, Chapel Hill, Chapel Hill, NC

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E. Aksoy, Middle East Technical University, Ankara, Turkey
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N. Kalkan, Gazi University, Ankara, Turkey
N. Hasirci, Middle East Technical University, Ankara, Turkey

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B. J. Gill, Rice University, Houston, Texas
D. L. Gibbons, The University of Texas MD Anderson Cancer Center, Houston, Texas
J. M. Kurie, The University of Texas MD Anderson Cancer Center, Houston, Texas
J. L. West, Duke University, Durham, North Carolina

98 **Cancer-activated adipocytes and their role in extracellular matrix remodeling and angiogenesis**
B. Seo, Cornell University, Ithaca, NY
J. Gonzalez, Cornell University, Ithaca, New York
S. Moore, Cornell University, Ithaca, New York
L. T. Vahdat, Weill Cornell Medical College, New York, New York
C. Fischbach, Cornell University, Ithaca, New York

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E. Y. Tokuda, The BioFrontiers Institute and the Howard Hughes Medical Institute, University of Colorado, Boulder, CO
J. L. Leight, The BioFrontiers Institute and the Howard Hughes Medical Institute, University of

Colorado, Boulder, Colorado
K. S. Anseth, The BioFrontiers Institute and the Howard Hughes Medical Institute, University of Colorado, Boulder, Colorado

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J. L. Dreyfuss, Massachusetts Institute of Technology, Cambridge, MA

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P. Pradhan, The University of Texas at Austin, Austin, TX

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S. Pedron, University of Illinois at Urbana-Champaign, Urbana, IL
E. Becka, University of Illinois at Urbana-Champaign, Urbana, Illinois
E. Roy, University of Illinois at Urbana-Champaign, Urbana, Illinois
B. Harley, University of Illinois at Urbana-Champaign, Urbana, Illinois

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S. Sonnenberg, University of California, San Diego, San Diego, CA

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B. P. Purcell, University of Pennsylvania, Philadelphia, PA
J. W. MacArthur, Jr., University of Pennsylvania, Philadelphia, Pennsylvania
J. Y. Woo, University of Pennsylvania, Philadelphia, Pennsylvania
J. A. Burdick, University of Pennsylvania, Philadelphia, Pennsylvania

106 **Injectable Poly(Vinyl Alcohol) Hydrogels for Cardiovascular Applications**
G. J. Braithwaite, Cambridge Polymer Group, Boston, MA
T. Wilson-Hill, Cambridge Polymer Group, Boston, Massachusetts
J. Hung, Massachusetts General Hospital, Boston, Massachusetts

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S. M. Dorsey, University of Pennsylvania, Philadelphia, PA
E. Tous, University of Pennsylvania, Philadelphia, Pennsylvania
J. R. McGarvey, University of Pennsylvania, Glenolden, Pennsylvania
J. F. Wenk, University of Kentucky, Lexington, Kentucky
J. H. Gorman, III, University of Pennsylvania, Glenolden, Pennsylvania
R. C. Gorman, University of Pennsylvania, Glenolden, Pennsylvania
J. A. Burdick, University of Pennsylvania, Philadelphia, Pennsylvania

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B. McNeill, University of Ottawa Heart Institute, Ottawa, ON, Canada
B. Vulesevic, University of Ottawa Heart Institute, Ottawa, Ontario, Canada

M. Ruel, University of Ottawa Heart Institute, Ottawa, Ontario, Canada
E. J. Suuronen, University of Ottawa Heart Institute, Ottawa, Ontario, Canada

109 **Hydrogels Designed to Provide Sustained, Stimuli-Responsive Release of Pro-Angiogenic Peptides**
A. H. Van Hove, University of Rochester, Rochester, NY
D. Benoit, University of Rochester, Rochester, New York

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A. J. Harmata, Vanderbilt University, Nashville, TN
C. L. Ward, United States Army Institute of Surgical Research, Fort Sam Houston, Texas
K. J. Zienkiewicz, Vanderbilt University, Nashville, Tennessee
J. C. Wenke, United States Army Institute of Surgical Research, Fort Sam Houston, Texas
S. A. Guelcher, Vanderbilt University, Nashville, Tennessee

111 **Polyvinyl alcohol-polyacrylic acid (PVA-PAA) hydrogels for osteochondral defect repair**
D. Bichara, Massachusetts General Hospital, Boston, MA
H. Bodugoz-Senturk, Massachusetts General Hospital, Boston, Massachusetts
D. Ling, Massachusetts General Hospital, Boston, Massachusetts
E. Malchau, Massachusetts General Hospital, Boston, Maryland
C. Bragdon, Massachusetts General Hospital, Boston, Massachusetts
O. Muratoglu, Massachusetts General Hospital, Boston, Massachusetts

112 **One Year Evaluation of a PCL-TCP Putty in an Ovine Critical Sized Metaphyseal Defect Model.**
S. Woods, DePuy Synthes, West Chester, PA
A. Petticoffer, DePuy Synthes, West Chester, Pennsylvania
P. Patel, DePuy Synthes, West Chester, Pennsylvania
D. Arens, AO Research Institute, Davos, Switzerland

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J. Veronick, University of Connecticut, Farmington, CT
Y. Khan, University of Connecticut, Farmington, Connecticut
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Y. Kutes, Institute of Materials Science, Storrs, Connecticut

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Y. Kang, Stanford University, Stanford, CA
N. Mochizuki, University of Tsukuba, Tsukuba, Ibaraki, Japan
L. Ren, Lanzhou University, Lanzhou,Gansu, China
A. Khademhosseini, Harvard Medical School, Cambridge, Massachusetts
J. Fukuda, University of Tsukuba, Ibaraki, Japan
Y. Yang, Stanford University, Stanford, California

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Z. Fang, Mayo Clinic, Rochester, MN

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D. L. Kaplan, Tufts University, Medford, Massachusetts
T. J. Lo, Tufts University, Medford, Massachusetts

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L. S. Brown, Stryker, Corp., Malvern, PA
M. M. Darmoc, Stryker, Corp., Malvern, Pennsylvania
T. D. Clineff, Stryker, Corp., Malvern, Pennsylvania

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O. O. Akintewe, University Of South Florida, Tampa, FL
S. J. DuPont, University Of South Florida, Tampa, Florida
R. G. Toomey, University Of South Florida, Tampa, Florida
N. D. Gallant, University Of South Florida, Tampa, Florida

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L. Mozdzen, University of Illinois at Champaign-Urbana, Champaign, IL

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N. J. Steinmetz, University of Glasgow, Glasgow, United Kingdom (Great Britain)
M. J. Dalby, University of Glasgow, Glasgow, United Kingdom (Great Britain)
N. Gadegaard, University of Glasgow, Glasgow, United Kingdom (Great Britain)

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K. Suffoletto, SUNY Buffalo, Buffalo, NY

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P. F. Costa, University of Minho, Guimarães, Portugal
C. Vaquette, Queensland University of Technology, Brisbane, Australia
C. Theodoropoulos, Queensland University of Technology, Brisbane, Australia
M. E. Gomes, University of Minho, Guimarães, Portugal
R. L. Reis, University of Minho, Guimarães, Portugal
D. W. Hutmacher, Queensland University of Technology, Brisbane, Australia

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K. J. McHugh, Boston University; Schepens Eye Research Institute; The Charles Stark Draper Laboratory, Inc., Boston, MA
S. L. Tao, The Charles Stark Draper Laboratory, Inc.; CooperVision, Inc., Cambridge, Massachusetts
M. Saint-Geniez, Schepens Eye Research Institute; Harvard Medical School, Boston, Massachusetts

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A. Gaharwar, Massachusetts Institute of Technology, Cambridge, MA
M. Nikkhah, Brigham and Women's Hospital, Harvard Medical School, Cambridge, Massachusetts
S. Sant, Brigham and Women's Hospital, Harvard Medical School, Cambridge, Massachusetts

A. Patel, Brigham and Women's Hospital, Harvard Medical School, Cambridge, Massachusetts
S. Mihaila, Brigham and Women's Hospital, Harvard Medical School, Cambridge, Massachusetts
A. Khademhosseini, Brigham and Women's Hospital, Harvard Medical School, Cambridge, Massachusetts

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D. J. Caldwell, University of Michigan, Ann Arbor, MI
D. J. Caldwell, University of Michigan, Ann Arbor, Michigan
R. R. Rao, University of Michigan, Ann Arbor, Michigan
J. P. Stegemann, University of Michigan, Ann Arbor, Michigan

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J. Wu, University of Pittsburgh School of Medicine, Pittsburgh, PA
Y. Du, University of Pittsburgh School of Medicine, Pittsburgh, PA, Pennsylvania
J. L. Funderburgh, University of Pittsburgh School of Medicine, Pittsburgh, Pennsylvania
W. R. Wagner, University of Pittsburgh, Pittsburgh, Pennsylvania

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A. W. Feinberg, Carnegie Mellon University, Pittsburgh, PA
R. N. Palchesko, Carnegie Mellon University, Pittsburgh, Pennsylvania
O. Creasey, University of Pittsburgh, Pittsburgh, Pennsylvania
J. L. Funerburgh, University of Pittsburgh, Pittsburgh, Pennsylvania

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S. Paterson, McMaster University, Hamilton, ON, Canada

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L. Liu, McMaster University, Canada, Hamilton, ON, Canada
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M. G. O'Toole, University of Louisville, Louisville, KY
R. M. Rostosky, University of Louisville, Louisville, Kentucky
T. H. Tezel, University of Louisville, Louisville, Kentucky
A. S. Gobin, University of Louisville, Louisville, Kentucky

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C. B. Hu, Abbott Medical Optics, Santa Ana, CA
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L. E. Bertassoni, Center for Biomedical Engineering, Department of Medicine, Brigham and Women's Hospital, Harvard Medical School; Harvard-MIT Division of Health Sciences and Technology, Massachusetts Institute of Technology; Faculty of Dentistry, University of Sydney, Aus, Cambridge, MA

M. Cecconi, 1. Center for Biomedical Engineering, Department of Medicine, Brigham and Women's Hospital, Harvard Medical School; 2. Harvard-MIT Division of Health Sciences and Technology, Massachusetts Institute of Technology;, Cambridge, Massachusetts

P. H. Molin, 1. Center for Biomedical Engineering, Department of Medicine, Brigham and Women's Hospital, Harvard Medical School; 2. Harvard-MIT Division of Health Sciences and Technology, Massachusetts Institute of Technology;, Cambridge, Massachusetts

E. S. Martinez-Martinez, 1. Center for Biomedical Engineering, Department of Medicine, Brigham and Women's Hospital, Harvard Medical School; 2. Harvard-MIT Division of Health Sciences and Technology, Massachusetts Institute of Technology, Cambridge, Massachusetts

M. Nikkhah, 1. Center for Biomedical Engineering, Department of Medicine, Brigham and Women's Hospital, Harvard Medical School; 2. Harvard-MIT Division of Health Sciences and Technology, Massachusetts Institute of Technology, Cambridge, Massachusetts

A. Khademhosseini, Center for Biomedical Engineering, Department of Medicine, Brigham and Women's Hospital, Harvard Medical School; Harvard-MIT Division of Health Sciences and Technology, Massachusetts Institute of Technology; Wyss Institute for Biologically Inspired Engin, Cambridge, Massachusetts

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T. M. Cervantes, Massachusetts General Hospital, Boston, MA

E. K. Bassett, Massachusetts General Hospital, Boston, Massachusetts

A. Tseng, Massachusetts General Hospital, Boston, Massachusetts

A. Kimura, Massachusetts General Hospital, Boston, Massachusetts

N. Roscioli, Kensey Nash Corporation, Exton, Pennsylvania

R. Gupta, Massachusetts General Hospital, Boston, Massachusetts

M. A. Randolph, Massachusetts General Hospital, Boston, Massachusetts

J. P. Vacanti, Massachusetts General Hospital, Boston, Massachusetts

I. Pomerantseva, Massachusetts General Hospital, Boston, Massachusetts

C. A. Sundback, Massachusetts General Hospital, Boston, Massachusetts

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Y. F. Tian, University of Chicago, Chicago, IL

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A. W. Peterson, University of Michigan, Ann Arbor, MI

A. W. Peterson, University of Michigan, Ann Arbor, Michigan

R. R. Rao, University of Michigan, Ann Arbor, Michigan

A. Y. Rioja, University of Michigan, Ann Arbor, Michigan

A. J. Putnam, University of Michigan, Ann Arbor, Michigan

J. P. Stegemann, University of Michigan, Ann Arbor, Michigan

136 **Scaffold pore size controls chondrogenic differentiation of human mesenchymal stem cells and cartilage formation in vitro and in vivo**

M. J. Gupte, University of Michigan, Ann Arbor, MI

J. Hu, University of Michigan, Ann Arbor, Michigan
H. Ma, University of Michigan, Ann Arbor, Michigan
G. Feng, University of Michigan, Ann Arbor, Michigan
K. Feng, University of Michigan, Ann Arbor, Michigan
G. Xiao, University of Michigan, Ann Arbor, Michigan
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S. Chase, Mayo Clinic, Rochester, MN
E. R. Wagner, Mayo Clinic, Rochester, Minnesota
S. Chase, Mayo Clinic, Rochester, Minnesota
D. Bravo, Mayo Clinic, Rochester, Minnesota
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A. J. Dixon, University of Virginia, Charlottesville, Virginia
A. H. Dhanaliwala, University of Virginia, Charlottesville, Virginia
J. A. Hossack, University of Virginia, Charlottesville, Virginia

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L. Fong, Rice University, Houston, TX
S. Lamhamedi Cherradi, The University of Texas MD Anderson Cancer Center, Houston, Texas
E. Burdett, Rice University, Houston, Texas
V. Ramamoorthy, The University of Texas MD Anderson Cancer Center, Houston, Texas
A. Lazar, The University of Texas MD Anderson Cancer Center, Houston, Texas
K. Kasper, Rice University, Houston, Texas
M. Farach-Carson, Rice University, Houston, Texas
D. Vishwamitra, The University of Texas MD Anderson Cancer Center, Houston, Texas
E. Demicco, Mount Sinai Medical Center, New York, New York
B. Menegaz, The University of Texas MD Anderson Cancer Center, Houston, Texas
H. Amin, The University of Texas MD Anderson Cancer Center, Houston, Texas
J. Ludwig, The University of Texas MD Anderson Cancer Center, Houston, Texas
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C. M. Neville, Massachusetts General Hospital, Boston, MA
K. M. Kulig, Massachusetts General Hospital, Boston, Massachusetts
S. Lauterbach, Ludwig-Maximilians-University, Munich, Germany
J. P. Vacanti, Massachusetts General Hospital, Boston, Massachusetts
C. R. Wittmer, Massachusetts General Hospital, Boston, Massachusetts
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J. J. Wang, University of California, San Diego, La Jolla, CA

K. L. Christman, University of California, San Diego, La Jolla, California
G. R. Boss, University of California, San Diego, La Jolla, California

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I. L. Kim, University of Pennsylvania, Philadelphia, PA
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V. Barron, National University of Ireland, Galway, Galway, Ireland
M. Neary, National University of Ireland, Galway, Galway, Ireland
G. O'Malley, National University of Ireland, Galway, Galway, Ireland
N. Rooney, Proxy Biomedical, Galway, Ireland
F. Barry, National University of Ireland, Galway, Galway, Ireland
M. Murphy, National University of Ireland, Galway, Galway, Ireland

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B. V. Sridhar, University of Colorado, Denver, CO

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B. Choi, University of California, Los Angeles, Los Angeles, CA

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S. G. Pathan, BioSurfaces Inc., Ashland, MA
D. W. Nelson, BioSurfaces Inc., Ashland, Massachusetts
S. M. Ali, BioSurfaces Inc., Ashland, Massachusetts
M. J. Bide, University of Rhode Island, Kingston, Rhode Island
L. M. Fitzgerald, BioSurfaces Inc., Ashland, Massachusetts
J. R. Araya, BioSurfaces Inc., Ashland, Massachusetts
T. E. Phaneuf, BioSurfaces Inc., Ashland, Massachusetts
M. A. Contreras, Beth Israel Deaconess Medical Center, Boston, Massachusetts
T. Phaneuf, BioSurfaces Inc., Ashland, Massachusetts
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A. Perera, Direct Flow Medical, santa rosa, CA

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G. Shi, 3D Biotek, LLC, North Brunswick, NJ

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D. W. Nelson, BioSurfaces, Inc., Ashland, MA
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M. J. Bide, University of Rhode Island, Kingston, Rhode Island
C. B. Meeks, BioSurfaces, Inc., Tufts University, Ashland, Massachusetts
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S. Lamichhane, The University of South Dakota, Sioux Falls, SD
A. Gallo, The University of South Dakota, Sioux Falls, South Dakota
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H. Choi, Harvard Medical School, Boston, MA

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D. B. Masters, Gel-Del Technologies, Inc, St. Paul, MN
L. K. Hansen, WuXi AppTec, St. Paul, Minnesota
R. A. Meyer, Gel-Del Technologies, Inc., St. Paul, Minnesota

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T. N. Vo, Rice University, Houston, TX
A. K. Ekenseair, Rice University, Houston, Texas
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J. A. Burdick, University of Pennsylvania, Philadelphia, Pennsylvania

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L. M. Ricles, The University of Texas at Austin, Austin, TX

S. Nam, The University of Texas at Austin, Austin, Texas
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S. Chen, Department of Chemical and Materials Engineering Chang Gung University, Kwei-Shan, Tao-Yuan, Taiwan 333, ROC, Tao-Yuan, Taiwan
C. Chen, Department of Chemical and Materials Engineering Chang Gung University, Kwei-Shan, Tao-Yuan, Taiwan 333, ROC., Tao-Yuan, Taiwan
J. Chen, Department of Chemical and Materials Engineering Chang Gung University, Kwei-Shan, Tao-Yuan, Taiwan 333, ROC, Tao-Yuan, Taiwan

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B. Li, West Virginia University School of Medicine, Morgantown, WV
P. Farjo, West Virginia University, Morgantown, West Virginia
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L. A. Kinard, Rice University, Houston, TX
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K. N. Cicotte, University of New Mexico, Albuquerque, NM
P. G. McGuire, Department of Cell Biology and Physiology, Albuquerque, New Mexico
T. R. Howdieshell, University of New Mexico Health Science Center, Albuquerque, New Mexico
E. L. Hedberg-Dirk, University of New Mexico, Albuquerque, New Mexico

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P. Ducheyne, University of Pennsylvania, Philadelphia, Pennsylvania
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L. Yan, University of Washington, Seattle, WA

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D. H. Betz, University of Utah, Salt Lake City, UT
T. A. Ford, University of Utah, Salt Lake City, Utah
B. M. Holt, University of Utah, Salt Lake City, Utah
M. Van Dyke, Virginia Polytechnic Institute and State University, Blacksburg, Virginia
J. P. Beck, University of Utah, Salt Lake City, Utah
R. D. Bloebaum, University of utah, Salt Lake City, Utah
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C. DePaula, DePuy Synthes - Biomaterials, West Chester, PA

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R. Payne, Tengion, Inc., Winston-Salem, NC
T. Knight, Tengion, Inc., Winston-Salem, North Carolina
J. Basu, Tengion, Inc., Winston-Salem, North Carolina
E. Rivera, Tengion, Inc, Winston-Salem, North Carolina
K. Mihalko, Carolinas Medical Center, Charlotte, North Carolina
N. Robbins, Tengion Inc., Winston-Salem, North Carolina
D. McCoy, Tengion Inc., Winston-Salem, North Carolina
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D. Jain, Tengion Inc., Winston-Salem, North Carolina

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W. W. Wong, Boston University, Boston, MA

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A. C. Brown, Georgia Institute of Technology, Atlanta, GA
S. Stabenfeldt, Arizona State University, Tempe, Arizona
B. Ahn, Georgia Institute of Technology and Children's Healthcare of Atlanta / Emory University School of Medicine, Atlanta, Georgia
R. Hannan, Georgia Institute of Technology, Atlanta, Georgia
K. Dhada, Georgia Institute of Technology, Atlanta, Georgia
W. Lam, Georgia Institute of Technology and Children's Healthcare of Atlanta / Emory University School of Medicine, Atlanta, Georgia
A. Lyon, Georgia Institute of Technology, Atlanta, Georgia
T. Barker, Georgia Institute of Technology and Emory University, Atlanta, Georgia

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W. Weber, University of Freiburg, Freiburg, Germany

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J. C. Liu, Purdue University, West Lafayette, IN
J. C. Liu, Purdue University, West Lafayette, Indiana
R. Su, Purdue University, West lafayette, Indiana

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A. Fathi, Jr., The University of Sydney, Sydney, Australia

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N. Annabi, Harvard Medical School, Cambridge, MA
M. Afshar, Harvard medical School, Cambridge, Massachusetts
K. Tsang, Harvard Medical School, Cambridge, Massachusetts
S. Mithieux, University of Sydney, Sydney, Australia
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A. S. Weiss, University of Sydney, Sydney, Australia
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S. Prateepchinda, Columbia University, New York, NY
H. H. Lu, Columbia University, New York, New York
G. B. Hasselgren, Columbia University, New York, New York
D. Seliktar, Technion – Israel Institute of Technology, Haifa, Israel

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T. Guda, University of Texas at San Antonio, San Antonio, TX
P. Brown-Baer, United States Army Institute of Surgical Research, Fort Sam Houston, Texas
T. Silliman, United States Army Institute of Surgical Research, Fort Sam Houston, Texas
A. Darr, Rutgers, The State University of New Jersey, Piscataway, New Jersey
J. Kohn, Rutgers, The State University of New Jersey, Piscataway, New Jersey

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H. A. Kuhn, University of Pittsburgh, Pittsburgh, Pennsylvania
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S. Kuznetsov, Columbia University Dental School, New York, New York
S. Eisig, Columbia University Dental School, NY, New York
H. H. Lu, Columbia University, New York, New York

179 **A novel air-based non-thermal plasma (NTP) approach for the enhancement of Ti-6Al-4V dental implants**
L. Witek, Oklahoma State University, Stillwater, OK
N. Tovar, New York University, New York, New York
C. Marin, UNIGRANRIO University-School of Health Sciences, Rio de Janeiro, Brazil
E. A. Bonafante, UNIGRANRIO University-School of Health Sciences, Rio de Janeiro, Brazil
R. Granato, UNIGRANRIO University-School of Health Sciences, Rio de Janeiro, Brazil
M. Suzuki, Tufts University School of Dental Medicine, Boston, Massachusetts
P. G. Coelho, New York University, New York, New York

180 **Structure/Property of Model Dentin Adhesive Exposed to Wet Environments**
P. Spencer, University of Kansa, Lawrence, KS
Q. Ye, University of Kansas, Lawrence, Kansas
R. Parthasarathy, University of Kansas, Lawrence, Kansas

V. Singh, University of Kansas, Lawrence, Kansas
A. Misra, University of Kansas, Lawrence, Kansas
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Q. Ye, University of Kansas, Lawrence, KS
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R. Parthasarathy, University of Kansas, Lawrence, Kansas
A. Misra, University of Kansas, Lawrence, Kansas
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182 **Combination Use of Autologous Periodontal Ligament-derived Cell Sheets and Beta-tricalcium Phosphate Granules in Periodontal Defects in Humans**
T. Iwata, Tokyo Women's Medical University, Tokyo, Japan

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H. Bodugoz-Senturk, Massachusetts General Hospital, Boston, MA
D. Bichara, Massachusetts General Hospital, Boston, Massachusetts
D. Ling, Massachusetts General Hospital, Boston, Massachusetts
C. Gupta, Massachusetts General Hospital, Boston, Massachusetts
M. Randolph, Massachusetts General Hospital, Boston, Massachusetts
O. Muratoglu, Massachusetts General Hospital, Boston, Massachusetts

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E. K. Brooks, University at Buffalo, Buffalo, NY
M. Ehrensberger, University at Buffalo, Buffalo, New York
M. Tobias, University at Buffalo, Buffalo, New York

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D. Hong, University of Pittsburgh, Pittsburgh, PA
D. Chou, University of Pittsburgh, Pittsburgh, Pennsylvania
P. Saha, University of Pittsburgh, Pittsburgh, Pennsylvania
O. Velikokhatnyi, University of Pittsburgh, Pittsburgh, Pennsylvania
P. N. Kumta, University of Pittsburgh, Pittsburgh, Pennsylvania

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S. J. L. Sullivan, University of Maryland, Baltimore County, Baltimore, MD
A. Au, Nutramax Laboratories, Inc., Edgewood, Maryland
M. Grzanna, Nutramax Laboratories, Inc., Edgewood, Maryland
T. Pham, University of Maryland, Baltimore County, Baltimore, Maryland
C. Frondoza, Nutramax Laboratories, Inc., Edgewood, Maryland
L. Topoleski, University of Maryland, Baltimore County, Baltimore, Maryland

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S. J. L. Sullivan, University of Maryland, Baltimore County, Baltimore, MD

L. Topoleski, University of Maryland, Baltimore County, Baltimore, Maryland

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M. E. Roy, Missouri Bone & Joint Research Foundation, St. Louis, MO
L. A. Whiteside, Missouri Bone & Joint Research Foundation; Signal Medical Corp., St. Louis, MO, St. Louis, Missouri
O. F. Noel, IV, Missouri Bone & Joint Research Foundation; Rocky Vista University College of Osteopathic Medicine, Parker, CO, St. Louis, Missouri

189 **Vitamin E-Stabilized, Highly Cross-linked UHMWPE Implants: A Short-Term Retrieval Study**
S. Rowell, Massachusetts General Hospital, Boston, MA
K. Wannomae, Massachusetts General Hospital, Boston, Massachusetts
O. Muratoglu, Massachusetts General Hospital, Boston, Massachusetts

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D. Ling, Massachusetts General Hospital, Boston, MA
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M. Guvendiren, University of Pennsylvania, Philadelphia, PA
K. Sudhir, University of Pennsylvania, Philadelphia, Pennsylvania
J. A. Burdick, University of Pennsylvania, Philadelphia, Pennsylvania

193 **Surface Properties Modulate Integrins, Pluripotent Markers, and Morphogens in Embryonic and Adult Stem Cells**
R. Olivares-Navarrete, Georgia Institute of Technology, Atlanta, GA
C. A. Cundiff, Georgia Institute of Technology, Atlanta, Georgia
S. L. Hyzy, Georgia Institute of Technology, Atlanta, Georgia
M. T. Cook, Georgia Institute of Technology, Atlanta, Georgia
S. L. Stice, University of Georgia, Athens, Georgia
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T. McDevitt, Georgia Institute of Technology, Atlanta, Georgia
B. D. Boyan, Georgia Institute of Technology, Atlanta, Georgia

194 **Effect of Nanofiber Mineral Content on Human Mesenchymal Stem Cell Osteogenesis**
S. D. Subramony, Columbia University, New York, NY
D. Qu, Columbia University, New York, New York
A. Su, Columbia University, New York, New York
J. P. Heisler, Columbia University, New York, New York
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195 **Comparative Evaluation of Hydrogels As a 3D Angiogenic Matrix for Adipose-Derived Stem Cells**
E. Chung, The University of Texas at Austin, Austin, TX
J. A. Rytlewski, The University of Texas at Austin, Austin, Texas
A. G. Merchant, The University of Texas at Austin, Austin, Texas

E. W. Lewis, The University of Texas at Austin, Austin, Texas
L. J. Suggs, The University of Texas at Austin, Austin, Texas

196 **Direct reprograming of mouse fibroblasts to cardiomyocytes using Yamanaka factors on engineered hydrogels**
D. L. Elbert, Washington University in St. Louis, St. Louis, MO
A. Smith, Washington University in St. Louis, St. Louis, Missouri
P. K. Nguyen, Washington University in St. Louis, St. Louis, Missouri
I. Efimov, Washington University in St. Louis, St. Louis, Missouri

197 **Protein-based Biomaterials Accelerate Osteogenic Differentiation**
Y. Kim, Purdue University, West Lafayette, IN
J. Liu, Purdue University, West Lafayette, Indiana

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C. Loose, Semprus BioSciences, Cambridge, MA
H. Wang, Semprus BioSciences, Cambridge, Massachusetts
R. Smith, Semprus BioSciences, Cambridge, Massachusetts
G. Brotske, Semprus BioSciences, Cambridge, Massachusetts
A. Cook, Semprus BioSciences, Cambridge, Massachusetts
Z. Zhang, Semprus BioSciences, Cambridge, Massachusetts

199 **Local Delivery of D-Amino Acids Reduces Bacterial Burden in Contaminated Rat Segmental Defects**
E. M. Prieto, Vanderbilt University, Nashville, TN
C. J. Sanchez, Jr., United States Army Institute of Surgical Research, Fort Sam Houston, Texas
C. A. Kruger, United States Army Institute of Surgical Research, Fort Sam Houston, Texas
K. J. Zienkiewicz, Vanderbilt University, Nashville, Tennessee
D. R. Romano, United States Army Institute of Surgical Research, Fort Sam Houston, Texas
K. S. Askers, United States Army Institute of Surgical Research, Fort Sam Houston, Texas
S. K. Hardy, United States Army Institute of Surgical Research, Fort Sam Houston, Texas
R. L. Woodburry, United States Army Institute of Surgical Research, Fort Sam Houston, Texas
S. A. Guelcher, Vanderbilt University, Nashville, Tennessee
J. C. Wenke, United States Army Institute of Surgical Research, Fort Sam Houston, Texas

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J. Kim, Syracuse University, Syracuse, NY
J. L. Gilbert, Syracuse University, Syracuse, New York

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S. Bhattacharyya, University of Pennsylvania, Philadelphia, PA

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G. E. Aninwene, II, Northeastern University, East Providence, RI
D. Stout, Brown University, Providence, Rhode Island
Z. Yan, Brown University, Providence, Rhode Island
T. J. Webster, Northeastern University, Boston, Massachusetts
B. C. LaBrec, Foster Biomedical Polymers and Compounds, Putnam, Connecticut

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D. MISRA, UNIVERSITY OF LOUISIANA AT LAFAYETTE, LAFAYETTE, LAFAYETTE, NY

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X. Chen, University of Minnesota, Minneapolis, MN
H. Hirt, University of Minnesota, Minneapolis, Minnesota
K. V. Holmberg, University of Minnesota, Minneapolis, Minnesota
S. Gorr, University of Minnesota, Minneapolis, Minnesota
C. Aparicio, University of Minnesota, Minneapolis, Minnesota

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W. Song, Wayne state university, Detroit, MI

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Y. Lee, University of Miami, Miami, FL
S. Wu, New Jersey Institute of Technology, Newark, New Jersey
I. Sidhu, New Jersey Institute of Technology, Newark, New Jersey
T. Livingston Arinzeh, New Jersey Institute of Technology, Newark, New Jersey
M. B. Bunge, University of Miami, Miami, Florida

207 **Superporous Extracellular Matrix Mimics for On-demand Release of Growth Factors Based on Nucleic Acid Aptamers and Superporous Hydrogels**
M. R. Battig, University of Connecticut, Storrs, CT
N. Chen, University of Connecticut, Storrs, Connecticut
Y. Wang, University of Connecticut, Storrs, Connecticut

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C. Sperling, Leibniz-Institute of Polymer Research Dresden, Dresden, Germany
M. Rentsch, Leibniz-Institute of Polymer Research Dresden / Hochschule Zittau/Görlitz, Dresden, Germany
M. Tsurkan, Leibniz-Institute of Polymer Research Dresden, Dresden, Germany
U. Freudenberg, Leibniz-Institute of Polymer Research Dresden, Dresden, Germany
M. F. Maitz, Leibniz-Institute of Polymer Research Dresden, Dresden, Germany
C. Werner, Leibniz-Institute of Polymer Research Dresden, Dresden, Germany

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J. Yang, Northwestern University, Evanston, IL
J. Yang, Northwestern University, Evanston, Illinois
R. Hoshi, Northwestern University, Evanston, Illinois
K. Baler, Northwestern University, Evanston, Illinois
G. Ameer, Northwestern University, Evanston, Illinois

210 **Novel Biomimetic Proteoglycans for Molecular Engineering of Degenerated Tissue**
K. Prudnikova, Drexel University, Philadelphia, PA
S. Lightfoot Vidal, Drexel University, Philadelphia, Pennsylvania
E. Vresilovic, Pennsylvania State College of Medicine, Hershey, Pennsylvania
M. Marcolongo, Drexel University, Philadelphia, Pennsylvania

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B. P. Purcell, University of Pennsylvania, Philadelphia, PA
M. Charati, University of Pennsylvania, Philadelphia, Pennsylvania
R. Wade, University of Pennsylvania, Philadelphia, Pennsylvania
J. A. Burdick, University of Pennsylvania, Philadelphia, Pennsylvania

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J. Kobayashi, Tokyo Women's Medical University, Tokyo, Japan

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S. Wang, The University of Tennessee, Knoxville, TN
X. Wu, The University of Tennessee, Knoxville, Tennessee

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O. A. Burnsed, Georgia Institute of Technology, Atlanta, GA
R. Olivares-Navarrete, Georgia Institute of Technology, Atlanta, Georgia
S. L. Hyzy, Georgia Institute of Technology, Atlanta, Georgia
K. O. Marchand, Georgia Institute of Technology, Atlanta, Georgia
B. D. Boyan, Georgia Institute of Technology, Atlanta, Georgia
Z. Schwartz, Georgia Institute of Technology, Atlanta, Georgia

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L. Wang, UT MD Anderson Cancer Center, Houston, TX
Q. Zhang, UT MD Anderson Cancer Center, Houston, Texas
J. A. Johnson, UT MD Anderson Cancer Center, Houston, Texas
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Q. Xu, Tufts University, Medford, MA

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J. A. M. Ramshaw, CSIRO - Materials Science and Engineering, Clayton, Australia
Y. Y. Peng, CSIRO - Materials Science and Engineering, Clayton, Australia
V. Stoichevska, CSIRO - Materials Science and Engineering, Clayton, Australia
L. Howell, CSIRO - Materials Science and Engineering, Clayton, Australia
S. Madsen, CSIRO - Materials Science and Engineering, Clayton, Australia
G. Dumsday, CSIRO - Materials Science and Engineering, Clayton, Australia
J. Werkmeister, CSIRO - Materials Science and Engineering, Clayton, Australia

219 **In vivo potential of functionally graded platelet lysates scaffolds for osteochondral repair**

V. E. Santo, University of Minho - 3B's Research Group, Caldas das Taipas, Portugal
A. R.C. Duarte, University of Minho - 3B's Research Group, Caldas das Taipas, Portugal
P. P. Carvalho, University of Minho, 3B's Research Group, Caldas das Taipas, Portugal
J. F. Requicha, University of Minho, 3B's Research Group, Caldas das Taipas, Portugal
C. A.A. Viegas, University of Trás-os-Montes e Alto Douro, Department of Veterinary Sciences, Vila Real, Portugal
I. R. Dias, University of Trás-os-Montes e Alto Douro, Department of Veterinary Sciences, Vila Real, Portugal
J. F. Mano, University of Minho, 3B's Research Group, Caldas das Taipas, Portugal
M. E. Gomes, University of Minho, 3B's Research Group, Caldas das Taipas, Portugal
R. L. Reis, University of Minho, 3B's Research Group, Caldas das Taipas, Portugal

220 **Hyaluronic acid Hydrogels Synthesized by Thiol-ene Step Growth Polymerization**
W. M. Gramlich, University of Pennsylvania, Philadelphia, PA
J. A. Burdick, University of Pennsylvania, Philadelphia, Pennsylvania

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T. Saxena, Georgia Institute of Technology, Atlanta, GA
L. Karumbaiah, Georgia Institute of Technology, atlanta, Georgia
E. Gaupp, Georgia Institute of Technology, Atlanta, Georgia
K. Patil, garrett.stanley@bme.gatech.edu, Atlanta, Georgia
R. Patkar, Georgia Institute of Technology, atlanta, Georgia
M. Betancur, Georgia Institute of Technology, Atlanta, Georgia
G. Stanley, Georgia Institute of Technology, Atlanta, Georgia
R. Bellamkonda, Georgia Institute of Technology, Atlanta, Georgia

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J. Kohn, Rutgers - The State University of New Jersey, Piscataway, NJ
S. Wang, Rutgers - The State University of New Jersey, Piscataway, New Jersey
J. Lo, Rutgers - The State University of New Jersey, Piscataway, New Jersey
S. Singh, Rutgers - The State University of New Jersey, Piscataway, New Jersey
J. Zahn, Rutgers - The State University of New Jersey, Piscataway, New Jersey
D. Shreiber, Rutgers - The State University of New Jersey, Piscataway, New Jersey

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N. B. Langhals, University of Michigan, Ann Arbor, MI
J. V. Larson, University of Michigan, Ann Arbor, Michigan
T. A. Kung, University of Michigan, Ann Arbor, Michigan
K. B. Sugg, University of Michigan, Ann Arbor, Michigan
J. D. Moon, University of Michigan, Ann Arbor, Michigan
P. S. Cederna, University of Michigan, Ann Arbor, Michigan
M. G. Urbanchek, University of Michigan, Ann Arbor, Michigan

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B. A. Clements, Rutgers - The State University of New Jersey, Piscataway, NJ
J. Bushman, Rutgers - The State University of New Jersey, Piscataway, New Jersey
S. Murthy, Rutgers - The State University of New Jersey, Piscataway, New Jersey
J. Kohn, Rutgers - The State University of New Jersey, Piscataway, New Jersey

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A. Srinivasan, Georgia Institute of Technology, Atlanta, GA
A. Haque, Georgia Institute of Technology, Atlanta, Georgia
M. Tahilramani, Georgia Institute of Technology, Atlanta, Georgia
R. V. Bellamkonda, Georgia Institute of Technology, Atlanta, Georgia
G. B. Stanley, Georgia Institute of Technology, Atlanta, Georgia

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T. Lim, Massachusetts Institute of Technology, Cambridge, MA
S. Rokkappanavar, Brigham and Women's Hospital, Harvard Medical School, Boston, Massachusetts
M. Kurisawa, Institute of Bioengineering and Nanotechnology, Singapore, Singapore
M. Spector, Brigham and Women's Hospital, Harvard Medical School, Boston, Massachusetts

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M. Mekhail, McGill, Montreal, QC, Canada
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D. Macaya, Massachusetts Institute of Technology, brookline, MA
K. Hayakawa, Massachusetts General Hospital, Charlestown, Massachusetts
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M. Spector, VA Medical Center Boston, Massachusetts Institute of Technology, Jamaica Plain, Massachusetts

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O. Faii, MIT, Cambridge, Massachusetts
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J. Kim, Department of BIN Fusion Tech. Chonbuk National University, Jeonju-si, Republic of Korea

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B. C. Evans, Vanderbilt University, Nashville, TN
K. M. Hocking, Vanderbilt University, Nashville, Tennessee
C. M. Brophy, Vanderbilt Heart and Vascular Institute, Nashville, Tennessee
C. L. Duvall, Vanderbilt University, Nashville, Tennessee

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A. York, Rutgers Unviersity, Piscataway, New Jersey
S. Ahuja, Rutgers University, Piscataway, New Jersey

S. Gadamsetty, Rutgers University, Piscataway, New Jersey
K. Uhrich, Rutgers University, Piscataway, New Jersey
R. Prud'homme, Princeton University, Princeton, New Jersey
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A. Almutairi, University of California, San Diego, La Jolla, CA
C. de Gracia Lux, University of California, San Diego, La Jolla, California
S. Joshi-Barr, University of California, San Diego, La Jolla, California
T. Nguyen, University of California, San Diego, La Jolla, California
E. Mahmoud, University of California, San Diego, La Jolla, California
N. Fomina, University of California, San Diego, La Jolla, California

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D. Cochran, University of Kentucky, Lexington, KY

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N. K. Comolli, Villanova University, Villanova, PA
R. Lojek, Villanova University, Villanova, Pennsylvania
A. Banerjee, University of Pennsylvania, Philadelphia, Pennsylvania
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Q. Wang, Baylor College of Medicine, Houston, TX
M. A. Barry, Baylor College of Medicine, Houston, Texas
M. Knight, Southwest Electronic Medical Research Institute, Houston, Texas
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M. J. Heffernan, Baylor College of Medicine, Houston, Texas

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C. Wang, The University of Hong Kong, Hong Kong SAR, Hong Kong
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S. L. Hyzy, Georgia Institute of Technology, Atlanta, GA
R. Olivares-Navarrete, Georgia Institute of Technology, Atlanta, Georgia
S. Ortman, Georgia Institute of Technology, Atlanta, Georgia
B. D. Boyan, Georgia Institute of Technology, Atlanta, Georgia
Z. Schwartz, Georgia Institute of Technology, Atlanta, Georgia

239 **Polydopamine-Coated PDMS-PCL Shape Memory Polymer Foams for Bone Regeneration**
A. Jimenez-Vergara, Rensselaer Polytechnic Institute, Troy, NY
D. J. Munoz-Pinto, Rensselaer Polytechnic Institute, Troy, New York
D. Zhang, Texas A&M University, College Station, Texas
M. Grunlan, Texas A&M University, College Station, Texas

M. S. Hahn, Rensselaer Polytechnic Institute, Troy, New York

240 **Sustained Bone Morphogenetic Protein 2 Delivery from Densified Titanium for the Hard Tissue Engineeering**

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

T. Jang, Seoul National Univ., Seoul, Republic of Korea

M. Kang, Department of Materials Science and Engineering, Seoul National University, Seoul, Korea, Seoul, Republic of Korea

H. Park, Seoul National Univ., Seoul, Republic of Korea

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

Y. Estrin, Department of Materials Engineering, Monash University, Clayton, Australia, Clayton, Australia

Y. Koh, Korea Univ., Seoul, Republic of Korea

241 **Molecule Release from Proteolytically Degradable Hyaluronic Acid Hydrogels for Improved Osteogenesis**

J. L. Holloway, University of Pennsylvania, Philadelphia, PA

B. Purcell, University of Pennsylvania, Philadelphia, Pennsylvania

S. Khetan, University of Pennsylvania, Philadelphia, Pennsylvania

J. A. Burdick, University of Pennsylvania, Philadelphia, Pennsylvania

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J. E. Samorezov, Case Western Reserve University, Cleveland, OH

E. Alsberg, Case Western Reserve University, Cleveland, Ohio

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B. Reves, University of Memphis, Memphis, TN

J. A. Jennings, University of Memphis, Memphis, Tennessee

P. Konofaos, University of Tennessee Health Science Center, Memphis, Tennessee

D. Petersen, University of Tennessee Health Science Center, Memphis, Tennessee

R. Wallace, University of Tennessee Health Science Center, Memphis, Tennessee

R. Smith, University of Tennessee Health Science Center, Memphis, Tennessee

T. Guda, University of Texas at San Antonio, San Antonio, Texas

M. Appleford, University of Texas at San Antonio, San Antonio, Texas

W. O. Haggard, University of Memphis, Memphis, Tennessee

J. D. Bumgardner, University of Memphis, Memphis, Tennessee

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J. O. Blanchette, University of South Carolina, Columbia, SC

M. L. Skiles, University of South Carolina, Columbia, South Carolina

L. R. Rucker, University of South Carolina, Columbia, South Carolina

S. Sahai, University of South Carolina, Columbia, South Carolina

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L. Bian, the Chinese University of Hong Kong, Shatin, Hong Kong
M. Guvendiren, the University of Pennsylvania, Philadelphia, Pennsylvania
R. Mauck, the University of Pennsylvania, Philadelphia, Pennsylvania
J. A. Burdick, the University of Pennsylvania, Philadelphia, Pennsylvania

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S. R. Caliari, University of Illinois at Urbana-Champaign, Urbana, IL

247 **Coil-tagging of Vascular Endothelial Growth Factor for Oriented and Tunable Biomaterials Functionalization**
F. Murschel, Ecole Polytechnique de Montreal, Montreal, QC, Canada
B. Liberelle, Ecole Polytechnique de Montreal, Montreal, Québec, Canada
G. St-Laurent, Biotechnology Research Institute, Montreal, Québec, Canada
M. Jolicoeur, Ecole Polytechnique de Montreal, Montreal, Québec, Canada
Y. Durocher, Biotechnology Research Institute, Montreal, Québec, Canada
R. S. Hodges, University of Colorado, School of Medicine, Aurora, Colorado
G. De Crescenzo, Ecole Polytechnique de Montreal, Montreal, Québec, Canada

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A. S. C. Soon, University of California, Los Angeles, Los Angeles, CA
T. Segura, University of California, Los Angeles, Los Angeles, California

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D. L. Elbert, Washington University in St. Louis, St. Louis, MO
J. L. Roam, Washington University in St. Louis, St. Louis, Missouri
P. K. Nguyen, Washington University in St. Louis, St. Louis, Missouri

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M. Browning, Texas A&M University, College Station, TX
B. Russell, Texas A&M Health Science Center, Houston, Texas
J. Rivera, Texas A&M Health Science Center, Houston, Texas
P. T. Luong, Texas A&M University, College Station, Texas
M. Hook, Texas A&M Health Science Center, Houston, Texas
E. Cosgriff-Hernandez, Texas A&M University, College Station, Texas

251 **Engineering functional microparticles to fabricate instructive cell microenvironments**
C. A. Custódio, 3B's Research Group – Biomaterials, Biodegradables and Biomimetics, Caldas das Taipas-Guimarães, Portugal
V. E. Santo, 3B's Research Group- Biomaterials, Biodegradables and Biomimetics, Caldas das Taipas-Guimarães, Portugal
M. M. E. Gomes, 3B's Research Group-Biomaterials, Biodegradables and Biomimetics, Caldas das Taipas-Guimarães, Portugal
R. L. Reis, 3B's Research Group- Biomaterials, Biodegradables and Biomimetics, Caldas das Taipas-Guimarães, Portugal
J. F. Mano, 3B´s Research Group-Biomaterials, Biodegradables and Biomimetics, Caldas das Taipas-Guimarães, Portugal

252 **Biomimetic microenvironments for controlling morphogenesis of human pancreatic ductal**

epithelial cells
A. Raza, Indiana-University Purdue-University Indianapolis, Indianapolis, IN

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254 **Synthetic Matrix Vesicles Modulate Mineralization Response of Human Osteoblast-like Cells**
P. J. Chuang, Columbia University, New York, NY
T. O. Akinade, Columbia University, New York, New York
L. C. Kam, Columbia University, New York, New York
H. H. Lu, Columbia University, New York, New York

255 **A bio-inspired hybrid nanosack for the delivery of pancreatic islets and FGF-2 to improve islet engraftment at the omentum site**
H. Jun, University of Alabama at Birmingham, Birmingham, AL
P. Hwang, University of Alabama at Birmingham, Birmingham, Alabama
D. Lim, University of Alabama at Birmingham, Birmingham,, Alabama
S. Gilbert, University of Alabama at Birmingham, Birmingham,, Alabama
W. Cui, University of Alabama at Birmingham, Birmingham, Alabama
J. Corbett, Medical College of Wisconsin, Milwaukee, Wisconsin

256 **Design of Short Synthetic β-sheet Forming Peptide Amphiphiles for Antimicrobial Applications**
Z. Ong, Institute of Bioengineering and Nanotechnology, Singapore, Singapore
Y. Yang, Institute of Bioengineering and Nanotechnology, Singapore, Singapore

257 **Biphasic Scaffolds for Bone Repair: Nanofiber-Permeated Pore Network for Enhanced Cell Population**
C. S. Nelson, University of Connecticut Health Center, Farmington, CT
Y. Khan, University of Connecticut, Farmington, Connecticut
C. T. Laurencin, University Of Connecticut Health Center, Farmington, Connecticut

258 **Polyethylene glycol-based Protein Nanocapsules for Functional Delivery of a Differentiation Transcription Factor**
A. Biswas, University of California at Los Angeles, Los Angeles, CA
Y. Liu, University of California at Los Angeles, Los Angeles, California
G. Fan, University of California at Los Angeles, Los Angeles, California
Y. Tang, University of California at Los Angeles, Los Angeles, California

259 **Precisely integrating multiple different protein ligands into supramolecular assemblies**
G. A. Hudalla, University of Chicago, Chicago, IL
T. Sun, University of Chicago, Chicago, Illinois
J. H. Collier, University of Chicago, Chicago, Illinois

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260 **Thermoluminescence in UV- and X-Irradiated PEEK**
D. Adhikari, University of Memphis, Memphis, TN
T. Riahinasab, University of Memphis, Memphis, Tennessee
B. Walters, University of Memphis, Memphis, Tennessee
R. Gnawali, University of Memphis, Memphis, Tennessee

M. S. Jahan, University of Memphis, Memphis, Tennessee

261 **Production and Characterization of Melt-Spun PEEK Fibers for Biomedical Applications**
E. S. Ouellette, Syracuse University, Syracuse, NY
J. L. Gilbert, Syracuse University, Syracuse, New York

262 **Injectable Lubricants for Prosthetic Joints**
S. Lee, Technical University of Denmark, Kgs. Lyngby, Denmark

263 **Mechanical and biological analysis of compression molded polyetheretherketone-titanium (PEEK-Ti) composites**
H. Park, 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, Seoul National Univ., Seoul, Republic of Korea
M. Kang, 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
Y. Estrin, Department of Materials Engineering, Monash University, Clayton, Australia

264 **Polymerized Biodegradable Cement to Replace Poly(Methyl Methacrylate) in Vertebral Compression Fracture Augmentation – a Biomechanical Evaluation**
B. M. Schlossberg, Pioneer Surgical, Woburn, MA

265 **Optimized Wear Resistance and Toughness of Vitamin E blended, High Temperature Melted and Radiation Cross-linked UHMWPE**
B. Doshi, Massachusetts General Hospital, Boston, MA
E. Oral, Massachusetts General Hospital, Boston, Massachusetts
O. Muratoglu, Massachusetts General Hospital, Boston, Massachusetts

266 **Vitamin E Does Not Elute Out of Vitamin E-Grafted Ultra High Molecular Weight Polyethylene**
M. Guo, Zimmer Inc, Warsaw, IN
A. Rufner, Zimmer Inc, warsaw, Indiana
D. Pletcher, Zimmer Inc, Warsaw, Indiana
O. Popoola, Zimmer Inc, Warsaw, Indiana
D. Yakimicki, Zimmer Inc, Warsaw, Indiana
J. Rufner, Zimmer Inc., Warsaw, Indiana

267 **Oxidative Analysis of Retrieved Moderately Cross-linked UHMWPE Acetabular Bearings After 10 Years In Vivo**
C. Reyes, Massachusetts General Hospital, Boston, MA
S. Rowell, Massachusetts General Hospital, Boston, Massachusetts
C. A. Engh, Jr., AORI, Alexandria, Virginia
R. Hopper, AORI, Alexandria, Virginia
O. Muratoglu, Massachusetts General Hospital, Boston, Massachusetts

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R. Agarwal, University of Texas at Austin, Austin, TX
V. Singh, University of Texas at Austin, Austin, Texas
P. Jurney, University of Texas at Austin, Austin, Texas
L. Shi, University of Texas at Austin, Austin, Texas
S. Sreenivasan, University of Texas at Austin, Austin, Texas
K. Roy, University of Texas at Austin, Austin, Texas

269 **Mathematical Modeling of Bi-phasic Mixed Particle Drug Release from Nanoparticles**
S. S. Hossain, The University of Texas at Austin, Austin, TX
S. Hossainy, Abbott Vascular, Santa Clara, California
D. Davalian, Abbott Vascular, Santa Clara, California

270 **How Different Drugs Affect the Properties, Degradation, and Release Profiles of Drug Delivery Films**
C. L. Rabek, University of Kentucky, Lexington, KY
T. D. Dziubla, University of Kentucky, Lexington, Kentucky
D. A. Puleo, University of Kentucky, Lexington, Kentucky

271 **Injectable Hydrogels with Controlled Release of Covalently Incorporated Dexamethasone**
D. Bezuidenhout, University of Cape Town, Cape Town, South Africa
N. H. Davies, University of Cape Town, Cape Town, South Africa
A. Oosthuysen, University of Cape Town, Cape Town, South Africa
P. Zilla, University of Cape Town, Cape Town, South Africa

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H. Yildiz, Northeastern University, Boston, MA
R. L. Carrier, Northeastern University, Boston, Massachusetts

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A. Janorkar, University of Mississippi Medical Center, Jackson, MS
N. Patel, University of Mississippi Medical Center, Jackson, Mississippi

274 **The physical properties of particles dominate cellular uptake and subsequent influences on cell functions**
Z. Mao, Zhejiang University, China, Hangzhou, China

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M. Javadi, Brigham Young University, Provo, UT

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276 **Multifunctional Drug-Delivery Nanoparticles for Elastic Matrix Stabilization and Repair in Aortic Aneurysms**
B. Sivaraman, Cleveland Clinic, Cleveland, OH
A. Ramamurthi, Cleveland Clinic, Cleveland, Ohio

277 **Magnetic Barcode Assay for Genetic Detection of Pathogens**
M. Liong, Massachusetts General Hospital-Harvard Medical School, Charlestown, MA

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P. Fattahi, Pennsylvania State University, State College, PA
M. R. Abidian, Pennsylvania State University, University Park, Pennsylvania

279 **Co-Delivery of Paclitaxel and Nitric Oxide from Abluminal and Luminal Surfaces of a Coronary Stent**
A. Gallo, The University of South Dakota, Sioux Falls, SD

280 **Development of an in vitro Focal Neuronal Injury Platform With Simultaneous Neural Recording and Conducting Polymer/Graphene Oxide Nanocomposite-mediated Electrochemical Sensing**
C. L. Weaver, University of Pittsburgh, Pittsburgh, PA
N. R. Snyder, University of Pittsburgh, Pittsburgh, Pennsylvania
T. Cui, University of Pittsburgh, Pittsburgh, Pennsylvania

281 **Bio-Inspired Assembly for Surface Localization of Gadolinium to Improve Relaxivity of an MRI Contrast-Enhancing Liposome**
C. E. Smith, University of Illinois at Urbana-Champaign, Urbana, IL
H. Kong, University of Illinois at Urbana-Champaign, Urbana, Illinois

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G. L. A. Cunha, Massachusetts Institute of Technology, Cambridge, MA
A. Freiman, Massachusetts Institute of Technology, Cambridge, Massachusetts
L. Indolfi, Massachusetts Institute of Technology, Cambridge, Massachusetts
N. Artzi, Massachusetts Institute of Technology, Cambridge, Massachusetts
J. L. Dreyfuss, Universidade Federal de São Paulo, São Paulo, Brazil
E. R. Edelman, Massachusetts Institute of Technology, Cambridge, Massachusetts

283 **Use of Nanoparticles for Improving Enzyme Stability to Prolong Biosensor Functionality**
G. Zhang, Clemson University, Clemson, SC

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285 **Effectively Inducing and Monitoring Adipose-derived Stem Cells-mediated Tissue Regeneration using a PEGylated Fibrin and Gold Nanoparticles**
E. Chung, The University of Texas at Austin, Austin, TX
R. S. Stowers, The University of Texas at Austin, Austin, Texas
S. Y. Nam, The University of Texas at Austin, Austin, Texas
M. A. Samano, The University of Texas at Austin, Austin, Texas
L. M. Ricles, The University of Texas at Austin, Austin, Texas
S. Y. Emelianov, The University of Texas at Austin, Austin, Texas
L. J. Suggs, The University of Texas at Austin, Austin, Texas

286 **Accelerated Re-epithelialization of Skin Wounds Using Epidermal Growth Factor Coacervate**
N. Johnson, University of Pittsburgh, Pittsburgh, PA
Y. Wang, University of Pittsburgh, Pittsburgh, Pennsylvania

287 **Multilayer films addressing bleeding and infection**
B. B. Hsu, Massachusetts Institute of Technology, Cambridge, MA
P. T. Hammond, Massachusetts Institute of Technology, Cambridge, Massachusetts

288 **Electrospun Ultralow-fouling Poly(Sulfobetaine Methacrylate) for Nonadherent, Superabsorbent, Antimicrobial, and Reusable Wound Dressings**
Q. Liu, University of Akron, Akron, OH
R. Lalani, University of Akron, Akron, Ohio
D. Kontoveros, University of Akron, Akron, Ohio
L. Liu, University of Akron, Akron, Ohio

289 **Disease State Affects Tissue Microenvironment and Material Performance**
N. Oliva, MIT, Cambridge, MA

290 **Quick-Release Medical Tape**
B. Laulicht, Harvard-MIT Division of Health Sciences and Technology, Cambridge, MA
R. Langer, MIT, Cambridge, Massachusetts
J. Karp, Harvard/MIT, Cambridge, Massachusetts

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291 **Enhancement of colloidal stability of cell signal-responsive gene carriers for disease cell-specific delivery**
Y. Katayama, Faculty of Engineering, Kyushu University, Fukuoka, Japan
S. Kushio, Kyushu University, Fukuoka, Japan
C. Kim, Kyushu University, Fukuoka, Japan
T. Niidome, Faculty of Engineering, Kyushu University, Fukuoka, Japan
T. Mori, Faculty of Engineering, Kyushu University, Fukuoka, Japan

292 **Novel Solution of Nucleic Acid Delivery for in-vivo Diagnosis: Self-assembled Nanopieces**
H. Yu, Warren Alpert Medical School, Brown University, Providence, RI

293 **Design of Dendrimer-Based System for Delivery of Therapeutic SiRNA for Treating Cardiac Disease**
J. Liu, Georgia Institute of Technology, Atlanta, GA
C. Gu, Georgia Institution of Techonology, Atlanta, Georgia
B. Cabigas, Emory University, Atlanta, Hawaii
K. Pendergrass, Emory University, Atlanta, Georgia
M. Brown, Emory University, Atlanta, Georgia
Y. Luo, Peking University, Beijing, China
M. Davis, Georgia Institute of Technology and Emory University, Atlanta, Georgia

294 **The Development of Safe and Effective Polymeric Carriers for SiRNA Delivery**
A. R. Shrivats, Carnegie Mellon University, Pittsburgh, PA
E. Hsu, Carnegie Mellon University, Pittsburgh, Pennsylvania
A. Watt, Carnegie Mellon University, Pittsburgh, Pennsylvania
S. McBride, Carnegie Mellon University, Pittsburgh, Pennsylvania
S. Liu, Carnegie Mellon University, Pittsburgh, Pennsylvania
P. Alvarez-Urena, Carnegie Mellon University, Pittsburgh, Pennsylvania
S. Averick, Carnegie Mellon University, Pitsburgh, Pennsylvania
H. Cho, Carnegie Mellon University, Pittsburgh, Pennsylvania
E. Paredes, Carnegie Mellon University, Pittsburgh, Pennsylvania

S. R. Das, Carnegie Mellon University, Pittsburgh, Pennsylvania
K. Matyjaszewski, Carnegie Mellon University, Pittsburgh, Pennsylvania
J. O. Hollinger, Carnegie Mellon University, Pittsburgh, Pennsylvania

295 **A Versatile Coiled-coil Tethering System for the Biofunctionalization of Recharged Gene Delivery Vectors**
C. Fortier, Ecole Polytechnique de Montreal, Montreal, QC, Canada
B. Liberelle, Ecole Polytechnique de Montreal, Montreal, Québec, Canada
Y. Durocher, CNRC-NRC Montreal-Royalmount, Montreal, Québec, Canada
G. De Crescenzo, Ecole Polytechnique de Montreal, Montreal, Québec, Canada

296 **Polysialic Acid-N-Trimethyl Chitosan Nanoparticles for Oligonucleotide Delivery**
P. R. Wardwell, Syracuse University, Syracuse, NY
R. M. Iyer, Syracuse University, Syracuse, New York
P. N. Borer, Syracuse University, Syracuse, New York
M. McPike, Aptamatrix, Syracuse, New York
M. B. Forstner, Syracuse University, Syracuse, New York
R. A. Bader, Syracuse University, Syracuse, New York

297 **Targeted Delivery of micro-RNA by Ephrin-A1 Conjugated Nanoliposomal Particles (NLP) for Malignant pleural Mesothelioma**
H. Lee, University of Florida, Gainesville, FL

298 **MicroRNA 29a Inhibitor Loaded Gelatin Nanofibers for Localized Gene Therapy**
E. N. James, University of Connecticut Health Center, Middletown, CT
A. M. Delany, University of Connecticut Health Center, Farmington, Connecticut
L. S. Nair, University of Connecticut Health Center, Farmington, Connecticut

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299 **Peptide-grafted Poly(ethylene glycol) Hydrogels Support Endothelial Progenitor Cell Rolling and Adhesion Under Shear**
W. Seeto, Auburn University, Auburn, AL
Y. Tian, Polytechnic Institute of New York University, Auburn, Alabama
E. A. Lipke, Auburn University, Auburn, Alabama

300 **A non-toxic additive to introduce X-ray contrast into poly(lactic acid). Implications for transient medical implants such as bioresorbable coronary vascular scaffolds**
Y. Wang, Maastricht University, Maastricht, Netherlands
L. H. Koole, Maastricht University, Maastricht, Netherlands

301 **MSCs Enhanced Endothelial Regeneration and Reduced Fibrosis on Bioengineered Vascular Graft**
W. Tan, University of Colorado, Boulder, CO

302 **Small-Diameter Biodegradable Vascular Grafts Mechanical Characterization and Tissue Interactions**
A. Melchiorri, University of Maryland, College Park, MD
Z. R. Brandes, University of Maryland, College Park, Maryland
N. Hibino, Children's National Medical Center, District of Columbia, District of Columbia
J. P. Fisher, University of Maryland, College Park, Maryland

303 **Degradable polar hydrophobic ionic polyurethane promotes endothelial and wound healing phenotype of circulating angiogenic cells**
E. S. Mathieu, University of Ottawa Heart Institute, Ottawa, ON, Canada

304 **Aortic tissue-stent mechanical interaction in transcatheter aortic valve replacement**
J. Mummert, University of Connecticut, Storrs, CT
E. Sirois, University of Connecticut, Storrs, Connecticut
W. Sun, University of Connecticut, Storrs, Connecticut

305 **Introducing a polymeric device for the treatment of Abdominal Aortic Aneurysms: Design and in vitro performance**
D. Cohn, The Hebrew University of Jerusalem, Jerusalem, Israel
A. Bloom, Hadassah University Medical Center, Jerusalem, Israel

306 **Reconfigurable Biodegradable Shape-memory Elastomers using "click" Chemistry**
S. Ninh, Carnegie Mellon University, Pittsburgh, PA
C. Bettinger, Carnegie Mellon University, Pittsburgh, Pennsylvania

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307 **Non-Invasive Diagnosis of Intracerebral Hemorrhage Using Iodinated Liposomal Nanocarriers**
K. McNeeley, Georgia Institute of Technology, Atlanta, GA
K. McNeeley, Georgia Institute of Technology, Atlanta, Georgia
R. Bellamkonda, Georgia Institute of Technology, Atlanta, Georgia

308 **Synthesis of Solid Lipid Nanoparticles and their Interaction with Skin**
X. Calderon-Colon, The Johns Hopkins University Applied Physics Laboratory, Laurel, MD
M. W. Patchan, The Johns Hopkins University Applied Physics Laboratory, Laurel, Maryland
M. L. Theodore, The Johns Hopkins University Applied Physics Laboratory, Laurel, Maryland
H. T. Le, The Johns Hopkins University Applied Physics Laboratory, Laurel, Maryland
J. L. Sample, The Johns Hopkins University Applied Physics Laboratory, Laurel, Maryland
J. J. Benkoski, The Johns Hopkins University Applied Physics Laboratory, Laurel, Maryland
J. B. Patrone, The Johns Hopkins University Applied Physics Laboratory, Laurel, Maryland

309 **Intracellular dynamics of oligopeptide-modified phospholipid polymer nanoparticles**
K. ISHIHARA, The University of Tokyo, Tokyo, Japan

310 **Surface Characterization of Functionalized Gold Nanoparticles**
L. Gamble, University of Washington, Seattle, WA
A. Rafati, University of Washington, Seattle, Washington
S. D. Techane, University of Washington, Seattle, Washington
D. G. Castner, University of Washington, Seattle, Washington

311 **Composite Biomaterials Active against Opportunistic Pathogens**
M. D. Leonida, Fairleigh Dickinson University, Teaneck, NJ
A. Benzecry, Fairleigh Dickinson University, Teaneck, New Jersey
A. Suria, Fairleigh Dickinson University, Teaneck, New Jersey

312 **Reduced Adhesion of Staphylococcus aureus to ZnO/PVC Nanocomposites**
B. M. Geilich, Northeastern University, Brookline, MA
T. J. Webster, Northeastern University, Boston, Massachusetts

313 **Cecropin-mellitin modified surfaces exhibit high antimicrobial activity and low cytotoxicity against human cells**

M. B. Evangelista, BIOCANT - Technology Transfer Association and CNC - Center for Neuroscience and Cell Biology, Cantanhede, Portugal
A. Rai, Biocant - Parque Tecnologico de Cantanhede and CNC - Center for Neuroscience and Cell Biology, Cantanhede, Portugal
M. B. Evangelista, Biocant - Parque de Tecnologico de Cantanhede and CNC - Center for Neuroscience and Cell Biology, Cantanhede, Portugal
S. Pinto, CNC - Center for Neuroscience and Cell Biology, Cantanhede, Portugal
L. S. Ferreira, Biocant - Parque Tecnologico de Cantanhede and CNC - Center for Neuroscience and Cell Biology, Cantanhede, Portugal

314 **Multivalent Gd-DOTA Decorated Starlike Amphiphilic Dextran Micelles as Sensitive MRI Probes**

H. Ai, Sichuan University, Chengdu, China
H. Su, Sichuan University, Chengdu, China
D. Li, Sichuan University, Chengdu, China
C. Wu, Sichuan University, Chengdu, China
C. Xia, Sichuan University, Chengdu, China
Q. Gong, Sichuan University, Chengdu, China
B. Song, Sichuan University, Chengdu, China

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316 **The Efficacy of Vitamin E and a Hindered Amine Light Stabilizer in stabilizing UHMWPE from Oxidation**

A. Bellare, Brigham & Women's Hospital, Harvard Medical School, Boston, MA

317 **Collagen and Elastin Binding Polyphenols Protect Scaffolds and Stem Cells from Diabetes-Related Complications**

J. P. Chow, Clemson University, Clemson, SC

318 **Extraction Analysis of Vitamin E-Grafted Polyethylene**

S. Spiegelberg, Cambridge Polymer Group, Inc., Boston, MA
N. Turner, Cambridge Polymer Group, Boston, Massachusetts
T. Wilson-Hill, Cambridge Polymer Group, Boston, Massachusetts
D. Pletcher, Zimmer, Inc., Warsaw, Indiana
A. Rufner, Zimmer, Inc., Warsaw, Indiana

319 **Antioxidant Cerium Oxide Nanoparticle Composite Hydrogels for Islet Encapsulation and Protection**

J. D. Weaver, University of Miami, Miami, FL
C. L. Stabler, University of Miami, Miami, Florida

320 **Reducing Lipid Absorption in Highly Crosslinked Grafted Vitamin E Polyethylene**

D. Pletcher, Zimmer, Inc, Warsaw, IN
A. Rufner, Zimmer, Inc, Warsaw, Indiana

321 **Microparticulate Formulations of Antioxidant Poly(β-Amino Ester) Polymers for Wound Healing Applications**

N. M. Shah, University of Kentucky, Lexington, KY

S. H. Deschamp, University of Kentucky, Lexington, Kentucky
J. Hilt, University of Kentucky, Lexington, Kentucky
T. D. Dziubla, University of Kentucky, Lexington, Kentucky

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322 **Development of new toxin-adsorbing and hemocompatible surfaces as a step towards a miniaturized artificial kidney**
J. H. Janssen, Maastricht University and INterface BIOmaterials BV, Geleen, Netherlands

323 **Development of a Catheter-Deployable Device for the Capture of Rare Analytes in Blood**
J. C. Sy, Massachusetts Institute of Technology, Cambridge, MA
J. Fernandez Esmerats, Massachusetts Institute of Technology, Cambridge, Massachusetts
A. E. Wisniowska, Massachusetts Institute of Technology, Cambridge, Massachusetts
J. M. Milwid, Massachusetts Institute of Technology, Cambridge, Massachusetts
M. J. Cima, Massachusetts Institute of Technology, Cambridge, Massachusetts

324 **Bioactive coatings for vascular implants: a promising strategy using oriented tethering of EGF on chondroitin sulfate**
P. Lequoy, Ecole de Technologie Supérieure, Montreal, QC, Canada
B. Liberelle, Ecole Polytechnique de Montreal, Montreal, Québec, Canada
C. Fortier, Ecole Polytechnique de Montreal, Montreal, Québec, Canada
G. De Crescenzo, Ecole Polytechnique de Montreal, Montreal, Québec, Canada
S. Lerouge, Ecole de Technologie Superieure, Montreal, Québec, Canada

325 **Development of Viral Nanoparticle Networks and Hybrids for Enhanced Tumor Homing and Penetration**
A. M. Wen, Case Western Reserve University, Cleveland, OH
N. F. Steinmetz, Case Western Reserve University, Cleveland, Ohio

326 **Precisely Designed Thermo-responsive Polymer Brush Surface for Cell Separation**
K. Nagase, Tokyo Women's Medical University, Tokyo, Japan
A. Kimura, Waseda 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

327 **Ultrathin Surface Coating of Thermoresponsive Block Copolymers for Fabricating Cell Sheets**
M. Nakayama, Tokyo Women's Medical University, Tokyo, Japan
Y. Kimura, Keio University, Tokyo, Japan
N. Yamada, Keio University, Tokyo, Japan
H. Kanazawa, Keio University, Tokyo, Japan
T. Okano, Tokyo Women’s Medical University, Tokyo, Japan

328 **Robust Photolabile Physically Crosslinked Polymer Networks**
C. Zhu, Carnegie Mellon University, Pittsburgh, PA
C. Bettinger, Carnegie Mellon University, Pittsburgh, Pennsylvania

329 **Slippery When Wet: Gradient Surface Functionalization of Hydrogels for Lubricity Control**
B. A. Krick, University of Florida, Gainesville, FL
A. A. Pitenis, University of Florida, Gainesville, Florida
A. C. Dunn, University of Florida, Gainesville, Florida
W. Sawyer, University of Florida, Gainesville, Florida

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330 **Dose Response to TGF-β3 of Co-Cultured Chondrocytes and Mesenchymal Stem Cells on Porous Polymer Scaffolds**
R. L. Dahlin, Rice University, Houston, TX
M. Ni, Rice University, Houston, Texas
V. V. Meretoja, Rice University, Houston, Texas
F. K. Kasper, Rice University, Houston, Texas
A. G. Mikos, Rice University, Houston, Texas

331 **Heparin-containing Hydrogels for Sustained Release of Cathepsin Inhibitors for Treatment of Tendon Degeneration**
S. P. Seto, Georgia Institute of Technology, Atlanta, GA
T. Miller, Georgia Institute of Technology, Atlanta, Georgia
Y. Qiu, Georgia Institute of Technology, Atlanta, Georgia
M. O. Platt, Georgia Institute of Technology, Atlanta, Georgia
J. S. Temenoff, Georgia Institute of Technology, Atlanta, Georgia

332 **Effects of Ceramic Structural Properties on Chondrocyte Response**
M. K. Boushell, Columbia University, New York, NY
R. Z. LeGeros, New York University, New York, New York
H. H. Lu, Columbia University, New York, New York

333 **Cartilage Tissue Engineering with Silk Fibroin Scaffolds Fabricated by Indirect Additive Manufacturing Technology**
V. Shyu, Chang Gung Memorial Hospital, Chang Gung University, College of Medicine, Taoyuan, Taiwan, Tao-Yuan, Taiwan

334 **Co-electrospun Scaffolds with Gradients in Fiber Alignment and Chemistry for the Regeneration of Ligament-Bone Transitions**
A. R. Whittington, Virginia Polytechnic Institute and State University, Blacksburg, VA
S. Samavedi, Virginia Polytechnic Institute and State University, Blacksburg, Virginia
P. Gaddam, Virginia Polytechnic Institute and State University, Blacksburg, Virginia
A. R. Whittington, Virginia Polytechnic Institute and State University, Blacksburg, Virginia
A. S. Goldstein, Virginia Polytechnic Institute and State University, Blacksburg, Virginia

335 **Micropatterned co-cultures of endothelial cells and mesenchymal stem cells within gelatin methacrylate hydrogels**
M. Nikkhah, Harvard Medical School, Cambridge, MA

336 **Electrospun Bilayered Vascular Scaffolds for Engineering Small Diameter Blood Vessels**
S. Lee, Wake Forest School of Medicine, Winston-Salem, NC

337 **Novel Bioactive Coatings to Improve Allograft Incorporation Evaluated in eGFP Chimeric Rats**
A. Das, University of Virginia, Charlottesville, VA

Y. Lin, University of Virginia, Charlottesville, Virginia
Q. Cui, University of Virginia, Charlottesville, Virginia
E. Botchwey, Gatech, Atlanta, Georgia

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338 **Adverse Tissue Response to Corrosion and Products of Corrosion in CoCr Dual-Modular Neck Hip Prostheses**
D. J. Hall, Rush University Medical Center, Chicago, IL
R. M. Urban, Rush University Medical Center, Chicago, Illinois
H. J. Cooper, Rush University Medical Center, Chicago, Illinois
J. L. Wright, Rush University Medical Center, Chicago, Illinois
E. L. Dahlmeier, Rush University Medical Center, Chicago, Illinois
J. J. Jacobs, Rush University Medical Center, Chicago, Illinois

339 **Prediction of Voltage Shifts During Fretting Corrosion of Titanium Alloy: Effect of Area, Impedance and Mechanics**
Y. Liu, Biomedical and Chemical Engineering Department, Syracuse Biomaterials Institute, Syracuse University, Syracuse, NY,, Syracuse, NY
S. Mali, Biomedical and Chemical Engineering Department, Syracuse Biomaterials Institute,Syracuse University, Syracuse, New York
J. Gilbert, Biomedical and Chemical Engineering Department, Syracuse Biomaterials Institution,Syracuse University, Syracuse, New York

340 **Wear-corrosion Synergism under Fretting and Sliding Contacts in Hip Prosthesis**
M. T. Mathew, Rush University Medical Center, Chicago, IL

341 **Study of bio-tribocorrosion behavior of Ti6Al4V alloys colonized with osteoblastic-like cells for metal hip prosthesis**
M. J. C. Runa, University of Minho, Guimarães, Portugal
M. H. R. Fernandes, University of Porto, Faculty of Dental Medicine, Porto, Portugal
M. M. T. Mathew, Rush University Medical Center, Chicago, Illinois
L. A. S. Rocha, University of Minho, Guimaraes, Portugal

342 **Fretting Corrosion Performance Test of Spinal Screw and Rod Constructs: Effect of Stainless Steel –Titanium Combination**
S. A. MALI, SYRACUSE UNIVERSITY, Syracuse, NY

343 **Tribocorrosion Behavior of Anodic Titanium Oxide Films and Assessment of Cell-Materials Interactions**
S. A. Alves, University of Minho, Guimaraes, Portugal
R. Bayón, Fundación IK4-Tekniker, Eibar, Spain
V. S. de Viteri, Fundación IK4-Tekniker, Eibar, Spain
M. P. Garcia, Faculty of Dental Medicine of Porto University, Porto, Portugal
A. Igartua, Fundación IK4-Tekniker, Eibar, Spain
M. H. Fernandes, Faculty of Dental Medicine of Porto University, Porto, Portugal
L. A. Rocha, University of Minho, Guimaraes, Portugal

344 **Quartz crystal mass monitoring to study tribofilm formation and retention in self-mating CoCrMo systems**
R. Pourzal, Rush University Medical Center, Chicago, IL

345 **Hydroxyapatite Coated Porous Magnesium with for Biomedical Applications**
M. Kang, Department of Materials Science and Engineering, Seoul National University, Seoul, Republic of Korea, Seoul, Republic of Korea

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A. R. Amini, University of Connecticut Health Center, Farmington, CT
C. T. Laurencin, University of Connecticut Health Center, Farmington, Connecticut
S. P. Nukavarapu, University of Connecticut Health Center, Farmington, Connecticut

347 **Biomimetic Citrate-Presenting Osteoinductive Composites**
R. T. Tran, The Pennsylvania State University, University Park, PA
C. Zhang, The University of Texas at Arlington, Arlington, Texas
B. Banik, The Pennsylvania State University, University Park, Pennsylvania
J. L. Brown, The Pennsylvania State University, University Park, Pennsylvania
J. Yang, The Pennsylvania State University, University Park, Pennsylvania

348 **Development of Bioactive Glass Scaffolds for Segmental Bone Repair**
M. N. Rahaman, Missouri University of Science and Technology, Rolla, MO

349 **A novel magnesium-based bone substitutes: An alternative to autologous bone grafting to treat large bone defects**
K. W. K. Yeung, The University of Hong Kong, Hong Kong, Hong Kong
K. H. M. Wong, The University of Hong Kong, Hong Kong, Hong Kong
P. K. Chu, City University of Hong Kong, Hong Kong, Hong Kong
K. D. K. Luk, The University of Hong Kong, Hong Kong, Hong Kong
K. M. C. Cheung, The University of Hong Kong, Hong Kong, Hong Kong

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J. J. Rivera, Massachusetts Institute of Technology, Cambridge, MA
M. Rodrigues, University of Pittsburgh, Pittsburgh, Pennsylvania
V. Raut, Cleveland Clinic, Cleveland, Ohio
L. M. Alvarez, Massachusetts Institute of Technology, Cambridge, Massachusetts
L. Stockdale, Massachusetts Institute of Technology, Cambridge, Massachusetts
A. Nuschke, University of Pittsburgh, Pittsburgh, Pennsylvania
C. Boehm, Cleveland Clinic, Cleveland, Ohio
D. Stolz, University of Pittsburgh, Pittsburgh, Pennsylvania
A. Wells, University of Pittsburgh, Pittsburgh, Pennsylvania
G. F. Muschler, Cleveland Clinic, Cleveland, Ohio
L. Griffith, Massachusetts Institute of Technology, Cambridge, Massachusetts

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A. Y. Cheng, Georgia Institute of Technology, Atlanta, GA
A. Shekaran, Georgia Institute of Technology, Atlanta, Georgia
A. J. Garcia, Georgia Institute of Technology, Atlanta, Georgia

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J. K. Wise, University of Michigan, Ann Arbor, MI
A. I. Alford, University of Michigan, Ann Arbor, Michigan
J. P. Stegemann, University of Michigan, Ann Arbor, Michigan

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M. Hoffman, University of Rochester, Rochester, NY
C. Xie, University of Rochester, Rochester, New York
D. Benoit, University of Rochester, Rochester, New York

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D. W. Baker, University of Texas at Arlington, Coppell, TX
J. Zhou, University of Texas at Arlington, Arlington, Texas
Y. Tsai, University of Texas at Arlington, Arlington, Texas
K. Patty, University of Texas at Arlington, Arlington, Texas
H. Weng, University of Texas at Arlington, Arlington, Texas
E. N. Tang, University of Texas at Arlington, Arlington, Texas
L. Tang, University of Texas at Arlington, Arlington, Texas

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R. Londono, University of Pitttsburgh, Pittsburgh, PA
T. J. Keane, University of Pittsburgh, Pittsburgh, Pennsylvania
B. M. Brown, University of Pittsburgh, Pittsburgh, Pennsylvania
M. T. Wolf, University of Pittsburgh, Pittsburgh, Pennsylvania
S. F. Badylak, University of Pittsburgh, Pittsburgh, Pennsylvania

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S. Haughney, Iowa State University, Ames, IA
Y. Phanse, Iowa State University, Ames, Iowa
L. Petersen, Iowa State University, Ames, Iowa
A. Ramer-Tait, Iowa State University, Ames, Iowa
J. Hostetter, Iowa State University, Ames, Iowa
B. Narasimhan, Iowa State University, Ames, Iowa
M. Wannemuehler, Iowa State University, Ames, Iowa

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A. O. Awojoodu, Georgia Institute of Technology, Atlanta, GA

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S. Jain, Northeastern University, Boston, MA
M. M. Amiji, Northeastern University, Boston, Massachusetts

359 **The Influence of Keratin Biomaterial Treatment on Macrophage Phenotype in Spinal Cord Injury**

B. Fearing, Wake Forest University Health Sciences, Winston-Salem, NC

360 **Immunotherapy with Shear-thinning Injectable Hydrogels to Treat Obstructive Nephropathy**
D. E. Soranno, Children's Hospital of Philadelphia, Philadelphia, PA
H. D. Lu, University of Pennsylvania, Philadelphia, Pennsylvania
H. M. Weber, University of Pennsylvania, Philadelphia, Pennsylvania
J. A. Burdick, University of Pennsylvania, Philadelphia, Pennsylvania

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S. Srinivasan, Georgia Institute of Technology, Atlanta, GA
G. Patel, Georgia Institute of Technology, Atlanta, Georgia
U. (. Goh, Georgia Institute of Technology, Atlanta, Georgia
J. E. Babensee, Georgia Institute of Technology, Atlanta, Georgia

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K. A. Davis, Syracuse University, Syracuse, NY
J. H. Henderson, Syracuse University, Syracuse, New York

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M. Ebara, National Institute for Materials Science, Tsukuba, Japan
T. Aoyagi, National Institute for Materials Science, Tsukuba, Japan

365 **Sequential Growth Factor Delivery within Fibrin Loaded Porous Degradable Hydrogels**
B. Jiang, Illinois Institute of Technology, Chicago, IL
B. Akar, Illinois Institute of Technology, Chicago, Illinois
T. Waller, Illinois Institute of Technology, Chicago, Illinois
J. Larson, Illinois Institute of Technology, Chicago, Illinois
A. Appel, Illinois Institute of Technology, Chicago, Illinois
E. Brey, Illinois Institute of Technology, Chicago, Illinois

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R. Wade, University of Pennsylvania, Philadelphia, PA
J. A. Burdick, University of Pennsylvania, Philadelphia, Pennsylvania

367 **Facile preparation of phododegradable hydrogel by photo-mediated crosslinking**
C. Ki, Indiana University-Purdue University Indianapolis, Indianapolis, IN
H. Shih, Indiana University-Purdue University Indianapolis, Indianapolis, Indiana
C. Lin, Indiana University-Purdue University Indianapolis, Indianapolis, Indiana

N/A **Clickable, Photodegradable Cell Culture Scaffolds to Modulate Valvular Interstitial Cell Phenotype In Situ**
C. M. Kirschner, University of Colorado, Boulder, CO
C. M. Kirschner, University of Colorado, Boulder, Colorado
D. L. Alge, University of Colorado, Boulder, Colorado
S. T. Gould, University of Colorado, Boulder, Colorado
K. S. Anseth, University of Colorado, Boulder, Colorado

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S. Selvam, Georgia Institute of Technology, Trivandrum, India
S. M. Lehman, Georgia Institute of Technology, Atlanta, Georgia
K. Reddie, Georgia Institute of Technology, Atlanta, Georgia
N. Murthy, University of California Berkeley, Berkeley, California
A. J. Garcia, Georgia Institute of Technology, Atlanta, Georgia

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C. Zhong, Sr., Cornell University, Ithaca NY, NY
C. Chu, Cornell University, Ithaca, New York

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D. Guo, Brigham and Women's Hospital, Cambridge, Massachusetts
S. Chester, MIT, Cambridge, Massachusetts
S. Yang, Brigham and Women's Hospital, Cambridge, Massachusetts
A. Kashyap, Brigham and Women's Hospital, Cambridge, Massachusetts
G. Campbell, Brigham and Women's Hospital, Cambridge, Massachusetts
R. Wood, Harvard University, Cambridge, Massachusetts
R. Rijal, Brigham and Women's Hospital, Cambridge, Massachusetts
R. Karnik, MIT, Cambridge, Massachusetts
R. Langer, MIT, Cambridge, Massachusetts
J. Karp, Brigham and Women's Hospital, Cambridge, Massachusetts

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L. Yang, The First Affiliated Hospital of Soochow University, Suzhou, China
L. Zhang, Brown University, Providence, Rhode Island
B. W. Sheldon, Brown University, Providence, Rhode Island
T. J. Webster, Brown University, Providence, Rhode Island

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R. S. Ward, Exthera Medical Corporation, Berkeley, CA

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A. Shukla, Rice University, Houston, TX
J. West, Duke University, Durham, North Carolina

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J. Chang, ETEX Corporation, Cambridge, MA

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Y. Chen, Rhode Island Hospital/Alpert Medical School, Brown University, Providence, RI

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S. Hahn, Pohang University of Science and Technology (POSTECH), pohang, Republic of Korea
M. Lee, POSTECH, Pohang, Republic of Korea
J. Yang, POSTECH, pohang, Republic of Korea
H. Jung, POSTECH, pohang, Republic of Korea
W. Hur, The Catholic University, Seoul, Republic of Korea
S. Yoon, The Catholic University, Seoul, Republic of Korea

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B. Narasimhan, Iowa State Univesrity, Ames, IA
Y. Phanse, Iowa State University, Ames, Iowa
P. A. Lueth, Iowa State University, Ames, Iowa
A. E. Ramer-Tait, University of Nebraska–Lincoln, Lincoln, Nebraska
B. R. Carrillo-Conde, University of Texas Austin, Austin, Texas
B. Narasimhan, Iowa State University, Ames, Iowa
M. J. Wannemuehler, Iowa State University, Ames, Iowa
B. H. Bellaire, Iowa State University, Ames, Iowa

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P. Chetprayoon, Graduate School of Engineering, Osaka University, Osaka, Japan
M. Matsusaki, Graduate School of Engineering, Osaka University, Osaka, Japan
M. Akashi, Graduate School of Engineering, Osaka University, Osaka, Japan

380 **Understanding the Influence of Stent Design on Arterial Drug Distribution and Effect through Computational Modeling**

R. A. Tzafriri, CBSET Inc, Lexington, MA
E. R. Edelman, MIT, Cambridge, Massachusetts

381 **Surface Modification of Red Blood Cells Using Novel Plasma Membrane Anchors**

S. Pandya, University of Texas at San Antonio, san antonio, TX
M. Salinas, University of Texas at San Antonio, San Antonio, Texas
E. Abdelaziz, University of Texas at San Antonio, san antonio, Texas
G. Negrete, University of Texas at San Antonio, san antonio, Texas
C. Agrawal, University of Texas at San Antonio, san antonio, Texas

382 **Polymeric Microparticles for Controlled Fibrolysis in Abdominal Aortic Aneurysms (AAAs)**

B. Sivaraman, Cleveland Clinic Foundation, Cleveland, OH
A. Sylvester, Case Western Reserve University & Cleveland Clinic, Cleveland, Ohio
A. Ramamurthi, Cleveland Clinic, Cleveland, Ohio

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h. ma, university of washington, Seattle, WA

384 **Synthesis of Antimicrobial Monomers Using Ciprofloxacin**

Y. Delaviz, University of Toronto, Toronto, ON, Canada
M. W. Laschuk, University of Toronto, Toronto, Ontario, Canada

M. Yang, University of Toronto, Toronto, Ontario, Canada
J. Santerre, University of Toronto, Toronto, Ontario, Canada

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F. Y. N. McWhorter, University of California, Irvine, Irvine, CA

386 **Cell Interaction Distance Modulates Chondrocyte Responses on Co-Cultured Scaffolds**
X. Zhang, Columbia University, New York, NY
K. L. Moffat, Columbia University, New York, New York
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N. H. Goldhaber, Columbia Univeristy, New York, New York
H. H. Lu, Columbia University, New York, New York

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X. Liu, Clemson University, Richmond, VA
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S. J. Higbee, Rice University, Houston, TX
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J. L. West, Duke University, Houston, Texas

389 **Phosphorylating apatite-specific peptide inhibits osteoblast mineralization**
J. Ramaswamy, University of Michigan Ann Arbor, Ann Arbor, MI
H. Nam, University of Michigan Ann Arbor, Ann Arbor, Michigan
N. E. Hatch, University of Michigan Ann Arbor, Ann Arbor, Michigan
D. H. Kohn, University of Michigan Ann Arbor, Ann Arbor, Michigan

390 **Osteogenic differentiation of ASC and MSC in modular protein/ceramic microenvironments**
R. R. Rao, University of Michigan, Ann Arbor, MI
R. R. Rao, University of Michigan, Ann Arbor, Michigan
A. W. Peterson, University of Michigan, Ann Arbor, Michigan
J. P. Stegemann, University of Michigan, Ann Arbor, Michigan

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

392 **3D hydrogel fibers based system to design heterotypic bone vascularization approaches**
S. M. Mihaila, 3B's Research Group, Caldas das Taipas - Guimarães, Portugal
E. G. Popa, 3B's Research Group, Caldas das Taipas - Guimarães, Portugal
R. L. Reis, 3B's Research Group, Caldas das Taipas - Guimarães, Portugal
A. P. Marques, 3B's Research Group, Caldas das Taipas - Guimarães, Portugal
M. E. Gomes, 3B's Research Group, Caldas das Taipas - Guimarães, Portugal

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M. T. Wolf, University of Pittsburgh, Pittsburgh, PA
M. T. Wolf, University of Pittsburgh, Pittsburgh, Pennsylvania
C. A. Carruthers, University of Pittsburgh, Pittsburgh, Pennsylvania
C. L. Dearth, University of Pittsburgh, Pittsburgh, Pennsylvania
P. M. Crapo, University of Pittsburgh, Pittsburgh, Pennsylvania
A. Huber, University of Pittsburgh, Pittsburgh, Pennsylvania
O. A. Burnsed, University of Pittsburgh, Pittsburgh, Pennsylvania
R. Londono, University of Pittsburgh, Pittsburgh, Pennsylvania
S. A. Johnson, University of Pittsburgh, Pittsburgh, Pennsylvania
K. A. Daly, University of Pittsburgh, Pittsburgh, Pennsylvania
E. C. Stahl, University of Pittsburgh, Pittsburgh, Pennsylvania
J. M. Freund, University of Pittsburgh, Pittsburgh, Pennsylvania
C. J. Medberry, University of Pittsburgh, Pittsburgh, Pennsylvania
L. E. Carey, University of Pittsburgh, Pittsburgh, Pennsylvania
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N. J. Amoroso, University of Pittsburgh, Pittsburgh, Pennsylvania
S. F. Badylak, University of Pittsburgh, Pittsburgh, Pennsylvania

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J. Gilmore, Clemson University, Clemson, SC

395 **Histological Evaluation of Abdominal Wall Defect Repair with a Novel Warp-Knit Mesh**

G. Hilas, Poly-Med, Inc., Anderson, SC
S. Peniston, Poly-Med, Inc., Anderson, South Carolina
J. Corbett, Poly-Med, Inc., Anderson, South Carolina

396 **Evaluation of a Polyamide-Gelatin Mesh seeded with Human Endometrial Mesenchymal Stem Cells for the repair of Pelvic Organ Prolapse**

J. A. M. Ramshaw, CSIRO - Materials Science and Engineering, Clayton, Australia
D. Ulrich, Monash Institute of Medical Research, Clayton, Australia
S. L. Edwards, CSIRO - Materials Science and Engineering, Clayton, Australia
J. F. White, CSIRO - Materials Science and Engineering, Clayton, Australia
C. Su, CSIRO - Materials Science and Engineering, Clayton, Australia
K. Tan, Monash Institute of Medical Research, Clayton, Australia
A. Rosamilia, Monash University, Calyton, Australia
C. E. Gargett, Monash Institute of Medical Research, Clayton, Australia
J. A. Werkmeister, CSIRO - Materials Science and Engineering, Clayton, Australia

397 **In Vitro Cellular Response to Surgical Mesh Materials Derived from Dermal ECM**

K. M. Kulig, Massachusetts General Hospital, Boston, MA
X. Luo, Massachusetts General Hospital, Boston, Massachusetts
E. B. Finkelstein, Massachusetts General Hospital, Boston, Massachusetts
X. Liu, Kensey Nash Corporation, Exton, Pennsylvania
J. P. Vacanti, Massachusetts General Hospital, Boston, Massachusetts
S. Goldman, Kensey Nash Corporation, Exton, Pennsylvania
C. A. Sundback, Massachusetts General Hospital, Boston, Massachusetts
C. M. Neville, Massachusetts General Hospital, Boston, Massachusetts

398 **Potential utility of woven flax fiber meshes in surgical repair of incisional hernias**

S. A. A. Michel, Maastricht University, Maastricht, Netherlands

M. L. W. Knetsch, Maastricht University, Maastricht, Netherlands
D. G. Molin, Maastricht University, Maastricht, Netherlands
L. H. Koole, Maastricht University, Maastricht, Netherlands

399 **Differentiation by FT-IR of Absorbable Polyesters Used in Production of Surgical Meshes**
K. D. Gray, Jr., Poly-Med, Inc., Anderson, SC
C. Culbreath, Poly-Med, Inc., Anderson, South Carolina
J. Corbett, Poly-Med, Inc., Anderson, South Carolina

400 **In Vitro Degradation Property of Two Fully-Absorbable Poly(lactide-co-glycolide) Meshes**
M. Deng, Johnson & Johnson Global Surgey Group, Somerville, NJ
M. Deng, Johnson & Johnson, Somerville, New Jersey
D. Burkley, Johnson & Johnson, Somerville, New Jersey
M. Xu, Johnson & Johnson, Somerville, New Jersey
S. Savidge, Johnson & Johnson, Somerville, New Jersey
I. Koyfman, Johnson & Johnson, Somerville, New Jersey
C. Yang, Johnson & Johnson, Somerville, New Jersey
Y. Li, Johnson & Johnson, Somerville, New Jersey

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T. L. Lowe, University of Tennessee Health Science Center, Memphis, TN
L. Wu, University of Tennessee Health Science Center, memphis, Tennessee
D. R. Janagam, University of Tennessee Health Science Center, memphis, Tennessee
S. Jiang, University of Tennessee Health Science Center, memphis, Tennessee

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N. Ravi, V.A. Medical Center, St. Louis, MO
P. D. Hamilton, VA Medical Center, St. Louis, Missouri

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

403 **Polyion Complex-Coated Polymeric Micelles with Highly Stability as Cell-Specific Drug**

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Y. Ohya, Kansai University, Suita, Osaka, Japan
Y. Morimoto, Kansai University, Suita, Japan
A. Takahashi, Kansai University, Suita, Japan
A. Kuzuya, Kansai University, Suita, Japan
A. Maruyama, Kyushu University, Fukuoka, Japan

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

405 **Altering Fibrin Matrix Properties with pNIPAm Microgels for Wound Healing Applications**
A. M. Douglas, Georgia Institute of Technology, Atlanta, GA

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A. Janorkar, University of Mississippi Medical Center, Jackson, MS
T. Wheeler, University of Mississippi Medical Center, Jackson, Mississippi
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B. M. Bailey, Texas A&M University, College Station, TX
L. N. Nail, Texas A&M University, College Station, Texas
M. A. Grunlan, Texas A&M University, College Station, Texas

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B. L. Banik, The Pennsylvania State University, State College, PA
J. L. Brown, The Pennsylvania State University, University Park, Pennsylvania

409 **Dermal substitutes using electrospun silk fibroin nanofiber sponge**
C. Park, Nano-Bio Regenerative Medical Institute, Hallym University, Chuncheon, Republic of Korea

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C. R. Gajjar, North Carolina State University, Raleigh, NC
C. Li, North Carolina State University, Raleigh, North Carolina
S. Chung, Korea Institute of Science & Technology Evaluation & Planning, Seoul, Korea, Democratic People's Republic of
R. Payne, Tengion Inc., Winston-Salem, North Carolina
M. W. King, North Carolina State University, Raleigh, North Carolina

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C. Wang, The University of Hong Kong, Hong Kong SAR, Hong Kong
M. Wang, The University of Hong Kong, Hong Kong SAR, Hong Kong

412 **Bone Marrow Absorption and Retention using Capillary Action via Micro-Channel Structure**
D. S. Oh, Columbia University, New York, NY

F. Y. Lee, Columbia University, New York, New York
H. Tawfeek, Columbia University, New York, New York
P. H. Lim, Columbia University, New York, New York
D. Ganbat, Kyung Hee University, Yongin, Republic of Korea
Y. Kim, Kyung Hee University, Yongin, Republic of Korea

413 **Bioactive Shape Memory Polymer Scaffolds for Bone Defect Repairs**
D. Zhang, Texas A&M University, College Station, TX
O. J. George, Texas A&M University, College Station, Texas
K. M. Petersen, Texas A&M University, College Station, Texas
M. A. Grunlan, Texas A&M University, College Station, Texas

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E. J. Levorson, Rice University, Houston, TX
O. Hu, Rice University, Houston, Texas
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A. G. Mikos, Rice University, Houston, Texas

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H. Huang, Kansas State University, Manhattan, KS
X. Sun, Kansas State University, Manhattan, Kansas

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J. V. Larson, University of Michigan, Ann Arbor, MI
T. A. Kung, University of Michigan, Ann Arbor, Michigan
M. G. Urbanchek, University of Michigan, Ann Arbor, Michigan
P. S. Cederna, University of Michigan, Ann Arbor, Michigan
N. B. Langhals, University of Michigan, Ann Arbor, Michigan

417 **Trilayered Design in Aortic Valve Tissue Engineering: A Polymeric Approach**
J. Liao, Mississippi State University, Mississippi State, MS
J. Guan, Ohio State University, Columbus, Ohio

418 **Differentiation of Mesenchymal Stem Cells on Polymeric Ligament Fascicle Substitute**
K. L. Lee, Rensselaer Polytechnic Institute, Troy, NY
G. A. Ngai, Rensselaer Polytechnic Institute, Troy, New York
S. C. Varghese, Rensselaer Polytechnic Institute, Troy, New York
J. A. Cooper, Jr., Rensselaer Polytechnic Institute, Troy, New York

419 **The effect of different sterilization techniques on material characteristics of a biodegradable nanocomposite polymer for use in tissue engineering purposes and its in-vitro and in-vivo biocompatibility**
L. Yildirimer, University College London, London, United Kingdom (Great Britain)

420 **Shape-memory Activated Change in Scaffold Fiber Alignment Directs Stem Cell Morphology**
L. Tseng, Syracuse University, Syracuse Biomaterials Institute, Syracuse, NY

421 **In Vitro Osteoblastic Differentiation on Bioactive Glass and Glass-ceramic Surfaces**
O. C. Alves, Ribeirao Preto Dental School, University of Sao Paulo, Ribeirao Preto (SP), Brazil, Ribeirão Preto-SP, Brazil
F. S. Oliveira, Ribeirao Preto Dental School, University of Sao Paulo, Ribeirao Preto (SP), Brazil,

Ribeirão Preto, Brazil
E. D. Zanotto, Federal University of Sao Carlos, Sao Carlos (SP), Brazil, São Carlos, Brazil
O. Peitl, II, Federal University of Sao Carlos, Sao Carlos (SP), Brazil, São Carlos, Brazil
M. M. Beloti, Ribeirao Preto Dental School, University of Sao Paulo, Ribeirao Preto (SP), Brazil, Ribeirão Preto, Brazil
A. L. Rosa, Ribeirao Preto Dental School, University of Sao Paulo, Ribeirao Preto (SP), Brazil, Ribeirão Preto, Brazil
P. T. Oliveira, Ribeirao Preto Dental School, University of Sao Paulo, Ribeirao Preto (SP), Brazil, Ribeirão Preto, Brazil

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D. R. Armant, Wayne State University, Detroit, Michigan
H. W. T. Matthew, Wayne State University, Detroit, Michigan

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R. E. Coronado, University of Texas Health Science Center San Antonio / University of Texas at San Antonio, San Antonio, TX

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R. M. Baker, Syracuse University, Syracuse, NY
J. H. Henderson, Syracuse University, Syracuse, New York
P. T. Mather, Syracuse University, Syracuse, New York

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A. M. Oelker, Massachusetts Institute of Technology, Cambridge, Massachusetts
L. G. Griffith, Massachusetts Institute of Technology, Cambridge, Massachusetts
P. T. Hammond, Massachusetts Institute of Technology, Cambridge, Massachusetts

426 **Hyaluronan-Based Multi-Phasic Scaffolds for Osteochondral Tissue Regeneration**
S. L. Fenn, University of Vermont, Burlington, VT
T. Miao, University of Vermont, Burlington, Vermont
R. A. Oldinski, University of Vermont, Burlington, Vermont

427 **Comparison of Elastomeric Polymers for Bladder Regeneration**
S. Sivaraman, Clemson university, Clemson, SC
N. Amoroso, University of Pittsburgh, Pittsburgh, Pennsylvania
W. Wagner, University of pittsburgh, Pittsburgh, Pennsylvania
S. Sant, University of Pittsburgh, Pittsburgh, Pennsylvania
J. Nagatomi, Clemson University, Clemson, South Carolina

428 **Development and Characterization of a Novel Polycaprolactone Fumarate (PCLF) Scaffold Manufactured through a Sacrificial Molding Technique**
S. C. Chase, Mayo Clinic, Rochester, MN
E. Wagner, Mayo Clinic, Rochester, Minnesota
D. Bravo, Mayo Clinic, Rochester, Minnesota
M. Dadsetan, Mayo Clinic, Rochester, Minnesota
S. Kakar, Mayo Clinic, Rochester, Minnesota
M. Yaszemski, Mayo Clinic, Rochester, Minnesota

429 **Spatial control of drug delivery in multilayered poly(vinyl alcohol) scaffold for tissue regeneration**

T. Miao, University of Vermont, Burlington, VT
T. Miao, University of Vermont, Burlington, Vermont
R. A. Oldinski, University of Vermont, Burlington, Vermont

430 **Novel Scaffold Design that Adds a Third Dimension to Engineering Complex Tissues**
T. He, North Carolina State University, Raleigh, NC
K. Sippel, ITA, RWTH Aachen University, Raleigh, North Carolina
A. O. Inman, III, North Carolina State University, Raleigh, North Carolina
N. Monteiro-Riviere, North Carolina State University, Raleigh, North Carolina
S. Lee, Wake Forest Institute of Regenerative Medicine, Winston-Salem, North Carolina
M. W. King, College of Textiles, North Carolina University & College of Textiles, Donghua University, Raleigh, North Carolina

431 **Is Interconnected Pore Volume Equal to Pore Size? Novel Technique to Evaluate Internal Pore Volume of Tissue Engineering Scaffolds**
T. He, North Carolina State University, Raleigh, NC
J. Liang, North Carolina State University, Raleigh, North Carolina
S. H. Bernacki, North Carolina State University, Raleigh, North Carolina
M. W. King, North Carolina State University, Raleigh, North Carolina

432 **Inverse Opal Scaffolds for Regenerative Medicine: Fabrication, Advantages and Applications**
Y. Zhang, Georgia Institute of Technology, Atlanta, GA
K. P. Regan, Bates College, Lewiston, Maine
Y. Xia, Georgia Institute of Technology, Atlanta, Georgia

900 **Grooved PLGA Films Incorporated with RGD/YIGSR Peptides for Potential Application on Skeletal Muscle Tissue Engineering**
P. WANG, Swinburne University of Technology, Melbourne, Australia

901 **Self-assembling “smart” hydrogels with bioadhesive properties for tissue engineering applicati**
J. Vernengo, Rowan University, Glassboro, NJ
C. Wiltsey, Rowan University, Glassboro, New Jersey
T. Christiani, Rowan University, Glassboro, New Jersey
J. Williams, Rowan University, Glassboro, New Jersey
J. Scaramazza, Rowan University, Glassboro, New Jersey
C. Van Sciver, Rowan University, Glassboro, New Jersey
K. Toomer, Rowan University, Glassboro, New Jersey
J. Sheehan, Rowan University, Glassboro, New Jersey
A. Branda, Rowan University, Glassboro, New Jersey
J. Kadlowec, Rowan University, Glassboro, New Jersey
C. Iftode, Rowan University, Glassboro, New Jersey

902 **Novel Biointegrative Cross-linked Degradable Polyurethane Scaffold Matrix**
A. Datta, Biomerix Corporation, Somerset, NJ
D. Grande, Feinstein Institute for Medical Research, Manhasset, New York

903 **Construction of a Collagen-Based, Split Thickness Cornea Substitute**
V. N. HASIRCI, METU, Ankara, Turkey
A. ACUN, METU, Ankara, Turkey

904 **A three-dimensional co-culture model of the aortic valve using magnetic levitation**
L. R. Balaoing, Rice University, Houston, TX

H. Tseng, Rice University, Houston, Texas
B. Grigoryan, Texas A&M University, College Station, Texas
R. M. Raphael, Rice University, Houston, Texas
T. C. Killian, Rice University, Houston, Texas
G. R. Souza, Nano3D Biosciences, Houston, Texas
K. J. Grande-Allen, Rice University, Houston, Texas

905 **Synthesis of a Novel Injectable, ROS-degradable Tissue Engineering Scaffold**
J. R. Martin, Vanderbilt University, Nashville, TN

Animal Models for Biomaterial and Medical Device Testing

433 **Injectable Poly(N-isopropylacrylamide)-grafted HA and Chitosan Hydrogel as a Barrier for Prevention of Postoperative Abdominal Adhesion in Laparoscopic Surgery**
C. Chen, Chang Gung University, Taoyuan, Taiwan, ROC, Tao-Yuan, Taiwan

434 **Development of Pre-Clinical In Vivo Models to Assess the Efficacy of Antimicrobial Products to Reduce Device-Related Infections**
L. K. Hansen, WuXi AppTec, Inc., St. Paul, MN
D. Johnson, WuXi AppTec, Inc., St. Paul, Minnesota
K. Jenkins, WuXi AppTec, Inc., St. Paul, Minnesota
C. Bauer, WuXi AppTec, Inc., St. Paul, Minnesota

435 **Platelet activation in juvenile ovines implanted with the PediaFlow® 4th generation pediatric ventricular assist device**
V. Shankarraman, University of Pittsburgh, Pittsburgh, PA
S. Olia, University of Pittsburgh, Pittsburgh, Pennsylvania
E. Kocyildirim, University of Pittsburgh, Pittsburgh, Pennsylvania
T. M. Maul, University of Pittsburgh, Pittsburgh, Pennsylvania
M. V. Kameneva, University of Pittsburgh, Pittsburgh, Pennsylvania
S. Snyder, LaunchPoint Technologies, Goleta, California
P. D. Wearden, University of Pittsburgh, Pittsburgh, Pennsylvania
H. S. Borovetz, University of Pittsburgh, Pittsburgh, Pennsylvania
W. R. Wagner, University of Pittsburgh, Pittsburgh, Pennsylvania

906 **Evaluation of Magnesium Alloys for Use as Degradable Stents in a Rat Trachea Bypass Model**
T. Gilbert, ACell, Columbia, MD

907 **Anatomical Effects in the Development of a Delayed Wound Healing Model**
K. A. Kentner, ACell, Inc., Columbia, MD
K. Stuart, ACell, Inc., Columbia, Maryland
K. Lam, Bridge PTS, San Antonia, Texas
C. Koeller, Bridge PTS, San Antonia, Texas
D. Ochoa, Bridge PTS, San Antonia, Texas
R. Patton, Bridge PTS, San Antonio, Texas
T. Laufenberg, Bridge PTS, San Antonio, Texas
C. Lewis, Bridge PTS, San Antonio, Texas
P. Attar, Bridge PTS, San Antonio, Texas
A. D. Janis, ACell, Inc., Columbia, Maryland

Benchtop Tissue Surrogates to Model Drug Uptake and Efficacy

436 **The Development of Hydrogel Microwells for Perfused 3D Culture of Hepatocytes**
J. Shepard, Massachusetts Institute of Technology, Cambridge, MA
V. Chan, University of Illinois at Urbana-Champaign, Urbana, Illinois
M. Rhoads, Massachusetts Institute of Technology, Cambridge, Massachusetts
M. Raredon, Massachusetts Institute of Technology, Cambridge, Massachusetts
R. Dyer, Massachusetts Institute of Technology, Cambridge, Massachusetts
P. Hammond, Massachusetts Institute of Technology, Cambridge, Massachusetts
R. Bashir, University of Illinois at Urbana-Champaign, Urbana, Illinois
L. Griffith, Massachusetts Institute of Technology, Cambridge, Massachusetts

Biofunctional Polymers for Gene Delivery

437 **Hemocompatible pH-responsive polymeric nanoparticle for intravenous siRNA**
C. E. Nelson, Vanderbilt University, Nashville, TN
J. R. Kintzing, Vanderbilt University, Nashville, Tennessee
J. M. Shannon, Vanderbilt Univeristy, Nashville, Tennessee
M. K. Gupta, Vanderbilt University, Nashville, Tennessee
C. L. Duvall, Vanderbilt Univeristy, Nashville, Tennessee

438 **Lyophilized Poly(ethylene glycol-b-(dimethylaminoethyl methacrylate-co-butyl methacrylate))-DNA Nanoparticles for Nonviral Gene Therapy**
E. J. Adolph, Vanderbilt University, Nashville, TN
C. E. Nelson, Vanderbilt University, Nashville, Tennessee
J. M. Shannon, Vanderbilt University, Nashville, Tennessee
C. L. Duvall, Vanderbilt University, Nashville, Tennessee
S. A. Guelcher, Vanderbilt University, Nashville, Tennessee

439 **Transformation of Cationic Materials into Neutral Biocompatible Systems for siRNA Delivery: Property and Function Characterization**
J. Liu, Georgia Institute of Technology, Atlanta, GA
J. Zhou, Peking University, Beijing, China
Y. Luo, Peking University, Beijing, China

440 **Spider Silk Gene Delivery Systems for Intracellular Cell Targeting**
O. Tokareva, Tufts University, Medford, MA
D. Glettig, Tufts University, Medford, Massachusetts
R. Abbott, Tufts University, Medford, Massachusetts
D. L. Kaplan, Tufts University, Medford, Massachusetts

N/A **Aptamer-Functionalized DNA Nanostructures for Targeted Antisense Delivery in Cancer**
P. Charoenphol, University of Massachusetts - Amherst, Amherst, MA
H. Bermudez, University of Massachusetts - Amherst, Amherst, Massachusetts

443 **Comb-shaped Cationic Polycarbonates for Gene Delivery and Antimicrobial Applications**
Z. Ong, Institute of Bioengineering and Nanotechnology, Singapore, Singapore
D. J. Coady, IBM Almaden Research Centre, San Jose, California
J. L. Hedrick, IBM Almaden Research Centre, San Jose, California
Y. Yang, Institute of Bioengineering and Nanotechnology, Singapore, Singapore

Bioinspired Smart Materials for Regenerative Medicine Applications

444 **Hyaluronic Acid-Catechol Hydrogel for Liver Tissue Engineering**
J. Lee, Yonsei University, Seoul, Republic of Korea
J. Shin, Yonsei University, Seoul, Republic of Korea
C. Lee, Yonsei University, Seoul, Republic of Korea
S. Cho, Yonsei University, Seou, Republic of Korea

445 **Theoretical Piezoelectric Composite Model for Use in a Spinal Fusion Cage**
L. Friis, University of Kansas, Lawrence, KS
N. E. Tobaben, University of Kansas, Lawrence, Kansas
J. P. Domann, University of Kansas, Lawrence, Kansas

446 **Enzymatic Stability of Novel Biomimetic Aggrecan for Treatment of Tissue Degeneration**
S. Lightfoot Vidal, Drexel University, Philadelphia, PA

447 **Enzymatic surface erosion of high-moduli polycarbonates based on natural phenols**
S. D. Sommerfeld, Rutgers - The State University of New Jersey, Piscataway, NJ
Z. Zhang, Rutgers - The State University of New Jersey, Piscataway, New Jersey
M. Costache, Rutgers - The State University of New Jersey, Piscataway, New Jersey
J. Kohn, Rutgers - The State University of New Jersey, Piscataway, New Jersey

448 **Growth Factor Delivery Systems that Mimic Natural Extracellular Matrix and Supply Biological Molecules in Bone Tissue Engineering**
W. Swieszkowski, Sr., Warsaw University of Technology, Warsaw, Poland

Biological Responses to Surface Modification of Biomaterials

449 **SLIPS Surface Treatment of Medical Devices that Prevents Blood Clot Formation in the Absence of Anticoagulants**
D. C. Leslie, Harvard University, Boston, MA
A. Waterhouse, Harvard University, Boston, Massachusetts
A. L. Watters, Harvard University, Boston, Massachusetts
J. B. Berthet, Harvard University, Boston, Massachusetts
T. M. Valentin, Harvard University, Boston, Massachusetts
A. Hansen, Children's Hospital Boston, Boston, Massachusetts
A. Nedder, Children's Hospital Boston, Boston, Massachusetts
T. Wong, Harvard University, Cambridge, Massachusetts
P. Kim, Harvard University, Cambridge, Massachusetts
M. Super, Harvard University, Boston, Massachusetts
J. Aizenberg, Harvard University, Cambridge, Massachusetts
D. E. Ingber, Harvard University, Boston, Massachusetts

450 **Mechanically-Stimulated Co-cultured Tissue-Specific Scaffolds for Tendon/Bone Interface**

Engineering

J. O. Cooper, The University of Memphis, Memphis, TN
M. Goodhart, The University of Memphis, Memphis, Tennessee
J. D. Bumgardner, The University of Memphis, Memphis, Tennessee
W. O. Haggard, The University of Memphis, Memphis, Tennessee
J. A. Jennings, The University of Memphis, Memphis, Tennessee

451 **In vivo Evaluation of an Endothelial Cell-Specific Biomimetic Peptide Fluorosurfactant Polymer Coating for Expanded Poly(tetrafluoroethylene) Vascular Grafts**

J. Bastijanic, Case Western Reserve University, Cleveland, OH
L. Dudash, Case Western Reserve University, Cleveland, Ohio
F. Kligman, Cleveland Clinic Foundation, Cleveland, Ohio
M. T. Allemang, University Hospitals, Cleveland, Ohio
R. O. Lakin, University Hospitals, Cleveland, Ohio
B. A. Eslahpazir, University Hospitals, Cleveland, Ohio
V. S. Kashyap, University Hospitals, Cleveland, Ohio
K. Kottke-Marchant, Cleveland Clinic Foundation, Cleveland, Ohio
R. Marchant, Case Western Reserve University, Cleveland, Ohio

452 **Innovative Injury versus Non-Injury Migration Assays**

K. R. Ammann, University of Arizona, Tucson, AZ
K. J. DeCook, University of Arizona, Tucson, Arizona
P. L. Tran, University of Arizona, Tucson, Arizona
M. J. Slepian, University of Arizona, Tucson, Arizona

453 **In Vitro Behavior of Human Osteoblastic Cells Cultured on Titanium Surfaces Modified by Oxidative Nanopatterning**

K. F. B. Prado, Dental School of Ribeirão Preto, University of São Paulo, Ribeirão Preto, Brazil
F. Variola, University of Ottawa, Ottawa, Canada
M. R. W. Ferreira, Dental School of Ribeirão Preto, University of São Paulo, Ribeirão Preto, Brazil
R. R. Fernandes, Dental School of Ribeirão Preto, University of São Paulo, Ribeirão Preto, Brazil
F. G. Azevedo, Dental School of Ribeirão Preto, University of São Paulo, Ribeirão Preto, Brazil

454 **Improved Osteoblast Response to UV-Irradiated Superhydrophilic PMMA/TiO2 Nanocomposites**

M. Shayan, University of Pittsburgh, Pittsburgh, PA

455 **Macrophage Interactions with Nanoporous Titanium Surfaces**

M. B. Ariganello, Université de Montréal, Ottawa, ON, Canada

456 **Surface Chemistry Modulation of Valvular Interstitial Cells**

M. N. Rush, University of New Mexico, Albuquerque, NM
E. Esquivel, University of New Mexico, Albuquerque, New Mexico
E. L. Hedberg-Dirk, University of New Mexico, Albuquerque, New Mexico

457 **Anti-fouling Medical Coatings Prepared with Amphiphilic PEG-Silanes**

M. A. Grunlan, Texas A&M University, College Station, TX
M. L. Hawkins, Texas A&M University, College Station, Texas
M. A. Rufin, Texas A&M University, College Station, Texas
J. A. Gruetzner, Texas A&M University, College Station, Texas

458 **The use of a library of industrial materials to determine the nature of substrate-dependent**

performance of primary adherent human cells
M. Ni, Institute of Bioengineering and Nanotechnology, Singapore, Singapore

459 **Decreasing bacterial colonization around the Intraosseous Transcutaneous Amputation Prosthesis without inducing cytotoxicity to fibroblasts using hydroxyapatite, silver and fibronectin**
M. Chimutengwende-Gordon, Institute of Orthopaedics and Musculoskeletal Science, University College London, London, United Kingdom (Great Britain)
C. Pendegrass, Institute of Orthopaedics and Musculoskeletal Science, UCL, Stanmore, United Kingdom (Great Britain)
G. Blunn, Institute of Orthopaedics and Musculoskeletal Science, Stanmore, United Kingdom (Great Britain)

460 **Octacalcium phosphate/gelatin composite: the effect of synthesis and crystal elongation on rabbit tibia bone repair**
O. Suzuki, Tohoku University Graduate School of Dentistry, Sendai, Japan

461 **Osteopontin Expression by Osteogenic Cells Cultured on Nanoporous Tiatanium**
P. Adachi, Jr., University of Sao Paulo, Ribeirao Preto, Brazil
W. M. A. Maximiano, Jr., School of Dentistry of Ribeirao Preto, Ribeirao Preto, Brazil
A. L. Rosa, School of Dentistry of Ribeirao Preto, Ribeirao Preto, Brazil
A. Nanci, Université de Montréal, Montréal, Québec, Canada
P. T. Oliveira, School of Dentistry of Ribeirao Preto, Ribeirao Preto, Brazil

462 **Amino Acid - Based Antifouling Poly (serine methacrylate)**
Q. Liu, University of Akron, Akron, OH
A. Singh, University of Akron, Akron, Ohio
L. Liu, University of Akron, Akron, Ohio

463 **Effect of protein adsorption on human osteoblast response to porous ferritic fibre networks**
R. L. Spear, University of Cambridge, Cambridge, United Kingdom (Great Britain)
B. Srigengan, University of Cambridge, Cambridge, United Kingdom (Great Britain)
A. E. Markaki, University of Cambridge, Cambridge, United Kingdom (Great Britain)

464 **Interaction of Endothelial and Smooth Muscle Cells with Paclitaxel-Immobilized Self Assembled Monolayers**
S. Lamichhane, The University of South Dakota, Sioux Falls, SD
S. Lancaster, South Dakota Innovation Partners, Sioux Falls, South Dakota
E. Thiruppathi, The University of South Dakota, Sioux Falls, South Dakota
G. Mani, The University of South Dakota, Sioux Falls, South Dakota

908 **Limits to the utilization of polydopamine coating with the example of flax fibers as a substrate**
S. A. A. Michel, Maastricht University, Maastricht, Netherlands
M. L. W. Knetsch, Maastricht University, Maastricht, Netherlands
L. H. Koole, Maastricht University, Maastricht, Netherlands

909 **Combined Treatment of a Tendon Gap with a Biomimetic Electrospun Scaffold, Stromal Cells and GDF5**
R. James, University of Connecticut Health Center, Farmington, CT

Biologically Derived Materials From Natural Resources

465 **Basic Properties of Starfish Bone and Its Phase Transformation Reaction in Phosphate Salt Solution**
A. Takeuchi, Shinshu University, Matsumoto, Japan
D. Honda, Shinshu University, Matsumoto, Japan
K. Ishikawa, Kyushu University, Fukuoka, Japan

466 **Material Screening for Skeletal Muscle Regeneration**
B. E. Pollot, University of Texas at San Antonio, San Antonio, TX
C. R. Rathbone, United States Army Institute of Surgical Research, Fort Sam Houston, Texas
J. C. Wenke, US Army Institute of Surgical Research, Fort Sam Houston, Texas
T. Guda, University of Texas at San Antonio, San Antonio, Texas

467 **Comparison of Mechanical Response of Intact Artery and Isolated Arterial Elastin**
B. Stephen, University of Maryland Baltimore County, Baltimore, MD
L. Topoleski, University of Maryland Baltimore County, Baltimore, Maryland

468 **Guest-Host Assembly of Shear-Thinning Hyaluronic Acid Hydrogels**
C. B. Rodell, University of Pennsylvania, Philadelphia, PA
J. A. Burdick, University of Pennsylvania, Philadelphia, Pennsylvania

469 **Magnetically guided alignment of bio-nanofibers into ordered structures for controlling stem cell behaviors**
C. Mao, University of Oklahoma, Norman, OK

470 **Design and Synthesis of an Adherent Artificial Pulmonary Pleura**
D. E. Wagner, University of Vermont, Burlington, VT
R. A. Oldinski, University of Vermont, Burlington, Vermont
N. R. Bonenfant, University of Vermont, Burlington, Vermont
D. J. Weiss, University of Vermont, Burlington, Vermont

471 **Promoting Chondrogenesis and Maintaining the Bioactivity of Proteins using a Biomimetic Material**
G. Portocarrero, New Jersey Institute of Technology, Hillside, NJ
A. Molina, New Jersey Institute of Technology, Newark, New Jersey
G. Collins, New Jersey Institute of Technology, Newark, New Jersey
T. Arinzeh, New Jersey Institute of Technology, Newark, New Jersey

472 **Thermally stable polylactide stereocomplex conjugated by bio-based compound at both initiating and terminal groups**
H. Ajiro, Osaka University, Suita, Japan
T. H. Thi, Viet Tri University of Industry, Phu Tho, Viet Nam
T. Fujiwara, The University of Memphis, Memphis, Tennessee
M. Akashi, Osaka University, Suita, Japan

473 **Biomimetic apatite-coated chitosan based scaffolds for bone regeneration**
H. Park, University of California, Los Angeles, Los Angeles, CA

474 **Three-Dimensional Biomolecular Architectures for Characterizing Bacterial Sociomicrobiology**
J. B. Shear, University of Texas at Austin, Austin, TX
J. Connell, University of Texas at Austin, Austin, Texas

M. Fitzpatrick, University of Texas at Austin, Austin, Texas
E. T. Ritschdorff, University of Texas at Austin, Austin, Texas
E. C. Spivey, University of Texas at Austin, Austin, Texas
M. Whiteley, University of Texas at Austin, Austin, Texas

475 **DMSO Resistance of Hyaluronic Acid-Based Hydrophilic Coatings**
J. Rosenman, Biocoat, Inc., Horsham, PA
E. Pervin, Biocoat, Inc., Horsham, Pennsylvania
J. Simon, Biocoat, Inc., Horsham, Pennsylvania

476 **Chitosan Source Evaluation by Two Degradation Assessment Methods for a Local Delivery Device**
K. Smith, The University of Memphis, Memphis, TN
A. Parker, The University of Memphis, Memphis, Tennessee
A. Jennings, The University of Memphis, Memphis, Tennessee
W. Haggard, The University of Memphis, Memphis, Tennessee

477 **Naturally Derived Fatty Acid Biomaterials for Local Drug Delivery**
K. M. Faucher, Atrium Medical Corporation, MAQUET GETINGE Group, Hudson, NH
N. Artzi, MIT, Cambridge, Massachusetts
T. Albergo, Atrium Medical Corporation, MAQUET GETINGE Group, Hudson, New Hampshire
J. Bienkiewicz, Atrium Medical Corporation, MAQUET GETINGE Group, Hudson, New Hampshire
S. Conroy, Atrium Medical Corporation, MAQUET GETINGE Group, Hudson, New Hampshire
A. Dale, Atrium Medical Corporation, MAQUET GETINGE Group, Hudson, New Hampshire
I. Kozlova, Atrium Medical Corporation, MAQUET GETINGE Group, Hudson, New Hampshire
E. R. Edelman, MIT, Cambridge, Massachusetts
P. Martakos, Atrium Medical Corporation, MAQUET GETINGE Group, Hudson, New Hampshire

478 **Fabrication of a Bioinspired Cellulose-based Composite with Biocompatible Surface as a Potential Scaffold in Vascular Tissue Engineering**
P. Pooyan, Georgia Institute of Technology, Atlanta, GA
L. P. Brewster, 1) Emory University School of Medicine; 2) Georgia Institute of Technology, Atlanta, Georgia
R. Tannenbaum, 1) University of Alabama at Birmingham; 2) Georgia Institute of Technology, Atlanta, Georgia
H. Garmestani, Georgia Institute of Technology, Atlanta, Georgia

479 **Fabrication of Silk/Chitosan-based Hydrogels by Gamma Irradiation**
P. Uttayarat, Thailand Institute of Nuclear Technology (Public Organization), Nakornnayok, Thailand

480 **Crosslinked Hyaluronic Acid Hydrogel Networks Designed as Mechano-stimulators**
P. S. Varde, Syracuse University, Syracuse, NY
J. M. Hasenwinkel, Syracuse University, Syracuse, New York

481 **Peptide block copolymers to improve silk biomaterial/hard-tissue interfaces**
R. Calabrese, Tufts University, Medford, MA
G. Qin, Tufts University, Medford, Massachusetts
D. L. Kaplan, Tufts University, Medford, Massachusetts

482 **Two-layer silk tubular scaffolds for small diameter blood vessel regeneration**
V. Catto, Politecnico di Milano, Milano, Italy
R. Elia, Tufts University, Medford, Massachusetts

M. Tanzi, Politecnico di Milano, Milano, Italy
G. Freddi, INNOVHUB - Stazioni Sperimentali per l'Industria - Divisione Stazione Sperimentale per la Seta, Milano, Italy
S. Farè, Politecnico di Milano, Milano, Italy
D. L. Kaplan, Tufts University, Medford, Massachusetts

483 **A Comparative Study of Decellularized Extracellular Matrix Biomaterials from Different Sources**
x. luo, Tongji Hospital, Huazhong University of Science and Technology,Wuhan, People's Republic of China, Wuhan,Hubei, China

484 **Self-Deployable Current Source Fabricated From Edible Materials**
Y. Kim, Carnegie Mellon University, Pittsburgh, PA
C. J. Bettinger, Carnegie Mellon University, Pittsburgh, Pennsylvania
S. Chun, Carnegie Mellon University, Pittsburgh, Pennsylvania
J. Whitacre, Carnegie Mellon University, Pittsburgh, Pennsylvania

910 **Investigating the osteogenic potential of decellularized extracellular matrices derived from different tissues of origin**
V. Z. Beachley, Johns Hopkins University, Baltimore, MD
M. Gibson, Johns Hopkins University, Baltimore, Maryland
J. Elisseeff, Johns Hopkins University, Baltimore, Maryland

911 **Solution Structure of Poly-amido-saccharides**
S. E. Stidham, Boston University, Boston, MA
S. L. Chin, Boston University, Boston, Massachusetts
E. L. Dane, Boston University, Boston, Massachusetts
M. W. Grinstaff, Boston University, Boston, Massachusetts

Biologically Inspired Biomaterials Approaches for Cancer Research

485 **Biphasic Cell Responses on Laterally Mobile Films**
A. P. Kourouklis, Umass, Amherst, Amherst, MA
R. V. Lerum, Umass, Amherst, Amherst, Massachusetts
H. Bermudez, Umass, Amherst, Amherst, Massachusetts

486 **Synergy of matrix stiffness and EGFR inhibition in apoptosis of pancreatic tumor cells in 3D**
C. Lin, Indiana University-Purdue University at Indianapolis, Indianapolis, IN
C. Ki, Indiana University-Purdue University at Indianapolis, Indianapolis, Indiana

487 **Stem cells as a photosensitizer carrier to attack cancer cells for photodynamic therapy of breast cancer**
C. Mao, University of Oklahoma, Norman, OK

488 **Matrix Rigidity Regulates Osteolytic Gene Expression in Oral Squamous Cell Carcinomas**
J. M. Page, Vanderbilt University, Nashville, TN

489 **Hyaluronic Acid Based Hydrogels with Tunable Properties for the Study of Breast Cancer**
S. A. Fisher, University of Toronto, Toronto, ON, Canada
S. C. Owen, University of Toronto, Toronto, Ontario, Canada
M. S. Shoichet, University of Toronto, Toronto, Ontario, Canada

912 **Fibronectin and Type I Collagen Synergy in Tumor Progression**
K. Wang, Cornell University, Ithaca, NY
R. Andresen-Eguiluz, Cornell University, Ithaca, New York
B. Seo, Cornell University, Ithaca, New York
S. Hu, Cornell University, Ithaca, New York
C. Fischbach, Cornell University, Ithaca, New York
D. Gourdon, Cornell University, Ithaca, New York

Biomaterial Strategies for Innervation, Nerve Repair and Integration

490 **Multifunctional Alginate Scaffolds for Spinal Cord Repair**
D. Shahriari, Michigan State University, East Lansing, MI
D. Lynam, Michigan State University, East Lansing, Michigan
K. Koffler, University of California, San Diego, La Jolla, California
C. Chan, Michigan State University, East Lansing, Michigan
M. Tuszynski, University of California, San Diego, La Jolla, California
J. Sakamoto, Michigan State University, East Lansing, Michigan

491 **Potential Neural Interface Material Printed via Projection Micro-StereoLithography (PmSL)**
K. N. Cicotte, University of New Mexico Sandia National Laboratories, Albuquerque, NM
S. Buerger, Sandia National Laboratories, Albuquerque, New Mexico
P. P. Lin, MD Anderson Cancer Center, Houston, Texas
G. Reece, MD Anderson Cancer Center, Houston, Texas
E. L. Hedberg-Dirk, University of New Mexico, Albuquerque, New Mexico
S. M. Dirk, Sandia National Laboratories, Albuquerque, New Mexico

492 **Intracortical Electrodes of Different Material, Shape, Size and Tethering Induce Differential Inflammatory Responses that Significantly Impact Chronic Electrode Function.**
L. Karumbaiah, Georgia Institute of Technology, Atlanta, GA
T. Saxena, Georgia Institute of Technology, Atlanta, Georgia
K. Patil, Georgia Institute of Technology, Atlanta, Georgia
R. Patkar, Georgia Institute of Technology, Atlanta, Georgia
M. Betancur, Georgia Institute of Technology, Atlanta, Georgia
G. B. Stanley, Georgia Institute of Technology, Atlanta, Georgia
R. V. Bellamkonda, Georgia Institute of Technology, Atlanta, Georgia

493 **Controlled release of Chondroitinase ABC to the injured spinal cord**
M. Pakulska, University of Toronto, Toronto, ON, Canada

494 **Decellularized Equine Sciatic Nerve Hydrogel for Peripheral Nerve Repair**
S. T. LoPresti, University of Pittsburgh, Pittsburgh, PA

495 **Basement Membrane-Polycaprolactone Blend Nanofibers as a Scaffold for Tissue Engineering**
S. Lenz, University of Virginia, Charlottesville, VA
R. Neal, University of Virginia, Charlottesville, Virginia
D. Abebayehu, University of Virginia, Charlottesville, Virginia
B. Brooks, University of Virginia, Charlottesville, Virginia
R. C. Ogle, LifeNet Institute of Regenerative Medicine, Norfolk, Virginia
E. Botchwey, Georgia Institute of Technology, Atlanta, Georgia

496 **Microspheres for sustained delivery of NEP1-40 and chondroitinase ABC for treatment of**

spinal cord injury
T. Wilems, Washington University, St. Louis, MO
D. McCreedy, Washington University, St.Louis, Missouri
L. Marquardt, Washington University, St. Louis, Missouri
S. E. Sakiyama-Elbert, Washington University, St. Louis, Missouri

497 **Decellularized Equine Sciatic Nerve as a Scaffold for Peripheral Nerve Repair**
T. Prest, University of Pittsburgh, Pittsburgh, PA

498 **Electrically Conductive Nerve Guidance Channel**
Z. Zhang, Laval University, Quebec, QC, Canada
Z. Du, Laval University, Quebec, Québec, Canada

913 **Photoreactive Interpenetrating Network with Tunable Stiffness as a Scaffold for Neurite Growth**
P. Khoshakhlagh, Tulane University, New orleans, LA
E. L. Horn-Ranney, Tulane University, New Orleans, Louisiana
M. J. Moore, Tulane University, New Orleans, Louisiana

Biomaterial Strategies for Large-Area Bone Regeneration

499 **Effect of novel putty-like resorbable calcium alkali orthophosphate bone substitute cements designed for restoring contours in craniofacial surgery on bone formation and osteoblastic phenotype expression in vivo**
C. Knabe, Philipps University Marburg, Marburg, Germany
G. Berger, Federal Institute for Materials Research and Testing, Berlin, Germany
R. Gildenharr, Federal Institute for Materials Research and Testing, Berlin, Germany
F. Dombrowski, Federal Institute for Materials Research and Testing, Berlin, Germany
K. Reiter, Philipps University Marburg, Marburg, Germany
A. Houshmand, Philipps University Marburg, Marburg, Germany
M. Stiller, Philipps University Marburg, Marburg, Germany

500 **Vascular endothelial growth factor expression in posterolateral rabbit fusion: An evaluation of bone graft materials**
F. V. Lamberti, Pioneer Surgical, Greenville, NC
W. R. Walsh, University of New South Wales, Syndey, Australia
R. A. Oliver, University of New South Wales, Sydney, Australia
Y. Yu, University of New South Wales, Sydney, Australia
B. Schlossberg, Pioneer Surgical, Woburn, Massachusetts

N/A **Fabrication of Customized Porous Hydroxyapatite (HA) implants for Bone Reconstruction**
H. Jung, 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
M. Kang, 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
Y. Koh, Dental Laboratory Science and Engineering, Korea University, Seoul, Republic of Korea
Y. Estrin, Department of Materials Engineering, Monash University, Clayton, Australia

N/A **Sustained Bone Morphogenetic Protein 2 Delivery from Densified Titanium for the Bone Regeneration**
H. Jung, Department of Materials Science and Engineering, Seoul National University, Seoul, Korea, Seoul, Republic of Korea
M. Kang, Department of Materials Science and Engineering, Seoul National University, Seoul, Korea, Seoul, Republic of Korea
H. Kim, Department of Materials Science and Engineering, Seoul National University, Seoul, Korea, Seoul, Republic of Korea
Y. Estrin, Department of Materials Engineering, Monash University, Clayton, Australia, Clayton, Republic of Korea

503 **Developing Polymer/Ceramic Scaffolds using a Factorial Design of Experiments and Response-surface Analysis**
J. A. Minton, Miami University, Hamilton, OH
C. Janney, Miami University, Oxford, Ohio
C. Focke, Miami University, Oxford, Ohio
P. James, Miami University, Oxford, Ohio
A. Yousefi, Miami University, Oxford, Ohio

504 **Comparison of beta-tricalcium phosphate foam made using Mg stabilizer and by heat treatment**
K. Ishikawa, Kyushu University, Fukuoka, Japan
T. Nikaido, Kyushu University, Fukuoka, Japan
K. Tsuru, Kyushu University, Fukuoka, Japan

505 **Effect of Calcium Phosphate Coatings and Bone Morphogenetic Protein (BMP)-2 on In Vivo Bone Regeneration using 3-dimensional Poly (propylene fumarate) Scaffolds in Rabbit Calvarial Model**
M. Dadsetan, Mayo Clinic, Rochester, MN

506 **Testing of a Bioactive, Moldable Bone Graft Substitute in an Infected, Critically-Sized Defect Model**
M. Brown, University of Kentucky, Lexington, KY
Y. Zou, University of Kentucky, Lexington, Kentucky
R. Peyyala, University of Kentucky, Lexington, Kentucky
T. Milbrandt, University of Kentucky, Lexington, Kentucky
L. Cunningham, University of Kentucky, Lexington, Kentucky
T. Dziubla, University of Kentucky, Lexington, Kentucky
D. Puleo, University of Kentucky, Lexington, Kentucky

507 **Performance of polymer + OCP composite scaffolds in the CSD rabbit calvaria model**
O. Ortiz, Rutgers - The State University of New Jersey, Piscataway, NJ
R. Z. LeGeros, New York University, New York, New York
J. Kohn, Rutgers - The State University of New Jersey, Piscataway, New Jersey

508 **Improving Transport Limitations of Tissue Engineered Bone Scaffolds**
S. Tabbaa, Clemson University, Clemson, SC

509 **The Effect of Wicking Fibers on Transport Properties of Tissue Engineered Scaffolds**
S. Tabbaa, Clemson University, Clemson, SC

510 **A Novel Approach to Engineer Vascularized Osteon-like Constructs for Cortical Bone Tissue Engineering**

X. Chen, Stevens Institute of Technology, Hoboken, NJ
H. Wang, Stevens Institute of Technology, Hoboken, New Jersey

914 **Surface Modified Chitosan Tissue Engineering Scaffolds for Biomimetic Periosteum on Cortical Bone Allografts**
R. Romero, Colorado State University, Fort Collins, CO
M. J. Kipper, Colorado State University, Fort Collins, Colorado

Biomaterials and Medical Product Commercialization

511 **A novel technique for micromotion measurement of unicompartmental tibial trays for design comparison**
G. Yildirim, Pipeline Orthopedics, Cedar Knolls, NJ

N/A **From Bench to Business: What Every Academic Should Consider Before Launching a Startup**
M. Van Dyke, Virginia Polytechnic Institute and State University, Blacksburg, VA

915 **Fabrication and Tissue Anchoring performance of Nylon and Polypropylene Barbed Surgical Sutures**
H. Cong, North Carolina State University, Raleigh, NC
S. Roe, North Carolina State University, Raleigh, North Carolina
M. King, North Carolina State University, Raleigh, North Carolina
P. Mente, North Carolina State University, Raleigh, North Carolina
G. Ruff, 4Vilcom Circle, Chapel Hill, Raleigh, North Carolina

916 **Reduction of Absorption Time for a Polydioxanone Homopolymer Using Polyethylene glycol**
D. R. Ingram, Poly-Med, Inc., Anderson, SC, SC

Biomaterials Design and Tissue Engineering via Synthetic Biology

513 **Multiscale Organization of Nanofiber-based Structures: Nature Design, Bio-inspired Engineering and Future Directions**
C. Zhong, Synthetic Biology Center, Massachusetts Institute of Technology, Cambridge, MA
T. K. Lu, Synthetic Biology Center, Massachusetts Institute of Technology, Cambridge, Massachusetts

Biomaterials Education

N/A **Motivational Differences Between Bioengineering and Mechanical Engineering Students**
A. N. Kirn, Clemson University, Clemson, SC
L. Benson, Clemson University, Clemson, South Carolina

515 **Biomaterial Implant Design Competition for High School Students**
A. C. Parker, The University of Memphis, Memphis, TN
J. M. Goodhart, The University of Memphis, Memphis, Tennessee
T. Phung, The University of Memphis, Memphis, Tennessee
J. Williams, The University of Memphis, Memphis, Tennessee
J. D. Bumgardner, The University of Memphis, Memphis, Tennessee

516 **Alternative Methods to Determine Extractable Monomer Content of Polydioxanone (PDO)**
C. Culbreath, Poly-Med, Inc., Anderson, SC
J. Olbrich, Poly-Med, Inc., Anderson, South Carolina
J. Corbett, Poly-Med, Inc., Anderson, South Carolina

517 **Integrating creative thinking into biomaterials education: A first year bioengineering seminar module to teach how to design musculoskelatal bioengineering systems for regenerative purposes**
T. Ozdemir, The Pennsylvania State University, University Park, PA

Biomaterials for Cardiac Repair

518 **Development of Electrospun Hyaluronic Acid Scaffolds Containing Multivalent Peptide Conjugates**
N. A. Rode, UC Berkeley, Oakland, CA
N. C. Marks, UC Berkeley, Berkeley, California
K. E. Healy, UC Berkeley, Berkeley, California

917 **Stem Cell Therapy in Heart Failure: Application Strategies for the CardioCel® Matrix**
J. A. M. Ramshaw, CSIRO, Clayton, Australia
A. Vashi, CSIRO, Clayton, Australia
J. F. White, CSIRO, Clayton, Australia
K. M. McLean, CSIRO, Clayton, Australia
W. M. L. Neethling, University of Western Australia, Fremantle, Australia
J. A. Werkmeister, CSIRO, Clayton, Australia

Biomaterials for Modulating Immune and Inflammatory Processes

519 **Distinct Local Macrophage Phenotypes Are Associated With Divergent Tissue Remodeling Outcomes Following Implantation of Biologic Scaffolds**
B. N. Brown, McGowan Institute for Regenerative Medicine, Pittsburgh, PA
K. A. Kukla, Carnegie Mellon University, Pittsburgh, Pennsylvania
B. M. Sicari, McGowan Institute for Regenerative Medicine, Pittsburgh, Pennsylvania
N. J. Turner, McGowan Institute for Regenerative Medicine, Pittsburgh, Pennsylvania
L. Zhang, McGowan Institute for Regenerative Medicine, Pittsburgh, Pennsylvania
S. F. Badylak, McGowan Institute for Regenerative Medicine, Pittsburgh, Pennsylvania

520 **How Estrogen Receptor Signaling Modulates the Response of Human Macrophages to Wear Particles**
C. Li, Department of Orthopaedic Surgery, Stanford University School of Medicine, Stanford, CA
C. Nich, Department of Orthopaedic Surgery, Stanford University School of Medicine, Stanford, California
J. K. Antonios, Department of Orthopaedic Surgery, Stanford University School of Medicine, Stanford, California
Z. Yao, Department of Orthopaedic Surgery, Stanford University School of Medicine, Stanford, California
K. Kealoha-Steck, Department of Pathology, Stanford University School of Medicine, Stanford, California
M. Fontaine, Department of Pathology, Stanford University School of Medicine, Stanford, California

S. B. Goodman, Department of Orthopaedic Surgery, Stanford University School of Medicine, Stanford, California

521 **Composition of Intraperitoneal Electrospun Conduits Influence Recruited Cell Phenotype and Matrix Synthesis**
C. A. Bashur, Cleveland Clinic, Cleveland, OH
M. J. Eagleton, Cleveland Clinic, Cleveland, Ohio
A. Ramamurthi, Cleveland Clinic, Cleveland, Ohio

522 **Bliateral regulation of human monocytes and matrix-encapsulated mesenchymal stromal/stem cells in vitro and in full-thickness cutaneous wounds**
D. A. Cantu, University of Wisconsin-Madison, Madison, WI

523 **Chitosan Particles Induce Human U937 Macrophages to Release Anti-Inflammatory Factors and Mesenchymal Stem Cell Chemokines Through Pathways Involving STAT-1**
D. Fong, École Polytechnique de Montréal, Montréal, QC, Canada
M. B. Ariganello, École Polytechnique de Montréal, Montréal, Québec, Canada
J. Girard-Lauzière, École Polytechnique de Montréal, Montréal, Québec, Canada
C. D. Hoemann, École Polytechnique de Montréal, Montréal, Québec, Canada

524 **Modulation of in vitro nitric oxide production in murine macrophages by immobilized and soluble glycosaminoglycans**
G. Tan, Institute for Frontier Medical Sciences, Kyoto University, Kyoto, Japan
Y. Tabata, Institute for Frontier Medical Sciences, Kyoto University, Kyoto, Japan

525 **Development of Controlled Drug-Releasing Constructs to Mediate Inflammation in an Islet Transplant Site**
J. D. Weaver, University of Miami, Miami, FL
Y. Song, University of Miami, Miami, Florida
A. Pileggi, University of Miami, Miami, Florida
P. Buchwald, University of Miami, Miami, Florida
C. L. Stabler, University of Miami, Miami, Florida

526 **Time Course of Macrophage Polarization in Response to Wear Particles in vitro**
J. K. Antonios, Stanford University School of Medicine, Stanford, CA
C. Li, Stanford University School of Medicine, Stanford, California
Z. Yao, Stanford University School of Medicine, Stanford, California
A. J. Rao, Stanford University School of Medicine, Stanford, California
S. B. Goodman, Stanford University School of Medicine, Stanford, California

527 **Vascularization for Bone Tissue Engineering through Modulation of Macrophage Behavior**
K. L. Spiller, Columbia University, New York, NY
R. Anfang, Columbia University, New York, New York
J. Ng, Columbia University, New York, New York
K. Nakazawa, Columbia University, New York, New York
G. Vunjak-Novakovic, Columbia University, New York, New York

528 **Polyanhydride particle vaccine platform enhances antigen-specific cytotoxic T cell responses**
K. Ross, Iowa State University, Ames, IA
L. Huntimer, Iowa State University, Ames, Iowa
R. Darling, Iowa State University, Ames, Iowa
A. Ramer-Tait, Iowa State University, Amesq, Iowa

B. Narasimhan, Iowa State University, Ames, Iowa
M. Wannemuehler, Iowa State University, Ames, Iowa

529 **Deposition and Persistence of Polyanhydride Nanoparticle Vaccines upon Intranasal Administration**
K. Ross, Iowa State University, Ames, IA
S. Haughney, Iowa State University, Ames, Iowa
T. Brenza, Iowa State University, Ames, Iowa
L. Huntimer, Iowa State University, Ames, Iowa
P. Boggiatto, Iowa State University, Ames, Iowa
M. Wannemuehler, Iowa State University, Ames, Iowa
B. Narasimhan, Iowa State University, Ames, Iowa

530 **Humoral responses elicited by polyanhydride nanoparticle formulations are facilitated by enhanced CD4+ T cell helper cells**
K. Ross, Iowa State University, Ames, IA
L. Huntimer, Iowa State University, Ames, Iowa
R. Darling, Iowa State University, Ames, Iowa
A. Ramer-Tait, Iowa State University, Ames, Iowa
B. Narasimhan, Iowa State University, Ames, Iowa
M. Wannemuehler, Iowa State University, Ames, Iowa

531 **Polyanhydride Nanoparticle-based Influenza Vaccine Elicits Viral Neutralizing Titers and Enhances Cell-Mediated Immunity**
K. Ross, Iowa State University, Ames, IA
L. Huntimer, Iowa State University, Ames, Iowa
W. Wu, Iowa State University, Ames, Iowa
S. Carpenter, Iowa State University, Ames, Iowa
B. Narasimhan, Iowa State University, Ames, Iowa
M. Wannemuehler, Iowa State University, Ames, Iowa

532 **Enhancing Mechanical Properties of Fibrin Matrices for Wound Healing Applications through Optimized B-knob Engagement**
K. C. Clause, Georgia Institute of Technology, Atlanta, GA

533 **Investigation of interaction between the dynamic polymer surfaces and collagen molecules**
K. Nam, Tokyo Medical and Dental University, Tokyo, Japan
J. Seo, Tokyo Medical and Dental University, Tokyo, Japan
T. Kimura, Tokyo Medical and Dental University, Tokyo, Japan
N. Yui, Tokyo Medical and Dental University, Tokyo, Japan
A. Kishida, Tokyo Medical and Dental University, Tokyo, Japan

534 **Specific cytokines released by monocytes cultured on a degradable polyurethane (D-PHI) influence VSMC response**
K. Battiston, University of Toronto, Toronto, ON, Canada
B. Ouyang, University of Toronto, Toronto, Ontario, Canada
R. Labow, University of Ottawa Heart Institute, Ottawa, Ontario, Canada
C. Simmons, University of Toronto, Toronto, Ontario, Canada
J. Santerre, University of Toronto, Toronto, Ontario, Canada

535 **Cell-Specific ECM Down-Regulates the Inflammatory Response to Nervous System Implants**
M. B. Christensen, University of Utah, Salt Lake City, UT
J. L. Skousen, University of Utah, Salt Lake City, Utah

N. Khan, University of Utah, Salt Lake City, Utah
P. A. Tresco, University of Utah, Salt Lake City, Utah

536 **Microstructured Immunoregulatory Scaffolds for Controlling Host-Biomaterial Interactions**
N. Washburn, Carnegie Mellon University, Pittsburgh, PA
M. Ramadan, Carnegie Mellon University, Pittsburgh, Pennsylvania
T. Hinton, Carnegie Mellon University, Pittsburgh, Pennsylvania
A. Feinberg, Carnegie Mellon University, Pittsburgh, Pennsylvania

537 **Polyanhydride nanoparticle vaccine platform delays tumor growth in an antigen specific model**
R. Darling, Iowa State University, Ames, IA

538 **Ultra Strong, Thermoresponsive Double-Network Hydrogels**
R. Fei, Texas A&M University, Bryan, TX
M. A. Grunlan, Texas A&M University, College Station, Texas

539 **Controlled Nitric Oxide Releasing Dendronized Poly(vinyl chloride) for Improving Biocompatibility of Implantable Devices**
S. P. Hopkins, Michigan Technological University, Houghton, MI

540 **Novel h9e Peptide Sequence for Medical Uses**
T. L. Carter, Kansas State University, Manhattan, KS

541 **Modulation of Host Response by Anti-inflammatory Drugs to Improve the Efficacy of Immuno-isolated Islets in Diabetes Therapy**
T. T. Dang, Massachusetts Institute of Technology, Cambridge, MA
A. V. Thai, Massachusetts Institute of Technology, Cambridge, Massachusetts
J. Cohen, Joslin Diabetes Center, Boston, Massachusetts
J. E. Slosberg, Massachusetts Institute of Technology, Cambridge, Massachusetts
K. Siniakowicz, Joslin Diabetes Center, Boston, Massachusetts
J. C. Doloff, Massachusetts Institute of Technology, Cambridge, Massachusetts
M. Ma, Massachusetts Institute of Technology, Cambridge, Massachusetts
J. Hollister-Lock, Joslin Diabetes Center, Cambridge, Massachusetts
K. Tang, Massachusetts Institute of Technology, Cambridge, Massachusetts
Z. Gu, Massachusetts Institute of Technology, Cambridge, Massachusetts
H. Cheng, Massachusetts Institute of Technology, Cambridge, Massachusetts
G. C. Weir, Joslin Diabetes Center, Boston, Massachusetts
R. Langer, Massachusetts Institute of Technology, Cambridge, Massachusetts
D. G. Anderson, Massachusetts Institute of Technology, Cambridge, Massachusetts

542 **Magnetic Resonance Imaging Tracking of Dendritic Cells Homing to the Draining Lymph Nodes in Mice**
Y. Xu, Sichuan University, Chengdu, China
D. Wang, Sichuan University, Chengdu, China
Y. Liu, Sichuan University, Chengdu, China
C. Xia, West China Hospital, Sichun University, Chengdu, China
Q. Gong, West China Hospital, Sichuan University, Chengdu, China
B. Song, West China Hospital, Sichuan University, Chengdu, China
C. Wu, Sichuan University, Chengdu, China
G. Lin, Sichuan University, Chengdu, China
D. Li, Sichuan University, Chengdu, China
H. Ai, Sichuan University, Chengdu, China

918 **Encapsulation of antigen in chitosan particles enhances activation and antigen specific response by antigen presenting cells**
B. Koppolu, University of Arkansas, Fayetteville, AR
D. A. Zaharoff, University of Arkansas, Fayetteville, Arkansas

919 **Transplantable Matrix Permits T Cell and Dendritic-Fusion Cell Interaction**
K. M. Charoen, Boston University, Boston, MA
T. Konry, Shriners Childrens Hospitals, Boston, Massachusetts
S. Cohen, Ben Gurion University, Negev, Israel
D. Avigan, Beth Israel/Deaconess Medical Center, Boston, Massachusetts
M. Yarmush, Shriners Hospitals for Children, Boston, Massachusetts
M. W. Grinstaff, Boston University, Boston, Massachusetts

Biomaterials for Modulating Immune and Inflammatory Processes2

543 **Thermally stable self-adjuvanting vaccines via self-assembling peptides**
T. Sun, University of Chicago, Chicago, IL

Biomaterials for Triggered Delivery to the Cytosol

546 **Polycationic Hydrogel Nanoparticles for siRNA Delivery**
D. C. Forbes, The University of Texas at Austin, Austin, TX
D. C. Forbes, The University of Texas at Austin, Austin, Texas
H. Frizzell, The University of Texas at Austin, Austin, Texas
B. Carrillo-Conde, The University of Texas at Austin, Austin, Texas
N. A. Peppas, The University of Texas at Austin, Austin, Texas

547 **Redox Responsive Polymeric Nanocapsules for Protein Delivery**
M. Zhao, University of California, Los Angeles, Los Angeles, CA
Y. Tang, University of California Los Angeles, Los Angeles, California

548 **Ultrasonically Activated Delivery to the Cytosol using Acoustic Droplet Vaporization**
W. G. Pitt, Brigham Young University, Provo, UT
J. R. Lattin, Brigham Young University, Provo, Utah
M. J. McRae, Brigham Young University, Provo, Utah
K. Moake, Brigham Young University, Provo, Utah

Biomaterials in Medical Device Recycling and Reprocessing

549 **Toward a heat-curling polymeric needle designed for safe disposal**
P. Yang, Syracuse University, Syracuse, NY
P. T. Mather, Syracuse University, Syracuse, New York

920 **Study on the Antimicrobial Properties of a High Copper Content Zr-based Bulk Metallic Glass**
W. He, The University of Tennessee, Knoxville, TN
L. Huang, The University of Tennessee, Knoxville, Tennessee
E. Fozo, The University of Tennessee, Knoxville, Tennessee

P. Liaw, The University of Tennessee, Knoxville, Tennessee

Biomaterials in the Fourth Dimension – Controlling Temporal Properties

550 **Fabrication of a Light-Emitting Shape Memory Polymeric Web**
A. H. Torbati, Syracuse University, Jamesville, NY

551 **Controlled Guidance of Spinal Motor Axons through Synthetic Click Hydrogels**
D. D. McKinnon, University of Colorado at Boulder, Boulder, CO

552 **Characterization of Dynamic Shape-Memory (Meth)Acrylate Networks for Tissue Engineering Applications**
E. Hewett, Georgia Institute of Technology, Atlanta, GA
K. Smith, MedShape Solutions, Inc., Atlanta, Georgia
K. Gall, Georgia Institute of Technology, Atlanta, Georgia
Z. Schwartz, Georgia Institute of Technology, Atlanta, Georgia
B. D. Boyan, Georgia Institute of Technology, Atlanta, Georgia

553 **Smart Supramolecular Hydrogels encapsulated Bioengineered Stem Cells for Cancer Therapy**
J. Yeom, POSTECH, Pohang, Republic of Korea
S. Kim, POSTECH, Pohang, Republic of Korea
H. Jung, POSTECH, Pohang, Republic of Korea
H. Namgung, POSTECH, Pohang, Republic of Korea
J. Yang, POSTECH, Pohang, Republic of Korea
K. Kim, POSTECH, Pohang, Republic of Korea
Y. Sung, POSTECH, Pohang, Republic of Korea
S. Hahn, POSTECH, Pohang, Republic of Korea

554 **Signal-processing Biomaterials**
K. Jakobus, University of Freiburg, Freiburg, Germany
W. Weber, University of Freiburg, Freiburg, Germany

555 **Gellan gum-based Spongy-like Hydrogels depict improved Cellular Performance**
L. P. da Silva, University of Minho (Portugal), Guimarães, Portugal
M. T. Cerqueira, University of Minho, Guimarães, Portugal
R. A. Sousa, University of Minho, Guimarães, Portugal
A. P. Marques, University of Minho, Guimarães, Portugal
V. M. Correlo, University of Minho, Guimarães, Portugal
R. L. Reis, University of Minho, Guimarães, Portugal

556 **Smart Nanofiber Webs for “On-off” Release of Cells and Drugs**
M. Ebara, National Institute for Materials Science, Tsukuba, Japan
T. Aoyagi, National Institute for Materials Science, Tsukuba, Japan

557 **A Novel Platform for On Demand Delivery of Multiple Proteins**
N. Mokarram, Georgia Institute of Technology and Emory University, Atlanta, GA
A. Merchant, Georgia Institute of Technology and Emory University, Atlanta, Georgia
R. Bellamkonda, Georgia Institute of Technology and Emory University, Atlanta, Georgia

558 **Dynamic Photo-Tunable Gels to Modulate Matrix Stiffness**
R. S. Stowers, The University of Texas at Austin, Austin, TX

C. L. Davis, The University of Texas at Austin, Austin, Texas
B. Han, The University of Texas at Austin, Austin, Texas
L. J. Suggs, The University of Texas at Austin, Austin, Texas

921 **Shape-memory Surfaces facilitate Time-dependent Observation of Cell Functions**
K. Uto, National Institute for Materials Science (NIMS), Tsukuba, Japan
M. Ebara, National Institute for Materials Science (NIMS), Tsukuba, Japan
T. Aoyagi, National Institute for Materials Science (NIMS), Tsukuba, Japan

Biomaterials to Decode Cell-Cell Signaling

559 **Hydrogel-based Platforms for Co-Culture and On-Demand Cell Retrieval of Human Mesenchymal Stem Cells**
T. E. Rinker, Georgia Institute of Technology and Emory University, Atlanta, GA
T. M. Hammoudi, Georgia Institute of Technology and Emory University, Atlanta, Georgia
H. Lu, Georgia Institute of Technology, Atlanta, Georgia
J. S. Temenoff, Georgia Institute of Technology and Emory University, Atlanta, Georgia

Biomimetic Surfaces: From Multi-scale Fabrication Methods to Diagnostic, Therapeutic and Clinical Applications

560 **Vascularized Biomaterials for Rapid Soft-Stiff Transitions in Medical Devices**
A. Balasubramanian, Carnegie Mellon University, Pittsburgh, PA
C. Bettinger, Carnegie Mellon University, Pittsburgh, Pennsylvania

561 **Reinforcement of Calcium Phosphate Cement Using Silk Fibroin (SF) and Self-assembled SF-Hydroxyapatite Complex**
B. Li, Soochow University, Suzhou, Jiangsu Province, China

562 **Clickable PEG nanogel coatings compared to PEG/BSA nanogels: synergy between PEG and BSA contributes to ultralow protein adsorption as assessed by single molecule fluorescence**
D. L. Elbert, Washington University in St. Louis, St. Louis, MO
C. D. Donahoe, Washington University in St. Louis, St. Louis, Missouri

563 **Mucin Layers as Biomimetic Coating for Polymeric Biomaterials**
S. Lee, Technical University of Denmark, Kgs. Lyngby, Denmark

Cardiovascular Biomaterials

564 **Design, Preparation and in vitro Assay of a Novel Endothelial Progenitor Cell Capturing Vascular Prosthesis**
B. Li, Laval University, Quebec City, QC, Canada
Z. Zhang, Laval University, Quebec, Québec, Canada
X. Xie, Sichuan University, Chengdu, China
Y. Zhong, Sichuan University, Chengdu, China
R. Guidoin, Laval University, Quebec, Québec, Canada
Y. Douville, Laval University, Québec, Québec, Canada

565 **pH neutralization and inflammation prevention by RA and PLLA-grafted magnesium**

hydroxide nanoparticles
D. Han, Korea Institute of Science and technology, Seoul, Republic of Korea

566 **Improvement of Interfacial Adhesion by ATRP and Stereocomplex for Drug-Eluting Stents**
D. Han, Korea Institute of Science and Technology, Seoul, Republic of Korea

567 **Optimization and characterization of a new injectable radiopaque chitosan-based embolizing hydrogel for endovascular therapies**
F. Zehtabi, École de technologie supérieure, Montreal, QC, Canada

568 **Characterization and Optimization of Nanoliposomes to Deliver 17β-Estradiol**
K. Bowey, McGill University, Montreal, QC, Canada
I. Cloutier, Montreal Heart Institute, Montreal, Québec, Canada
J. Tanguay, Montreal Heart Institute, Montreal, Québec, Canada
M. Tabrizian, McGill University, Montreal, Québec, Canada

569 **Superior in vivo biocompatibility of a hydrophilic polymer coated prosthetic vascular graft**
M. L. W. Knetsch, Maastricht University, Maastricht, Netherlands

570 **Hyaluronic Acid Enhancement of Polyethylene for Cardiovascular Applications**
N. Lewis, Colorado State University, Fort Collins, CO

571 **Functionalization of Nonwoven Poly(Ethylene Terephthalate) Structures Designed as Compliant Small-Diameter Vascular Grafts**
S. Noel, Ecole Polytechnique de Montreal, Montréal, QC, Canada
B. Liberelle, Ecole Polytechnique de Montréal, Montréal, Québec, Canada
A. Yogi, National Research Council Canada, Ottawa, Ontario, Canada
M. J. Moreno, National Research Council Canada, Ottawa, Ontario, Canada
M. N. Bureau, National Research Council Canada, Boucherville, Québec, Canada
L. Robitaille, National Research Council Canada, Boucherville, Québec, Canada
G. De Crescenzo, Ecole Polytechnique de Montréal, Montréal, Québec, Canada

572 **Functional macromolecules for simple surface modification of a biodegradable magnesium alloy to reduce thrombogenicity and improve corrosion resistance**
S. Ye, University of Pittsburgh, Pittsburgh, PA
V. Shankarraman, University of Pittsburgh, Pittsburgh, Pennsylvania
Y. Jang, North Carolina A&T State University, Greensboro, North Carolina
H. Sakaguchi, Toray Co LtD, Pittsburgh, Pennsylvania
Y. Yun, North Carolina A&T State University, Greensboro, North Carolina
W. R. Wagner, University of Pittsburgh, Pittsburgh, Pennsylvania

573 **Impact of Age on Bovine Pericardial Composition and Mechanics**
T. J. Tod, Edwards Lifesciences, Irvine, CA
J. R. Yamada, Edwards Lifesciences, Irvine, California
J. A. Benton, Edwards Lifesciences, Irvine, California

574 **Fabrication and Mechanical Evaluation of Bicomponent PET/Silk Small Diameter Arterial Prostheses**
X. Yang, Key Lab of Textile Science and Technology, College of Textiles, Donghua University, Shanghai, 201620, ChinaCollege of Textiles, North Carolina State University, Raleigh 27695, USA, Raleigh, NC
L. Wang, Key Lab of Textile Science and Technology, College of Textiles, Donghua University, Shanghai, 201620, China, Shanghai, China

M. W. King, Key Lab of Textile Science and Technology, College of Textiles, Donghua University, Shanghai, 201620, China, Raleigh, North Carolina
G. Guan, Key Lab of Textile Science and Technology, College of Textiles, Donghua University, Shanghai, 201620, China, Shanghai, China
Y. Guan, Key Lab of Textile Science and Technology, College of Textiles, Donghua University, Shanghai, 201620, China, Shanghai, China

575 **Synthesis of Polycarbonate Urethanes with Functional Poly(ethylene glycol) Side Chains Intended for Bioconjugation**
X. Xie, Sichuan University, Chengdu, China
Q. Fu, Sichuan University, Chengdu, China
Y. Zhong, Sichuan University, Chengdu, China
Z. Zhang, Université Laval, Quebec City, Québec, Canada
Y. Xu, Sichuan University, Chengdu, China

922 **Development of a Shape Memory Patch for Minimally Invasive Repair of Vascular Rupture**
T. Boire, Vanderbilt University, Nashville, TN

923 **Cardiac Lead Retrieval Analysis: Insulation Degradation Hinders Long Term Performance**
M. Tohfafarosh, Drexel University, Philadelphia, PA
A. Sevit, Drexel University, Philadelphia, Pennsylvania
J. Patel, Exponent Inc., Phialdelphia, Pennsylvania
A. Greenspon, Thomas Jefferson University Hospital, Philadelphia, Pennsylvania
J. M. Prutkin, University of Washington, Seattle, Washington
S. Kurtz, Drexel University, Philadelphia, Pennsylvania

Ceramics and Composites in Bone Tissue Engineering and Drug Delivery

577 **Bilayered Calcium Sulfate Space-Making Composites with Multiple Drug Delivery Capabilities**
B. R. Orellana, University of Kentucky, Lexington, KY
M. V. Thomas, University of Kentucky, Lexington, Kentucky
J. Z. Hilt, University of Kentucky, Lexington, Kentucky
D. Puleo, University of Kentucky, Lexington, Kentucky

578 **Fabrication of Customized Porous Hydroxyapatite (HA) implants for Osteotomy**
H. Jung, Department of Materials Science and Engineering, Seoul National University, Seoul, Republic of Korea
T. Jang, Department of Materials Science and Engineering, Seoul National University, Department of Materials Science and Engineering, Seoul National University, Republic of Korea
M. Kang, Department of Materials Science and Engineering, Seoul National University, Department of Materials Science and Engineering, Seoul National University, Republic of Korea
S. Kim, Seoul National Univ., seoul, Republic of Korea
H. Kim, Department of Materials Science and Engineering, Seoul National University, Department of Materials Science and Engineering, Seoul National University, Republic of Korea
Y. Koh, Department of Materials Science and Engineering, Seoul National University, bDepartment of Dental Laboratory Science and Engineering, Korea University, Republic of Korea
Y. Estrin, Department of Materials Engineering, Monash University, Clayton, Australia, cDepartment of Materials Engineering, Monash University, Clayton, Australia, Republic of Korea

579 **Cell Growth on a Gradient Calcium Polyphosphate Scaffold in a Perfusion Bioreactor**
L. Chen, Wayne State University, Detroit, MI

N/A **Injectable pectin- hydroxyapatite biocomposites for minimally-invasive bone surgery**
M. Tanzi, Politecnico di Milano, Milano, Italy

581 **Synthesis and Characterization of Amorphous Magnesium Phosphate: A Novel Bone Cement Precursor**
N. Ostrowski, University of Pittsburgh, Pittsburgh, PA
B. Lee, University of Pittsburgh, Pittsburgh, Pennsylvania
N. Enick, University of Pittsburgh, Pittsburgh, Pennsylvania
A. Roy, University of Pittsburgh, Pittsburgh, Pennsylvania
P. N. Kumta, University of Pittsburgh, Pittsburgh, Pennsylvania

582 **Comparative Properties of Gelatin/Synthetic Bone Mineral Composite and Bovine Bone**
R. Z. LeGeros, New York University, New York, NY
S. Saraswat, New York University, New York, New York
P. Khanna, New York University, New York, New York
D. Mijares, New York University, New York, New York
J. Dai, New York University, New York, New York

583 **Effect of silica doping on microstructral and biological properties of brushite cements**
S. Bose, Washington State University, Pullman, WA
S. Vahabzadeh, Washington State University, Pullman, Washington
M. Roy, Washington state university, Pull, Washington
A. Bandyopadhyay, Washington state university, Pullman, Washington

584 **A Biomimetic Collagen-apatite Scaffold with Unique Multi-level Lamellar Structure for Bone Tissue Engineering**
Z. Xia, University of Connecticut, Coventry, CT
M. Wei, University of Connecticut, Storrs, Connecticut

Dental / Craniofacial Materials

585 **Antimicrobial and Mechanical Properties of Bioactive Glass Reinforced Dental Composites**
D. Khvostenko, Oregon State University, Corvallis, OR
J. Kruzic, Oregon State University, Corvallis, Oregon
J. Ferracane, Oregon Health and Science University, Portland, Oregon
J. Mitchell, Oregon Health and Science University, Portland, Oregon

586 **Development of mandibular reconstruction device made of titanium fiber scaffold**
M. Hirota, Yokohama City University Graduate School of Medicine, Yokohama, Japan

587 **Effect of Seeding Density on Human Dental Pulp Cell Response in Polyethylene Glycol-Fibrinogen Hydrogel**
S. Prateepchinda, Columbia University, New York, NY
H. H. Lu, Columbia University, New York, New York
G. B. Hasselgren, Columbia University, New York, New York
D. Seliktar, Technion – Israel Institute of Technology, Haifa, Israel

588 **Antibiotic-loaded Porous Poly(methyl methacrylate) for Space Maintenance and Local Drug Delivery**
S. R. Shah, Rice University, Houston, TX
S. Shah, Rice University, Houston, Texas

N. Raindel, Rice University, Houston, Texas
A. Henslee, Rice University, Houston, Texas
P. Spicer, Rice University, Houston, Texas
F. Kasper, Rice University, Houston, Texas
A. G. Mikos, Rice University, Houston, Texas

924 **Three-Dimensionally Printed b-Tri-Calcium Phosphate/Hydroxyapatite-Bone Morphogenic Protein Scaffolds for Long Bone Regeneration**
N. M. Tovar, New York University College of Dentistry, New York, NY
M. Sobieraj, Hospital for Joint Diseases, New York University Langone Medical Center, New York, New York
L. Witek, Oklahoma State University, Stillwater, Oklahoma
J. Smay, Oklahoma State University, Stillwater, Oklahoma
P. G. Coelho, New York University College of Dentistry, New York, New York

Developing the Next Generation of Cardiovascular Devices - From Concept to Implantation (An Industry Perspective)

589 **Factors Affecting Distal Tip Stiffness of Pacemaker and Defibrillator Leads**
D. Walsh, U.S. Food and Drug Administration, Silver Spring, MD
B. Stephen, U.S. Food and Drug Administration, Silver Spring, Maryland
L. Topoleski, University of Maryland Baltimore County, Baltimore, Maryland
O. Vesnovsky, U.S. Food and Drug Administration, Silver Spring, Maryland
N. Duraiswamy, U.S. Food and Drug Administration, Silver Spring, MD, Maryland

590 **Delivery of Vitamin-C (L-Ascorbic Acid) from Coronary Stent Material Surfaces**
E. Thiruppathi, The University of South Dakota, Sioux Falls, SD
S. Kakade, The university of South Dakota, Sioux Falls, South Dakota
G. Mani, The university of South Dakota, Sioux Falls, South Dakota

591 **A Nanofibrous Bioactive Vascular Graft for Small Vessel Reconstruction**
M. D. Phaneuf, BioSurfaces, Inc., Ashland, MA
S. G. Pathan, BioSurfaces, Inc., Ashland, Massachusetts
S. M. Ali, BioSurfaces, Inc., Ashland, Massachusetts
M. J. Bide, University of Rhode Island, Kingston, Rhode Island
D. W. Nelson, BioSurfaces, Inc., Ashland, Massachusetts
J. R. Araya, Northeastern University, Boston, Massachusetts
T. E. Phaneuf, BioSurfaces, Inc., Ashland, Massachusetts
T. M. Phaneuf, BioSurfaces, Inc., Ashland, Massachusetts
F. W. LoGerfo, Beth Israel Deaconess Medical Center, Boston, Massachusetts
M. A. Contreras, Beth Israel Deacones Medical, Boston, Massachusetts

592 **A Novel Nitric Oxide-eluting Nanocomposite Polymer for Cardiovascular Applications**
N. Naghavi, University College London (UCL), London, United Kingdom (Great Britain)

925 **Evaluation of Various Materials for Tip Penetration of Pacemaker and Defibrillator Leads**
D. Walsh, U.S. Food and Drug Administration, Silver Spring, MD
B. Stephen, U.S. Food and Drug Administration, Silver Spring, Maryland
N. Duraiswamy, U.S. Food and Drug Administration, Silver Spring, Maryland
O. Vesnovsky, U.S. Food and Drug Administration, Silver Spring, Maryland
L. Topoleski, University of Maryland, Baltimore County, Baltimore, Maryland

Development, Analysis, and Design of Heart Valve Biomaterials - The State of The Art

593 **Cell Injection Initiates the Recellularization Process in Decellularized Porcine Aortic Valve Scaffolds**
D. B. Spoon, Mayo Clinic, Rochester, MN
B. J. Tefft, Mayo Clinic, Rochester, Minnesota
K. Coffman, Mayo Clinic, Rochester, Minnesota
S. Pan, Mayo Clinic, Rochester, Minnesota
D. Taylor, Texas Heart Institute, Houston, Texas
A. Lerman, Mayo Clinic, Rochester, Minnesota
R. D. Simari, Mayo Clinic, Rochester, Minnesota

594 **Textile Heart Valve Prosthesis: Early In Vitro Fatigue Performances**
F. HEIM, Laboratoire de Physique et Mecanique Textiles, MULHOUSE, France

595 **Valve Epithelial-to-Mesenchymal Transition is Enhanced on Composite Collagen-Hyaluronic Acid Hydrogels**
M. Sewell-Loftin, Vanderbilt University, Nashville, TN
D. DeLaughter, Vanderbilt University, nashville, Tennessee
J. Barnett, Vanderbilt, Nashville, Tennessee
W. Merryman, Vanderbilt, nashville, Tennessee

596 **A NOVEL MODEL FOR HEART VALVE BIOMATERIAL FATIGUE RESPONSE**
M. S. Sacks, University of Texas at Austin, Austin, TX
W. Zhang, University of Texas at Austin, Austin, Texas

597 **Fabrication of Advanced Poly(ethylene glycol) Diacrylate Hydrogels for Heart Valve Tissue Engineering**
X. Zhang, Rice University, Houston, TX
B. Xu, Rice University, Houston, Texas
H. Tseng, Rice University, Houston, Texas
M. L. Cuchiara, Duke University, Durham, North Carolina
J. L. West, Duke University, Durham, North Carolina
J. K. Grande-Allen, Rice University, Houston, Texas

Drug Delivery

598 **Nanoparticle-based Platform Enables Increased Intracellular Antibiotic Delivery and Killing of Brucella**
B. H. Bellaire, Iowa State University, Ames, IA
Y. Phanse, Iowa State University, Ames, Iowa
P. Lueth, Iowa State University, Ames, Iowa
B. Narasimhan, Iowa State University, Ames, Iowa

599 **Liposomal Delivery of FTY720 Modulates Inflammatory Response in Macrophages**
C. E. Segar, Georgia Institute of Technology and Emory University, Atlanta, GA
E. Botchwey, Georgia Institute of Technology and Emory University, Atlanta, Georgia

600 **Antimicrobial Effectiveness of a Triclosan Coated Warp-Knit Mesh**
G. Hilas, Poly-Med, Inc., Anderson, SC
K. Nichter, Poly-Med, Inc., Anderson, South Carolina

S. Peniston, Poly-Med, Inc., Anderson, South Carolina
S. Nagatomi, Poly-Med, Inc., Anderson, South Carolina

601 **In vitro Studies of Silica Xerogels for Controlled, Sustained Gene Delivery**
H. Qu, University of Pennsylvania, Philadelphia, PA

602 **Effects of Ionic Dissolution Products of Bioceramics on the Structure and Bioactivity of Doxorubicin**
H. Pacheco, University of North Carolina at Charlotte, Charlotte, NC
I. Nesmelova, University of North Carolina at Charlotte, Charlotte, North Carolina
D. Dréau, UNC Charlotte, Charlotte, North Carolina
A. El-Ghannam, UNC Charlotte, Charlotte, North Carolina

603 **Administration Methods for Injectable Systems Involving Precipitation Mechanics**
J. Olbrich, Poly-Med, Inc., Anderson, SC
K. Gray, Poly-Med, Inc., Anderson, South Carolina
D. Ingram, Poly-Med, Inc., Anderson, South Carolina
S. Taylor, Poly-Med, Inc., Anderson, South Carolina
J. Corbett, Poly-Med, Inc., Anderson, South Carolina

604 **Increased Efficacy of Doxorubicin Delivery with Phytosterol Nanoassemblies**
K. R. Fath, Queens College - City University of New York, Flushing, NY
S. H. Frayne, Fordham University, Bronx, New York
N. Nakatsuka, Fordham University, Bronx, New York
I. Kandinov, Queens College -- City University of New York, Flushing, New York
B. J. Cohen, Queens College -- City University of New York, Flushing, New York
I. A. Banerjee, Fordham University, Bronx, New York

605 **MaSp2 based recombinant spider silk particles: processing of a new drug delivery vesicles**
K. Kazmierska, Adam Micwiekicz University, Poznan, Poland
E. Felcyn, Greater Poland Cancer Centre, Poznan, Poland
A. Florczak, Adam Mickiewicz University, Poznan, Poland
M. Nowacka, Poznan University of Technology, Poznan, Poland
A. Mackiewicz, Poznan University of Medical Sciences, Poznan, Poland
H. Dams-Kozlowska, Greater Poland Cancer Centre, Poznan, Poland

606 **Smart Transdermal Vaccine Delivery Systems Using Hyaluronic Acid Derivatives**
K. Kim, Massachusetts General Hospital, Cambridge, MA
H. Kim, Pohang University of Science and Technology, Pohang, Republic of Korea
S. Yun, Massachusetts General Hospital, Cambridge, Massachusetts
S. Hahn, Pohang University of Science and Technology, Pohang, Republic of Korea

607 **Heteromultivalent Ligand Modification to Enhance Specific Bioactivity of Vascular Nanomedicine Platforms**
L. L. Tian, Case Western Reserve University, Cleveland, OH
C. Modery, Case Western University Reserve, Cleveland, Ohio
G. Kaur, Case Western Reserve University, Cleveland, Ohio
V. Pan, Case Western Reserve University, Cleveland, Ohio
T. Wong, Case Western Reserve University, Cleveland, Ohio
M. Ravikumar, Case Western Reserve University, Cleveland, Ohio
A. Sen Gupta, Case Western Reserve University, Cleveland, Ohio

608 **Surface Hybridization of Macrophages with Dendrimer via Copper-Free Click Chemistry**

L. Xu, Virginia Commonwealth University, RICHMOND, VA

609 **Correlating Akt Signaling Molecule Activation to Cytocompatibility of Photoinitiators**
L. Xu, Virginia Commonwealth University, RICHMOND, VA

610 **Doped Hallyosite Nanotubes as a Drug Delivery Tool for Anti-Cancer Treatment**
L. Sun, Louisiana Tech University, Ruston, LA
D. Mills, Louisiana Tech University, Ruston, Louisiana

611 **Drug delivery system by micro-encapsulation of a radio-protective inclusion complex**
L. A. Heinrich, Sr., marcotech oHG, Muenster, Germany
B. Pajaziti, Jr., Westphalian Wilhelms University Muenster, Muenster, Germany
R. Roziev, Sr., medbiopharm Ltd., Obninsk, Kaluga Region, Russian Federation

612 **Effectiveness of Anti-biofilm Agents against Staphylococcus aureus biofilms**
M. Brown, University of Kentucky, Lexington, KY
G. Huerta, University of Kentucky, Lexington, Kentucky
T. Fields, University of Kentucky, Lexington, Kentucky
R. Peyyala, University of Kentucky, Lexington, Kentucky
T. Milbrandt, University of Kentucky, Lexington, Kentucky
T. Dziubla, University of Kentucky, Lexington, Kentucky
D. Puleo, University of Kentucky, Lexington, Kentucky

613 **Drug-Eluting Microarrays**
M. R. Carstens, University of Florida, Gainesville, FL
B. G. Keselowsky, University of Florida, Gainesville, Florida

614 **Controlled Release of Antimicrobial Surrogate Can Be Imaged Over 7 Days In Vivo.**
M. Giers, Arizona State University, Tempe, AZ

615 **Soybean based Absorbable Polymers for Cancer Prevention**
N. Srivastava, Bezwada Biomedical, LLC, Hillsborough, NJ

616 **In Situ Forming Drug Delivery Scaffold for Treating Avascular Necrosis of the Femoral Head**
P. Fisher, University of Kentucky, Lexington, KY
D. A. Puleo, University of Kentucky, Lexington, Kentucky
J. Z. Hilt, University of Kentucky, Lexington, Kentucky
T. A. Milbrandt, University of Kentucky, Lexington, Kentucky

617 **Structural Analysis of Unimer Nanoparticles Composed of Hydrophobized Poly(amino acid)s and Their Potential Application as Drug Carriers**
P. Piyapakorn, Graduate School of Engineering, Osaka University, Japan, Osaka, Japan
T. Akagi, Graduate School of Engineering, Osaka University, Osaka, Japan
M. Akashi, Graduate School of Engineering, Osaka University, Osaka, Japan

618 **Combinatorial Cationic Lipid-like Nanoparticles for Efficient Intracellular Cytotoxic Protein Delivery**
Q. Xu, Tufts University, Medford, MA

619 **Resorbable Temperature-Responsive Hydrogels Are Biocompatible Controlled Release Vehicles**
R. McLemore, Banner Good Samaritan Medical Center, Phoenix, AZ

620 **Acid-responsive micelle-forming polymers as new anticancer theraperutics**
S. Park, Department of BIN Fusion Technology, Jeonju, Republic of Korea

621 **Photo-cross-linkable chitosan-lactide hydrogels for growth factor delivery: Development and in vitro characterization**
S. Kim, Stanford University, Palo Alto, CA
Y. Kang, Stanford University, Stanford, California
A. Mercado-Pagan, Stanford University, Stanford, California
Y. Yang, Stanford University, Stanford, California

622 **Analysis of Molecular Weight Growth and Degradation of a Simvastatin Polymeric Prodrug**
T. Asafo-Adjei, University of Kentucky, Lexington, KY
D. A. Puleo, University of Kentucky, lexington, Kentucky
T. D. Dziubla, University of Kentucky, Lexington, Kentucky

623 **Modulation of microRNAs for Treatment of Glioblastoma Multiforme**
Y. Yin, Worcester Polytechnic Institute, Worcester, MA
D. Rassias, Worcester Polytechnic Institute, Worcester, Massachusetts
A. Jain, Worcester Polytechnic Institute, Worcester, Massachusetts

624 **Co-delivery of chemo drug and siRNA using layer-by-layer nanoparticles for triple negative breast cancer treatment**
Z. Deng, MIT, cambridge, MA
S. Morton, MIT, cambridge, Massachusetts
P. Hammond, MIT, cambridge, Massachusetts

800 **Hyperbranched Polyester Hydrogels with Controlled Drug Release and Cell Adhesion Properties**
A. K. Gaharwar, Massachusetts Institute of Technology, Cambridge, MA
H. Zhang, Brigham and Women's Hospital, Harvard Medical School,, Cambridge, Massachusetts
A. Patel, Brigham and Women's Hospital, Harvard Medical School,, Cambridge, Massachusetts
S. Mihaila, Brigham and Women's Hospital, Harvard Medical School, Cambridge, Massachusetts
G. Iviglia, Brigham and Women's Hospital, Harvard Medical School, Cambridge, Massachusetts
S. Mukundan, Brigham and Women's Hospital, Harvard Medical School, Cambridge, Massachusetts
H. Bae, Brigham and Women's Hospital, Harvard Medical School, Cambridge, Massachusetts
H. Yang, University of Science and Technology, Anhui, China, China
A. Khademhosseini, Brigham and Women's Hospital, Harvard Medical School, Cambridge, Massachusetts

801 **An injectable nanodelivery system for prolonged release of the local anesthetic lidocaine**
I. K. Yazdi, The Methodist Hospital Research Institute, Houston, TX
S. Khaled, The Methodist Hospital Research Institute, Houston, Texas
J. Van Eps, The Methodist Hospital, Houston, Texas
J. Fernandez-Moure, The Methodist Hospital, Houston, Texas
N. Taghipour, The Methodist Hospital Research Institute, Houston, Texas
J. Martinez, The Methodist Hospital Research Institute, Houston, Texas
S. Haddix, The Methodist Hospital Research Institute, Houston, Texas
E. Tasciotti, The Methodist Hospital Research Institute, Houston, Texas

802 **Controlled sequential release of multi-agents from layer-by-layer films for surface delivery applications**
J. Min, Massachusetts Institute of Technology, Cambridge, MA

926 **A Novel HA-based Micelle Material as a Potent Delivery System**
T. Teng, Industrial Technology Research Institute, Hsinchu, Taiwan

927 **Polymer Nanoparticles for Delivery of Multiple Therapeutic Agents and their Effects on Glioma Growth**
A. S. Ediriwickrema, Yale University, New Haven, CT
J. Zhou, Yale University, New Haven, Connecticut
M. Saltzman, Yale University, New Haven, Connecticut

928 **Highly efficient siRNA delivery method by self-assembled RNA microsponges**
D. Han, University of Seoul, Seoul, Republic of Korea
J. Lee, University of Seoul, Seoul, Republic of Korea

929 **Characterization of UV-Responsive Expansile Nanoparticles**
A. Colby, Boston University, Boston, MA

930 **Cisplatin-Loaded Biodegradable Nanofiber Meshes for Treating Malignant Pleural Mesothelioma**
J. A. Kaplan, Boston University, Newton, MA
R. Yonekura, Boston University, Boston, Massachusetts
Y. L. Colson, Brigham and Women's Hospital, Boston, Massachusetts
M. W. Grinstaff, Boston University, Boston, Massachusetts

931 **Sustained Release of Functional Antibiotics From a Keratin Hydrogel**
S. Tomblyn, KeraNetics, LLC, Winston-Salem, NC
H. Meng, Miami University, Oxford, Ohio
M. Ellenburg, KeraNetics, LLC, Winston-Salem, North Carolina
L. Burnett, KeraNetics, LLC, Winston-Salem, North Carolina
J. Saul, Miami University, Oxford, Ohio

932 **An Implantable Intraperitoneal Drug Delivery Device for the Treatment of Advanced Ovarian Cancer**
H. Ye, Massachusetts Institute of Technology, Cambridge, MA
L. Tanenbaum, Massachusetts Institute of Technology, Cambridge, Massachusetts
M. Del Carmen, Massachusetts General Hospital, Boston, Massachusetts
M. Birrer, Massachusetts General Hospital, Harvard Medical School, Boston, Massachusetts
M. J. Cima, Massachusetts Institute of Technology, Cambridge, Massachusetts

Drug Delivery for Inflammatory Diseases

625 **Delivery of acetylsalicylic acid to dendritic cells using degradable micropaticles**
E. Bracho-Sanchez, University of Florida, Gainesville, FL
J. L. Lewis, Univeristy of Florida, Gainesville, Florida
B. G. Keselowsky, University of Florida, Gainesville, Florida

627 **Anti-inflammatory biocompatible dexamethasone-loaded porous microparticles for acute lung injury**
D. Jeong, Departiment of BIN Fusion Chonbuk national University ,, Jeongu, Republic of Korea

628 **Hyaluronic Acid-Gold Nanoparticle-Tocilizumab Complex for the Treatment of Rheumatoid Arthritis**

H. Lee, POSTECH, San 31, Hyoja-dong, Nam-gu, Pohang, Kyungbuk, Republic of Korea
M. Lee, POSTECH, San 31, Hyoja-dong, Nam-gu, Pohang, Kyungbuk, Republic of Korea
K. Kim, POSTECH, San 31, Hyoja-dong, Nam-gu, Pohang, Kyungbuk, Republic of Korea
S. Hahn, POSTECH, San 31, Hyoja-dong, Nam-gu, Pohang, Kyungbuk, Republic of Korea

629 **Efficacy of Three Antibiotic Loaded Polymer Coatings for Bone Screws**
Z. Hartsell, University of Memphis, Memphis, TN
A. Hoban, University of Memphis, Memphis, Tennessee
J. Bumgardner, University of Memphis, Memphis, Tennessee
H. Courtney, Veterans Affairs Medical Center and University of Tennessee Health Science Center, Memphis, Tennessee
M. Gosney, Smith & Nephew, Memphis, Tennessee
W. Haggard, University of Memphis, Memphis, Tennessee

933 **Antimicrobial and Bioactive Composite Scaffolds for Bone Tissue Engineering**
N. HASIRCI, Middle East Technical University, ANKARA, Turkey
A. E. Aksoy, Middle East Technical University, Ankara, Turkey
V. HASIRCI, Middle East Technical University, Ankara, Turkey

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626 **Targeting and Treating Bone Metastases Using Layer-by-Layer Functionalized Nanoparticles**
S. Morton, Massachusetts Institute of Technology, Cambridge, MA

Engineering Cells and Their Microenvironments

630 **Directing Stem Cell Fate in 3D through Cell Inert and Adhesive Diblock Copolymer Domains**
A. J. Engler, UC San Diego, La Jolla, CA
P. Viswanathan, The University of Sheffield, Sheffield, United Kingdom (Great Britain)
S. Chirasatitsin, UC San Diego, La Jolla, California
K. Ngamkham, The University of Sheffield, Sheffield, United Kingdom (Great Britain)
G. Battaglia, The University of Sheffield, Sheffield, United Kingdom (Great Britain)

631 **A Multicellular 3D Heterospheroid Liver Tumor Model for Anti-Cancer Drug Testing**
D. S. Yip, New Jersey Institute of Technology (NJIT), Newark, NJ

632 **Effect of Cell Ratio on Osteoclast and Osteoblast Differentiation in a Ceramic Bone Substitute System**
D. T. Nguyen, Clemson University, Central, SC
K. J. L. Burg, Clemson University, Clemson, South Carolina

633 **Ischemic Preconditioning to Enhance Osteogenic-Angiogenic Coupling**
J. Blanchette, University of South Carolina, Columbia, SC
S. Sahai, University of South Carolina, Columbia, South Carolina
A. Williams, University of South Carolina, Columbia, South Carolina
M. Skiles, University of South Carolina, Columbia, South Carolina
B. Hanna, University of South Carolina, Columbia, South Carolina

634 **Bioactivity of a multivalent cell membrane binder in 3D spheroid culture: effects of RGD-**

dendrimer conjugate on cell proliferation, expression and aggregation
L. Jiang, College of Engineering, Peking University, China, Beijing, China
Y. Luo, College of Engineering, Peking University, China, Beijing, China

635 **Immobilization of ephrinB2 in an orientation-regulated manner on the surface of hydrogels with different elasticities**
M. Yamamoto, Kyoto University, Kyoto, Japan
H. Toda, Kyoto University, Kyoto, Japan
Y. Tabata, Kyoto University, Kyoto, Japan

636 **Protection and Functionalization of Cell Surfaces Using Nano-Barrier Films**
M. Matsusaki, Osaka University, Osaka, Japan
T. Yoshikai, Osaka University, Osaka, Japan
A. Matsuzawa, Mitsubishi Paper Mills Limited, Kyoto, Japan
M. Akashi, Osaka University, Osaka, Japan

637 **"Co-endocytic" delivery of proteins via artificial receptor/ligand interaction on cell surface**
T. Mori, Kyushu University, Fukuoka, Japan

638 **Time Course, Spatial Distribution, and Patterns of Spontaneous Spiking Activity of Chick Forebrain Neuronal Network Cultured on Microelectrode Array Platform**
Z. Gao, Clemson University, Clemson, SC

934 **Synthetic extracellular matrix for investigating 3D vascular network formation**
M. P. Schwartz, University of Wisconsin-Madison, Madison, WI
J. Zhang, Morgridge Institute for Research, Madison, Wisconsin
Z. Hou, Morgridge Institute for Research, Madison, Wisconsin
D. G. Belair, University of Wisconsin-Madison, Madison, Wisconsin
A. W. Xie, University of Wisconsin-Madison, Madison, Wisconsin
M. R. Zanotelli, University of Wisconsin-Madison, Madison, Wisconsin
E. H. Nguyen, University of Wisconsin-Madison, Madison, Wisconsin
J. A. Thomson, Morgridge Institute for Research, University of Wisconsin-Madison, University of California-Santa Barbara, Madison, Wisconsin
W. L. Murphy, University of Wisconsin-Madison, Madison, Wisconsin

935 **Transient Expression of Neurogenin-2 through Nanoparticles Enhances Neuronal Differentiation of Human Embryonic Stem Cell-Derived Neural Progenitors**
X. Li, Johns Hopkins University, Baltimore, MD

936 **Directing Neural Stem Cell Recruitment: Crosstalk Signaling Between ECM and SDF-1α**
S. Stabenfeldt, Arizona State University, Tempe, AZ
C. P. Addington, Arizona State University, Tempe, Arizona
C. Pauken, Arizona State University, Tempe, Arizona
M. R. Caplan, Arizona State University, Tempe, Arizona

Engineering Instructive Cues Biomaterials

639 **Expression of Sonic Hedgehog in Non-Diabetic Wounds Treated with Poly(Methacrylic Acid-co-Methyl Methacrylate)**
A. Lisovsky, University of Toronto, Toronto, ON, Canada
M. V. Sefton, University of Toronto, Toronto, Ontario, Canada

640 **Synergistic Effect of Silicon and Calcium Ions on Osteogenic Differentiation of Human Adipose Stem Cells**
A. I. Rodrigues, 3Bs Research Group, University of Minho, Portugal, Caldas das Taipas - Guimarães, Portugal
M. B. Oliveira, 3Bs Research Group, Caldas das Taipas - Guimarães, Portugal
J. F. Mano, 3Bs Research Group, Caldas das Taipas - Guimarães, Portugal
M. E. Gomes, 3Bs Research Group, Caldas das Taipas - Guimarães, Portugal
I. B. Leonor, 3Bs Research Group, Caldas das Taipas - Guimarães, Portugal
R. L. Reis, 3Bs Research Group, Caldas das Taipas - Guimarães, Portugal

641 **Vesicle Trafficking as a Mechanism to Sense and Respond to Nanofiber Architecture**
A. M. Higgins, The Pennsylvania State University, University Park, PA

642 **Developing Grafted Poly(γ-propargyl L-glutamate) as a Platform to Present Nano-Clustered Extracellular Cues**
C. M. Chopko, Massachusetts Institute of Technology, Cambridge, MA
J. Valdez, Massachusetts Institute of Technology, Cambridge, Massachusetts
P. Hammond, Massachusetts Institute of Technology, Cambridge, Massachusetts
L. Griffith, Massachusetts Institute of Technology, Cambridge, Massachusetts

643 **Heterogeneous polymer surfaces with organized collagen layers influence preosteoblasts behavior**
C. Dupont-Gillain, Université catholique de Louvain, Louvain-la-Neuve, Belgium
E. Zuyderhoff, Université catholique de Louvain, Louvain-la-Neuve, Belgium

644 **Cellular Orientation Control Using Microcontact Printing and Mechanical Conditioning for Tissue Engineered Blood Vessels for Atherosclerosis**
E. L. Lee, Boston University, Boston, MA
H. H. Bendre, Boston University, Boston, Massachusetts
J. Y. Wong, Boston University, Boston, Massachusetts

645 **Combinatorial Screening of Cell Response to Surface Chemistry Gradient on a Soft Biomaterial**
G. Mohan, University of South Florida, Tampa, FL
N. D. Gallant, University of South Florida, Tampa, Florida

646 **Development of hydrogels functionalized with cell adhesive peptide and growth factors for control of endothelial cell activities for therapeutic angiogenesis**
H. Shin, Hanyang University, Seoul, Republic of Korea

N/A **Microengineered Hydrogels for Directing Mesenchymal Stem Cell Fate**
K. A. Kilian, University of Illinois at Urbana-Champaign, Urbana, IL

648 **Isotropic and Directed hMSCs Migration Within a Three-dimensional, Peptide-Functionalized PEG Hydrogel**
K. A. Kyburz, BioFrontiers Institute, University of Colorado, Boulder, CO
J. A. Young, University of Colorado, Boulder, Colorado
K. S. Anseth, BioFrontiers Institute and the Howard Hughes Medical Institute, University of Colorado, Boulder, Colorado

649 **Films of varying methacrylic acid content modulate gene expression in dTHP1 and endothelial cells**
L. A. Wells, University of Toronto, Toronto, ON, Canada

M. S. Valic, University of Toronto, Toronto, Ontario, Canada
M. V. Sefton, University of Toronto, Toronto, Ontario, Canada

650 **Epithelial cyst phenotype is modulated by synthetic hydrogel elastic properties and adhesive ligand density**
N. O. Enemchukwu, Georgia Institute of Technology, Atlanta, GA
A. J. Garcia, Georgia Institute of Technology, Atlanta, Georgia

651 **Functionalized fibronectin and RGD Titanium alloy surfaces used for Intraosseous Transcutaneous Amputation Prostheses in vitro**
R. P. Dowling, University College London, Stanmore, United Kingdom (Great Britain)
C. J. Pendegrass, University College London, Stanmore, United Kingdom (Great Britain)
G. W. Blunn, University College London, Stanmore, United Kingdom (Great Britain)

652 **Development of In Situ Crosslinked Electrospun Gelatin Scaffolds**
R. M. Nezarati, Texas A&M University, College Station, TX
C. M. Radzicki, Texas A&M University, College Station, Texas
E. Cosgriff-Hernandez, Texas A&M University, College Station, Texas

653 **An Engineered Inert Matrix for In-Vitro Maintenance of Cancer Stem Cells**
S. K. Sarvestani, University of South Carolina, Columbia, SC
X. Yang, University of South Carolina, Columbia, South Carolina
E. Jabbari, University of South Carolina, Columbia, South Carolina

654 **Design and Characterization of Porous MMP-sensitive Synthetic Hydrogels by Gelatin Leaching for Neovascularization Applications**
S. Sokic, Illinois Institute of Technology, Chicago, IL
M. Christenson, Illinois Institute of Technology, Chicago, Illinois
J. Larson, Illinois Institute of Technology, Chicago, Illinois
G. Papavasiliou, Illinois Institute of Technology, Chicago, Illinois

655 **Decellularized Tissue Extracellular Matrices: a Potential Source of Biomaterials for Tissue Engineering**
Y. S. Takeda, Tufts University, Medford, MA
Q. Xu, Tufts University, Medford, Massachusetts

937 **Top-Down Synthesis of Versatile Polyaspartamide Linkers for Single-step Protein Conjugation to Materials**
C. Cha, Brigham and Women's Hospital, Harvard Medical School, Cambridge, MA
J. Jeong, University of Illinois, Urbana, Illinois
H. Kong, University of Illinois, Urbana, Illinois

How Do Polymeric Implants Fail?

656 **Clinical Implications of Crosslinked UHMWPE Implants with Stress Concentrations: A Retrievals Analysis**
F. Ansari, University of California, Berkeley, Berkeley, CA
E. Patten, University of California, Berkeley, Berkeley, California
J. Chang, University of California, Berkeley, Berkeley, California
S. Chou, University of California, Berkeley, Berkeley, California
A. Mehdizadeh, University of California, Berkeley, Berkeley, California
M. Kury, University of California, Berkeley, Berkeley, California

J. I. Huddleston III, Stanford University Medical Center, Redwood City, California
B. A. Jewett, Slocum Center for Orthopedics & Sports Medicine, Eugene, Oregon
D. Mickelson, University of Washington, Seattle, Washington
H. Kim, University of California, San Francisco, San Francisco, California
M. Ries, University of California, San Francisco, San Francisco, California
L. Pruitt, University of California, Berkeley, Berkeley, California

657 **Bearing Surface Damage Analysis of Coupled Total Shoulder Replacement Retrievals**
L. Malito, University of California, Berkeley, Berkeley, CA
F. Ansari, University of California, Berkeley, Berkeley, California
A. Mehdizadeh, University of California, Berkeley, Berkeley, California
J. Koller, University of California, Berkeley, Berkeley, California
S. G. Gunther, Martha Jefferson Hospital, Charlottesville, Virginia
T. Norris, San Francisco Shoulder, Elbow & Hand Clinic, San Francisco, California
M. Ries, University of California, San Francisco, San Francisco, California
L. Pruitt, University of California, Berkeley, Berkeley, California

658 **Load Dependent Creep Behavior & Its Relationship to Crystallinity in Absorbable Materials**
M. L. Dreher, FDA/CDRH, Silver Spring, MD

Hydrogels for Cellular Transplantation in the Central Nervous System

659 **Cell-Seeded Injectable Gelatin-Hydroxyphenylpropionic Acid Hydrogel for the Regeneration of Retina**
S. Rokkappanavar, Harvard Medical School, Jamaica Plain, MA
T. Lim, Harvard-MIT Division of Health Sciences and Technology, Jamaica Plain, Massachusetts
J. Chen, Massachusetts Eye and Ear Infirmary, Boston, Massachusetts
M. Kurisawa, Institute of Bioengineering and Nanotechnology, Singapore, Singapore
M. Spector, Harvard Medical School, Jamaica Plain, Massachusetts

Image Analysis in Implant Pathology Investigation

660 **X-ray Phase Contrast Imaging of Hydrogels for Tissue Engineering**
A. A. Appel, Illinois Institute of Technology, Chicago, IL
J. C. Larson, Illinois Institute of Technology, Chicago, Illinois
A. B. Garson, III, Washington University in St. Louis, St. Louis, Missouri
B. Jiang, Illinois Institute of Technology, Chicago, Illinois
A. Zysk, Illinois Institute of Technology, Chicago, Illinois
M. O. Wang, University of Maryland, College Park, Maryland
B. B. Nguyen, University of Maryland, College Park, Maryland
E. C. Opara, Wake Forest Institute for Regenerative Medicine, Winston-Salem, North Carolina
J. Fisher, University of Maryland, College Park, Maryland
M. A. Anastasio, Washington University in St. Louis, St. Louis, Missouri
E. Brey, Illinois Institute of Technology, Chicago, Illinois

661 **Long-Term Wear Analysis of Retrieved Medially-Pivoting TKA Inserts**
W. C. Clem, Wright Medical Technology, Inc., Arlington, TN

Implant Pathology

544 **Decoy Protein Delivery from Titanium Implants**
M. Keeney, Stanford University, Stanford, CA
Z. Yao, Stanford University, Stanford, California
K. Egashira, Kyushu University, Fukuoka, Japan
S. B. Goodman, Stanford University, Stanford, California
F. Yang, Stanford University, Stanford, California

545 **Orthopaedic Wear Particle Disease and NFκB Signaling**
Z. Yao, Stanford University School of Medicine, Stanford, CA
M. Keeney, Stanford University School of Medicine, Stanford, California
J. K. Antonios, Stanford University School of Medicine, Stanford, California
C. Li, Stanford University School of Medicine, Stanford, California
R. L. Smith, Stanford University School of Medicine, Stanford, California
F. Yang, Stanford University School of Medicine, Stanford, California
K. Egashira, Kyushu University, Fukuoka, Japan
S. B. Goodman, Stanford University School of Medicine, Stanford, California

576 **Magnetic Capture of Endothelial Cells to Vascular Stents Within An Externally Applied Magnetic Field**
B. J. Tefft, Mayo Clinic, Rochester, MN
S. Uthamaraj, Mayo Clinic, Rochester, Minnesota
J. Y. Gooden, Mayo Clinic, Rochester, Minnesota
J. J. Harburn, Durham University, Stockton, United Kingdom (Great Britain)
M. Klabusay, St. Anne's University Hospital, Brno, Czech Republic
D. R. Holmes, Jr., Mayo Clinic, Rochester, Minnesota
R. D. Simari, Mayo Clinic, Rochester, Minnesota
D. Dragomir-Daescu, Mayo Clinic, Rochester, Minnesota
G. S. Sandhu, Mayo Clinic, Rochester, Minnesota

662 **Longevity of Implant-Associated Infectious Biofilms**
A. M. Tatara, Rice University, Houston, TX
F. K. Kasper, Rice University, Houston, Texas
A. G. Mikos, Rice University, Houston, Texas

663 **Hippocampal Neurogenesis is Down-Regulated in Animals with Small-Scale Nervous System Implants**
M. B. Christensen, University of Utah, Salt Lake City, UT
B. D. Winslow, University of Utah, Salt Lake City, Utah
A. E. Higgins, University of Utah, Salt Lake City, Utah
P. A. Tresco, University of Utah, Salt Lake City, Utah

Nanomaterials

664 **Intracellular Behavior of Biodegradable Dextran-graft-oligo(lactide) Nanogels Collapsing under Reductive Condition in Cytosol for Efficient Cellular Drug Delivery**
A. Takahashi, Kansai University, Suita, Osaka, Japan
A. Kuzuya, Kansai University, Suita, Osaka, Japan
Y. OHYA, Kansai University, Suita, Osaka, Japan

665 **Graphene coated substrates for cell attachment and proliferation**
A. Aryaei, university of Toledo, Toledo, OH

A. Jayatissa, University of Toledo, Toledo, Ohio
M. Gautam, University of Toledo, Toledo, Ohio
A. Jayasuriya, University of Toledo, Toledo, Ohio

666 **Engineering thermo-responsive nano-shells**
D. Cohn, The Hebrew University of Jerusalem, Jerusalem, Israel

667 **Nanotechnology-derived catheters for reduced inflammation and infection**
L. Liu, Northeastern University, Boston, MA, Boston, MA

668 **Brazilian Spider Silk Protein Masp2 Production in E.coli System with Synthetic Biology**
V. A. Michalczechen-Lacerda, University of Brasília, Brasilia, Brazil
V. A. Michalczechen-Lacerda, University of Brasília, Brasília, Brazil
O. Tokareva, Tufts University, Medford, Massachusetts
G. R. Vianna, Embrapa Genetics Resources and Biotechnology, Brasilia, Brazil
A. M. Murad, Embrapa Genetics Resources and Biotechnology, Brasilia, Brazil
D. L. Kaplan, Tufts University, Medford, Massachusetts
E. L. Rech, Embrapa Genetics Resources and Biotechnology, Brasília, Brazil

669 **Preparation of Positively and Negatively Charged Nanogels Using Oligolactide-grafted Polysaccharides and Their Polyion Complex Formation**
Y. Yano, Kansai university, Suita, Osaka, Japan
A. Furuhata, Kansai University, Suita, Japan
A. Takahashi, Kansai University, Suita, Japan
A. Kuzuya, Kansai University, Suita, Japan
Y. Ohya, Kansai University, Suita, Japan

938 **The micro/nano-sized bioactive glasses and their cytological behaviours**
C. Mao, South China University of Technology, Gainesville, FL

939 **Efficacy of Novel Active Targeting Dendrimer for Paclitaxel Delivery to Breast Cancer Cells**
A. Satsangi, University of Texas at San Antonio, Helotes, TX
J. L. Ong, University of Texas at San Antonio, San Antonio, Texas
S. Roy, University of Texas Health Science Center at San Antonio, San Antonio, Texas
R. Vadlamudi, University of Texas Health Science Center at San Antonio, San Antonio, Texas

Nanostructured Biomaterials and Porous Scaffolds

670 **Micro- to Nano-patterned Titanium Improves and Guides In Vitro Adhesion of Bone Marrow Stromal Cells**
A. F. Cipriano, University of California, Riverside, Riverside, CA
N. De Howitt, University of California, Riverside, Riverside, California
S. C. Gott, University of California, Riverside, Riverside, California
M. P. Rao, University of California, Riverside, Riverside, California
H. H. Liu, University of California, Riverside, Riverside, California

671 **Posterolateral Fusion in a New Zealand White Rabbit Model**
B. M. Schlossberg, Pioneer Surgical, woburn, MA

672 **Design of surfaces with mechanical nanoheterogeneities for a better control of cell-material interactions**
C. Dupont-Gillain, Université catholique de Louvain, Louvain-la-Neuve, Belgium

S. Degand, Université catholique de Louvain, Louvain-la-Neuve, Belgium

673 **Synthesis and Characterization of Antiepileptic Nanomedicine for Transbuccal Delivery**
D. C. Aduba, Jr., Virginia Commonwealth University, Richmond, VA
O. Y. Zolotarskaya, Virginia Commonwealth University, Richmond, Virginia
G. Bowlin, Virginia Commonwealth University, Richmond, Virginia
H. Yang, Virginia Commonwealth University, Richmond, Virginia

674 **Microfabricated Nanoporous Gold Electrodes for Triggered Drug Release**
E. Seker, University of California, Davis, Davis, CA
C. A. R. Chapman, University of California, Davis, Davis, California

675 **Composite Chitosan/Silk Fibroin Nanofibers for Osteogenic Differentiation of Human Mesenchymal Stem Cells**
G. Lai, Department of Chemical and Materials Engineering, Chang Gung University, Tao-Yuan, Taiwan
J. Chen, Department of Chemical and Materials Engineering, Chang Gung University, Tao-Yuan, Taiwan

676 **Injectable Nano-hybrid Scaffold for Biopharmaceuticals Delivery and Tissue Engineering**
H. Tan, Nanjing University of Science and Technology, Nanjing, China

677 **Controlling the porosity of electrospun PCL scaffold by Simultaneous Salt releasing Method**
J. Lee, Nano-Bio Regenerative Medical Institute, Hallym University, Chuncheon, Republic of Korea

678 **Bioskiving: Fabrication of Tendon-derived Collagen Nerve Guidance Materials**
K. A. Alberti, Tufts University, Medford, MA
Q. Xu, Tufts University, Medford, Massachusetts

679 **Rosette nanotube composites for cartilage applications**
L. Sun, Northeastern University, Boston, MA

680 **Femtosecond Laser-Patterned Nanopore Arrays for Spatio-Temporal Control of Bioactive Molecule Release**
L. H. Hofmeister, Vanderbilt University, Nashville, TN
A. Zachman, Vanderbilt University, Nashville, Tennessee
L. Costa, University of Tennessee Space Institute, Tullahoma, Tennessee
T. Boire, Vanderbilt, Nashville, Tennessee
W. Hofmeister, University of Tennessee Space Institute, Tullahoma, Tennessee
H. Sung, Vanderbilt University, Nashville, Tennessee

681 **Poly (ethylene glycol)-poly(3,4- ethylenedioxythiophene):poly (styrenesulfonate) Hydrogel Nanofibers for Sensitive Detection of Glucose**
M. Abidian, Pennsylvania State University, University Park, PA
G. B. Kim, Pennsylvania State University, State College, Pennsylvania

682 **Response of chitosan/PCL nanofibers with airway epithelial cells**
N. Bhattarai, North Carolina A&T State University, Greensboro, NC

683 **On the Use of Dexamethasone Loaded Liposomes to Induce the Osteogenic Differentiation of Human Mesenchymal Stem Cells**
N. S. Monteiro, 3B´s Research Group – Biomaterials, Biodegradables and Biomimetics,

Guimaraes, Portugal

684 **Release of Bioactive Agent from Liposomes Immobilized on Electrospun Nanofibers Targeting Tissue Engineering Applications**
N. S. Monteiro, 3B´s Research Group – Biomaterials, Biodegradables and Biomimetics, Guimaraes, Portugal

685 **Directional Cell Migration Induced by Electrospun Silk Nanofibers**
P. Uttayarat, Thailand Institute of Nuclear Technology (Public Organization), Nakornnayok, Thailand

N/A **Nanofiber-based Wound Dressings for Controlled Release of Hydrophilic Drugs**
V. Leung, University of British Columbia, Richmond, BC, Canada

687 **Hydrogel Composites Containing Carbon Nanobrushes as an Effective Biomaterial for Tissue Regeneration**
W. H. Marks, Harvard University, Cambridge, MA
S. C. Yang, University of Rhode Island, Kingston, Rhode Island
G. W. Dombi, University of Rhode Island, Kingston, Rhode Island
S. K. Bhatia, Harvard University, Cambridge, Massachusetts

N/A **Multi-drug delivery system based on injectable hyaluronic acid-liposome hybrid hydrogel**
X. Yang, Uppsala University, Uppsala, Sweden

689 **Bundle Structure Gel Formation Using the Co-flow Microfluidic Device**
Y. Takahashi, The University of Tokyo., Tokyo, Japan
N. Kato, Utsunomiya University, Utsunomiya, Japan
Y. T. Matsunaga, The University of Tokyo, Tokyo, Japan

940 **Structural, Mechanical and In Vitro Characterization of Plasma-Coated Electrospun Nanofiber Scaffolds for Vascular Graft Applications**
H. Savoji, 1- École Polytechnique de Montréal, 2- Laboratory of Endovascular Biomaterials (LBeV), Research Centre, Centre Hospitalier de l'Université de Montreal (CRCHUM), Montreal, QC, Canada
A. Hadjizadeh, École Polytechnique de Montréal, Montreal, Québec, Canada
M. Maire, Laboratory of Endovascular Biomaterials (LBeV), Research Centre, Centre Hospitalier de l'Université de Montreal (CRCHUM), Montreal, Montreal, Québec, Canada
S. Lerouge, 1- École de Technologie Supérieure, 2- Laboratory of Endovascular Biomaterials (LBeV), Research Centre, Centre Hospitalier de l'Université de Montreal (CRCHUM), Montreal, Québec, Canada
A. Ajji, École Polytechnique de Montréal, Montreal, Québec, Canada
M. R. Wertheimer, École Polytechnique de Montréal, Montreal, Québec, Canada

941 **Degradation of Ultrasound Contrast Agents Embedded in a Tissue Phantom**
S. Gleeson, Case Western Reserve University, Cleveland, OH
L. Solorio, Case Western Reserve University, Cleveland, Ohio
A. A. Exner, Case Western Reserve University, Cleveland, Ohio

New and Improved Biomaterials Used in Ophthalmology

690 **Ocular Biocompatibility of a SIBS-based Glaucoma Drainage Tube**
Y. P. Kato, InnFocus Inc, Miami, FL

691 **Surface-Modified Silicone Contact Lenses from Interfacial Design to Clinical Evaluation**
Z. Zhang, Semprus BioSciences, Cambridge, MA
J. Li, Semprus BioSciences, Cambridge, Massachusetts
H. Wang, Semprus BioSciences, Cambridge, Massachusetts
D. Donahue, Semprus BioSciences, Cambridge, Massachusetts
C. Loose, Semprus BioSciences, Cambridge, Massachusetts
A. Cook, Semprus BioSciences, Cambridge, Massachusetts

942 **Poly(ethylene glycol) based Diels-Alder hydrogels for biomedical applications**
A. Goepferich, University of Regensburg, Regensburg, Germany

Orthopaedic Biomaterials

693 **Nanoclay Enriched Electrospun Polycaprolactone Scaffolds for Bone Tissue Engineering**
A. Gaharwar, Massachusetts Institute of Technology, Cambridge, MA
S. Mukundan, Brigham and Women's Hospital, Harvard Medical School, Cambridge, Massachusetts
A. Patel, Brigham and Women's Hospital, Harvard Medical School, Cambridge, Massachusetts
S. Mihaila, Brigham and Women's Hospital, Harvard Medical School, Cambridge, Massachusetts
A. Dolatshahi-Pirouz, Brigham and Women's Hospital, Harvard Medical School, Cambridge, Massachusetts
E. Karaca, Brigham and Women's Hospital, Harvard Medical School, Cambridge, Massachusetts
K. Ragaranjan, Brigham and Women's Hospital, Harvard Medical School, Cambridge, Massachusetts
A. Khademhosseini, Brigham and Women's Hospital, Harvard Medical School, Cambridge, Massachusetts

694 **Clinical Relevance of ISO 18192-1 Spinal Disc Wear Parameters to the PCM Cervical Disc System**
A. W. L. Turner, NuVasive, Inc., San Diego, CA

695 **Fretting Corrosion Analysis of Ti-Mo-Zr-Fe (TMZF) and Gas Atomized Dispersion Strengthened Co-Cr-Mo (GADS) Alloys Under Shot Peened, and Shot Peened, Cleaned and Passive Conditions**
A. J. Ferrel, Syracuse University, Syracuse, NY

696 **Surface Cross-linking of Vitamin E Blended UHMWPE by Low Energy Irradiation**
A. Neils, Massachusetts General Hospital, Boston, MA
J. Ward, Massachusetts General Hospital, Boston, Massachusetts
B. Doshi, Massachusetts General Hospital, Boston, Massachusetts
E. Oral, Massachusetts General Hospital, Boston, Massachusetts
O. Muratoglu, Massachusetts General Hospital, Boston, Massachusetts

697 **The initial concentration of vitamin E in irradiated UHMWPE affects vitamin E grafting**
A. Neils, Massachusetts General Hospital, Boston, MA
E. Oral, Massachusetts General Hospital, Boston, Massachusetts
O. Muratoglu, Massachusetts General Hospital, Boston, Massachusetts

698 **Fabrication of Crosslinked Carboxymethylchitosan Microspheres and Their Incorporation Into Composite Scaffolds for Enhanced Bone Regeneration**
B. Reves, University of Memphis, Germantown, TN
J. A. Jennings, University of Memphis, Memphis, Tennessee
J. D. Bumgardner, University of Memphis, Memphis, Tennessee

W. O. Haggard, University of Memphis, Memphis, Tennessee

699 **Strength and Friction Characteristics of a Porous Structured Titanium Biomaterial**
B. S. Mitchell, Pipeline Orthopedics, cedar knolls, NJ
D. F. Swarts, Pipeline Orthopedics, cedar knolls, New Jersey

700 **Diffusion of Vitamin E in Radiation Cross-linked UHMWPE using Homogenization under Pressure**
B. Doshi, Massachusetts General Hospital, Boston, MA
E. Oral, Massachusetts General Hospital, Boston, Massachusetts
O. Muratoglu, Massachusetts General Hospital, Boston, Massachusetts

701 **Bioactivity of Amorphous Bioactive Glass and Glass-Ceramic in Simulated Body Fluid**
C. S. Lewis, Bio2 Technologies, Woburn, MA
J. Krevolin, Bio2 Technologies, Woburn, Massachusetts

702 **0243-000037107Novel Porous Titanium Implants Demonstrate Bone Ingrowth In A Rabbit Model**
C. Ngo, Stryker Orthopaedics, Mahwah, NJ
R. Zhang, Stryker Orthopedics, Mahwah, New Jersey
M. Poggie, Stryker Orthopaedics, Mahwah, New Jersey
G. Kulesha, Stryker Orthopaedics, Mahwah, New Jersey
J. Muth, Stryker Orthopaedics, Mahwah, New Jersey
C. Aponte, Stryker Orthopaedics, Mahwah, New Jersey
S. Coyle, Stryker Orthopaedics, Mahwah, New Jersey
N. Dong, Stryker Orthopaedics, Mahwah, New Jersey

703 **Surface Crosslinking of Vitamin E Blended UHMWPE via Spatial Extraction of Vitamin E Through High Temperature Processing**
C. Gupta, Massachusetts General Hospital, Boston, MA
E. Oral, Massachusetts General Hospital, Boston, Massachusetts
O. Muratoglu, Massachusetts General Hospital, Boston, Massachusetts

704 **Poly(vinyl alcohol)-poly(2-acrylamido-2-methyl-1-propane sulfonic acid) hydrogels as a synthetic cartilage material**
C. Serrano, Massachusetts General Hospital, Boston, MA
H. Bodugoz-Senturk, Massachusetts General Hospital, Boston, Massachusetts
O. Muratoglu, Massachusetts General Hospital, Boston, Massachusetts

705 **Physical and Mechanical Characteristics of a Porous Structured Titanium Biomaterial**
D. F. Swarts, Pipeline Orthopedics, Cedar Knolls, NJ

706 **Osseointegration Effect of BMP-2 on Dental Implants: A 3-6 Week In Vivo Study**
D. Y. Yoo, New York University College of Dentistry, New York, NY
C. Marin, Universidade Federal de Santa Catarina, Florianopolis, Brazil
R. Jimbo, Malmo University, Malmo, Sweden
R. Anchieta, New York University College of Dentistry, New York, New York
L. Machado, New York University College of Dentistry, New York, New York
F. Guastaldi, New York University College of Dentistry, New York, New York
N. Tovar, New York University College of Dentistry, New York, New York
P. G. Coelho, New York University College of Dentistry, New York, New York

707 **Vitamin-E highly crosslinked UHMWPE wear particles induce less osteolysis compared to virgin UHMWPE in murine calvarial bone model**

D. Bichara, Massachusetts General Hospital, Boston, MA
E. Malchau, Massachusetts General Hospital, Boston, Massachusetts
N. Sillesen Hylleholt, Massachusetts General Hospital, Boston, Massachusetts
S. Cakmak, Massachusetts General Hospital, Boston, Massachusetts
O. Muratoglu, Massachusetts General Hospital, Boston, Massachusetts

708 **Bond Quality and Corrosion Properties of Titanium Foam on Cobalt Chrome Substrates**
D. Scholvin, Wright Medical Technology, Inc., Arlington, TN
J. P. Moseley, Wright Medical Technology, Inc., Arlington, Tennessee
D. Linton, Wright Medical Technology, Inc., Arlington, Tennessee

709 **Effect of Irradiation on the Strength and Lubricity of PVA-PAA Hydrogels for Cartilage Repair**
D. Ling, Massachusetts General Hospital, Boston, MA
H. Bodugoz-Senturk, Massachusetts General Hospital, Boston, Massachusetts
H. Kluk, Masachusetts General Hospital, Boston, Massachusetts
O. Muratoglu, Massachusetts General Hospital, Boston, Massachusetts

710 **A New Technique for Surface Cross-linked UHMWPE by Diffusion of Peroxides**
E. Oral, Massachusetts General Hospital, Boston, MA
R. Gul, Massachusetts General Hospital, Boston, Massachusetts
O. Muratoglu, Massachusetts General Hospital, Boston, Massachusetts

711 **Oxidation Resistant Peroxide Crosslinked UHMWPE**
E. Oral, Massachusetts General Hospital, Boston, MA
R. Gul, Massachusetts General Hospital, Boston, Massachusetts
O. Muratoglu, Massachusetts General Hospital, Boston, Massachusetts

712 **Coefficient of Friction for Porous Metal Structures Against Cortical Bone**
G. Gupta, Biomet, Warsaw, IN
K. McKlain, Biomet, Warsaw, Indiana

713 **Novel Microwave Assisted Route for Preparing Monetite Bone Cement with No Heat Generation**
H. Zhou, The University of Toledo, Toledo, OH
S. B. Bhaduri, The University of Toledo, Toledo, Ohio
T. J. F. Luchini, The University of Toledo, Toledo, Ohio
A. K. Agawal, The University of Toledo, Toledo, Ohio
V. K. Goel, The University of Toledo, Toledo, Ohio

714 **Fabrication of Customized Porous Hydroxyapatite (HA) implants for Orthopaedic Application**
H. Jung, 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
M. Kang, Department of Materials Science and Engineering, Seoul, Republic of Korea
H. Kim, Department of Materials Science and Engineering, Seoul National University, Seoul, Republic of Korea
Y. Koh, Department of Materials Science and Engineering, Seoul National University, Seoul, Republic of Korea
Y. Estrin, cDepartment of Materials Engineering, Monash Univers, Seoul, Australia

715 **Impact Strength Correlates with Fatigue Strength of Irradiated Vitamin E/UHMWPE Blends**
J. Ward, Massachusetts General Hospital, Boston, MA
B. Doshi, Massachusetts General Hospital, Boston, Massachusetts
E. Oral, Massachusetts General Hospital, Boston, Massachusetts
O. Muratoglu, Massachusetts General Hospital, Boston, Massachusetts

716 **Magnesium ions facilitate integrin alpha-2 and alpha-3-mediated proliferation and partially promotes differentiation in hBMSCs**
K. Lee, Asan Medical Center, Seoul, Republic of Korea

717 **Engineering the Rate of Degradation of Polyester Scaffolds for Bone Tissue Engineering**
K. N. Cicotte, University of New Mexico, Albuquerque, NM
S. M. Dirk, Sandia National Laboratories, Albuquerque, New Mexico
E. L. Hedberg-Dirk, University of New Mexico, Albuquerque, New Mexico

718 **A Co-Polymer of Chitosan and Dextran Coating on Ti6Al4V for Orthopedic Applications**
L. Actis, The University of Texas at San Antonio, San Antonio, TX
A. Srinivasan, The University of Texas at San Antonio, San Antonio, Texas
A. Ramasubramanian, The University of Texas at San Antonio, San Antonio, Texas
J. L. Ong, The University of Texas at San Antonio, San Antonio, Texas

719 **A Clinically Relevant Oxidation Model for UHMWPE and its Comparison to Retrievals**
M. Fung, Massachusetts General Hospital, Boston, MA
O. Muratoglu, Massachusetts General Hospital, Boston, Massachusetts
S. Rowell, Massachusetts General Hospital, Boston, Massachusetts
A. Neils, Massachusetts General Hospital, Boston, Massachusetts
E. Oral, Massachusetts General Hospital, Boston, Massachusetts

720 **Bioactive PEEK**
S. Ajami, UCL, University College London, STANMORE, MIDDLESEX, United Kingdom (Great Britain)
M. Coathup, UCL, Stanmore, Middlesex, United Kingdom (Great Britain)
A. McCabe, Accentus, Oxfordshire, United Kingdom (Great Britain)
J. Shawcross, Accentus, Oxfordshire, United Kingdom (Great Britain)
P. Agg, Accentus, Oxfordshire, United Kingdom (Great Britain)
G. Blunn, UCL, Stanmore, Middlesex, United Kingdom (Great Britain)

721 **Injectable, Bioactive Two-solution Bone Cements (η-TSBC) with Strontium Substituted Hydroxyapatite Microspheres**
S. Jariwala, Syracuse University, Syracuse, NY
J. Hasenwinkel, Syracuse University, Syracuse, New York

722 **The Effect of Silica-substitution, Sintering and Particle Size on Bone Healing of Apatite Granules**
S. Woods, DePuy Synthes, West Chester, PA
A. Petticoffer, DePuy Synthes, West Chester, Pennsylvania
D. Arens, AO Research Institute, Davos, Switzerland

723 **Wear Rates of Ultra High Molecular Weight Polyethylene (UHMWPE) uncorrelated to Contact Area**
S. A. Woods, DePuy Orthopaedics, Warsaw, IN

724 **Comparative Handling, Intrusion and Antibiotic Elution Characteristics of a New, High**

Viscosity Bone Cement
S. He, Stryker Co, Mahwah, NJ
S. He, Stryker Co, Mahwah, New Jersey
H. Mulvihill, Stryker Co, Limerick, Ireland
Y. Bogatch, Stryker Co, Mahwah, New Jersey
E. O'Grandy, Stykrer Co, Limerick, Ireland
D. McQueen, Kansas Orthopaedic Center, Wichita, Kansas

725 **Cell-mediated degradable hydrogels tailored to adult cells for cartilage tissue engineering**
S. C. Skaalure, University of Colorado, Boulder, CO
S. J. Bryant, University of Colorado, Boulder, Colorado

726 **A Comparison of Small Punch Results on Aged Highly Crosslinked UHMWPE**
S. Spiegelberg, Cambridge Polymer Group, Boston, MA
C. Segura, Cambridge Polymer Group, Boston, Massachusetts
M. Peiserich, Zimmer, Inc., Warsaw, Indiana
A. Rufner, Zimmer, Inc., Warsaw, Indiana

727 **Radiation-Induced Radicals in Polyaryletheretherketone (PEEK)**
T. Riahinasab, University of Memphis, Memphis, TN
B. Walters, University of Memphis, Memphis, Tennessee
M. S. Jahan, University of Memphis, Memphis, Tennessee

728 **Real-time Monitoring of Hardening of Nanosilica Sol containing DCPA Cements in an ESEM**
H. Zhou, The University of Toledo, Toledo, OH
H. Zhou, The University of Toledo, Toledo, Ohio
S. Bhaduri, The University of Toledo, Toledo, Ohio
T. J. F. Luchini, The university of toledo, Findlay, Ohio

729 **Effect of UHMWPE Patellar Component Thickness on Quadriceps Tendon Force Following Total Knee Arthroplasty**
X. Xie, Clemson University, Clemson, SC
J. DesJardins, Clemson University, Clemson, South Carolina
H. Yao, Clemson University, Charleston, South Carolina
L. Thompson, Clemson University, Clemson, South Carolina
F. Voss, University of South Carolina, School of Medicine, Columbia, South Carolina
M. LaBerge, Clemson University, Clemson, South Carolina

730 **Porous polyurethane scaffold for facilitating healing in critical sized bone defect**
Y. Lui, The University of Hong Kong, Hong Kong, Hong Kong
W. Ip, The University of Hong Kong, Hong Kong, Hong Kong

731 **Reducing Cytotoxicity of Injectable Poly(propylene-co-caprolactone) Copolymers for Bone Tissue Engineering**
Z. Fang, Mayo Clinic, Rochester, MN

943 **Comparison of the Fixation Strength of PEEK and Composite Knotless Instability Anchors**
M. Hawkins, Stryker Orthopaedics, Mahwah, NJ
J. Spalazzi, Stryker Orthopaedics, Mahwah, New Jersey

944 **Enhanced Bioactivity of PEEK by Accelerated Neutral Atom Beam Technique**
M. H. Maxwell, Exogenesis Corporation, Billerica, MA
S. Kirkpatrick, Exogenesis Corporation, Billerica, Massachusetts

R. Svrluga, Exogenesis Corporation, Billerica, Massachusetts
J. Khoury, Exogenesis Corporation, Billerica, Massachusetts

945 **A Biomechanical Study to Compare an All-Suture Anchor to a Composite Suture Anchor in Sheep Cadaver Humeri**
J. N. Bair, IMDS Discovery Research, Logan, UT
R. E. Olsen, IMDS Discovery Research, Logan, Utah
J. Pugsley, IMDS Discovery Research, Logan, Utah
K. Pilgeram, Stryker Orthopaedics, San Jose, California

946 **Biomechanical Testing of Soft Tissue Allografts Sterilized Using Two Different Methods**
M. Hawkins, Stryker Joint Preservation, Mahwah, NJ
C. Kevin, University of Colorado - Denver, Aurora, Colorado
T. Baldini, University of Colorado - Denver, Aurora, Colorado
E. McCarty, University of Colorado - Denver, Aurora, Colorado

947 **Comparison of Silicated–Apatite and β-TCP Granules in a Critical Size Bone Defect Model**
A. C. Petticoffer, Depuy Synthes, West Chester, PA
S. A. Woods, Depuy Synthes, West Chester, Pennsylvania
M. Fulmer, Depuy Synthes, West Chester, Pennsylvania
R. Harten, Depuy Synthes, West Chester, Pennsylvania

948 **Cationic, Multifunctional Dendrimers for Treatment of Osteoarthritis**
B. G. Cooper, Boston University, Boston, MA
M. W. Grinstaff, Boston University, Boston, Massachusetts
C. Ghobril, Boston University, Boston, Massachusetts

949 **Contrast Enhanced Computed Tomography of Equine Joint Cartilage Demonstrates Consistent Imaging Relationships Across Joint Surfaces**
R. Stewart, Boston University, Allston, MA
B. Nelson, Colorado State University, Fort Collins, Colorado
H. Lusic, Boston University, Boston, Massachusetts
B. Snyder, Center for Advanced Orthopaedic Studies, Beth Israel Deaconess Medical Center, Boston, Massachusetts
L. Goodrich, Colorado State University, Fort Collins, Colorado
M. Grinstaff, Boston University, Boston, Massachusetts

950 **Engineering a Muscle Mimetic Extracellular Matrix Biomaterial**
S. Hurd, University of Arkansas, Fayetteville, AR
B. Kasukonis, University of Arkansas, Fayetteville, Arkansas
K. Cherry, University of Arkansas, Fayetteville, Arkansas
S. Ahmadi, University of Arkansas for Medical Sciences, Little Rock, Arkansas
J. Wolchok, University of Arkansas, Fayetteville, Arkansas

951 **Fabrication and Characterization of Poly(para-phenylene) for use as a Porous Scaffold Biomaterial**
C. P. Frick, University of Wyoming, Laramie, WY
A. L. DiRienzo, University of Wyoming, Laramie, Wyoming
C. M. Yakacki, University of Colorado at Denver, Denver, Colorado
D. L. Safranski, MedShape Solutions, Inc., Atlanta, Georgia

952 **Degradation and characterization of porous constructs for craniofacial space maintenance and antibiotic delivery**

A. Henslee, Rice University, Houston, TX

Patterning Microenvironments for Tissue Engineering and Morphogenesis

732 **Biomechanics of Cell Sheets Based Arterial Tissue using a Novel Force Sensor**
D. E. Backman, Boston University, Boston, MA
J. Y. Wong, Boston University, Boston, Massachusetts

733 **Orthogonal Photo-reactive Hydrogel of Tunable Stiffness for In Vitro Guided Neurite Growth**
E. L. Horn-Ranney, Tulane University, New Orleans, LA
P. Khoshakhlagh, Tulane University, New Orleans, Louisiana
M. J. Moore, Tulane University, New Orleans, Louisiana

734 **Two-Dimensional Micropatterns of Self-Assembled Poly(N-isopropylacrylamide) Microgels for Adhesion, Alignment, and Temperature-induced Detachment of NIH 3T3 Fibroblast Cells**
H. Tsai, University of Rochester, Rochester, NY
K. Vats, University of Rochester, Rochester, New York
M. Z. Yates, University of Rochester, Rochester, New York
D. S. W. Benoit, University of Rochester, Rochester, New York

735 **Bioengineering a tendon-like substitute: adult stem cell behavior in aligned fibrous scaffolds and stimulating culturing environments**
M. T. Rodrigues, 3B's Research Group - University of Minho, Caldelas das Taipas - Guimarães, Portugal

736 **A Contour-Based Approach Enables Individual Cell Identification for Cell-Material Analyses**
M. E. Brasch, Syracuse University, Syracuse, NY
R. M. Baker, Syracuse University, Syracuse, New York
L. Manning, Syracuse University, Syracuse, New York
J. H. Henderson, Syracuse University, Syracuse, New York

737 **Biomimetic substrate-dependent myogenic commitment of iPSC-derived cells**
N. Hwang, Seoul National University, Seoul, Republic of Korea
E. Lee, Seoul National University, Seoul, Republic of Korea

953 **Cell Motility and Persistence Controlled by Topography of Cell Culture Substrates**
W. Tong, City University of Hong Kong, Hong Kong, Hong Kong
Q. Tand, City University of Hong Kong, Hong Kong, Hong Kong
S. Peng, City University of Hong Kong, Hong kong, Hong Kong
S. Pang, City University of Hong Kong, Hong Kong, Hong Kong
Y. Lam, City University of Hong Kong, Hong Kong, Hong Kong

954 **Selective cell patterning on photoactive electrospun meshes**
J. S. Hersey, Boston University, Boston, MA
M. W. Grinstaff, Boston University, Boston, Massachusetts

955 **Effects of Blocking Cell-Cell and Cell-Matrix Interactions on Cardiac Cell Mechanical Properties**
A. Desai, Clemson University, Clemson, SC
S. Deitch, Clemson University, Clemson, South Carolina
D. Dean, Clemson University, Clemson, South Carolina

Physical Parameters in the Design of Drug Delivery Systems

738 **Injectable Multiblock P(PF-co-CL) Copolymer and Dual Drug Delivery for Treatment of Bone Defects**
M. Dadsetan, Mayo Clinic, Rochester, MN

956 **Injectable and Degradable Sulfated Hyaluronic Acid Hydrogels for Sustained Protein Delivery**
V. Chuo, University of Pennsylvania, Philadelphia, PA
B. Purcell, University of Pennsylvania, Philadelphia, Pennsylvania
S. M. Dorsey, University of Pennsylvania, Philadelphia, Pennsylvania
J. A. Burdick, University of Pennsylvania, Philadelphia, Pennsylvania

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739 **Quantification of the Influence of Protein-Protein Interactions on Adsorbed Protein Structure and Bioactivity**
A. A. Thyparambil, Clemson University, Clemson, SC
Y. Wei, Clemson University, Clemson, South Carolina
R. A. Latour, Clemson University, Clemson, South Carolina

740 **Collection of prostaglandin E2 and leukotriene B4 from implanted microdialysis probes**
A. Diaz-Perez, University of Arkansas, Fayetteville, AR

741 **Directing Macrophage Polarization with Microdialysis Probe Implants: Perfusion Fluid and IL-4 Effects**
G. Bajpai, University of Arkansas, Fayetteville, AR

742 **Interaction Forces Related to Protein Adsorption on Polymer Brush Surfaces**
S. Sakata, The University of Tokyo, Tokyo, Japan
Y. Inoue, The University of Tokyo, Tokyo, Japan
K. Ishihara, The University of Tokyo, Tokyo, Japan

743 **Recovering functionalities of deficient mucus with a polyethylene glycol-lectin conjugate**
T. Crouzier, Massachusetts Institute of Technology, Cambridge, MA
K. Ribbeck, MIT, Cambridge, Massachusetts

744 **Development of Tuned Interfacial Force Field Parameters in CHARMM for the Accurate Molecular Dynamics Simulation of Peptide Adsorption on Biomaterial Surfaces**
T. Abramyan, Clemson University, Clemson, SC
J. A. Snyder, Clemson University, Clemson, South Carolina
J. A. Yancey, Clemson University, Clemson, South Carolina
S. J. Stuart, Clemson University, Clemson, South Carolina
R. A. Latour, Clemson University, Clemson, South Carolina

Role of Biological Factors in Osteoconduction and Bone Engineering

745 **Synergistic effect of sustained release growth factors from PLGA microspheres and**

dynamic bioreactor flow on hMSC osteogenic differentiation in alginate scaffolds
B. B. Nguyen, University of Maryland, College Park, MD
G. Della Porta, Università di Salerno, Fisciano, SA, Italy
E. Reverchon, Università di Salerno, Fisciano (Sa), Italy
J. P. Fisher, University of Maryland, College Park, Maryland

746 **Surface modified PLLA as drug delivery scaffold for bone regeneration**
M. Bosetti, Università del Piemonte Orientale "A. Avogadro", Novara, Italy

747 **Influence of Bone Morphogenetic Protein-7 Encapsulated and Coated Chitosan Microparticles on Osteoblasts Proliferation and Differentiation**
V. P. R. Mantripragada, The University of Toledo, Toledo, OH

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748 **Stable Feeder- and Xeno-free Surfaces for Long-term Growth of Undifferentiated Human Embryonic Stem Cells**
A. R. Dilenno, Massachusetts Institute of Technology, Cambridge, MA
A. M. Coclite, Massachusetts Institute of Technology, Cambridge, Massachusetts
J. R. Millman, Massachusetts Institute of Technology, Cambridge, Massachusetts
J. Tan, Massachusetts Institute of Technology, Cambridge, Massachusetts
C. K. Colton, Massachusetts Institute of Technology, Cambridge, Massachusetts
K. K. Gleason, Massachusetts Institute of Technology, Cambridge, Massachusetts

749 **Elucidating the role of integrin α5 in mediating the therapeutic potency of circulating angiogenic cells cultured on collagen matrix**
B. Vulesevic, University of Ottawa Heart Institute, Ottawa, ON, Canada
B. McNeill, University of Ottawa Heart Institute, Ottawa, Ontario, Canada
M. Ruel, University of Ottawa Heart Institute, Ottawa, Ontario, Canada
E. J. Suuronen, University of Ottawa Heart Institute, Ottawa, Ontario, Canada

750 **Functional roles of microRNA 489 and 148b in hMSCs osteogenesis depend on microenvironment elasticity.**
. Yang, University of Colorado, Boulder, Boulder, CO
K. S. Anseth, University of Colorado, Boulder, Boulder, Colorado

751 **Differentiation of Human Bone Marrow Mesenchymal Stem Cells on Decellularized Extracellular Matrix Materials**
D. M. Hoganson, Washington University in St. Louis, St. Louis, MO
A. M. Meppelink, Massachusetts General Hospital, Boston, Massachusetts
C. J. Hinkel, Washington University in St. Louis, St. Louis, Missouri
S. M. Goldman, DSM Biomedical, Exton, Pennsylvania
S. Liu, DSM Biomedical, Exton, Pennsylvania
J. P. Gaut, Washington University in St. Louis, St. Louis, Missouri
J. P. Vacanti, Massachusetts General Hospital, Boston, Massachusetts

752 **Biphasic Peptide Amphiphile Nanomatrix Scaffold for Enhanced Osteogenic Response**
H. Jun, University of Alabama at Birmingham, Birmingham, AL
J. Vines, University of Alabama at Birmingham, Birmingham, Alabama
D. Patel, University of Alabama at Birmingham, Birmingham, Alabama
J. Anderson, University of Alabama at Birmingham, Birmingham,, Alabama
S. Gilbert, University of Alabama at Birmingham, Birmingham,, Alabama

D. Lim, University of Alabama at Birmingham, Birmingham,, Alabama

753 **The Effect of Fiber Size on the Neuronal Differentiation of Mouse Embryonic Stem Cells**
J. M. Holzwarth, University of Michigan, Ann Arbor, MI

754 **The Potential of Tissue Engineering in Maxillofacial Reconstruction Following Oral Cancer Treatment**
J. Shaul, Clemson University, Central, SC

755 **Novel Sugar-Glass Nanoparticles system for Biomolecules Stabilization and Delivery in Tissue Engineering Applications**
j. Giri, Parffenbarg Research Center,, Gaithersburg, MD

756 **Modified PEGDA Hydrogels to Promote Mesenchymal Stem Cell Adhesion In Vitro**
K. M. Ferlin, University of Maryland, College Park, MD
M. E. Prendergast, University of Maryland, College Park, Maryland
D. S. Kaplan, Food and Drug Administration, Silver Spring, Maryland
J. P. Fisher, University of Maryland, College Park, Maryland

757 **Effect of Titanium Nanotopography on Mesenchymal Stem Cell Fate**
M. M. Beloti, School of Dentistry of Ribeirao Preto - University of Sao Paulo, Ribeirao Preto, Brazil
R. B. Kato, School of Dentistry of Ribeirao Preto, University of Sao Paulo, Ribeirao Preto, Brazil
F. S. de Oliveira, School of Dentistry of Ribeirao Preto, University of Sao Paulo, Ribeirao Preto, Brazil
M. Q. Hassan, School of Dentistry, University of Alabama at Birmingham, Birmingham, Alabama
P. T. de Oliveira, School of Dentistry of Ribeirao Preto, University of Sao Paulo, Ribeirao Preto, Brazil
A. L. Rosa, School of Dentistry of Ribeirao Preto, University of Sao Paulo, Ribeirao Preto, Brazil

758 **Differentiation of Adipose Derived Stem Cells on Nanofibrous Collagen and Elastin Matrices**
M. J. Springer, University of Florida, Gainesville, FL
J. Allen, University of Florida, Gainesville, Florida

759 **Multifunctional Scaffold for the Delivery of Neural Stem Cells to Promote Regeneration after Traumatic Brain Injury**
N. B. Skop, University of Medicine and Dentistry of New Jersey and New Jersey Institute of Technology, Newark, NJ
C. H. Cho, New Jersey Institute of Technology, Newark, New Jersey
S. W. Levison, University of Medicine and Dentistry of New Jersey, Newark, New Jersey

760 **Modulation of Cell Behaviour using Self–Assembled Binary Colloidal Crystals**
P. Wang, Industrial Research Institute Swinburne (IRIS), Swinburne University of Technology, Hawthorn VIC, Australia, Melbourne, Australia

761 **Viability and Function of Induced Pluripotent Stem (IPS) Cell-Derived Hepatocytes on Bioprinted Gelatin Scaffolds**
R. N. Shah, Northwestern University, Chicago, IL
A. Rutz, Northwestern University, Chicago, Illinois
A. Jakus, Northwestern University, Chicago, Illinois
K. Chien, Northwestern University, Chicago, Illinois

762 **The Effects of Mechanical Stimulation on Controlling and Maintaining Marrow Stromal Cell**

Differentiation into Vascular Smooth Muscle Cells
R. Yao, Boston University, Watertown, MA

763 **Patterned Polyethylene glycol Coatings for Peptide Presentation and Cellular Adhesion**
S. K. Schmitt, University of Wisconsin - Madison, Madison, WI
D. J. Ciancio, University of Wisconsin-Madison, Madison, Wisconsin
W. L. Murphy, University of Wisconsin - Madison, Madison, Wisconsin
P. Gopalan, University of Wisconsin - Madison, Madsion, Wisconsin

764 **Functional analysis of zinc finger and BTB domain containing 16 (ZBTB16) during osteoblastic differentiation of periodontal ligament-derived human multipotent mesenchymal stromal cells**
S. Onizuka, Section of Periodontology, Department of Hard Tissue Engineering, Graduate School, Tokyo Medical and Dental University, Tokyo, Japan

765 **Engineered Collagen-Glycosaminoglycan Scaffold Arrays for Understanding Regulators of MSC Fate**
S. R. Caliari, University of Illinois at Urbana-Champaign, Urbana, IL

766 **Effect of Surface Chemistry on Stem Cell Response in 2-D vs. 3-D Cell Culture Niches**
S. Sarkar, National Institute of Standards and Technology, Gaithersburg, MD
C. G. Simon, Jr., National Institute of Standards and Technology, Gaithersburg, Maryland
R. I. Lock, National Institute of Standards and Technology, Gaithersburg, Maryland
J. P. Dunkers, National Institute of Standards and Technology, Gaithersburg, Maryland

767 **Supplemental Magnesium Ions Altered Human Embryonic Stem Cell Morphology while Retaining Pluripotency**
T. Nguyen, University of California, Riverside, Moreno Valley, CA
C. Liew, University of California, Riverside, Riverside, California
H. Liu, University of California, Riverside, Riverside, California

768 **Stem Cell-Based Meniscus Tissue Engineering Using a Hydrogel Form of Decellularized Matrix**
X. Yuan, Columbia University, New York, NY
D. E. Arkonac, Columbia University, New York, New York
G. Vunjak-Novakovic, Columbia University, New York, New York

769 **Formation of Embryoid Bodies with Controlled Sizes and Maintained Pluripotency in Three-Dimensional Alginate Inverse Opal Scaffolds**
Y. Zhang, Georgia Institute of Technology, Atlanta, GA
Y. Xia, Georgia Institute of Technology, Atlanta, Georgia

957 **GHK-Modified Alginate Hydrogels Enhance VEGF Secretion by Mesenchymal Stem Cells**
K. Leach, UC Davis, Davis, CA
M. Hughbanks, UC Davis, Davis, California

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770 **Surface Characterization of Nano-Features Induced by a Low Temperature Oxidation Method**
A. Cheng, Georgia Institute of Technology, Atlanta, GA

771 **Enzymatic pH Control enables Spatially Controlled CaP Deposition onto Micropatterned Surfaces**
A. W. G. Nijhuis, Radboud University Nijmegen Medical Center, Nijmegen, Netherlands

772 **An Approach for Assessing Scaffold Hydrophobicity**
D. Munoz-Pinto, Rensselaer Polytechnic Institute, Troy, NY
B. Grigoryan, Texas A&M University, College Station, Texas
M. Grunlan, Texas A&M University, College Station, Texas
M. S. Hahn, Rensselaer Polytechnic Institute, Troy, New York

773 **Surface Functionalization of Cobalt-Chromium Alloy Using Phosphoric and Phosphonoacetic Acids**
E. Thiruppathi, The University of South Dakota, Sioux Falls, SD
J. Peacock, The University of South Dakota, Sioux Falls, South Dakota
G. Mani, The University of South Dakota, Sioux Falls, South Dakota

774 **Surface roughness properties of a micro-textured carbide-coated CoCrMo implant alloy during wear**
G. Ettienne-Modeste, University of Maryland, Baltimore County, Nottingham, MD

775 **Surface modification of poly(D,L-lactic acid) scaffolds for orthopedic applications: a non-destructive route via diazonium chemistry**
H. Mahjoubi, McGill University, Montreal, QC, Canada
M. Cerruti, McGill University, Montreal, Québec, Canada

776 **Nano-structured surface modification on Ti alloy by electron cyclotron resonance plasma oxidation**
H. Masumoto, Tohoku University, Sendai, Japan

777 **Inorganic/Organic Coating Layer to Induce Apatite Formation in DPBS**
I. Lee, Yonsei University, Seoul, Republic of Korea

778 **Preparation and Characterization of Functional Polypyrrole Particles**
J. Mao, Centre de recherché du CHU de Québec, Université Laval, Québec City, QC, Canada

779 **Versatile surface modification of biomaterials using biocompatible and photoreactive phospholipid polymers**
K. Fukazawa, The University of Tokyo, Tokyo, Japan

780 **Flexible Polyetherimide-Silica Hybrid Xerogel Coating on Magnesium**
M. Kang, Department of Materials Science and Engineering, Seoul National University, Seoul, Republic of Korea, Seoul, Republic of Korea

781 **QCM-D as an useful tool for the combined immobilization of cell adhesion peptide and growth factor on biomaterial surfaces.**
P. Thalla, École de technologie supérieure (ÉTS), Montreal, QC, Canada

782 **Tricalcium phosphate embedded poly(vinylidene fluoride) coating on magnesium for biomedical applications**
S. Kim, WCU Hybrid Materials Program, Department of Materials Science and Engineering, Seoul National University, Seoul, Korea., Seoul, Republic of Korea
H. Park, WCU Hybrid Materials Program, Department of Materials Science and Engineering, Seoul National University, Seoul, Korea, Seoul, Republic of Korea

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

N/A **Evaluating the Level of Adhesion and Optimizing Thermal Bonding between Nitinol Wire and Thermoplastic Polymer films**
S. Navada, College of Textiles,North Carolina State University, Raleigh, NC

784 **Evaluating the Level of Adhesion and Optimizing Thermal Bonding between Nitinol Wire and Thermoplastic Polymer Films.**
S. Navada, College of Textiles, North Carolina State University, Raleigh, NC

785 **Regulating Smooth Muscle Cells on Poly(ethylene glycol)-grafted Poly(epsilon-caprolactone) Networks**
S. Wang, The University of Tennessee, Knoxville, TN
X. Liu, The University of Tennessee, Knoxville, Tennessee

786 **Versatile surface functionalization of inorganic materials with cyclic phosphoesters**
Y. Iwasaki, Kansai University, Osaka, Japan
Y. Yamamoto, Kansai University, Osaka, Japan
T. Shimomura, Kansai University, Osaka, Japan

787 **Facile method of preparing of temperature-responsive cell culture surface by using photoinitiator immobilized polystyrene surfaces**
Y. AKIYAMA, Tokyo Women's Medical University, Tokyo, Japan

788 **Shear Stress-dependent Cell Detachment from Temperature-responsive Cell Culture Surfaces in Microfluidic Device**
Z. Tang, Institute of Advanced Biomedical Engineering and Science, TWIns, Tokyo Women's Medical University, Tokyo, Japan
Z. Tang, Institute of Advanced Biomedical Engineering and Science, TWIns, Tokyo Women's Medical University, Tokyo, Japan
Y. Akiyama, Institute of Advanced Biomedical Engineering and Science, TWIns, Tokyo Women's Medical University, Tokyo, Japan
K. Itoga, Institute of Advanced Biomedical Engineering and Science, TWIns, Tokyo Women's Medical University, Tokyo, Japan
J. Kobayashi, Institute of Advanced Biomedical Engineering and Science, TWIns, Tokyo Women's Medical University, Tokyo, Japan
T. Okano, Institute of Advanced Biomedical Engineering and Science, TWIns, Tokyo Women's Medical University, Tokyo, Japan

958 **Microporous Ti implant compact coated with hydroxyapatite produced by electro-discharge-sintering and electrostatic-spray-deposition**
Y. Jo, Sejong University, Seoul, Republic of Korea
W. Lee, Sejong University, Seoul, Republic of Korea
S. Cheon, Sejong University, Seoul, Republic of Korea
Y. Jo, Sejong University, Seoul, Republic of Korea
Y. Kim, wonkwang health science university, Jeonbuk, Republic of Korea

959 **Surface Micromechanical Testing Methods for Contact Lenses: Indentation, Friction and Dehydration**
J. L. Gilbert, Syracuse University, Syracuse, NY
E. A. Lewis, Syracuse University, Syracuse, New York

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960 **Angiotensin II-functionalized Quantum Dot Interactions with Cells**
A. Goepferich, University of Regensburg, Regensburg, Germany

961 **Modifying the Surface Chemistry of pH-Responsive Expansile Nanoparticles for Altered Circulation, Targeting and Efficacy Towards Cancer**
M. Stolzoff, Boston University, Boston, MA
A. H. Colby, Boston University, Boston, Massachusetts
C. Ghobril, Boston University, Boston, Massachusetts
J. S. Hersey, Boston University, Boston, Massachusetts
Y. L. Colson, Brigham and Women's Hospital, Boston, Massachusetts
T. M. Porter, Boston University, Boston, Massachusetts
M. W. Grinstaff, Boston University, Boston, Massachusetts

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789 **Targeted Inhibition of HIV-1 Utilizing a Bioengineered Nanofibrous Polyester Material**
J. Araya, Northeastern University, Ashland, MA
L. Fitzgerald, Biosurfaces, Inc., Ashland, Massachusetts
T. Phaneuf, Biosurfaces, Inc., Ashland, Massachusetts
S. Pathan, Biosurfaces, Inc., Ashland, Massachusetts
D. Nelson, Biosurfaces, Inc., Ashland, Massachusetts
D. Thoresen, Saint Michael's College, Ashland, Massachusetts
M. Bide, University of Rhode Island, Ashland, Massachusetts
T. Phaneuf, Biosurfaces, Inc., Ashland, Massachusetts
M. Phaneuf, Biosurfaces, Inc., Ashland, Massachusetts

790 **Functionalized polyanhydride nanoparticles preserve protein stability and activate antigen presenting cells**
J. E. Vela Ramirez, Iowa State University, Ames, IA
R. Roychoudhury, Indiana University, Bloomington, Indiana
H. Habte, Iowa State University, Ames, Iowa
M. Cho, Iowa State University, Ames, Iowa
N. Pohl, Indiana University, Bloomington, Indiana
M. Wannemuehler, Iowa State University, Ames, Iowa
B. Narasimhan, Iowa State University, Ames, Iowa

791 **Functionalization of Pentablock Copolymers with Pathogen-Mimicking Sugars for Targeted Delivery**
J. Adams, Iowa State University, Ames, IA
S. Mallapragada, Iowa State University, Ames, Iowa
N. Pohl, Indiana University, Bloomington, Indiana
M. Goswami, Iowa State University, Ames, Iowa

792 **Selective Deposition of Conductive Polymer Films Using Agarose Stamps**
E. E. Richards, The Pennsylvania State University, University Park, PA
N. Madduri, The Pennsylvania State University, University Park, Pennsylvania
M. R. Abidian, The Pennsylvania State University, University Park, Pennsylvania
S. Majd, The Pennsylvania State University, University Park, Pennsylvania

793 **Mechanical Properties of Triclosan Containing Sol-gel Thin Films on Titanium Alloy**
H. Qu, University of Pennsylvania, Philadelphia, PA

794 **A Strongly Adherent, Biocompatible, Efficacious Antimicrobial Coating for Orthopedic Implants**
M. A. Schallenberger, Bacterin International, Inc., Belgrade, MT
T. R. Meyer, Bacterin International, Inc., Belgrade, Montana
H. M. Lovick, Bacterin International, Inc., Belgrade, Montana

795 **Lower critical solution temperature of copolymers of N-vinyl-2-caprolactam and its derivative: effects of pH and polymer compositions**
S. Tang, University of Tennessee, Knoxville, Knoxville, TN
Y. Cao, University of Tennessee, Knoxville, Tennessee
S. Goddard, University of Tennessee, Knoxville, Knoxville, Tennessee
W. He, University of Tennessee, Knoxville, Knoxville, Tennessee

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N/A **Comparison of Commercially Available Wound Drains in a Bacterial Migration Assay and Agar Infection Model**
D. X. Denty, Bacterin International Inc., Belgrade, MT
M. A. Schallenberger, Bacterin international Inc., Belgrade, Montana
T. R. Meyer, Bacterin International Inc., Belgrade, Montana

797 **A Thermodynamic Approach to Engineering Antifouling Surfaces**
J. T. Decker, University of Florida, Gainesville, FL
C. M. Kirschner, University of Florida, Boulder, Colorado
C. Long, University of Florida, Gainesville, Florida
J. Finlay, University of Birmingham, Birmingham, United Kingdom (Great Britain)
M. Callow, University of Birmingham, Birmingham, United Kingdom (Great Britain)
J. Callow, University of Birmingham, Birmingham, United Kingdom (Great Britain)
A. Brennan, University of Florida, Gainesville, Florida

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Q. Wang, Northeastern Univeristy, Boston, MA

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799 **A Preliminary Study on Effects of Cyclic Loading and In Vitro Degradation on Mesh Porosity**
M. Deng, Johnson & Johnson Global Surgery Group, Somerville, NJ
V. Zhou, Johnson & Johnson, Somerville, New Jersey
E. Vailhe, Johnson & Johnson, Somerville, New Jersey
J. Flint, Johnson & Johnson, Somerville, New Jersey
M. Deng, Johnson & Johnson, Somerville, New Jersey

The Role of Antioxidants in Biomaterials

803 **Electron Beam Warm Irradiation Improves Oxidative Resistance and Grafting of Blended Vitamin E Polyethylene**

D. Pletcher, Zimmer, Inc., Warsaw, IN
M. Guo, Zimmer, Inc., Warsaw, Indiana
A. Rufner, Zimmer, Inc., Warsaw, Indiana

804 **Effects of Natural Antioxidants on Polyethylene Radicals in UHMWPE**
M. S. Jahan, University of Memphis, Memphis, TN
B. Walters, University of Memphis, Memphis, Tennessee
A. Ali, AgResearch Ltd., Christchurch, New Zealand
A. Ghosh, AgResearch Ltd., Christchurch, New Zealand

805 **Effect of Vitamin C on the Growth of Endothelial Cells for Stent and Vascular Graft Applications**
S. Kakade, The University of South Dakota, Sioux Falls, SD
G. Mani, The University of South Dakota, Sioux Falls, South Dakota

962 **Evaluation of Oxidation Induction Time as a Tool for Characterization of AO Content**
M. A. Ross, DePuy Synthes Joint Reconstruction, Warsaw, IN
V. S. Narayan, DePuy Synthes Joint Reconstruction, Warsaw, Indiana

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806 **Enzymatic Treatment of Minced Porcine Cartilage Improves Cellular Outgrowth and GAG Production in 3D in vitro Cultures**
A. J. McNally, Exactech, Inc., Gainesville, FL
C. Chapman, Exactech, Inc., Gainesville, Florida
K. Sly, Exactech, Inc., Gainesville, Florida
S. Lin, Exactech, Inc., Gainesville, Florida

807 **The Effect of Adding a Hydrogel Porogen into a Poly(lactic-co-glycolic acid) Scaffold**
A. Clark, University of Kentucky, Lexington, KY

808 **Electrospinning of Chitosan and its Correlation with Degree of Deacetylation and Rheological Property**
A. Nandgaonkar, North Carolina State University, Raleigh, NC
W. Krause, North Carolina State University, Raleigh, North Carolina

809 **Enhanced cell proliferation on controlled pore size of chitosan nanofibers mat**
B. Gu, Korea Institute of Radiological and Medical Science, Seoul, Republic of Korea
S. Park, Korea Institute of Radiological and Medical Science, Seoul, Republic of Korea
M. Kim, Korea Institute of Radiological and Medical Science, Seoul, Republic of Korea
C. Kim, Korea Institute of Radiological and Medical Science, Seoul, Republic of Korea

N/A **Scaffold-mediated REST siRNA delivery of mussel-inspired nanofibers induces neuronal differentiation of stem cells**
C. Sing Yian, Nanyang Technological University, Singapore, Singapore
P. Rujitanaroj, Nanyang Technological University, Singapore, Singapore
W. Low, Nanyang Technological University, Singapore, Singapore
K. Jinghao, Northwestern University, Evanston, Illinois
L. Dong-Keun, Northwestern University, Evanston, Illinois
P. B. Messersmith, Northwestern University, Evanston, Illinois

811 **Surface Modification of Poly(ε-caprolactone) Scaffolds Fabricated via Selective Laser**

Sintering for Cartilage Regeneration in Craniofacial Surgery
C. Chen, Department of Chemical and Materials Engineering, Chang Gung University, Tao-Yuan 33302, Taiwan, ROC, Tao-Yuan, Taiwan

812 **Liquified Capsules Encapsulating Microparticles to Provide Cell Adhesion Sites Enhance Cellular Functions**
C. R. Correia, 3B's Research Group - Biomaterials, Biodegradables and Biomimetics, University of Minho, Guimarães, Portugal
R. L. Reis, 3B's Research Group – Biomaterials, Biodegradables and Biomimetics, University of Minho, Guimarães, Portugal
J. F. Mano, 3B's Research Group – Biomaterials, Biodegradables and Biomimetics, University of Minho, Guimarães, Portugal

813 **Poly(butylene succinate) and poly(3-hydroxybutyrate-co-3-hydroxyvalerate) blend nanofibers for skin tissue engineering**
D. Sundaramurthi, SASTRA University, Thanjavur, India
U. Krishnan, SASTRA University, Thanjavur, India
S. Sethuraman, SASTRA University, Thanjavur, India

814 **Gelatin-based Hydrogels as Potential Cellular Delivery Systems for Cardiac Tissue Engineering**
G. Camci-Unal, Harvard Medical School, Cambridge, MA
N. Alemdar, Harvard Medical School, Cambridge, Massachusetts
A. Khademhosseini, Harvard Medical School, Cambridge, Massachusetts

815 **Fabrication of Anisotropic Cell Sheets for Designing Well-organized Myotube Assembly**
H. Takahashi, Tokyo Women's Medical University, Tokyo, Japan

816 **Co-culture of Human Gingival Fibroblasts and Vascular Endothelial Cells in a Perfused Degradable/Polar/Hydrophobic/Ionic Polyurethane (D-PHI)**
J. W. C. Cheung, University of Toronto, Toronto, ON, Canada
C. A. G. McCulloch, University of Toronto, Toronto, Ontario, Canada
J. Santerre, University of Toronto, Toronto, Ontario, Canada

817 **Development of Interconnected PolyHIPEs for Injectable Bone Grafts**
J. L. Robinson, Texas A&M University, College Station, TX
R. S. Moglia, Texas A&M University, College Station, Texas
M. C. Stuebben, Texas A&M University, College Station, Texas
M. A. P. McEnery, Texas A&M University, College Station, Texas
E. Cosgriff-Hernandez, Texas A&M University, College Station, Texas

818 **Effects of Low Oxygen Tension during Expansion on Chondrogenic Potential of Osteoarthritis Chondrocytes**
J. Wang, Syracuse Biomaterials Institute and the Department of Biomedical and Chemical Engineering, Syracuse University, Syracuse, NY
K. Davis, Syracuse Biomaterials Institute and the Department of Biomedical and Chemical Engineering Syracuse University, Syracuse, New York
J. Henderson, Syracuse Biomaterials Institute and the Department of Biomedical and Chemical Engineering Syracuse University, Syracuse, New York

819 **Tyrosine-Derived Polycarbonates to Treat a Rabbit Critical-Sized Segmental Bone Defect**
J. Kim, Hongik University, Sejong, Republic of Korea

820 **Nanocomposite Bone Scaffolds Based on Biodegradable Polymers and Hydroxyapatite**
M. Dadsetan, Mayo Clinic, College of Medicine, Rochester MN; Paracelsus Medical University, Salzburg, Austria, Rochester, MN

821 **Decellularized Human Vocal Fold as a Scaffold for Laryngeal Tissue Engineering**
J. R. Tse, University of California, Los Angeles, Cerritos, CA
J. L. Long, University of California, Los Angeles, Los Angeles, California

822 **Tissue Engineered Model of the Inner Neural Retina**
K. E. Kador, Bascom Palmer Eye Institute,University of Miami Miller School of Medicine, Miami, FL
P. Venugopalan, Bascom Palmer Eye Institute,University of Miami Miller School of Medicine, Miami, Florida
R. B. Montero, University of Miami, Coral Gables, Florida
J. Hertz, Bascom Palmer Eye Institute,University of Miami Miller School of Medicine, Miami, Florida
E. Lavik, Case Western Reserve University, Cleveland, Ohio
F. Andreopoulos, University of Miami, Coral Gables, Florida
J. L. Goldberg, Bascom Palmer Eye Institute,University of Miami Miller School of Medicine, Miami, Florida

823 **hMSC and Fibroblast Dispersion Cultures in Chitosan-based Injectable Hydrogels for Cartilage Regeneration**
K. J. Walker, Oklahoma State University, Stillwater, OK
S. V. Madihally, Oklahoma State University, Stillwater, Oklahoma

824 **In Situ Crosslinkable Gelatin Hydrogel for Ex Vivo Organ Culture of Cardiac Tissue**
K. Park, Ajou University, Suwon, Republic of Korea
K. Park, Ajou University, Suwon, Republic of Korea
Y. Lee, Ajou University, Suwon, Republic of Korea
J. Son, Ajou University, Suwon, Republic of Korea
Y. Yang, Inje University School of Medicine, Busan, Republic of Korea

825 **Preparation and characterization of soft tissue-polymer complex for percutaneous device**
K. Nam, Tokyo Medical and Dental University, Tokyo, Japan
R. Matsushima, Tokyo Medical and Dental University, Tokyo, Japan
Y. Shimatsu, Tokyo Medical and Dental University, Tokyo, Japan
T. Kimura, Tokyo Medical and Dental University, Tokyo, Japan
T. Fujisato, Osaka Institute of Technology, Osaka, Japan
A. Kishida, Tokyo Medical and Dental University, Tokyo, Japan

826 **Smooth Muscle Cell Migration in 3D Biomimetic Poly(ethylene glycol) Hydrogels**
L. Lin, Case Western Reserve University, Cleveland Heights, OH
J. Zhu, Case Western Reserve University, Cleveland, Ohio
K. Kottke-Marchant, Cleveland Clicnic, Cleveland, Ohio
R. Marchant, Case Western Reserve University, Cleveland, Ohio

827 **Responses of Vascular Endothelial Cells to Photo-embossed Topography on Polymer Films and Fibers**
L. Qiu, Institute of Bioengineering, Queen Mary, University of London, London, United Kingdom, London, United Kingdom (Great Britain)

828 **Pre-vascularized Gellan Gum-Hyaluronic Acid Spongy-like Hydrogels improve Skin wound healing**

M. T. Cerqueira, 3B's Research Group, University of Minho, Caldas das Taipas, Guimarães, Portugal
L. da Silva, 3B's Research Group, University of Minho, Caldas das Taipas, Guimarães, Portugal
T. Santos, 3B's Research Group, University of MInho, Caldas das Taipas, Guimarães, Portugal
R. Pirraco, 3B's Research Group, University of Minho, Caldas das Taipas, Guimarães, Portugal
A. Martins, 3B's Research Group, University of Minho, Caldas das Taipas, Guimarães, Portugal
V. Correlo, 3B's Research Group, University of Minho, Caldas das Taipas, Guimarães, Portugal
A. P. Marques, 3B's Research Group, University of Minho, Caldas das Taipas, Guimarães, Portugal
R. L. Reis, 3B's Research Group, University of Minho, Caldas das Taipas, Guimarães, Portugal

829 **A new technique for Development of perfusable multilayered blood vessel-like structures on Microfluidic Chip**
M. Hasan, Harvard Medical School, Cambridge, MA
G. Jeong, Harvard Medical School, Cambridge, Massachusetts

830 **Processing and Storage Effects on Poly(ethylene glycol) Hydrogel Mechanical Properties and Bioactivity**
P. Luong, Texas A&M University, College Station, TX
M. Browning, Texas A&M University, College Station, Texas
R. Bixler, Texas A&M University, College Station, Texas
E. Cosgriff-Hernandez, Texas A&M University, College Station, Texas

831 **Designing Degradable Microporous Bacterial Cellulose Scaffolds and its Biomimetic Composites for Bone and Cartilage Tissue Engineering**
P. Favi, University of Tennessee - Knoxville, Knoxville, TN

832 **Structural and Compositional Changes of Porcine Articular Cartilage After Partial Enzymatic Digestion**
P. Lee, Exactech Taiwan, Hsinchu, Taiwan
C. Chen, Exactech Taiwan, Hsinchu, Taiwan
K. Sly, Exactech Inc., Gainesville, Florida
S. Lin, Exactech Inc., Gainesville, Florida

833 **Development of poly(3-hydroxybutyrate-co-3-hydroxyvalerate) nanofibrous scaffold for esophageal tissue engineering**
P. Kuppan, SASTRA University, Thanjavur, India
S. Sethuraman, SASTRA University, Thanjavur, India
U. Krishnan, SASTRA University, Thanjavur, India

834 **Mechanical properties of stem cells from different sources during vascular smooth muscle cell differentiation**
R. Chen, Clemson University, Clemson, SC
D. Dean, Clemson University, Clemson, South Carolina

835 **Combination Delivery of Small RNAs Enhances Muscle Regeneration**
S. Lee, Wake Forest School of Medicine, Winston-Salem, NC
N. Kim, Wake Forest School of Medicine, Winston-Salem, North Carolina

836 **Host Stem Cell Mobilization for In Situ Muscle Tissue Regeneration**
S. Lee, Wake Forest School of Medicine, Winston-Salem, NC

837 **Biomechanics and Bioresorbable Material Study toward Pelvic Organ Prolapse Corrective Mesh Design**

S. Aghyarian, Department of Chemistry and The Alan G. MacDiarmid NanoTech Institute, The University of Texas at Dallas, Richardson, TX
C. Manz, Department of Materials Science and Engineering, The University of Texas at Dallas, Richardson, Texas
A. Pereira, Department of Chemistry and The Alan G. MacDiarmid NanoTech Institute, The University of Texas at Dallas, Richardson, Texas
N. Mammoottil, Department of Chemistry and The Alan G. MacDiarmid NanoTech Institute, The University of Texas at Dallas, Richardsoon, Texas
C. Watson, Department of Chemistry and The Alan G. MacDiarmid NanoTech Institute, The University of Texas at Dallas, Rchardson, Texas
B. Lund, Department of Chemistry and The Alan G. MacDiarmid NanoTech Institute, The University of Texas at Dallas, Richardson, Texas
P. Zimmern, Department of Urology, The University of Texas Southwestern Medical Center, Dallas, Texas
R. Eberhart, Department of Urology, The University of Texas Southwestern Medical Center, Dallas, Texas
H. Tibbals, Department of Urology, The University of Texas Southwestern Medical Center, Dallas, Texas
W. Voit, Department of Materials Science and Engineering, The University of Texas at Dallas; Department of Urology, The University of Texas Southwestern Medical Center, Dallas, TX 75390 4Department of Mechanical Engineering, The University of Texas at Dallas, Richardson, Texas
D. Smith, Department of Chemistry and The Alan G. MacDiarmid NanoTech Institute, The University of Texas at Dallas; Department of Materials Science and Engineering, The University of Texas at Dallas, Richardson, Texas

838 **Structural Deformation Studies of Scaffolds and Method for Non-Invasively Monitoring Tissue Growth**
S. Madihally, Oklahoma State University, Stillwater, OK
J. Podichetty Thribhuvan, Oklahoma State University, Stillwater, Oklahoma

839 **Enhancing Segmental Defect Regeneration through a Thrombopoietic Agent**
T. G. Chu, Indiana University School of Dentistry, Indianapolis, IN

840 **Preparation and Characterization of Porcine Esophageal Extracellular Matrix**
T. Keane, University of Pittsburgh, Pittsburgh, PA
R. Londono, University of Pittsburgh, Piitsburgh, Pennsylvania
R. Carey, University of Pennsylvania, Pittsburgh, Pennsylvania
J. Reing, University of Pittsburgh, Pittsburgh, Pennsylvania
S. F. Badylak, University of Pittsburgh, Pittsburgh, Pennsylvania

841 **Platelet-Derived Growth Factor Stimulated Migration of Bone Marrow Mesenchymal Stem Cells into an Injectable Gelatin-Hydroxyphenylpropionic Acid Hydrogel**
W. Niu, VA Boston Healthcare System, Brigham and Women's Hospital, Boston, MA

842 **Conductive Fabrics for Electrically Stimulated Cell Culture**
Y. Wang, Laval University, Quebec, QC, Canada
M. Rouabhia, Laval University, Québec, Québec, Canada
Z. Zhang, Laval University, Québec, Québec, Canada

843 **Rapid Formation of Engineered Microvasculatures Using Microfluidic Techniques**
Y. T. Matsunaga, The University of Tokyo, Tokyo, Japan
N. Brandenberg, The University of Tokyo, Tokyo, Japan
I. Matsuda, The University of Tokyo, Tokyo, Japan

M. Umezu, Waseda University, Tokyo, Japan
Y. Okubo, The University of Tokyo, Tokyo, Japan

844 **In Situ Forming Gelatin-Based Bioadhesive and Sprayable Hydrogels for Skin Regeneration**
Y. Lee, Ajou University, Suwon, Republic of Korea
J. Bae, Ajou University, Suwon, Republic of Korea
K. Park, Ajou University, Suwon, Republic of Korea

845 **Minimally Invasive Spine Fracture Risk Prediction Based on QCT and Image Analysis**
Z. Fang, Mayo Clinic, Rochester, MN

963 **Small diameter acellular vascular grafts with integrin a4b1 positive cell-caputuring surface**
T. YAMAOKA, National Cerebral and Cardiovascular Center Research Institute, Suita, Japan
S. Somekawa, National Cerebral and Cardiovascular Center Research Institute, Suita, Japan
N. Kobayashi, National Cerebral and Cardiovascular Center Research Institute, Suita, Japan
Y. Hirano, Kansai University, Suita, Japan
N. Mihashi, National Cerebral and Cardiovascular Center Research Institute, Suita, Japan
T. Sakuma, National Cerebral and Cardiovascular Center Research Institute, Suita, Japan
T. Moritan, Suzuka University of Medical Science, SuzukaSuzuka, Japan
Y. Kimura, Kyoto Institute of Technology, Kyoto, Japan
T. Fujisato, Osaka Institute of Technology, Osaka, Japan
A. Mahara, National Cerebral and Cardiovascular Center Research Institute, Suita, Japan

Translational Research in Nano-biomaterials

846 **Histologic and Histomorphometric Analysis of Two Graft Materials in a Non-instrumented Canine Interspinous Spinal Fusion Model**
A. S. Ismailoglu, NuVasive Inc., San Diego, CA
H. Yuan, University of Twente, Enschede, Netherlands
F. Vizesi, NuVasive Inc., San Diego, California
X. Luo, University of Twente, Enschede, Netherlands
J. de Bruijn, University of Twente, Enschede, Netherlands
E. Erbe, NuVasive Inc., San Diego, California

847 **Characterization of Porcine Vascular Tissue and Gold Nanoparticles as a Vascular Graft Material**
A. M. Ostdiek, University of Missouri, Columbia, MO
S. Grant, University of Missouri, Columbia, Missouri

848 **Carbon Nanotube-Polyimide Composite Microneedles for Rapid Transdermal Drug Delivery**
B. J. Lyon, California Institute of Technology, Pasadena, CA
A. Aria, California Institute of Technology, Pasadena, California
M. Gharib, California Institute of Technology, Pasadena, California

849 **Nanosilver Surfaces for Improved Understanding of Biocompatibility and Antibacterial Efficacy of Medical Device Coatings**
E. M. Sussman, U.S. Food and Drug Administration, Silver Spring, MD
B. J. Casey, U.S. Food and Drug Administration, Silver Spring, Maryland
J. Zheng, U.S. Food and Drug Administration, Silver Spring, Maryland
B. J. Dair, U.S. Food and Drug Administration, Silver Spring, Maryland
D. V. Patwardhan, U.S. Food and Drug Administration, Silver Spring, Maryland

850 **Microwave Assisted Synthesis of Alkaline Earth Phosphates Nanospheres**
H. Zhou, The University of Toledo, Toledo, OH
S. B. Bhaduri, The University of Toledo, Toledo, Ohio
T. J. F. Luchini, The University of Toledo, Toledo, Ohio

851 **Microwave Assisted Alkaline Earth Phosphate Biomimetic Coating Deposition on Implants**
H. Zhou, The University of Toledo, Toledo, OH
V. K. Goel, University of Toledo, Toledo, Ohio
S. B. Bhaduri, The University of Toledo, Toledo, Ohio

852 **Auricular Reconstruction with a Novel Nanocomposite Scaffold**
L. Nayyer, Univeresity College London (UCL), London, United Kingdom (Great Britain)

853 **Fabrication of Novel Polylactic Acid/Amorphous Magnesium Phosphate Bionanocomposite Fibers for Tissue Engineering Applications via Electrospinning**
M. Nabiyouni, University of Toledo, Toledo, OH

854 **Regulation of Human Tendon Fibroblast Response by Fiber Diameter of Electrospun Polymer Scaffolds**
N. M. Lee, Columbia University, New York, NY
C. Erisken, Columbia University, New York, New York
W. N. Levine, Columbia University, New York, New York
H. H. Lu, Columbia University, New York, New York

855 **Nano-grafts for Anterior Cruciate Ligament Reconstruction**
S. E. Smith, University of Missouri, Columbia, MO
S. Grant, University of Missouri, Columbia, Missouri
R. White, University of Missouri, Columbia, Missouri

Tribocorrosion of Metallic Biomaterials

856 **Factors Affecting the Performance of Metal Components in Artificial Hips**
O. Vesnovsky, U.S. Food and Drug Administration, Silver Spring, MD
N. P. Anderson, U.S. Food and Drug Administration, Silver Spring, Maryland
M. A. Di Prima, U.S. Food and Drug Administration, Silver Spring, Maryland
C. A. Engh, Jr., Anderson Orthopaedic Institute, Alexandria, Virginia
L. W. Grossman, U.S. Food and Drug Administration, Silver Spring, Maryland
R. Hopper, Anderson Orthopaedic Institute, Alexandria, Virginia
B. Stephen, U.S. Food and Drug Administration, Silver Spring, Maryland
L. Topoleski, University of Maryland Baltimore County, Baltimore, Maryland

Wound Dressings That Do More Than Covering the Wounds

857 **Development of Vancomycin-Linked Poly(β-amino ester) Hydrogels**
A. Vasilakes, University of Kentucky, Lexington, KY
D. Puleo, University of Kentucky, Lexington, Kentucky
J. Hilt, University of Kentucky, Lexington, Kentucky
T. Dziubla, University of Kentucky, Lexington, Kentucky

858 **Dynamic Biomaterials for Healing Chronic Wounds**

B. D. Almquist, MIT, Cambridge, MA
S. Castleberry, MIT, Cambridge, Massachusetts
P. T. Hammond, MIT, Cambridge, Massachusetts

859 **Multivalent Sonic Hedgehog-Hyaluronic Acid Conjugates for Enhanced Neovascularization During Diabetic Wound Healing**
B. W. Han, University of California, Berkeley, Berkeley, CA
W. Jackson, University of California, Berkeley, Berkeley, California
H. Layman, University of California, San Francisco, San Fancisco, California
N. A. Rode, University of California, Berkeley, Berkeley, California
D. Dashti, University of California, Berkeley, Berkeley, California
A. Conway, University of California, Berkeley, Berkeley, California
N. Boudreau, University of California, San Francisco, San Francisco, California
D. Schaffer, University of California, Berkeley, Berkeley, California
K. E. Healy, University of California, Berkeley, Berkeley, California

860 **Decellularized Extracellular Matrix Microparticles Support Fibroblast Growth and are a Vehicle for Cellular Delivery in a Model of Anastomosis Healing**
D. Hoganson, Washington University in St. Louis, St. Louis, MO
G. E. Owens, California Institute of Technology, Pasadena, California
E. K. Bassett, Massachusetts General Hospital, Boston, Massachusetts
A. M. Meppelink, Massachusetts General Hospital, Boston, Massachusetts
C. Bowley, DSM Biomedical, Exton, Pennsylvania
C. J. Hinkel, Washington University in St. Louis, St. Louis, Missouri
E. B. Finkelstein, Syracuse University, Syracuse, New York
S. M. Goldman, DSM Biomedical, Exton, Pennsylvania
J. P. Vacanti, Massachusetts General Hospital, Boston, Massachusetts

861 **Development of Supercritical CO2-Treated Human Amniotic Membrane Combined with Adipose Derived Stem Cells for Wound Treatment**
J. Wehmeyer, U.S. Army Institute of Surgical Research, Fort Sam Houston, TX

862 **Development of modified collagen films containing red propolis extracts to wound healing application**
J. C. Cardoso, Universidade Tiradentes, Watertown, MA

863 **Controlling the Delivery of Vascular Endothelial Growth Factor and Platelet Derived Growth Factor**
L. Kelly, University of Sheffield, Sheffield, United Kingdom (Great Britain)
L. Platt, University of Sheffield, Sheffield, United Kingdom (Great Britain)
S. MacNeil, University of Sheffield, Sheffield, United Kingdom (Great Britain)
P. Genever, University of York, York, United Kingdom (Great Britain)
S. Rimmer, University of Sheffield, Sheffield, United Kingdom (Great Britain)

864 **AnastomoSEAL – Biopolymeric patches for the treatment of colorectal anastomosis**
M. Dornish, FMC BioPolymer AS, Sandvika, Norway
S. Paolettk, University of Trieste, Trieste, Italy
N. Bouvy, University of Maastricht, Maastricht, Netherlands
M. Bosco, SIGEA SRL, Trieste, Italy
M. Foulc, RESCOLL, Pessac, France
W. Fediuk, I.E. "IMPULS", Gdansk, Poland

865 **Absorbable Polyurethanes for Wound Healing Applications**

N. Srivastava, Bezwada Biomedical, LLC, Hillsborough, NJ

866 **Factors Associated with the Ideal Donor Site Dressing for Burn Patients after Split-Thickness Skin Grafting**
R. Jindani, North Carolina State University, Raleigh, NC

867 **Development of Mucoadhesive Films with Increased Residence Time for Treatment of Local Disorders**
S. k. RAMINENI, University Of Kentucky, Lexington, KY, KY

868 **Layer-by-Layer Delivery of siRNA**
S. Castleberry, Massachusetts Institute of Technology, Cambridge, MA
P. Hammond, Massachusetts Institute of Technology, Cambridge, Massachusetts

869 **Wound healing processes using Punica granatum Linn extracts incorporated in collagen based films**
W. A. Araujo, Universidade Tiradentes, Watertown, MA

964 **Antibacterial microfilm dressing with silver-nanoparticles promotes healing of contaminated excisional wounds**
A. Agarwal, Imbed Biosciences Inc, Madison, WI
T. B. Nelson, Imbed Biosciences, Inc, Madison, Wisconsin
P. R. Kierski, University of Wisconsin-Madison, Madison, Wisconsin
M. Budianto, University of Wisconsin-Madison, Madison, Wisconsin
C. J. Murphy, University of California, Davis, Davis, California
M. J. Schurr, University of Colorado, Denver, Aurora, Colorado
C. J. Czuprynski, University of Wisconsin-Madison, Madison, Wisconsin
N. L. Abbott, University of Wisconsin-Madison, Madison, Wisconsin
J. F. McAnulty, University of Wisconsin-Madison, Madison, Wisconsin

965 **Evaluating Performance of Hydrogel-Based Adhesives for Soft Tissue Applications**
L. Sanders, Clemson University, Clemson, SC

966 **Use of Tryptophan to Prevent Pseudomonas aeruginosa Biofilm Growth on Wound Dressings**
K. S. Brandenburg, University of Wisconsin-Madison, Madison, WI
J. F. McAnulty, University of Wisconsin-Madison, Madison, Wisconsin
N. L. Abbott, University of Wisconsin-Madison, Madison, Wisconsin
C. J. Murphy, University of California-Davis, Davis, California
M. J. Schurr, University of Colorado-Denver, Aurora, Colorado
N. Shah, University of California-Davis, Davis, California
A. Agarwal, Imbed Biosicences Inc, Madison, Wisconsin
C. J. Czuprynski, University of Wisconsin-Madison, Madison, Wisconsin

967 **Dendritic Hydrogels as Portable Systems for Hemostasis of Abdominal and Extremity Wounds**
C. Ghobril, Boston University, Boston, MA
A. Nazarian, Beth Israel Deaconess Medical Center, Boston, Massachusetts
E. Rodriguez, Beth Israel Deaconess Medical Center, Boston, Massachusetts
M. Grinstaff, Boston University, Boston, Massachusetts

Plenary Papers