

# **BioInterface Symposium and Workshop Abstracts 2011**

**(BioInterface 2011)**

**Bloomington, Minnesota, USA  
24-26 October 2011**

**ISBN: 978-1-61839-447-7**

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright© (2011) by the Surfaces in Biomaterials Foundation  
All rights reserved.

Printed by Curran Associates, Inc. (2012)

For permission requests, please contact the Surfaces in Biomaterials Foundation  
at the address below.

Surfaces in Biomaterials Foundation  
1000 Westgate Drive, Suite 252  
St. Paul, Minnesota 55114

Phone: 651-290-6267

[www.surfaces.org](http://www.surfaces.org)

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2634  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

## TABLE OF CONTENTS

### THE ROLE OF GOVERNMENT IN THE BIOMATERIALS INDUSTRY

Establishment of a Biological Risk Evaluation Program to Meet FDA and Notified Body Requirements and Current Expectations .....	1
<i>Phil Triolo</i>	
The Future of 10993: Review of Proposed ISO 10993 Changes: Blood (10993-4) and Genotoxicity (10993-3) .....	2
<i>Thor Rollins</i>	
Navigating Government Guidances for Developing Combination Products .....	3
<i>Janice Kruse</i>	
Post Approval Changes for PMA Combination Products.....	4
<i>Clark Thompson</i>	
Linking Science and Law — They Move in Different Directions .....	5
<i>Ralph F. Hall</i>	
Relationships and Responsibilities for Complex Products: A Regulator's View.....	6
<i>Susan Alpert</i>	
Extractables and Leachables: What to Do and Why to Do It? .....	7
<i>Roger Pearson</i>	
ODE Update on the 510(k) Program.....	8
<i>Angela Krueger</i>	

### APPLIED TECHNOLOGY WORKSHOPS

Surface and Interface Characterization of Biomedical Materials Using Contact Angle Based Techniques.....	9
<i>Dehua Yang, Ryan Farel</i>	
Identifying, Creating and Commercializing Intellectual Property: Managing Patent Portfolios, Offensive and Defensive Use of Intellectual Property.....	10
<i>Colin Fairman Sr.</i>	
Slippery Wisdom: Some Perspectives on Hydrophilic Coating Projects.....	12
<i>Mark Gross</i>	
Using Materials Characterization to Address Challenges in Biomedical Devices .....	13
<i>John G. Newman</i>	
Keynote Speaker: Controlling Cell Trafficking In Vivo with Biomaterials.....	14
<i>David Mooney</i>	

### IMPROVING HEMOCOMPATIBILITY

From Benchtop To Bedside: The Evolution of a Completely Biological Tissue-Engineered Blood Vessel .....	15
<i>Nicolas L'Heureux</i>	
Adsorption and Hemocompatibility Properties of Elastin-Like Polypeptide Surfaces .....	17
<i>Elizabeth M. Srokowski</i>	
Carboxyl-Ebselen-Based Layer-by-Layer Film: A Potential Antithrombotic and Antimicrobial Coating .....	19
<i>Wenyi Cai</i>	
Surface Modifications with Improved Long-Term Hemocompatibility.....	21
<i>Alonzo Cook</i>	

### MATERIOMICS & CELL BIOMATERIAL INTERACTIONS

Microengineered Hydrogels for Stem Cell Bioengineering and Tissue Regeneration .....	23
<i>Ali Khademhosseini</i>	
Can Cells Read Braille? High Throughput Screening of Topographical Libraries .....	24
<i>Jan de Boer</i>	

<b>Utilizing Dissipative Microbalance Technology (QCM-D) to Quantify Coating Degradation Processes and Elucidate a More Fundamental Understanding of How Blood-Borne Molecules Interact With Implant Coatings .....</b>	25
<i>Mark A. Poggi</i>	
<b>Using Atomic Force Microscopy to Probe Biofilm Cohesion .....</b>	26
<i>Greg Haugstad</i>	

## **HEART VALVES AND TISSUE ENGINEERED DEVICES**

<b>The Future of Heart Valve Surgery .....</b>	28
<i>Ivan Vesely</i>	
<b>Bioprosthetic Heart Valve Materials and Characterization.....</b>	29
<i>Aditee Kurane, Jaishankar Kuttu</i>	
<b>A Tissue-Engineered Aneurysm Model for Evaluation of Endovascular Devices.....</b>	30
<i>Jeremy Touroo</i>	
<b>Nanomechanical and Spectroscopic Characterization of Collagen Tissues in Medical Device Applications.....</b>	32
<i>Jiping Dong</i>	

## **POINT-COUNTERPOINT SESSION**

<b>Point-Counterpoint Topic: Let it Be Resolved That Surface-Immobilized Heparin Cannot Be Made Obsolete; It Will Continue to Be the Most Optimal Blood Compatible Biointerface.....</b>	33
<i>Patrick T. Cahalan, James M. Anderson</i>	

## **VASCULAR STENT AND RELATED**

<b>Imaging the Structural Degradation of Carbon Nanomaterials in the Brain at High Resolution – Considerations for Potential Vascular Applications .....</b>	34
<i>Alexandra Porter</i>	
<b>Bio-Accumulation of Metals in Biological Fluids Resulting from Implants.....</b>	35
<i>Bill Katz</i>	
<b>Engineer Cell-Biomaterial Interface with Hyaluronic Acid.....</b>	36
<i>Chun Wang</i>	
<b>Reactive Block Copolymers for Surface-Functionalization of Biomaterials.....</b>	38
<i>Jeffrey Linhardt</i>	

## **SURGICAL BIOMATERIALS: HEMOSTATS, SEALANTS AND SURGICAL ADHESIVES**

<b>Tissue Sealants, Adhesives, Hemostats and Adhesion Prevention Devices for Improved Surgical Outcomes .....</b>	40
<i>Arthur J. Coury</i>	
<b>Sealing and Healing of Clear Corneal Incisions with a Dextran Aldehyde-PEG Amine Tissue Adhesive .....</b>	41
<i>H. Keith Chenault</i>	
<b>Seprafilm: Chemically Modified HA/CMC for the Prevention of Postsurgical Adhesions .....</b>	42
<i>Thomas H. Jozefiak</i>	
<b>DuraSeal: Surgical Sealant for the Reduction of CSF Leaks in Cranial and Spinal Surgery .....</b>	44
<i>Steven L. Bennett</i>	

## **EXCELLENCE IN SURFACE SCIENCE AWARD**

<b>Responsive Nanoscale Drug Delivery Systems .....</b>	45
<i>Nicholas A. Peppas</i>	

## **CHARACTERIZATION OF BIOMATERIALS**

<b>Navigating Government Guidances for Developing Combination Products .....</b>	46
<i>David G. Castner</i>	
<b>Synchrotron-Based Fourier Transform Infrared Chemical Imaging of Functional SAM and Antibody Biosensor Devices.....</b>	47
<i>Steven L. Goodman</i>	

<b>The Role of Surface Oxide Composition on Albumin and Fibrinogen Adsorption onto Inorganic Combinational Materials .....</b>	49
<i>Lance Lohstreter</i>	
<b>Structure-Property Correlation Using Nanoscale Spectroscopy and Thermal Analysis Methods .....</b>	51
<i>Khoren Sahagian</i>	

## **BIOLOGICAL PERFORMANCE OF MATERIALS**

<b>Chemical Functionalization of PLA Surfaces Enhances Osteogenic Differentiation of MC3T3 Cells .....</b>	53
<i>A. M. C. Barradas</i>	
<b>Bioactive Organic Coatings for Orthopedic Devices.....</b>	55
<i>Val DiTizio</i>	
<b>Non-Adhesive and Antimicrobial Coatings for Medical Implants .....</b>	56
<i>Ton Dirks</i>	
<b>Flexible Patterning of Cellular Microenvironment.....</b>	57
<i>Ruby T.S. Lam</i>	
<b>Author Index</b>	