

BioInterface Symposium and Workshop Abstracts 2010

(BioInterface 2010)

**Atlanta, Georgia, USA
18-20 October 2010**

ISBN: 978-1-61782-915-4

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© (2010) by the Surfaces in Biomaterials Foundation
All rights reserved.

Printed by Curran Associates, Inc. (2011)

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

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
Web: www.proceedings.com

TABLE OF CONTENTS

BIOCOMPATIBILITY (PODIUM AND POSTER SESSION)

| | |
|---|----|
| Protein Sorting on to Patterned Surfaces | 2 |
| <i>David W. Grainger</i> | |
| Analysis of Proteins Associated with the Carmeda Bioactive Surface (CBAS®) After Acute Blood Contact | 4 |
| <i>Roy Biran</i> | |
| Reduced Protein Deposition: A Mechanism for In Vivo Persistence of Heparin Bioactivity on CBAS-ePTFE Vascular Grafts | 5 |
| <i>John L. Fisher</i> | |
| Modification of Surface Oxides on the Newer β Titanium Alloys by Calcium and Phosphorous to Enhance Bone Cell Adhesion for Implant Applications | 6 |
| <i>Rahul Bhola</i> | |
| Validation of Automated Vascularization Analysis at the Tissue-Material Interface | 7 |
| <i>Steven J. Potts</i> | |
| A Comparative Assessment of Corrosion Resistance and Biocompatibility of Ti-Ta Alloys for Orthopedic Implants | 9 |
| <i>Smit Pandya</i> | |
| Methods for Evaluating the Effect of Drug-Eluting Balloons and Other Intravascular Solid Formulation Delivery Systems on Distal Bed Perfusion | 10 |
| <i>Mark E. Smith</i> | |

PREVENTION OF BIOFILM INFECTIONS

| | |
|---|----|
| Biomaterials Approaches to Device-Centered Infection | 13 |
| <i>David W. Grainger</i> | |
| DSM Non-Biofouling Coatings: A Stealth Approach to the Fighting Biofilms | 14 |
| <i>Jens Thies</i> | |
| Biomaterials In a New Role: Treatment and Prevention of Infectious Disease | 17 |
| <i>Robert Ward</i> | |
| In Vivo Antibiotic Release Profile from an Antibiotic Coated Orthopaedic Implant | 18 |
| <i>Claire Kavanagh</i> | |

ADVANCES IN SURFACE ANALYSIS AND SURFACE CHARACTERIZATION

| | |
|--|----|
| Contact Angles at the Macro- and Micro-Level for Assessing Wettability and Surface Free Energy of Dental Biomaterials | 21 |
| <i>Conrado Aparicio</i> | |
| The Effect of Surface Treatment and Manufacturing Techniques on Ti-Ta Alloy | 23 |
| <i>Puneet Gill</i> | |
| The Distortion of Spherical Sessile Drops | 24 |
| <i>C. W. Extrand, Sung In Moon</i> | |
| Helium Ion Microscopy | 26 |
| <i>John A. Notte IV</i> | |

APPLIED TECHNOLOGY WORKSHOPS

| | |
|--|----|
| Plasma Surface Modification for Lifescience Applications: A Technology Review | 28 |
| <i>Demetrius Chrysostomou</i> | |
| Transition Temperature Microscopy: Nanoscale Thermal Analysis Technique | 29 |
| <i>Khoren Sahagian</i> | |
| Silver-Based Antimicrobial Technology for Plastic Devices | 30 |
| <i>Scott Jaynes</i> | |

| | |
|--|----|
| Biochemical Markers in Pre-Clinical Studies | 31 |
| <i>Jaipal Singh</i> | |

KEYNOTE LECTURE

| | |
|---|----|
| Importance of Polymer Biocompatibility for Drug Eluting Stent (DES) Outcomes | 33 |
| <i>Josiah N. "Cy" Wilcox</i> | |

NEW BIOMATERIALS (PODIUM AND POSTER SESSION)

| | |
|--|----|
| New Synthetic Biodegradable Pseudo-Protein Biomaterials, their Performance and Applications | 35 |
| <i>Chih-Chang Chu</i> | |
| Phospholipid Surface Modification of Microporous Biopolymer-Microglial Cell Implants for Spinal Cord/CNS Repair | 37 |
| <i>Eugene P. Goldberg</i> | |
| Cerium Oxide Paper Sensors for Hydrogen Peroxide and Glucose Detection | 39 |
| <i>Maryna Ornatska</i> | |
| Novel Photoreactive Primer for Silicone Surfaces | 41 |
| <i>Jie Wen, Patrick E. Guire</i> | |
| Monomers and Absorbable Polymers for Biomedical Applications | 43 |
| <i>Rao S. Bezwada</i> | |
| Smart Thermo-responsive Cell Culture Surfaces | 45 |
| <i>Tahmina Naqvi</i> | |
| Recombinant Human Tropoelastin as a Novel Biomaterial | 47 |
| <i>Robert Kellar</i> | |
| Sputtered Porous Columnar Coatings for Non-Polymeric Drug Delivery | 49 |
| <i>Brent C. Bell</i> | |

NEW APPROACHES TO COMBINATION VASCULAR DRUG DELIVERY

| | |
|---|----|
| How Should One Consider Existing and Emerging Technologies in Cardiovascular Drug Delivery | 52 |
| <i>Elazer Edelman</i> | |
| Balloon Based Drug-Eluting Systems: "The Comeback Kid" | 54 |
| <i>Ronald Sahatjian</i> | |
| Drug Microstructure to Drug Release | 56 |
| <i>Dinesh Patwardhan</i> | |
| Effects of Processing and Environmental Conditions on the Mechanical Properties of a Bioresorbable Vascular Scaffold (BVS) | 57 |
| <i>Ashley Kelly</i> | |

OPHTHALMIC TECHNOLOGIES AND IMPLANTS

| | |
|--|----|
| Past, Present and Future of Contact Lens Research and Materials Development | 60 |
| <i>Robert A. Scott</i> | |
| Wettable Silicone Hydrogel Contact Lenses | 61 |
| <i>Yongxing Qiu</i> | |
| Biomaterials Characterization Using Nanoscale Thermal and IR Spectroscopy | 62 |
| <i>Khoren Sahagian</i> | |
| Pinch Testing of Hydrophilic Lubricous Coatings | 64 |
| <i>Junwei Li</i> | |

POINT-COUNTERPOINT SESSION

| | |
|---|----|
| Be it Resolved That the Concept of an Inert, Biocompatible Biomaterial is Folly. All Biomaterials Elicit a Host Response | 66 |
| <i>David Williams, Barbara Boyan, Donald L. Elbert</i> | |

BIINTERFACE & PETIT INSTITUTE FOR BIOENGINEERING AND BIOSCIENCE (IBB)
WORKSHOP: NEW FRONTIERS IN BIOSURFACE APPLICATIONS

| | |
|---|----|
| Biomaterial/Glycan Cell Interactions | 69 |
| <i>Julia Babensee</i> | |
| Dynamic, Self-Healing, and Nanostructured Hydrogel Coatings | 71 |
| <i>Andrew Lyon</i> | |
| Employing Double-Stranded Probes on Colloidal Particles for Nucleic Acid Detection | 72 |
| <i>Valeria Milam</i> | |
| New Approaches to Analyze DNA and Proteins Immobilized at Surfaces | 73 |
| <i>David Grainger</i> | |
| Biofilm Infections and Biomaterials | 74 |
| <i>James Bryers</i> | |
| Author Index | |