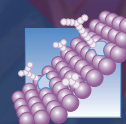


BIOINTERFACE 2012

Onsite Materials



October 23-25, 2012
University College Dublin | Dublin, Ireland



Surfaces in
Biomaterials
Foundation

Fáilte Surfaces in Biomaterials Colleagues,

I am glad to welcome you to the 2012 BioInterface Symposium at the University College at Dublin.

The Surfaces in Biomaterials Foundation is dedicated to exploring creative solutions to technical challenges at the biointerface by fostering educational and multidisciplinary cooperation among industrial, academic, clinical, and regulatory communities. BioInterface 2012 is a hallmark event for the foundation in that it marks the first time the symposium will be held outside of the United States. Our annual BioInterface Symposium and Workshop provides an extensive overview of innovative biomaterial science applications and gives us the chance to meet and discuss important developments in our industry. Corporations and educational institutions with products and services relevant to engineers, scientists, medical practitioners, and academicians in the fields of biomaterials and diagnostic research come to this annual conference to network, learn, share information and enjoy the company of fellow professionals.

We hope your time at the 2012 BioInterface Symposium in Dublin will stimulate your thinking and provide a valuable experience that you can utilize in your ensuing endeavors. Thank you for attending the BioInterface symposium and taking part in making history for your Foundation.

Sincerely,

Dan Hook
President, Surfaces in Biomaterials Foundation

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TUESDAY, OCTOBER 23

Biointerface Workshop | The Biointerface – Developing Concepts

Chair: John Hunt, University of Liverpool

8.45a – 9.30a:	Pre-Registration
9.30a – 9.45a:	Welcome and Introduction
9.45a – 10.30a:	Workshop Speaker 1: Implanted Polymers and Devices <i>with Mai Nguyen Misra, Medtronic</i>
10.30a – 11.15a:	Workshop Speaker 2: Advances in Dental and Orthopaedic Surfaces <i>with Reto Luginbuhl, RMS Foundation</i>
11.15a – 11.45a:	Exhibit Break
11.45a – 12.30p:	Workshop Speaker 3: Evaluation of the Pharmaceutical Applications of Citrox, A Natural Extract From Sour Oranges <i>with Howard Thomas, Citrox Biosciences Ltd</i>
12.30p – 1.15p:	Workshop Speaker 4: Bionanotechnology – Potential for Implant Devices <i>with Prof. Gill Lee, University College Dublin</i>
1.15p – 2.15p:	Lunch
2.15p – 3.00p:	Workshop Speaker 5: Lessons Learned - Old Surfaces Drive New Innovation <i>with Eduardo Ascenso Pires, Ceramed</i>
3.00p – 3.30p:	Exhibit Break
3.30p – 4.30p:	Applied Technology Workshops: 6 Presentations at 20 Minutes Each <i>Chair: Peg Palmer, Surface Solutions Lab</i>
3:30p - 3:50p:	Room 1: “Low Pressure and Atmospheric Plasma Processing: Applications for the Life Sciences” <i>Speaker: Mikki Larner, Plasma Technology Systems</i> Room 2: “Modify the Surface, Not the Biomaterials - Novel Room Temperature Surface Modification Technologies for Medical Devices” <i>Speaker: John O'Donoghue, EnBio Limited</i>
3:50p - 4:10p:	Room 1: “KARIM: Knowledge Acceleration and Responsible Innovation Meta-Network” <i>Speaker: Hugh Hayden, KARIM</i> Room 2: “Resolving Questions of Biological Interface Chemistry with TOF-SIMS and FIB-TOF Tomography” <i>Speaker: Gregory L. Fisher, Physical Electronics</i>
4:10p - 4:30p:	Room 1: Tyndall Institute (TBD) <i>Speaker: Tyndall Institute (TBD)</i> Room 2: “Plasma Processes” <i>Speaker: Demetrius Chrysostomou, PVATePla America</i>
7.00p:	Guinness Storehouse <i>7.00: Shuttle Departs Hotel for Guinness Storehouse</i> <i>7.30: Guinness Storehouse Tour</i> <i>7:50: Special Speaker: Fergal Murray; Guinness Brewmaster</i>
8.30p - 11:00p:	Gala Conference Dinner <i>With special intruductions by: Vincent Cunnane, Shannon Development and Brendan Cremin, UCD</i>



WEDNESDAY, OCTOBER 24

- 8.30a – 9.25a: **Pre-Registration and Student Poster Session**
Co-chairs: Kristen O'Halloran Cardinal, University of Cal Poly – San Luis Obispo and Brian Meenan, University of Ulster
- 9.25a – 9.30a: **Welcome and Introduction**
- 9.30a – 11.00a: **Session 1: Controlling the Biomaterial-Tissue Interaction A: Infection and Immunity**
Co-Chairs: Jonathan Thompson, DePuy Orthopaedics Worldwide and Larry Salvati, Bausch and Lomb
- 9.30a – 10.00a: **Invited Speaker: Prof. G.H.I.M. Walenkamp, M.D., Ph.D.**
"Local Antibiotic Carriers: Pharmacokinetics and its Consequences for Prevention and Therapy"
- 10.00a – 11.00a: **"Persistence of a Bioluminescent Bacteria on and Around Degradable and Non Degradable Surgical Meshes in a Murine Model"**
Jelmer Sjollem, University of Groningen
"Antibacterial Coated Implants in the Management of Risk Patients – Development and Implementation"
Andrea Montali, Synthes GmbH
"Preclinical Evaluation of an Antibiotic Releasing Coating for Hip Arthroplasty"
Jonathan Thompson, DePuy Orthopaedics Worldwide
- 11.00a – 11.15a: **Exhibit Break**
- 11.15a – 12.45p: **Session 2: Controlling the Biomaterial-Tissue interaction B: Integration and Inflammation**
Co-Chairs: Ruud Bank; University of Groningen and Gene Boland; Cardiovascular Innovation Institute
- 11.15a – 11.45a: **Invited Speaker: Dror Seliktar, Technion**
"Cell-Compatible Hydrogels Designed for Tissue Regeneration"
- 11.45a – 12.45p: **"Fibrinogen Based Soft Tissue Scaffold for Chronic Wounds"**
Gene Boland, Cardiovascular Innovation Institute
"Immobilization of Growth Factors on Inorganic Materials"
Yoshihiro Ito, Nano Medical Engineering Laboratory, RIKEN Advanced Science Institute
"On the Role of Surface Acidity of β -TiNb Alloy in its Interaction with Osteoblast-like MG-63 Cells"
Ivan Jirka, J. Heyrovský Institute of Physical Chemistry Academy of Sciences of the Czech Republic
- 12.45p – 2.00p: **Attendee Luncheon**
Student Town Hall Meeting
Co-chairs: Kristen O'Halloran Cardinal, Cal Poly-San Luis Obispo; Brian Meenan, University of Ulster; Mikki Larner, Plasma Technology Systems
Surfaces in Biomaterials Foundation Business Meeting
- 2.00p – 3.30p: **Session 3: Biomaterial Characterization - Sponsored by Physical Electronics**
Chair: George Grobe, Bausch & Lomb
- 2.00p – 2.30p: **Invited Speaker: Anna Belu, Medtronic**
Topic: "Characterization of Surfaces and Interfaces in the Medical Device Industry"

2.30 – 3.30:

“Three-Dimensional Depth Profiling of PLGA Copolymer”

Colm McManamon, University College Cork

“Quantitative Characterization of Biomaterials and their Interaction with Living Cells by AFM”

C. Pettersson, JPK Instruments AG

“Prevention of Device Associated Infections: Strategies for Immobilization of Antimicrobial Actives”

Reto Luginbuehl, RMS Foundation

3.30 – 5.00:

Exhibit Break & General Poster Session

The full listing of Wednesday poster sessions is on page 10.

5.00 – 6.00:

Keynote Speaker Presentation: Emerging Biointerface Solutions - Translating Results to the In Vivo Environment, Patients and Commercial Entities

Buddy Ratner, University of Washington

Emerging Biointerface Solutions - Translating Results to the In Vivo Environment, Patients and Commercial Entities

The modern field of biomaterials started in the 1950s with daring experiments that proved that synthetic polymers could change the face of medicine. Since then, millions of medical devices made of synthetic or modified natural materials have been implanted as components of medical devices. All these devices trigger a similar reaction upon implantation, the foreign body reaction (FBR). Biocompatibility, for materials that are found to be acceptable by routine cytotoxicity, is largely associated with a thin, avascular, non-adherent foreign body capsule. Surface modifications can be effective in addressing this FBR, though only rarely (an example of a zwitterionic surface will be presented). Most surface chemistries seem to produce similar FBR healing responses. Based on studies over the past 10 years at the University of Washington, a class of 3D biomaterials will be described that readily integrates into tissue and stimulates spontaneous reconstruction of tissue. The material is made by sphere-templating of synthetic polymers yielding close-packed spherical pores of approximately 35 microns diameter that are interconnected by 12 micron throats. The unique healing of these porous gels implanted in tissue is believed to be related to macrophage recruitment into the pore structure. The integrative healing effect noted is independent of biomaterial – similar results are observed with sphere-templated silicone rubber and pHEMA hydrogel. In addition, surface chemical modification of the hydrogel with carbonyl diimidazole (CDI), or immobilization on the hydrogel of collagen I or laminin did not change the healing response. Also, good healing results have been seen upon implantation in skin (subcutaneously, percutaneously), heart muscle, sclera, skeletal muscle, bone and vaginal wall. This talk will describe these sphere-templated materials, and the concept of a 3D biointerface mechanically driving the reaction. These materials have been important in four companies that are bringing this new class of polymers to medical practice.

About the Presenter: Buddy D. Ratner, Ph.D.

University of Washington

Buddy D. Ratner is Director of the University of Washington Engineered Biomaterials (UWEB21) Engineering Research Center. He holds the Michael L. and Myrna Darland Endowed Chair in Technology Commercialization and is Professor of Bioengineering and Chemical Engineering, University of Washington.

Buddy Ratner received his Ph.D. (1972) in Polymer Chemistry from the Polytechnic Institute of Brooklyn. He has been at the University of Washington since 1972. From 1985-1996, he directed the National Institutes of Health-funded National ESCA and Surface Analysis Center for Biomedical Problems. In 1996, he assumed the directorship of UWEB (now UWEB21).

He has authored more than 400 scholarly works and has more than 20 issued patents. He is Editor of the Journal of Undergraduate Research in BioEngineering, on the advisory board of Biointerphases and serves on the editorial boards of ten other journals. He is the lead editor for *Biomaterials Science: An Introduction to Materials in Medicine*, a textbook that has sold more than 25,000 copies.





THURSDAY, OCTOBER 25

8.30a – 9.00a:	Pre-Registration and Student Poster Session <i>Co-chairs: Kristen O'Halloran Cardinal, University of Cal Poly – San Luis Obispo and Brian Meenan, University of Ulster</i>
9.00a – 10.30a:	Session 4: Drug Delivery Systems - Recent Advances <i>Co-Chairs: Aylvin Dias, DSM Biomedical; Yen-Lane Chen, Boston Scientific</i>
9.00a - 9.30a:	Invited Speaker: Wim Hennink; Universiteit Utrecht <i>"Biodegradable Polymers for Protein Delivery"</i>
9.30a – 10.30a:	"Designing Biomaterials for the Host" <i>Prof. Abhay Pandit, National University of Ireland Galway</i> "Poly(ester amide) Degradable Polymer Platform Inspired by Challenges in Drug Delivery" <i>George Mihov, DSM Biomedical</i> "Taming the Untameable Thin Film: How to Tailor Hydrophobic Drug Release, Mechanical Properties, and Delivery Profiles Independently" <i>Terry W.J. Steele, Nanyang Technological University</i>
10.30a – 11.00a:	Exhibit Break and Student Poster Session
11.00a – 12.30p:	Session 5: Emerging Treatments in Wound Healing <i>Co-Chairs: Brian Meenan, University of Ulster and Abhay Pandit, National University of Ireland, Galway</i>
11.00a – 11.30a:	Invited Speaker: David Grainger, University of Utah <i>Lost in translation: Correlating In Vitro and In Vivo Data in Anti-Microbial Biomaterials</i>
11.30a – 12.30p:	"Therapeutic Biodegradable Polymers for Wound Healing Devices" <i>Melissa Reynolds, College of Engineering Colorado State</i> "Control of Surface Chemistry in a Biomimetic Therapeutic Device for Treating Bacteremia and Sepsis" <i>Robert Ward, ExThera Medical Corporation</i> "Retinal Pigment Epithelial Cell Viability and Functionality on Electrospun PLLA Biomaterial Scaffolds" <i>Dr. George Burke, University of Ulster</i>
12.30p – 2.00p:	Awards Luncheon Student Poster Winner <i>Excellence in Surface Science Award Presentation: Marcus Textor, ETH Zurich, Laboratory for Surface Science and Technology — "Biointerfaces in 2D and 3D"</i>
2.00p – 3.30p:	Session 6: Plasma Medicine - Processing Technology to Control the Biointerface <i>Co-Chairs: Denis Dowling, University College Dublin; Dan Storey, IonAtom Consulting, LLC</i>
2.00p – 2.30p:	Invited Speaker: Marcela Bilek, University of Sydney <i>"Bioactivation of Surfaces Using Embedded Radicals"</i>
2.30p – 3.30p:	"Plasma Assisted Deposition of Biopolymers for Enhanced Wound Healing" <i>Liam O'Neill, PlasMedica Technologies Ltd.</i> "Atmospheric Plasma Surface Modification of Electrospun Poly(L-lactic acid): Effect on Mat Properties and Cell Culturing" <i>Matteo Gherardi, Alma Mater Studiorum – Università di Bologna</i> "Non Thermal Plasmas for Cancer Treatment: Results and Perspectives" <i>Jean-Michel Pouvesle, Université d'Orleans, France</i>
3.30p – 4.30p:	Exhibit Break & General Poster Session <i>The full listing of Thursday poster sessions is on page 12.</i>
4.30p – 5.30p:	Session 7: Point-Counterpoint Session: Antimicrobial vs. Antifouling <i>Moderator: Chris Loose, Semprus Biosciences</i>

Point-Counterpoint Session: Antimicrobial vs. Antifouling

“Let it be resolved, “Anti-infective medical devices that rely upon prevention of bacterial adhesion are doomed to failure; only devices that deliver anti-microbial agents will prove effective in preventing medical device infection.”

Pro Side: Roger Bayston, University of Nottingham

Roger Bayston has worked in the fields of medical microbiology and surgical infection for almost 40 years, during which time his research interests have included interactions between bacteria and biomaterials and design and development of antimicrobial biomaterials. He has produced more 120 peer-reviewed publications, several book chapters and one book. He was educated in Sheffield UK, where he then took MMedSci and PhD degrees before moving to the University of London, Great Ormond Street Hospital and The National Hospital Queen Square. He is also a Senior Fellow of the Royal College of Pathologists. Since 1993 he has been in Nottingham University Hospitals where he is now Associate Professor of Surgical Infection and Head of the Biomaterials – Related Infection Group. He is Immediate Past President of the Society for Research into Hydrocephalus and Spina Bifida, and serves on national working groups on neurosurgical infection, orthopaedics and microbiology education.



Con Side: David Grainger, University of Utah



David W. Grainger is the George S. and Dolores Doré Eccles Presidential Endowed Chair in Pharmaceutics and Pharmaceutical Chemistry, Distinguished University Professor, and Chair of the Department of Pharmaceutics and Pharmaceutical Chemistry, and Distinguished Professor of Pharmaceutics and Bioengineering at the University of Utah. Grainger's research expertise is focused on improving implanted medical device performance, drug delivery of new therapeutic proteins, nucleic acids and live vaccines, nanomaterials interactions with human tissues, low-infection biomaterials, and innovating diagnostic devices based on DNA and protein biomarker capture. Additionally, he is an expert in applications of surface analytical methods to biomedical interfaces, including analytical methods development for difficult organic surface patterns and nanomaterials, and also internationally recognized as an expert in perfluorinated thin films and biomaterials. Grainger has won several research awards, including the prestigious 2007 Clemson Award for Basic Research from the Society for

Biomaterials, and the 2005 American Pharmaceutical Research and Manufacturers Association award for “Excellence in Pharmaceutics”. He has also received several teaching awards for outstanding mentoring and teaching service at all student levels. Grainger is an elected Fellow of both the American Association for the Advancement of Science (AAAS) and the American Institute of Medical and Biological Engineering (AIMBE), and Inducted Honorary Fellow, International Union of the Societies of Biomaterials Science and Engineering, 2008. Grainger serves on editorial boards for 6 major research journals in the biomedical materials field, reviewing over 50 manuscripts annually. He is a scientific advisor to several international research centers in regenerative medicine and biotechnology. Grainger has helped found 3 biomedical technology companies, sits on the Scientific Advisory boards for 4 biomedical companies, and actively consults internationally with industries in applications of materials in biotechnologies and medicine.



Biointerfaces in 2D and 3D

Marcus Textor, ETH Zurich, Laboratory for Surface Science and Technology

Interfaces between synthetic materials and biological systems – biointerfaces – constitute one of the most dynamic and expanding fields in bio-related science and technology. The field is driven both by a number of growing industrial and clinical applications (medical implants, biochips, tissue engineering, drug delivery and screening) and by the desire to understand biointerface processes at a basic level. This field is by definition highly interdisciplinary spanning across the disciplines of physics, materials science and engineering, chemistry, biology, bioinformatics and medicine. It is widely appreciated today that progress, both in terms of science and industrial activities in this field, very much depends on a successful integration of those disciplines, and that education of today's students in a stimulating environment and with an interdisciplinary approach is a key factor. Thanks to the availability of a toolbox of advanced characterization techniques, rapid progress has been made in terms of a changeover from empirical,

qualitative, static studies to a quantitative, molecular understanding of interfacial processes and its dynamic aspects.

In my talk, I will lead through a number of research directions my group has been involved in during my time at ETH. Introducing biologically relevant functionalities at surfaces through self-assembly of (macro)molecules has a number of specific key aspects that range from molecular order of surface films, control over surface density of biofunctional groups to ease of upscaling for industrial production. Assembly of multifunctional copolymers and their applications for homogeneous surfaces and patterning is shown exploiting biomimetic surface adhesion sites derived from bacterial siderophores. Emphasis is placed on both ex-situ and in-situ dynamic characterization techniques as essential tools to decipher the notoriously difficult surface structure–property relationship.

About the Presenter: Marcus Textor, ETH Zurich

Marcus Textor is a professor emeritus of ETH Zurich. He studied chemistry at the University of Zurich. Receiving a fellowship of the Royal Society, he spent two years as a postdoctoral fellow at the School of Molecular Sciences, University of Sussex, Brighton, UK. Research covered the preparation and characterization of single crystal surfaces, and the monitoring of catalytic model reactions at these surfaces in vacuo. In 1978 he took up an industrial position at Alusuisse R&D Laboratories, Switzerland, finally with world-wide R&D responsibilities for materials and surface aspects in the application of aluminium and composites for the industrial, automotive and packaging sectors. In 1994 he joined ETH Zurich, Department of Materials and established a research group and teaching program in the area of surfaces and interfaces of light metals and biointerfaces. His main interests in the last decade cover both fundamental, quantitative aspects in the behaviour of materials in contact with biological milieus and the design of surfaces that elicit biospecific responses on the level of proteins, cells/bacteria and tissue. His research activities aimed at

developments for the field of biosensors, novel cell culture platforms, biomaterials/medical devices, functional nanoparticles and smart carriers for

drug delivery and medical imaging. He is a member of several international societies and received in 2006 an Award of The AVS Biomaterials Interface Division for substantial contributions to the field of Surfaces in Biotechnology. He has supervised 42 Ph.D. and 91 diploma/master theses and (co)-chaired 20 international conferences in the area of biomaterials, biotechnology and life sciences.



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GENERAL POSTERS

- **“Osteoconductivity of Biomimetic LbL Thin Films Atop a Bone Mechanomimetic Substrate”**
Beatrice Labat, PhD, Centre Universitaire Evreux
- **“On-Demand Antimicrobial Drug Release by External Temperature Triggers”**
Jelmer Sjollem, University of Groningen
- **“Dual Action Antimicrobial Polymers”**
Dr. Nattharika (Megan) Aumsuwan, DSM Biomedical
- **“Biomedical Particle Interfaces Optical Control”**
Alexandra G. Bezrukova, St. Petersburg State Polytechnical University
- **“Tissue Engineering Scaffolds with Tailored Properties Using Plasma-Assisted Processing”**
Niall Rooney, Proxy Biomedical Ltd., Coilleach, Spiddal, Co. Galway, Ireland
- **“Novel Designs of Vascular Implant-Associated Local Drug Delivery Systems”**
Svea Petersen, Institute for Biomedical Engineering
- **“Growth Hormone Delivery from PEA Fibers for the Treatment of Corneal Wounds”**
John Zupancich, DSM Biomedical, Koestraat
- **“Poly(Ester Amide) Degradable Drug Delivery Systems for Prevention and Treatment of Failed Back Surgery Syndrome”**
Mirian Gillissen, DSM Biomedical
- **“Engineering Fully Dense Apatite-Wollastonite Glass and Glass-Ceramic Substrates for Human Mesenchymal Stem Cell Adhesion Studies”**
Maria G Katsikogianni, Biomaterials and Tissue Engineering Research Group, Leeds Dental Institute Clarendon Way Leeds
- **“Different Cell Reaction of Cell Lines and Primary Human Cells Towards Biomaterials”**
Stefanie Lischer, Empa, Swiss Federal Laboratories for Materials Science and Technology
- **“Improved Wettability of Silicone Hydrogel Contact Lenses”**
Christopher Loose, Semprus BioSciences
- **“Fluoropolymer Coating Deposition Using a Novel Micro-Blasting Technique”**
Eamonn Quirke, University College Dublin
- **“Ag-Antimicrobial Films Obtained by Sputtering Showing Fast Bactericide Kinetics and Nanoparticulate Uniformity”**
John Kiwi, Ecole Polytechnique Fédérale Lausanne
- **“A Biodegradable and Biocompatible Nanopattern for Selective Cell Growth”**
Elena Martinez, University College Dublin
- **“Plasma Functionalized Carbon for Direct Electron Transfer Type Laccase Cathodes”**
Malika Ardhaoui, Laboratoire de Génie des Procédés Plasma et Traitements de Surface, Université Pierre et Marie Curie-Chimie ParisTech

STUDENT POSTERS

- **“Characterization of PVA-Ag Hydrogels Surfaces in Order to Get Potential Bactericide Wound-Dressings”**
Renata Nunes Oliveira, Federal University of Rio de Janeiro
- **“Photocatalytic Activity of Anatase Coatings on Ti-Based Alloys for Medical Devices”**
Martina Lorenzetti, Jožef Stefan Institute
- **“In-Situ Ellipsometry Analysis of Protein Adsorption Dynamics on Atmospheric Plasma Modified Surfaces”**
C. P. Stallard, University College Dublin
- **“Scalable Synthesis of Uniform Superparamagnetic Particles with Tuneable Physical Properties”**
James O’ Mahony, University College Dublin
- **“Osteocyte Apoptosis – A Mean of Bone Resorption?”**
Mobina Chaudhry, Gothenburg University



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GENERAL POSTERS

- **"Influence of Plasma Treatment on Hemocompatibility of Dacron Vascular Grafts"**
Ita Junkar, Jožef Stefan Institute, Slovenia
- **"Multi-Component Plasma Polymers for Site-Specific Immobilization of Proteins"**
Andrey Shukurov, Charles University in Prague
- **"Degradation of Phospholipids Exposed to RF Oxygen Plasma"**
Kristina Eleršič, Jožef Stefan Institute, Slovenia
- **"Nanoparticle Surface Modification for Optimal Growth of Cells"**
Hynek Biederman, Charles University, Prague
- **"Advanced Plasma Treatments for Improving Orthopaedic Surfaces"**
Cristina Diaz, AIN - Centro de Ingeniería Avanzada de Superficies
- **"Secure your Bio-Coatings with Plasma Technology"**
Demetrius Chrysostomou, PVA TePla America
- **"Molecular Level Cleaning of Implantable Devices"**
Demetrius Chrysostomou, PVA TePla America
- **"VitroStealth® - A Versatile Non-Biofouling Coating Based on UV Curing Technology"**
Ton Dirks, DSM Biomedical
- **"Biocompatibility and Biodegradation Studies of Poly(ester amide) Implants for Intraocular Drug Delivery"**
George Mihov, DSM Biomedical

STUDENT POSTERS

- **"Development of a Methodology for Assessing"**
Claire Staunton, University College Dublin
- **"Atmospheric Helium Plasma for Skin Treatment Applications"**
Ahmed Chebbi, University College Dublin
- **"Determination of Effect of Surface Properties on Protein Adhesion Under Flow Conditions"**
Mick Donegan
- **"Antibacterial and Antifouling Catheter Coatings Using Surface Grafted PEG-b-cationic Polycarbonate Diblock Copolymers"**
Xin Ding, National University of Singapore & Institute of Bioengineering and Nanotechnology
- **"Semicrystalline Polymer Topographies Orienting Stem Cells Adhesion: The "True Ultimate" Mediating Role of a Polymer Brush"**
Michel Klein Gunnewiek, University of Twente
- **"Characterization of Rabbit Mesenchymal Stem Cell Attachment on Calcium Phosphate Surface"**
Vita Zalite, Riga Technological University
- **"Stimuli-Responsive Block Copolymer Vesicles for Active Burn Wound Dressings: Synthesis, Characterization, Self-Organization and Biodegradation"**
Katrin-Stephanie Tücking, University of Siegen, Faculty Science and Technology, Physical Chemistry I
- **"Hydrogel Functionalised Cantilevers for Microorganism Growth Detection"**
Niall Maloney, Trinity College Dublin
- **"Sol-Gel Derived TiO₂-B₂O₃-ZnO Bioactive Material as Base Layer Under Dental Fillings"**
Laura Tirle, Babes-Bolyai University

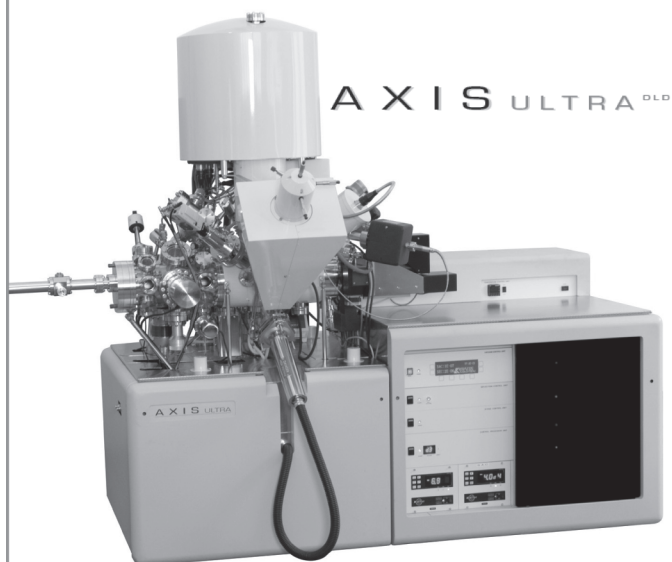


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Information from the first 10nm of the surface.
- **Quantitative**
Determination of elemental and chemical composition, with sensitivity to all elements (except H & He) at concentrations > 0.1 atomic percent.
- **Non-destructive**
Sample not consumed during analysis including angle resolved depth profiles.
- **Capable of imaging**
Lateral distribution of surface chemical composition at <3 μm spatial resolution.



KRATOS
ANALYTICAL
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SHUTTLE TRANSPORTATION SCHEDULE

Tuesday, October 23

Depart Burlington
8.00am
8.40am

Arrive UCD
8.20am
9.15am

Depart UCD
4.45pm
5.30pm

Arrive Burlington
5.10pm
6.00pm

Depart Burlington
7.00pm

Arrive Storehouse
7.30pm

Depart Storehouse
Following Dinner

Arrive Burlington

Wednesday, October 24

Depart Burlington
8.00am
8.40am

Arrive UCD
8.20am
9.15am

Depart UCD
6.15pm
7.00pm

Arrive Burlington
6.40pm
7.30pm

Thursday, October 25

Depart Burlington
8.00am
8.40am

Arrive UCD
8.20am
9.15am

Depart UCD
5.45pm
6.30pm

Arrive Burlington
6.10pm
7.00pm



 **Medtronic**

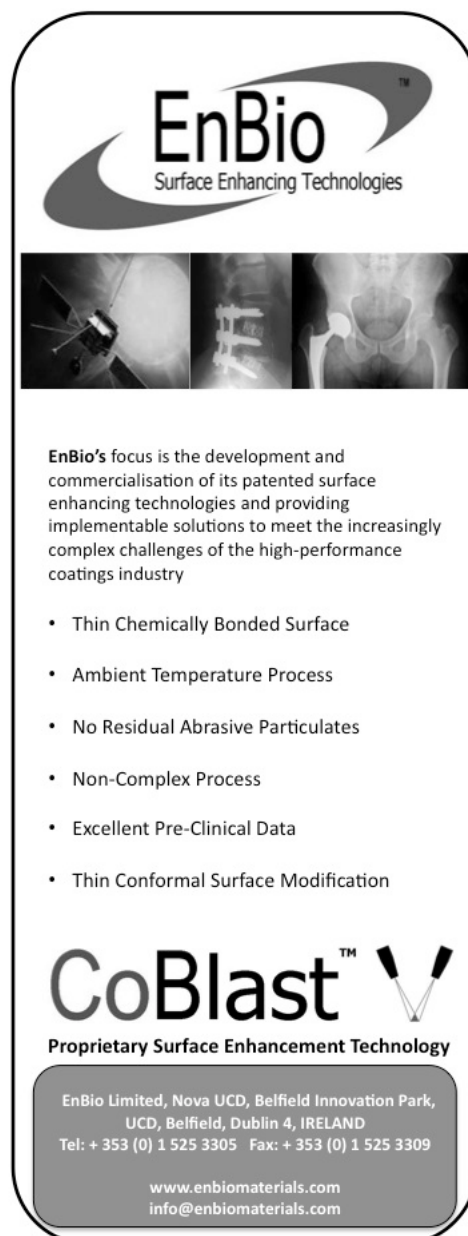
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