Surface Science of Biologically Important Interfaces
9th Annual Meeting
13th-14th September 2007

Thursday 13th September 2007

10:00-10:25 **Registration and Coffee**

Session 1 – Biofunctionalising and Patterning Surfaces
Chaired by – Rein Ulijn and Nicola Tirelli

10.25-10.30 **Opening Remarks** followed by:

10:30-11:00 Surface Modification for Biomedical Applications: Surfaces to Direct Cell Behaviour
Morgan Alexander
University of Nottingham

11:00-11:15 Polyphenol Restoration of Cell Spreading Inhibition on Glycoprotein Substrates
J. McCol, R. Horvath, A. Aref, L. Larcombe, S. Morgan, I. Chianella, G. Yakubov, J.J. Ramsden
Cranfield University, Unilver Corporate Research

11:15-11:30 A Tool for Investigating Cell-Material Interactions Using Surface Chemical and Topographical Gradients
J. Yang, F. Rose, N. Gadegaard, M. Alexander
University of Nottingham, University of Glasgow

11:30-11:45 Immobilization of PAMAM Dendrons for Surface Bio-catalysis
N. Pollock, L. J. Twyman, S. L. McArthur
University of Sheffield

11:45-12:00 Enhancing Silicone Biocompatibility Using Biomimetic Topographies
J. P. Frimat, J. West, A. Bayat, P. Day
Institute for Analytical Sciences, Dortmund and University of Manchester

12:00-12:15 Novel Method for the Site Specific Immobilisation of Recombinant Proteins
L. S. Wong, J. L Thirlway, J. Micklefield
University of Manchester

12:15-12:30 The Effect of Defined Linear Features on Surface Hygiene and Cleanability
A. K. Packer, P. J. Kelly, K. A. Whitehead, J. Verran
Manchester Metropolitan University

12:30-1:30 **Buffet Lunch in the MIB Atrium sponsored by Veeco Instruments.**

Session 2 – Nanostructured Surfaces and Interfaces
Chaired by – Phil Messersmith and Andrew Thomas

1:30-2:00 Biologically Programmed Synthesis, Assembly and Properties of Inorganic Nanomaterials
R. R. Naik
Air Force Research Laboratory Materials and Manufacturing Directorate
Wright Patterson AFB, Ohio

2:00-2:15 Replicating Cell-Cell Adhesion Using Vesicles
K. P. Liem, R. J. Mart, X. Wang, S. J. Webb
University of Manchester

2:15-2:30 Synthesis of Bioactive Nanoparticles from Glycosylated Polymers
S. G. Spain, N. R. Cameron
Durham University

2:30-2:45 Dopamine-mediated Grafting of TiO_2 Anatase Nanoparticles. Control over PEGylation and Functionality
T. Kotsokechagia, F. Cellesi, N. Tirelli
University of Manchester

2:45-3:00 Nanoscale Patterning of Photosynthetic Light Harvesting Proteins
N. P. Reynolds, S. Janusz, C. N. Hunter, G. J. Leggett
University of Sheffield

3:00-3:15 Myofibrillar and Cellular Structure of Micropatterned Cardiac Myocytes: A Combined Confocal and Atomic Force Microscopy Study
N. A. Geisse, S. P. Sheehy, K. K. Parker
Harvard University

3:15-3:30 Accessing the Dimensions and Internal Structure of Supported Lipid Bilayers through Direct Measurement of Bilayer Optical Anisotropy
S. Carrington, M. Swann, J. Popplewell, E. Reimhult, D. Jose, M. Textor
Farfield Scientific Ltd, Laboratory for Surface Science & Technology, ETH, Zurich

3:30-4:00 **Coffee in the MIB Atrium**

Keynote Presentation
Introduced by – Rein Ulijn.

4:00-5:00 Adhesive Strategies in Nature: Biointerfacial Designs Inspired by Mussels and Geckos
P. Messersmith
Northwestern University

5:00-6:00 **Poster Presentations and Wine Reception sponsored by Asylum Research. Poster Prize judged by Prof. R. J. Young, Head of the School of Materials.**

6:00-10:00 **Conference Dinner at Lal Haweli - sponsored by Kratos Analytical. Address: 68-72 Wilmslow Road, Rusholme (Tel: 0161-248 9700).**
Pick up at the MIB – coaches arrive 6.30 pm, ready to depart 6.45 pm.
Return transport arranged for 9.30 pm.

Friday 14th September 2007

Session 3 – Responsive Surfaces
Chaired by Nicola Tirelli and Simon Webb

9:00-9:30 Stimuli Responsive Surfaces to Control Biomolecules and Cells
J. Vörös
ETH Zurich

9:30-9:45 Enzyme Responsive Poly(ethylene glycol) Monolayers
S. J. Todd, M.R. Alexander, J. E. Gough, R. V. Ulijn
University of Manchester, University of Nottingham

9:45-10:00 Protease Specificity Screening on Liquid Crystal Arrays
L. S. Birchall, R. V. Ulijn, S. J. Webb
University of Manchester

10:00-10:15 Responsive Surfaces for Embryonic Cell Culture
S. Dey, R. A. J. Rose, B. Kelam, C. Alexander
University of Nottingham

10:15-10:45 **Coffee in the MIB Atrium**

Session 4 – Surface Analysis Techniques
Chaired by – Sally McArthur and Morgan Alexander.

10:45-11:15 Depth Profiling of Organic Thin Films Using C_{60} Ions
A. G. Shard
National Physical Laboratory

11:15-11:45 'Surface Analysis' beyond the Surface - C_{60} ToF-SIMS Biochemical Imaging
N. Lockyer
The University of Manchester

11:45-12.00 Patterning of Plasma Polymers for Bioarrays
G. Mishra, S. McArthur
University of Sheffield

12:00-12:15 Adsorption of Phenylglycine and Phenylalanine on TiO_2 Rutile (110) and Anatase (101) Single Crystal Surfaces
A. G. Thomas, W. R. Flavell, C. Chatwin, A. R. Kumarasinghe, S. M. Rayner, P. F. Kirkham
University of Manchester

12:15-12:30 Rapid Surface Analysis Under Ambient Conditions using Plasma-Assisted Desorption Ionization (PADI) Mass Spectrometry
L. Ratcliffe, F. Rutten, D. Barrett, T. Whitmore, D. Seymour, C. Greenwood, Y. Aranda-Gonzalvo, S. Robinson, M. McCoustra
University of Nottingham, University of Keele, Herriot-Watt University, Hiden Analytical Ltd, Warrington

12:30-12:45 Interfacial Adsorption of Peptide Surfactants
L. Pan, J. Zhao, J. R. Lu
University of Manchester

12:45-1:45 **Buffet Lunch in the MIB Atrium sponsored by Veeco Instruments.**

Session 5 – Cell-Surface Interfaces
Chaired by – Frank Rutten and Nick Lockyer

1:45-2:15 Star-PEG – tailoring surfaces for specific cell adhesion
J. Groll
DWI an der RWTH Aachen e.V.

2:15-2:30 How Surfaces Determine Tissue Organisation By Controlling Matrix Gene Expression
J. A. Gillard, P. Saravanapavan, H. Xu, F. Khan, J. R. Lu, J. M. Garland
Manchester Cardiovascular Research Group, University of Manchester

2:30-2:45 Evolution of Anti-Inflammatory and Antimicrobial Resorcinarene-Peptides for Biomaterial Modification
M. Charnley, K. Fairfull-Smith, N. H. Williams, C. W. I. Douglas, S. L McArthur, J. W. Haycock
University of Sheffield

2:45-3.00 Imaging Mammalian Cells in the Low Vacuum Electron Microscope
S.E. Kirk, J.N. Skepper, A.M. Donald
University of Cambridge

3.00-3:15 Immobilisation of Tailored Pectin Polysaccharides onto Polystyrene Surfaces: Surface Characterization and Cell Behaviour
I. Liakos, G. Ceccone, D. Gilliland, F. Rossi, C. Della Volpe, S. Siboni, R. Verhoef, W. Schols, B. Jorgensen, P. Ulvskov, C. Bussy, M. D. Nagel, G. Cascardo, Cassinelli, M. Morra
European Community Joint Research centre, Institute of Heatlth and Consumer Protection, Italy, UniTN, WU, NL, DIAS, Dk, UTC, F, Nobil Bio Ric, Italy

3:15-3:30 Deposition of Mammalian Cells and Biomaterials *via* Piezoeletric Drop On Demand Ink-jet Printing
R. Saunders, J. E. Gough, B. Derby
University of Manchester

3:30-3:45 The Cellular Response to a Polyurethane Surface Modified with Extracellular Matrix Proteins – Towards the Development of a Tissue Engineered Blood Vessel
K. H. Smith, A. B. Jozwiak, D. V. Bax, C. M. Kielty, R. A. Black
University of Liverpool, University of Manchester

3:45-4:00 Cell Responses to Wedge Hydrogel on Glass Substrate as a Continuous Gradient of Stiffness
P. Kuntanawat, C. D. W. Wilkinson, M. O. Riehle
University of Glasgow

4:00 **Closing Remarks**

Poster Presentations

1. Polymer Arrays for Screening Bacterial Adhesion and Biofilm Formation
J. Lok, S Clarke, P. Williams, D. G. Anderson, R. S. Langer, M.R. Alexander, M. C. Davies
University of Nottingham, Centre for Biomolecular Sciences, Massachusetts Institute of Technology

2. Characteristics of Plasma Polymerised Microchannel Surfaces: Electroosmotic Flow and Zeta Potential Studies
M. Salim, B. O'Sullivan, P. C. Wright, S. L McArthur
University of Sheffield

3. Micropatterning of Peptides for Cell-Surface Guidance
S. T. Kho, T. L . Parker, N. Gadegaard, M. Alexander
University of Nottingham, University of Glasgow

4. Enzyme-Responsive Polymer Hydrogel Particles
P. D. Thornton, R. J. Mart, R. V. Ulijn
University of Manchester

5. Non-Fouling PDMS Produced Radio Frequency Tetraglyme Plasma Deposition
S. Forster, G. Mishra, S. L. McArthur
University of Sheffield

6. Removal of Chronic Wound Proteases Using an Enzyme-Responsive Hydrogel Dressing
N. Bibi, J. E. Gough, R. V. Ulijn
University of Manchester

7. Cell Adhesion of Micropatterned Substrates
P Stevenson, A. Donald
University of Cambridge

8. Understanding the Interaction of Nano-carbons with Amino-acid Sequences
I. A. Kinloch, B. G. Cousins, Y. Li, M. Roberts, L. Gross, R. V. Ulijn
University of Manchester

9. Discrimination of Prostate Cancer Cell Lines Using ToF-SIMS
M. J. Baker, E. Gazi, M. D. Brown, N. W. Clarke, J. C. Vickerman, N. P. Lockyer
University of Manchester

10. The Effect of Fluoride and Salivary Pellicle on Hydroxyapatite Dissolution
S. B. Jones, G. D. Reese, R. P. Shellis, M. E. Barbour
University of Bristol, GlaxoSmithKline

11. The Application of ESEM to Biological Samples
J. E. McGregor, A. M. Donald
University of Cambridge

12. Plasma Polymer Surfaces for High-Throughput Microfluidic Proteomic Analysis
G.J.S.Fowler, A.M.Pereira, B.O'Sullivan, G.Mishra, P.C.Wright, S.L.McArthur
University of Sheffield

13. The Effect of Cluster and Polyatomic Ion Beams on Biopolymers – Prospects for Molecular Depth Profiling Using Tof-SIMS
S. Rabbani, J.S. Fletcher, N.P. Lockyer, J.C. Vickerman
University of Manchester

14. Fmoc-Diphenylalanine Self Assembles to a Hydrogel via a Novel Architecture Based on π-π Interlocked β-sheets.
A. M. Smith, V. Jayawarna, R. J. Williams, R. Collins, P. Coppo, S. J. Eichhorn, A. F. Miller, A. Saiani, R. V. Ulijn
University of Manchester

15. Enzyme-Triggered Self-Assembly of Peptide Hydrogels via Reversed Hydrolysis
R.J.Williams, A.M. Smith, R.V. Ulijn
University of Manchester

16. Polymer Hyrdrogel Microarrays for Biomedical Screening by Inkjet Printing
H. Qu, N Lockyer, R. V. Ulijn
University of Manchester

17. Enzyme-Assisted Self-Assembly of Designer Peptide Based Nanostructures
A. K. Das, R.V. Ulijn
University of Manchester

18. Magnetically Responsive Vesicle Aggregates for Tissue Engineering
K. P. Liem, R. J. Mart, S. J. Webb
University of Manchester

19. Controlling Cell Morphology on Cellulose using Immobilised Amino Acids
D. Kalaskar, J. E. Gough, R. V. Ulijn, W. S. Sampson, M. R. Alexander, S. J. Eichhorn
University of Manchester, University of Nottingham

20. Functionalization of Silica Gel Nanoparticles via Surface ATRP
P. De Leonardis, F. Cellesi, C. D. Vo and N. Tirelli
University of Manchester

21. Synthesis and Characterisation of TiO2 Nanoparticles Grated with Dopamine-PEG Derivitives
T. Kotsokechagia, F. Cellesi, N. Tirelli
University of Manchester

22. Biodesulphurisation by Immobilized Bacteria Coated with Fe3O4 Nanoparticles
F.Ansari, J.J. Ramsdon, Yun Peng Yeh
Cranfield University

22. Endothelial cell-targeting using HPMA copolymer-Doxorubicin-RGD conjugates
K. W. Wan, M. J. Vicent, R. Duncan
Keele University; Centro de Investigacion Principe Felipe, Valencia, Spain; Cardiff University