University of Glasgow

Interdisciplinary Research Collaboration in Proteomic Technologies

Radical Solutions for Researching the proteome

Meeting Report:
RASOR Symposium 2010: Lab-on-a-chip for Cell and Proteomics
Bute Hall, Main Building, University of Glasgow, 05 March 2010

The RASOR consortium hosted a 1-day symposium for a focused discussion on the recent technical advances in applying nanotechnology and miniaturisation in cell and proteomics research. With the support of the University of Glasgow, Lab on a Chip journal, Agilent Technologies, Roche Applied Science and Labcyte, we were able to host the RASOR Symposium in the magnificent Bute Hall. The event successfully attracted 180 delegates from a wide cross-section of the academic and commercial scientific community from all over the UK and beyond.

The RASOR Scientific Director, Dr Andy Pitt opened the meeting with an introduction to the RASOR consortium – Radical Solutions for Researching the Proteome - an Interdisciplinary Research Collaboration between engineers and biomolecular, medical and physical scientists to develop new technologies for cell and proteomic research.

Prof Jon Cooper and Dr Logan Mackay presented digital microfluidic tools based on Surface Acoustic Wave (SAW) and Electrowetting on Dielectrics (EWOD) respectively. Both technologies were developed within RASOR to automate liquid handling and sample preparation for Mass Spectrometry. Prof Ted Hupp presented using peptide libraries and peptide aptamer microarrays to study protein-protein interactions. These talks touched on all three main research themes of RASOR: Array Enabled Detection, Identification and Quantification, Nanoproteomics, and Functional Analysis of Protein Populations.

The highlight was the plenary talk by **Professor George Whitesides** on simple, low-cost diagnostic systems using open-channel on paper. The simple but elegant designs will provide extremely cheap diagnostic tools affordable by poorest population in the developing world such as in Africa. The University Vice-Principal, Prof Steve Beaumont welcomed Prof Whitesides, and gave a brief introduction about him. Prof Whitesides is the Woodford L. & Ann A. Flowers University Professor at the Department of Chemistry, Harvard University. His

research interests range from physical and organic chemistry, materials science, biophysics, complexity and emergence, surface science, microfluidics, optics, self-assembly, micro- and nanotechnology, science for developing economies, catalysis, rational drug design, cell-surface biochemistry, simplicity, and infochemistry to energy production and conservation and origin of life. During the last 50 years of his research life, Professor Whitesides published over 900 papers. He is the most cited living chemist in the world with an H-factor of 147. He was cited 9000 times in 2009. He has won numerous awards and honours, and holds many eminent advisory positions. In 2002, he served as chairman of the panel that evaluated the state of chemical research in the United Kingdom. Their findings were summarized what is now known as the Whitesides Report.

Single cell manipulation and analysis appeared to be the common interest of most guest speakers. Dr Guillaume Charras presented a novel microfluidic device for studying cell migration in three dimensions. Dr Tracy Melvin presented the development of miniaturised devices for user-defined and automated non-invasive optical cell sorting. In addition, Prof Kishan Dholakia demonstrated photoporation as a fast and effective method for cell transfection. Prof Mark Bradley presented the novel polymer-library based microarray technology for high-content cell screenings. This versatile technology has allowed the selection of polymers for a myriad of applications, including control of stem cells fate, corneal bandages, bacterial capture and thermally responsive surfaces with a number of materials being exploited in real-life situations. Droplet-based tools for high efficiency cellular analysis were presented by Prof Andrew deMello, including methods to generate droplets at kHz frequencies, and structures for ultra-fast sample dilution and two-dimensional separations. A selection of 27 posters were presented and discussed at the symposium.

For further information, please visit:
www.gla.ac.uk/rasor

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