Bioprocessing Technology Institute
A*STAR
CREATING GROWTH. ENHANCING LIVES.

Seminar Announcement

Glycoarrays as Tools in GlycoBiotechnology



Speaker : **Professor Sabine L Flitsch**
DPhil MA DiplChem CChem FRSC
MIB & School of Chemistry
The University of Manchester

Date : **Monday, 2 November 2015**

Time : **10.00am**

Venue : **Creation Theatrette, Level 4, Matrix**

Hosts : **Professor Pauline Rudd**
Visiting Scientist, BTI
Dr Zhang Peiqing
Research Scientist, BTI

Please click here to register for the seminar.

Abstract

The analysis of carbohydrate and glycoconjugate structures and their interactions with proteins are core to modern glycomics. Mass spectrometry (MS) is one of the most useful analytical tools in glycomics because of high sensitivity and minimal requirements for labelling of probes. We have been interested in developing MS –based methodologies for structure-function studies of glycans with focus on two aspects: (i) application of MALDI-Tof MS for the label free analysis of glycan binding proteins on glycan arrays; (ii) determination of three-dimensional structure of carbohydrates with the aim to develop de-novo sequencing protocols using MS-based techniques.

We have recently reported a method for the sequence determination of oligosaccharides, which includes ion mobility MS for three dimensional structure determination [1]. This sequencing method allows us to determine the identity of each sugar building block at high resolution after in-source fragmentation, thus opening up the way for generic sequencing strategies. This technology has now been expanded to allow us to distinguish between the two anomeric configurations thus completing the full stereochemical structural analysis of glycan oligomers and conjugates.

About the Speaker
http://www.manchester.ac.uk/research/Sabine.flitsch

Sabine Flitsch graduated with a Diplom in Chemistry from the University of Münster (Germany) and obtained her DPhil in 1985 from the University of Oxford. She spent three years at the Massachusetts Institute of Technology, USA as a Research Fellow (with H. G. Khorana) before returning to the UK to hold academic positions at the Universities of Exeter, Oxford, Edinburgh and Manchester. She is currently Professor of Biological Chemistry at the University of Manchester with her research group housed at the Manchester Institute of Biotechnology (MIB).

Her research interests are on the interface of chemistry and biology with focus on applications in Biotechnology. Her focus is on glycobiotechnology, using biocatalysis for the synthesis of complex carbohydrates and glycoconjugates such as glycolipids, glycoproteins, polysaccharides, glycomaterials and glycoarrays. These glycoarrays are used to discover new carbohydrate-protein interactions using mass spectrometry as a label-free analytical tool.

Recent publications

[1] P. Both, A. P. Green, C. Gray, R. Šardzík, J. Voglmeir, C. Fontana, M. Austeri, M. Rejzek, D. Richardson, R. A. Field, G. Widmalm, S. L. Flitsch and C. E. Eyers. Discrimination of epimeric glycans and glycopeptides using IM-MS and its potential for carbohydrate sequencing. **Nature Chemistry. 2013**; 6(1): 65.

[2] G. T. Noble, F. L. Craven, J. Voglmeir, R.Šardzík, S. L. Flitsch and S. J. Webb. Accelerated Enzymatic Galactosylation of N-Acetylglucosaminolipids in Lipid Microdomains**. J. Am. Chem. Soc. 2012**; 134(31): 13010-13017.

[3] R. Šardzík, A. P. Green, N. Laurent, P. Both, C. Fontana, J. Voglmeir, M. J. Weissenborn, R. Haddoub, P. Grassi, S. M. Haslam, G.Widmalm, and S. L. Flitsch. Chemoenzymatic Synthesis of O-Mannosylpeptides in Solution and on Solid Phase. J. **Am. Chem. Soc. 2012**; 134(10): 4521-4524.

[4] R. Castangia, M. Austeri, S. L. Flitsch. Enzymatic Amine Acyl Exchange in Peptides on Gold Surfaces. **Angewandte Chemie 2012**; 51(52):13016-13018.

[5] J. Rannes, A. Ioannou, S. Willies, G. Grogan, C. Behrens, S.L. Flitsch, N.J.Turner, Glycoprotein labelling using engineered variants of galactose oxidase obtained by directed evolution. **J. Am. Chem. Soc. 2011**; 133(22): 8436-8439.