



Glycoscience Tools for Biotechnology & Bioenergy, a BBSRC NIBB

## **Carbohydrate Recognition and Inhibition**

Norwich City Football Club, Carrow Road, Norwich  
20-21<sup>st</sup> November 2014

### **Participants:**

Sherif Abouelhadid, Sarah Allman, Jesus Angulo, Sibyl Batey, Marc Bayliss, David Benito, Gurdyal Besra, Stephen Bornemann, Balakumaran Chandrasekar, Harriet Chidwick, Jon Clarke, Paul Crocker, Emmanuelle Crost, Jon Cuccui, Sonia De Munari, Ann Dixon, Claire Doherty, Martin Fascione, Charlie Fehl, Rob Field, Sabine Flitsch, Matthew Gibson, Tracy Gloster, Pat Gunning, Andy Hacking, Edward Hems, Alex Holden, Irina Ivanova, Nathalie Juge, Nina Kamennaya, Devon Kavanaugh, Norihito Kawasaki, Sakonwan Kuhadomlarp, Martina Lahmann, Dimitris Latousakis, Charlotte Leclaire, Seung Seo Lee, Bruno Linclau, Donald MacKenzie, Gavin Miller, Daniel Mitchell, Sergey Nepogodiev, Hermen Overkleeft, C David Owen, Thomas Parsons, Giulia Pergolizzi, Martin Rejzek, Sarah-Jane Richards, Andrew Round, Sylvain Royer, David Russell, Andrew Staphnill, Louise Tailford, Elizabeth Thursby, Daniel Ungar, Gerd Wagner, Ben Wagstaff, Alexandra Wittmann, Katherine Wilson, Rebecca Winsbury, Ian Young, Rob Young

### **Thursday 20<sup>th</sup> November**

The meeting started with a drinks reception and dinner. During the evening, delegates were asked to consider the following questions at their tables:

- Why is glycoscience under-appreciated by science, medicine and industry generally?
- Why is carbohydrate recognition important, academically and commercially?
- How might inhibitors of carbohydrate recognition be useful in biotechnology and medicine?

The delegates changed tables in between courses to ensure varied discussion. The results of the discussions were captured on post it notes for review on Day 2.

### **Friday 21<sup>st</sup> November**

#### **Welcome and scene setting:**

Dr Nathalie Juge (IFR) - Welcomed everyone to the event. The aims of the event were to encourage networking between all delegates and to give an overview of the range of activities in theme area in the UK.

Professor Rob Field (JIC) – also welcomed everyone, and introduced IBCarb - a network on industrial biotechnology focussed on carbohydrates, and not a glycoscience network. Delegates were also reminded of the discussion points from dinner the evening before. The format of the meeting was made up of 3 main speakers with accompanying flash presentations.

#### **Session 1**

There was a **key-note lecture from Professor Del Besra**, (University of Birmingham) “The mycobacterial cell wall: assembly and new drug targets”. This was followed by some questions and discussion.

The first series of **flash presentations** then followed:

- Tracey Gloster (University St Andrew's) “Structure & function of eukaryotic carbohydrate processing enzymes”

- Jesus Angulo (University of East Anglia) “Ligand based NMR spectroscopy to study carbohydrate-receptor interactions”
- Marc Bayliss (DSTL) “Antimicrobial Vaccine Programme”
- Martina Lahmann (University of Bangor) “Carbohydrate synthesis and analysis”

Delegates then enjoyed a networking **Coffee break**.

### **Session 1 - Flash presentations continued:**

- Patrick Gunning (IFR) “Atomic Force Microscopy”
- Gavin Miller (University of Manchester) “Synthetic chemistry, chemoenzymatic methods, orthogonal glycosylation methods in uronate systems”
- Nathalie Juge (IFR) “Molecular mechanisms of gut bacteria – mucus interaction: impact on health and disease”
- Tom Parsons (University of Oxford) “Working at the Chemistry-Biology interface” *on behalf of Ben Davies*
- Ann Dixon (University of Warwick) “How lectins and glycans interact from protein structure perspective”

### **Session 2**

**Key speaker Professor Paul Crocker** (University of Dundee) “Towards therapeutic targeting of lectins in the immune system” followed by some questions and discussion.

The second series of **flash presentations** then followed:

- Norihito Kawasaki (IFR) “Intestinal glycobiology: what you eat shapes your immune function”
- David Owen (St Andrew’s) “Studies into Sialidases” *on behalf of Garry Taylor*
- Stephen Bornemann (JIC) “Glucan enzymology”
- Jon Cuccui (LSHTM) “Understanding the nature/biological roles of glycans”
- Balakumaran Chandrasekar (University of Oxford) “Activity-profiling of glycosidases in plants”
- Daniel Ungar (University of York) “Vesicle traffic based enzyme sorting in the golgi”
- Dan Mitchell (University of Warwick) “Non carbohydrate inhibitors of human lectins”
- Sabine Flitsch (MIB, University of Manchester) “Chemo-enzymatic synthesis of O-mannosyl glycopeptides on array surfaces”

The IBCarb Network Manager, Claire Doherty gave an overview of the IBCarb network. Delegates then participated in a networking **lunch**.

### **Session 3**

Started with the **key speaker Professor Hermen Overkleeft** (Leiden University) “Chemical Tools for Glycobiology Research - Results and Perspectives” which was followed by questions and discussion.

The second series of **flash presentations** then followed

- Rob Young (GSK) “Open source discovery with GSK”
- Sarah Allman (OU) “Chemical and enzymatic synthesis of Carbohydrates for functional studies of protein-carbohydrate interactions”
- Bruno Linclau (University of Southampton) “Organic chemistry, especially organofluorine chemistry and synthesis of fluorinated carbohydrates”
- Martin Fascione (University of York) “Chemical glycobiology studies in rare sugars in bacteria.” Also highlighted that funding had been received (ALERT-14) for an automated carbohydrate synthesiser to be located in York early 2015.
- Gerd Wagner (Kings College London) “Chemical inhibitors of glycosylation”

- Seung Seo Lee (University of Southampton) “Enzyme Chemical Biology group ; enzyme characterisation, SARs of small molecules and proteins and enzymatic synthesis”
- Andy Round (University of East Anglia) Towards polysaccharide sequencing - Sliding contact force spectroscopy unzips oligo-G junction zones in alginate”
- Matt Gibson (University of Warwick) “Materials for glycobiology, - Glycan/Glycoprotein mimetics and Biosensing & low-cost diagnostics”
- Rob Field (JIC) “Chemical genetics and RNAi to study germinating barley”

### **Summary**

Professor Rob Field summarised the meeting, which included discussion of the answers to the questions generated over dinner the previous evening as well as some general points about an open source inhibitor library, access to equipment, industry and EU links, potential future IBCarb events and funding opportunities.

### **Close**

The meeting closed with a final networking session over afternoon tea before departure.