

MEETING REPORT

Royal Society of Chemistry Carbohydrate Group and Biochemical Society Glycobiology Group Joint Spring Meeting: Complex Carbohydrates: Structure, Recognition and Synthesis, University of St. Andrews, 25-28 March 1996

The Spring Meeting of the Royal Society of Chemistry (RSC) Carbohydrate Group was held jointly for the first time with the Glycobiology Group of the Biochemical Society; the topic was 'Structure, Recognition and Synthesis of Complex Carbohydrates' and the venue was the scenic University of St. Andrews in Scotland. About 150 scientists with a broad range of backgrounds, from synthetic chemists and spectroscopists to enzymologists and parasitologists participated. The result was a lively, well-integrated meeting with lectures on a variety of inter-related topics. The standard of presentations was uniformly high, with well-crafted slides used to illustrate the latest developments in Glycobiology.

Five plenary lectures were given: Fraser Stoddart (University of Birmingham) set the ball rolling with an after dinner lecture on the nanoscale synthesis of cyclodextrin analogues and carbohydrate containing dendrimers. The former were found to be arranged in stacks that form nanotubes in the solid state while the latter, characterized by NMR and MALDI-TOF MS, and carried up to 18 sugar units at the periphery. There followed a presentation by Barry Hardy (Oxford University) on the Glycoscience Network (<http://bellatrix.p-cl.ox.ac.uk.TGN>) and the First Electronic Glycoscience Conference (EGC-1) held last summer which succeeded not only in allowing hundreds of participants to browse and discuss many diverse papers but also in making many carbohydrate scientists computer literate! Barry Hardy announced that the next electronic meeting (EGC-2) will be held September 1996.

From the synthesis of oligosaccharide analogues, including thioglycosides, of glycolipids, Goran Magnusson (Lund University) showed that four hydroxyl groups and the glycosidic oxygen were needed for bacterial adhesion; an interesting model, invoking co-operative H-bonding, was presented to account for the interactions.

Monica Palcic (University of Alberta) described the use of glycosyltransferases, many of which have been cloned, for the efficient preparation of natural and unnatural oligosaccharide structures. Particularly elegant was the use of deuterium-labelled sugars and various glycosyltransferases to selectively label different arms of N-linked complex oligosaccharides.

In a very comprehensive lecture on the race for glycoconjugate vaccines against meningitis, Harold Jennings (NRC Ottawa) described the chemical modification of polysaccharides to achieve immunogenicity and, in addition, illustrated the power of NMR in determining the helical conformation of a binding epitope. Raymond Lemieux (University of Alberta) delivered an after dinner tour-de-force on how water provides the impetus for molecular associations in aqueous solution.

The theme of recognition was illustrated by Kurt Drikamer (Oxford University) in an invited lecture on carbohydrate recognition by calcium-dependent animal lectins. A number of other invited lectures covered various aspects of the surface glycoconjugates of protozoan parasites. Chris Jones (NIBSC) discussed the structures of GPI anchors, while Pedro Bonay (Madrid) spoke about the carbohydrate binding proteins of *T. cruzi*. John Brimacombe (University of Dundee) described the synthesis of substrates used in studies by Mike Ferguson (University of Dundee) on the GPI biosynthetic pathway of *T. brucei*.

We were treated to the use of state-of-the-art instruments by a representative from PerSeptive Biosystems, who described the use of MALDI-TOF-MS with post source decay for glycosylation site analysis, and Charles Weller (St. Andrews) who used HCCH-TOCSY NMR experiments to investigate the structure of a glycan with ^{13}C and ^{15}N -labelled oligosaccharides from recombinant hCG. In addition, ^{13}C edited NOESY spectra were used

to generate a restrained molecular dynamics simulation of the glycan in association with the protein. The production of such isotopically labelled glycoproteins was described by Jonathan Miles Brown (Martek Biosciences).

We were also provided with updates on the latest developments in synthetic carbohydrate chemistry. Stuart Warriner (Cambridge University) described the efficient synthesis of a high mannose nonasaccharide, Geert-Jan Boons (University of Birmingham) discussed the use of new chemoselective glycosylation reactions using a bulky leaving group (with a post-script from Ray Lemieux, to keep us all on the correct mechanistic track), while Pierre Sinay (Paris) spoke about the construction of a C-disaccharide where the interglycosidic oxygen atom is replaced by a methylene group. Bill Mackie (University of Leeds) gave an interesting overview of the structures of arabinogalactan-proteins and described the synthesis of component di- and trisaccharides, Sabine Flitsch (University of Edinburgh) spoke about the use of enzyme cleavable linkers for solid-phase carbohydrate synthesis and David Leigh (UMIST) described the use of stannylene acetals and ethers. No carbohydrate meeting would be complete without reference to Sialyl

Lewis X and Jeremy Prodger (Glaxo Wellcome) addressed the synthesis of analogues and their biological activity.

In addition, almost 50 posters were on display and from these ten were selected for short oral presentations in parallel sessions. The prize for best student presentation went to Melanie Underwood (Oxford University) who gave an excellent talk entitled "Heparan sulphate fragments: their synthesis and interaction with growth factors". A number of companies enlivened the coffee breaks with an exhibition of some novel technologies.

In her closing address, Elizabeth Hounsell, Chairman of the group, thanked the 150 participants for attending this joint meeting which was superbly organized by Rob Field, Trevor Rutherford and their colleagues. The organizers of the next Spring meeting (Galway, 24-27 March, 1997) have a very high standard to live up to.

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