POLY **Scott Iacono, Sheng Lin-Gibson, Jeffrey Youngblood** **Monday, September 09, 2013**

94 - Monodisperse, sequence-defined homo- and heterofunctionalized glycooligomers and their multivalent binding modes

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Earlier we introduced a new approach towards monodisperse, sequence-controlled oligo- and polymers based on solid phase synthesis and the stepwise addition of tailor-made building blocks (SPPoS).Through the choice of building blocks applied in each step, we are able to precisely control the physicochemical properties of the macromolecule and tune from hydrophilic to hydrophobic, flexible to stiff, go from linear to branched chains or introduce chirality at different points in the polymer chain.Recently we expanded this approach towards the solid phase synthesis of multifunctional glycopolymers. Through this combination we are now able to control the number of sugar ligands attached to the polymer scaffold, their position on the scaffold as well as their distancing and to go from homomultivalent to heteromultivalent systems presenting different ligands at different positions.

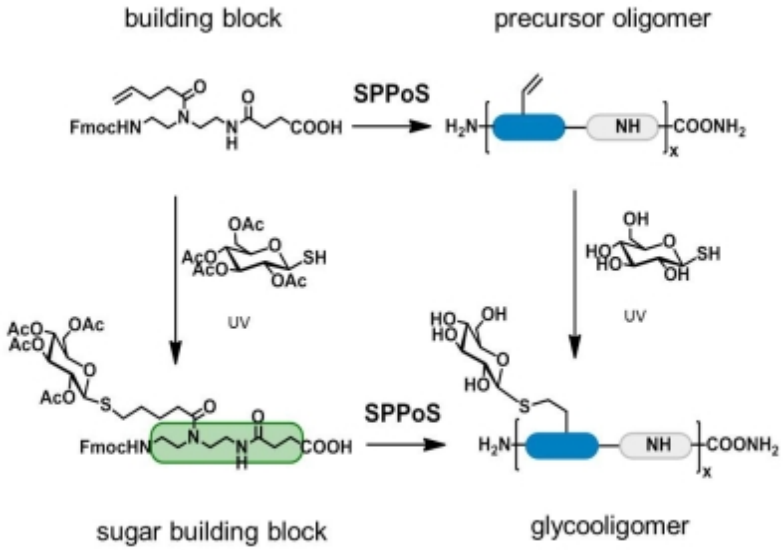

Figure 1: Thiol-ene coupling of building blocks and oligomer precursors to obtain homo- and heteromultivalent glycopolymers

With this toolbox at hand, we look at the fundamental principles of multivalent binding and systematically evaluate the influence of

different scaffold parameters using surface plasmon resonance (SPR), NMR and a novel affinity assay based on soft colloidal probe reflection interference microscopy (SCP RICM).This information is then applied for the design of glycomaterials for biomedical applications such as targeted gene delivery and anti-bacterial coatings.

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Sequence-Controlled Polymers (01:30 PM - 05:35 PM)
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