

“Click” Modular Approach to Glycosylated Resins: Design, Synthesis and Preliminary Lectin recognition Studies

Gaojian Chen,^a Lei Tao^a, Giuseppe Mantovani,^a Daniel Nyström^b and David M. Haddleton^{a*}

^a*Department of Chemistry, the University of Warwick, Coventry CV4 7AL, UK.* ^b*Royal Institute of Technology, Fibre and Polymer Technology, Teknikringen 56-58, SE-100 44 Stockholm, Sweden.*

The covalent immobilization of a range of carbohydrate derivatives onto resin beads is described. Copper-catalyzed Huisgen [2+3] cycloaddition (often termed “click” reaction) was used to graft mannose-containing azides to complementarily functionalized alkyne surfaces, namely: a) Wang resin or b) “Rasta” particles consisting of a “clickable” alkyne polymer loose outer shell and a Wang resin inner core. For the second approach, Wang resin beads were first converted into immobilized ATRP initiators, then polymerization of trimethylsilyl-protected propargyl methacrylate followed by deprotection with TBAF afforded the desired polymalkyne clickable scaffold. An appropriated α -mannopyranoside azide was then clicked onto it, to give a mannose functionalized “Rasta” resin. IR, gel-phase ¹H NMR and elemental analysis have been used to characterize the modified resins. The binding abilities of these D-mannose-modified particles were then tested using fluorescein labelled Concanavalin A (Con A), lectin known for its ability of binding certain mannose-containing molecules. Our preliminary results indicated that the novel glycohybrid materials presented in this work are able to efficiently recognize mannose-binding model lectines such as Con A, opening the way for their potential application in affinity chromatography, sensors and other protein recognition/separation fields.