OC12. Biotinylated Polymer Surface Coated Metal Nanoparticles and Their Bioconjugation to Streptavidin

Ravin Narain

Department of Chemistry and Biochemistry, Laurentian University, 935, Ramsey Lake Rd, P3E 2C6, ON, Canada
rnarain@laurentian.ca

We report here the preparation of novel biotinylated glyconanoparticles and temperature sensitive biotinylated magnetic nanoparticles from well-defined glycopolymers and poly(N-isopropylacrylamide) synthesized via the reversible addition fragmentation chain transfer (RAFT) polymerization process. The in-situ reduction of the RAFT prepared glycopolymers and gold tetrachloride via a chemical or photochemical process resulted in the formation of mono-disperse biotinylated gold glyconanoparticles. On the other hand, the biotinylated coated magnetic nanoparticles were obtained by the surface exchange of oleic acid on stabilized iron oxide nanoparticles with an excess of p(NIPAM) or *b*-p(NIPAM) at 60 °C in dioxane. The availability of the biotin ligands on the surface of the iron oxide and gold glyconanoparticles towards bio-conjugation to streptavidin was studied by several methods. We have demonstrated that the binding of the biotin ligands on the surface of the temperature-responsive magnetic nanoparticles to streptavidin can be turned on and off as a function of temperature. Furthermore, the biotinylated glyconanoparticles underwent aggregation in the presence of streptavidin as revealed by spectrophotometry which indicates the accessibility of the biotin for conjugation. These results were further confirmed by surface plasmon resonance even in the case of surface immobilized streptavidin.