

Detection of Glycoprotein based on FRET between Nanoparticles

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ABSTRACT

Glycan moiety of glycoproteins plays an essential role in its biological activity *in vivo*, and detailed profiling of the pattern or degree of branched oligosaccharide chains are of great importance in development of protein therapeutics. However, most analyses have relied on conventional methods involving complex multi-step procedures. Here we report an approach to fast and easy detection of the glycosylation degree based on fluorescence resonance energy transfer (FRET) between concanavalin A-conjugated gold nanoparticles (ConA-AuNPs) and dextran-conjugated quantum dots (Dex-QDs). The changes in photoluminescence (PL) quenching of Dex-QDs were correlated with degree of mannosylation and the length of branched mannose-chains attached onto glycoproteins. Parallel analysis of the diversely mannosylated bovine serum albumins (Man-BSAs) using image analyzer further demonstrated the potential of our system for high-throughput analysis for glycosylation degree.