

Glyco-Nanoparticles for biosensing and therapeutic-targeting

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During the last decade significant interest has arisen in the research of Nano Particles (NPs) for biomedical applications. The integration of nanotechnology into the field of medical science has opened new possibilities. Working with nanomaterials has allowed a better understanding of molecular biology. As a consequence, there is the potential of providing novel methods for the treatment of diseases which were previously difficult to target due to size restrictions. The major applications of nanoparticles in the biomedical field are related to drug delivery and targeting or to the generation of novel diagnostic tools. Thanks to their structural and multivalency properties, NPs may present high drug loading, increase drug stability and allow drug targeting to specific tissue, body district, reducing side effects. In other words NPs could be “magic bullets” for the treatment of many pathologies. In this context, the glycol-world enter under different aspects: 1) gain advantage of the multivalent presentation of NPs, in order, for example, to mimick the natural multivalent presentation of glycosidic residues on biomolecules, or for the multivalent presentation of glycodrugs^{1,2}; 2) afford a plethora of potential targeting agent; 3) constitute itself a multifunctional NP³. Herein we will present the generation of glycofunctionalised CdSe NPs, and their application for the generation of sensitive biosensors as potential diagnostic tools.⁴ We will also describe our recent achievements obtained with glyco-based NPs, known as cellulose nanocrystals, in the field of bone-tissue targeting in vivo, and as promising antibacterial agents.^{3,5}

References

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