

Particles for Biomedical Applications – Controlled Drug Delivery and Bioimaging

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Abstract

Nanotechnology has found its presence in many industries and applications, and one such promising application is in the biomedical arena. It has been exploited for the development of nanotheranostics, for drug delivery and bioimaging purposes. For example, drug delivery in the form of nanomedicine utilizes nano-sized particles to transport and release pharmaceutical compound into the body, to achieve the most desirable therapeutic outcome and in the safest possible manner. In this presentation, we will focus on how nanotechnology can be applied for nanotheranostics, i.e. drug delivery and bioimaging. The scope will be on the use of bottom-up approaches to develop various types of particles, and how these can be modified for targeted, controlled and sustained release of drugs in orthopedic, geriatric, and oncologic applications. We will also review how multi-layered and hollow particles are currently developed to deliver multiple drugs and bioimaging probes. At the same time, this presentation would also review the toxicological responses of some nanomaterial candidates, and how this would translate to developing safer nano-materials for biomedical applications.