Volume 4, Issue 1, 2015, 230 ISSN 2284-6808

Letters in Applied NanoBioScience

www.NanoBioLetters.com

Editorial Open Access Journal

Published on-line: 30.03.2015

Targeted and controlled drug delivery through nanomaterial methods

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1. EDITORIAL

Nanotechnology provides exciting new tools and materials for the pharmaceutical and biotechnology industries that have the potential to dramatically improve drug delivery. The small size and high surface-to-volume ratio of nanomaterials make them ideal candidates for drug delivery in order to guide therapeutics to tissues, coax them through biological barriers at surfaces of and within cells, and escape drug clearance among many others. Intelligent drug delivery systems have utilized nanomaterial approaches in order to maximize therapeutic efficacy while minimizing undesirable side-effects.

This special issue brings together innovative research in various approaches that incorporate nanomaterials for targeted and controlled drug delivery. In the work by Chou *et al*., nanosuspension formulations were investigated to identify critical parameters that dictate the particle size reduction limit for wet milled formulations. Their findings may contribute to feasibility assessments when deciding to utilize nanosuspension formulations. In the article by Hu *et al*., DMSA Fe2O3 DOX nanoparticles had a significantly higher calcein loading rate and delivered DOX to the desired site without exhibiting cytotoxic activity. Chiang *et al*., demonstrated the suitability of using a modeling approach to predict the in vivo performance of a nanosuspension formulation for the delivery of DCU. Yeh *et al*. demonstrated that they could control the drug release rate of PLGA nanoparticles by tuning the hydrophobicity of the formulations. Furthermore, Javadi *et al*. explored the use of acoustically activated drug delivery using 200 nm liposomes. Lastly, the scope of this special issue brings together research in the field of nanomaterial methods for targeted and controlled drug delivery and offers the reader a broad perspective on this field.