Title: Polymeric Nanostructured Materials for Biomedical Applications

Author: Zhaohui Tang Chaoliang He Huayu Tian Jianxun Ding Benjamin S. Hsiao Benjamin Chu Xuesi Chen

PII: S0079-6700(16)30033-8
DOI: http://dx.doi.org/doi:10.1016/j.progpolymsci.2016.05.005
Reference: JPPS 986

To appear in: *Progress in Polymer Science*

Received date: 12-5-2015
Revised date: 21-5-2016
Accepted date: 31-5-2016

Please cite this article as: Tang Z, He C, Tian H, Ding J, Hsiao BS, Chu B, Chen X, Polymeric Nanostructured Materials for Biomedical Applications, *Progress in Polymer Science* (2016), http://dx.doi.org/10.1016/j.progpolymsci.2016.05.005

Polymeric Nanostructured Materials for Biomedical Applications

Zhaohui Tang[a], Chaoliang He[a], Huayu Tian[a], Jianxun Ding[a],

Benjamin S. Hsiao[b,*], Benjamin Chu[b] and Xuesi Chen[a,*]

[a] *Key Laboratory of Polymer Ecomaterials, Changchun Institute of Applied Chemistry, Chinese Academy of Sciences, Changchun 130022, China*

[b] *Department of Chemistry, Stony Brook University, Stony Brook, NY 11794-3400, United States*

ABSTRACT

Polymeric nanostructured materials (PNMs), which are polymeric materials in nanoscale or polymer composites containing nanomaterials, have become increasingly useful for biomedical applications. In specific, advances in polymer-related nanoscience and nanotechnology have brought a revolutionary change to produce new biomaterials with tailored properties and functionalities for targeted biomedical applications. These materials, including micelles, polymersomes, nanoparticles, nanocapsules, nanogels, nanofibers, dendrimers and nanocomposites, have been widely used in drug delivery, gene therapy, bioimage, tissue engineering and regenerative medicine. This review presents a comprehensive overview on the various types of PNMs, their fabrication methods and biomedical applications, as well as the challenges in research and development of future PNMs.

Keywords: Polymer, Nanostructure, Biomaterials, Nanocarriers, Biomedical Applications

* Corresponding authors: xschen@ciac.ac.cn (XS. Chen) , Tel.: +86 431 85262112, Fax: +86 431 85262112

benjamin.hsiao@stonybrook.edu (BS. Hsiao), Tel.: +1 631 632 7793, Fax: +1 631 632 6518