Title: Polyphophazenes as anti-cancer drug carriers: From synthesis to application

Author: Akram Muhammad Li Wang Haojie Yu Wael A. Amer Hamad Khalid Nasir M. Abbasi Yongsheng Chen Zain-ul-Abdin M. Saleem

PII: S0079-6700(14)00084-7
DOI: http://dx.doi.org/doi:10.1016/j.progpolymsci.2014.07.009
Reference: JPPS 886

To appear in: *Progress in Polymer Science*

Received date: 10-10-2013
Revised date: 9-6-2014
Accepted date: 29-7-2014

Please cite this article as: Muhammad A, Wang L, Yu H, Amer WA, Khalid H, Abbasi NM, Chen Y, Saleem M, Polyphophazenes as anti-cancer drug carriers: From synthesis to application, *Progress in Polymer Science* (2014), http://dx.doi.org/10.1016/j.progpolymsci.2014.07.009

Polyphophazenes as anti-cancer drug carriers: From synthesis to application

Akram Muhammad, Li Wang*, Haojie Yu*, Wael A. Amer, Hamad Khalid, Nasir M. Abbasi, Yongsheng Chen, Zain-ul-Abdin, M. Saleem

State Key Laboratory of Chemical Engineering, Department of Chemical and Biological Engineering, Zhejiang University, Hangzhou 310027, China.

Abstract

Currently, most of administered anti-cancer drugs are low molecular weight compounds (as compare to polymers) and hydrophobic in nature. Such small molecular anti-cancer drugs possess fast clearance rate from the blood circulating system and have toxic side effects. Poly(organophosphazenes) have wide range of biomedical applications owing good biocompatibility, sustainability and degradability into non-toxic by-products. So, in this review, we have carefully selected such poly(organophosphazenes), which proved to be good anti-cancer drug carriers because of overcoming crucial issues related to the administration of anti-cancer drugs i.e poor hydrophilicity, lack of cancer cells specificity, and fast clearance rate from blood circulating system. Thence, the main focus of this review is to highlight the advancement that have been achieved in the synthesis of poly(organophosphazenes) and their application in anti-cancer drug delivery system (DDS).

Keywords: Anti-cancer drug, poly(organophosphazene), pH-responsiveness, drug delivery system

***Corresponding authors**: opl_wl@zju.edu.cn (L. Wang); hjyu@zju.edu.cn (H. Yu). Tel: +86-571-8795-3200; Fax: +86-571-8795-1612; E-mail: