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One-pot green synthesis of doxorubicin loaded-silica nanoparticles for *in vivo* cancer therapy

Shan Jiang^{1#}, Li Hua^{2#}, Zilong Guo^{1#}, Lin Sun^{1*}

¹ College of Chemistry, Jilin University, Changchun, P. R. China 130012

² Department of Immunology, Norman Bethune College of Medicine, Jilin University, Changchun, P. R. China 130021

*Corresponding author.

E-mail address: slin168168@jlu.edu.cn

#These authors contributed equally to this work

Abstract

The present work reveals a new and simple one-pot green method to load doxorubicin (DOX) drugs in silica nanoparticles for efficient *in vivo* cancer therapy. The synthesis of DOX loaded silica nanoparticles (SiNPs/DOX) is based on the efficient encapsulation of DOX in surfactant Tween 80 micelles which act as a template for the formation of silica nanoparticles. The release profile, cellular uptake behavior, cytotoxicity and antitumor effect of SiNPs/DOX nanoparticles were investigated and compared to free DOX. The silica nanoparticles improved the cellular drug delivery efficiency and exhibited high cytotoxicity, successfully achieving the inhibition of tumor growth. Notably, the tumor size and weight of SiNPs/DOX group was 2-fold and 1.7-fold smaller than that of free DOX group, and 4-fold and 2-fold smaller than that of PBS group. The one-pot green synthesis system may have the potential to be developed as a promising drug delivery system.

Keywords

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