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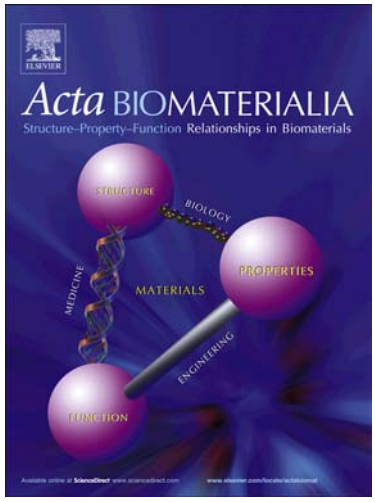

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ACCEPTED MANUSCRIPT

Electrospun PLA/MWCNTs composite nanofibers for combined chemo- and photothermal therapy

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Abstract

Carbon nanotubes are effective thermal generators by absorbing near-infrared radiation (NIR). In this study, multiwalled carbon nanotubes (MWCNTs) and doxorubicin (DOX) were successfully electrospun into the poly-*L*-lactic acid (PLLA) nanofibers. It is confirmed that NIR radiation could not only initiate burst release of DOX from the fibers due to the relatively low glass transition temperature (Tg) of PLLA, but also significantly increase the temperature of fibers-covering tumor site. The multifunctional fibers showed increased cytotoxicity both *in vitro* and *in vivo* by the combination of photothermal induced hyperthermia and chemotherapy with DOX. This drug delivery system could be very useful and convenient in future clinical applications for localized cancer therapy.

Key words: electrospun nanofibers; doxorubicin; MWCNTs; local treatment; combination cancer therapy

1. Introduction

Over the past decades, many therapeutic strategies have been developed to treat cancer which is becoming the leading cause of death. Local treatment, which could maximize drug concentration of targeting site and minimize systematic toxicity, is a better choice than systemic chemotherapy to treat unresectable tumors and to prevent postoperative recurrence [1-3]. Many local delivery systems such as drug loaded fibers, hydrogel and wafers, have been studied for local therapy in recent years [4-7].

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