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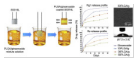

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Research paper

Drug-eluting coating of ginsenoside Rg1 and Re incorporated poly(lactic-*co*-glycolic acid) on stainless steel 316L: Physicochemical and drug release analyses

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Abstract

Active ingredients of ginsenoside, Rg1 and Re, are able to inhibit the proliferation of vascular smooth muscle cells and promote the growth of vascular endothelial cells. These capabilities are of interest for developing a novel drug-eluting stent to potentially solve the current problem of late-stent thrombosis and poor endotheliazation. Therefore, this study was aimed to incorporate ginsenoside into degradable coating of poly(lactic-*co*-glycolic acid) (PLGA). Drug mixture composed of ginseng extract and 10% to 50% of PLGA (*x*PLGA/g) was coated on electropolished stainless steel 316L substrate by using a dip coating technique. The coating was characterized principally by using attenuated total reflectance-Fourier transform infrared spectroscopy, scanning electron microscopy and contact angle analysis, while the drug release profile of ginsenosides Rg1 and Re was determined by using mass spectrometry at a one month immersion period. Full and homogenous coating coverage with acceptable wettability was found on the 30PLGA/g specimen. All specimens underwent initial burst release dependent on their composition. The 30PLGA/g and 50PLGA/g specimens demonstrated a controlled drug release profile having a combination of diffusion- and swelling-controlled mechanisms of PLGA. The study suggests that the 30PLGA/g coated specimen expresses an optimum composition