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Characterization and fabrication of poly (ϵ -Caprolactone) film coated with phlorotannin for biomedical application

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In various biomedical application including tissue engineering and drug delivery system (DDS), poly (ϵ -caprolactone) (PCL) has been commonly used as an excellent bioresorbable and biocompatible polymer. Phlorotannins, which a subgroup of tannins, are known to have various biological activities such as anti-inflammation, anti-oxidant and anti-cancer. The purpose of the present study was to fabricate phlorotannin-coated PCL film for using biomedical engineering. Fabrication of films were used by solvent casting technique and coating method. Briefly, PCL film was coated by phlorotannin solution (1, 3 and 5 wt%) and then mechanical characterization of fabricated film was investigated through Fourier Transform Infrared Spectroscopy (FT-IR), universal testing machine (UTM) and water-contact angle. Furthermore, cytotoxicity and anti-inflammation of film were investigated by using the MTT assay and nitric oxide production assay on LPS-stimulated macrophage RAW264.7 cells, respectively. Based on water-contact angle, phlorotannin-coated PCL film was more highly hydrophilic surface compared with non-coated PCL film. In addition, phlorotannin-coated PCL film did not show cytotoxicity and significantly inhibited the nitric oxide production. The results of this study suggested that phlorotannin-coated PCL film is potentially useful as a bioactive ingredient in tissue engineering and DDS fields.

Biography

Gun-Woo Oh has studied in Interdisciplinary Program of Biomedical, Mechanical & Electrical Engineering from Pukyong National University in Busan, Korea. He also has worked in marine biomedical science lab where he is able to experiment constantly on cells, synthesis, extraction and others, and the adviser is Won-Kyo Jung and then he applied doctoral course in same University and lab.

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