Hydroxyapatite/PLA biocomposite thin films for slow drug delivery of antibiotics for the treatment of bone and implant-related infections.

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Abstract

Drug delivery systems were developed from coralline hydroxyapatite (HAp) and biodegradable polylactic acid (PLA). Gentamicin (GM) was loaded in either directly to PLA (PLAGM) or in HAp microspheres. Drug loaded HAp was used to make thin film composites (PLAHApGM). Dissolution studies were carried out in phosphate buffered saline (PBS). The release profiles suggested that HAp particles improved drug stabilization and availability as well controlled the release rate. The release also displays a steady state release. In vitro studies in human Adipose Derived Stem Cells (hADSCs) showed substantial quantities of cells adhering to hydroxyapatite containing composites. The results suggested that the systems could be tailored to release different clinical active substances for a wide range of biomedical applications.