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ABSTRACT BOOK
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Currently developed injectable materials such as calcium-based bone cements have tried to replace the conventional PMMA. However, their brittleness affects their stability and may cause another fracture. Hence, our group has recently fabricated an injectable biodegradable polycaprolactone (PCL) - magnesium (Mg) hybrids to solve the problems. A wide range of mechanical properties was obtained by altering the PCL and Mg composition. And the rapid degradation of Mg was suppressed by the silane coupling agent surface treatment. This study aims to investigate the mechanical and in-vitro properties of the newly developed hybrid. Four types of PCL-Mg hybrids were prepared by incorporating 0.1g and 0.6g Mg beads with and without silane treatment into 1g PCL, respectively. Compression test was conducted to evaluate the mechanical properties of the hybrids. Green fluorescent protein osteoblasts (GFPOB) were cultured on the hybrids for 1 and 3 day(s) to evaluate their cell attachment and proliferation. 1-fold and 3-fold higher compressive moduli were found on the 0.1g and 0.6g Mg-PCL hybrids with and without silane treatment than pure PCL, respectively, indicating that the mechanical property of pure PCL was enhanced by incorporating Mg beads. GFPOBs grew well on the hybrids except the untreated 0.6g Mg-PCL. This was probably due to the large release of Mg which may cause toxic effect. Hence, the results suggested that the silane treatment was able to slow down the degradation of Mg. Further osteogenic properties and in-vivo studies are required for validating this material for clinical use.