

Basic Research—Biology

Biocompatibility and Osteogenic/Calcification
Potential of Casein Phosphopeptide-amorphous
Calcium Phosphate Fluoride



Abstract:

Introduction: Casein phosphopeptide-amorphous calcium phosphate (CPP-ACP) and CPP-ACP with fluoride (CPP-ACFP) have been shown to provide bioavailable ions to promote mineralization. Hence, the aim of this study was to evaluate the materials' biocompatibility and osteogenic/calcification potential for endodontic applications. **Methods:** Human and mouse osteoblastlike and fibroblast-like cell lines were incubated with 0.05%–3.0% w/v CPP-ACP and CPP-ACFP, and toxicity, proliferation, alkaline phosphatase, interleukin (IL)-1 α , and IL-6 production, collagen type I, osteocalcin, and osteopontin production, and mineralization/calcification were determined. **Results:** CPP-ACP and CPP-ACFP were non-toxic and had no significant effect on proliferation or production of the inflammatory cytokine IL-1 α . Alkaline phosphatase activity of the osteoblast-like cells was significantly increased ($P < .05$) by CPP-ACP and CPP-ACFP, as was the production of the osteotropic cytokine IL-6, the formation of calcium mineral deposits, and the secretion of mineralization-related proteins (collagen type I and osteocalcin). **Conclusions:** CPPACP and CPP-ACFP are biocompatible and have the potential to induce osteoblastic differentiation and mineralization. Potential applications include apexification, perforation repair, vital pulp therapy, and regenerative endodontic procedures. (J Endod 2018;44:452–457)