

## Development and Characterization of Hydroxyapatite Based Nanocomposites for Local Drug Delivery to Periodontal Pockets

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**Abstract :** The aim of this study is to fabricate hydroxyapatite based nanocomposites for local drug delivery in periodontal pockets. Hydroxyapatite is chemically similar to the mineral component of bones and hard tissues in mammals. Synthetic biocompatibility and bioactivity with human teeth and bone, making it very attractive for biomedical applications. Nanocomposite is a multiphase solid material where one of the phases has one, two or three dimensions of less than 100 nanometres (nm), or structures having nanoscale repeat distances between the different phases that make up the material. Nanostructured calcium phosphate materials play an important role in the formation of hard tissues in nature. It is reported that calcium phosphates materials in nano-size can mimic the dimensions of constituent components of calcified tissues. Nano-sized materials offer improved performances compared with conventional materials due to their large surface-to-volume ratios. The specific biological properties of the nanocomposites, as well as their interaction with cells, include the use of bioactive molecules. The approach of periodontal tissue engineering is considered promising to restore bone defect through the use of engineered materials with the aim that they will prohibit the invasion of fibrous connective tissue and help repair the function during bone regeneration.

**Keywords :** bioactive, hydroxyapatite, nanocomposites, periodontal

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