

## Newly Synthesized Polymer Hydrogels and Hydroxyapatite Nanoparticles (nHAP) for Biomedical Application: Histological and Biochemical Studies in Rats

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### Abstract

The development of biocompatible zwitterionic polymers and polymer-reinforced calcium phosphate pastes and cements in combination with specific drugs, has been considered as a promising strategy in bone tissue engineering and dental medicine. The main purpose of this work was to evaluate the relationship between physicochemical and mechanical properties of newly synthesized polymer hydrogels and hydroxyapatite nanoparticles (nHAP) and their biocompatibility *in vivo*. Standard hematological, biochemical and histological laboratory tests with Wistar rats and statistical analysis of the data obtained were performed. The results from the histological, hematological and biochemical analyses revealed that all tested materials are characterized by good biocompatibility and biodegradation. No hard inflammatory effects were noticed, only slight foreign body reaction responses were observed. The histological findings made by us confirmed the acceptance of the implanted materials and the good tolerance to their componential compounds.

*Key words:* zwitterionic polymers, histological, hematological and biochemical tests