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Derived Pectin/Apatite Bionanocomposites for Bone Healing  
Applications

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**From Waste to High-Value Product: Jackfruit Peel Derived Pectin/Apatite  
Bionanocomposites for Bone Healing Applications<sup>†</sup>**

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**Abstract**

Public requirements encouraged by the current asset framework drive industry to expand its general effectiveness by enhancing existing procedures or finding new uses for waste. Thus, the aim of this study was the isolation, fabrication, and characterization of pectin derived from jackfruit (*Artocarpus heterophyllus*) peels and the generation of hybrid of pectin (P)/apatite (HA) (P/HA) bionanocomposites. In this process, the natural pectin polymer derived from the peel of jackfruits was used in different concentrations for the fabrication of HA bionanocomposites. Characterization of the isolated pectin and bionanocomposites samples was performed with <sup>1</sup>H NMR and <sup>13</sup>C NMR, FTIR, XRD, SEM-EDX, and HR-TEM. Cytocompatibility, ALP, fibroblast stem cells, anti-inflammatory and cell adhesion testing of the fabricated bionanocomposites was showed good biocompatibility. Our results signify that the fabricated bionanocomposites might be applicable as bone graft materials.

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