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Functional Slow Release of Encapsulated Ibuprofen in Cross-linked Gellan Gum Hydrogel for Tissue Engineering Application

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Abstract : Dication cross-linked gellan gum hydrogel loaded with Ibuprofen with excellent mechanical properties had been synthesized as potential candidate for non-toxic biocompatible polymer material in tissue engineering. The gellan gum hydrogel with 5% Ibuprofen had produced a slow release profile with total drug release time of 25 hours as a resulting low swelling value recorded at 22+0.5%. Its compressive strength, 200.13+21 kPa was highest of all other hydrogel ratio of 0.5% and 1.0% Ibuprofen incorporation. Young's Modulus of the hydrogel with 5% Ibuprofen was recorded at 1.8+0.01 MPa, indicating good gel strength in which it is capable of withstanding a fair amount of subjected force during topical wound dressing application. Excellent mechanical properties, together with slow release profile, make the ibuprofen-loaded hydrogel a prospect candidate as biocompatible extracellular matrices in wound management.

Keywords : gellan gum, ibuprofen, slow drug release, hydrogel
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