

## Development of novel chitosan based biocompatible controlled drug release membranes

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Chitin [poly(N-acetyl-D-glucosamine)], present in the exoskeleton of crustaceans when partially deacetylated under alkaline condition gives chitosan which has been shown to be a valuable natural biocompatible polymer. It shows excellent biological properties such as biodegradability and immunological, antibacterial and wound-healing activity. All these interesting properties of chitosan make this natural polymer an ideal element for formulating drug delivery devices for several biomedical applications such as wound healing materials, vascular grafts and cartilage regeneration. However, due to its poor mechanical properties, chitosan is often crosslinked for such applications.

In this study chitosan membranes cross-linked with different amounts of genipin (a naturally occurring non-toxic pigment) were prepared by the casting method from acetic acid. The viscosity average molecular weight was measured by a Canon fnesk capillary viscometer, the degree of crosslinking from ninhydrin test, the tensile strength, swelling and drug permeation properties of the membranes in *in-vitro* gastric juice at 37°C were investigated. The surface and internal morphology of the dried gels were observed using atomic force microscopy (AFM) and scanning electron microscopy (SEM) respectively.

The dried membranes were greenish blue in colour and the intensity of the colour increased with genipin concentration and was directly proportional to the degree of crosslinking. The tensile strength was found to be inversely proportional to the degree of crosslinking. Swelling studies indicated it to be pH dependent.

Impact of this study will benefit the people of the Pacific in the near future by improving their livelihood while adapting to climate change. Low-lying, atoll islands and coastal communities can capitalize on the rising sea-level and consider crustacean farming along the coastline inundated with seawater. This can be carried out at commercial level to improve livelihood; meat for consumption and the crustacean shells for pharmaceutical use.