

## Fucoidan-based particles for Diabetes Mellitus treatment

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Marine organisms are rich in a variety of materials with potential use in Tissue Engineering and Regenerative Medicine. One important example is fucoidan, a sulfated polysaccharide extracted from the cell wall of brown seaweeds. Fucoidan is composed by L-fucose, sulfate groups and glucuronic acid. It has important bioactive properties such as anti-oxidative, anticoagulant, anticancer and reducing the blood glucose (1). In this work, the biomedical potential of fucoidan-based materials as drug delivery system was assessed by processing modified fucoidan (MFu) into particles by photocrosslinking using superamphiphobic surfaces and visible light. Fucoidan was modified by methacrylation reaction using different concentrations of methacrylate anhydride, namely 8% v/v (MFu1) and 12% v/v (MFu2). Further, MFu particles with and without insulin (5% w/v) were produced by pipetting a solution of 5% MFu with triethanolamine and eosin-y onto a superamphiphobic surface and then photocrosslinking using visible light (2). The developed particles were characterized to assess their chemistry, morphology, swelling behavior, drug release, insulin content and encapsulation efficiency. Moreover, the viability assays of fibroblast L929 cells in contact with MFu particles showed good adhesion and proliferation up to 14 days. Furthermore, the therapeutic potential of these particles using human beta cells is currently under investigation. Results obtained so far suggest that modified fucoidan particles could be a good candidate for diabetes mellitus therapeutic approaches.

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