NATURAL POLYMER MEMBRANES WITH ANTIMICROBIAL PROPERTIES

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Fibroin is a protein obtained from silkworm cocoon. It has been extensively studied in the field of tissue engineering due to its biocompatibility, controllable degradation, good mechanical properties. Silk fibroin, produced in film form, can be used to incorporate labile signaling molecules as well as drugs for controlled release. The antimicrobial loaded, such as nisin or other bioproducts, with biological properties, into fibroin films has an extensive applicability. Nisin is a antimicrobial peptide, size 3.4kDa, produced by the bacterium *Lactococcus lactis*. The bioproduct, film plus nisin, has been used as a natural preservative in food packaging industries, increasing the shelf life of products. For this reason the aim of this work was produced films based on Fibroin and added an antimicrobial biomolecule. The fibroin was extract from silkworm cocoon. In the dialysis process, two different types of membranes were use, resulting in two films samples with different protein chain sizes, with the incorporating of commercial nisin. Parameters such as solution volume, viscosity and temperature were evaluated in the drying step to identify the best condition for obtaining porous membranes. Samples produced were characterized by BCA - total proteins, antimicrobial activity assay and Fourier Transform Infrared Spectroscopy (FTIR). The film production was observed and it is possible to produce fibroin films with nisin without changing the characteristics of the material. The fibroin film with nisin has the ability to prevent the proliferation of Gram-Positive microorganisms. The film produced can be applied in packaging food industries, increasing the shelf life of the product, being an innovation in the field of bioproducts.