J Nanomater Mol Nanotechnol 2018, Volulme: 7
DOI: 10.4172/2324-8777-C10-048

Development of wound dressing prototypes based on polyurethane/polyaniline composites doped with a usnic acid

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The development of bioinspired antibacterial devices based on the synergistic interaction of components represents a strong and promising alternative in the control of growth and attachment of bacteria to surfaces. The association of synthetic materials (such as conducting polymers with antibacterial activity) and natural products (such as usnic acid derivatives, characterized by strong antibiolfim properties) can be explored in a synergistic point of view in which both forms of bacterial control (planktonic and biofilm attached structures). In this work, we have explored the development of conductive composites of polyaniline chemically deposited on polyurethane and doped with usnic acid (resulting in the conductive form of polyaniline) against two prototypes of gram-negative (*E. coli*) and gram-positive bacteria (*S. aureus*) The results confirmed that composite presented strong biofilm inhibition and reduction in the viable bacterial population, introducing advantages such as low cost and eco-friendly behavior, applied in an efficient material that avoids the use of hazardous biocides and antibiotics. The doping level established by usnic acid avoids the use of strong acids, characterizing a promising prototype for use as wound dressing system.

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