

NANOCELLULOSE BASED MATERIALS WITH ANTI-BIOFILM PROPERTIES

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Cellulosic nanomaterials have garnered significant attention from the scientific community due to their favorable properties among nanostructured materials. These materials are naturally available from waste materials, cost-effective, and generally characterized by a high biocompatibility.¹ Additionally, nanocellulose can be easily modified to create materials with novel properties and applications. In this work we specifically concentrated on materials with antimicrobial properties. The antibiotic resistance in the treatment of chronic infections related to the surgical introduction of medical devices, generates in Europe almost 25.000 thousand deaths per year.² Developing medical devices, such as catheters, coated with nanocellulosic materials with antibacterial properties, could potentially prevent the formation of biofilms, which are bacterial aggregations that render them resistant to antibiotic treatments. This project aims to the production of a multi-layered material made of various functionalized nanocellulose to produce an effective antibiofilm device. In the end, we designed a prototype catheter with a polydimethylsiloxane (PDMS) base covered by a plastic polymeric layer using Evatane[®] 40-55, and two nanocellulosic layers held together by electrostatic interactions.

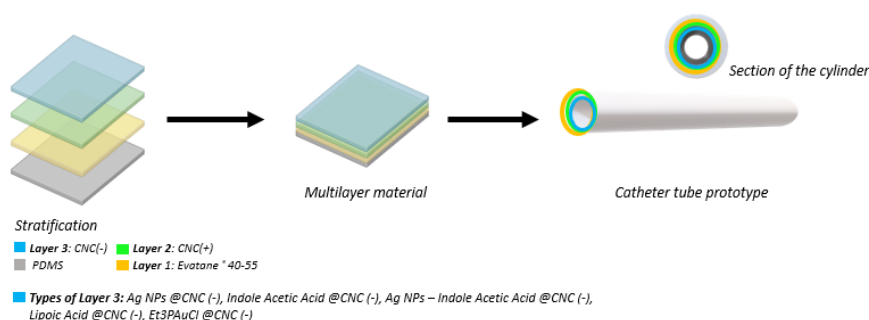


Figure 1. Stratification and formation of the catheter prototype.³

Key words: *nanocellulose, nanomaterials, antibacterial*

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