



II EPNAT

Encontro de Polímeros Naturais

Meeting on Natural Polymers

21 a 23 de outubro de 2020.

Organização:



The 2nd Meeting on Natural Polymers – EPNAT brought together entrepreneurs, undergrad and graduate students, postdocs, and professors to discuss emerging research challenges and strategies for different applications of natural polymers. The II EPNAT was chaired by scholars from leading universities in Brazil: University of Araraquara (UNIARA), University of São Paulo USP–FZEA, Pirassununga, University of Campinas (UNICAMP), São Paulo State University (UNESP, Araraquara & Ilha Solteira campuses), Federal University of São Paulo (UNIFESP, Diadema campus), and Federal University of Piauí (UFPI).

The event took place virtually in 2020, gathering 1013 participants, 173 abstracts submitted and a strong international engagement, as the lectures given by top-notch speakers, which can you watch on-demand at <https://www.youtube.com/watch?v=P5ylh2UrZpQ&t=4673s>.



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PLA/ β -CHITIN WHISKERS/SILVER NANOPARTICLES ASYMMETRIC MEMBRANES AS WOUND DRESSING MATERIALS

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Area: () Food and Agriculture (X) Medical and Pharmaceutical () Multifunctional Applications

Asymmetric nanofibrous nonwovens have emerged as promising materials for wound dressing application due to their inherent high porosity and surface area to volume ratio, which enable a proper control of moisture balance at the wound site and favor the gas permeation, transport of nutrients as well as the metabolic waste elimination. Here, we report on the application of solution blow spinning (SB-Spinning) and electrospinning to prepare PLA-based nonwovens, whose surfaces were functionalized by combining the filtration of beta-chitin whiskers aqueous suspension followed by dispersion of silver nanoparticles (AgNPs) via SB-Spinning, thus yielding to an asymmetric structure. SEM images clearly revealed the asymmetric character of such material consisting of a nanofiber matrix coated by a homogeneous thin layer of beta-chitin whiskers and AgNPs. The diameter of SB-spun and electrospun PLA fibers were determined as $1,600 \pm 500$ nm and 346 ± 81 nm, respectively, and both surfaces displayed a pronounced hydrophobic character according to water contact angle experiments (above 90°). However, the deposition of β -chitin whiskers/AgNPs strongly decreased the water contact angle ($\approx 55^\circ$) revealing that the surface became hydrophilic. In vitro experiments showed that such bio-based asymmetric material has outstanding antimicrobial activity toward *Staphylococcus aureus* and *Escherichia coli*. Overall, although further physicochemical and biological assays are required, these preliminary results indicate that such materials are promising candidates for wound dressing applications.

Keywords: Chitin Whiskers; Spun Fibers; Wound Dressing.