



S1.1.3 - Study of Nanoscale Structures for Application in the Filtering Layer Coupled with Micro-scale Materials for FFP2 Masks

Vânia Pais¹, Carlos Mota¹, João Bessa¹
¹Bibernamics, University of Minho, Guimarães, Portugal

The ongoing COVID-19 disease has been declared a pandemic by the World Health Organisation (WHO) [1]. This disease has different types of transmission routes, but respiratory droplet and airborne one are the most prevalent method of contamination. Therefore, the development of efficient protection systems is vital, either for application in the current pandemic or in other contexts that require it [2]. SARS-CoV-2 (the virus that is responsible for COVID-19 disease) has a size ranging from 60 to 140 nm [2]. So, filters with small diameter fibers, like the ones produced by electrospinning, are an important solution to retain this specific type of virus, since the virus has very small dimensions. In this study, polyamide (PA) nanofibers production appears has a solution with the potential to promote SARS-CoV-2 retention. The nanofibers were produced through electrospinning technique and variables such as polymers' concentration, flow rate and needle's diameter were optimized to obtain fibers with very low diameters. Fibers with diameters at nanoscale allow

the presence of numerous tiny pores, which increases the filtration efficiency of nanoparticles.

Vânia Pais

Vânia Pais¹ is a researcher at Fibrenamics, University of Minho since 2018 and completed her Master Degree on Biotechnology in 2016. Her research focuses on the development of functionalized nanostructures through the electrospinning technique. Vânia's current research is concerned with the optimization of nanofibers' properties in order to apply them in multilayer masks. Vânia had also studied nanostructures to be applied in the UV protection and self-cleaning field.

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