

## **The use of natural and bio- based polymers in electrospinning**

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The ongoing research on sustainable applications in terms of new materials, new processes and new technological solutions pave the way to the introduction of natural and bio-based polymers in more and more fields of science and in everyday life. Among sustainable polymers we can distinguish between bio-based one – materials derived from biomass – and natural ones – macromolecules that can be found in Nature. Both categories are widely used in food, pharmaceutical and medicine applications thanks to their inherent advantages of biocompatibility, biodegradability, nontoxicity and hypoallergenicity. Furthermore, they show unique chemical structures and physical characteristics that confer them inherent bioactivity thus distinguishing them from conventional polymers. In terms of sustainability, the use of biobased materials can improve the overall effects not only on the environment, as waste generation and carbon footprint will be decreased, but also on the biological environment, as after degradation the produced by-products are nonhazardous and easily removable from the body.

The combination of natural and bio-based polymers peculiarities with electrospinning technology advantages led to innovation in fields requiring high material specificity and affinity, i.e. tissue engineering, wound healing and biosensing. Some requirements as adhesion of cells, interaction with cells, mechanical support, and micro/nano-morphologies that will allow the exchange of major factors for the survival of cells, make electrospinning of natural and bio-based materials an outstanding candidate for developing tailored structures.

In this communication, some examples of the use of natural and bio-based polymers for realizing electrospun 3D engineered structures useful for health and well-being applications are described.