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Electrospinning and bioactive compounds: the use of nanotechnology to tailor food ingredients

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Abstract

Brazilian biodiversity has been received great notoriety in many types of research, mainly due to the wide variety of native fruits little explored. These fruits usually are sources of bioactive compounds, molecules capable of promoting a range of health benefits when consumed regularly by the diet. However, these properties are considerably reduced due to the exposition of the bioactive compounds to variations in factors intrinsic to production processes, such as temperature and light, and to the food digestion process itself, such as pH and oxygen, thus causing changes in the molecular structure of those compounds leading to loss of stability. The incorporation of these bioactive compounds in nanostructures has been shown to be efficient in maintaining stability and consequent potentiation of biological activity, and, this way, leading to advances in ingredient engineering. Besides, nanostructures possess the advantage of having a larger surface area, which increases solubility and also allows more precise targeting of molecules in the body.Electrospinning is a procedure that use the understanding of nanotechnology, materials development engineering, and physic properties to produce nanostructures with unique utilities and assets. In those electrodynamic methods, the polymeric solution is ejected over the use of the high electrical potential at mild conditions in terms of pressure and temperature. Additionally, there are two main configurations to use the equipment: uniaxial (polymer and bioactive compound in solution previously homogenized it is ejected) or coaxial (setup in which mixture of polymer and target compound happened only on the moment of the jet ejection). Several authors have already highlighted the efficient use of these methods in the application process of bioactive compounds in nanostructured systems and no matter the physical properties of the bioactive compound used, a protective effect it was always shown as long as nanotechnology was applying.

Biography:

Anna Braga has completed her PhD at the age of 29 years from Federal University of Rio Grande (Brazil) and postdoctoral studies from Federal University of São Paulo (Brazil), and now she is a professor with a permanent position at the same university. She is a permanent professor in the Postgraduate Program in Nutrition and the Postgraduate Program in Bioproducts and Bioprocesses at UNIFESP, working with international partners in Sweden and the United Kingdom.She has published more than 30 papers in reputed journals andresearch in the areas of Food Science, Chemical Engineering, Biotechnology and Nanotechnology.

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