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ENCAPSULATION OF BIOACTIVES BY HIGH THROUGHPUT ELECTROSPRAYING ASSISTED BY PRESSURIZED GAS

Cristina Prieto [1], Emma Talón [2], Jose M. Lagaron [1,*]
[1]Novel Materials and Nanotechnologies Laboratory, Institute of Agrochemistry and Food Technology (IATA), Spanish Council for the Scientific Research (CSIC), Paterna, Spain
[2] R&D Department, Bioinicia S.L., Paterna, Spain

** Corresponding author: lagaron@iata.csic.es*

One of the most promising approaches to preserve bioactive compounds is their encapsulation within protective matrices. Recent developments in engineering and industrial investment have allowed our research group to develop an innovative encapsulation technique based on the combination of electrohydrodynamic technology and the pneumatic atomization process. This novel high-throughput technology, termed electrospraying assisted by pressurized gas (EAPG), is based on the atomization of the polymer solution by a pneumatic injector using compressed air that nebulizes within a high electric field. During this process, the solvent is evaporated at room temperature in an evaporating chamber and the encapsulated material is collected as a free-flowing powder. This technology is a versatile technique that presents multiple advantages compared to conventional encapsulation techniques. For instance, it is carried out at room temperature, which reduces the denaturation of bioactive compounds, produces particles with high encapsulation efficiency, results in reduced particle size with a narrow size distribution, does not require a subsequent step to separate the particles from the medium, and it is highly versatile in terms of the encapsulating materials and bioactive compounds that can be processed. In addition, by means of this technology, it is possible to achieve the production volumes required by commodity food applications.

The current presentation will introduce the technology and highlight some use cases for the stabilization, shelf-life extension, and controlled release of different bioactive compounds.

Keywords: EAPG encapsulation, omega-3, probiotics, polyphenols, functional foods, nutraceuticals.

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