

*Área temática: Biotecnología, Ficología Aplicada*

## **EFFICIENT RECOVERY OF BIOFUNCTIONAL PRODUCTS FROM MICROALGAE BY COUNTERCURRENT CHROMATOGRAPHY**

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### **ABSTRACT**

In recent years, great progress has been made in the identification of a large number of molecules present in the biomass of microalgae and cyanobacteria, mainly thanks to the use of increasingly sensitive analytical techniques. These advances have also gone hand in hand with the biofunctional valorization of these compounds, driven primarily by the use of high-throughput screening bioassays. However, on the road to the commercial exploitation of these valuable compounds, the question of how to extract them efficiently from the cellular matrix to bring them to market is a major challenge. While numerous methods for extracting these compounds from biomass are known, they involve complex and costly purification procedures and have limited applicability at pilot or industrial scales. Under these circumstances and in response to these needs, our group has developed and applied novel approaches to support the automation and feasibility of the separation processes developed for the efficient recovery of valuable algal-derived compounds by countercurrent chromatography (CCC). CCC uses two immiscible liquid phases without solid support, which allows excellent sample loading and recovery. One of the two liquid phases (the stationary phase) is retained in the column by centrifugal force, while the other (the mobile phase) is pumped through the column. We have succeeded in developing multiple sequential injection-CCC methods to recover algae-derived compounds such as astaxanthin, lutein, fucoxanthin, polyphenols, peptides, mycosporine-like amino acids (MAAs), and polyunsaturated fatty acids. This separation strategy could provide useful models for the production of bioactive products from microalgae in a biorefinery context.

**Keywords:** *countercurrent chromatography, isolation, microalgae, biomass, biorefinery.*

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