University of Naples Federico II

Department of Pharmacy

International PhD course in

Nutraceuticals, Functional Foods and Human Health

From agri-food waste and by-products to novel food supplements and nutraceuticals development.

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The proposed doctorate of research project it is centered on the development of new food supplements and nutraceuticals and is based on the ecological and environmentally sustainable recovery of active compounds from residues and by-products from the agri-food sector as valuable sources of compounds for nutraceutical and pharmaceutical applications. The bioactive content and potency of compounds contained in agri-food wastes and by-products will be explored to determine the potential development and realization of new food supplements and nutraceuticals in a waste-oriented valorization approach to address and/or support conventional drug therapy especially in diseases where conventional drug therapy is not tolerated. The project is positioned in the context of circular economy, eco-sustainability, waste/by-product recovery and reuse. It is proposed to develop and optimize a green, promising technology for recovery of bioactive compounds from wastes and by-products of the agri-food area. Conventional and non-conventional analytical techniques will be used for extraction and recovery using eco-friendly and sustainable solvents with attention to environmental sustainability and to the aspects of the circular economy. The characterization and optimization of high-resolution analytical techniques will allow to complete the proposed project assessment with the characterization of the bioactive compounds identified to be used in the formulation of food supplements and nutraceuticals in the various administration forms. The recent analytical approaches that are intended to be used imply a minimum use of solvents, rapid extraction times, high yield and low probability of deterioration of the active compounds, and represent a new frontier for obtaining high value-added compounds which can be used in the formulation, manufacture and eventual evaluation for commercialization of new food supplements and nutraceuticals. The proposed project encompasses all the above aspects and also aims to verify the safety, efficacy, pharmacological target attainment, the mechanism of action and bio availability of the newly obtained dietary supplements and nutraceuticals which will be assessed and validated by evaluating them based on in vitro and in vivo testing. Economic, market and commercialization aspects will also be considered in detail in the exploitation of the proposed project.

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