Dipartimento di Farmacia

Università degli Studi di Napoli Federico II

PROJECT TITLE

"Microgreens and plant exosomes for the formulation of innovative nutraceuticals indicated for the control of metabolic disorders"

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Project description

The term "microgreens" refers to plants harvested a few days after germination. These plants offer, as a main advantage, a higher concentration (up to 20-30 times) of active ingredients compared to the adult plant, at the same dry weight. This richness in bioactive substances depends on the need of the newborn plant to defend itself from the attack of external agents, in a moment of great physiological vulnerability. Microgreens are grown in strictly controlled conditions of artificial lighting, temperature, humidity and nutrients. These conditions allow to standardize the title of active ingredients, offering the pharmaceutical industry phytocomplexes with a concentrated, controlled and reproducible qualitative-quantitative profile of active ingredients, for the formulation of innovative natural products, indicated for the control of the health state.

Plant exosomes are natural nanovectors that plants use for the transport of microRNA and bioactive molecules, as messengers for the regulation of specific cellular functions. Considering the cross-link existing between the animal and plant kingdoms, the scientific literature states that plant exosomes may contain active ingredients, especially microRNA, which are similar to those occurring in human exosomes, described as responsible for the regulation of physio-pathological conditions. Therefore, it is reasonable to hypothesize that exosomes isolated from plant matrices may be used for the formulation of nutraceutical products indicated for the regulation of altered metabolic processes.

This project aims to design innovative formulations based on phytocomplexes from microgreens and plant exosomes (pursuant to Annex 1 of the Ministerial Decree of 10 August 2018 "Regulation of the use of plant substances and preparations in food supplements", updated with Ministerial Decree of 9 January 2019), as possible natural alternatives for the treatment of metabolic disorders, opening up new therapeutic perspectives in the field of personalized medicine and nutraceutical science.

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