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PROJECT TITLE
Biotechnological development of exosomes for the health and well-being of the skin

Project description (max 300 words**)**

Exosomes are tiny extracellular vesicles secreted by most cell types, which are filled with proteins, lipids, and nucleic acids (non-coding RNAs, mRNA, DNA), can be released by donor cells to modulate the function of recipient cells subsequently. The therapeutic value of exosomes lies in their ability to modulate the cell microenvironment, regulate gene expression and induce cell differentiation, positively impacting skin health. Plant cell-derived exosomes can restore physiological skin function and regenerate or rejuvenate damaged skin tissue through various mechanisms, such as decreasing matrix metalloproteinase (MMP) expression, increasing collagen and elastin production and modulating intracellular signalling pathways and intercellular communication [1,2]. They can therefore be used as skin-longevity-stimulating actives through epigenetic control mechanisms. Plant exosomes have also been studied for their ability to stimulate cell regeneration and tissue repair, with potential applications in the therapy of skin diseases [3].
Plant exosomes represent a new frontier in science and technology, with potential applications in various fields, from cosmetics to medicine, offering new opportunities for skin health and well-being.
To verify the efficacy of the new exosomes on ageing skin, cosmetic-clinical studies will be carried out on healthy volunteers in a double-blind trial, to assess the improvement of skin parameters using non-invasive medical bioengineering devices.
In addition, the development of this research project involves collaboration with raw material companies and international research Centres, where the PhD student may carry out.

REFERENCES
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