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ENGLISH VERSION OF THE WORK ABSTRACT

Development of cosmetic products using retinol molecule and appropriately selected peptide for the care of skin with acne problems, skin with imperfections and aging skin.

The dynamic development of the cosmetic industry and consumer expectations have increased the demand for effective and modern solutions in the delivery of active substances through the epidermal layers. The use of solid lipid nanoparticles (SLN) encapsulated with active compounds, such as retinol and peptide, is a way to effectively penetrate the compounds into the deeper layers of the epidermis. The synergistic action of bioactive compounds incorporated into lipid nanocarriers affects the regulation of numerous processes in the skin with minimal acting doses.

The main objective of the research carried out within the framework of this doctoral dissertation was to develop a method for obtaining SLNs incorporated with retinol and oligopeptide and to evaluate the application properties of cosmetic products containing them.

The dissertation was prepared in the form of a thematically coherent series of four articles published in scientific journals from the list of the Ministry of Science and Higher Education. The first two articles take the form of a literature review – based on dozens of sources – on retinol and peptides: their chemical structure, mode of action and function in the skin, and properties and effects on the skin, as well as on the use of these compounds in cosmetic and pharmaceutical products in the form of lipid nanoparticles. The third article details the methodology for obtaining SLN encapsulated with retinol and pentapeptide-18, while the last article describes the effects of cosmetic products containing the developed SLN dispersion on the skin, based on *in vivo* studies.

In the course of the research, the composition of SLNs incorporated with retinol and oligopeptide was optimized and the stability of the tested dispersions was confirmed, taking into account the basic physicochemical parameters – mean particle size (Z-Ave), polydispersity index (PDI) and zeta potential (ZP). The SLN production method was then transferred from the laboratory to the production scale. In the next stage, three cosmetic products, with anti-aging, anti-acne and eye care properties, were developed using an optimized dispersion of lipid nanoparticles in their formulation. The stability of the obtained cosmetic products was confirmed using the multiple light scattering method, while their efficacy on the skin was verified in the course of *in vivo* studies with volunteers – in terms of improving skin elasticity, reducing the appearance of wrinkles and enhancing seboregulatory function.