

A comparative toxicity study of a nanopreparation containing retinyl palmitate as the active agent and designed to treat skin conditions”

Carolina Aristimuño¹, Felipe Goñi¹, Amaia Aspiazu¹, Patxi Vilches¹, Albiñe Leizea¹, Cesare Errico², Federica Chiellini² and **Blanca Suárez-Merino¹**

¹*GAIKER Technological Center, Parque Tecnológico de Zamudio Ed 202, 48170, Zamudio, Vizcaya, Spain*

²*Department of Chemistry & Industrial Chemistry, University of Pisa, Via Risorgimento 35, 56126 Pisa, Italy*

Keywords: skin conditions, toxicity, nanopreparation, emulsion, 3T3, L929, HACAT

Photoaging is a premature skin condition caused by long-term exposure to the ultraviolet B radiations of the sun, and is frequently associated with skin cancer. Retinoids are natural and synthetic vitamin A derivatives. They are lipophilic molecules and penetrate the epidermis easily. Their ability to modulate genes involved in cellular differentiation and proliferation, makes them good candidates to treat and prevent photoaging.

The SkinTreat Project (EU FP7) aims to develop novel user-centered customized topical nano therapeutic strategies, and novel drug delivery systems, for skin diseases (Contact Dermatitis, Photoaging and Psoriasis), based on personalized skin protocols.

In this current investigation we performed a comparative toxicity study on a novel nanopreparation based on polylactic-co-glycolic acid (PLGA) with and without retinyl palmitate as the active principle.

To assess for cytotoxicity we used a colorimetric approach based on the activity of the mitochondrial dehydrogenase enzyme (MTT test). Mouse fibroblast (3T3 and L929) as well as human keratinocytes (HACAT) were seeded in 96-well plates and incubated with the aforementioned nanopreparations for 24 hours. The mutagenic potential of both nanopreparations were studied using bacterial reverse mutation test (AMES). Cellular stress by means of ROS production (DCFDA) was also assessed upon nanopreparation exposure by flow cytometry.