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Bicosomes: A smart skin drug delivery platform

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Skin's main function is to protect our body from external aggression. This is mainly achieved by a strong barrier function performed by the outer layer of the skin: The stratum corneum (SC). In contrast, most skin alterations and pathologies originate in the inner layers of the skin (Epidermis, Dermis or Hypodermis) and therefore require targeted treatments. Skin penetration is one of the biggest challenges for drug delivery. Most topical ingredients do not really penetrate the SC, acting on the skin's surface and disappearing after a single wash. Other ingredients include chemical enhancers and/or other aggressive compounds that penetrate disrupting the skin barrier and causing damage. In both cases, efficacy and safety are compromised. Formulators of are facing the challenge to create skin care products able to penetrate gently the skin, remains there and deliver their content in the targeted layers. Bicosome platform offers a solution to these challenges. Structurally, Bicosomes are made up of internal smart biocompatible structures enclosed in a lipid vesicle protecting them and boosting their effects. Active molecules of many different natures can be incorporated to this platform. The smart structures of the bicosomes are small enough to penetrate the skin and self-aggregate into the tissue and grow being retained in specific layers. This induces a reinforcement of the skin structures and a targeted delivery. This delivery strategy allows a prolonged effect of actives because bicosome components retained in specific target layers remain there until this layer is lost following the natural desquamation process of the skin. These systems open a new and disruptive strategy, in which actives directed to the target layers and are remain retained exerting their action for days.

Biography

Rafael Bernad is a Biologist from the University of Oviedo in Spain. He has obtained his PhD in The Netherlands Cancer Institute studying the Nuclear Pore Complex and Nuclear Transport. His Postdoctoral Research focused in studying the Epigenetics of Centromeric Chromatin in the Spanish Cancer Research Institute. After 10 years involved in fundamental research, he moved to industry in 2010 where he played roles as Business Development and R&D. He has been involved in Drug Delivery development projects for injectable and topical pharmaceutical forms. He has recently joined Bicosome project.

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