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EVALUATION OF INGREDIENTS FOR TOPICAL SPECIFIC APPLICATIONS: AN *IN VITRO* TOLERANCE APPROACH

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In vitro reconstructed human tissue models are recognized as being sensitive and reliable models to replace or reduce laboratory animal use in preclinical studies. Dermo-pharmaceutical products target different body areas such as mucous membranes, healthy or damaged skin. The purpose of this work is to develop new and predictive *in vitro* experimental protocols in order to screen epithelia tolerance of ingredients, within the product development stage. Several 3D reconstructed models have been investigated. Among them, gingival and vaginal mucosa and injured skin were selected as relevant tools to widen our ingredient physiological applications (initially developed only for healthy skin). For mucosa, ingredients were applied at usual doses onto standard *in vitro* models, at progressive times. Cellular viability measurement (MTT test) led to irritation potential conclusion according to supplier recommendations. For damaged skin, an innovative 3D reconstructed human epidermis models (RhE) with a physically impaired barrier function was developed (reproducible mechanical superficial abrasion at stratum corneum level). The skin tolerance was determined by (1) cellular viability (MTT test); (2) barrier function (TEER measurement and Biotin permeability); and (3) morphological evaluation (Hematoxylin Eosin Staining). Ingredients with different chemical structures and functionalities were tested and compared to negative control. Model predictivity was challenged with short chain surfactants including Sodium dodecyl sulfate (positive controls) as well as benchmarks. This approach allows selection of suitable ingredients for each body area. Moreover, it helps to determine the well-tolerated doses of emulsifiers and thickeners, pillars of topical pharmaceutical formulations. The multiple endpoints analysis (MEA) designed for injured epidermis model enriches basic irritation information with cellular, morphological and functional effects, thus enabling to appreciate not only the toxicity but also the homeostasis recovery mechanisms. MEA opens perspectives of new experimental models.

Biography

Alicia Roso works for SEPPIC since 1986. She is a Chemical Engineer and has worked for 20 years in the cosmetic R&D team, firstly as Lab Technician then as Lab Manager. She joined the marketing team in 2006 as Product Manager and gained a marketing MBA from ESSEC business school in 2012. She was named as Air Liquide International Expert for health care formulation and emulsions in 2010. She is currently working as Scientific Communication Manager in the innovation direction team. She is Co-author of 23 patents on new ingredients or formulation technologies dedicated to cosmetology and dermo-pharmacy applications.

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