

EVALUATION OF EPIDERM FULL THICKNESS - 300 (EFT - 300) AS AN IN VITRO MODEL FOR SKIN IRRITATION

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EpiDerm Full Thickness (EpiDerm-FT™) 300 cultures (EFT-300) consist of a highly differentiated skin model containing normal, human epidermal keratinocytes (NHEK) and normal, human dermal fibroblasts (NHFB). Dermal exposure of irritant chemicals is known to cause inflammation and cytokine expression in the skin. We evaluated the tissue engineered EFT-300 as a model to study skin irritation after exposure to irritant chemicals. **PURPOSE:** The objective of the present study was to systematically evaluate the EFT-300 as a human skin equivalent and to study the irritation potential of the aliphatic hydrocarbons, nonane, decane and dodecane. **METHODS:** Before treatment, irritant chemicals were mixed with equal volume of mineral oil (baby oil). The EFT-300 tissues were cultured in Swell plates and topically exposed to 5ul of chemical mixture for 24 and 48 hours. The MTT assay was performed to determine tissue viability. Histological sections of the EFT-300 were observed for any morphological changes for 24 and 48 hr. ELISA tests were performed to quantify cytokine and chemokine release including IL-1a, IL-6 and IL-8. TEWL and erythema scores of rat skin in-vivo were measured to find out the correlation between EFT cultures and rat skin. **RESULTS:** As a result of treatment with nonane, decane and dodecane, there was no reduction in tissue viability or any significant alteration in the morphology of EFT-300 cultures after 24 and 48 hours. As the chain length increased from C9 to C12, IL-1a and IL-8 release were found to increase in the order of dodecane>decane>nonane. This is in concordance with our earlier in-vivo studies, which demonstrated that as the chain length increased from C9 to C12, the TEWL and erythema increased proportionately. **CONCLUSION:** There is a significant correlation between in-vivo and in-vitro skin irritation studies, which suggest that EFT-300 can be used as an alternative to use of animals in skin irritation research.

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