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Introduction

The skin serves as a dynamic interface between the body and its environment, performing vital functions such as protection, sensation, and thermoregulation. Consequently, understanding skin pharmacology how drugs interact with and affect the skin is essential for the development of dermatological treatments and cosmetics. To unravel the complexities of skin pharmacology, researchers rely on experimental models that mimic the structure and function of human skin. In this article, we delve into the experimental models of skin pharmacology, exploring their intricacies, applications, and significance in advancing dermatological research and therapeutic interventions [1].

Understanding skin pharmacology

Skin pharmacology encompasses the study of how drugs, formulations, and cosmetic ingredients interact with the skin to elicit therapeutic effects or adverse reactions. The unique structure of the skin, consisting of multiple layers and specialized cell types, presents challenges and opportunities for researchers aiming to elucidate drug permeation, absorption, metabolism, and efficacy [2,3].

Experimental models in skin pharmacology

In vitro models:

In vitro models involve the use of isolated skin cells, tissue samples, or reconstructed skin equivalents to study drug-skin interactions under controlled conditions. These models offer advantages such as reproducibility, cost-effectiveness, and ethical considerations compared to in vivo studies [4]. Reconstructed skin equivalents, comprising layers of keratinocytes and fibroblasts cultured on a scaffold, closely mimic the structure and function of human skin, making them valuable tools for evaluating drug permeation, irritation, and efficacy [5].

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