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The Influence of Skin Surface Lipids on Topical Formulations

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I. INTRODUCTION

As both the largest and most visible organ of the human body, the skin is of unequalled importance in portraying an individual's state of being. Therefore, the biology and chemistry of the skin and its appendages is important for both the cosmetic and pharmaceutical industries. The heterogeneous nature of the skin provides one of the difficulties in studying this tissue. Just as the skin itself comprises morphologically different layers, the glands, follicles, and microvasculature of the skin provide zones with different characteristic properties. One of these properties is that a thin, noncontinuous film of lipid is deposited on the skin surface from the sebaceous glands. Although often neglected in the design of a topical formulation, the presence of skin surface lipids can significantly influence the delivery of topical drugs. This influence may be either beneficial to, or detrimental in, obtaining the desired drug delivery characteristics and, thus, should be considered, especially for topicals applied to sebum-rich areas of the body (e.g., forehead, cheeks, and scalp). It is important to realize that the interaction between a drug and the skin surface lipid is not only dependent upon the physicochemical properties of the drug, but also upon the physicochemical nature of the vehicle. Topical agents can be formulated that will target sebum-rich zones of the skin (e.g., the hair follicle) or, alternatively, a topical agent can be formulated to minimize delivery through the hair follicle. Background information on skin surface lipids and a brief description of the approach necessary to formulate sebum-selective vehicles will be the focus of this