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Immunology of the Skin

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I. INTRODUCTION

The skin, by weight, is the largest organ of the body. Human skin serves to provide several important functions. These include maintaining physical protection (barrier function) against external agents and dessication; receiving sensory stimuli from the environment; regulating body temperature and water balance; excreting a variety of substances; participating in metabolic pathways (e.g., initiation of vitamin D synthesis and subcutaneous fat metabolism); and serving as a compartmentalized component of the immune system to provide protection against certain pathogens, toxins, and neoplasia. To protect the host from foreign materials and organisms, an extremely complex relationship has evolved between the skin and the immune system. Many of the cell types in skin synthesize a variety of bioactive compounds, many of which have profound effects, not only on local inflammatory responses and skin-associated immune responses but, also, on systemic immune responses.

The development of strategies to transdermally deliver pharmacologically active compounds is an exciting new area of research with far-reaching implications. However, transdermal delivery of pharmacologically active compounds also presents a number of challenging problems because the skin is normally fairly impervious to even relatively small molecules. Thus, from the pharmacologic point of view, one of the major requirements for effective transdermal delivery is to accentuate the rate of movement of compounds across the many different layers of cells and connective tissue that collectively form skin. However, transdermal delivery of a number of