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## Stratum Corneum Structure and Transport Properties

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### I. INTRODUCTION

The outermost layer of the skin, the stratum corneum, has an essential role as a barrier against the transport of water and of chemical and biological agents (1,2). This barrier is functionally the same, for short periods, in both living and dead skin (3), with lipids being responsible for the essential function (4,5). The biological and medical importance of this cannot be overstated, and the investigations into the individual structure and overall organization of the stratum corneum lipids has been extensive (6-12).

These investigations and the scientific examinations remain an ongoing process (13), but recent investigations allow a limited discussion of the relationship between structure and transport of water through the stratum corneum. This chapter will describe the layered structure and review its importance for transdermal transport.

### II. LIPID ORGANIZATION

The basis for the discussion is the layered structure proposed by Elias (13) and analyzed by Downing (14) and by us (15). The essential experimental information was suggested by electron micrographs (13) that disclosed the layered structure. Built on this information Elias (13) proposed the layered structure shown in Figure 3.1. The polar head groups of the lipids (Table 3.1) are gathered in layers with the nonpolar chains pointed in opposite directions forming layers of methyl groups in the plane where the hydrocarbon ends

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