

# AHA's

## (alpha hydroxy acids)

*are thought to be long-term damaging because they remove the skin's protective barrier.*

### Scientific Knowledge about Skin

Our general knowledge is increasing ever more rapidly. Currently, the time in which available knowledge doubles is estimated to be only seven years. This includes the many discoveries about natural human physiological processes, not least of which is skin physiology (Figure 1).

**Stratum Corneum:** For example, although the SC was once regarded as a layer of dead cells, it is no longer possible to defend that belief. Results of modern research have brought to light a large number of finer structures.<sup>8</sup> We now know the SC consists of at least two layers. The stratum compactum, strengthened by desmosomes, plays special roles of adding physical strength to the skin and, as its uppermost layer, controls the appearance of the skin

A large number of biologically controlled processes occur in the SC, some of which activate various enzyme systems. These systems thus depend upon an intact SC, with its particular composition of lipids and controlled moisture content. The lipids in this skin layer may even have biochemical effects on basal cell formation as well as their barrier function. Changes in lipid composition and natural skin moisture factors are, according to these discoveries, partly responsible for pathological alterations like psoriasis.

In short, the SC is in active and direct biological interaction with deeper, living layers. No longer do we have strict differentiation between the dead, upper layer and the living, deeper layers.

### The Skin's Barrier Function

One of the skin's principal functions is forming and maintaining a protective barrier. It both prevents external substances or stimuli from penetrating the body and controls the body's loss of moisture, heat or other useful substances.

Our knowledge of the structure and the function of the dermal barrier has been constantly increasing since the 1950's, thanks to continuing scientific research, although some aspects are still unresolved. Nowadays, researchers recognize the presence of certain lipids as indispensable to the skin's moisture-retention capacity<sup>10</sup>.

The barrier zone of the skin extends across many layers of cells; it is most marked between the stratum corneum (SC) and the living layers of the epidermis. The common "mortar and brick" model portrays the SC

in terms of bricks (nonnucleated hydrophilic cells rich in keratin) connected by a hydrophobic intercellular "mortar," rich in lipids. The lipid composition in these intercellular spaces changes subtly from the germinal layer to the SC. Living epidermal cells have large quantities of phospholipids while the neutral lipids, ceramides and free fatty acids predominate in the SC.

Depending on the region of the skin, substantial qualitative and quantitative differences also exist in the SC lipids, which determine the skin's penetrability; the higher the lipid content in the region, the easier it is for lipophilic substances to penetrate (Figure 1-2).

Even today, many doubts remain concerning the complex interactions of all the components that safeguard the protective function of the skin, keeping its moisture content and elasticity intact. It is, however, important to know that any alteration of the skin's surface (for example, every cleaning or washing operation in which lipids are removed from the SC) creates a temporary or persistent drying of the skin that can cause serious irritation<sup>10</sup>

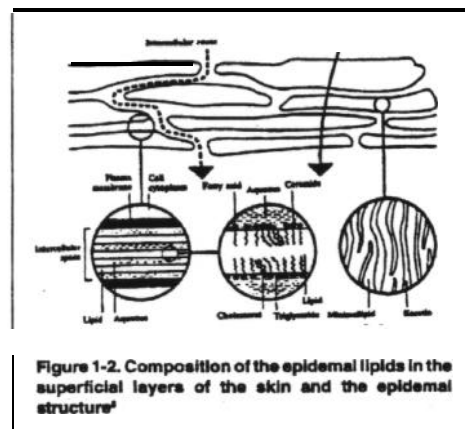


Figure 1-2. Composition of the epidermal lipids in the superficial layers of the skin and the epidermal structure<sup>8</sup>