

## Ceramides Research Paper

### APPEARS IN



Ceramides are a class of lipids or fats known as sphingolipids. These lipids are naturally found in the skin barrier and make up half our skin lipid barrier. Ceramides, therefore, help to keep our skin barrier healthy by essentially "holding" our skin cells together. Ceramides help to keep skin cells intact and retain the skin's water content. Three Ships' Replenish utilizes this powerful ingredient that is naturally found in the skin.

### CERAMIDES HELP TO KEEP SKIN CELLS INTACT AND RETAIN THE SKIN'S WATER CONTENT

Although ceramides are naturally found within the skin, you can never have too much of the lipid, particularly because as we age, the lipid content is lost. It is also more difficult to produce when our skin barrier is damaged. Ceramides help to keep the skin looking healthy and fresh. Overall, ceramides lock in moisture and help to restore the skin's natural barrier. As a result of extrinsic damage and harsh chemicals, the glue that keeps our skin together degrades; hence, by replenishing the skin with ceramides (i.e. "the glue"), the skin's protective barrier is restored.



Ceramides can be extracted from rice, sweet potatoes, and yeast. The plant-derived source is isolated and contains wheat germ oil. However, the exact method of extraction of ceramides

Three Ships sources is proprietary information.

## CERAMIDES HELPS TO IMPROVE AND RESTORE THE SKIN'S BARRIER FUNCTION

Hydration is critical for maintaining healthy skin. Hydration refers to the ability of the skin to hold water. In order to reduce the appearance of flaky skin, the stratum corneum water content should be above 10%. If the stratum corneum water content falls below this threshold, enzymatic function required for normal desquamation is impaired. The skin has many functions (e.g. protective shield, wound repair, temperature regulator). One of the functions of the skin is to serve as a barrier to water loss. In essence, the skin helps to prevent the evaporation of excess water from our bodies. Following chemical insults (e.g. the use of harsh chemicals), sun exposure, and humid conditions, the skin's ability to control the rate of water loss is compromised. Maintaining the barrier to water loss is important in the process of desquamation.

Desquamation is a natural process of skin shedding, where the attachments that hold the skin cells together are dissolved by enzymes. Desquamation occurs in the outermost layer of the skin, the stratum corneum. Normal desquamation is important for maintaining the function and physical appearance of the skin. Skin cells, like humans, have a life cycle involving their "birth" and "death." In the deepest layer of the epidermis, the stratum basale, new cells are created. Eventually, the skin cells make their way to the outermost layer of the skin, the stratum corneum where the cells are dead. Then, the dead skin cells slough away, and the newer skin cells replace the old ones and the cycle continues.

## SCIENTIFIC STUDY

### Study on Ceramides and Skin Function

Atopic dermatitis is a skin condition where the skin tends to be easily irritated and dry. In particular, patients experience an impaired barrier function as a result of increase in trans-epidermal water loss.

Relative to healthy skin, patients with atopic dermatitis have a decrease in the ceramides in the intercellular lipids and have altered ceramide constituents. In a recent study, it was confirmed that the quantity of Ceramide NP is significantly correlated with trans-epidermal water loss. These findings suggest that sphingomyelin metabolism in patients with atopic dermatitis results in a decreased level of ceramides causing a disrupted skin barrier.

It has been demonstrated, however, that formulations containing lipids similar to those in the skin (e.g. ceramides) may improve skin health. Through supplementation of ceramides in atopic dermatitis patients, sphingomyelin acylase activity increased. Moreover, ceramide levels are decreased in aged skin. By supplementing ceramides, ceramidase activity in aged skin increased, which helped improve the appearance and health of skin.

Ceramides are an important structural component of the epidermis which helps to maintain homeostasis in the body. Topical application of ceramides helps to improve and restore the skin's barrier function, promoting hydrated and healthy-looking skin.