

# Skin Exfoliation 101

*by Dr. Diana Howard*

With so much attention focused on addressing the needs of both maturing and prematurely-aging skin, and the continual interest in using ingredient complexes such as hydroxy acids, retinol and other mechanical and chemical exfoliants, we are often asked to explain how these different ingredients work on the skin. Let's review the basic structure and physiological processes of the skin so we can completely understand how exfoliation works.

## **The Process of Desquamation**

The outer layer of the skin, the epidermis, consists of a 10-micron thick Stratum Corneum layer, which accounts for about 10% of the epidermis. The very outer 3-4 layers of dead cells that comprise the Stratum Corneum are often referred to as the Stratum Disjunctum (the outermost layer that is affected during exfoliation). The Stratum Corneum is comprised of layers of keratin-rich corneocyte cells that are embedded in a glue-like matrix, which is shed naturally in a complex process called desquamation.

How does desquamation work? We know from our research that epidermal cells adhere to each other on the top, sides and bottoms of the cells via calcium dependent desmosomes. Desmosomes essentially adhere cells together. As the cells move upward from the deeper layers of the epidermis to the outermost layers of the Stratum Corneum, the desmosome attachments become weaker. Enzymes found only in skin and hair follicles accelerate this weakening action. These enzymes break the bonds of the desmosomes and free the cells to slough off. In addition to eliminating old corneocytes, this process eliminates damaged and contaminated cells that carry pollutants and microorganisms from the environment.

The exact mechanism that controls the desquamation process is unknown, but it is believed that cells are programmed when they are young and residing in the lower layers of the epidermis. Each cell has an internal clock that ensures the cell is linked for a certain period of time. Then cell cohesion decreases, allowing the cells to slough off. Interestingly, the enzyme responsible for weakening the bonds is inactive in the skin until activated by another enzyme. The factors that control this activation process are not readily understood.

The complex process known as keratinization commences when a new daughter cell is born at the basal cell layer (Stratum Germinativum) and it progresses upward until it is shed as a Stratum Corneum corneocyte. Keratinization normally takes about four weeks, however, it can take as long as seventy-five days, depending on age and the condition of the skin.

As to be expected, younger skin is more efficient at desquamation. As we age, the glue-like intercellular cement holding the cells together becomes denser, causing a build-up in the layers of cells. Cell sloughing becomes more difficult, resulting in skin that appears dull, thicker and less toned. This may be exacerbated by environmental factors (exposure to sunlight), hormonal

influences (androgens, estrogens and epidermal growth factor) and deficiencies in various vitamins (A and D). With all of these influences affecting the desquamation process, it is apparent why exfoliation is so important to the skin. Removing this build-up of dead, damaged cells stimulates the regeneration of new cells, improving the skin's appearance, feel and texture.

### **How can we Affect Desquamation?**

As professional skin therapists, we have several means to affect the desquamation process. We can choose mechanical exfoliants that help eliminate surface Stratum Corneum cells, or we can choose chemical exfoliants such as hydroxy acids, which aid in exfoliation and stimulate cell renewal. Whether you select mechanical or chemical means of exfoliation, each can benefit and provide substantial improvement to dry, acneic and photodamaged skin, depending on the technique and substance used.

### **Choosing the Correct Method of Exfoliation**

Exfoliation can be more difficult than it seems, as there are so many options for the treatment. But always remember that the process requires knowledge and care. Even a young, resilient skin can be negatively affected by exfoliation if not administered properly. Regardless of which type of exfoliants you select to use on your clients, you should always complete a Consultation Card to assess their skin type, the products they may be using at home, if they are using any prescription medications that will seriously alter their skin physiology and the frequency of use of these products.

As we focus on the benefits of exfoliation, we will see more refined methods of assisting with the desquamation of corneocytes. Our goal as scientists and professional skin therapists at The International Dermal Institute is to continue to research new ingredient complexes that help us to achieve the benefits of exfoliation while maintaining optimum skin fitness and health.