BCN SCRUB

prebiotic triple action scrub

BCN SCRUB is a triple action prebiotic facial and body scrub (physical, chemical and biological) that combines alumina microcrystals with lactic acid and a bioenzymatic extract for a more complete and controlled exfoliation that doesn't damage the skin barrier.

100ml tube | 3.38 fl. oz.

BCN SCRUB

BCN SCRUB improves the general appearance of the skin by increasing hydration, evening out the skin tone and making the skin look clearer, without damaging the skin's barrier function. It is the ideal weekly treatment to complement your usual cleansing, moisturising and skin protection routine.

The formula also contains a **broad spectrum prebiotic complex that rebalances and promotes the growth of a healthy and balanced** microbiome in addition **to Dihydroavenanthramide D (DHAv D) and a varied blend of essential oils**, with a broad antioxidant, soothing, anti-irritant and antihistamine action profile that reduces discomfort and redness of sensitised skin.

INDICATIONS

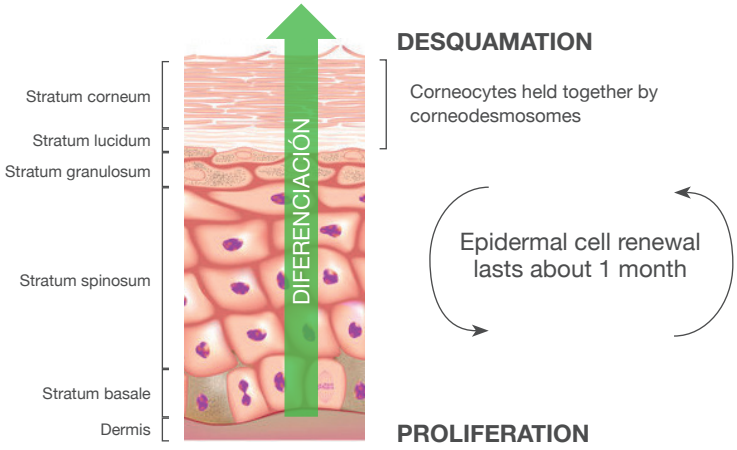
EFFECTIVE CELLULAR RENEWAL AND SKIN DESQUAMATION

The skin automatically renews itself every 28 days or so, when dead cells are naturally shed from the outer layer of the skin. Diseased or dead cells are replaced by new cells in perfect condition. **This process is essential for maintaining epidermal homeostasis** and can be affected by the passage of time, stress and fatigue or by external agents such as harsh weather conditions or solar radiation.

The cells of the basal layer of the epidermis divide to generate keratinocytes, which are connected to each other by desmosomes, and **move up through the different epidermal layers** towards the surface of the skin. As they move, these cells go through a maturation process, structurally and functionally changing [1].

When keratinocytes reach the outermost layer of the epidermis, or stratum corneum (SC), they are called corneocytes (or scales) and the junctions that hold them together are called corneodesmosomes. Corneocytes are dead cells, flattened and stacked in layers. Later, the corneocytes are naturally shed by desquamation (commonly called skin peeling)[2].

Under normal conditions, **there is a balance**



Epidermal layers and cell renewal process.

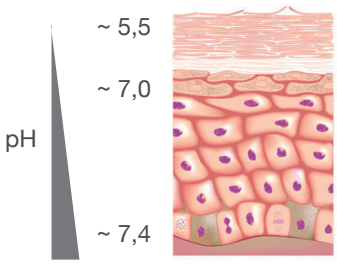
between cell proliferation and desquamation in a one-to-one correspondence, allowing the correct renewal of epidermal cells approximately once a month[2], which is an essential requirement for:

- maintaining an optimal barrier function to protect the skin from external aggressors and
- preventing TEWL to maintain adequate hydration levels.

In a young and healthy epidermis the desquamation and the development of new cells are balanced..

DESQUAMATION PROCESS

The desquamation process is dependent on endogenous proteolytic enzymes or proteases[3]. These proteases degrade proteins at the corneodesmosomal junctions, facilitating the removal of dead skin cells.

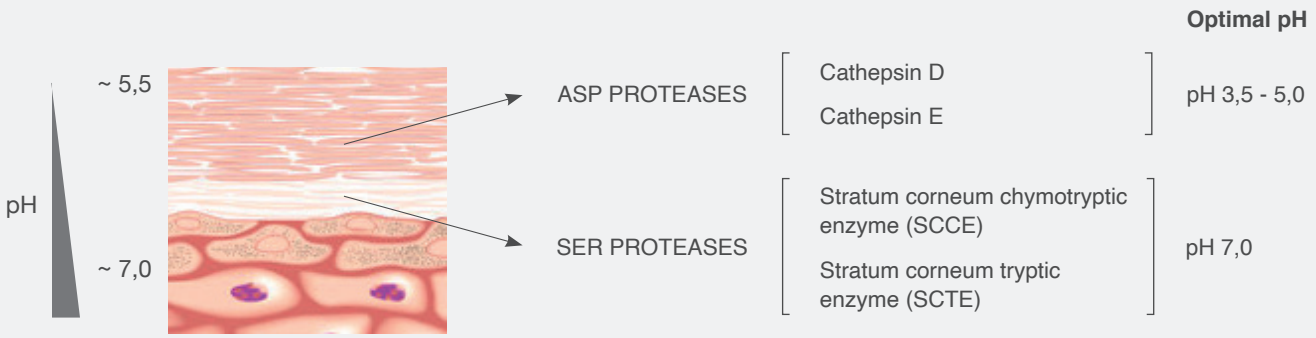


pH gradient in the epidermis

Its activity is pH-dependent, meaning that its optimal activity takes place within a certain pH range. The epidermis presents a pH gradient from around 5.5 on the surface of the SC to neutrality (pH around 7.0) in the granular stratum and over 7.4 in the basal layer[4].

There are a variety of **endogenous proteases in the epidermis and their activity varies depending on their location in the different epidermal layers and the pH in which they are found**: on the surface of the SC there will be more participation of the most active proteases in an acidic environment (Cys and Asp), while in the deeper layers of the SC, those whose optimal activity develops at neutral pH (Ser), will be more active and responsible for the degradation of intercellular proteins.

Thus, in the most superficial layers of the Stratum Corneum (SC) the most relevant proteases are the aspartic ones (Asp), cathepsin D and cathepsin E, being cathepsin D responsible for 80% of the activity of Asp proteases.



The pH gradient in the epidermis and the location of the different proteases in the epidermis ensure a controlled and specific desquamation of the corneocytes

Because cathepsin D is active only in an acidic environment (it works best in the 3.5 to 5.0 range), it can break down corneodesmosomes in the low pH environment of the SC surface, causing desquamation. However, **in deeper layers (with a higher pH) it cannot degrade the junctions between cells as efficiently, so its activity is specifically limited to the more superficial layers of the SC.**

ACTIVE INGREDIENTS

This innovative and complete **BCN SCRUB** formula owes its triple exfoliating action to **three types of active ingredients with a very distinct action profile:**

- **Alumina**, which in this formulation has a particle size of 80-150 microns and has no hard or irregular edges. It is an excellent powder scrub for deep peeling since it is the same material used in dermatologists' offices for microdermabrasion machines.
- **Lactic acid (AHA)** for a gentle chemical peel with minimal irritation and
- **A bio-enzymatic exfoliant** that mimics the activity of the protease Cathepsin D, the most important endogenous enzyme in the skin's peeling process, which breaks up the specific cell-to-cell interactions of the corneocytes in the stratum corneum and produces a gentle, controlled exfoliation with no side effects.

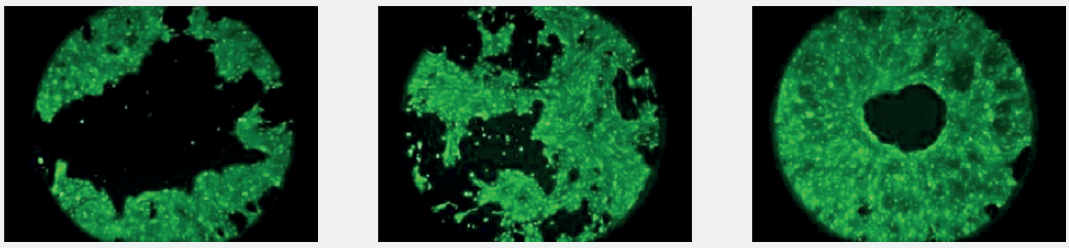
The exfoliating action of **BCN SCRUB** has been complemented with the main actives of the **BCN Prebiotics** line to achieve a complete formula with the following action profile:

- a **broad-spectrum prebiotic complex that** promotes the growth of a balanced microbiome to help you achieve healthy and glowy skin.

  It is made up of two different components:

  BIOALGAE: This is the **main prebiotic compound of the line** and is obtained from freshwater microalgae Chlorella Vulgaris. Bioalgae is considered a **topical superfood** for the skin thanks to its nutritional properties. In addition to its prebiotic action, several studies show that it has even more benefits for the skin:

  - **Helps stimulate cell regeneration** and can even improve the EGF (Epidermal Growth Factor) *



BASAL LEVEL | EGF (100 ng/ml) | WITH PREBIOTIC ACTIVE

The rapid migration and renewal of keratinocytes stimulates the regenerative and reparative properties of the skin barrier.

*An *in vitro* wound-healing test was performed on human keratinocytes demonstrating the enormous potential of BIOALGAE to stimulate and promote epidermal regeneration in just 18h.

  - Helps **calm and prevent inflammation** caused by microbiome imbalances to fight conditions like inflamm-ageing (visible or invisible chronic inflammation that accelerates premature ageing of the skin).
  - Helps **balance oily skin**, reducing sebum production and the appearance of comedones, commonly called blackheads.

  INULIN AND YOGURT POWDER: This mixture of Prebiotics combines the skin benefits of yogurt with the prebiotic activity of inulin, a fructose polysaccharide produced by plants.

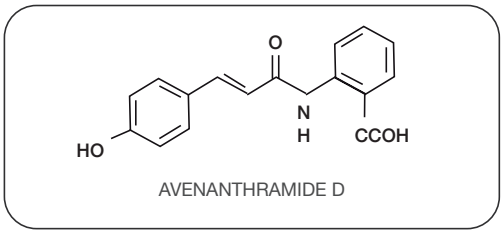
Most of the Prebiotics used today are short-chain carbohydrates that are naturally found in fruits and vegetables. Within this category, inulin is considered one of the most effective.

- **Dihydroavenanthramide D (DHAv D) and** a powerful and varied **blend of essential oils**, with a broad **antioxidant, soothing, anti-irritant and antihistamine action** profile that **reduces discomfort and redness in sensitive skin**.

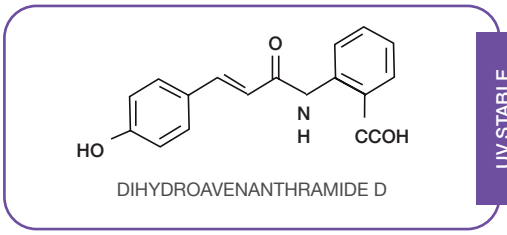
  DHAv D is a synthetic derivative of Avenanthramide D with the same antihistamine properties.

  Avenanthramides are a group of phenolic compounds found mainly in oats (mostly avenanthramides A, B and C), very effective **at relieving skin conditions such as itching, redness and hives in a dose-dependent manner**. In fact, **they are the main soothing active component of oats**.

  However, avenanthramides present a double challenge: there are only very small amounts of avenanthramides in oat extract and synthesising them is expensive. For this reason, and after an exhaustive screening of more than 40 synthetic avenanthramides, **Dihydroavenanthramide D has been selected as the most sustainable, stable, effective and safe alternative**.



AVENANTHRAMIDE D



DIHYDROAVENANTHRAMIDE D

UV STABLE

RESULTS

The **BCN SCRUB** formulation achieves:

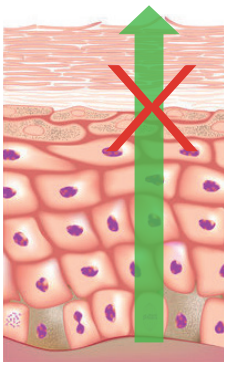
- <u>for its content in alumina, lactic acid and acid proteases sourced from plants:</u>
  - improves desquamation, specifically in the SC, of dead epidermal cells..
  - effective, controlled and gentle exfoliation with minimal irritation and less impact on the barrier function.
  - improves the overall appearance of the skin by increasing clarity and hydration..
- <u>complete prebiotic action:</u>
  - restores and maintains a healthy microbiome balance.
  - enhances the skin's immune response.
  - facilitates cell renewal, repairs the skin barrier and diminishes the appearance of scars.
  - revitalises and strengthens the skin.
- <u>due to avenanthramide D and essential oils:</u>
  - reduces itching, discomfort and redness that could be caused by the use of the scrub.

DETAILED INFORMATION

The skin's ability to maintain efficient cell renewal decreases with the ageing process and exposure to harsh environmental conditions, such as wind, air pollution, heat, sunlight or the use of certain cosmetics.

SC enzymes undergo age-related changes in both their levels and their activity. **As the skin ages there is a decrease in the amount of endogenous proteases in the skin**[5] **and an increase in skin pH** has also been documented[6, 7, 8].

Due to these changes, **the proteolytic activity of endogenous enzymes decreases**, the desquamation process becomes less efficient and uneven and the rate of cell renewal decreases with ageing[9]. **These changes translate into dry skin and a dull, lacklustre and aged complexion due to lack of oxygenation**.



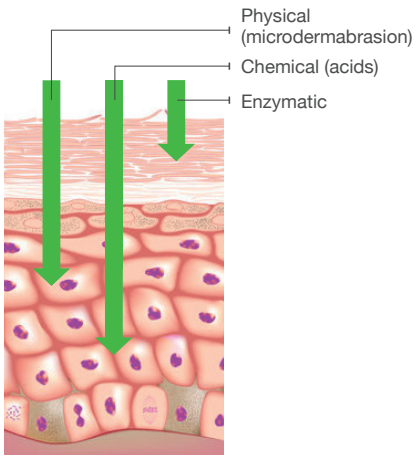
Reduction of desquamation efficiency with age.

As we age, it is important to complement the daily routine of cleansing, hydrating and protecting the face with a weekly exfoliation. In other words, help the natural process of the skin with a product that removes dead cells to give way to a cell renewal of the dermis.

THE ACTION OF BCN SCRUB

Exfoliation or peeling methods are widely used to make desquamation more efficient and to compensate for the inevitable slowdown in the shedding process of dead cells. **Exfoliation ensures effective regeneration** by allowing the skin to be more permeable and ready to absorb the nutrients and active principles of cosmetic products and also increase the effectiveness of medical-aesthetic treatments. It also stimulates cellular oxygenation. In short, **exfoliation methods rebalance the skin and improve its appearance**.

There are 3 categories of exfoliation methods:



1. **Physical exfoliation:** removes dead skin cells mechanically and **involves physically scrubbing the skin with an abrasive**. The mechanical methods of physical exfoliation are dermabrasion and microdermabrasion (microcrystals)[10].
2. **Chemical exfoliation**: requires the **application of acids** that reduce the cohesion between corneocytes. These can be **alpha-hydroxy acids (AHAs)** — like glycolic or lactic acid — or beta-hydroxy acids (BHAs), like salicylic acid.
3. **Enzymatic exfoliation:** it is based on the **application of proteases** that mimic the **skin's own natural enzymes to break cell-cell interactions and promote desquamation**. Proteases require an optimal pH to be active, so this method of exfoliation is **gentler than AHAs**, and with less risk of irritation.

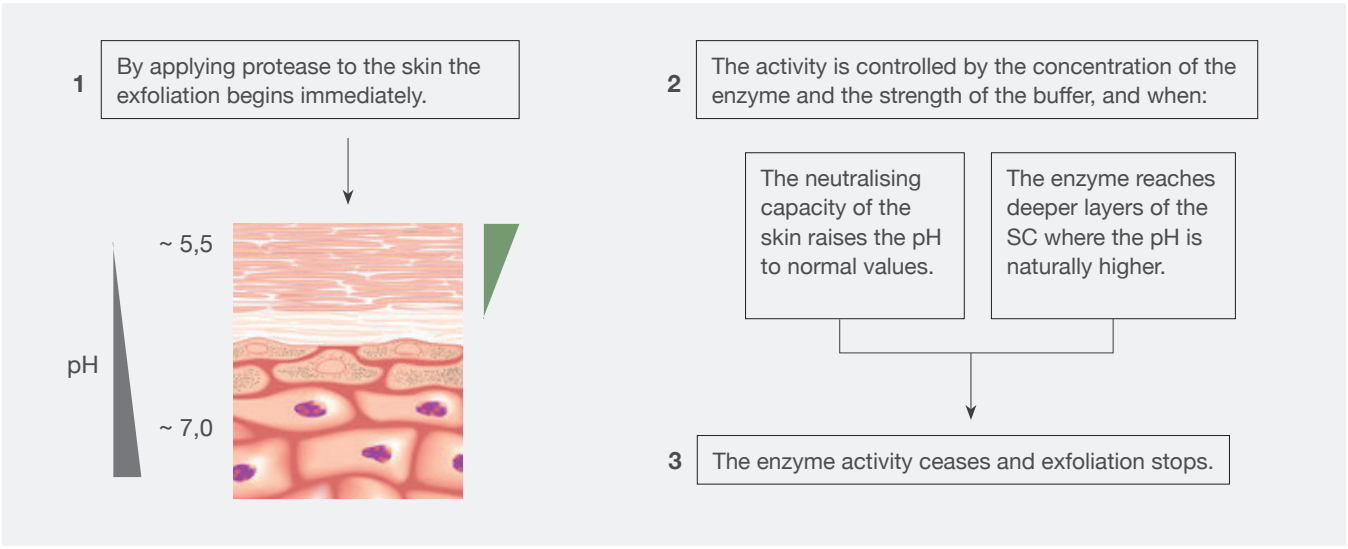
The new BCN SCRUB product from Institute BCN contains these three categories of exfoliating ingredients;

- **Physical Exfoliation:** the **alumina** is responsible for the mechanical removal of corneocytes by the physical action of microdermabrasion, achieving a very effective peeling result.
- **Chemical Exfoliation:** carried out in this case by **lactic acid**.

- **Enzyme Exfoliation:** performed by an acid protease with a proteolytic activity profile that mimics the effect of endogenous Cathepsin D to produce controlled and effective flaking without side effects or irritation.

Its pH-dependent activity offers a **double safety profile:**

- maintains **proteolytic activity** specifically **only in the SC**,
- i t becomes **inactive in deeper layers of the skin** (pH> 5.5).



To complement the exfoliating properties, other active ingredients have been included in the formula to regenerate and ensure the good condition and balance of the skin's microbiota as well as to calm and soften skin that may be slightly sensitised.

1. The **prebiotic complex** used in the **BCN Prebiotics line** is a naturally-occurring, sustainable compound with broad-spectrum prebiotic properties that **provide a number of skin benefits**:
    - **Direct prebiotic effect:** acts as a food source for good bacteria, while the harmful ones cannot digest it. The result is that, in a natural way, it stimulates the growth of beneficial microbial species to the detriment of pathogens, restoring the balance of the microbiome.
    - **Indirect prebiotic effect:** promotes the synthesis of antimicrobial peptides.
    - **Powerful EGF-like properties:** stimulates cell renewal.

2. Laboratory studies have shown that **DHAv D (dihydroadvenamin D)**, as well as being a **powerful antioxidant**, is a **histamine inhibitor**. Histamine is a hormone produced in the cells of our immune system — specifically mast cells and basophils (among others) — that acts as an inflammatory mediator in allergic reactions. Histamine is involved in the regulation of the immune system.

   Thus, DHAv D, as well as **reducing ROS-induced damage**, can also: **minimise inflammation, reduce itching and** possible **irritation** from applying the scrub, all thanks to its **antihistamine** properties.

REFERENCES:

1. Voegeli R, Rawlings AV. Corneocare. The role of the stratum corneum and the concept of total barrier care. H&PC Today. 8(4): 7.16, 2013.
2. Draelos ZD, Pugliese, PT. Physiology of the skin. 3rd ed. Allured Pub Corp; 2011.
3. Rawlings AV, Matts PJ. Stratum corneum moisturization at the molecular level: an update in relation to the dry skin cycle. J Invest Dermatol. 124(6):1099-110, 2005.
4. Schmid-Wendtner MH, Korting HC. The pH of the skin surface and its impact on the barrier function. Skin Pharmacol Physiol. 19(6):296-302, 2006.
5. Rawlings AV. Trends in stratum corneum research and the management of dry skin conditions. Int J Cosm Sci. 25: 63-95, 2003.
6. Schreml S, Zeller V, Meier RJ, Korting HC et al. Impact of age and body site on adult female skin surface pH. Dermatology.224(1):66-71, 2012.
7. Ali SM, Yosipovitch G. Skin pH: from basic science to basic skin care. Acta Derm Venereol. 93(3):261-7, 2013.
8. Choi EH, Man MQ, Xu P, Xin S et al. Stratum corneum acidification is impaired in moderately aged human and murine skin. J Invest Dermatol. 127(12):2847-56, 2007.
9. Cerimele D, Celleno L, Serri F. Physiological changes in ageing skin. Br J Dermatol. 122(Suppl 35):13-20, 1990.
10. Morante N. Why Exfoliation is Important in the Anti-Aging Process. SpecialChem, 2008. Retrieved September 1, 2014 from www.specialchem.com.