

SKIN CARE

Key Skincare Ingredients and Their Role In Skin Health

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Healthy skin is maintained through a combination of natural physiological processes and external support from skincare ingredients. Certain compounds, such as **hyaluronic acid, ceramides, niacinamide, salicylic acid, and vitamin C**, play important roles in maintaining skin hydration, barrier integrity, and overall skin health. These ingredients function through different mechanisms, including **moisture retention, lipid restoration, regulation of inflammation, exfoliation, and antioxidant protection**. Based on these mechanisms, they are widely formulated into skincare products such as **serums, creams, cleansers, masks and toners**. It is mandatory to know about the scientific basis behind these commonly used ingredients in making informed skincare choices and to understand how they support the structure and function of the skin.

HYALURONIC ACID

Hyaluronic acid is a **naturally occurring polysaccharide** in the skin. It is a hygroscopic molecule with exceptionally **strong water absorption properties**. It has typically been classified as a **humectant moisturizer**, since it draws water from the dermis to epidermis, helping maintain **optimal hydration** in the outer skin layers. HA forms a **Gel-like network** in the dermis which **regulates water balance** and functions as a sieve, excluding unwanted large molecules, thereby **enhancing and stabilizing the skin structure**. HA's significant water retention property makes it a key ingredient in skincare products which are mostly aimed for **hydration, plumpness and anti-aging**.

NIACINAMIDE

Niacinamide, also known as **nicotinamide**, belongs to the **vitamin B3** family. It promotes the synthesis of **ceramides, fatty acids, and proteins** within the skin, thereby supporting the **restoration of the hydrolipid barrier** which helps protect the dermis from the penetration of harmful agents. Niacinamide is effective in the care of various skin types including **dry, combination, oily, and acne-prone skin**. It also contributes to **preserving skin hydration and promoting a youthful appearance**. Additionally, niacinamide based dermo-cosmetics are known for their **antimicrobial, barrier-repairing, anti-inflammatory, anti-hyperpigmentation and photoprotective properties**.

SALICYLIC ACID

Salicylic acid is an **organic compound** derived from plants and is classified as a **Beta-hydroxy acid (BHA)** with a wide range of applications in dermo-cosmetic preparations for its **pore-cleansing and exfoliating properties**. It **reduces sebum secretion**, helps **unclog pores**, and **supports skin renewal**, thereby **improving overall skin texture**. Additionally, Salicylic acid **reduces hyperpigmentation** and is used in the treatment of photo-damaged skin. Due to its **bactericidal and fungicidal** properties, salicylic acid is often used as a **preservative** in various cosmetic formulations.

RETINOL

Retinol, a derivative of **Vitamin A**, is widely known for its **excellent anti-aging and anti-inflammatory** properties. Upon topical application, retinol is converted into **retinoic acid** within the skin, which **reduces**

wrinkles, fine lines, and irregular pigmentation associated with age-related issues. Retinol also stimulates collagen formation and inhibits its degradation, thereby improving overall skin complexion, treating post-inflammatory hyperpigmentation and reducing skin damage caused by sun exposure. Due to its strong activity, retinol is usually introduced at lower concentrations, as initial use may lead to mild dryness or skin irritation.

VITAMIN C

Vitamin C, also known as ascorbic acid, is a widely used antioxidant in skincare formulations. It plays an important role in protecting the skin from oxidative stress caused by UV radiation and pollution. Vitamin C promotes collagen synthesis, which helps improve skin firmness and elasticity. It also helps in skin brightening and reducing hyperpigmentation. Due to its efficient antioxidant and photo-protective properties, vitamin C is incorporated into various dermal preparations to maintain a healthy skin and youthful appearance.

CONCLUSION

In conclusion, skincare ingredients such as hyaluronic acid, niacinamide, salicylic acid, retinol and vitamin C play a significant role in maintaining skin health and protects it from day-to-day sun exposure, dermatological conditions and pollution. These ingredients offer benefits including skin hydration, exfoliation, anti-aging, barrier repair and restoration. They contribute to enhancement of overall skin texture and quality. Understanding the functions and limitations of these ingredients helps in selecting effective Dermo-cosmetic products for different skin types and concerns.

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Competing interests

The authors declare that they have no competing interests.

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