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**.

SALYCILIC 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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