Vitamins

Retinol GS 50



Revealing the power of younger-looking skin

NUTRITION · HEALTH · SUSTAINABLE LIVING

DSM
BRIGHT SCIENCE. BRIGHTER LIVING.

Introduction

The efficacy of retinol is well known and documented. Discovered more than 80 years ago, it is still today considered the gold standard in the cosmetic industry. It has been one of women's best allies in their fight against aging. As the world's leading supplier of vitamins, with more than 100 years of tradition, and building on our extensive knowledge of skin biology and a strong sense for beauty and in-depth understanding of people's skin aspirations, DSM is now launching retinol for the cosmetic industry.

Skin aging is a gradual process that results in multiple visible signs, such as fine lines and wrinkles, loss of skin elasticity, uneven skin tone or mottled pigmentation. Retinol brings multifaceted skin benefits. Scientific studies have shown that, working in the dermis and epidermis, retinol boosts collagen production in the skin, stimulates keratinocyte proliferation and epidermal thickness, and inhibits tyrosinase activity.[1,2,3] The effects of retinol on skin appearance are really impressive – it visibly improves the appearance of fine lines and wrinkles, increases skin firmness, tonicity and smoothness, and evens out dark spots and age spots.[4]

Key facts

UNIQUE PRODUCT FEATURES

- Highly potent and multifunctional anti-aging ingredient supplied in a stable 50% polysorbate 20 solution
- Protects against collagen degradation and increases collagen levels in the skin; improves elastin synthesis[5,6]
- Increases epidermal proliferation and thickness[1]
- Decreases melanin content and enhances corneocytes desquamation[2]

BENEFITS

- Visibly reduces the appearance of lines and wrinkles
- Improves skin tonicity, firmness, and elasticity
- Helps accelerate skin renewal for healthier, smoother and younger-looking skin
- Appearance of dark spots is reduced, skin appears more even

COSMETIC APPLICATION

- Anti-aging and anti-wrinkle products
- Even skin tone care and age spots treatment
- Skin resculpting and smoothing products
- Slimming and body sculpturing products

SUGGESTED CONCENTRATION

- 0.1% for day care and body care products
- 0.2% for night care products

INCI NAME (ACTIVE)

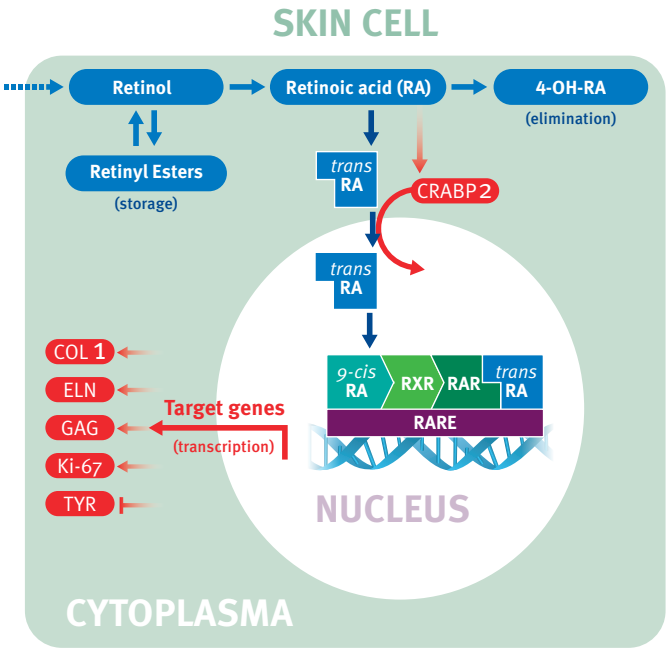
Retinol

Mechanism

Natural retinoids, including the cosmetically acceptable form of retinol (vitamin A alcohol) and its esters, play an important role in a variety of biological processes in skin, including growth, proliferation, and differentiation.

The efficacy of retinol has been well documented in clinical studies. Retinol can be used as a topical prophylactic treatment to prevent some of the signs of skin aging, as well as to treat skin already damaged by UV radiation, for example.[1] Retinol acts beneficially on collagen metabolism both by stimulating collagen neosynthesis and by reducing the expression of collagen-degrading enzymes (MMP-1). A low dose of retinol (0.1%) induces keratinocyte proliferation, promoting epidermal thickening.[3]

The mechanistic mode of action of retinoids is well characterized.



After retinol enters the cell by diffusion it is metabolized to retinoic acid (RA). Abundant retinol is stored in the form of retinyl ester until needed, or degraded as polar metabolites (4-OH-RA) by enzymes. Retinol enhances the expression of specific cellular receptors like cellular retinoic-acid-binding protein type 2 (CRABP-2).[3] Retinoic acid is transported from the cytoplasm to the nucleus by CRABP-2. There, retinoic acid binds to the retinoic acid receptor (RAR) which forms a heterodimer with the retinoid X receptor (RXR). This complex acts as a transcription factor on regions called retinoic acid response elements (RARE) and mediates RA-responsive gene expression, such as for type I procollagen (COL1), elastin (ELN), glycosaminoglycan (GAG), tyrosinase (TYR) and Ki-67 protein. These terminal biomarkers can be detected using *in vitro* techniques and are implicated in the beneficial anti-aging effects.

Efficacy

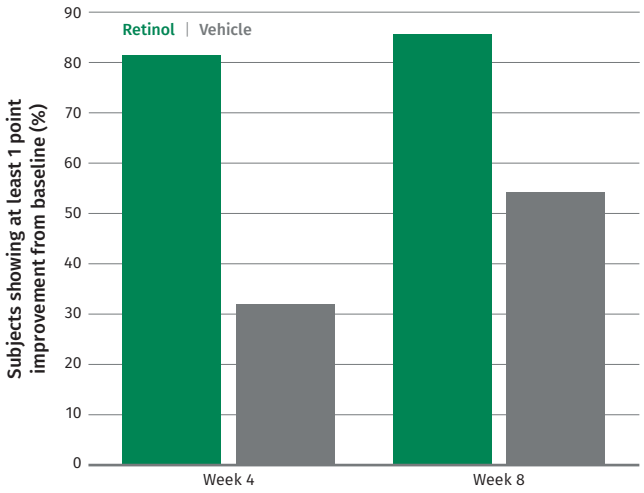
Evidence of retinol efficacy has been demonstrated in a series of histological studies, confirming its broad range of action across all major skin care applications as summarized in the table below. Clinical trials confirm its potency as early as four weeks after commencing treatment in some parameters at the 0.1% concentration level, as well as tremendous results in the long-term in the fight against photodamage.[4]

APPLICATION	MOLECULAR & GENE LEVEL	STRUCTURAL & FUNCTIONAL LEVEL	CONSUMER LEVEL
Anti-Ageing	• Increases collagen synthesis • Inhibits matrix metalloproteinases (MMPs) and reduces collagen degradation	• Improves organization of collagen and elastin fibres in papillary dermis • Improves structure of dermal-epidermal junction	• Reduces the appearance of lines and wrinkles • Improves firmness and elasticity
CORNEOCARE™	• Stimulates Ki-67 expression • Increases deposition of glycosaminoglycan in the epidermis	• Increases epidermal proliferation • Thickens the epidermis • Compacts the stratum corneum	• Improves skin smoothness • Decreases skin roughness
Skin Tone	• Downregulates tyrosinase activity • Decreases melanin content	• Inhibits melanosome transfer	• Reduces discoloration and mottled pigmentation • Rebalances uneven skin tone

In vivo

Retinol efficacy was evaluated in an eight-week, double-blind, split-face, vehicle-controlled, randomized study[4] conducted during the winter period among 64 female volunteers aged 40–65. 0.1% retinol containing moisturizer was applied daily. Clinical evaluations were performed by the dermatologist at baseline and at weeks 4 and 8 on each side of the face, based on the 0–9 scale.

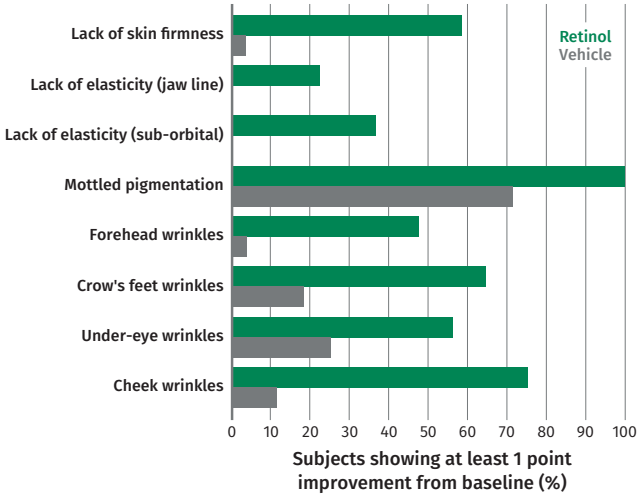
Retinol effect on overall photodamage



Results:

- 86% subjects showed improvement in the end of the study based on dermatological assessment

Retinol effect on key aging signs



Results:

Significant improvement in all parameters after 2 months:

- Significant wrinkle reduction across the whole face
- Skin firmness improved by 58%
- 100% visible effect on mottled pigmentation

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