

## THE SCIENCE WHITE PAPER SERIES OF IMAGE SKINCARE:

### **Retinol (retinyl palmitate)**

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### **ABSTRACT**

Image Skincare offers products with many active, scientifically proven and researched key ingredients to achieve a certain result on the skin. In order to achieve the maximum benefit, not only one key ingredient, but an array of synergistically working ingredients, to target specific skin concerns, is found in every product. This concept is found throughout each and every line and not the name of the product identifies which ingredient is used, but the ingredient listing. All key ingredients are named on the international nomenclature of cosmetic ingredients (INCI) and are furthermore described on product key ingredient manuals. The uniqueness about Image Skincare is the blend of these ingredients into an advanced formulation with a perfectly balanced pH, which dictated the effectiveness of several ingredients. All products follow the concept of the exclusive CPN System™, a unique blending of Correction, Prevention and Nutrition, only offered by Image Skincare. This three in one concept greatly enhances the effect of each product on the skin and achieves results quicker and more profound.

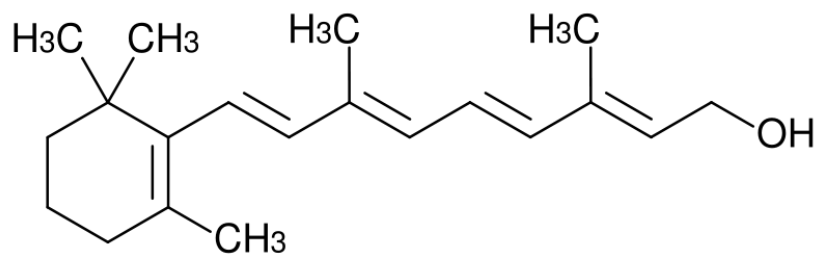
### **General Findings of Retinol**

Retinol is a form of Vitamin A that is used to treat, restore, and heal aging skin. As skin ages it loses its elasticity and collagen which results in thin and wrinkly skin. Photo-aging, or premature skin aging, occurs in skin due to overexposure to the sun and its UV

radiation. The result of photo-aging can be dark spots, wrinkles, droopy skin, a yellowish ting, broken blood vessels, leathery skin, and skin cancers with Also as you age your epidermis and dermis become thinner with reduced numbers of keratinocytes and fibroblasts. Retinol is an anti-oxidant that not only heals but prevents the skin from aging. It has been shown to reduce the risk of cancer and free radical damage of skin tissue by neutralizing free radicals. It stimulates cell growth and reproduction in the skin cells therefore helping skin cells grow back to their proper form to repair the damage caused by ageing. Retinol has also been found to be effective in treating cellulite, rosacea, acne scars, warts, and dermatitis.

### Formation of procollagen

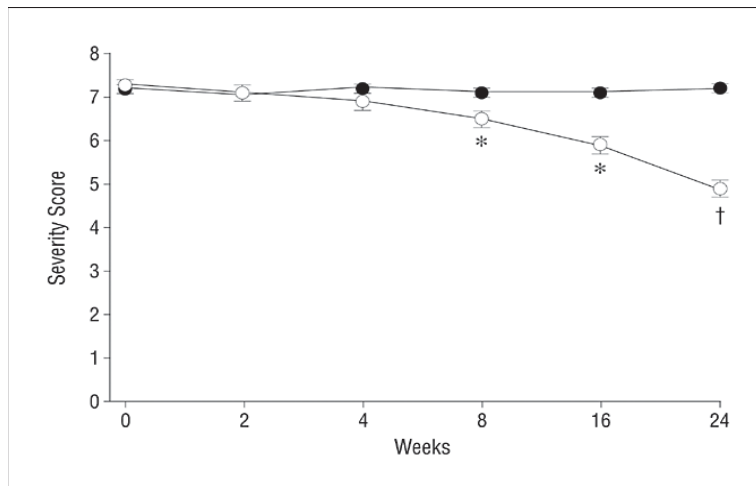
The reason retinol makes skin look younger is because it treats below the epidermis to treat deep wrinkles and photo damage. Photoaged skin has less procollagen formation. Retinol stimulates procollagen synthesis and increases the mature collagen band in the dermis. It also aids in regenerating new cells. As retinol sloughs off dead skin cells on top, it grows new cells underneath, and pushes these new cells to the epidermis. The dead skin cells are replaced by the new ones and the result is smoother, firmer skin with even pigmentation.



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Figure 1: Chemical Structure of retinol

A clinical study testing the effects of topical retinol on aging skin examined the result of retinol on 23 subjects with a minimum age of 80 in relatively good health and without active skin diseases. Over 24 weeks the upper inner arms of the subjects were compared to test the difference between those arms with a topical retinol treatment and those with a vehicle treatment. Dermatologist determined the differences in tactile roughness, fine wrinkling, and overall severity between the compared inner arms. Comparisons of clinical end points between the vehicle-treated skin and the retinol-treated skin were made with the paired *t* test. The results found retinol significantly reduced fine wrinkling compared to the vehicle treatment ( $-1.64$  [95% CI,  $-2.06$  to  $-1.22$ ] vs  $-0.08$  [95% CI,  $-0.17$  to  $0.01$ ];  $P < .001$  [N = 36]). Dermatologists found retinol started decreases the signs of aging in as fast as four weeks and continued to heal skin throughout the 24 weeks (Figure 2).



**Figure 2.** Topical retinol reduces the fine wrinkling in chronologically aged skin (n = 23). Error bars indicate standard error. \* $P < .01$  vs vehicle. † $P < .001$  vs vehicle.

Along with this the retinol also increased glycosaminoglycan expression ( $P = .02$  [n = 6]) compared with the vehicle. The retinol treatment showed an increase in GAG within the first month of treatment. After 24 weeks, the GAG levels in retinol-treated skin were 40% higher, on average, than in vehicle-treated skin ( $P = .02$ ). GAG is a hygroscopic material that possesses the capacity to bind water roughly 1000 times its own weight. When

GAG retains water it smoothes the fine wrinkles of natural aging skin.

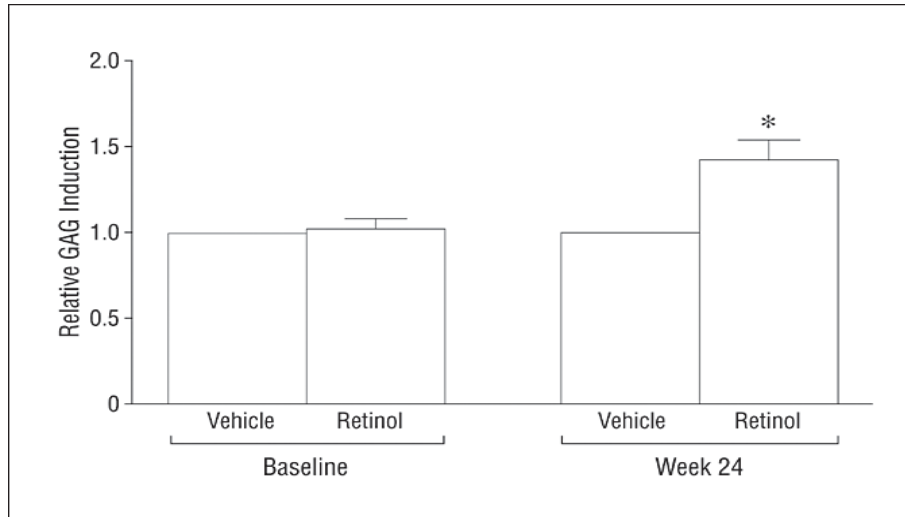


Figure 3: After 24 weeks GAG levels increased from the baseline time period in the retinol treated skin by 40%. The skin in the vehicle treatment showed no signs of increase.

As skin ages, it becomes thin as a result of a loss of collagen. Procollagen protein rebuilds collagen in chronologically aged skin. Skin with more procollagen protein can withstand skin breakdown and ulcer formation to a greater degree than untreated skin. In the image below procollagen protein in the skin was tested at the end of a 24 week period for amount of procollagen staining. The compared groups were skin with topical retinol treatment and skin with only a vehicle treatment. The staining was used to visibly measure the increase of the amount of procollagen protein in the skin after the two treatments. This clinical study shows retinol induces procollagen I, resulting in thicker, healthier looking skin.

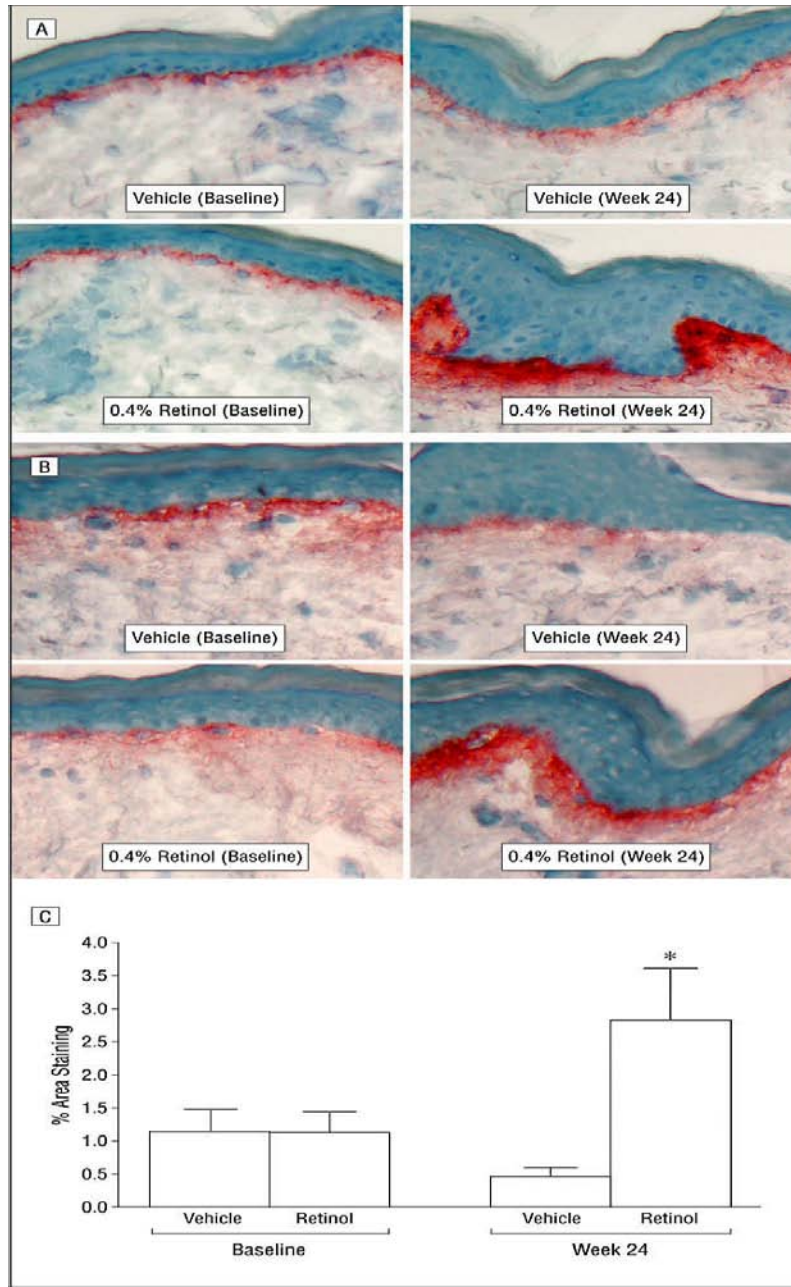


Figure 4: Area of stained procollagen protein was increased after 24 weeks of topical retinol treatment.

Retinol increases procollagen protein, GAG, and new cell regrowth. The effect of a topical retinol treatment is thicker, smoother, and healthier looking skin. It eliminates fine lines and wrinkles and will also reduce cellulite. Retinol activates

cell turnover by sloughing off dead skin cells and pushing new cells to the epidermis leaving even-toned, younger looking skin.

Image Skincare offers effective different products which contain retinol and its derivatives. The most potent product is *Ageless total retinol a, a combination of retinol-a* with alpha hydroxy acids and peptides for skin renewal. The *Ageless total repair crème, Vital C hydrating anti-aging serum and other products* contain retinol-a for youthful looking and more radiant skin.

#### References

1. **“Improvement of Naturally Aged Skin With Vitamin A (Retinol)”**, *Archives of Dermatology*, Vol. 143 No. 5, May 2007
2. “Pathophysiology of premature skin aging induced by ultraviolet light”, Fisher GJ, Wang ZQ, Datta SC, Varani J, Kang S, Voorhees JJ. *N Engl J Med*, 1997;337:1419-1428
3. “Two concentrations of topical tretinoin (retinoic acid) cause similar improvement of photoaging but different degrees of irritation: a double-blind, vehicle-controlled comparison of tretinoin 0.1% and 0.025% creams”, Griffiths CEM, Kang S, Ellis CN; et al. *Arch Dermatol*, 1995;131:1037-1044.
4. “Chemical structure of retinol (vitamin A)”, Self-made in BKChem + perl + vim. March 13, 2007.
5. “Topical tretinoin for treatment of photodamaged skin: a multicenter study”, Weinstein GD, Nigra TP, Pochi PE; et al. *Arch Dermatol*, 1991;127:659-665.
6. “Application of retinol to human skin in vivo induces epidermal hyperplasia and cellular retinoid binding proteins characteristic of retinoic acid but without measurable retinoic acid levels or irritation”, Kang S, Duell EA, Fisher GJ; et al. *J Invest Dermatol*, 1995;105:549-556.
7. “Retinoid induction of CRABP-II mRNA in human dermal fibroblasts: use as a retinoid bioassay”, Elder JT, Kaplan A, Cromie MA, Kang S, Voorhees JJ. *J Invest Dermatol*, 1996;106:517-521.
8. “Demographics of aging and skin disease”, Smith ES, Fleischer AB Jr, Feldman SR. *Clin Geriatr Med*. 2001;17:631-641

9. "Photoaging and topical tretinoin: therapy, pathogenesis, and prevention", Kang S, Fisher GJ, Voorhees JJ. *Arch Dermatol.* 1997;133:1280-1284
10. "Proteoglycans and glycosaminoglycans." Silbert JE. In: Goldsmith LA, ed. *Biochemistry and Physiology of the Skin.* New York, NY: Oxford University; 1983:448-461.

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