

## EFFICACY TEST

<b>Product Name</b>	Vitamin A Retinol (micro-encapsulated)
<b>Product Code</b>	AL00070
<b>INCI Name</b>	Retinol, Hydroxypropyl Cyclodextrin
<b>CAS Number</b>	68-26-8, 128446-35-5

### Action Mechanism

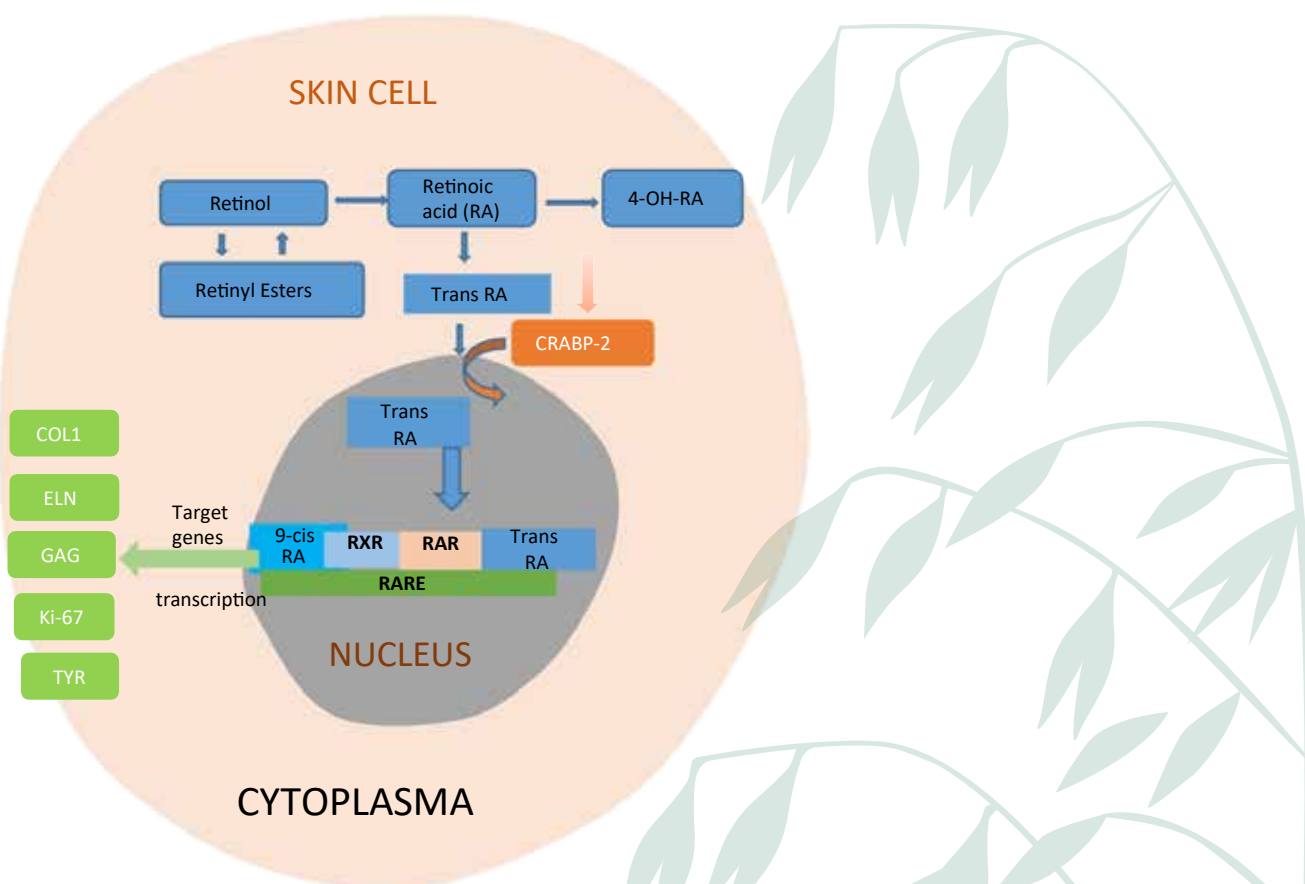


Fig 2. the metabolic mechanism of retinol on role on skin cell

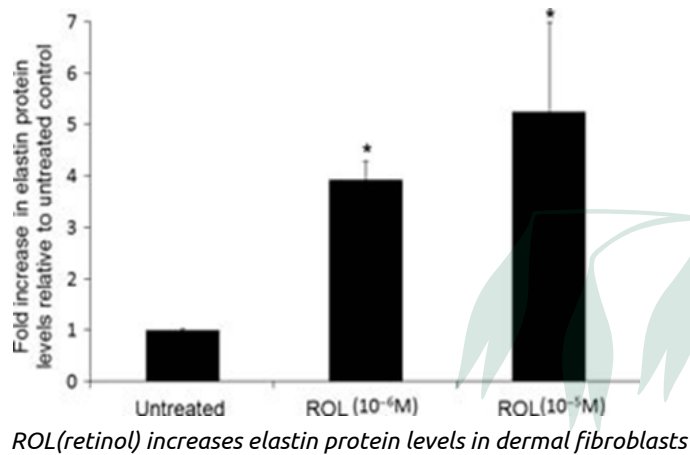
- Retinol enters the skin, it is metabolized to retinoic acid (RA). Abundant retinol is stored in the form of retinyl ester until needed, or degraded as polar metabolites (4-OH-RA) by enzymes

- Retinoic acid is transported from the cytoplasm to the nucleus by CRABP-2. 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 are implicated in the beneficial anti-aging effects.

## EFFICACY TEST

### Increases elastin protein levels (in vitro)



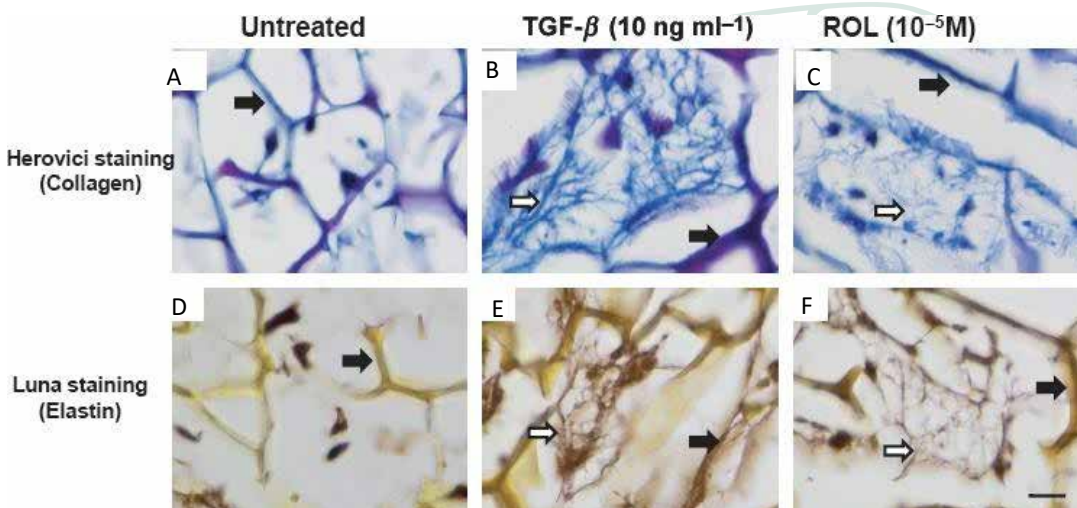
### Test Method

• Normal human adult dermal fibroblasts were treated with retinol at indicated concentrations for 72 h. Cell lysates were examined for elastin protein levels by direct ELISA.

### Results

- Retinol increases elastin protein levels in dermal fibroblasts.
- Retinol treatment led to a dose-dependent induction of elastin protein

### Efficacy Test



*ROL (retinol increases elastin fibre staining in 3D dermal fibroblast cultures*  
 \* Herovici-stained (collagen): (A–C) Collagen staining of control (A), TGF-β (B) and ROL-treated sample (C);  
 Luna-stained (elastin): (D–F) Elastin staining of control (D), TGF-β (E) and ROL-treated sample (F)

# EFFICACY TEST

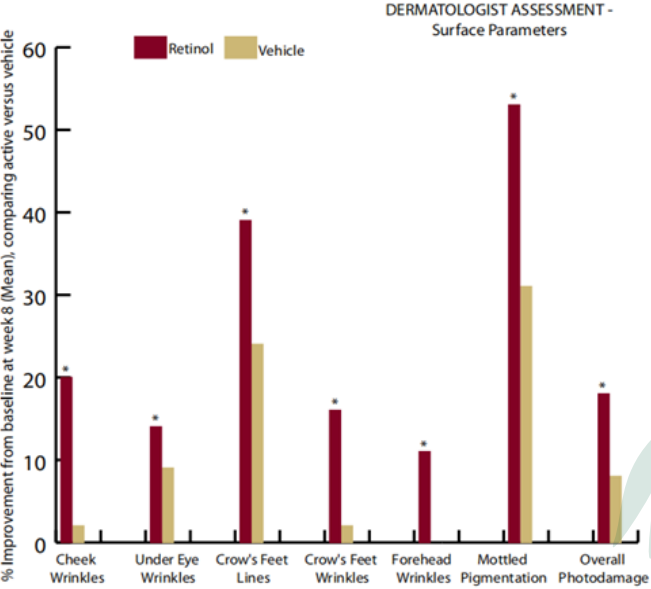
**Test Method:**

3D dermal fibroblast cultures, established in collagen scaffolds, were treated with TGF-b (10 ng/mL), or with ROL (10<sup>-5</sup> M), or remained untreated for 2 weeks. Histological staining of the 3D cultures was used to document the induction of collagen synthesis (a known ROL activity, shown by Herovici staining) and the enhancement of elastin fibre formation (shown by Luna staining).

**Results:**

ROL (Retinol) can induce collagen synthesis and collagen fibre formation, as well as elastin protein synthesis and elastin fibre formation.

**Anti-wrinkles & anti-photoaging (in vivo)**



*Clinical efficacy parameters: Comparison in surface parameters between 0.1% retinol-containing moisturizer and vehicle*

**Test method:**

In this eight-week, double-blind, split-face, randomized clinical study, a stabilized 0.1 % retinol-containing moisturizer was tested (36 subjects) against the vehicle (28 subjects) in women with moderate facial photodamage. Each product was applied once daily to the designated half side of the face.

**Results:**

Particularly prominent were the improvements from baseline in mottled pigmentation by 53%, crow's feet lines by 39% (and crow's feet wrinkles by 16%), cheek wrinkles by 20% and

overall photodamage by 18% after 8 weeks of Retinol applications.

The Retinol treated skin showed significant improvement ( P < 0.05 ) against vehicle (\*) in all wrinkle parameters, pigmentation and overall photodamage

## EFFICACY TEST

### Anti-wrinkles & anti-photoaging (in vivo)



*Improvement in wrinkle appearance (Patient using the 0.1% Retinol moisturizer at baseline (left) and at the end of the study (right))*

- After 8 weeks, there is a visible improvement in the appearance of skin wrinkling.

**Conclusion:** This study demonstrates that the stabilized 0.1% retinol moisturizer was efficacious in the improvement of the appearance of photodamage, with very low irritation potentials

- Protects against collagen degradation and increases collagen levels in the skin; improves elastin synthesis
- Helps reduce wrinkles, treat hyperpigmentation, and generally lessen signs of skin aging
- Decreases melanin content
- Treats acne and acne scarring