Nikkol VA-LINO 10
Double Function Retinol Derivative
(JOINT SESSION)

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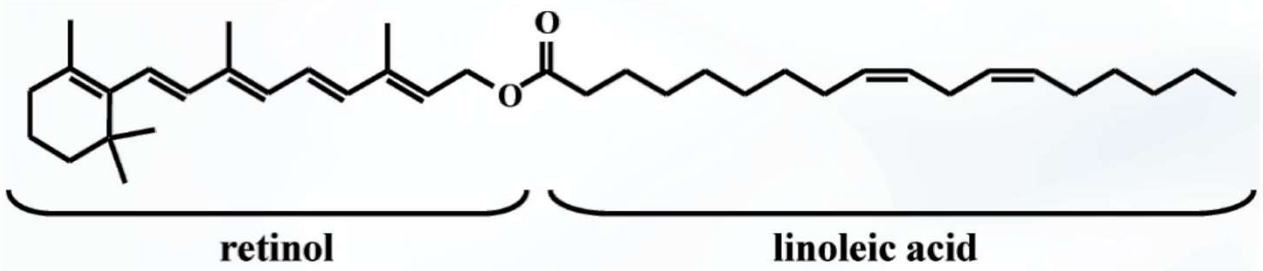
Characteristics of Nikkol VA-LINO 10

10% Retinyl Linoleate in Sugar Squalane

(Anti-aging + brightening)



- Reduce irritation commonly occurring with pure retinol
- Enhance collagen synthesis in dermis
- Enhance hyaluronic acid synthesis in epidermis
- Suppress melanin production

Addressing the common issues in pure retinol

	VA-LINO 10	Pure Retinol
Efficacy		
Anti-aging	Yes	Yes
Skin Turnover	Yes	Yes
Brightening	Yes	No
Stability		
Need for dark room	No	Yes
Nitrogen Blanket	No	Yes
Formula coloration	Less	Yes
Safety		
Irritation Potential[1]	None	Yes
Photosensitization [2] (humans)	None	most likely
Phototoxicity [3] (in-vitro)/ µg/ml	IC_{50}=40.896	IC_{50} =6.700
Ocular Irritation	*None*	?

[1] Patch test done on 2% of pure VA-LINO (equivalent to 20% of VA-LINO 10)

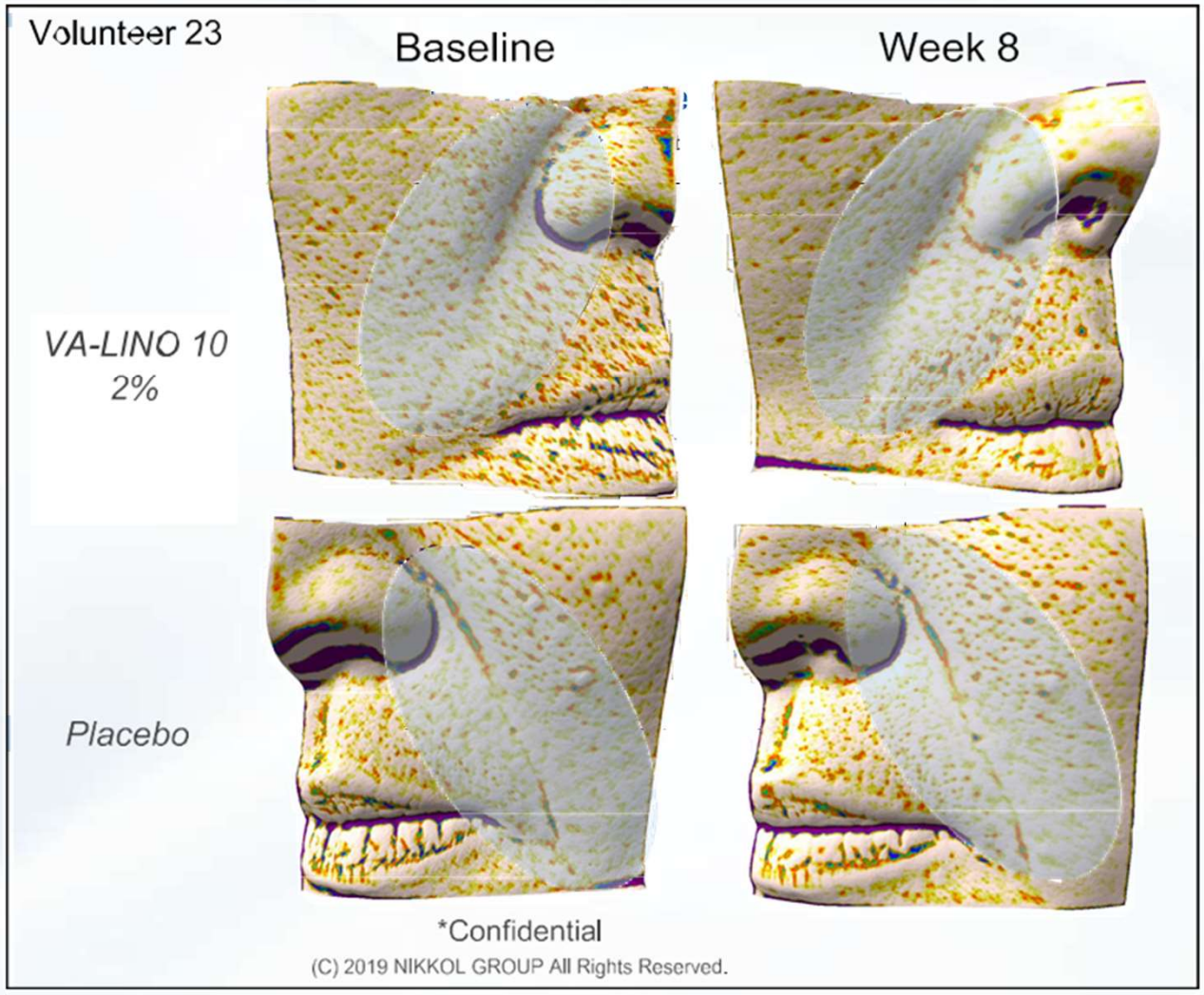
[2] Done on 20% of VA-LINO 10

[3] IC50 value after photoactivation; both ingredients not recommended for daywear

Clinical 1: Improvement of wrinkle & skin surface

Representative image from Split-face study

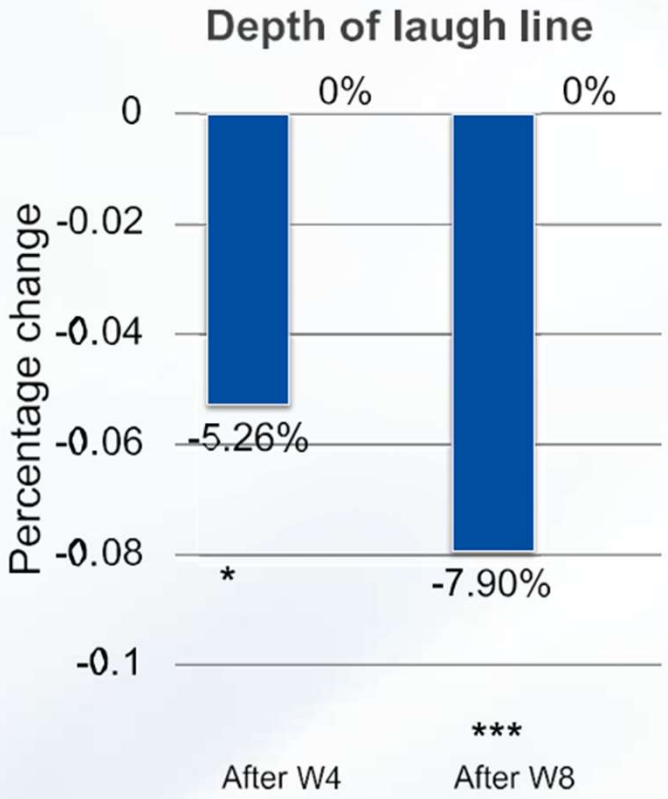
Treatment with **VA-LINO 10 (2%)** significantly improved wrinkle size in **4 & 8 weeks vs. initial & placebo**

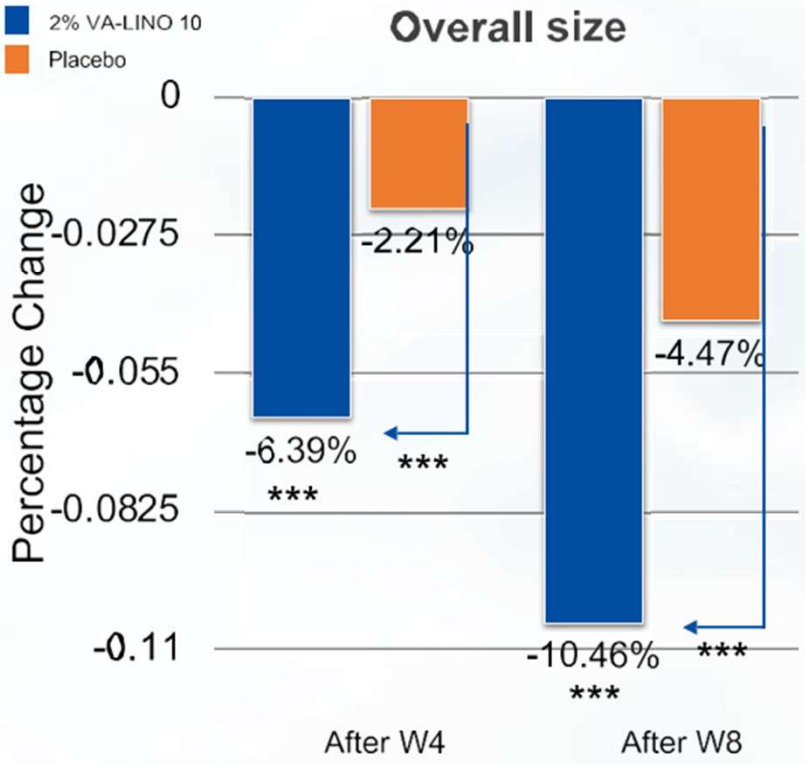


*Confidential

VA-LINO 10 shows decrease of overall wrinkle size & depth compared to baseline

Significance(Repeated measures ANOVA); p*<0.05, p*** < 0.001



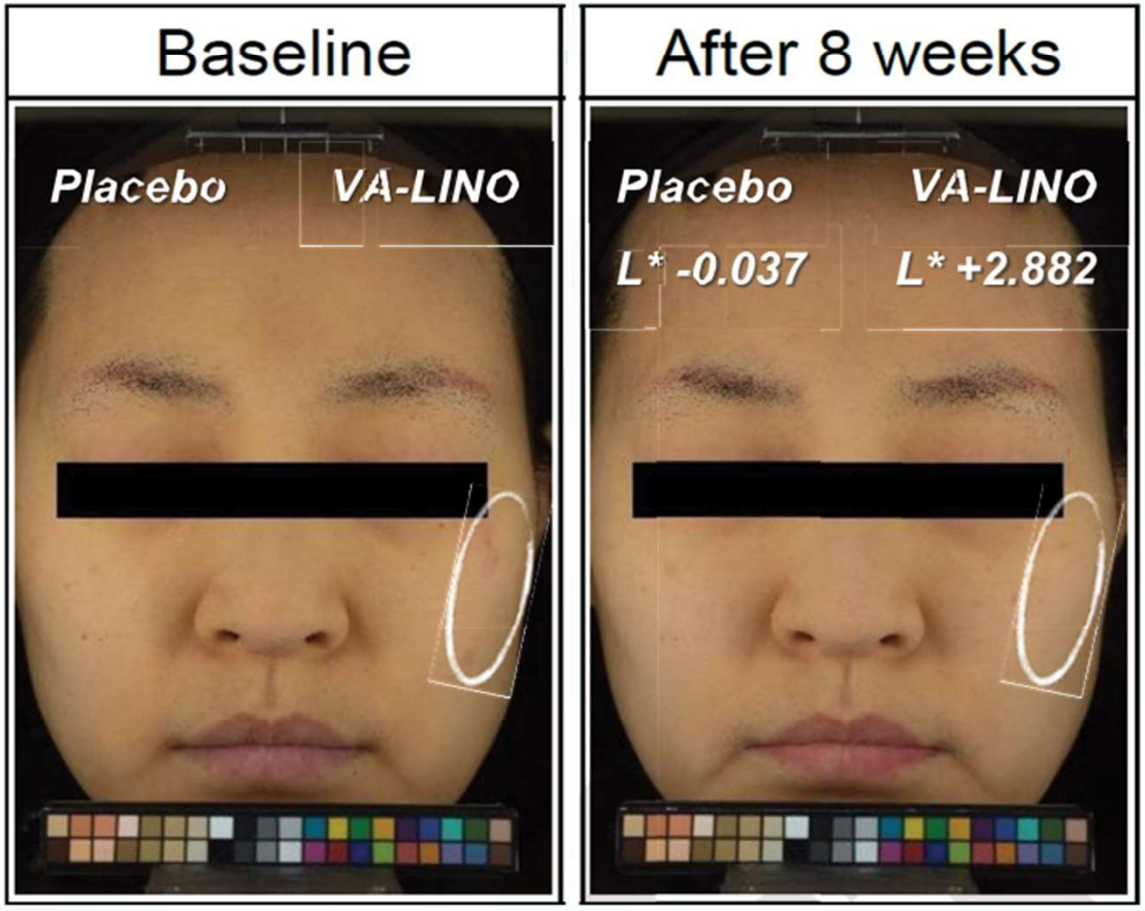


Clinical 2: Skin Brightening

Representative image from Split-face study

Treatment with **VA-LINO 10 (2%)** significantly improved skin brightness by 0.5 unit in the 8th week compared to placebo and baseline.

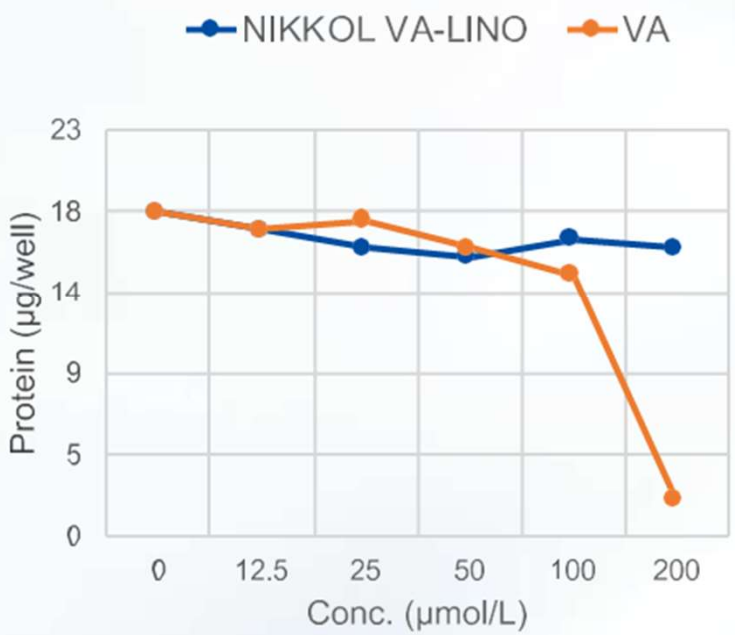
Visible improvement on spots on representative patient.



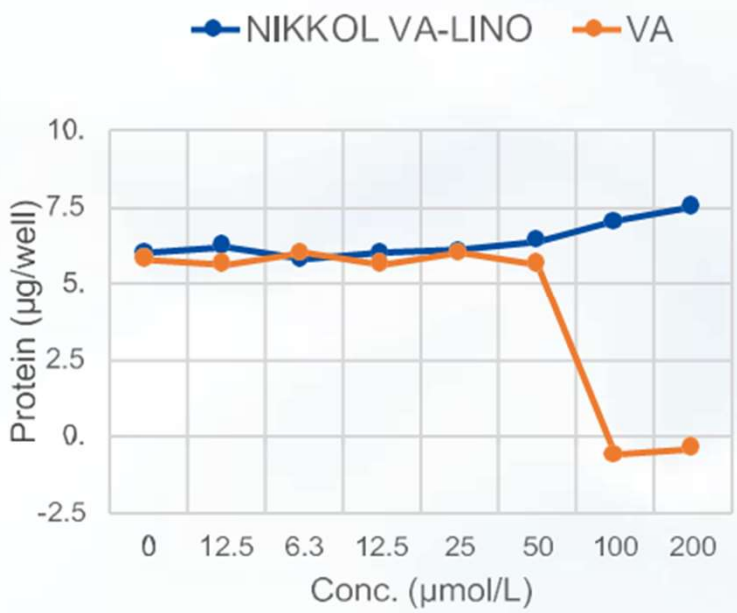
Safety Profile vs. Pure Retinol

Determination of cell viability through BCA Protein Assay

Keratinocytes



Fibroblasts



50µmol of VA-LINO =0.003 of pure product
Vitamin A = conversion ??

Anti-aging Mechanism

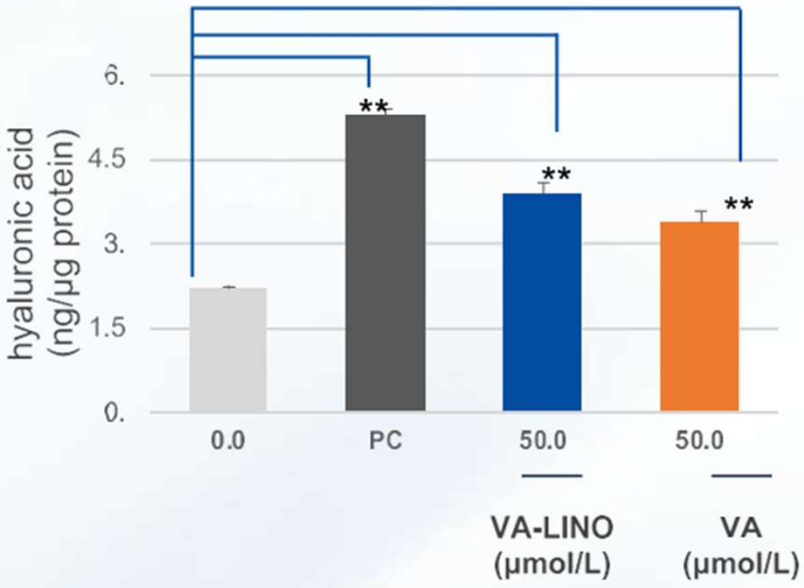
(*In vitro*)

01

VA-LINO enhances hyaluronic acid synthesis in both epidermis and dermis similar to retinol

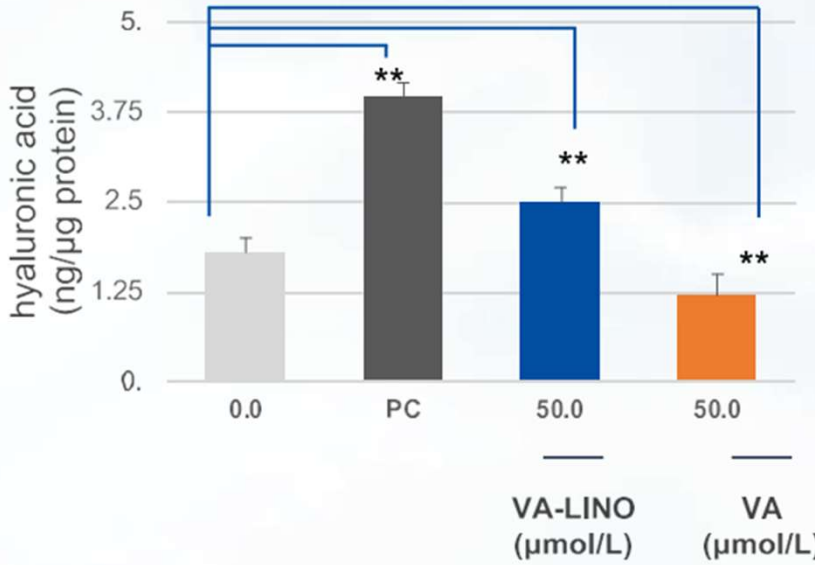
Keratinocytes

Significance; p** < 0.01



Fibroblasts

Significance ; p** < 0.01



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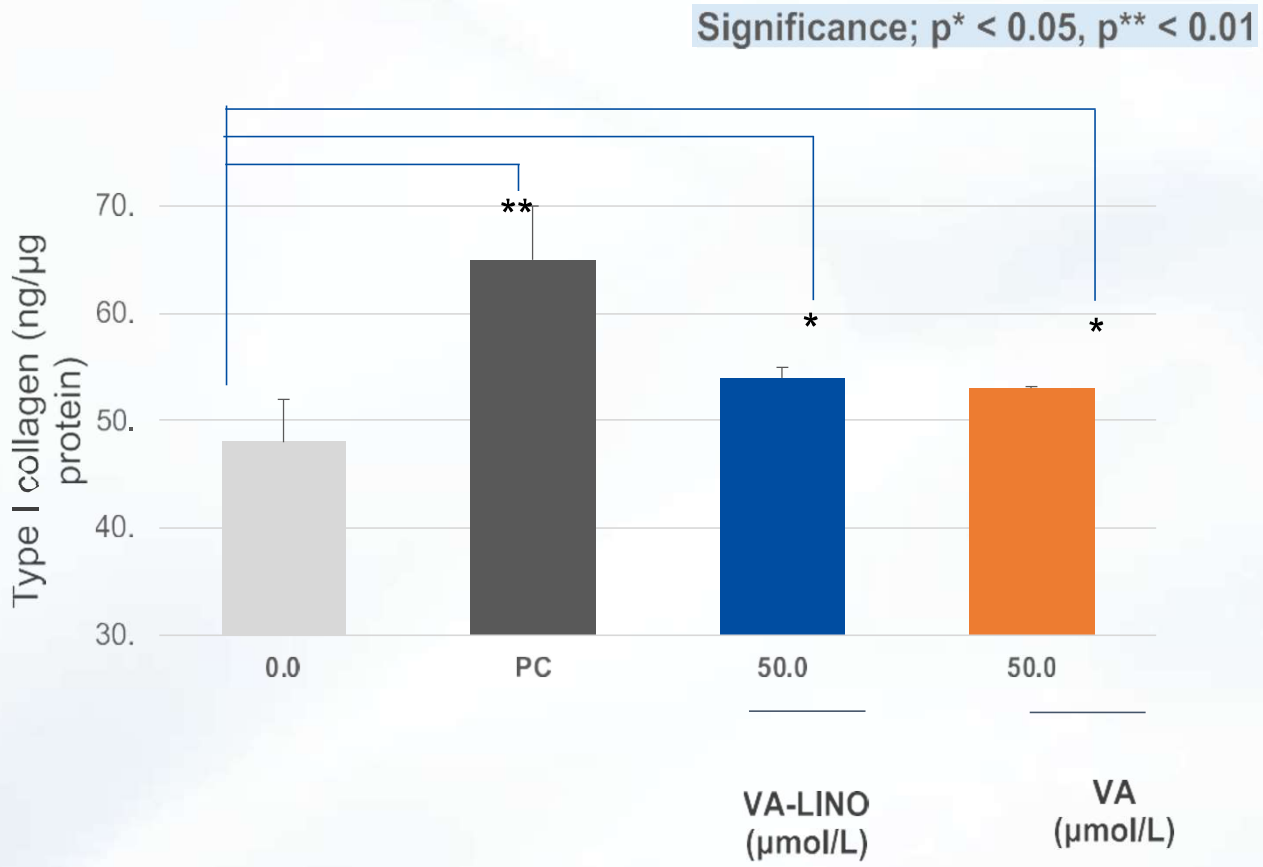
VA-LINO enhances collagen synthesis in dermis as well as retinol

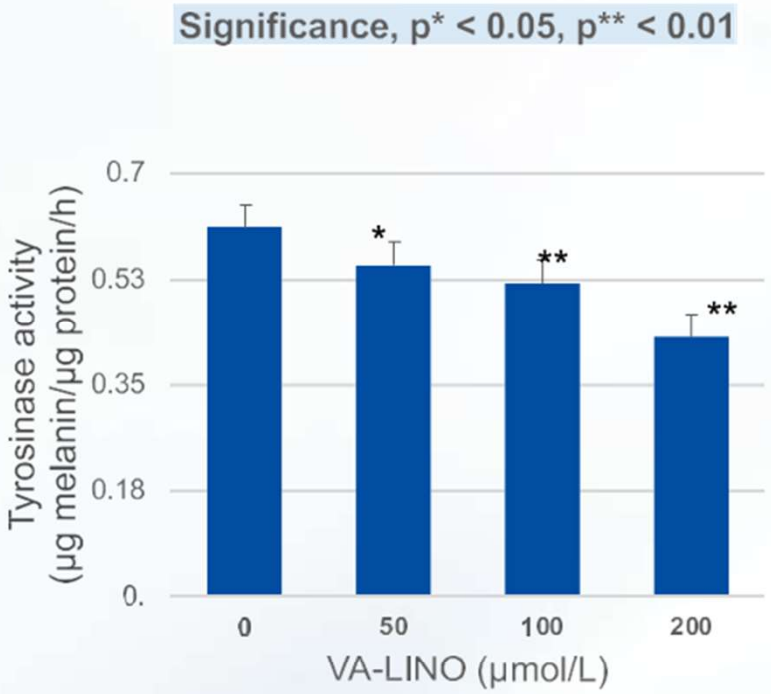


Skin brightening

(*In vitro*)

02

Brightening: VA-LINO suppresses tyrosinase activity in melanocytes

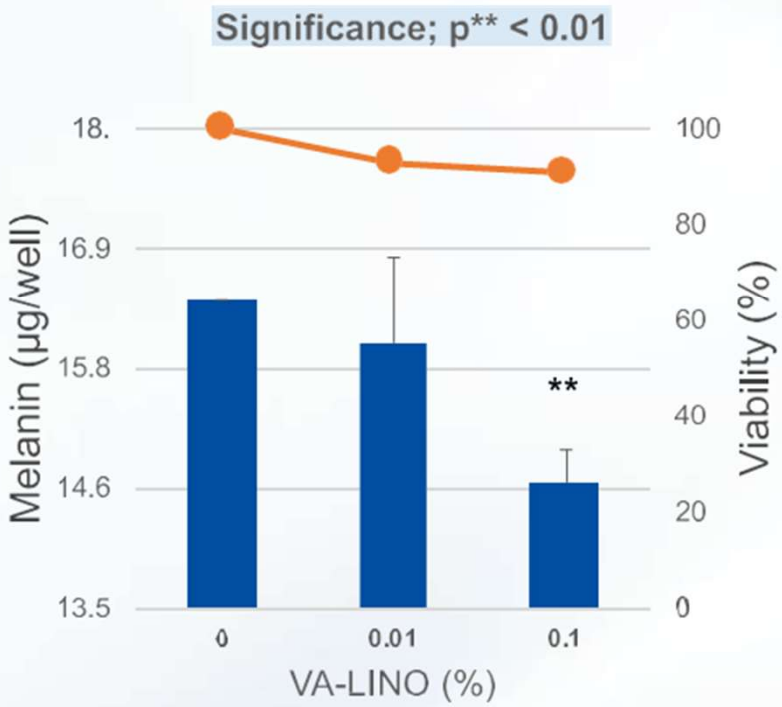


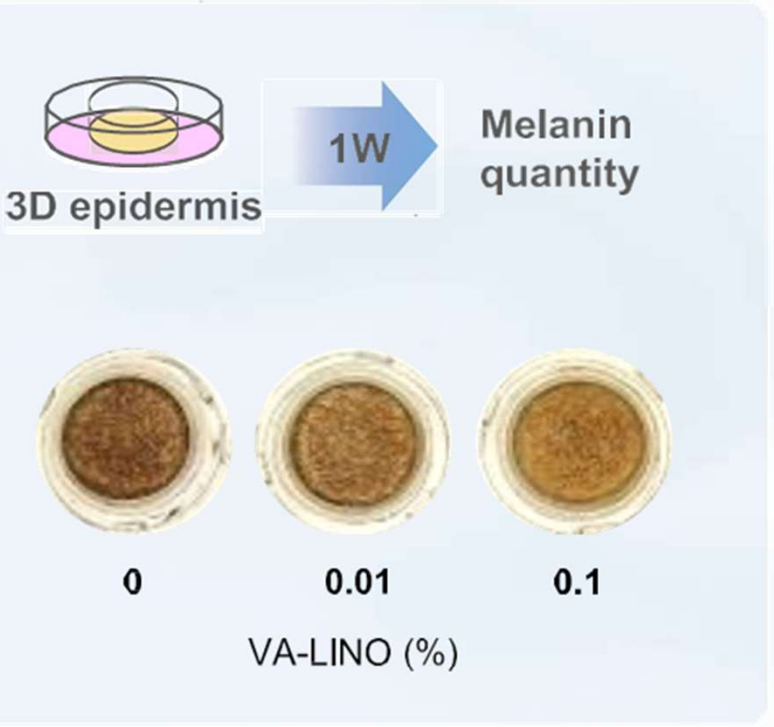
Cell: Melanocytes

Detection: Western blotting

PC: 50 mmol/L Lactic acid

Brightening: VA-LINO can suppress melanin production in epidermis skin model





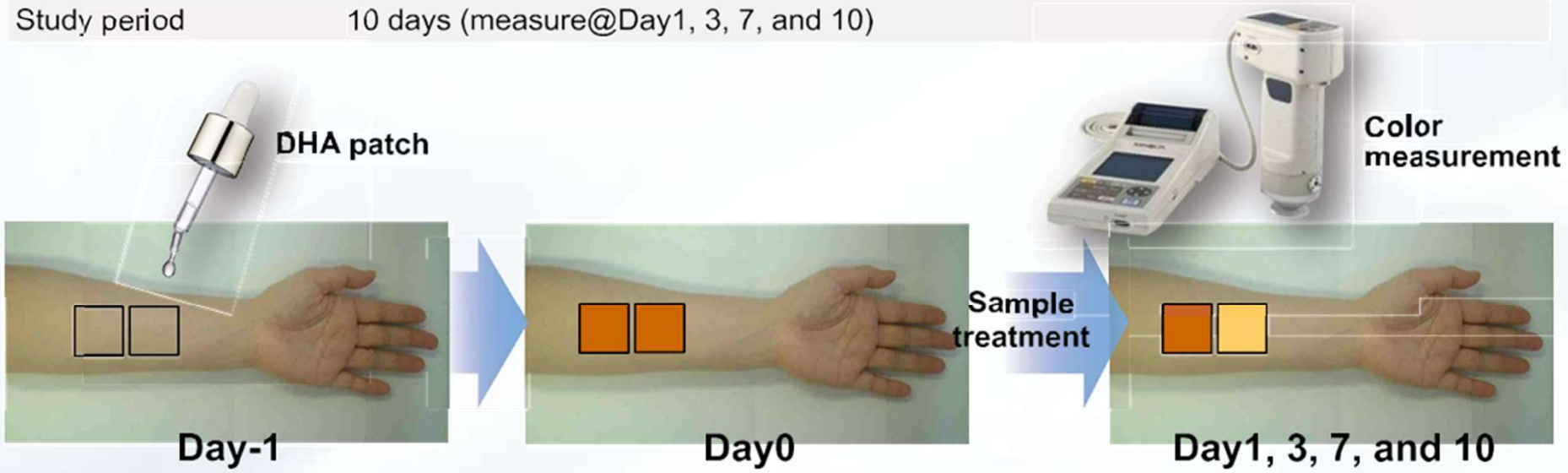
Skin turnover

(*Clinical trial*)

03

Test profile & Methods

Lists	Contents
Test sample	-0.2%VA-LINO (pure) cream -Placebo cream
Subjects	More than 20 (30~55 years old)
Test region	Forearm
Methods	30 μL of DHA solution was applied to 1.5 x 1.5 cm for 8 hours
Treatment	Twice a day (Every morning and night)
Study period	10 days (measure@Day1, 3, 7, and 10)



Skin turnover: VA-LINO shows significant fading of pigmentation area compared with placebo.

Results: Images of pigmentation area on forearms

4.3 unit increase in L-value after 1 wk.

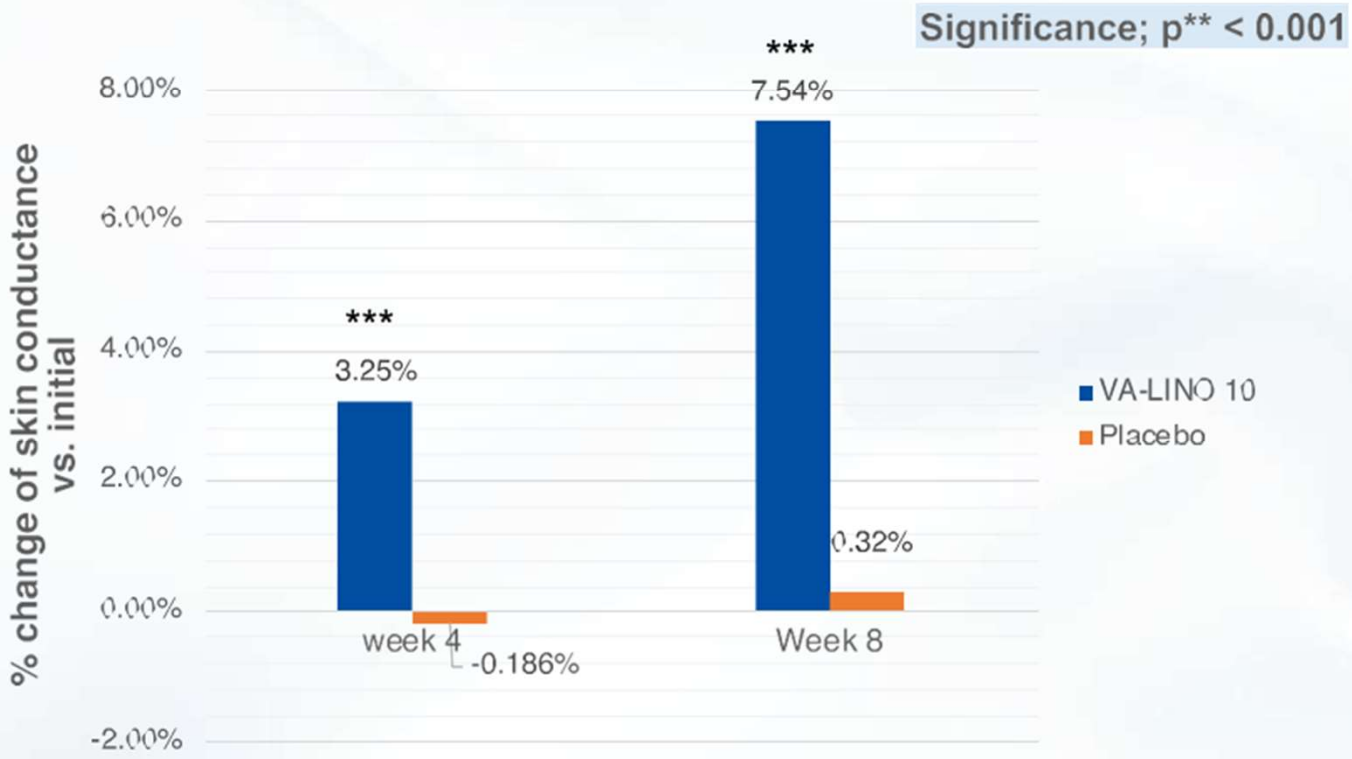
Skin hydration

(*Clinical trial*)

04

Skin conductance values (vs. initial) during test period

Test Period: January- March 2018 (winter)



Significant difference in skin hydration which can be attributed to the linoleic acid component

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Formulation Ease

04

Model Cream Formula

	INCI Name	Formula 1
Oil phase	Beheneth-20	2.00
	Glyceryl Stearate	1.00
	Fatty Alcohol	5.00
	Squalane	10.00
	Caprylic/ Capric Triglyceride	10.00
	Dimethicone (350cs)	0.20
	Tocopherol	0.10
	Nikkol VA-LINO 10	2.00
Water phase	Preservative	0.40
	1,3- Butylene Glycol	5.00
	Dipropylene Glycol	5.00
	Xanthan Gum (2% a.q.)	5.00
	EDTA-2NA	0.05
	Citric Acid (1% a.q.)	2.00
	Sodium Citrate (1% a.q.)	3.00
	Water	q.s.
	TOTAL	100

Procedure

1. Heat A and B to 80℃.
2. Add B to A while homogenizing and emulsify.
3. Cool down to 40℃ while stirring.

pH (bulk): around 5
Initial Viscosity (spindle 4, 6 rpm): 46000 mPa・s

Formulation guidelines

No drastic color change

effect of oil polarity	In the model formula, a 50:50 balance of polar ester oil & hydrocarbon shows the highest residual value
ideal pH	pH range should be between 4-6
chelating agent	0.05% EDTA-2NA and antioxidant (0.1% δ-tocopherol or 0.1% serine) will result to higher residual value
polyol	Any polyol can be used and no effect on residual value
fatty alcohol	Behenyl Alcohol (2.5%), shows the highest residual value; if Cetyl alcohol is to be used, 5% use level shows highest residual value.
heating restrictions	Heating does not impact the residual value. The formula can be heated at 80°C for 5 hours (e.g. wax formulation) without changes in assay.

Note: Residual values were taken on formulas stored at -5°C, 25°C, 45°C.
These is the result of single model formula which is a traditional EO system.

Why choose Nikkol VA-LINO 10?

1 **VA-LINO 10 is effective for for multiple signs of aging**

Improves fine line condition
Enhances skin brightness & skin turnover
Prevents dryness during skin retinization period

2 **VA-LINO 10 provides ease of formulation**

Less discoloration than conventional retinol
High heat stability (can be used for waxy formulas)
10% active in liquid squalane allows cold process formulas.

3 **Clean INCI name**

Not banned in retailer's clean list (unlike retinyl palmitate)
No animal-derived or palm-derived ingredient
ISO16128 natural origin index = 0.87

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