



Classic vitamin A

Highly effective anti-aging

Anallerg[®]—Pure-origin[®]



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Part 01

Introduction to Vitamin A

Vitamin series

VA/VB/VC/VE and their derivatives commonly used in cosmetics

VA and derivatives

- ✓ Retinol
- ✓ Hydroxypinacolone Retinoate (HPR)
- ✓ Retinal
- ✓ Retinyl propionate
- ✓ Retinyl palmitate
- ✓ Retinyl retinoate
- ✓ Tocopheryl retinoate

VBand derivatives

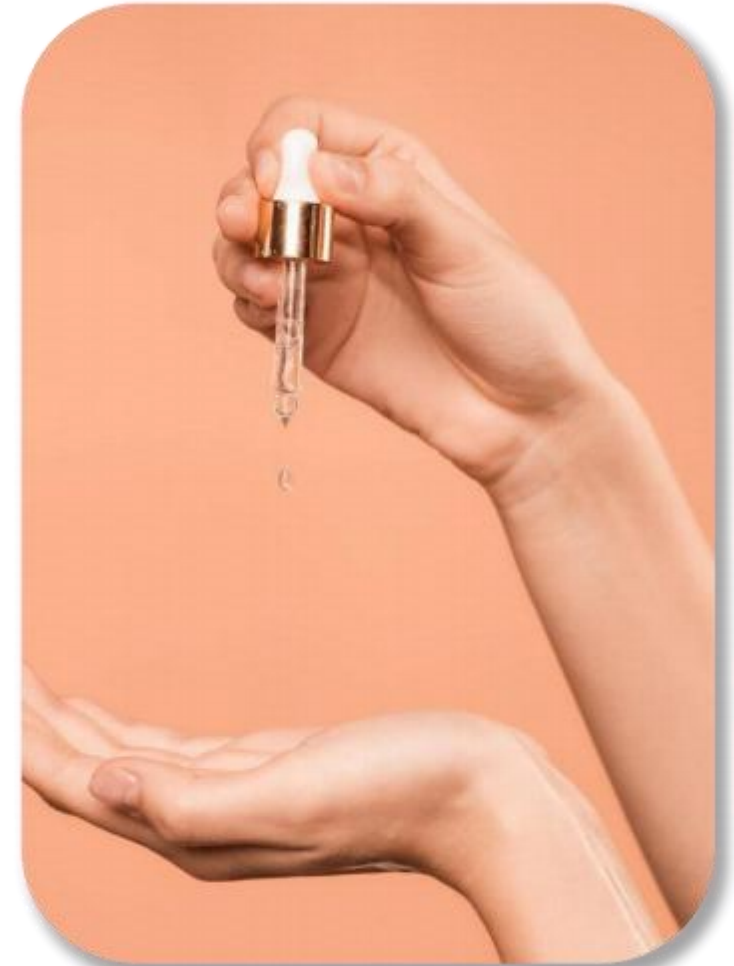
- ✓ Nicotinamide
- ✓ D-panthenol
- ✓ NMN
- ✓ Myristyl Nicotinate
- ✓ Tocopherol Nicotinate

VC and derivatives

- ✓ 3-o-ethyl ascorbic acid
- ✓ Ascorbyl tetraisopalmitate (VC-IP)
- ✓ Tetrahexyldecanol ascorbate (THD)
- ✓ Ascorbyl Glucoside
- ✓ Magnesium ascorbyl phosphate
- ✓ ascorbyl phosphate

VE and derivatives

- ✓ Tocopherol
- ✓ Tocopherol Nicotinate
- ✓ Tocopheryl acetate
- ✓ Tocopheryl retinoate



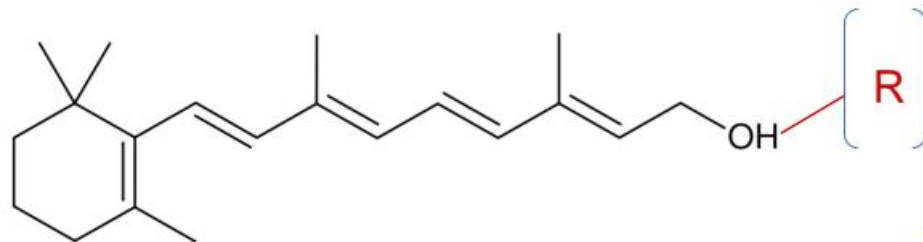
The parts in blue font are raw materials supplied by Anallerg in mature countries

Vitamin A

Definition



- ◆ Vitamin A is a collective term for a group of substances, which is the enzymatic hydrolysis product of β -Carotene.
- ◆ The vitamin A family includes **retinoic acid, retinol, retinal, retinyl palmitate, retinyl acetate, hydroxypinacolone retinoate (HPR)**, etc.
- ◆ The commonly used vitamin A in cosmetics is **retinal, retinyl palmitate, retinyl acetate, HPR**.



Vitamin A Acetate

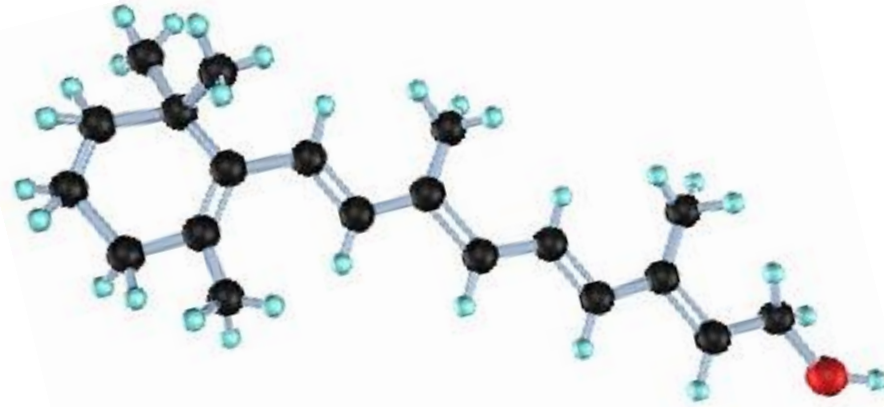


Vitamin A Palmitate

Retinol esters are more stable than retinol

Vitamin A

Physicochemical properties of vitamin A

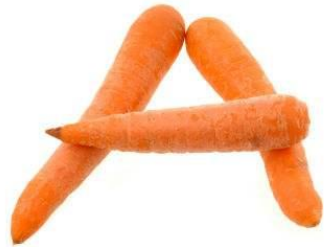


- Vitamin A belongs to the category of **oil soluble** vitamins, which are **light yellow crystals** and can be dissolved to varying degrees in most organic solvents, but not in water.
- Vitamin A contains **5 conjugated double bonds** and is **unstable** under light, high temperature, and air conditions, making it prone to deactivation.



Vitamin A

Physiological function of vitamin A

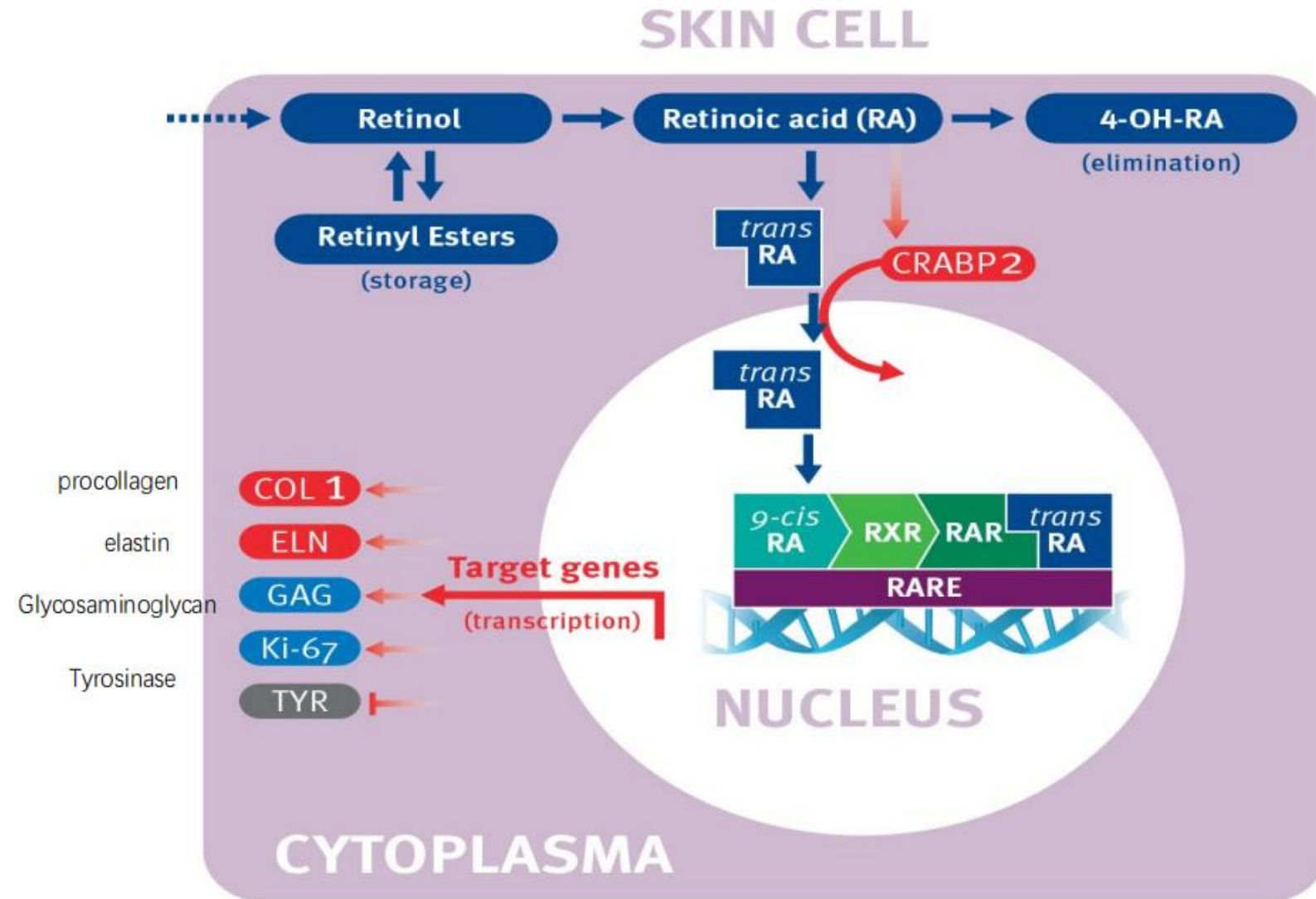


- Vitamin A has **many functions** such as promoting growth and reproduction, maintaining normal secretion of bone, epithelial tissue, vision, and mucosal epithelium.
- Lack of vitamin A, the surface layer of the skin may experience cellular flattening, irregularity, dryness, and other changes, which can reduce the function of epithelial cells, leading to a **decrease in skin elasticity, dryness, roughness, and loss of luster.**



Vitamin A

The mechanism of action of vitamin A



◆ Vitamin A and its derivatives need to undergo certain transformations to become retinoic acid in order to function.

◆ So its anti-aging effect ranges from strong to weak: **Retinoic acid > Retinal > Retinol > Retinyl ester**

Vitamin A

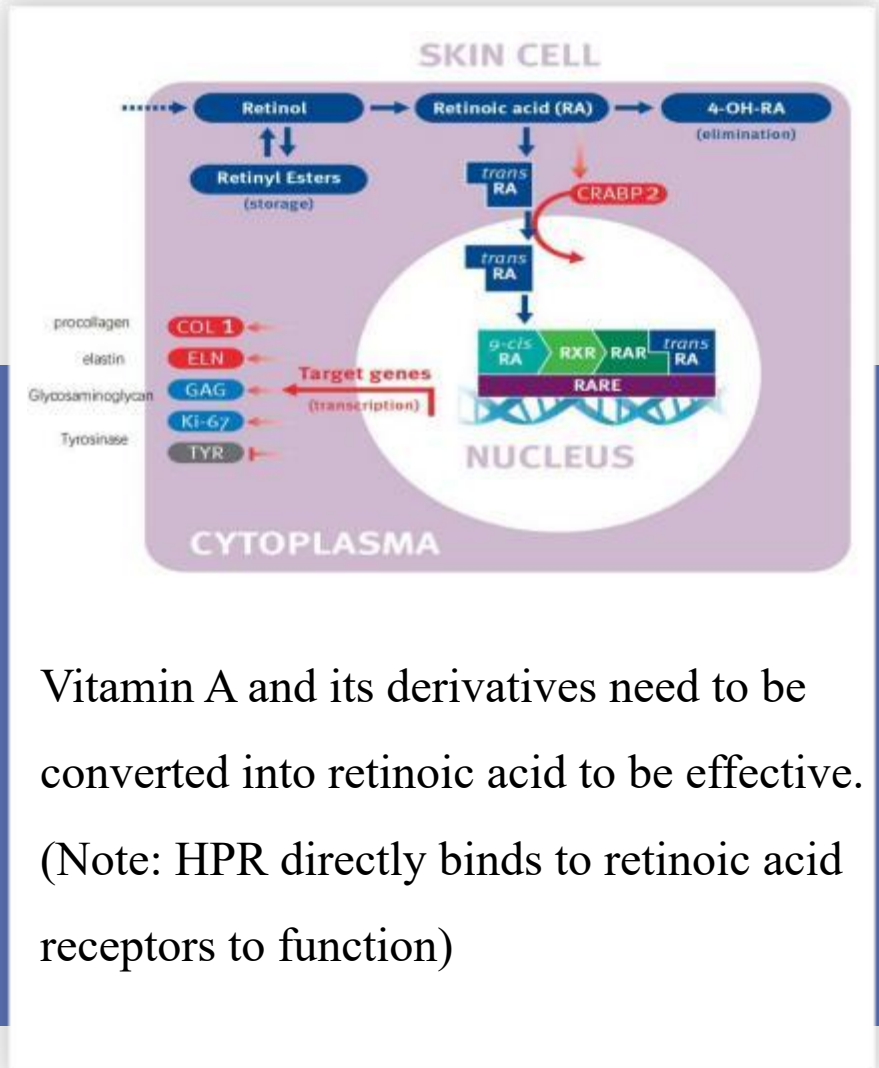
Classic VA, who can compete?

Efficacy: Retinoic acid > Retinal > Retinol > Vitamin A ester

Mildness: Vitamin A ester > Retinol > Retinal > Retinoic acid

Retinol first appeared as an anti-acne product and was approved by the FDA in 1971:

- Anti-wrinkle, anti-aging, firming
- Anti-acne, oil control, fine pores, increased gloss
- Lighten spots and reduce pigmentation
- Repair and reduce inflammation



Vitamin A and its derivatives need to be converted into retinoic acid to be effective. (Note: HPR directly binds to retinoic acid receptors to function)

Part 02

Introduction to Retinol Plus

VA series recommended solution

—Retinol



Anallerg®--Pure-origin® (INCI : Retinol)

Crystal powder with purity above 99.0%



Retinol first appeared as an anti-acne product and was approved by the FDA in 1971:

- Anti-wrinkle, anti-aging, firming
- Anti-acne, oil control, fine pores, increased gloss
- Lighten spots and reduce pigmentation
- Repair and reduce inflammation

Retinol crystal is unstable. If not protected, its content and purity may change during the testing and formulation process, and its activity will also decrease. Therefore, **it is currently not recommended to use pure products directly.**

VA series recommended solution

Current availability of retinol

Currently, globally, a retinol concentration of approximately 50% is predominantly achieved through high-content Tween-20 solubilization. The upstream raw materials for other commercially available solutions, whether with lower concentrations, compound formulations, or encapsulated nanoemulsions, are derived from this process.



COACHCHEM is committed to the research and production of Vitamin A derivatives. In 2021, we successfully achieved large-scale synthesis of retinol crystals (with a purity of over 99.0%), establishing ourselves as one of the few major producers of high-purity Vitamin A alcohol in China.

VA series recommended solution

The highest concentration of retinol on the market — GS-50

Retinol Liquid: GS-50

INCI Component	Percentage (%)	CAS
Retinol	42.75 - 49.50	68-26-8
BHA	0.90 - 1.10	25013-16-5
BHT	3.15 - 3.50	128-37-0
Polysorbat-20	45.90 - 53.20	9005-64-5



Polysorbat-20: In certain formulations or at high concentrations, polysorbate-20 may contribute to eye irritation. Some individuals may be sensitive or allergic to polysorbate-20, leading to skin irritation or allergic reactions.

BHA: The IARC classifies BHA as a possible carcinogen. The Endocrine Disruptors in the EU classifies BHA as a Class II substance.

BHT : BHT may be a preservative with potential carcinogenic risks.

VA series recommended solution

Advanced Retinol Liquid

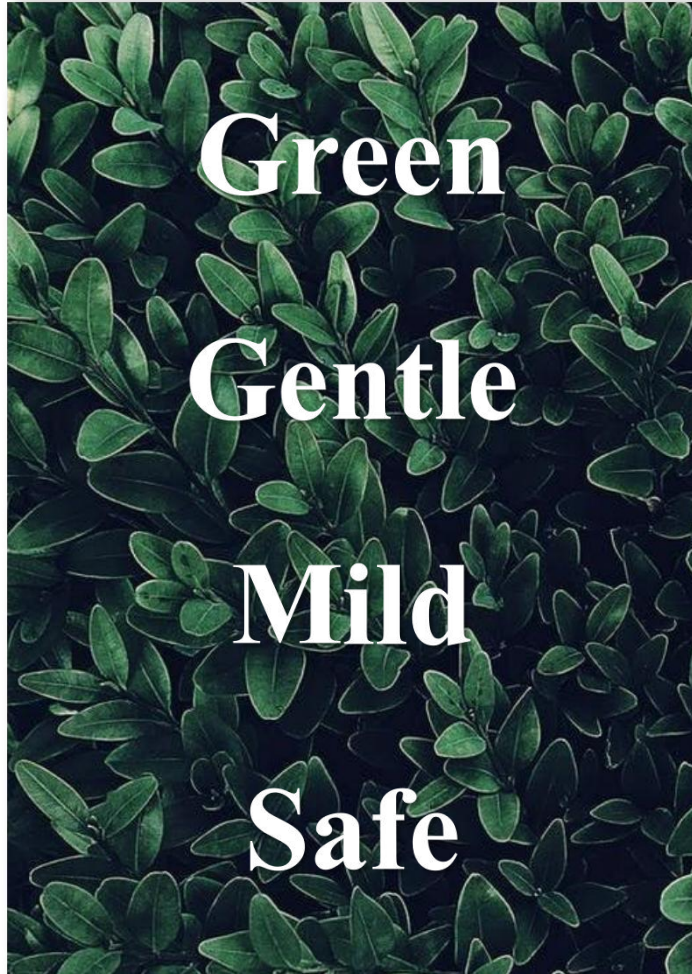
Why Upgrade retinol Solution?

- The bulk synthesis production of retinol is unstable, posing risks of shortages and unreliable supply.
- The carriers BHT and BHA in commercially available 50% retinol liquid are questioned for their safety.
- Inability to be used in oil-based systems like essential oils restricts a more extensive application of formulations.



VA series recommended solution

Upgraded 10% Retinol Liquid



Anallerg[®]--Pure-origin[®] -10B

- ✓ No Tween-20, substitute with lipid for a more environmentally friendly alternative to Tween-20.
- ✓ No BHT, no BHA.
- ✓ More flexible and extensive formula applications, suitable for formulations in oil-based systems.
- ✓ Stable, less prone to precipitation, making it more suitable for essential oil formulations.

VA series recommended solution

Upgraded 10% Retinol Liquid



Anallerg[®]--Pure-origin[®] -10B

INCI	%	CAS
Retinol	8.0-10.0	68-26-8
Tocopheryl acetate	35.0-45.0	58-95-7/7695-91-2/52225-20-4
Caprylic/capric triglyceride	45.0-55.0	65381-09-1/73398-61-5

Part 03

Solution for retinol

VA series recommended solution

Disadvantages: Instability and skin irritation

Skin irritation

Although retinol is much milder than retinoic acid, side effects still exist and can cause skin redness and peeling.



Instability

Retinol, can indeed be sensitive to certain environmental factors that may lead to its deactivation or degradation.

Oxygen, temperature/light, acid/heavy metals



VA series recommended solution

Application Difficulties

<p>Hardly soluble in water</p> <p>Oil-soluble vitamin, insoluble in water</p>	<p>Easy to inactivate</p> <p>Extremely sensitive to light, temperature, oxygen, etc.</p>	<p>Inconvenient to operate</p> <p>The production processes need to be isolated from oxygen, water and UV.</p>
<p>Irritating</p> <p>High concentrations of vitamin A can easily irritate the skin</p>	<p>Product tends to turn yellow</p> <p>Retinol tends to make the color darker and more yellow when used in formulas</p>	<p>Not easy to penetrate and absorb</p> <p>Large molecular weight, difficult to penetrate skin, low bioavailability</p>

VA series recommended solution

Retinol microemulsion

Retinol specifications: >99%, 50%, 10%

- **Anallerg[®]--Retinol-10C**: Utilizing encapsulation technology, transforms retinol into a microemulsion. This method prevents direct exposure of retinol to sensitive factors such as light and oxygen, enhancing the stability of the active substance and significantly reducing irritability. When applied in appropriate quantities, it allows effective control of potential irritations within acceptable limits.



VA series recommended solution

Retinol microemulsion

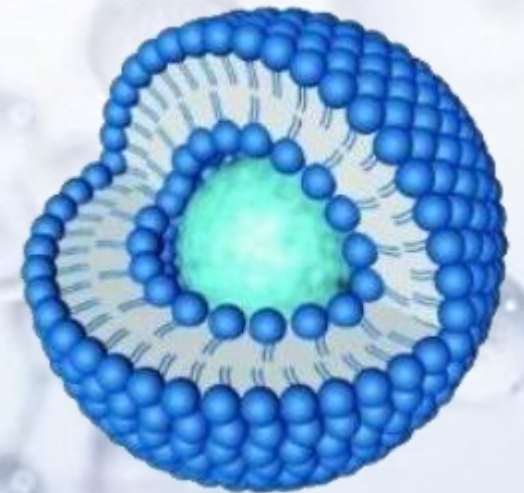
Source:

A new microemulsion prepared using encapsulation technology based on Retinol-50C.



Enhanced Features:

- Expertly encapsulated active substances in a lipid bilayer for precise and efficient release.
- Cell membrane-like structure ensures superior skin affinity, optimizing absorption and interaction.
- Formulation with a ceramide-like structure excels in soothing and reducing skin irritation, promoting a harmonious and calming skincare experience.



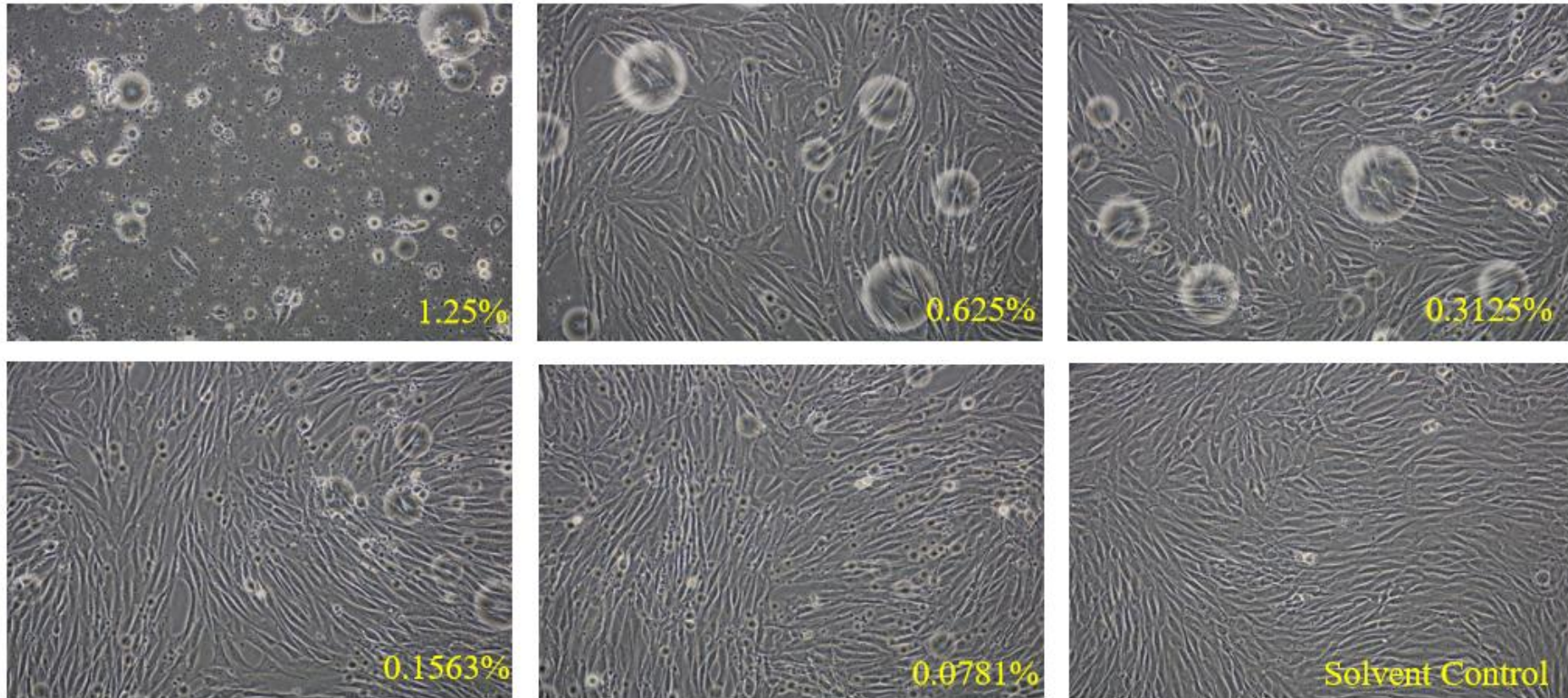
Part 04

The benefits of retinol

Anallerg[®] -- Pure-origin[®]

Cytotoxicity Test Based on Human Dermal Fibroblasts

- The MTT colorimetric results of Pure-origin[®] lotion



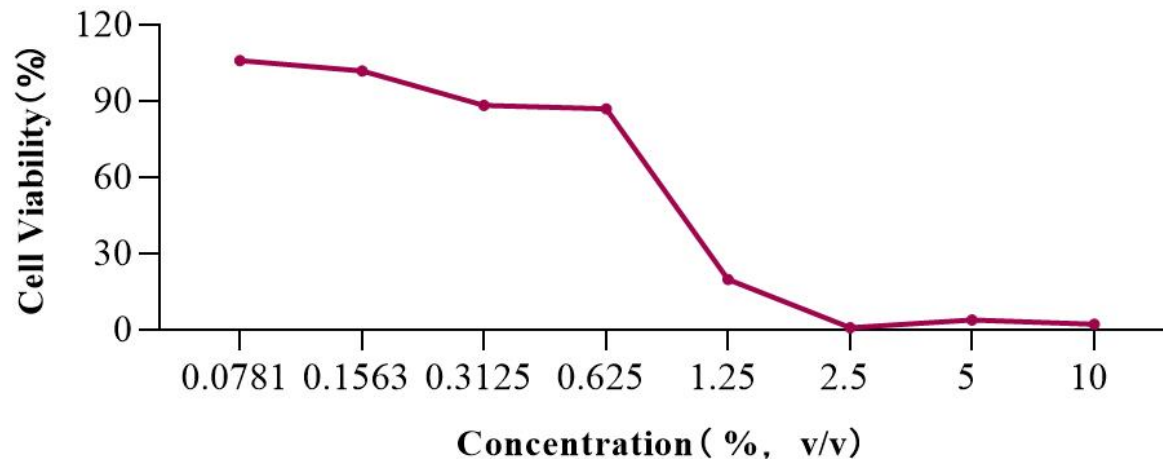
Note: The concentration of Pure-origin[®] in the lotion is 30mM

Anallerg[®] -- Pure-origin[®]

Cytotoxicity Test Based on Human Dermal Fibroblasts

➤ The MTT colorimetric results of Pure-origin[®] lotion

Concentration (%, v/v)	①	②	③	④	⑤	⑥	⑦	⑧	Positive Control	Blank Control
	0.0781	0.1563	0.3125	0.625	1.25	2.5	5	10	10%DMSO	/
Cell viability	105.92%	101.85%	88.15%	86.83%	19.78%	0.74%	3.75%	2.12%	6.45%	100.00%



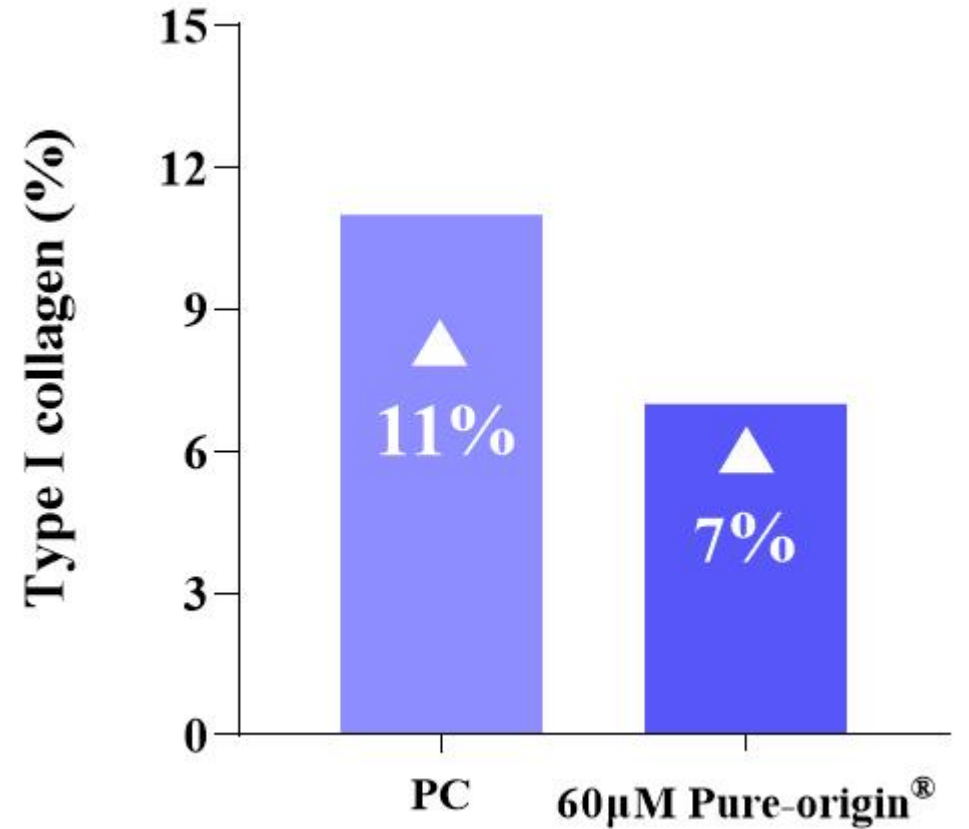
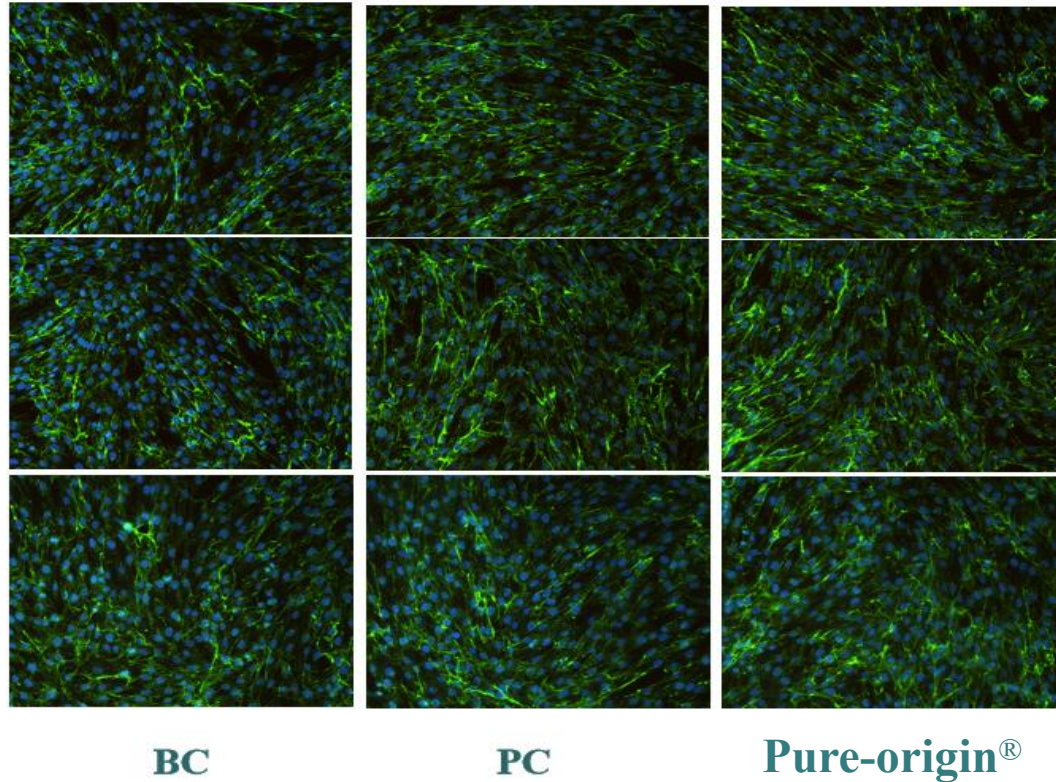
The Lotion showed no significant cytotoxicity in the concentration of 1.25% (Pure-origin[®] contents 47 ppm)

Anallerg[®] -- Pure-origin[®]

Promotes the synthesis of type I collagen in fibroblasts



➤ The effect of Pure-Origin[®] on the synthesis of type I collagen



Note: In the lotion, the concentration of Pure-origin[®] is 60µM, and PC is 100ng/ml TGF-β

The test results are from a third-party testing agency

Anallerg[®] -- Pure-origin[®]

Clinical testing on human skin

- 32 participants continuously used the 0.1% Anallerg[®]-Pure-origin[®] facial cream) for 14-days to 28-days.

◆ Improving elasticity and firmness

- ✓ R2 value - Cutometer MPA580
- ✓ R7 value - Cutometer MPA580
- ✓ Q1 value - Cutometer MPA580
- ✓ F4 value - Cutometer MPA580

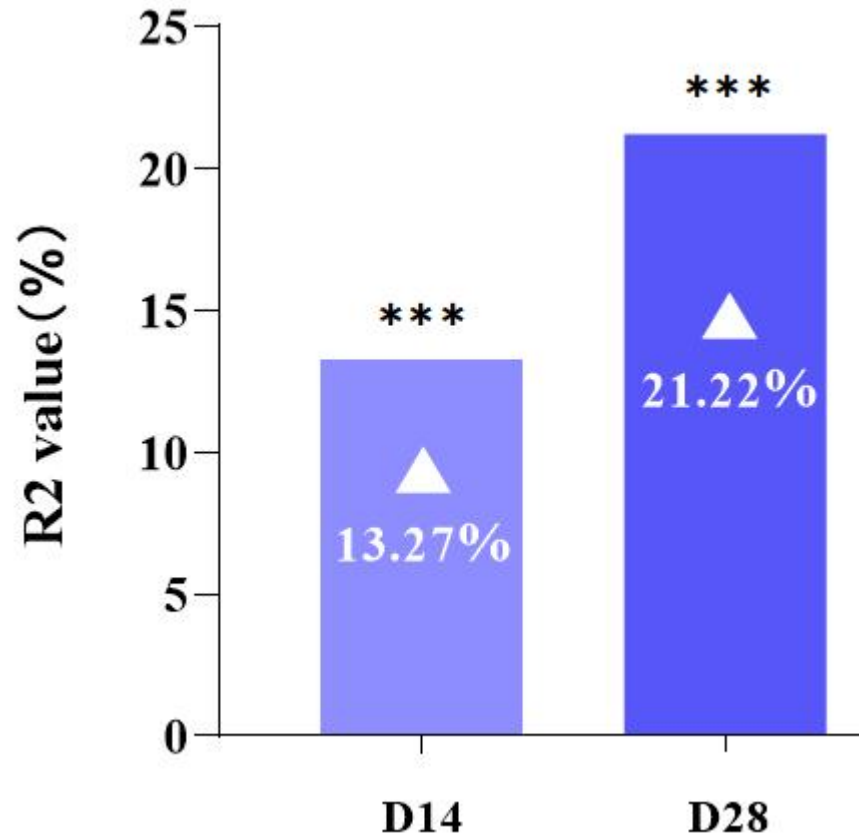
◆ Anti-wrinkle

- ✓ Crow's feet wrinkles - Image-Pro-Plus
- ✓ Under-eye wrinkles - Image-Pro-Plus

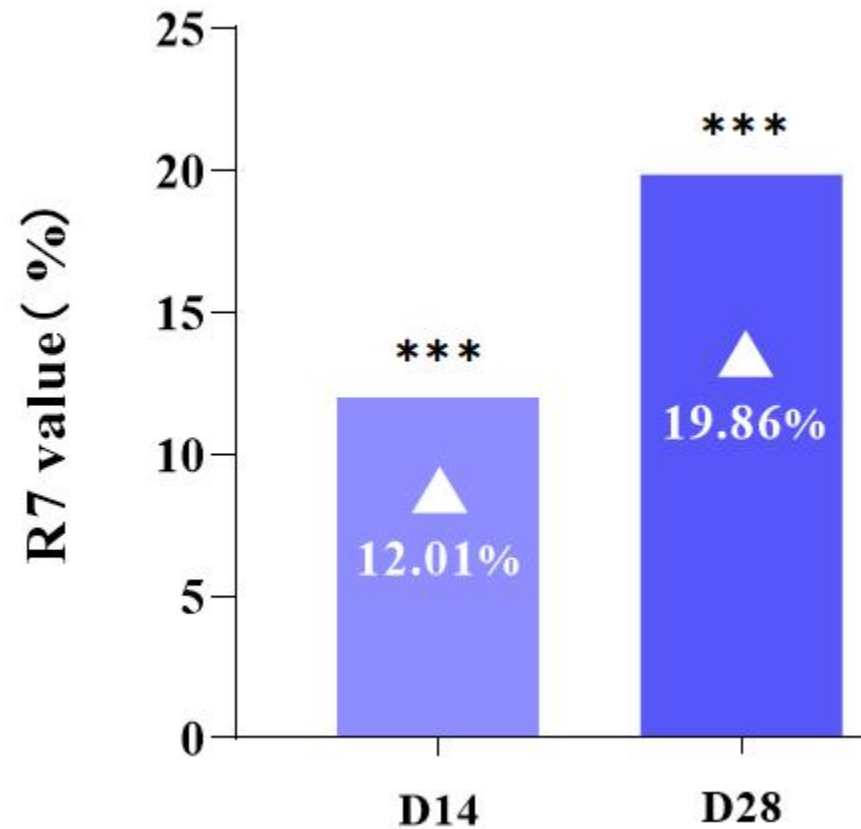
Anallerg[®] -- Pure-origin[®]

Clinical testing on human skin

R2 value



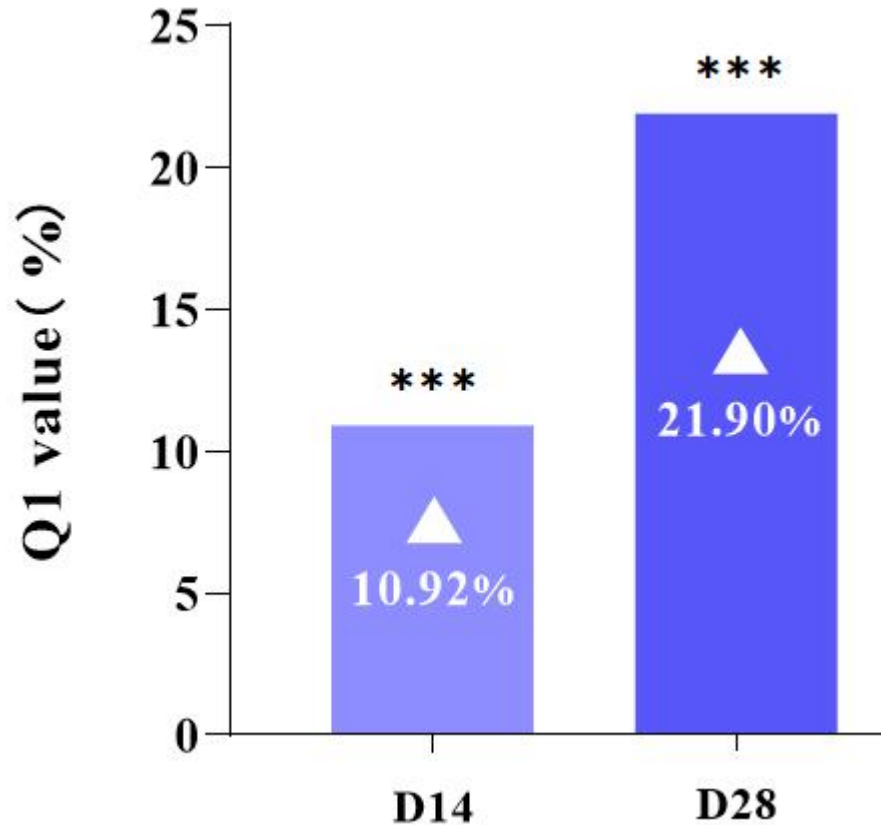
R7 value



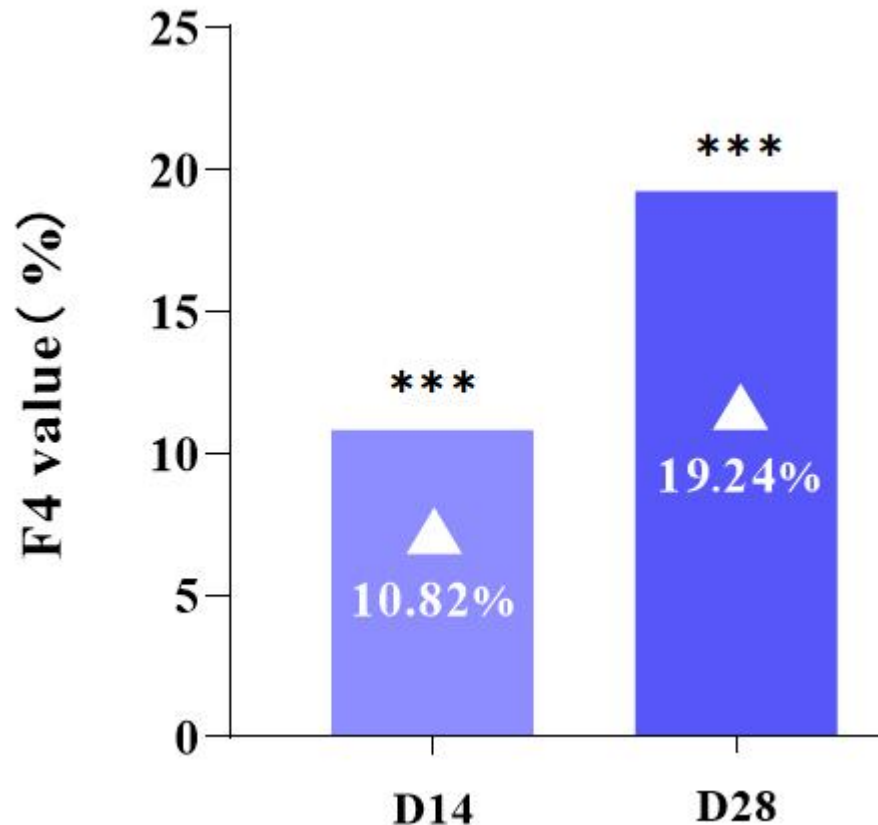
Anallerg[®] -- Pure-origin[®]

Clinical testing on human skin

Q1 value



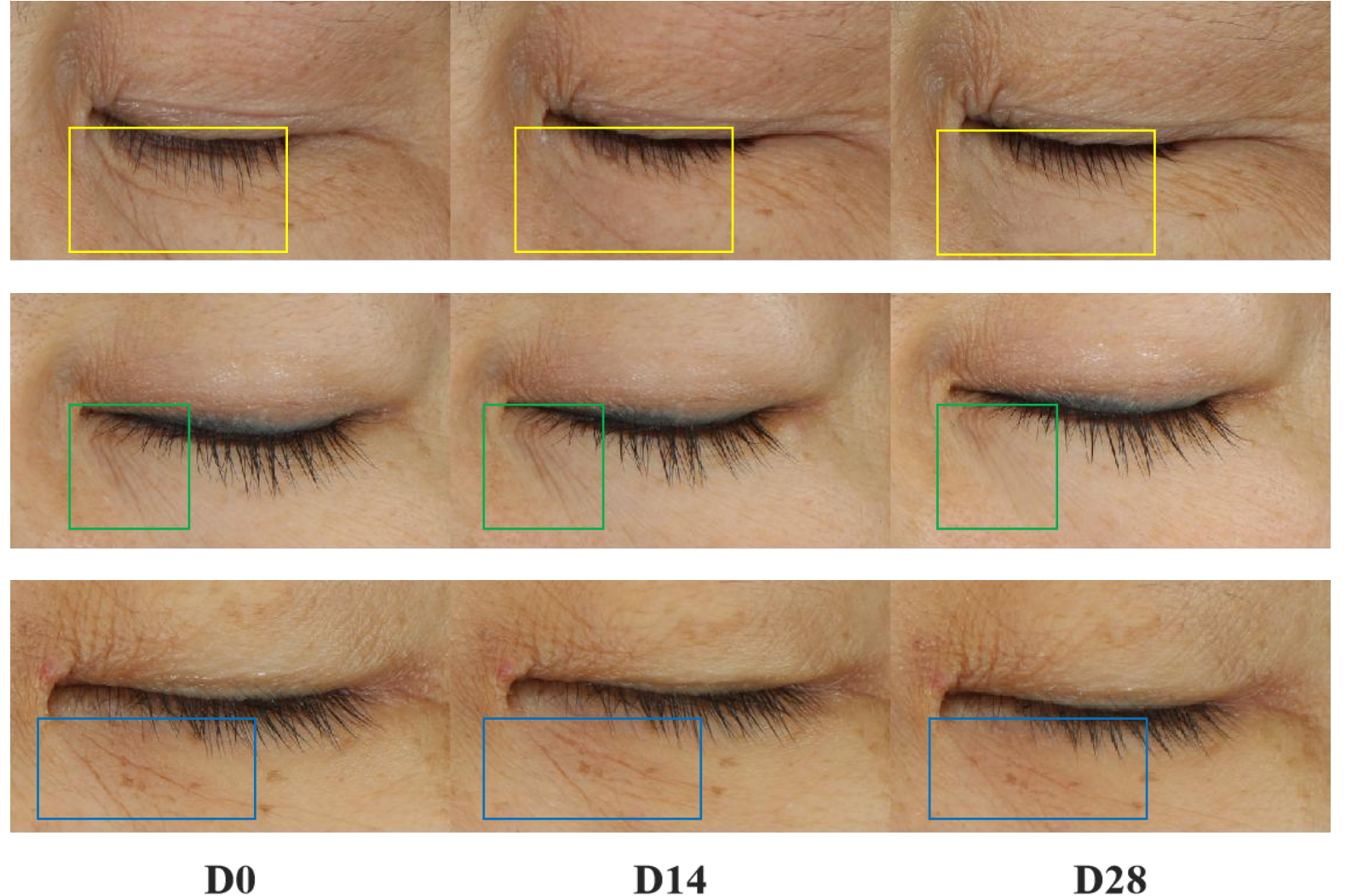
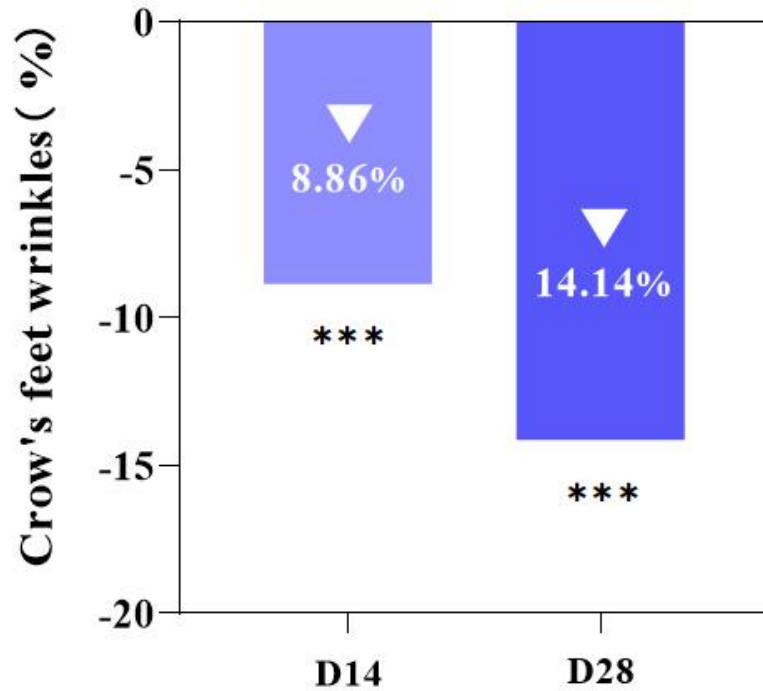
F4 value



Anallerg[®] -- Pure-origin[®]

Clinical testing on human skin

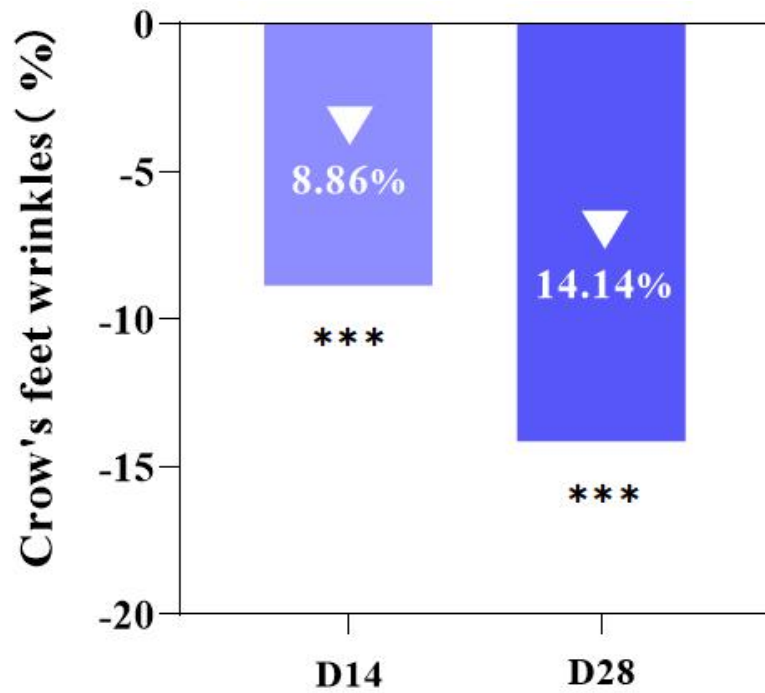
Crow's feet wrinkles



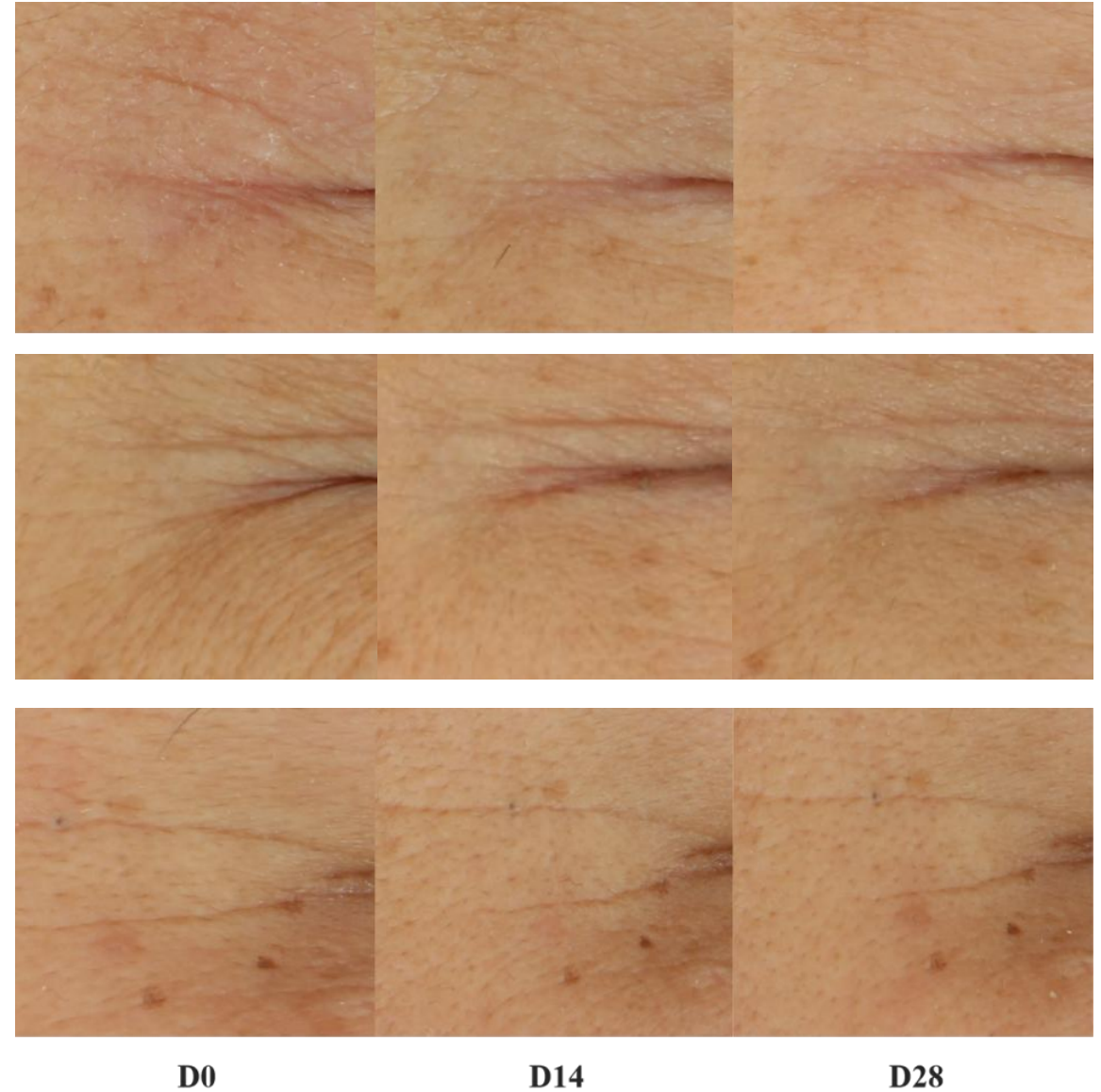
Anallerg[®] -- Pure-origin[®]

Clinical testing on human skin

Under-eye wrinkles



The test results are from a third-party testing agency



Retinol

The benefits of retinol

Efficacy summary

Firm and improve skin elasticity

Improve fine lines and anti-wrinkle

Lighten spots and reduce pigmentation

Anti-acne, oil control, smooth skin, fine pores

Repair and reduce skin inflammation

1

2

3

4

5

Vitamin A

Pure-origin[®] (Retinol)



➤ Advantages of COACHCHEM

- Purity and content > 99.0%
- COSMOS certification
- High quality, ton-level capacity
- stable batches
- Various specifications, customization accepted; approved by many parties
- Convenient and flexible formula, can be used in all-oil systems



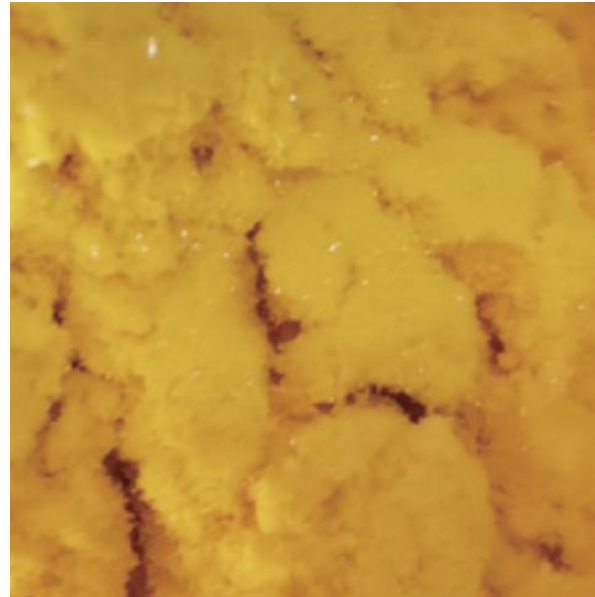
We also offer other Vitamin A derivatives

HPR (Hydroxypinacolone retinoate)



➤ Advantages of COACHCHEM

- Specifications: 99.0%, 10%
- High quality, ton-level capacity
- stable batches
- Accept customization; approved by multiple parties
- Existing specifications: pure product (more than 99.0%), 10% solution



We also offer other Vitamin A derivatives

Retinal



➤ Advantages of COACHCHEM

- Existing specifications: 99.0%, 6% microemulsion
- COSMOS certification
- High quality, ton-level production capacity
- stable batches
- Accept customization; approved by multiple parties



Two ECOCERT certificates of conformity for SHANGHAI COACHCHEM TECHNOLOGY CO.,LTD. The left certificate is for COSMOS raw materials, and the right is for COSMOS approved raw materials. Both certificates include a table of approved raw materials.

Commercial name / INCI / Function	%PPA	%CPA	%NM	%PeMe	Restriction	Approved since
Anallerg Pure-origin Retinol anti-aging	0	100	0	0	OK V4	11/07/2023
Anallerg Retinol Retinol Anti-aging	0	100	0	0	OK V4	26/07/2023

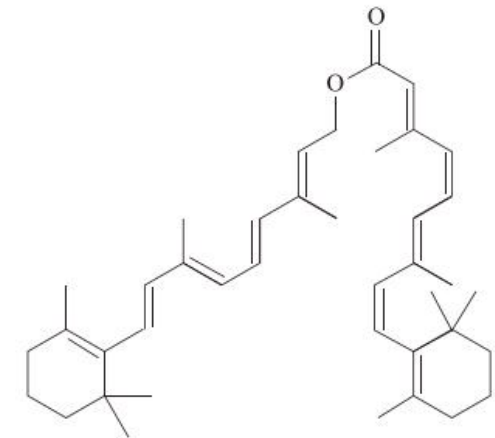
We also offer other Vitamin A derivatives

AAE (Retinyl retinoate)



➤ Advantages of COACHCHEM

- Existing specifications: 99.0%, 3% vesicles
- Purity and content > 98.0%
- High quality, ton-level production capacity
- Stable batches
- Accept customization; approved by multiple parties



CAS: 15498-86-9

N.W: 568.87

M.F: C₄₀H₅₆O₂

We also offer other Vitamin A derivatives

Vitamika® (Tocopheryl retinoate)



➤ New retinol derivatives that are milder and more stable

- High quality, ton-level production capacity, stable batches
- Specifications: Mainly recommend 10% oil solution
- Recipe application is simpler and more convenient



We also offer other Vitamin A derivatives

Summary



Product	Specifications	INCI composition
Anallerg[®]--Vitamika[®]	10% oil solution	Tocopheryl retinoate、Caprylic/Capric Triglyceride
Anallerg[®]--Pure-origin[®]	99.5%	Retinol
Anallerg[®]--Retinol-50C	50% retinol solution	Retinol, polysorbate-20, BHA, BHT
Anallerg[®]--Retinol-10C	10% Retinol microemulsion	Retinol, ethyl lauroyl arginate hcl, polyglyceryl-10 myristate, BHT, BHA, polysorbate 20, water, caprylic/capric triglyceride, glycerin
Anallerg[®]--Pure-origin[®]-10A	10% retinol oil solution	Retinol, tocopheryl acetate, caprylic/capric triglyceride, BHT
Anallerg[®]--HPR	99.5%	Hydroxypinacolone retinoate
Anallerg[®]--HPR-10	10% HPR solution	Hydroxypinacolone retinoate, isosorbide dimethyl ether
Anallerg[®]--Retinal	99.5%	Retinal
Anallerg[®]--Retinal-6C	6% retinal microemulsion	Retinal, glycerin, water, caprylic/capric triglyceride, polysorbate 80, inulin lauryl carbamate, sucrose laurate, 1,2-hexanediol, hydroxyacetophenone
Anallerg[®]--AAE-3C	3%AAE vesicles	Retinyl retinoate, Tocopherol, PPG-13-decyltetradeceth-24, Glycerin, Caprylic/capric triglyceride, Isopropyl lauroyl sarcosinate, Benzotriazolyl dodecyl p-cresol, Diethylhexyl syringylidenemalonate, Water.

Part 05

Retinol technical guidance

Retinol

Technical guidance

- **Solubility:** Retinol and retinyl esters can dissolve or mix with oils.
- **Contraindications:** Avoid mixing with acidic products.
- **pH Recommendation:** Formula pH should be in the range of 4.5-8.0.
- **Formula Addition Amount:** (Calculated based on retinol):

Overnight stay type: 0.10 - 0.30%; Day, hand cream, and body care: 0.05%;

- **Compatibility:** Add at low temperature (below 37° C) after mixing with water. Adding chelating agents or UV protectants to the formula can enhance product stability.

Retinol

Technical guidance

Application Techniques

- Products containing retinol are recommended for nighttime use or in combination with sunscreen.
- Redness, peeling, stinging, itching, and dryness may occur after 2-3 days of retinol use.
- During this period, enhance moisturization by adding ingredients like ceramides or temporarily suspend use for 1-2 days if symptoms are severe. Resume retinol use after establishing tolerance.
- Retinol products can be tailored to individuals with concentrations ranging from 0.05% to 0.30%. Gradually introducing retinol, starting once a week and progressing to twice daily, accommodates diverse tolerance levels, ensuring a personalized and effective skincare routine.
- When using retinol products during the day, it is recommended to use SPF15 or higher sunscreen to protect the skin.

T H A N K S