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Retinal

上海克琴科技有限公司

Shanghai Coachchem Technology Co., Ltd

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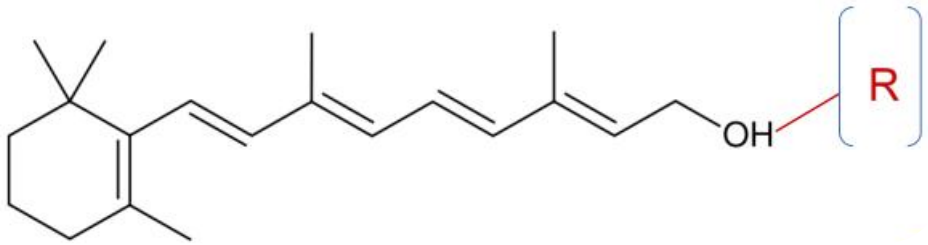
Vitamin A

- 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.



$R=COCH_3$
Vitamin A Acetate
$R=CO(CH_2)_{14}CO_3$
Vitamin A Palmitate

Retinol esters are more stable than retinol

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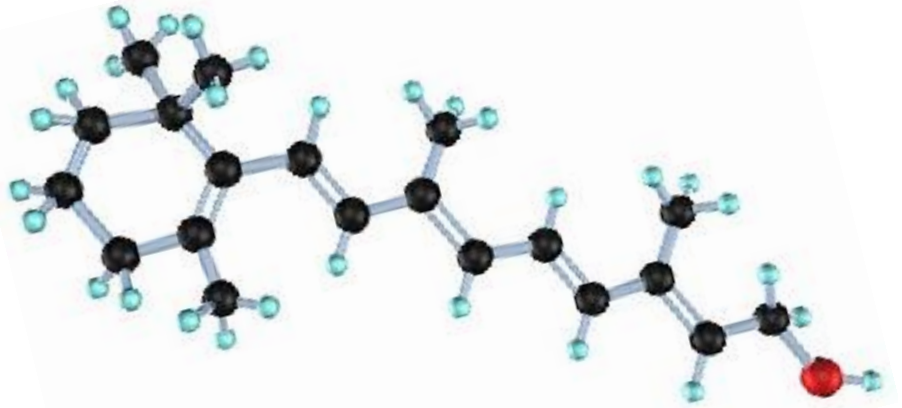
Physicochemical properties of vitamin A

COACHCHEM®



- 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.

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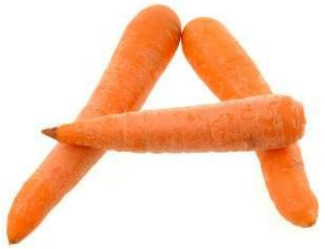
Physiological function of vitamin A



- 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.

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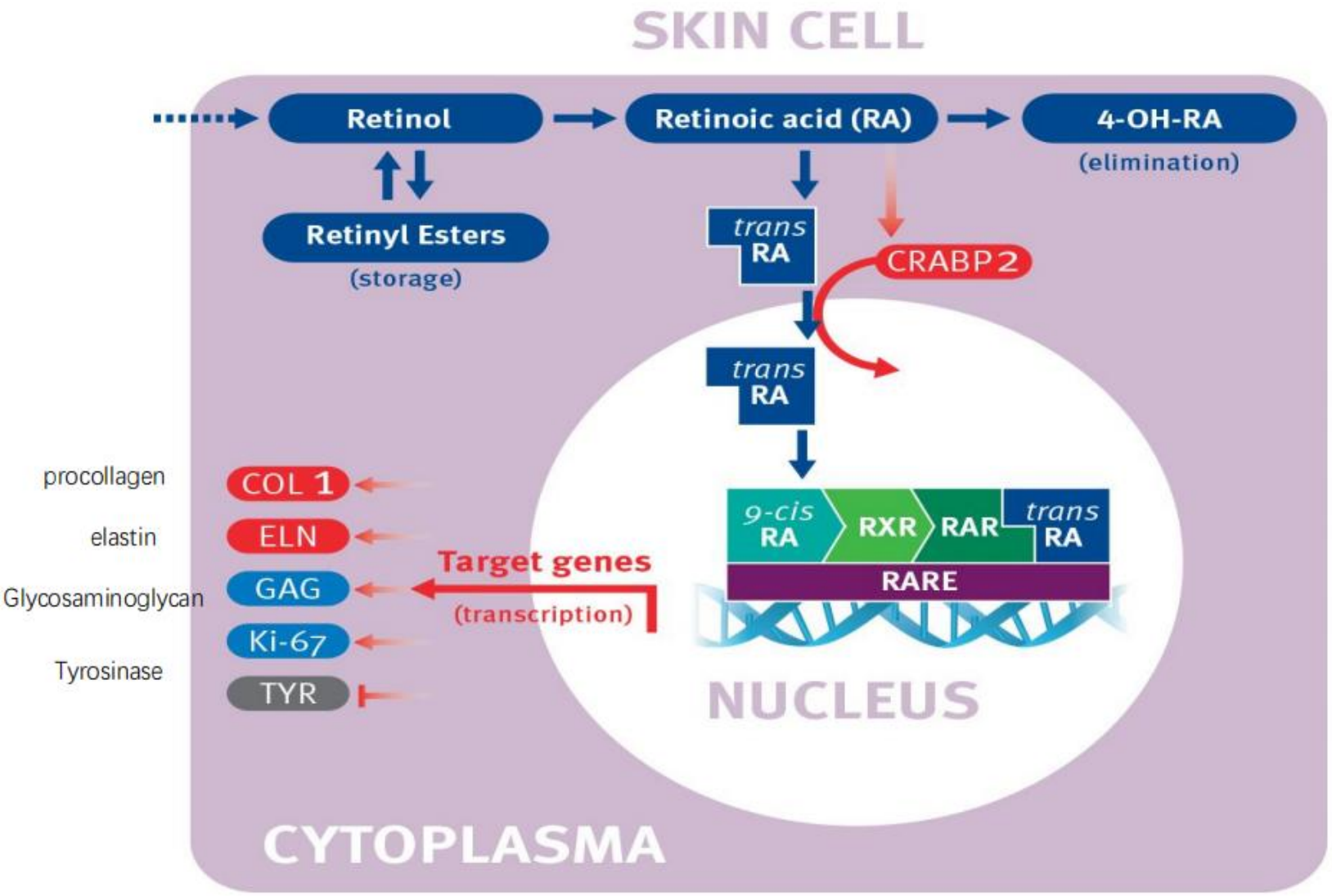
The mechanism of action of vitamin A



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

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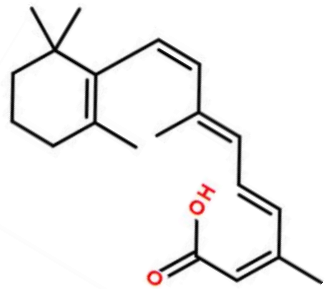
Retinoic acid

- Retinoic acid, also known as Vitamin A acid, is a metabolic product of Vitamin A within the body. Compounds like retinol, retinaldehyde, and retinyl esters can be converted into retinoic acid to exert their effects.
- Thickens the skin, accelerates metabolism, promotes the differentiation and proliferation of epidermal keratinocytes, inhibits melanin production, and reduces collagen degradation.
- Prohibited for use in cosmetics.



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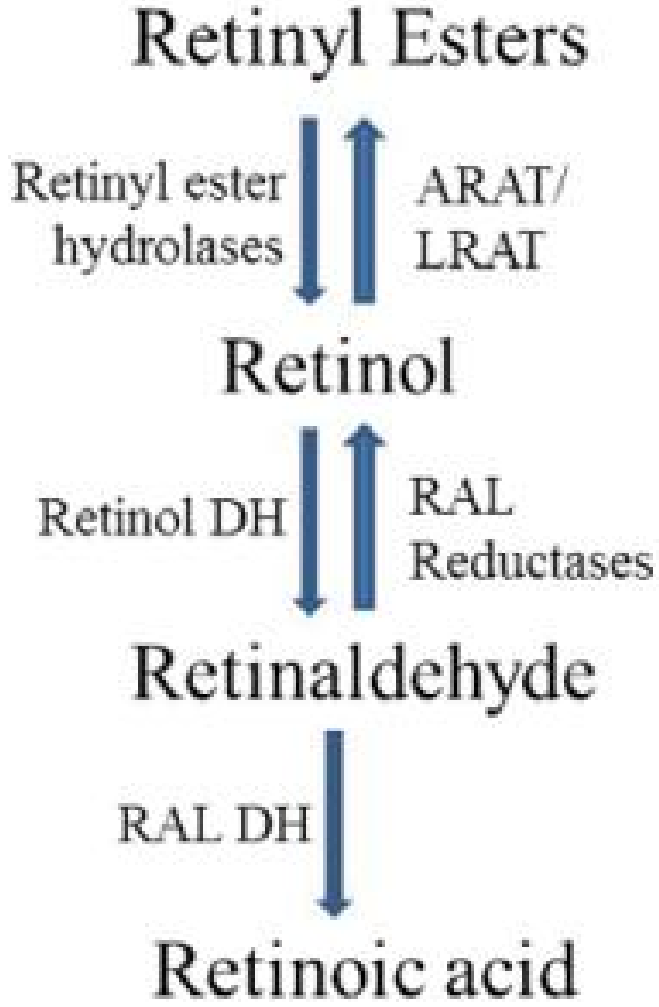
Retinal - Metabolism in the Skin

- Retinaldehyde (RAL) is a natural metabolic byproduct of retinol and a direct precursor to retinoic acid, possessing similar biological activity to retinoic acid.
- Its advantage lies in its multi-directional metabolism, as excess RAL can rapidly be converted back to retinol, stored, and deactivated in the form of retinyl esters.
- After being absorbed by the skin, the majority is converted into retinyl esters for slow-release storage, while a small amount of RAL is oxidized into retinoic acid by keratinocytes (KC) in a differentiation-dependent manner. A small quantity of retinoic acid within cells can significantly exert biological effects.



Hyuck Sun Kwon, Ji Hae Lee,Gyong Moon Kim, et al. [J].J Cosmet Dermatol. 2018;1–6.

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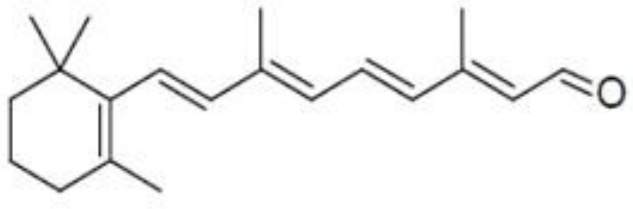
Retinal - Biological Activity



Retinal (RAL)

Stimulates CRABP-2 expression, controls cell growth and specialization, enhances skin thickness, promotes specific keratin proteins, regulates skin vascularization, repairs UV-induced damage to collagen and elastic fibers, clears comedones, and has antibacterial effects against Propionibacterium acnes.

S. Boisnic , M.-C. Branchet-Gumila,Y. Le Charpentier a C. Segard. [J]. Dermatology, 1999, 199(Suppl. 1):43-48.

Lachgar S , CharvÉRon M , Gall Y , et al. [J]. Dermatology, 1999, 199(1):25-27.

Pechere M, Pechere JC, Siegenthaler G, et al. [J]. Dermatology, 1999, 199(Suppl. 1):29-31

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Retinal - Efficacy Testing

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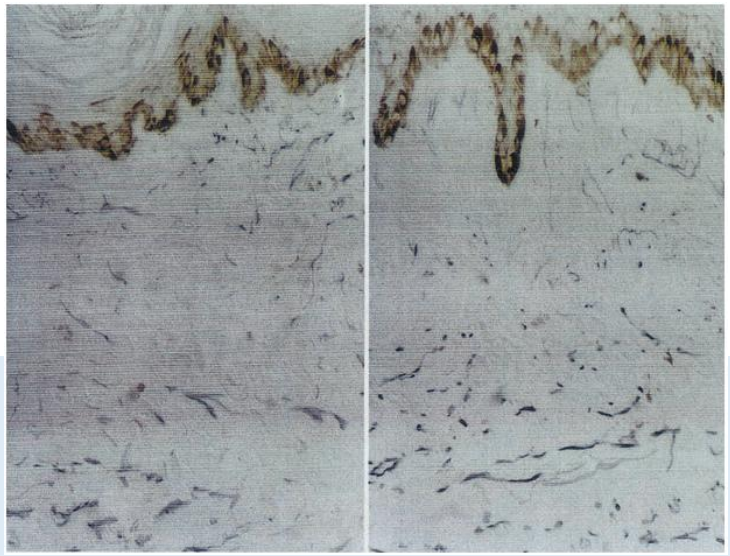
➢Repairs UV-induced damage to elastin fibers and collagen

1 2



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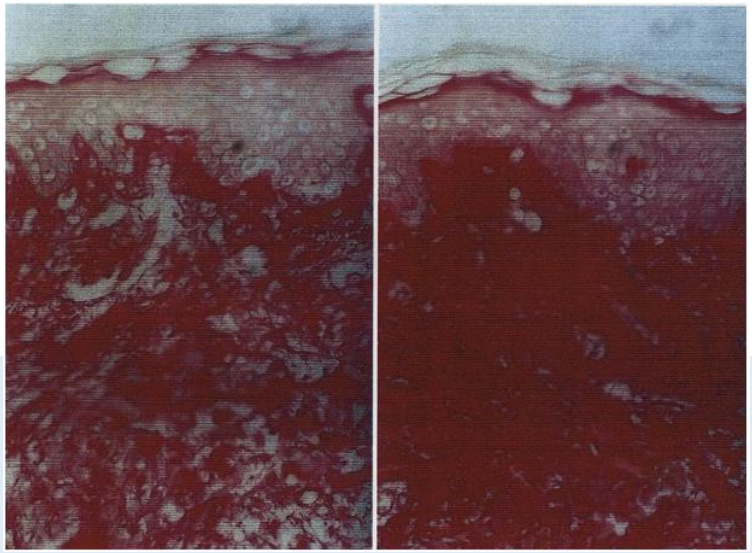

Fig. 1. Skin altered by UVA (control group): elastic fibers stained by(+)-catechin. × 160.

Fig. 2. Skin altered by UVA, then treated by a 0.05% retinaldehydecream (treated group): elastic fibers stained by (+)-catechin. × 160.

Fig. 3. Skin altered by UVA (control group): collagen stained by sir_x0002_ius red. × 160.

Fig. 4. Skin altered by UVA and treated by a 0.05% retinaldehyde cream (treated group): collagen stained by sirius red. × 160.

S. Boisnic , M.-C. Branchet-Gumila,Y. Le Charpentier a C. Segard. [J]. Dermatology, 1999, 199(Suppl. 1):43-48.

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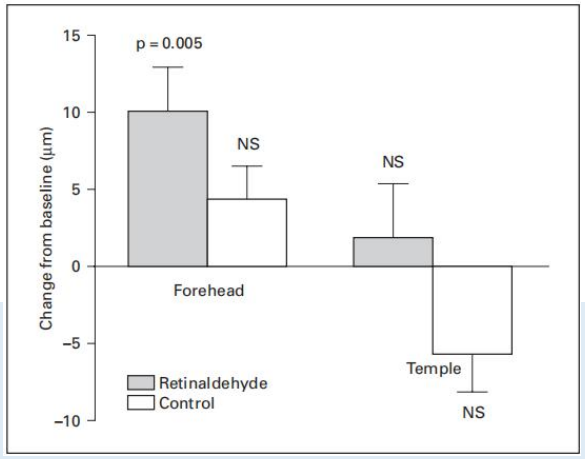
Retinal - Efficacy Testing

➢Countering skin aging induced by ultrasound and fluid technology

1



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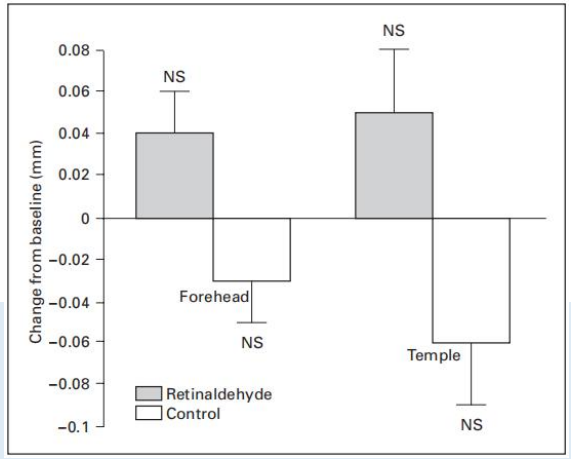

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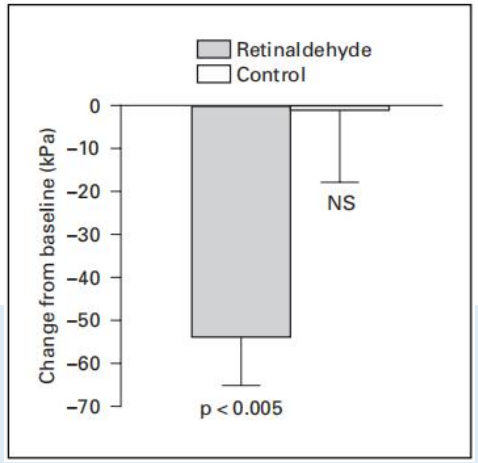

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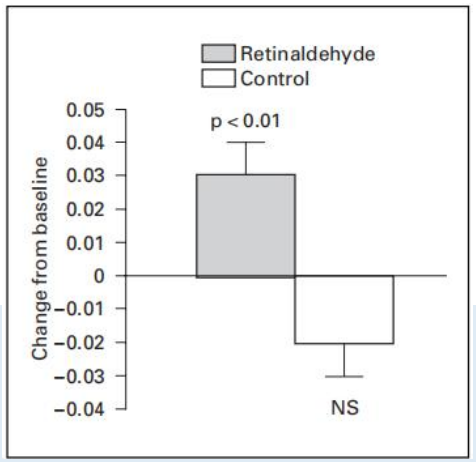

Fig. 1. Mean changes from baseline of epidermal thickness on the forehead and the temple, in the retinaldehyde group and the control group.

Fig. 2. Mean changes from baseline of dermal thickness on the forehead and the temple, in the retinaldehyde group and the control group.

Fig. 3.Mean changes from baseline of stiffness on the forehead, in the retinaldehyde group and the control group.

Fig. 4. Mean changes from baseline of elasticity on the forehead, in the retinaldehyde group and the control group.

Diridollou S , Vienne M P , Alibert M , et al. [J]. Dermatology, 1999, 199(Suppl. 1):37-41.

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Retinal - Efficacy Testing

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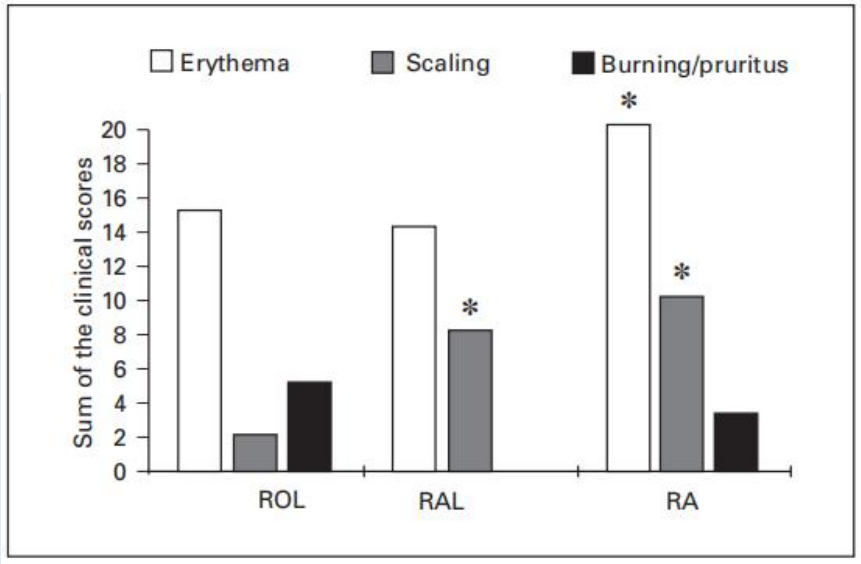
➢Retinal has good tolerance, while retinoic acid has higher irritability



ROL:Retinol
RAL:Retinal
RA:Retinoic acid

Fig. 1 Sum of the clinical scores for each parameter (erythema,desquamation and burning/pruritus) with ROL, RAL and RA, in the study population of the maximization test (n = 6); *p < 0.05, in the intergroup analysis.

Compared to retinoic acid, retinaldehyde has better tolerance and rapidly diminishes post-laser redness.

J.W. Fluhr, M.-P. Vienne,C. Lauze, et al. [J]. Dermatology, 1999, 199(Suppl. 1):57-60.

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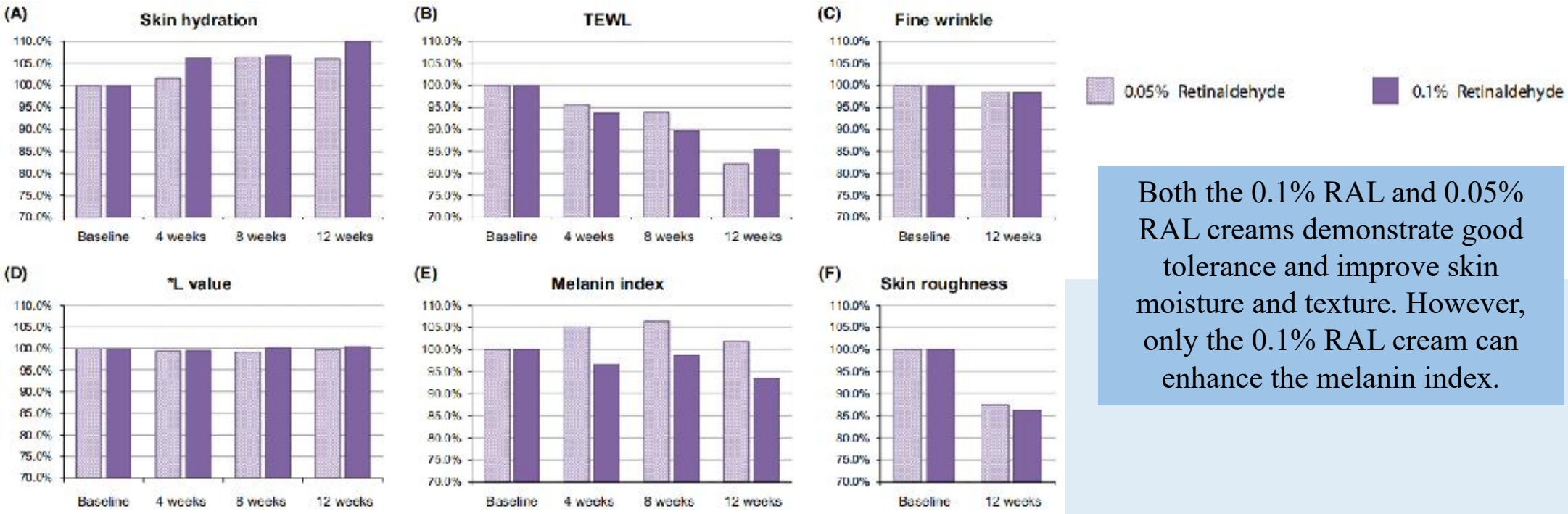
Retinal - Efficacy Testing

➢Effectively inhibits epidermal melanin



Both the 0.1% RAL and 0.05% RAL creams demonstrate good tolerance and improve skin moisture and texture. However, only the 0.1% RAL cream can enhance the melanin index.

Fig. 1.Changes in objective assessments after 12 weeks of application of RAL 0.05% and RAL 0.1% in patients with photoaged skin.. A significant improvement in the melanin index was evident only in the RAL 0.1% group (E)

Hyuck Sun Kwon, Ji Hae Lee,Gyong Moon Kim, et al. [J].J Cosmet Dermatol. 2018;1–6.

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Retinal - Efficacy Testing

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➢Effectively improves signs of skin photoaging

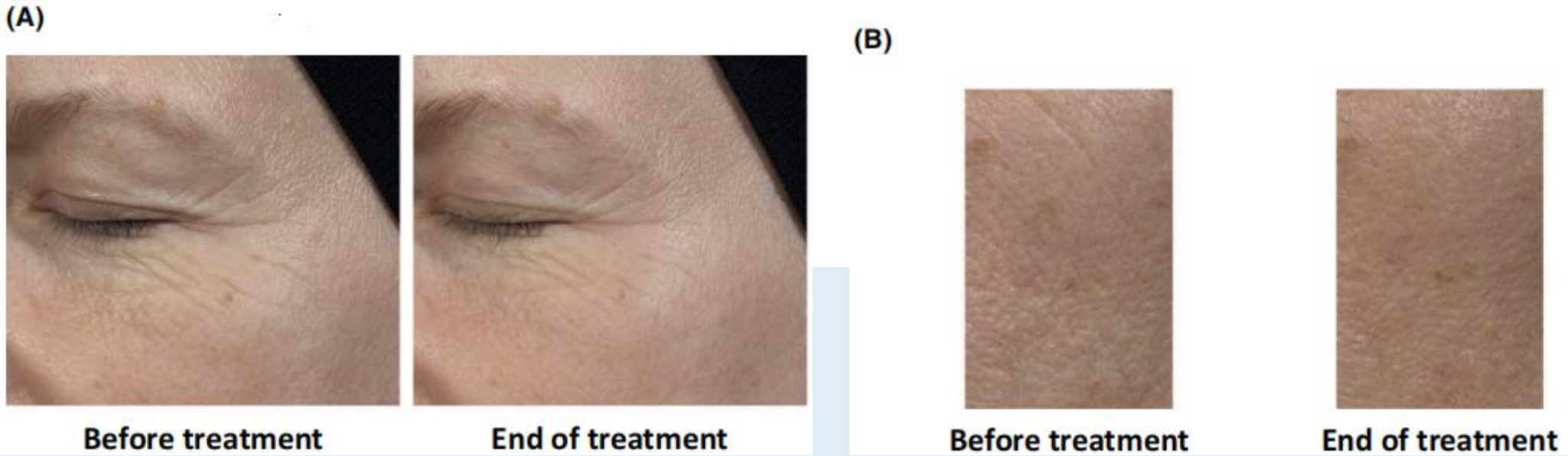

Fig. 1. Standardized photographs of the crow′ s feet area in subject of the cream , before and at the end of treatment. **A**, Change in wrinkle depth. **B**, Change in skin texture

Rouvrais Céline, Martine B , Mengeaud Valérie, et al. [J]. Journal of Cosmetic Dermatology, 2018.

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The effect of retinal

COACHCHEM®

- ✓ Delays natural skin aging and photoaging, fading fine lines
- ✓ Thickens skin, speeds up metabolism, promotes renewal of skin cells, resulting in smoother, softer skin
- ✓ Enhances the epidermis' moisture retention capacity
- ✓ Inhibits Propionibacterium acnes in the skin
- ✓ Suppresses the production of epidermal melanin

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Technical guidance

Application recommendations for retinal formulations:

01	Retinal can dissolve or mix with fats/oils
02	Avoid mixing with acidic products
03	Recommended pH for formulation: 3.5-5.5
04	Recommended dosage (based on retinaldehyde): 0.01~0.20%%
05	Addition at low temperature (below 40°C).
06	The addition of chelating agents or UV protectants in the formulation can enhance product stability.
07	For products containing retinoids, night-time use or combination with sunscreen is recommended
08	Product storage: Store below 25°C, protected from light

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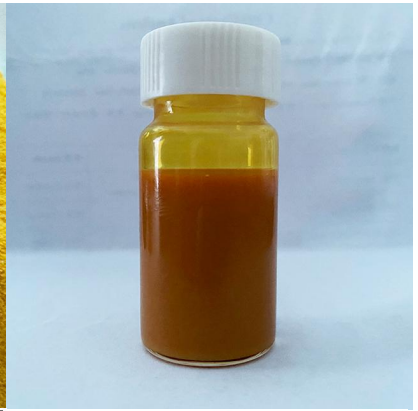
COACHCHEM

➢ Advantages of Anallerg®

- Purity > 99.0%
- Obtained COSMOS natural certification
- High quality, ton-level production capacity, stable batches
- Accept customization; approved by multiple parties
- Existing specifications: pure product (more than 99.0%), 6% nanoemulsion



ECOCERT

ATTESTATION OF CONFORMITY
- RAW MATERIALS -
COSMOS

This attestation has been granted by ECOCERT Greenlife to the company:

SHANGHAI COACHCHEM TECHNOLOGY CO.,LTD

Building 6, No.2088, Jiangzhuang Road Jinshan District
SHANGHAI
CHINA

whose non-organic raw materials (listed hereafter) have been assessed as compliant to the standard:

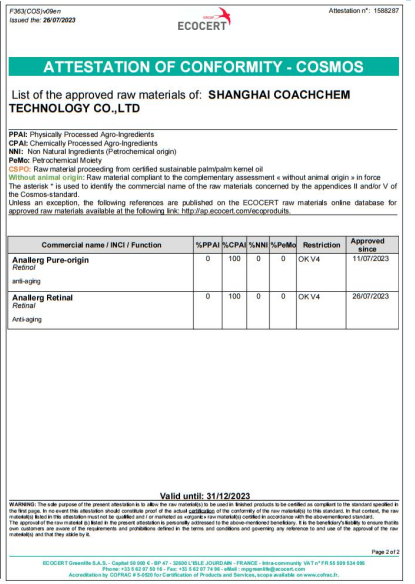
COSMOS standard (Version 4.0 - including all sub-versions)

This attestation of conformity has been issued on the basis of the terms and conditions for the verification of raw materials according to the COSMOS standard available on the COSMOS association website: https://cosmos-standard.org/ and the conformity has been established according to the requirements related to the raw materials contained in this standard.

Issued in: L'Isle Jourdain,
the: 26/07/2023,

Emilie CHERHAL
ECOCERT Greenlife General Manager

Valid until: 31/12/2023



ECOCERT

ATTESTATION OF CONFORMITY - COSMOS

List of the approved raw materials of: SHANGHAI COACHCHEM TECHNOLOGY CO.,LTD

PPAI: Physically Processed Agro-Ingredients
CPAI: Chemically Processed Agro-Ingredients
NNI: Non Natural Ingredients (Petrochemical origin)
PeMo: Petrochemical Moiety
CS/PO: Raw material proceeding from certified sustainable palm/palm kernel oil
Without animal origin: Raw material compliant to the complementary assessment « without animal origin » in force
The asterisk * is used to identify the commercial name of the raw materials concerned by the appendices II and/or V of the Cosmos-standard.
Unless an exception, the following references are published on the ECOCERT raw materials online database for approved raw materials available at the following link: http://sp.ecocert.com/ecoproduits.

Commercial name / INCI / Function	%PPAI	%CPAI	%NNI	%PeMo	Restriction	Approved since
Anallerg Pure-origin Retinol anti-aging	0	100	0	0	OK V4	11/07/2023
Anallerg Retinal Retinal Anti-aging	0	100	0	0	OK V4	26/07/2023

Valid until: 31/12/2023

THANKS