

NEW GENERATION NICOTINAMIDE

—Specifically Developed for High-quality Cosmetics

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01 GET TO KNOW NICOTINAMIDE

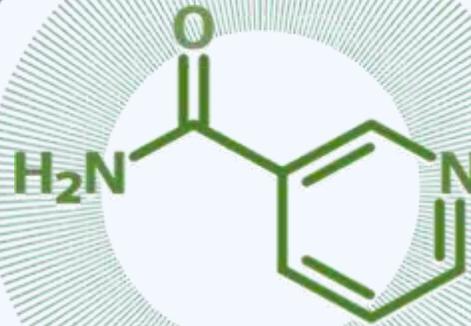
02 NEW GENERATION NICOTINAMIDE

Nicotinamide

01 What is Nicotinamide?

02 What is the skincare principle of niacinamide?

03 Why Does Niacinamide Intolerance Occur?



Get To Know Nicotinamide

【 **Scientific Name** 】 Pyridine-3-carboxamide

【 **Molecular Formula** 】 $C_6H_6N_2O$

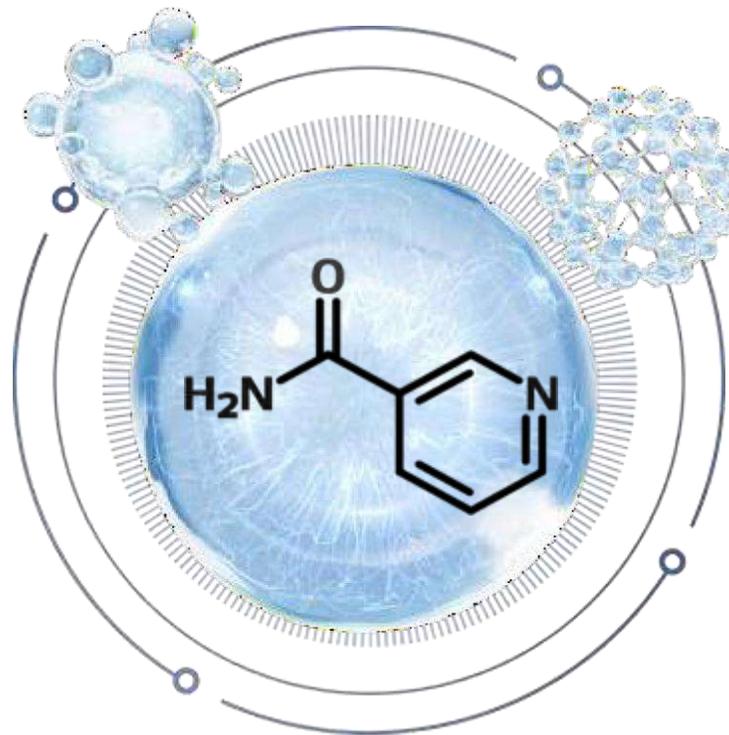
【 **C A S** 】 98-92-0

【 **N a m e** 】 Nicotinamide

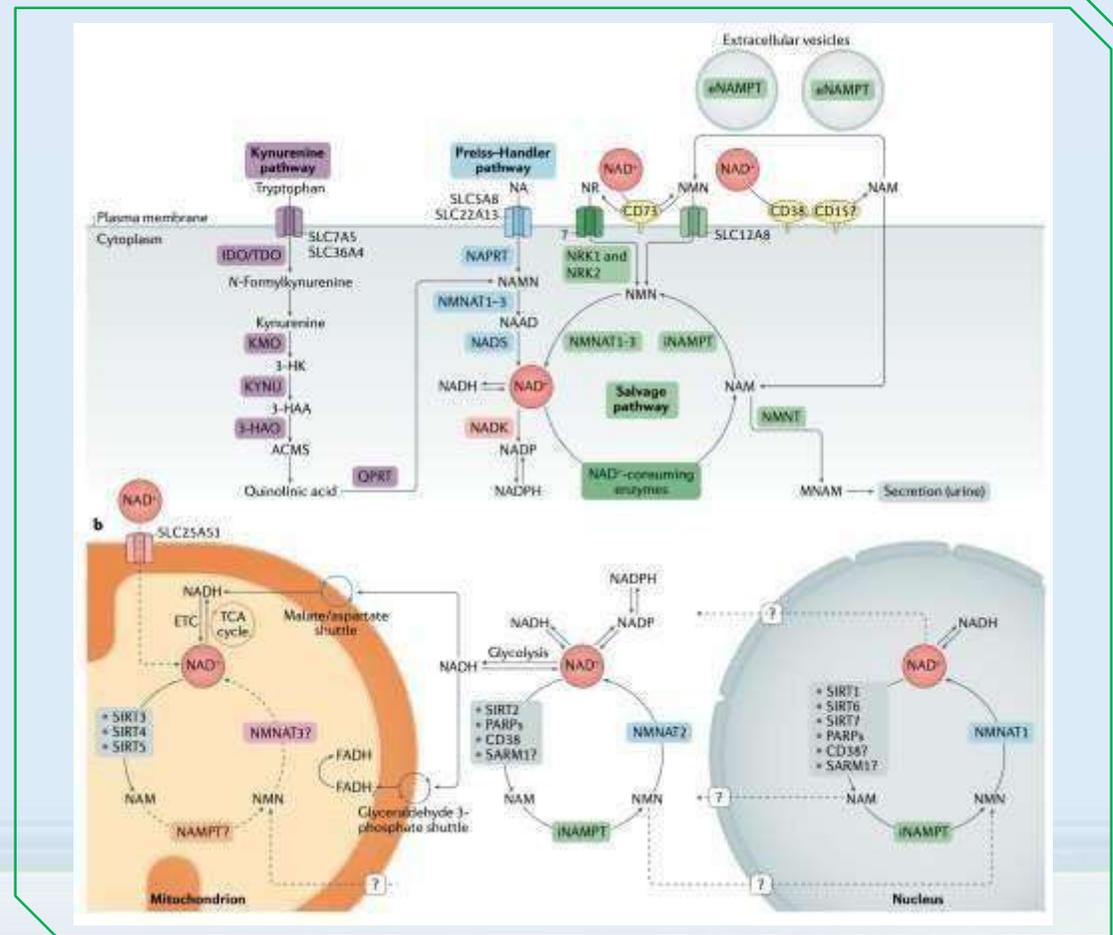
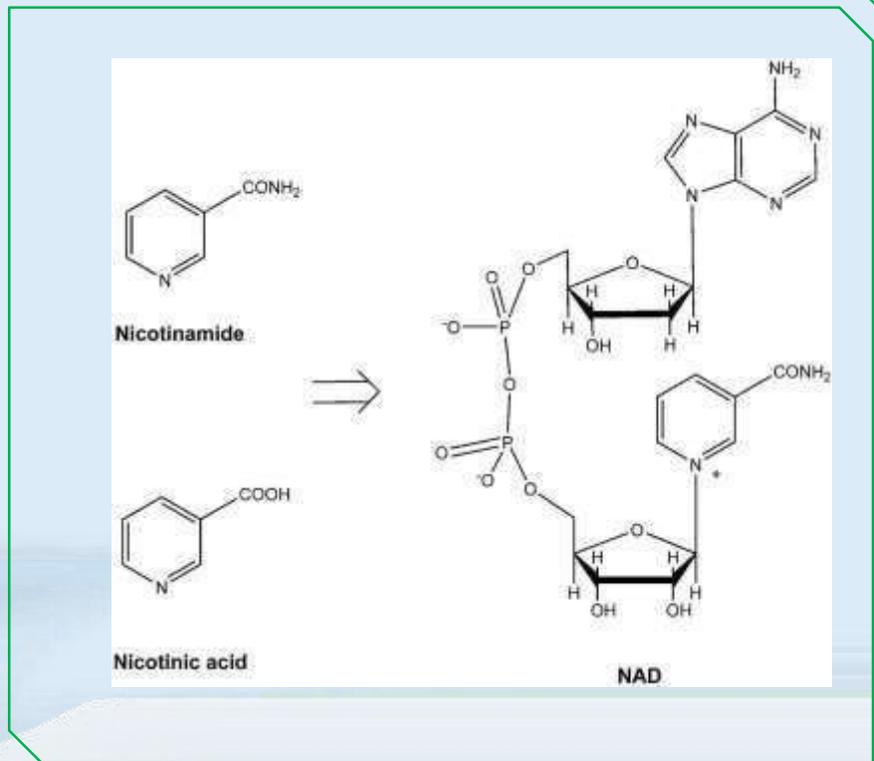
【 **I N C I** 】 **NIACINAMIDE**

【 **A l i a s** 】 Niacinamide, Vitamin PP, VB3, NSA

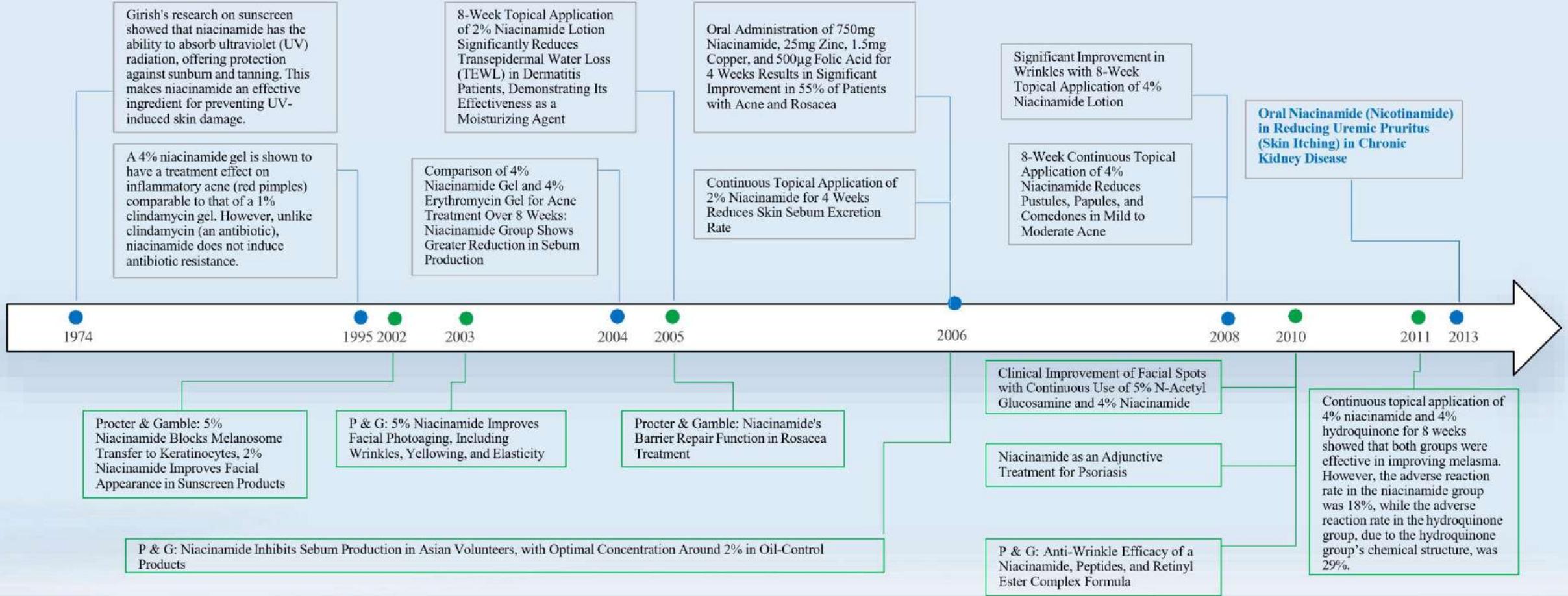
【 **Physical and Chemical Properties** 】 In its natural state, Niacinamide appears as white granules or powder and is easily soluble in water.



Nicotinamide & Metabolism



Function Research Reports of Nicotinamide in Dermatology



Discovery of Niacinamide's Daily Skincare Benefits

Verification of Niacinamide's Moisturizing, Anti-Aging, and Anti-Inflammatory Benefits

Exploration of Niacinamide's Anti-Wrinkle and Acne Treatment Effects

Nicotinamide In Cosmetics

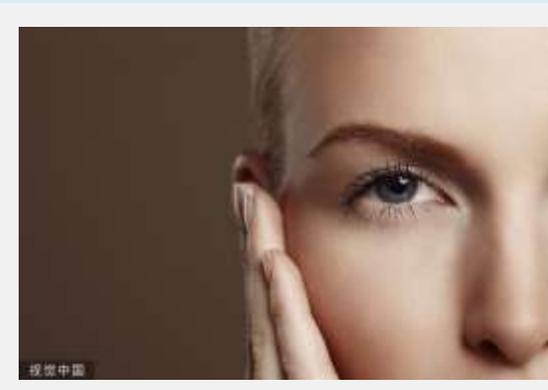
NICOTINAMIDE

The 'All-Purpose' Ingredients in Skincare

Since 1937, when research confirmed that niacinamide could treat **pellagra** , more than half a century of practical use has proven it to be a widely used and highly effective skincare ingredient.



Whitening and reducing
pigmentation



Anti-aging, improving fine lines
(Antioxidant properties)



Repairing and
enhancing
skin barrier function

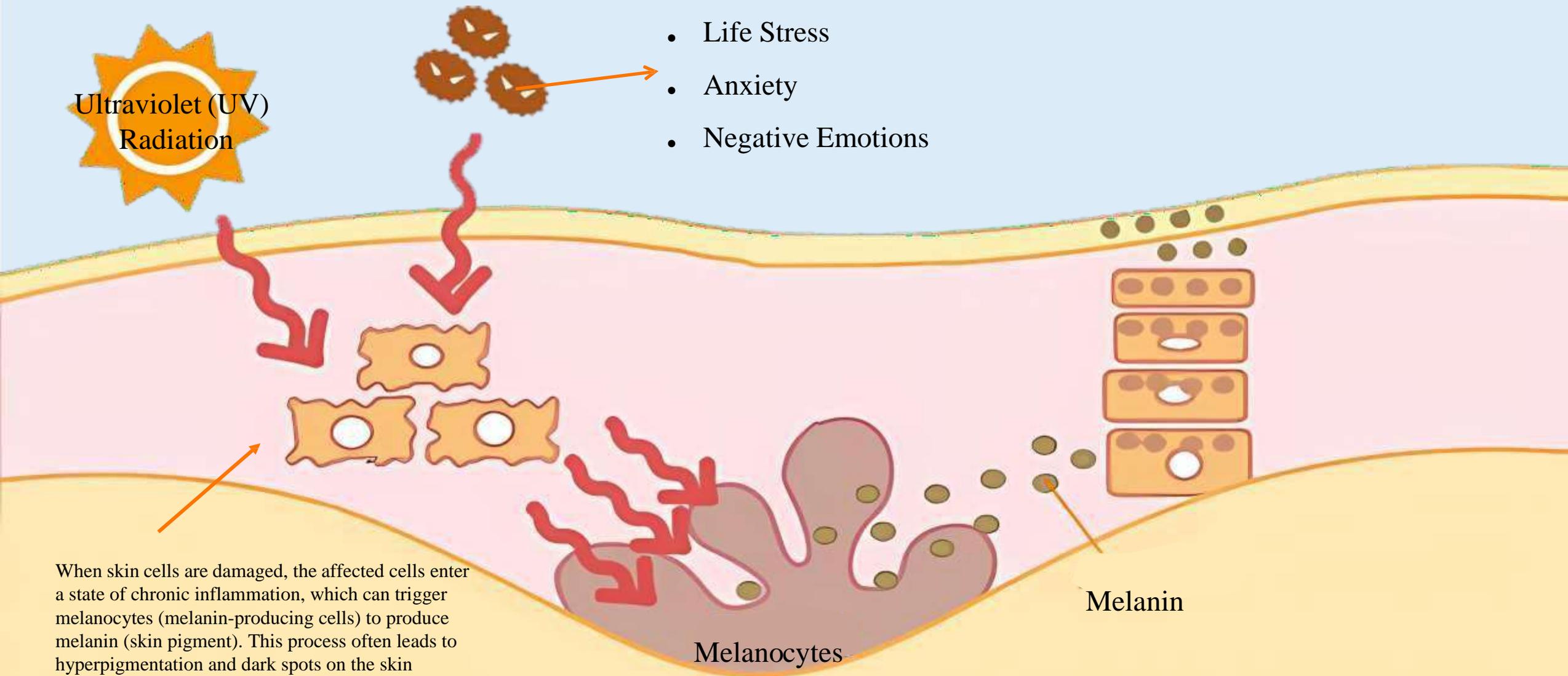


Oil control and
acne prevention

How Does the Skin Turn Black

- Life Stress
- Anxiety
- Negative Emotions

Ultraviolet (UV)
Radiation



When skin cells are damaged, the affected cells enter a state of chronic inflammation, which can trigger melanocytes (melanin-producing cells) to produce melanin (skin pigment). This process often leads to hyperpigmentation and dark spots on the skin

Melanin

Melanocytes

Nicotinamide in Cosmetics → Brightening

In 1974, Girish discovered that niacinamide has the ability to absorb ultraviolet (UV) radiation during his research on sunscreens.

「 He found that by combining 1-5% niacinamide with 1-4% sunscreen agents in a cream formulation, it effectively achieved whitening and sun protection. 」

In 1975, he filed a patent titled "Niacinamide for lightening human skin" (Patent No. CA1074234A).

5% Niacinamide Moisturizer



Baseline

4 weeks

8 weeks

Vehicle Moisturizer



Baseline

4 weeks

8 weeks

Figure 6. Facial images used for assessment of reduction of hyperpigmentation (human clinical study I). The subject used 5% niacinamide moisturizer on the right side of the face and vehicle moisturizer on the left side.

A clinical study conducted in 2002 by Procter & Gamble (P&G) in collaboration with the University of Cincinnati, USA, to verify the effectiveness of niacinamide in reducing age spots (lentigines).

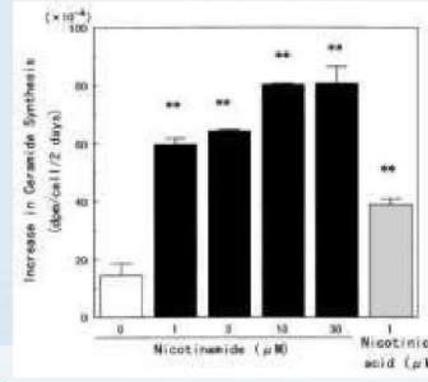
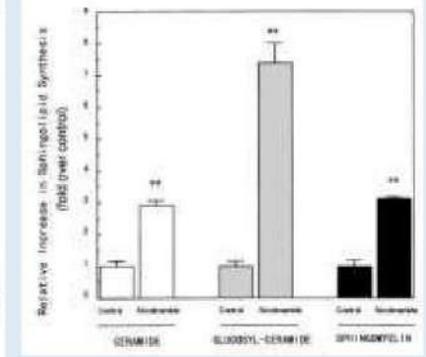
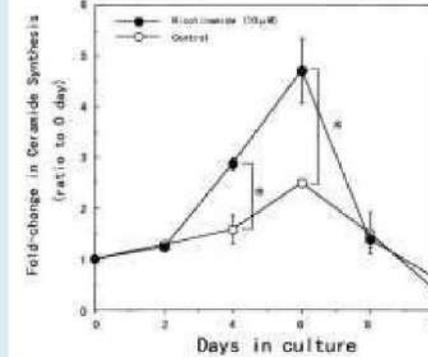
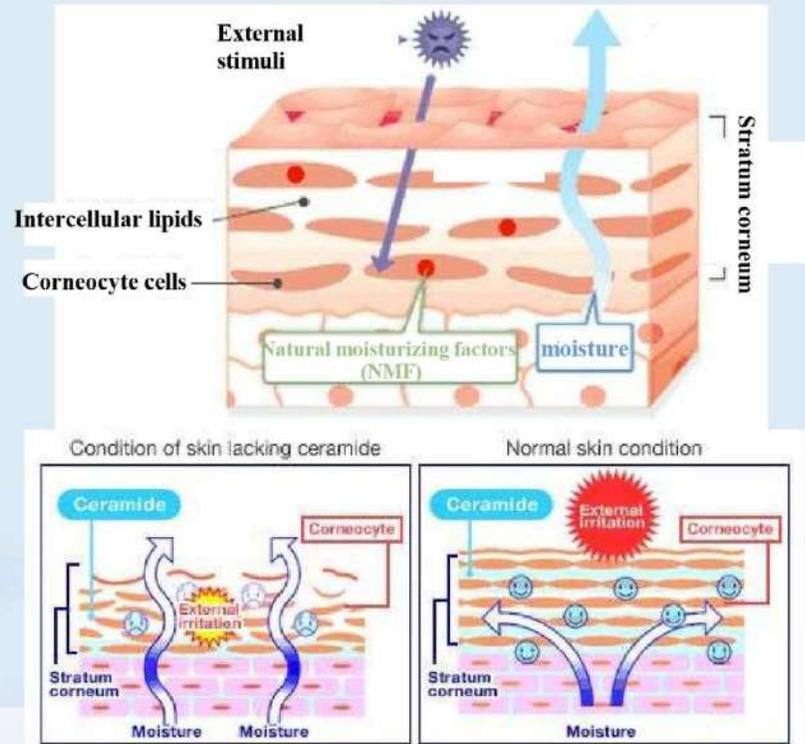
Data Source: *The effect of niacinamide on reducing cutaneous pigmentation and suppression of melanosome transfer*[J].

Cosmetics+Nicotinamide → Moisturizing and Repairing

Niacinamide can significantly promote the increase of **filaggrin**, **collagen fibers**, and **keratin**, while also boosting the production of lipid components in the skin barrier, such as **ceramides** and **free fatty acids**.

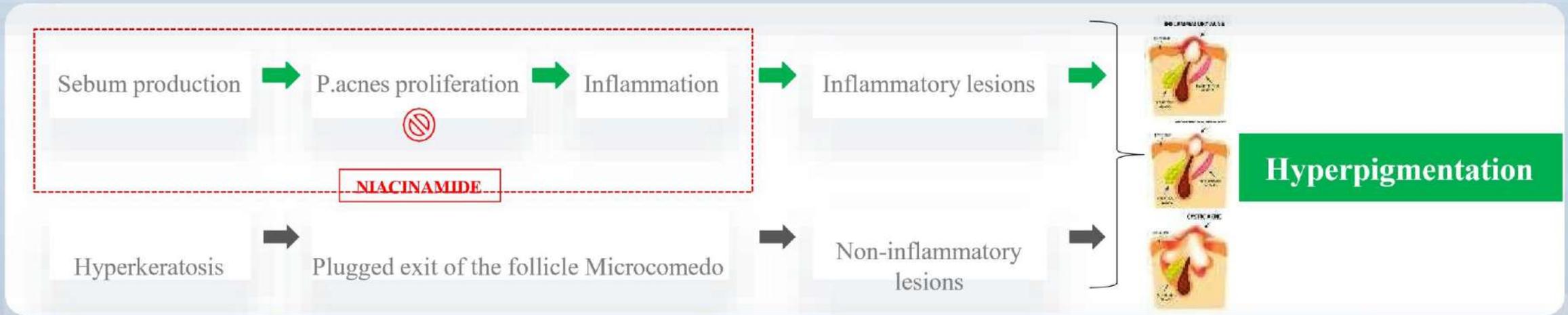
It can help alleviate the damage caused to the skin barrier by **surfactants** or **solvents**, playing a **repairing role**.

At the same time, niacinamide enhances the synthesis of **ceramides** in the skin, strengthens the skin barrier, and effectively reduces **water loss**, providing a **moisturizing effect**.



Cosmetics+Nicotinamide → Oil Control and Acne Suppression

Topical niacinamide can reduce the production of fatty acids and triglycerides in sebum (oil), thereby helping to shrink pores and decrease the severity of acne outbreaks



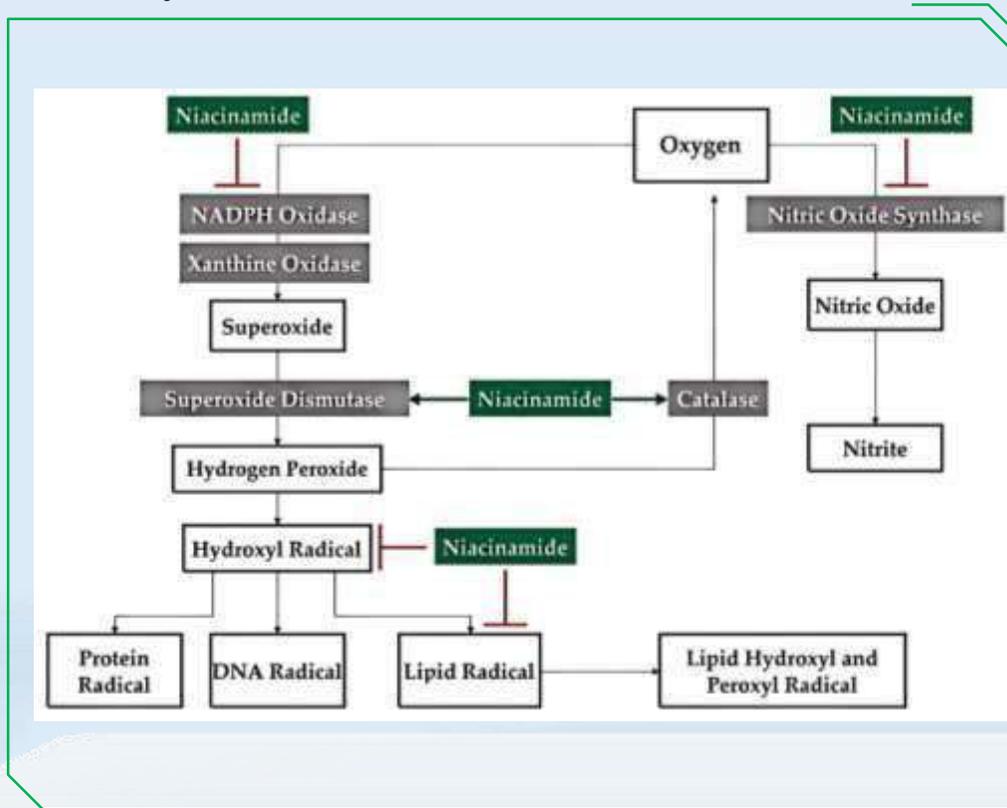
Clinical trial comparing 4% niacinamide with 1% clindamycin

	Nicotinamide (4%)	Clindamycin (1%)
Overall improvement of acne-prone skin	After 8 weeks of use, 82% of volunteers	After 8 weeks of use, 68% of volunteers
Reduce the severity of acne	-32% (4 weeks)	-64%(8 weeks)
Reduce acne-related damage	Inflammatory acne reduced by 60%	Inflammatory acne reduced by 43%
	Significant reduction in papules and pustules	

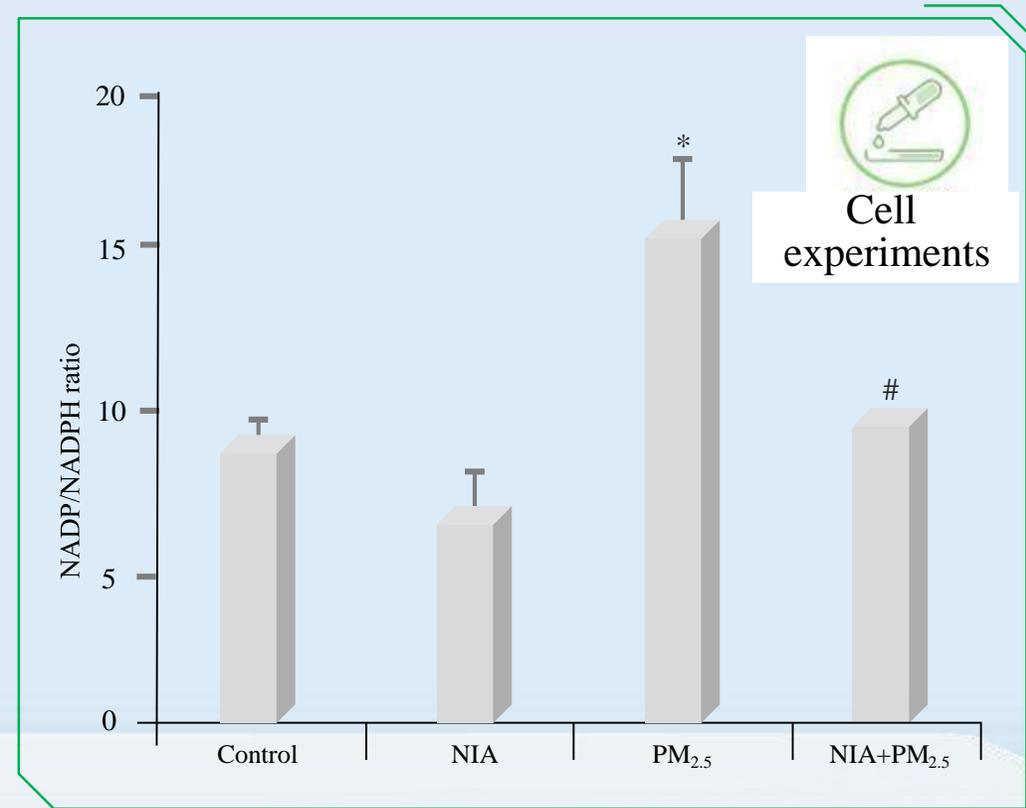
Conclusion: Niacinamide at a certain concentration can achieve effects similar to **clindamycin**, while reducing the risk of **antibiotic dependency** and **antibiotic resistance**.

Cosmetics+Nicotinamide → Antioxidant

Studies have demonstrated that **niacinamide** is an effective **antioxidant**. Niacinamide protects **keratinocytes** by reducing the **NADP/NADPH ratio**, thereby inhibiting the production of **reactive oxygen species (ROS)**. Additionally, niacinamide prevents **oxidative stress-induced molecular damage**, including **lipid peroxidation**, **protein carbonylation**, and **DNA modifications**.

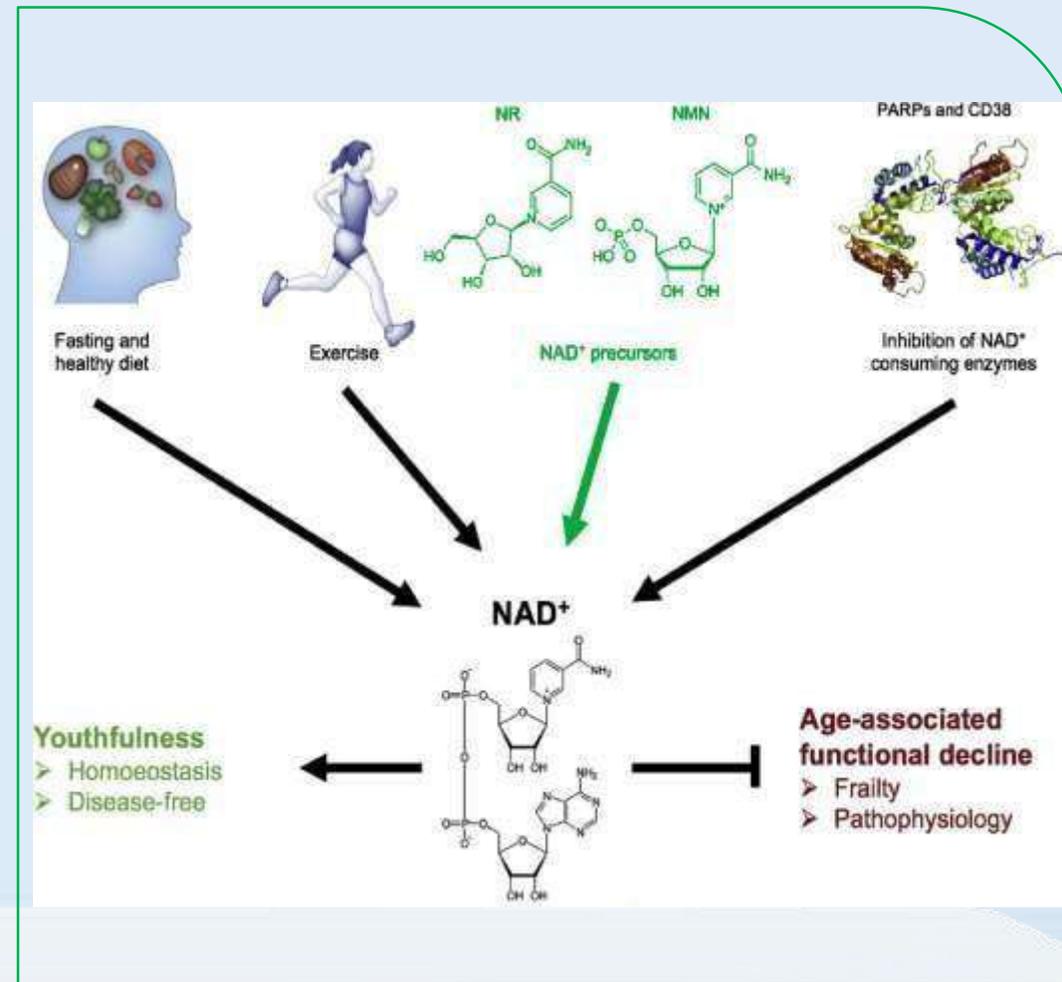
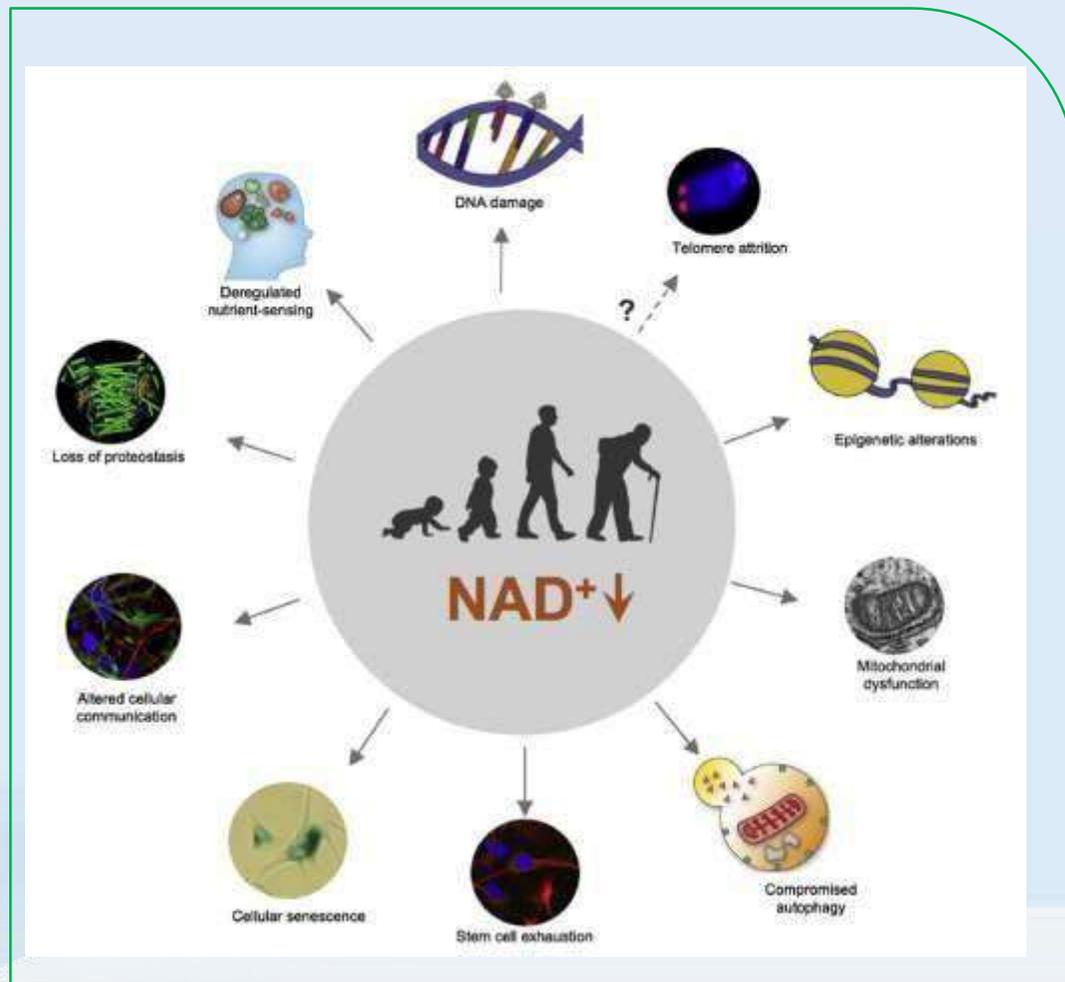


Niacinamide Antioxidant Mechanism



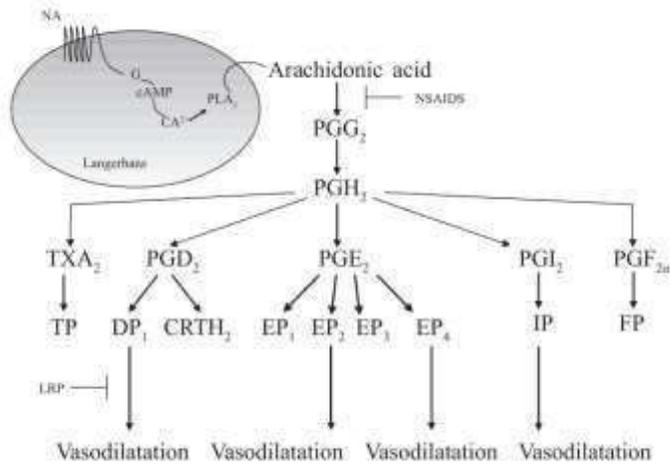
Niacinamide can lower the NADP/NADPH ratio

Cosmetics+Nicotinamide → Anti-aging



Niacin Vs Nicotinamide (Irritating Residue — Niacin)

The Side Effects of Nicotinamide-containing Skincare Products Primarily Result from a Byproduct of Niacinamide, Niacin



Molecular Mechanism of Niacin-Induced Skin Redness



Reduce the Niacin Content

Reduce Reduce

Reduce

Reduce

Reduce

Reduce

Skin Irritation



NEW GENERATION NICOTINAMIDE



Specially Developed for Cosmetics and Personal Care

01 NEW TECH

- ✓ Exclusive Nicotinamide Patent Technology
- ✓ Strong Biotechnological Synthesis Support

02 NEW STANDARDS

- ✓ Above Industry Corporate Standards
- ✓ Specifically Designed for the Cosmetics and personal care

03 NEW TRENDS

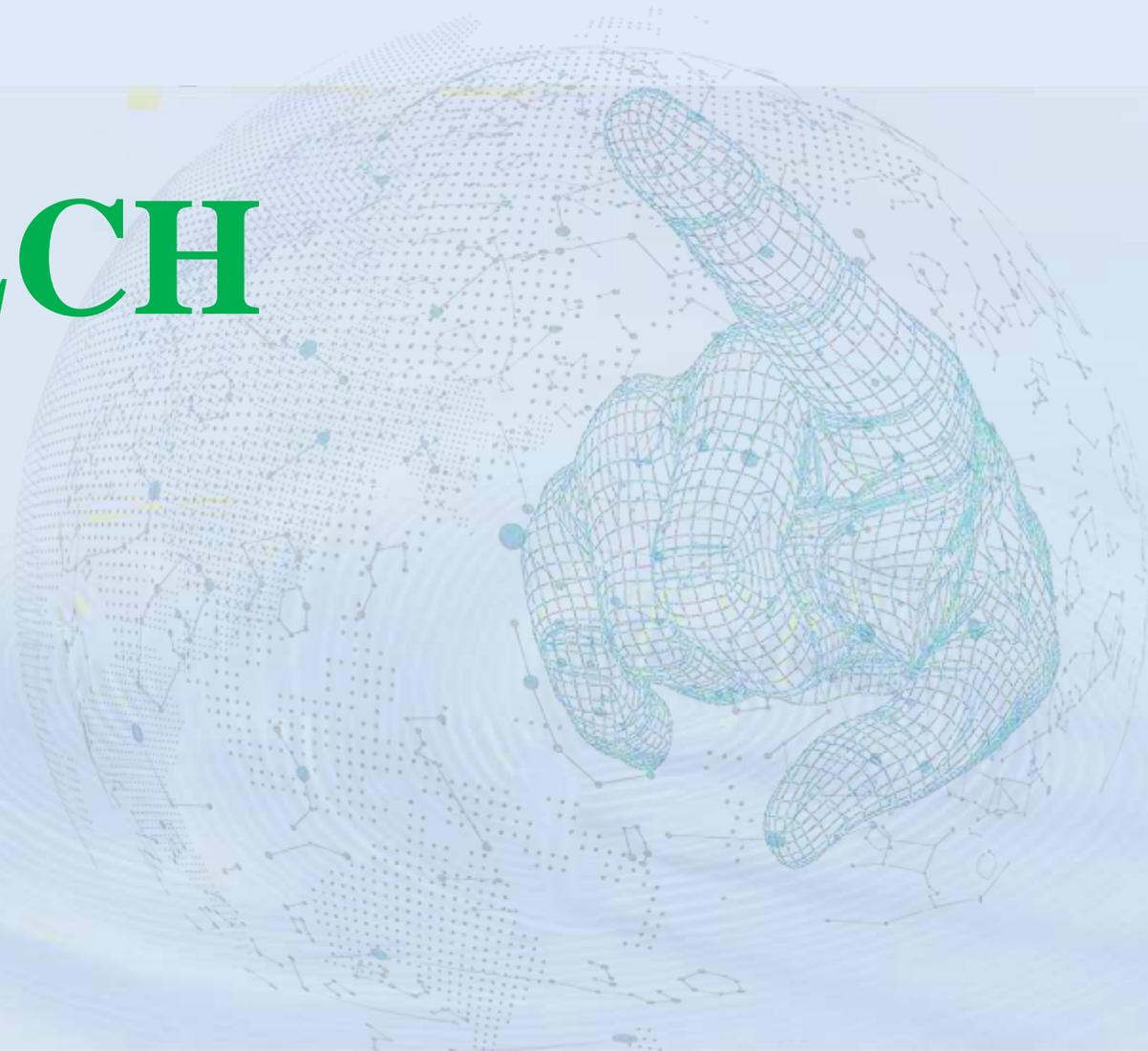
- ✓ Evaluated and Verified by Numerous Well-Known Industry Brands
- ✓ Leading the New Trend of Skincare

04 NEW FUNCTIONS

- ✓ Quantitative Scientific Data
- ✓ Rigorous Human Clinical Trials
- ✓ Allowing Consumers to Experience Real, New Results



NEW TECH



New Tech • - A World-class R&D Platform

Integrating the 'BT+IT+AI' Platform, Connecting the Entire Process from R&D to
Pilot Testing to Mass Production, Pioneering a New Era of Sustainability.

Bio manufacturing

Connecting with the Latest Cutting-Edge
Biotechnology Globally

Global Vision, Coordinating R&D
Planning

Rooted in the Industry, Focused on Innovative
Development Based on Industry Customer Demands

New Tech · Green and Efficient Biosynthetic Process

REGULAR NICOTINAMIDE



- Partial Substitution of Chemical Reactions
- Efficiency Comparable to Chemical Synthesis
- Energy Consumption Comparable to Chemical Synthesis
- Environmental Performance Improved, but Still Deviates from Regulations

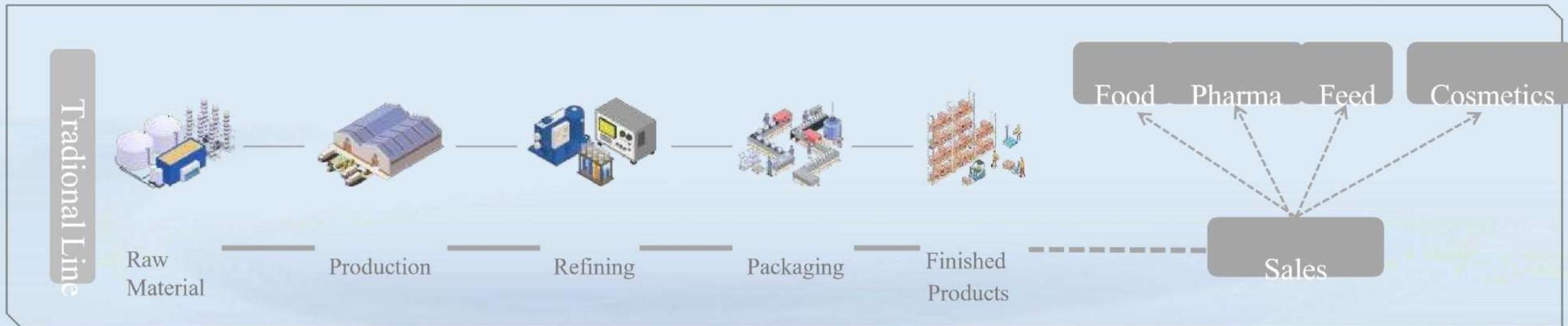
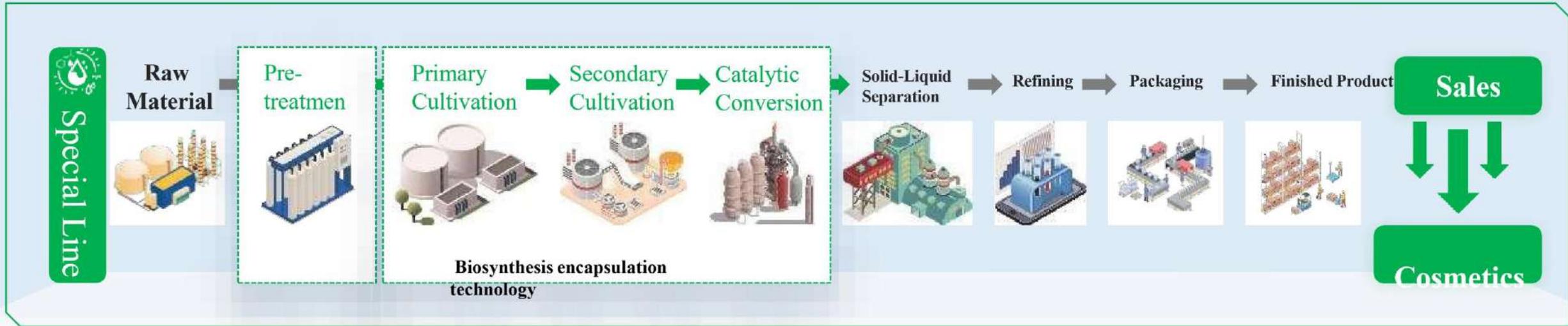


NEW GENERATION NICOTINAMIDE



- **Green and Environmentally Friendly Technology**
- **Aligned with National Initiatives of 'Carbon Neutrality' and 'Carbon Peak'**
- **High Efficiency, Low Energy Consumption in Raw Material Utilization**
- **Minimal Byproducts and High Yields**
- **Future Mainstream Technology**

New Tech · Production Lines and Process Specially Designed for Cosmetics and Personal Care



New Tech • Core Patents and Technological Barriers

1 PRODUCT 7 TECHNOLOGY PATENTS 4 AUTHORIZED PATENTS

Patent 1

Exclusive Raw Material Pretreatment Technology,
Significantly Improving the Microbial Conversion
Efficiency of Raw Materials

Patents 2 &3

Specialized Refining System, Providing Whiter and More Uniform
Products

Patent 4

Specialized Bioconversion System,
Converting Trace Amounts of Harmful Niacin
into Beneficial Nicotinamide

2024/10/30

NEW STANDARDS

New Standard · Upgraded 8 Testing Items

Significant Enhancement of 'Niacin Testing' Standard Methods

Revolutionizing Testing Standards in Collaboration with Professional Third-Party Testing Agencies

Viablife Promotes the Standardization and Regulation of Niacin Content Testing Methods in Nicotinamide;

Optimizing and Enhancing More Trace Element Testing Items in Corporate Standards, Striving for Excellence

- Ø Adding 'Solution Clarity' Item
- Ø Optimizing 'pH Value' Measurement Details
- Ø Incorporating 'Microbial' Control Items

Items		Specification
UV Identification		Complies
Hydroxide Identification		Complies
IR Identification		Complies
Nicotinamide Assay (HPLC)		99.0%-101.0%
Related Substances	Niacin	≤20ppm
	3-Cyanopyridine	≤50ppm
	Maximum Unknown Impurity	≤0.10%
	Total Impurities	≤0.2%
pH Value (10% Water Solution)		5.5-7.5
Solution Clarity (C, 50m, 5g/100mL Water) / FNU		≤3.00
Chromaticity (Calc./BY)		≤7
Loss on Drying		≤0.5%
Melting Point		128.0-131.0°C
Residue on Ignition (600°C, 2 hours)		≤0.10%
Heavy Metals		≤20ppm
Oxides		≤70ppm
Sulfates		≤190ppm
Readily Carbonizable		Complies
Microbial Testing	Total Number of Colonies	≤100 CFU/g
	Mold and Yeast	≤100 CFU/g
	Heat-resistant E.Coli	Must not be checked out
	Staphylococcus aureus	Must not be checked out

New Standard · Advancing Industry Standards, Striving for Excellence in Niacin Content

Before 2021

- The Niacin Content in Nicotinamide Added to Cosmetics is Generally Greater Than 100ppm;
- The New Generation of Nicotinamide Enters the Cosmetics.

2022

Collaboratively Promoting the Implementation of Industry Standards for Cosmetic-Grade Nicotinamide, Filling the Gap in the Industry. The Industry Standard for Niacin Content is Below 100ppm, While our Nicotinamide Has Niacin Content Below 50ppm.

2023

We Upgrades Production Technology, Innovates Corporate Standards, Optimizes Niacin Content to Below 20ppm

2024

Strives for Excellence, Further Adjusting Niacin Content to **Below 10ppm.**

Future

We Provide the Industry with Higher-Quality Nicotinamide.

New Standard · Niacin Content from 100 to 10 ppm

10 ppm

V/S

100 ppm

Comparison of nicotinic acid content in nicotinamide for cosmetics

Sample	claimed/ppm	Test result/ppm	Testing Report Lot.	Test by
Reference 1	<100	80.36	H202414595	G.D. FOODS AND COSMETICS TESTING CENTER
Reference 2	<100	43.77	H202414596	
New Generation Nicotinamide	<10	4.96	H202406500b	

Our Corporate Standards Have Been Raised from 100 ppm to the Current Industry Requirement of 10 ppm.

High Quality Standards · Comprehensive Certifications to Meet Global Demands

Cosmetic industry
certifications



International
standards and other
certifications



NEW FUNCTIONS



New Feature · **Easier to Use, More Storage-friendly**

Non-caking, Improved Flowability

After a year of observation and research, our Laboratory has discovered that the new generation Nicotinamide, treated with our special process, can maintain flowability and resist caking under normal storage conditions for an extended period.

The white and clean particles

No solvents or protein residues, resulting in a clearer aqueous solution.

Better solubility

The needle-shaped crystal process enables rapid dispersion in water

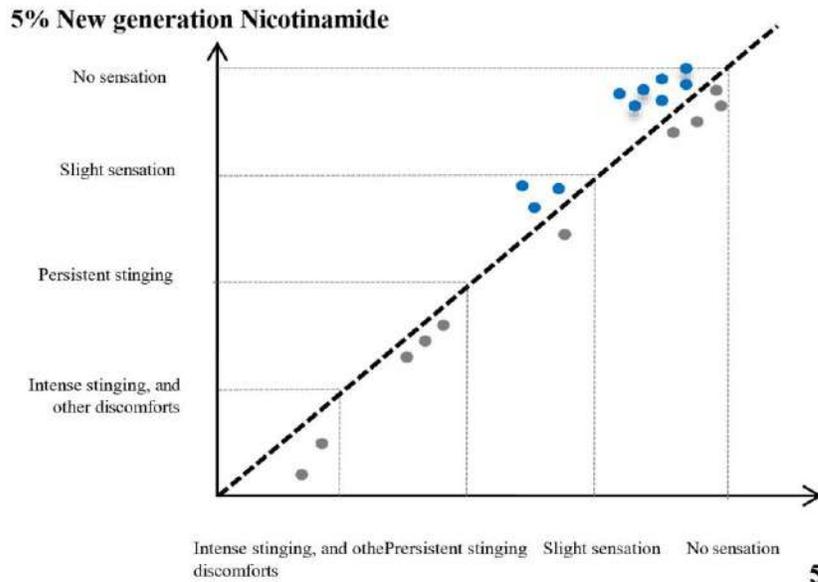
Low Irritation · A Skin Irritation Score of 0

Skin irritation test.

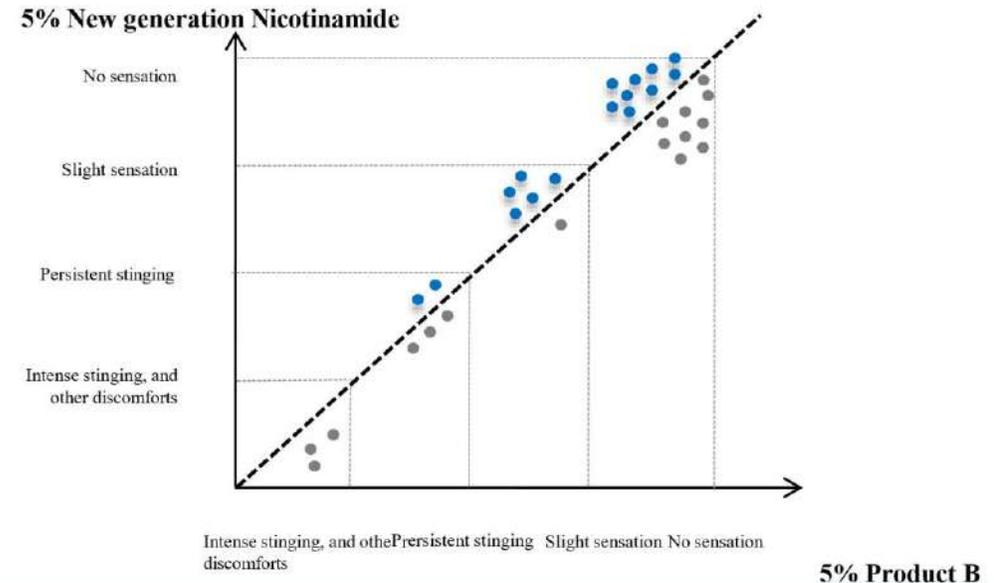
- Test with 26 volunteers:
- The new generation Nicotinamide showed a **0%** incidence of strong stinging sensation.
- Reference 1 and Reference 2 showed strong stinging sensations in **20%** and **18.75%** of cases, respectively.



Comparison of skin sensation test:
New generation Nicotinamide vs. Marketed Nicotinamide Product A



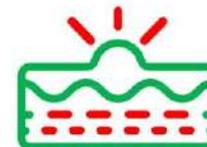
Comparison of skin sensation test:
New generation Nicotinamide vs. Marketed Nicotinamide Product B



Low Irritation · From Mild to None

Chick CAM Vascularity Test

- The evaluation result of New generation Nicotinamide shows **no irritation**.



5% New Generation Nicotinamide

Experimental Results

表 1 受试物鸡胚绒毛尿囊膜试验结果(反应时间法)

鸡胚编号 ID	Bleeding (s)	Vascular Dissolution (s)	Coagulation (s)
1	281	301	301
2	111	301	301
3	251	301	301
4	274	301	301
5	276	301	301
6	264	301	301

IS=0.97

Result Evaluation: Non-irritating

5% Competitor Nicotinamide Experimental

Results (Reaction Time Method)

表 1 受试物鸡胚绒毛尿囊膜试验结果(反应时间法)

鸡胚编号 ID	Bleeding (s)	Vascular Dissolution (s)	Coagulation (s)
1	51	301	301
2	56	301	274
3	108	301	301
4	54	301	301
5	70	301	301
6	78	301	301

IS=3.99

Result Evaluation: Mild Irritation

The vascularized, transparent chorioallantoic membrane (CAM) of incubated chicken embryos is highly sensitive to external substances and is used to evaluate the irritation potential of products. This method is often employed as an alternative to testing on sensitive areas such as the eyes. The results are quantified using the RC50, which is the critical concentration value that induces a response in 50% of the test subjects. A higher RC50 indicates a safer threshold for the product's addition.

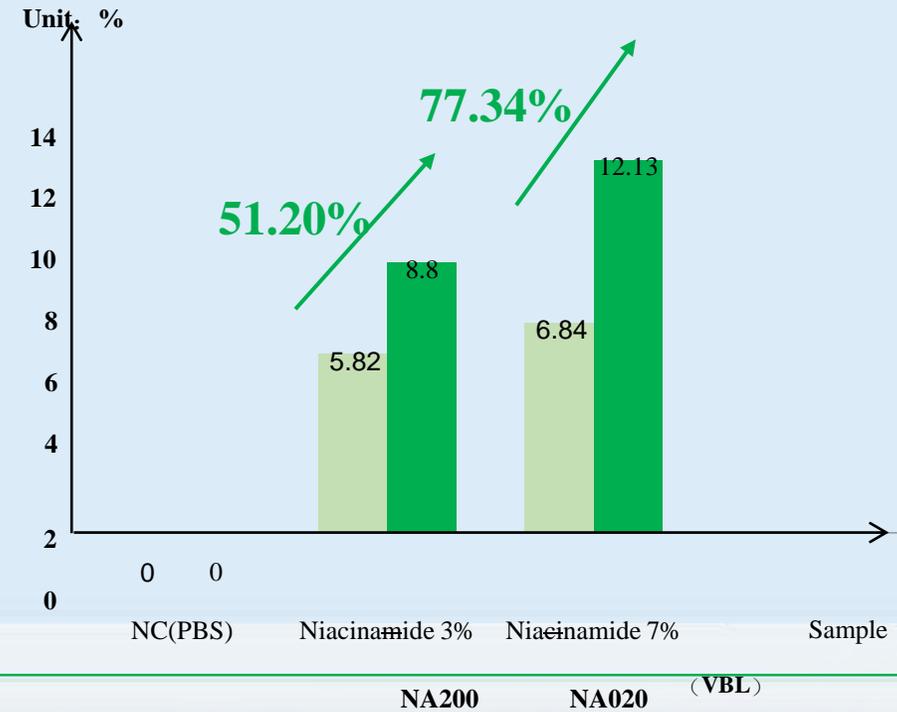
Low Irritation · New Generation Nicotinamide Promotes Skin Cell Growth

3D Full-Thickness Skin Model Test

- Compared to the control, the new generation of Nicotinamide promoted skin cell growth by **51.20%** at **3%** concentration and by **77.34%** at **7%** concentration.



Cell viability change statistics



Test method: T/SHRH 008-2018 Cosmetics - In Vitro Skin Irritation Test (SIT)

Whitening Effect · Improving Appearance Color and Increasing L* Value

3D Epidermal Skin Model Test

The New generation Nicotinamide significantly lightens the cell appearance, with a notable increase in luminosity (L* value). It also significantly reduces the melanin particles in the basal layer, granule layer + spinous layer, and stratum corneum. The inhibition rate of melanin particles from the basal layer to the stratum corneum progressively increases. **It inhibits melanin transport, improves the appearance of skin tone, and enhances luminosity (L* value), showing whitening effects.**

L* value improvement rate

UVB-induced model group 0

New generation
Nicotinamide

8.21%

Blank control group



Apparent color index

UVB-induced model group



The apparent color index darkened,
confirming effective testing conditions

New generation
Nicotinamide



Apparent color index significantly lightened

Whitening Effect · Inhibit Melanin Transfer

3D Epidermal Skin Model Test

The New generation Nicotinamide significantly lightens the cell appearance, with a notable increase in luminosity (L^* value). It also significantly reduces the melanin particles in the basal layer, granule layer + spinous layer, and stratum corneum. The inhibition rate of melanin particles from the basal layer to the stratum corneum progressively increases. **It inhibits melanin transport, improves the appearance of skin tone, and enhances luminosity (L^* value), showing whitening effects.**

The inhibition rate of melanin content in the stratum corneum

UVB-induced model group 0

Viablife New generation
Nicotinamide

66.75%

Blank control group



3D skin structure morphology, with normal distribution of melanin

Viablife New generation
Nicotinamide



The melanin content significantly decreased, showing a clear whitening effect.

UVB-induced model group



After UVB induction, the melanin content in the stratum corneum, granular layer, spinous layer, and basal layer significantly increased.

Whitening Effect · Inhibit Melanin Transfer Moisturizing Effects · Increase Skin Moisture and Aqp3 Levels

3D Epidermal Skin Model Test

- The New generation Nicotinamide can increase skin moisture content and AQP3 levels, **providing moisturizing effects.**

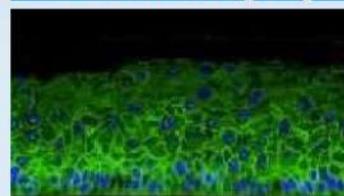
Skin Moisture Content Increase Rate

UVB-induced model group	0
Viablife New generation Nicotinamide	319.6%

AQP3 Content Increase Rate

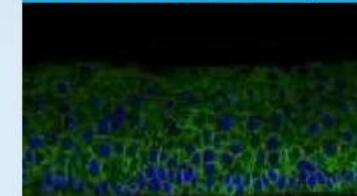
UVB-induced model group	0
Viablife New generation Nicotinamide	190.00%

Blank control group



In the 3D skin model, AQP3 shows green fluorescence.

UVB-induced model group



After UVB induction, AQP3 content significantly decreased, indicating that the experimental conditions were effective.

Viablife New generation Nicotinamide



The AQP3 content showed an increase in fluorescence signal.

Anti-wrinkle Effect · Inhibit Collagenase and Elastase Activity

Enzyme Inhibition Test

- The collagenase inhibition rate of the new generation Nicotinamide is **44.4%**, and the elastase inhibition rate is **43.1%**.

Collagenase inhibition rate

■ Blank control group ■ New generation Nicotinamide

0.99%

44.40%

Blank control group

New generation Nicotinamide

Elastase inhibition rate

■ inhibition rate

0.99%

43.10%

Blank control group

New generation Nicotinamide

The test concentration of the new generation Nicotinamide is 1%, and the positive control is EGCG 1.2 mg/mL. The test has been confirmed as effective

Anti-wrinkle Effect · Increase Epidermal Thickness Significantly

3D Epidermal Skin Model Test

- The new generation Nicotinamide significantly increases epidermal thickness, demonstrating **anti-wrinkle effects**.



Epidermal thickness increase rate

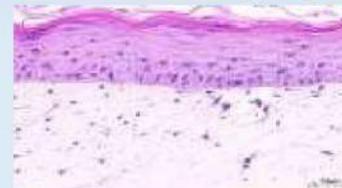
UVA-induced model group

0

New generation Nicotinamide

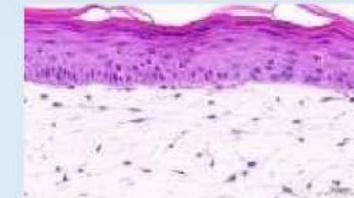
10.97%

Blank control group



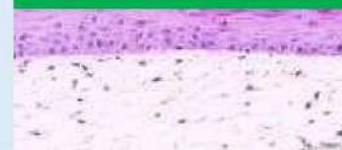
3D full-thickness skin model cells

UVB-induced model group



After UVA induction, the epidermal layer thickness significantly decreased, confirming the effectiveness of the experimental stimulation conditions.

Viablife New generation Nicotinamide



The epidermal layer thickness showed improvement.

new generation Nicotinamide was tested at a concentration of 2%, with the positive control using VC 100 µg/mL + VE

validated as effective.

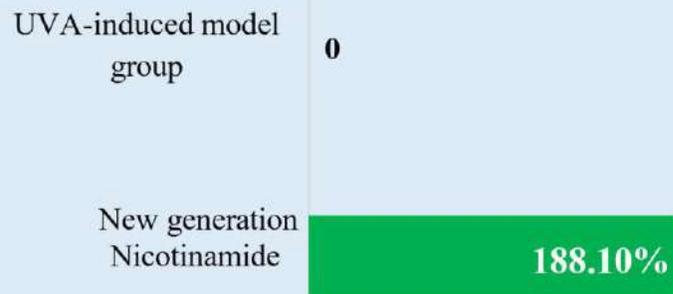
Anti-wrinkle Effect · Significantly Increase in Collagen I

Enzyme Inhibition Test

- New generation Nicotinamide can significantly increase the Collagen I content, demonstrating anti-wrinkle efficacy.



Collagenase Inhibition Rate



Blank control group



In the 3D full-thickness skin model cells, Collagen I is marked by green fluorescence signals.

New generation Nicotinamide



UVB-induced model group



After UVA induction, the Collagen I content significantly decreased, indicating that the experimental stimulation conditions were effective.

new generation Nicotinamide was tested at a concentration of 2%, with the positive control using VC 100 µg/mL + VE

validated as effective.

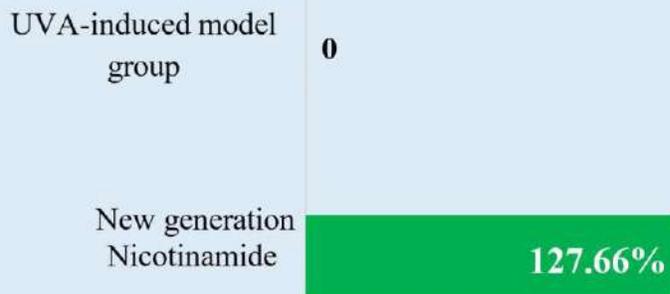
Anti-wrinkle Effect · Significantly Increase in Collagen IV

3D Epidermal Skin Model Testing

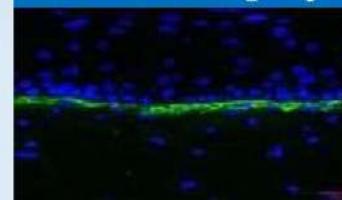
- The New Generation Niacinamide Significantly Increases Collagen IV Content and **Exhibits Anti-Wrinkle Effects.**



Collagen IV Content Elevation Rate

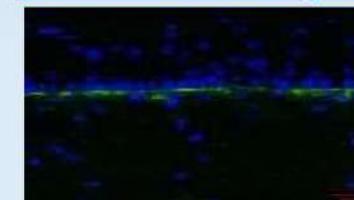


Blank control group



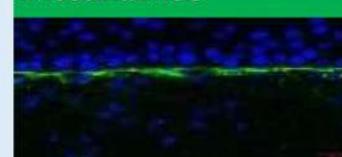
3D Full-Thickness Skin Model Cells, with Collagen IV as Green Fluorescent Signal

UVB-induced model group



After UVA induction, Collagen IV content significantly decreased, indicating that the experimental stimulation conditions were effective

New generation Nicotinamide



Fluorescent Signal of Collagen IV Content Increased

test concentration of the new generation niacinamide was 2%, with the positive control using VC at 100 µg/mL + VE at

confirmed to be effective.

High Concentration Niacinamide Safety · No Sensitization Risk in Human Patch Test at Concentrations of 10% or Below

- **In a human patch test** with 30 subjects, no sensitization reactions were observed at concentrations of 5%, 7%, 8%, and 10% of the new generation niacinamide.

**The New Generation
Niacinamide 100%
Pass Rate**

0 Adverse Reactions

**Reference Item 1
96.7% Pass Rate**

3.3% Adverse
Reactions



10% Addition
Concentration

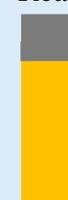
**Reference Item 2
90% Pass Rate**

3.3% Adverse
Reactions



8% Addition
Concentration

6.7% Adverse
Reactions

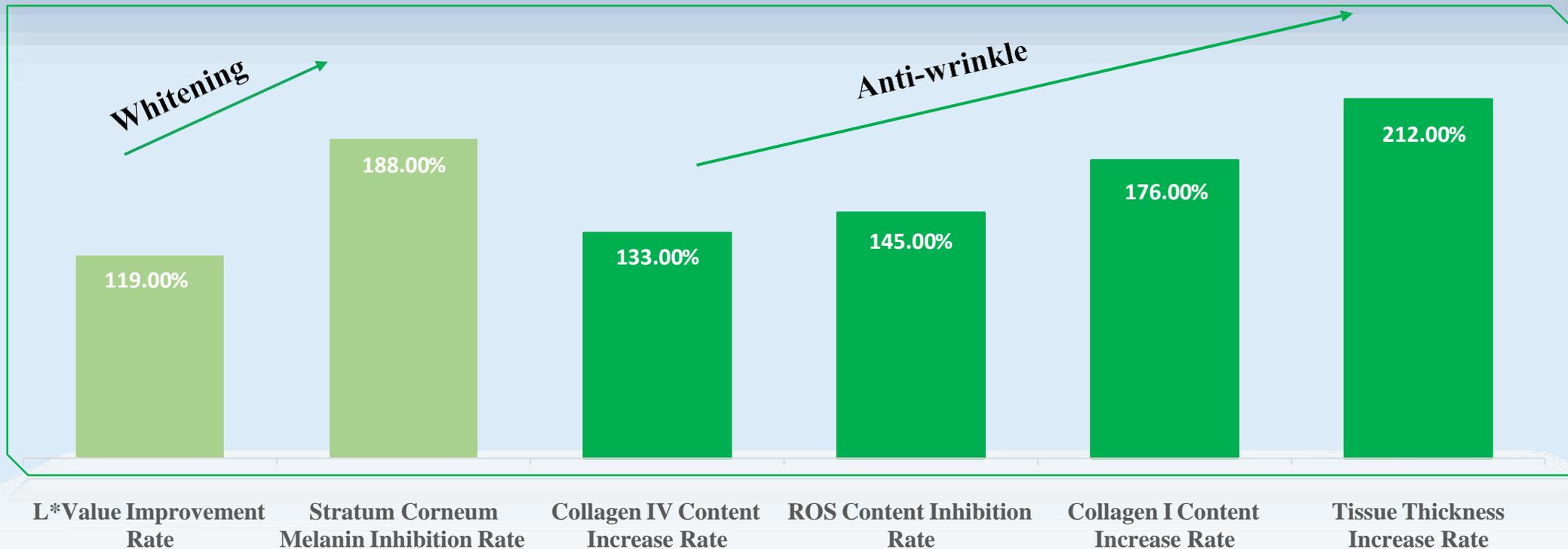


10% Addition
Concentration

Efficacy of High-Concentration

Nicotinamide · 2%→8% Whitening and Anti-Wrinkle Effects Increased by Double

- In the 3D Full-Thickness Skin Model Cell Test, the new generation niacinamide at concentrations of 2% to 8% showed an overall increase in whitening effects (L value improvement rate and stratum corneum melanin particle inhibition rate) by **119-188%**, and anti-wrinkle effects (ROS content inhibition rate, stratum corneum thickness improvement rate, type I collagen increase rate, and type IV collagen increase rate) by **133-212%**.

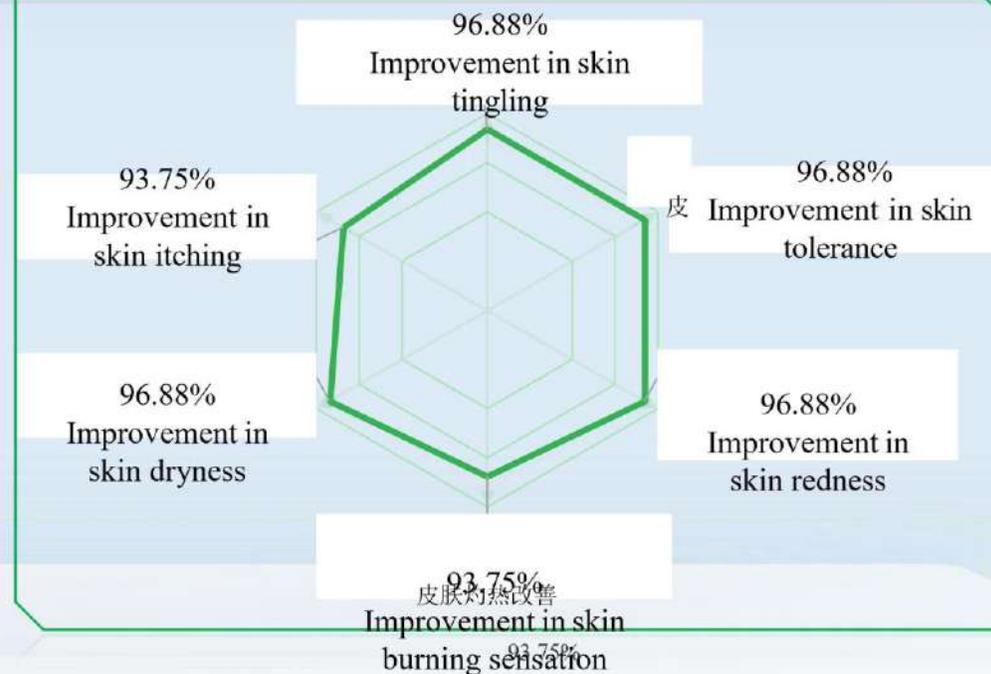
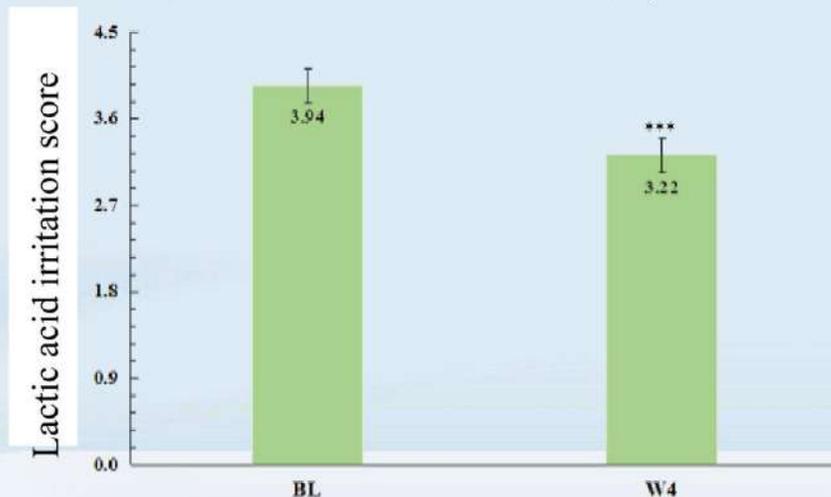


High-concentration Nicotinamide Human Test

10% New Generation Nicotinamide Human Test for 4 Weeks Without Stinging Reactions

- In a test with 32 subjects who were positive for lactic acid stinging (total score ≥ 3), continuous use of a product with 10% new generation niacinamide for 4 weeks resulted in an **18.27% decrease** in lactic acid stinging score, **demonstrating mildness (no irritation)**, suitable for sensitive skin.

Analysis of the Change in Average Total Lactic Acid Stinging Score Before and After Use of 10% Niacinamide Formula Sample



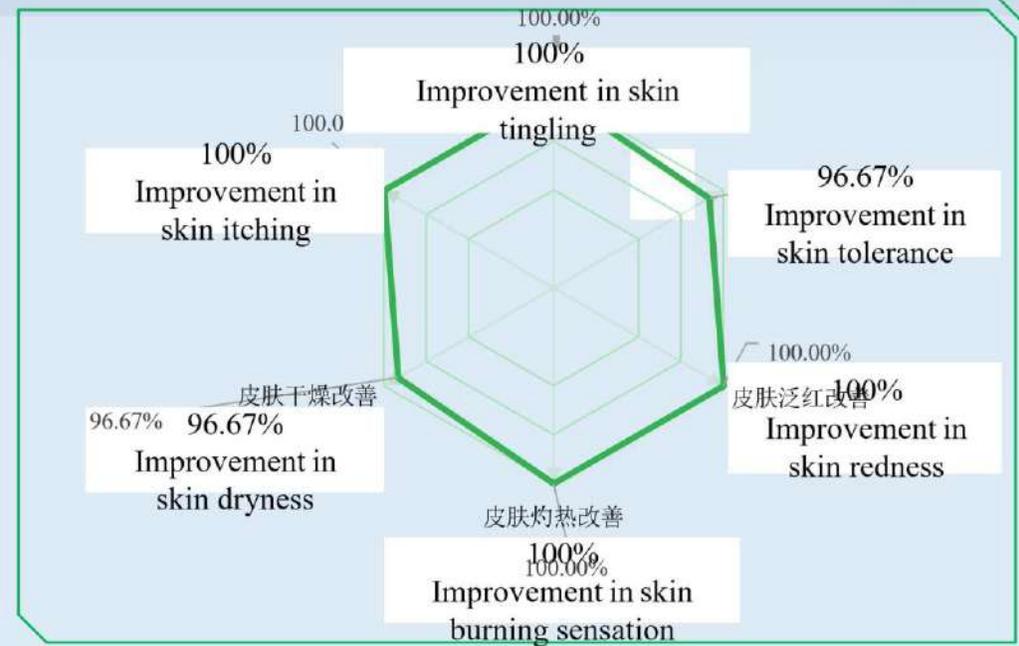
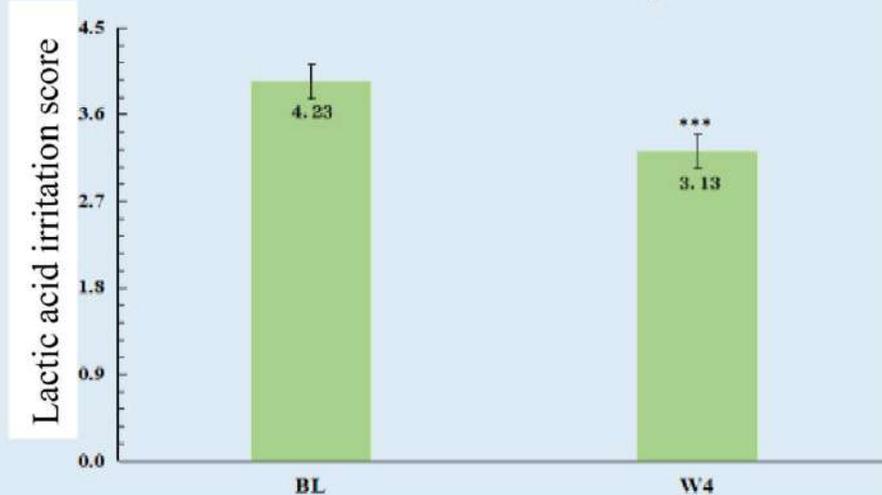
High-concentration Nicotinamide Human Test

15% New Generation Nicotinamide Human Test for 4 Weeks

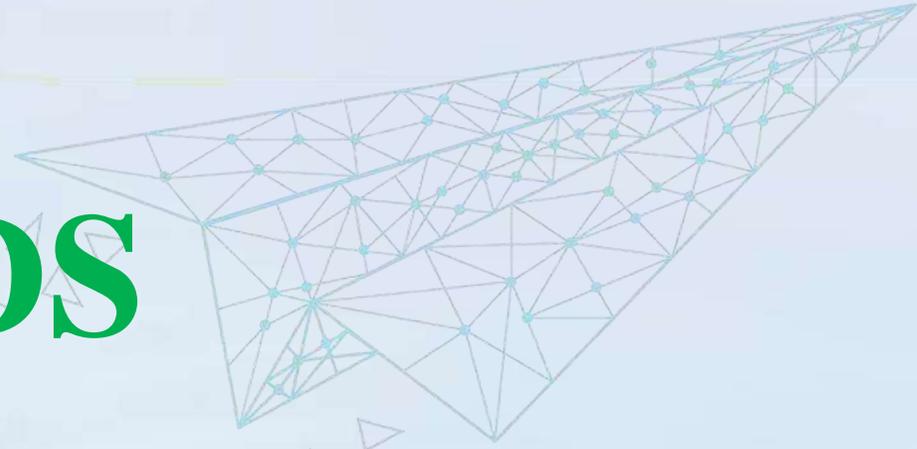
Without Stinging Reaction

- in a test with **30 subjects who were positive** for lactic acid stinging (total score ≥ 3), continuous use of a product with **15% new generation niacinamide** for 4 weeks resulted in a 26.00% decrease in lactic acid stinging score, **demonstrating mildness (no irritation)**, and is suitable for sensitive skin.

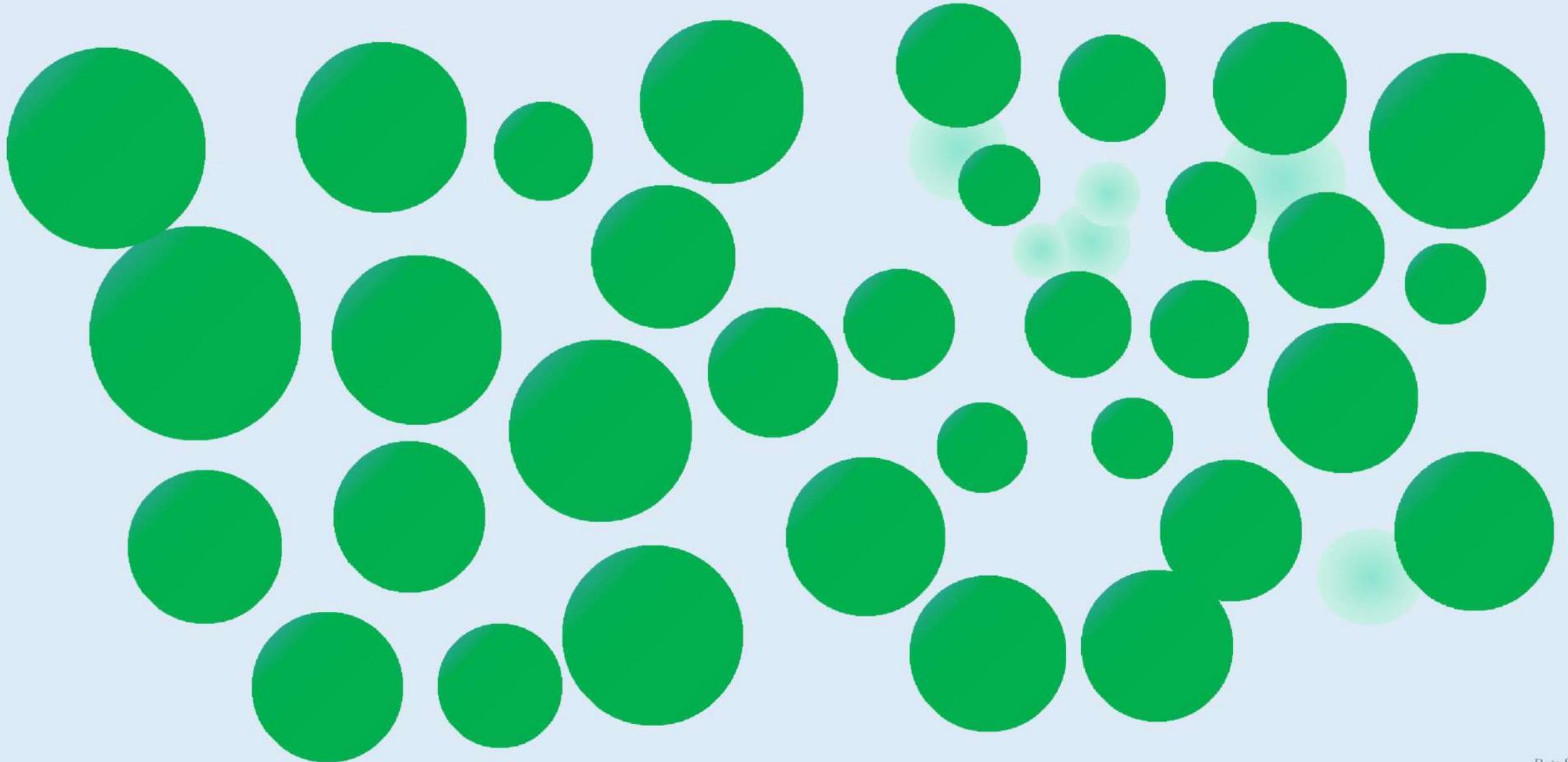
Analysis of the Change in Average Total Lactic Acid Stinging Score Before and After Use of 15% Niacinamide Formula Sample



NEW TRENDS



New Trend · New Generation Nicotinamide Partners with Numerous High Quality Customers



New Trend • New Generation Nicotinamide Partners with Numerous High Quality Customers

- As of November 2024, we have served and collaborated with **over 400** global brand clients and more than 10 domestic listed companies
- Six of our clients have entered the **Top 10** of the 2023 Skincare Brand Rankings

2023 Domestic Skincare Brand Performance Ranking

