



Good Quality Comes  
From Qualified Materials

# Next-Generation Sophorolipid

**Ingredients for**  
**Hair, Scalp & Preservation:**

***HC401, HV201 & SL415***



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- 02 SpecKare<sup>®</sup> HC 401 Introduction**
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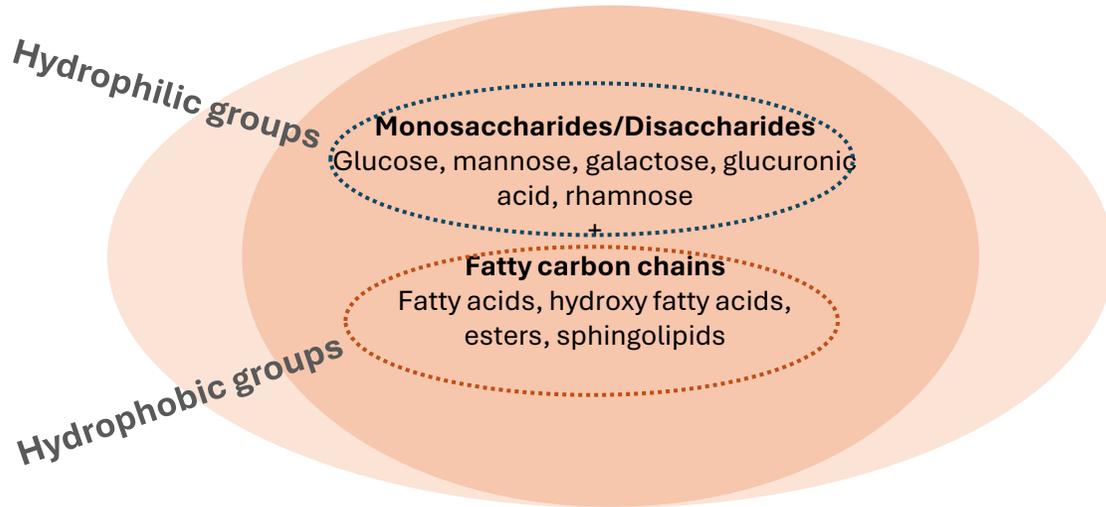




# Sophorolipids

# 01 Discovery of Sophorolipid

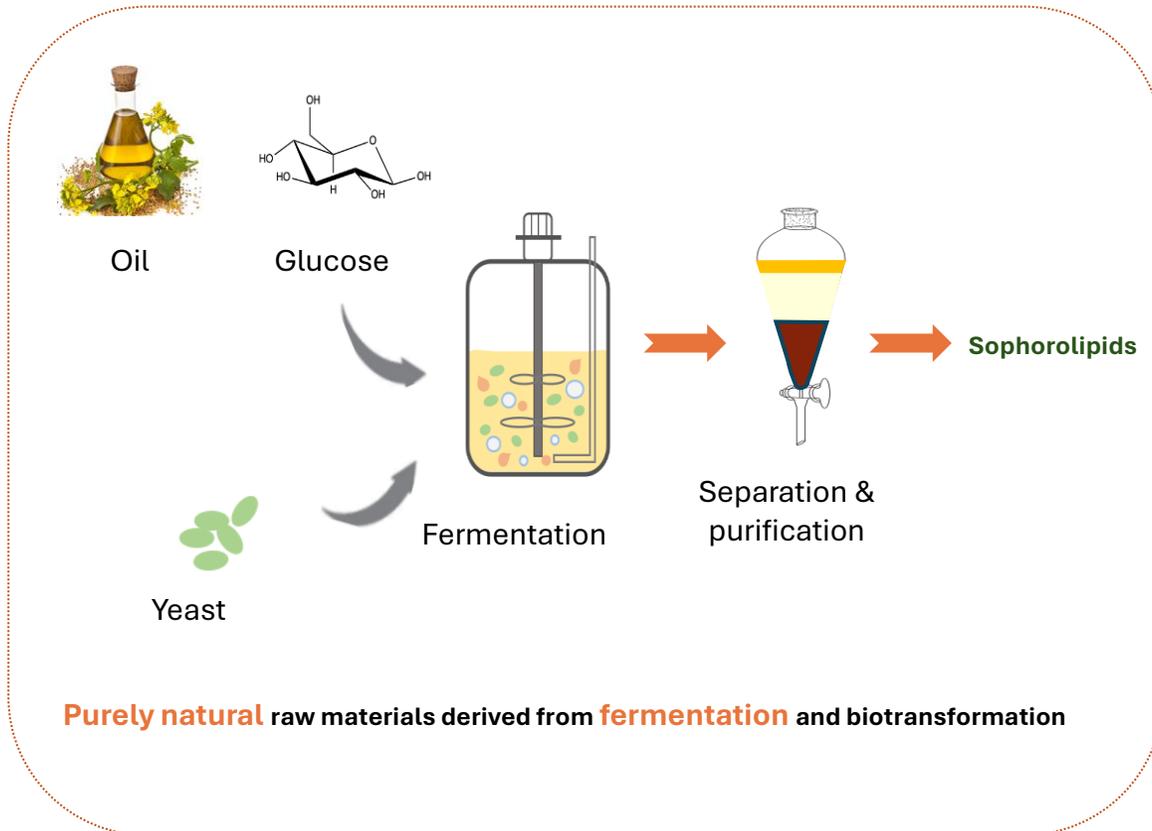
## Glycolipid biosurfactants



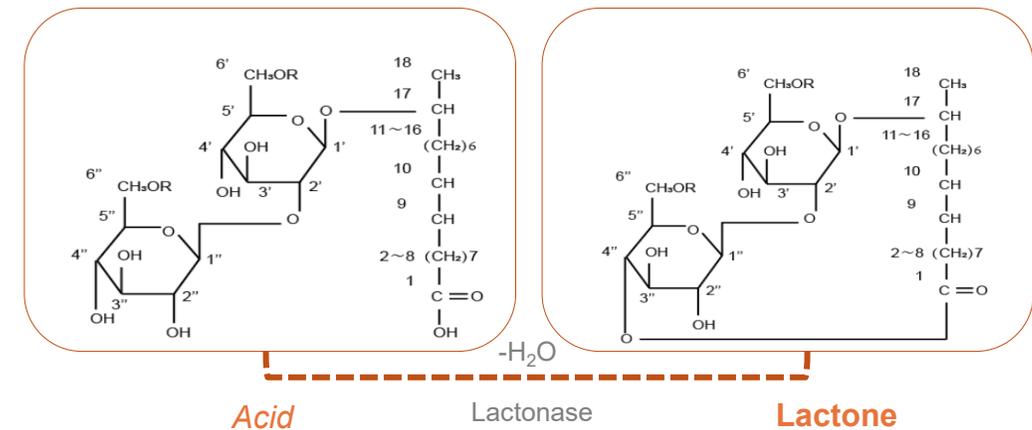
- ◆ In the 1950s, scientists discovered microorganisms in oil fields that could produce surfactants for the first time. Two types of bio-based surfactants, *glycolipids* and *lipopeptides*, were identified.
- ◆ In the 1990s, scientists isolated *Candida Bombicola* with high sophorolipid production, and the fermentation, separation, and purification processes of sophorolipids became gradually matured
- ◆ Since the 21<sup>st</sup> century, the application properties of sophorolipids have been widely studied, and they have been increasingly used in oil extraction, agriculture, and daily chemicals

- ✓ Glycolipids belong to low molecular weight biosurfactants and exhibit good surface activity.
- ✓ Sophorolipid has been added to the EPA SCIL (Safer Chemical Ingredients List) of Surfactants
- ✓ Its ingredients are proven to be safe for users and the environment.

# 01 Sophorolipid Production

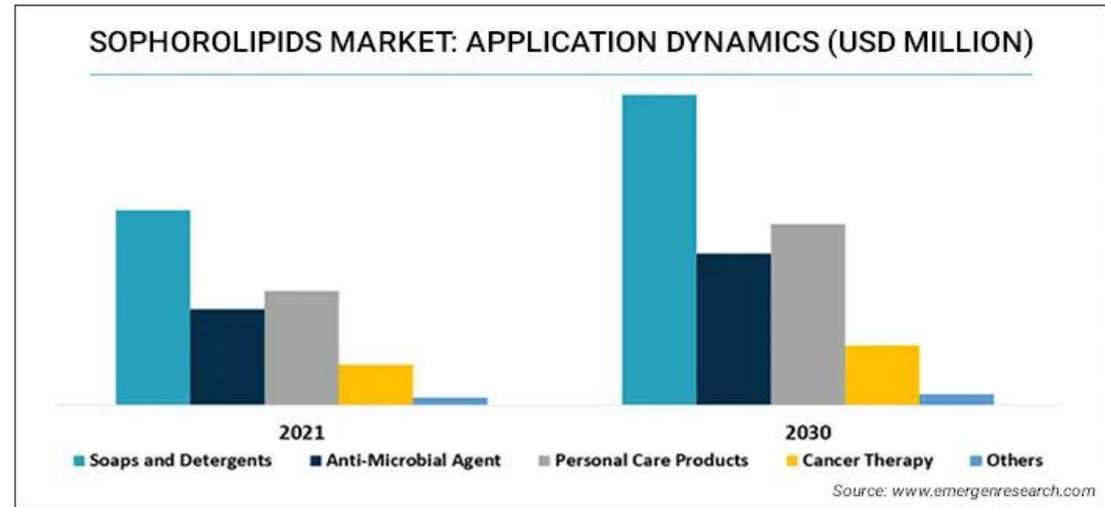
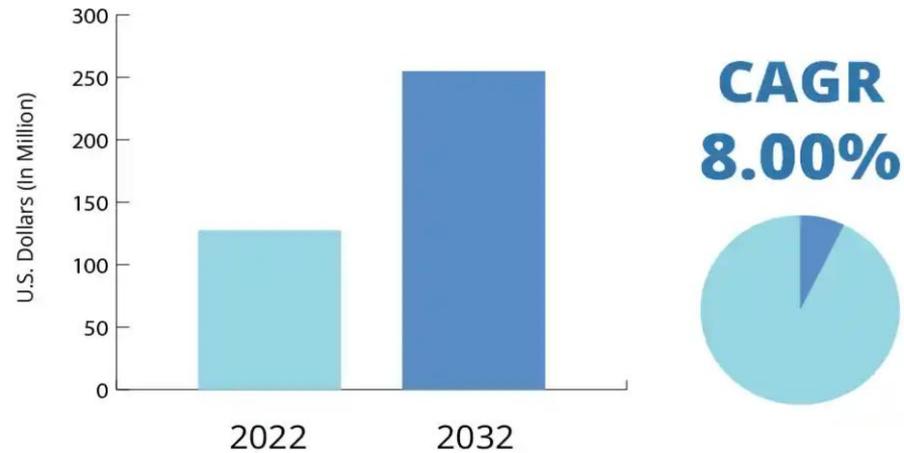


- ◆ The fermentation **yield is significantly higher** than other biosurfactants and is the most cost-effective biosurfactant.
- ◆ Natural Candida fermentation process produces a **mixture of two types** of sophorolipids (SLs).



# 01 Market and Property of Sophorolipid

Sophorolipids Market Size, 2022-2032



## Natural

Non-GMO, 100% biobased



## Sustainable

Readily biodegradable, Eco-friendly



## Gentle

Safe and mild



## Multifunctional

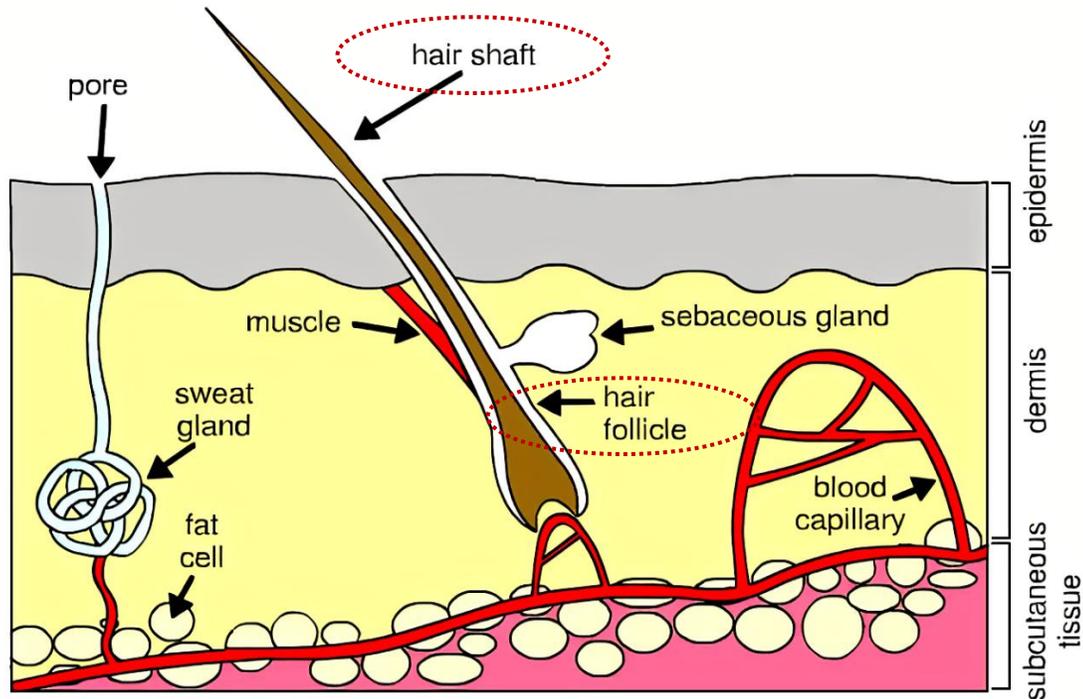
Non-ionic and anionic uses, can act as primary or secondary surfactants

# SpecKare<sup>®</sup> HC 401

- Repair & Strengthening
- Color protection
- Conditioning / Easy combing



# 01 Hair Structure



Hair consists of 2 parts: the hair follicle and the hair shaft.  
Hair follicles have two important parts:

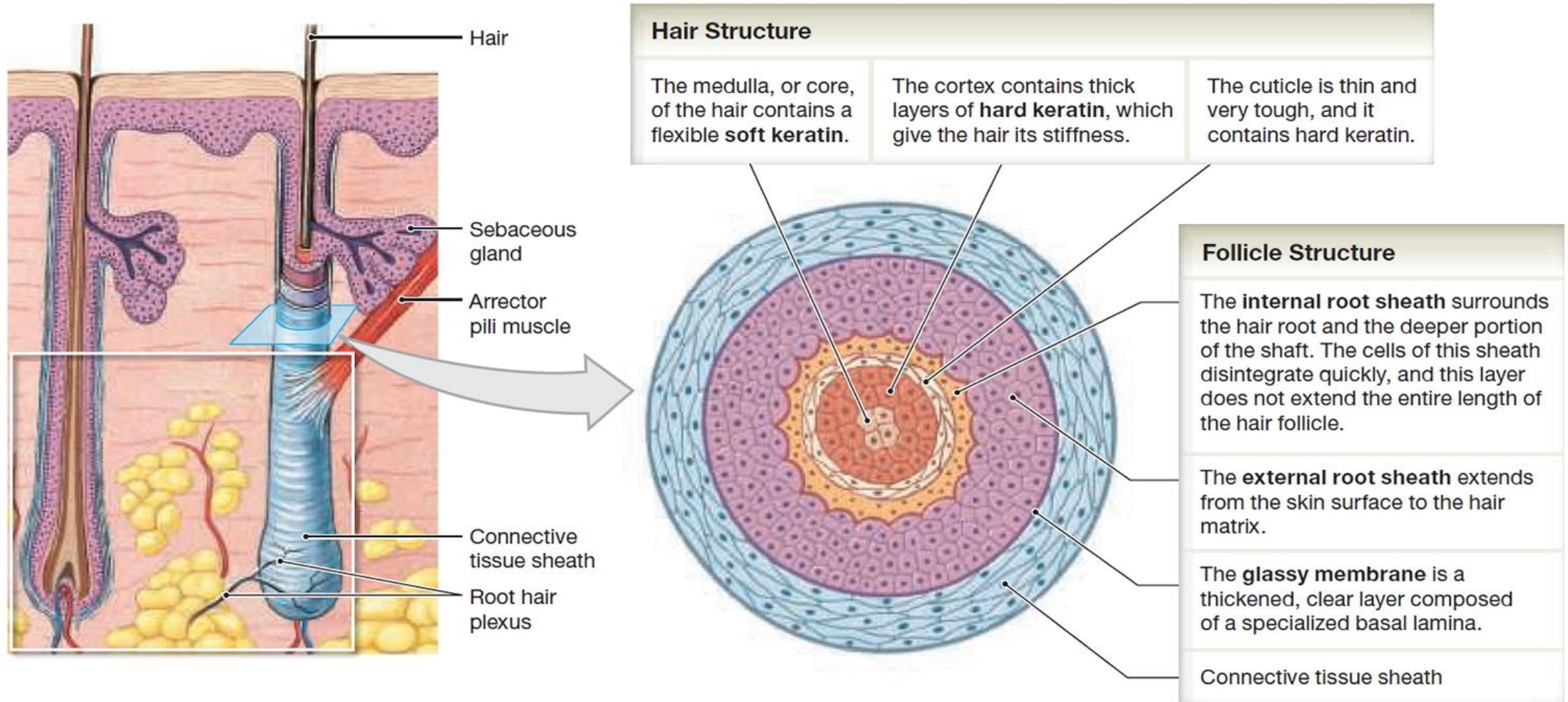
---One of which is sebaceous, its function is secreting sebaceous gland so that hair becomes soft, shiny and waterproof. The changes of sebaceous gland activity are the cause of oily hair condition or dry hair.

---The second part is very small muscle fibers for fixing hair on the scalp.

Hair shaft has no biochemical exchange, so we do not feel pain when cutting hair.

Structure of each hair is a decisive factor to health, thickness, length, the sleek, color as well as growth cycle.

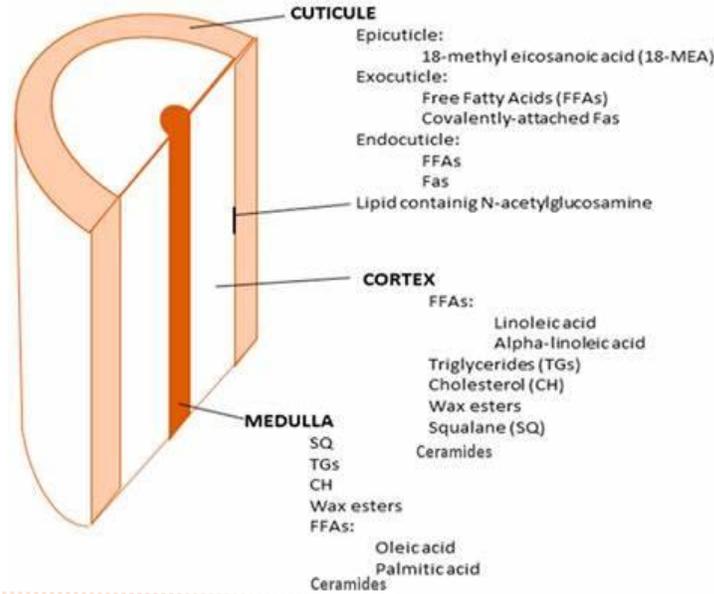
# 01 Hair Structure



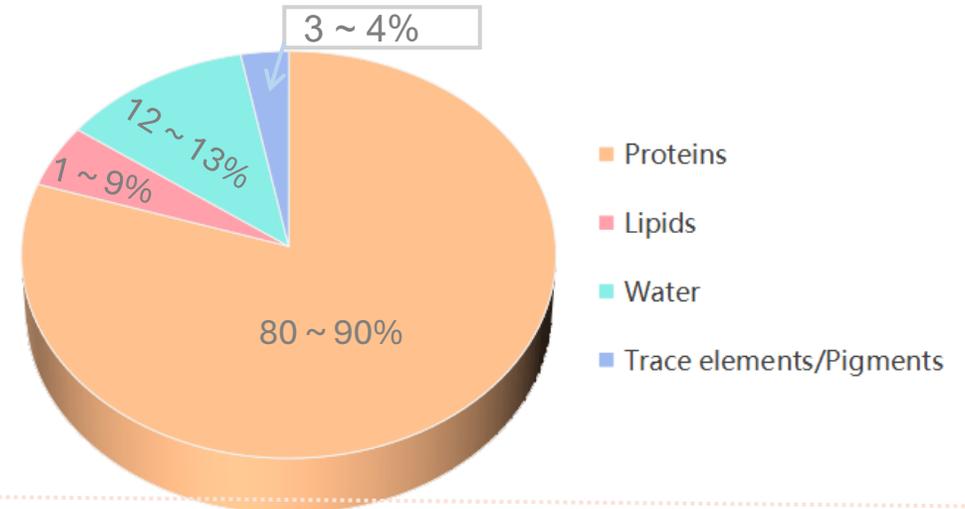
A longitudinal section and a cross section through a hair follicle

# 01 Hair Chemical Composition

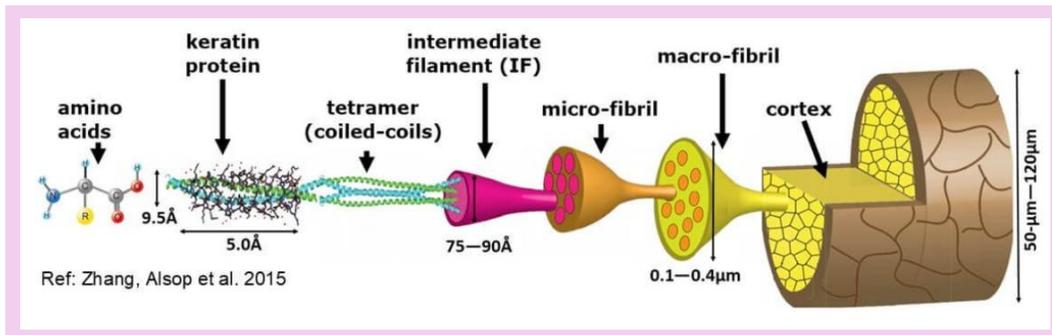
Hair Shaft Structure



Hair Chemical Composition



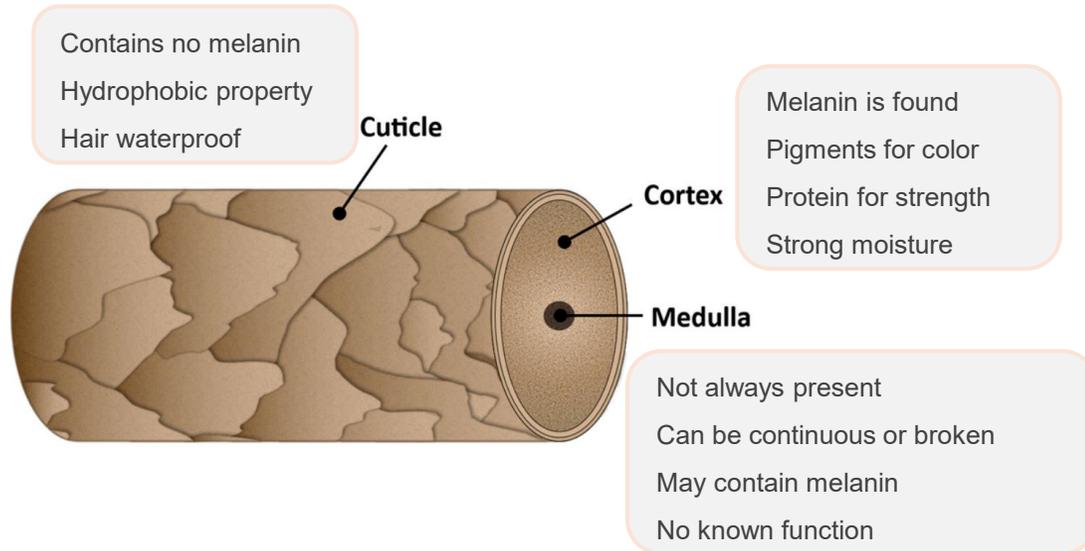
Hair Cortex Structure



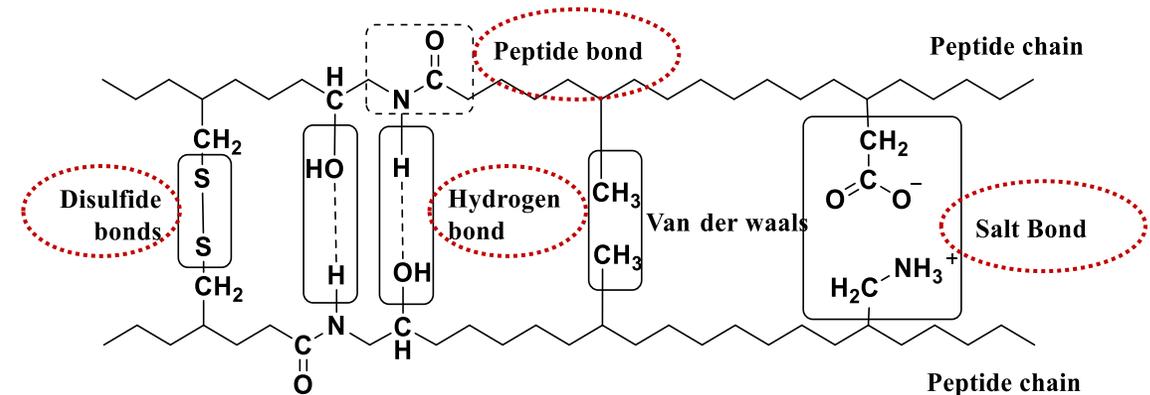
Human hair fibers are mainly comprised of proteins and lipids (1–9%). Hair shaft is made up of 3 parts: Medulla, cortex and cuticle. Cortex is the most important part of hair, accounting for 80% of hair including fibrillary bundles. Hair cortex decides shape, size, color, moisture, strength, elastic of hair.

# 01 Hair Structure & Performance

## Three Layers of the hair

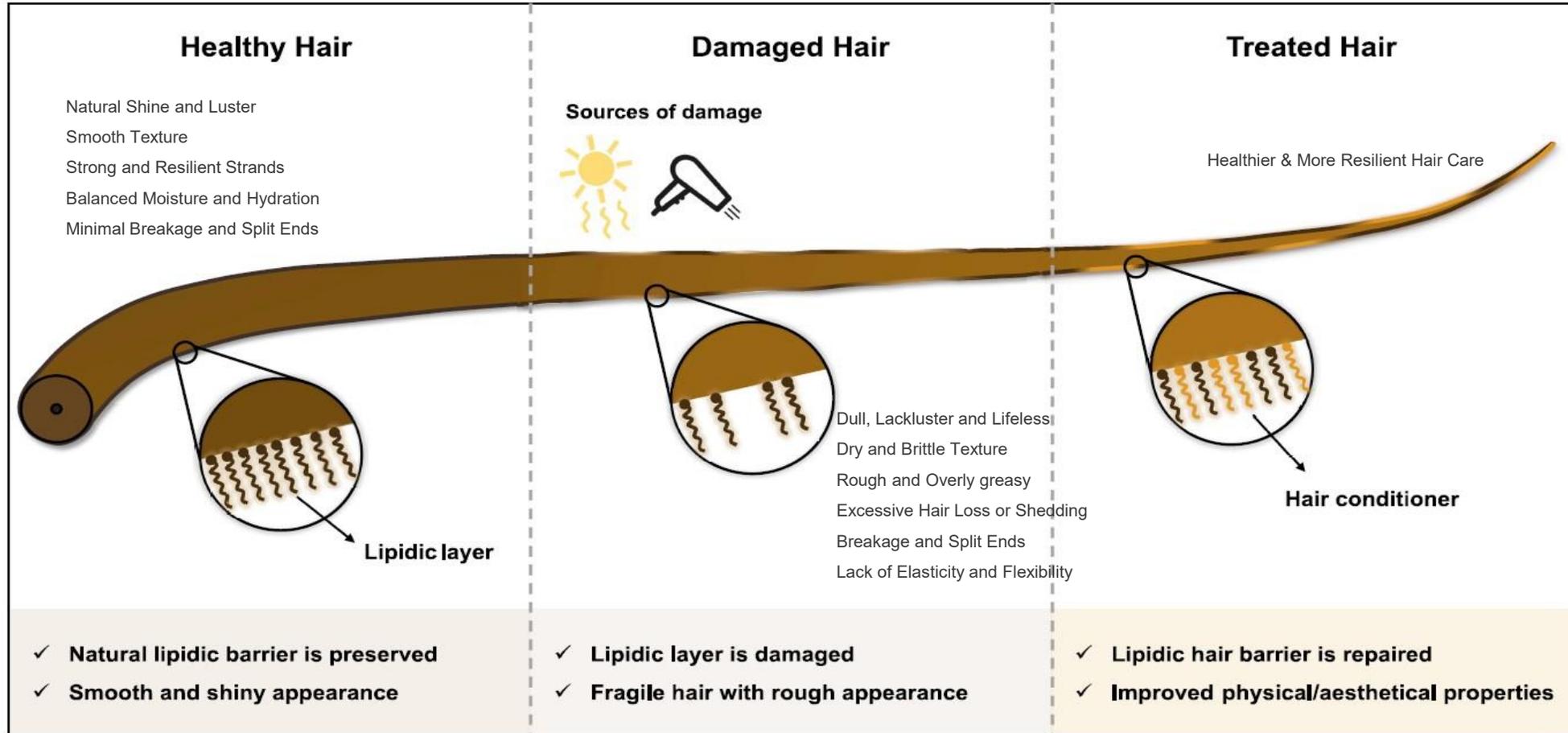


## Four Chemical bonds of the hair



The hair fiber is a hard alpha-keratin (protein) fiber, composed of microfibrils (Keratin Intermediate Filaments, KIF), which are made of orderly assembled alpha-helices of amino acids, and keratin-associated proteins (KAP), which form the intermicrofibrillar matrix. This forms the cortex of the hair fiber, which is, in turn, enclosed by the cuticle; flat, overlapping scales and comprised of proteins and lipids.

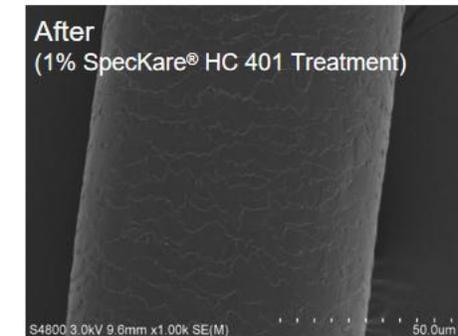
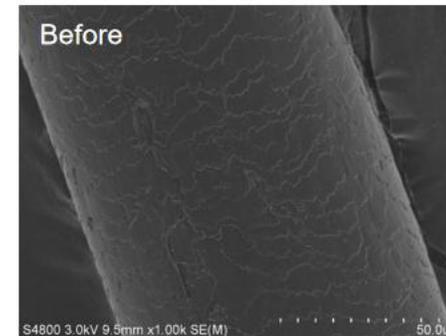
# 01 Hair Performance



# 02 Product Information of SpecKare® HC 401

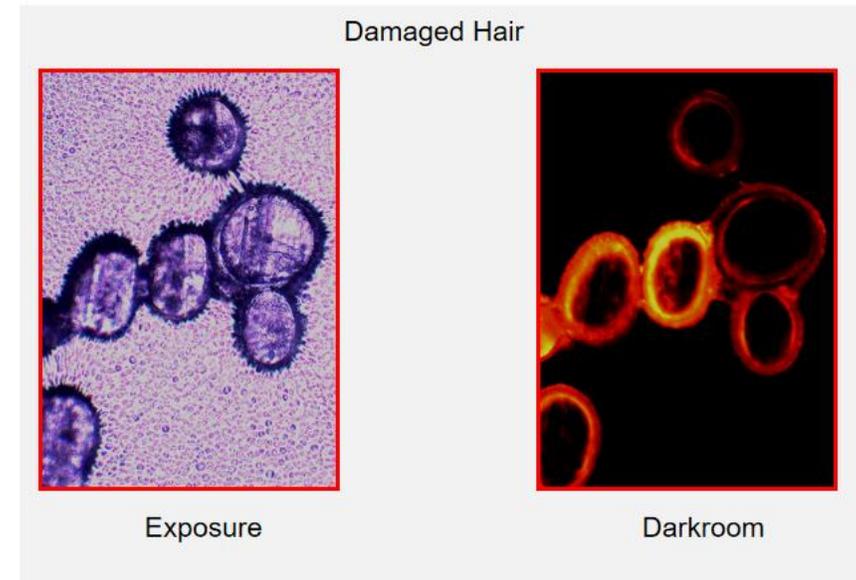
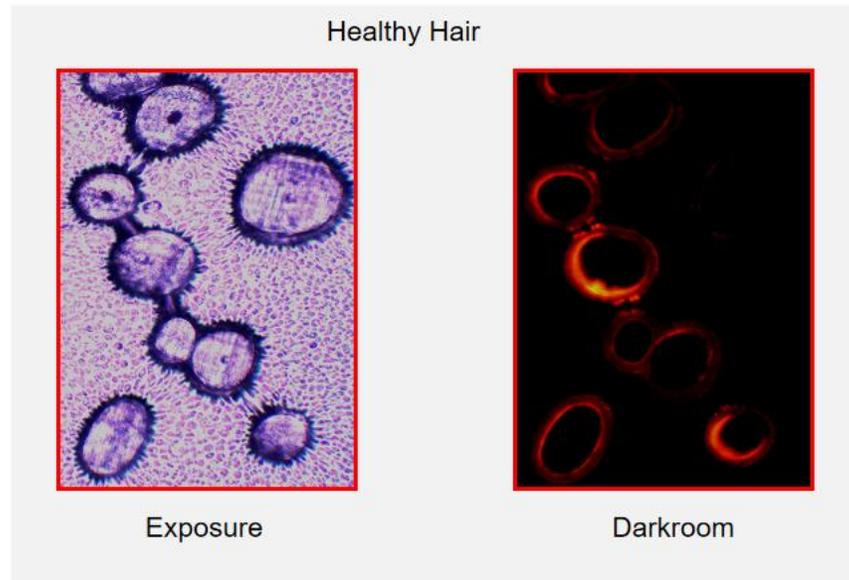
Product Name	SpecKare® HC 401
Product Code	17003500
INCI Name(Active)	Hydrolyzed Collagen, Hydrolyzed Pea Protein, Glycine, Carnosine, Yeast Ferment Extract
Appearance	Yellow to Brown Clear Liquid
pH	5.0-7.0
Rec. use level	1-2.5%
Application	Hair Care: shampoo, Conditioner, Serum, Spray
Usage	Water-soluble, Added at the post-production stage

- ◆ **SpecKare® HC 401** is a combination of low molecular protein, glycine with carnosine and Yeast Ferment Extract. It can make hair more healthier and resilient and can be used in hair care products for damaged hair.



## 02 SpecKare<sup>®</sup> HC 401 Action Mechanism

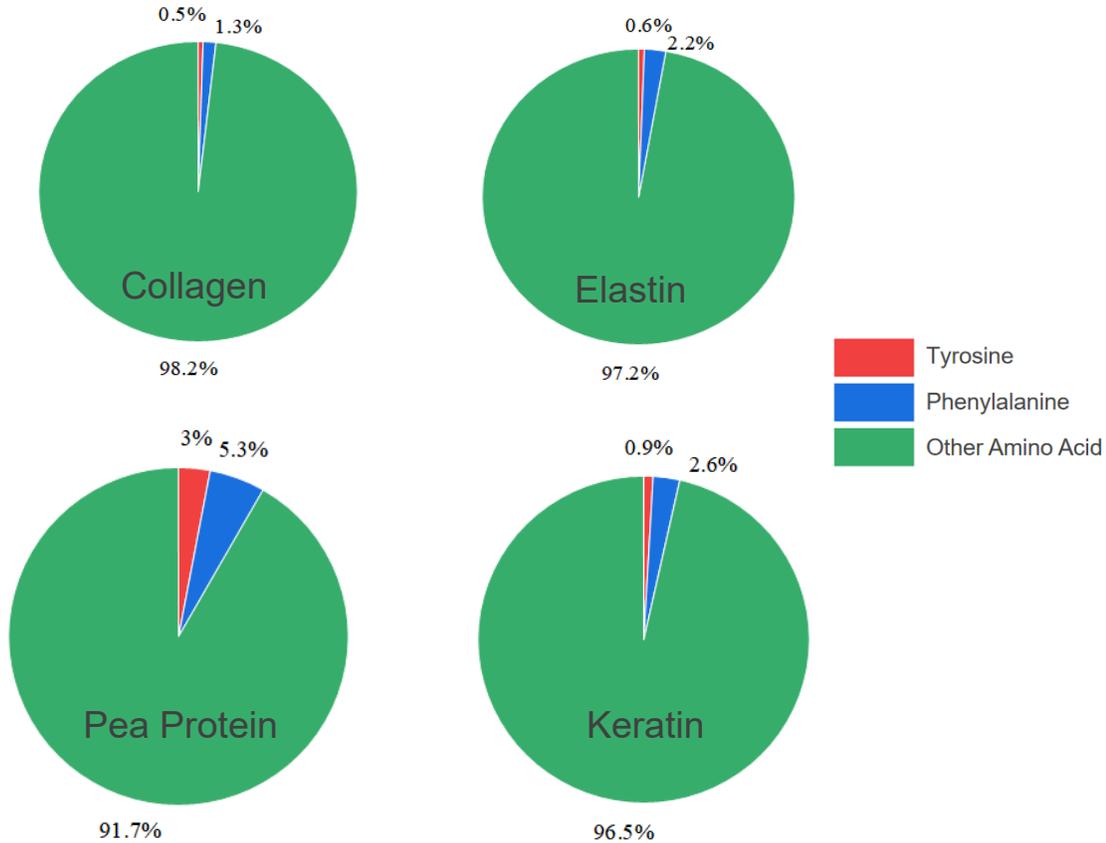
### ➤ Proteins deposition test



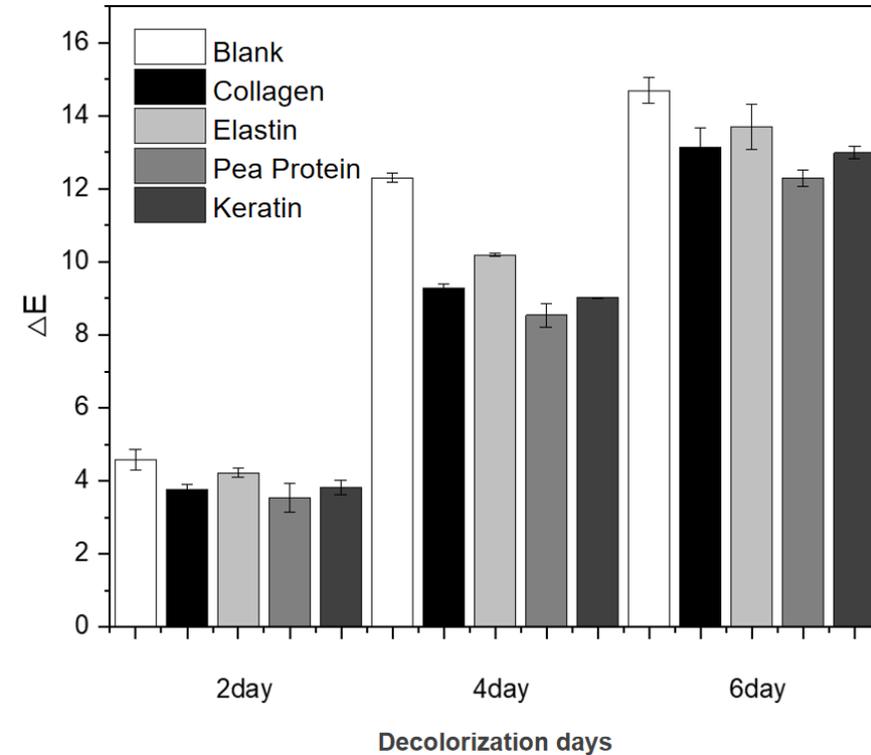
### Results:

- Fluorescence Labeling test results showed that low molecular proteins filled the voids and gaps of hair scales to achieve hair care effect by targeted deposition.

# 02 SpecKare<sup>®</sup> HC 401 Action Mechanism



## ➤ Color protection effect of different protein



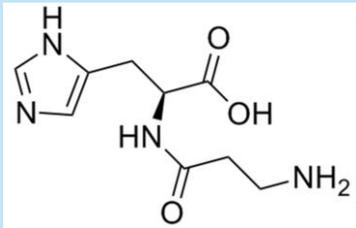
### Results:

Tyrosine and phenylalanine have UV-absorbing groups, which can absorb ultraviolet light and inhibit the photodegradation of pigment. The contents of tyrosine and phenylalanine were higher in the pea protein, which have better color protection property.

# 02 SpecKare<sup>®</sup> HC 401 Action Mechanism

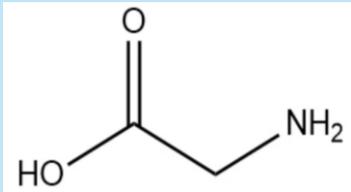
## ➤ Reconstructing ionic bond and hydrogen bond to compensate disulfide bond loss

Carnosine

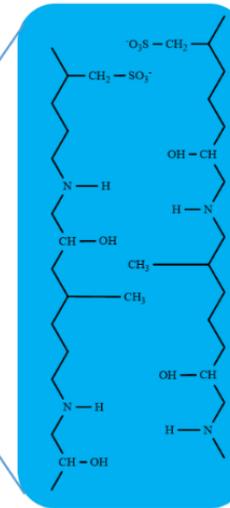


Carnosine binds with keratin to improve the crystallinity of keratin and increase the melting peak.

Glycine

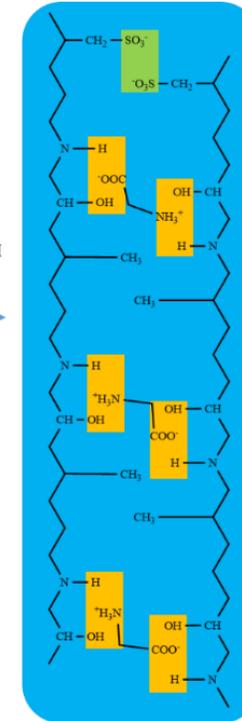


Glycine binds to keratin to repair and strengthen ionic and hydrogen bond networks.



ionic bond

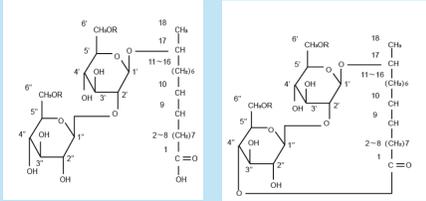
hydrogen bond



# 02 SpecKare<sup>®</sup> HC 401 Action Mechanism

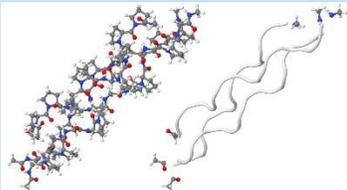
## ➤ Repairing cuticles scale and balanced moisture & hydration

Yeast Ferment Extract

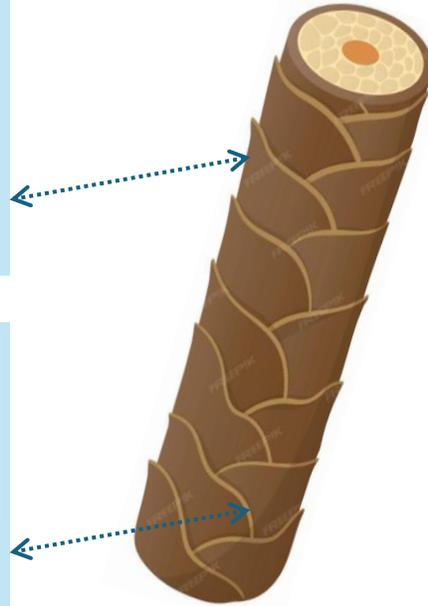


Increase moisture content in hair and reduce static electricity

Low Molecular Protein

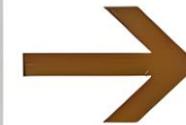
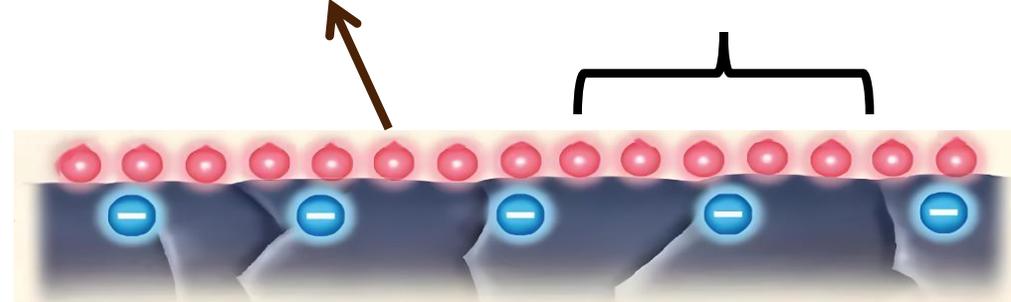


Protein can fill the hair scales, improve the closing ability, and form a water-locking barrier.



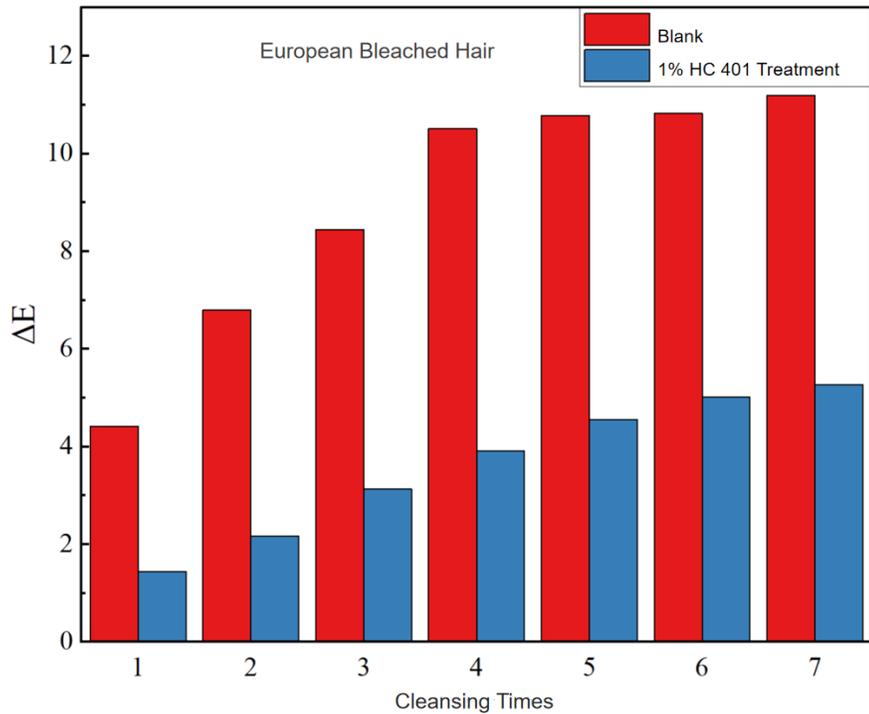
Yeast Ferment Extract

Cover the hair surface



# 02 SpecKare<sup>®</sup> HC 401 Efficacy

## ✓ Color Protection



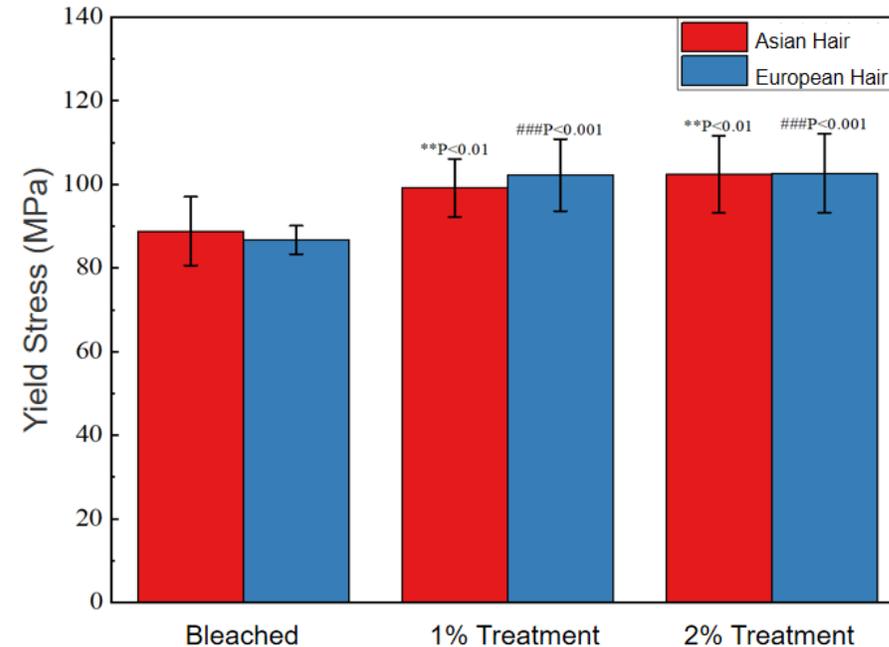
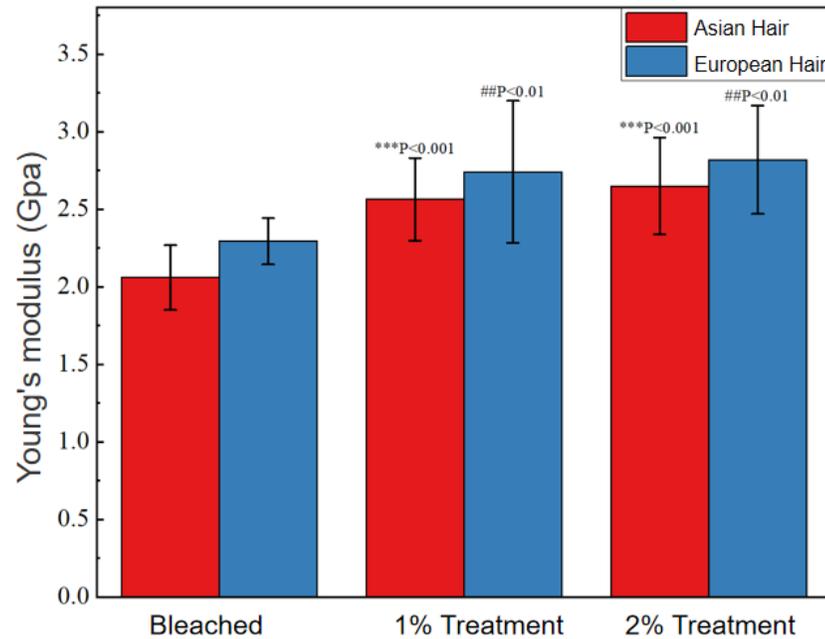
- **Results:**

Using Color Difference Analyzer measurement, compared with blank, after 1% SpecKare<sup>®</sup> HC 401 treatment, the color protection performance of bleached hair was improved significantly.



## 02 SpecKare<sup>®</sup> HC 401 Efficacy

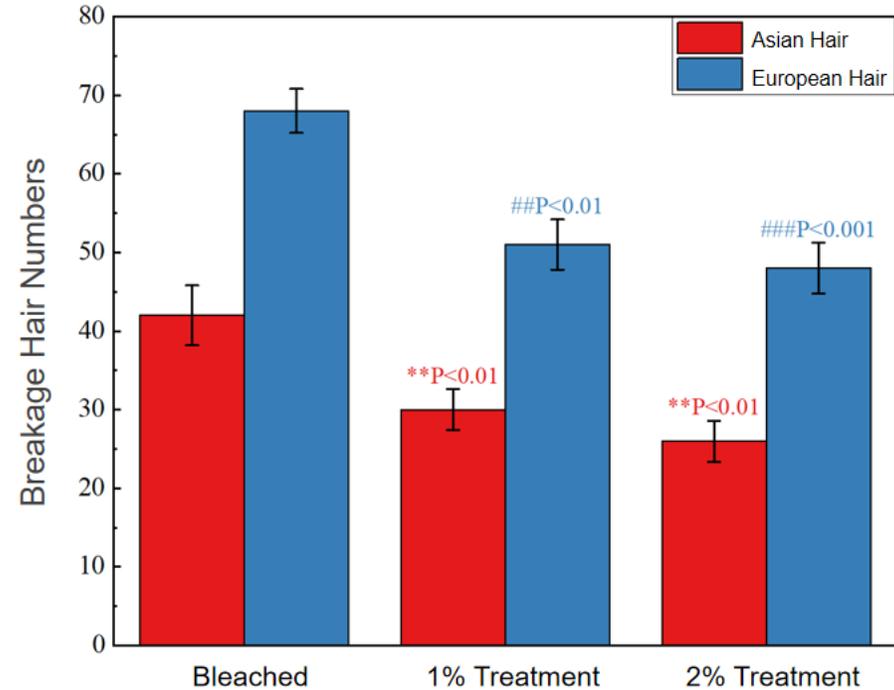
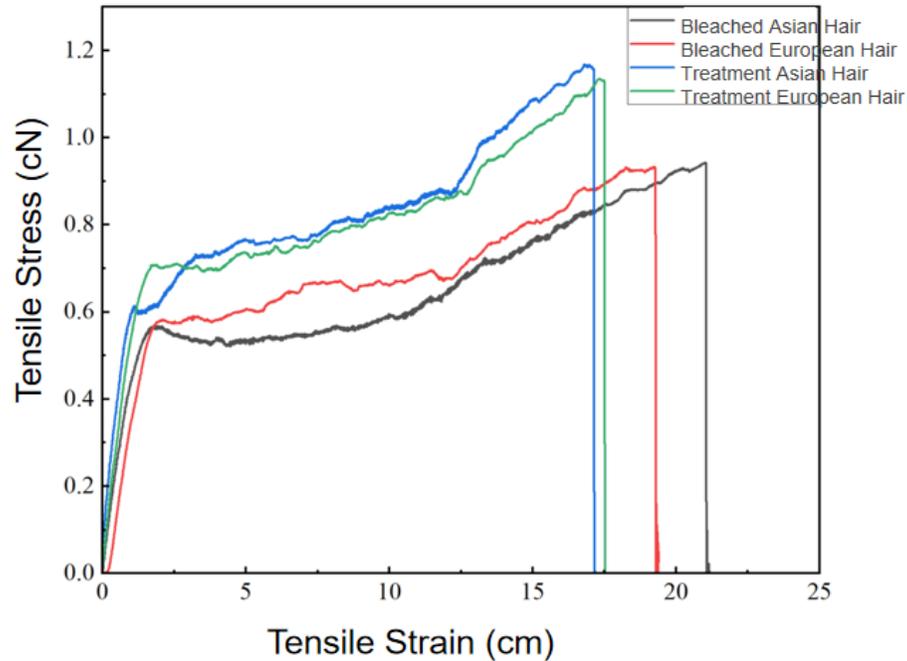
- ✓ Improving hair toughness and resistance to mechanical damage



- **Results:** After SpecKare<sup>®</sup> HC 401 treatment, the Young's modulus and yield stress of hair was significantly increased, effectively improving hair toughness and reducing the broken hair caused by mechanical damage.

# 02 SpecKare<sup>®</sup> HC 401 Efficacy

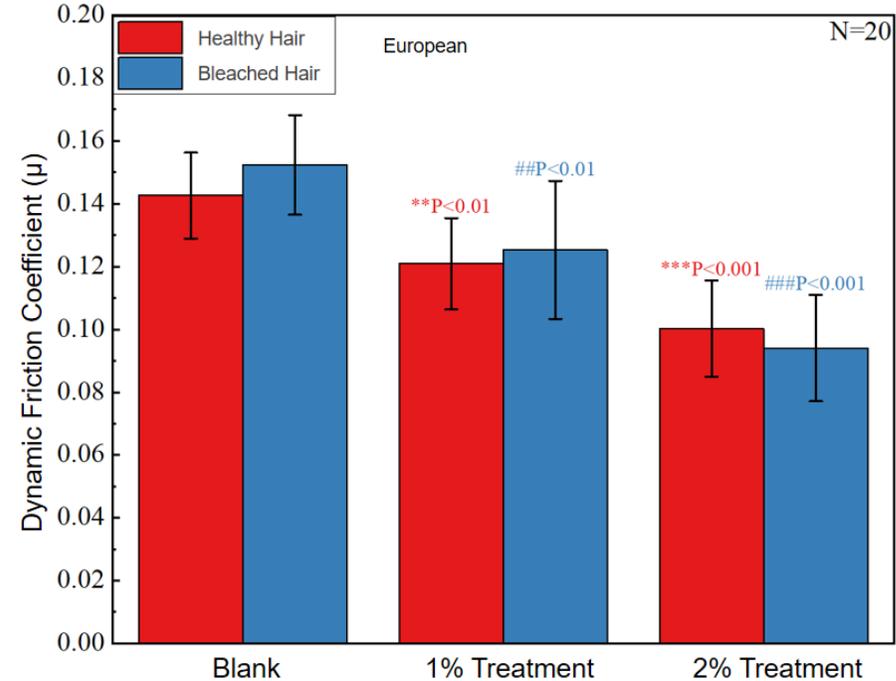
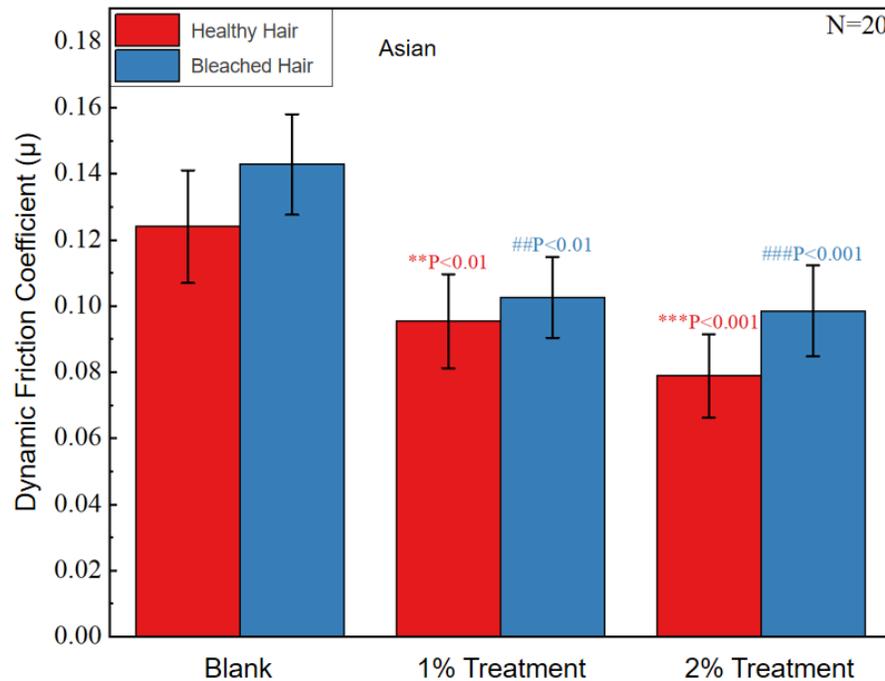
## ✓ Anti-Breakage and Hair Protection



- **Results:** After SpecKare<sup>®</sup> HC 401 treatment, the resistance of hair to mechanical damage was significantly increased, effectively reducing the broken hair caused by mechanical damage.

# 02 SpecKare<sup>®</sup> HC 401 Efficacy

## ✓ Smooth and Soft

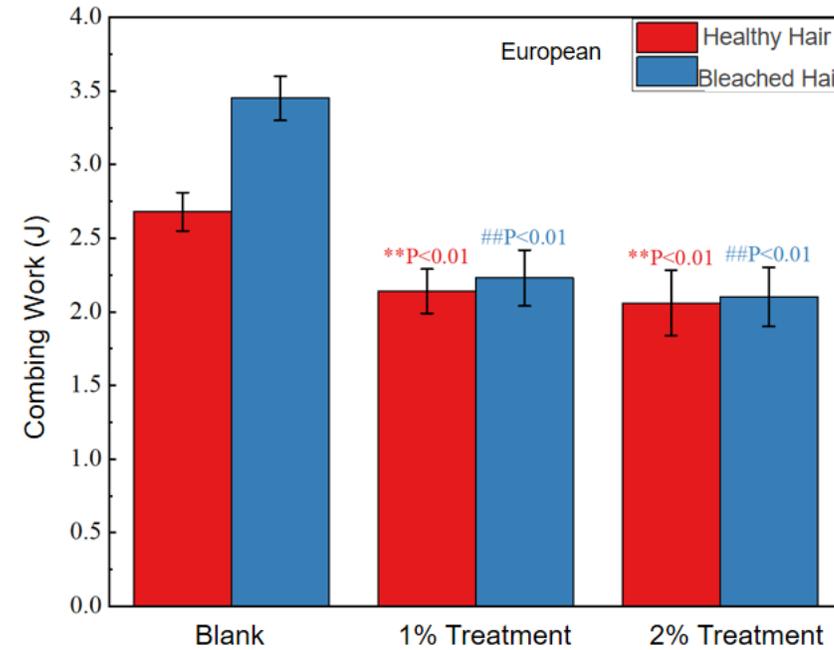
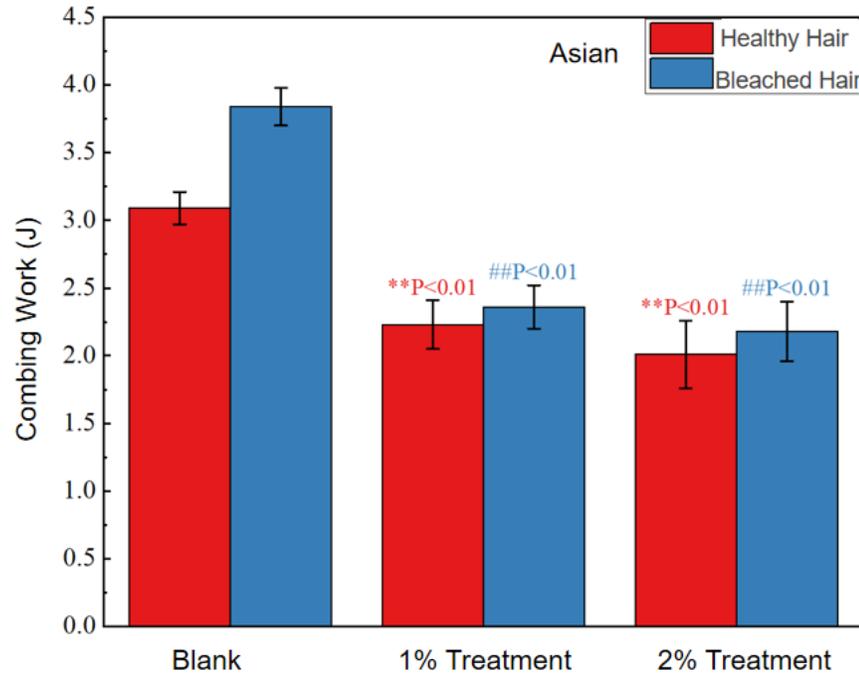


- **Results:**

After SpecKare<sup>®</sup> HC 401 treatment, the dynamic friction factor and roughness of all four hair types was significantly reduced, and the effect is better from 1% to 2%, the hair surface is smoother.

# 02 SpecKare<sup>®</sup> HC 401 Efficacy

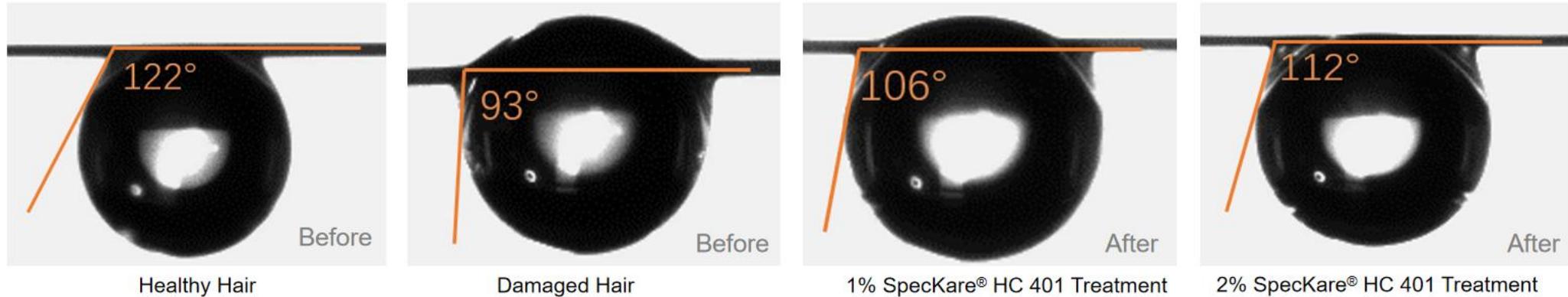
## ✓ Conditioning/Easy Combing



- **Results:** After SpecKare<sup>®</sup> HC 401 treatment, the smoothness of all four hair types was significantly improved, and the effect is increased from 1% to 2%.

## 02 SpecKare<sup>®</sup> HC 401 Efficacy

### ✓ Balanced Moisture and Hydration



- **Results:** After SpecKare<sup>®</sup> HC 401 treatment, the contact Angle between hair and water droplets were significantly enlarged by hanging drop method, which indicated that the product made hair more hydrophobic and had good water retention performance.

## 02 SpecKare<sup>®</sup> HC 401 Efficacy

- **Hair care --- Volunteer Questionnaire**

### Test Method

Subjects: 11 volunteers (9 females, 2 male)

Age range: 20-55 years old

Test site: scalp & hair

Test sample: 1% HC 401 shampoo

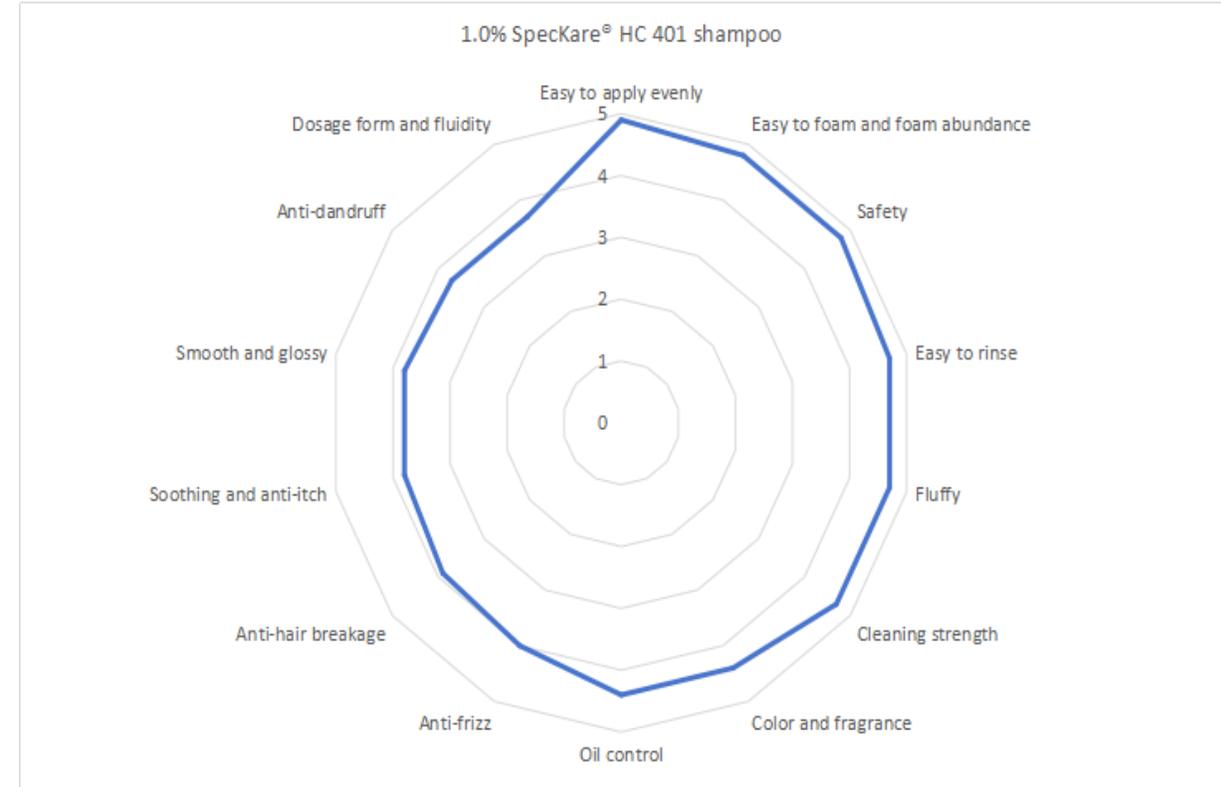
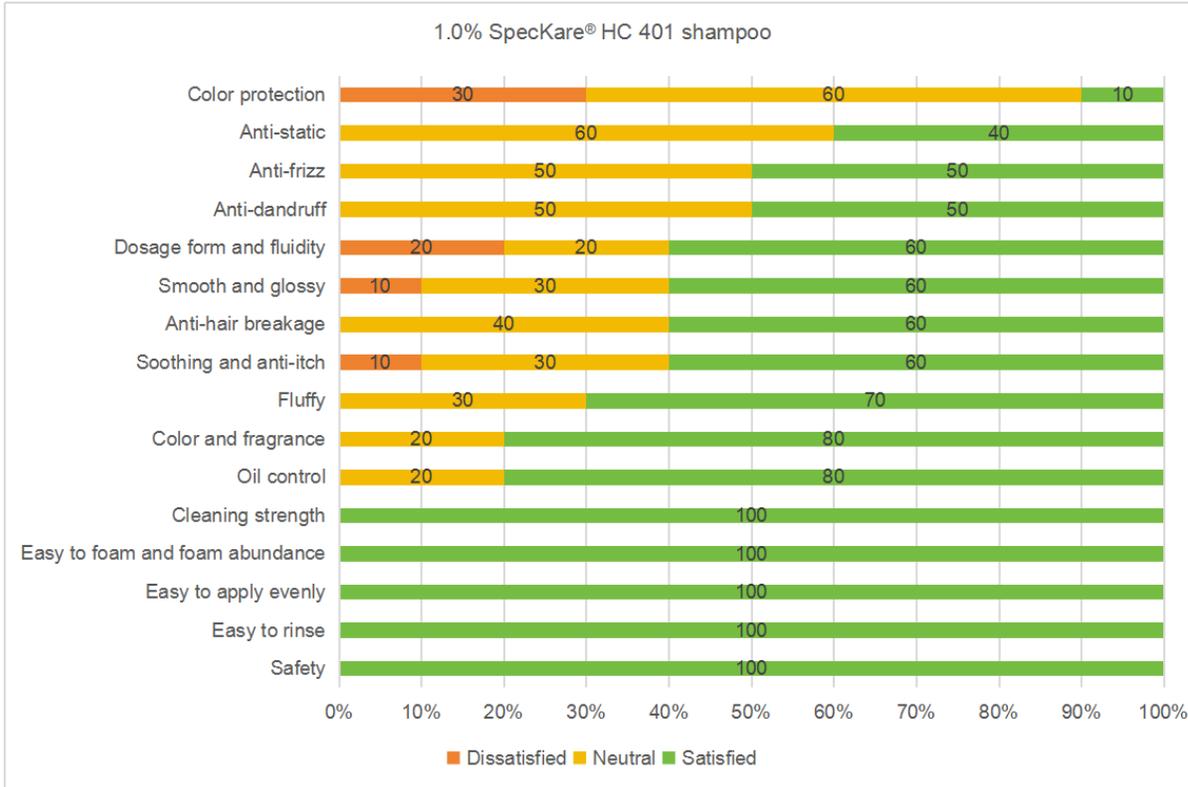
Test period: 28 D

Frequency of use: 2-3 times per week



# 02 SpecKare® HC 401 Efficacy

- **Hair care --- Subjective evaluation** (Anti-frizz, soothing & anti-itch, smooth and glossy, anti-hair breakage, anti-dandruff, oil control, safety, etc.)



## Test results:

- After 28 days, 1% **SpecKare® HC 401** hair shampoo can **obviously sooth scalp, improve hair smooth & soft, glossy, and reduce scalp itch & dandruff and hair breakage, clean and balance oil secretion of the scalp and hair.**
- **Moreover, SpecKare® HC 401 can protect hair color.**

# 03 SpecKare® HC 401 Application

## Clinically Tested Formula

### Smooth Shampoo

SC-AC2412012

w/w %	Trade Name	INCI Name
<b>Part A</b>		
To 100	Water	Water
0.05	Disodium EDTA	Disodium EDTA
12.0	SpecSufc® SLES	Sodium Laureth Sulfate, Water
10.0	SpecSufc® CAB	Cocamidopropyl Betaine, Water
5.0	SpecSufc® APG0814	Coco-Glucoside, Water
1.5	CMEA	Cocamide MEA
<b>Part B</b>		
1.0	SpecKare® HC 401	Hydrolyzed Collagen, Glycine, Hydrolyzed Pea Protein, Carnosine, Water, Yeast Ferment Extract, 1,2-Hexanediol, Ethylhexylglycerin
2.0	SpecKare® PQ-7	Polyquaternium-7
0.1	SpecPure® HK	Hydrolyzed Keratin
1.0	ParbFree® HE91	1,2-Hexanediol, Ethylhexylglycerin
<b>Part C</b>		
0.15	Fragrance	Fragrance
q.s	SpecPure® CAD	Citric Acid
0.4	NaCl	Sodium Chloride

#### ➤ Formula features:

The shampoo formula contains 1.0% SpecKare® HC 401, it has features as below: rich foam, good cleaning power, easy to rinse; effectively repair the cuticle and hair scales, increase hair luster and hydration; strengthen hair and reduce breakage; improve combing, reduce dry and split hair, make hair fluffy and smooth.

#### ➤ Procedure:

1. Heat Part A to 85 °C, stir until completely uniform.
2. Cool down to 45°C, add Part B and Part C, stir until completely uniform.
3. Cool down to room temperature.

#### ➤ Properties:

Appearance: Light Yellow viscosity liquid

pH: 6.0±0.5

Viscosity(25°C, 2#, 30 rpm, mPa·s): 2000±500



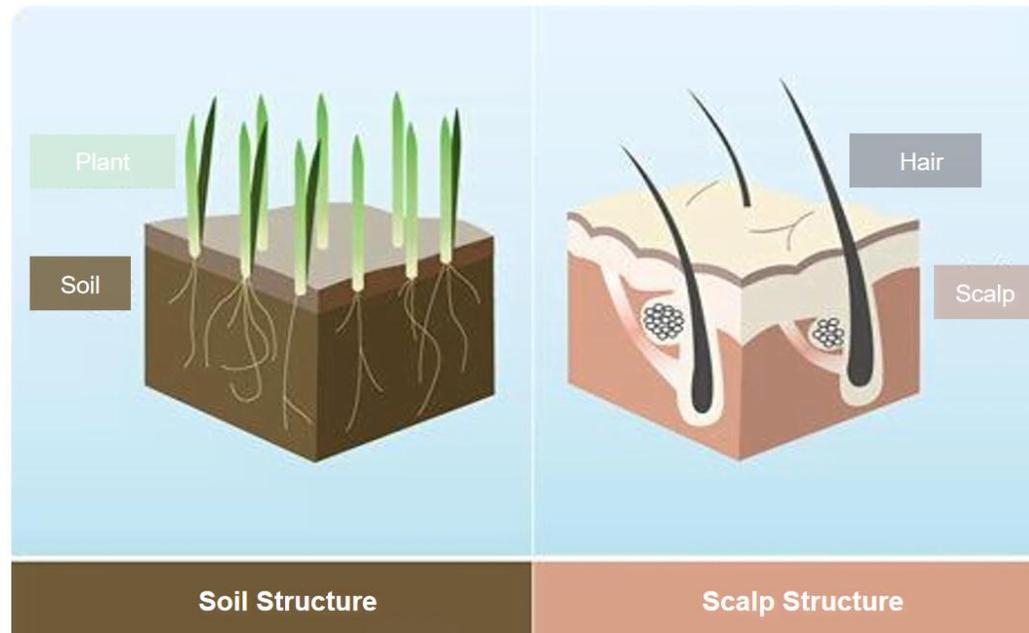
# SpecKare<sup>®</sup> HV 201

- Anti-hair loss
- Promoting VEGF secretion
- Regulating cell cycle
- Increasing hair density

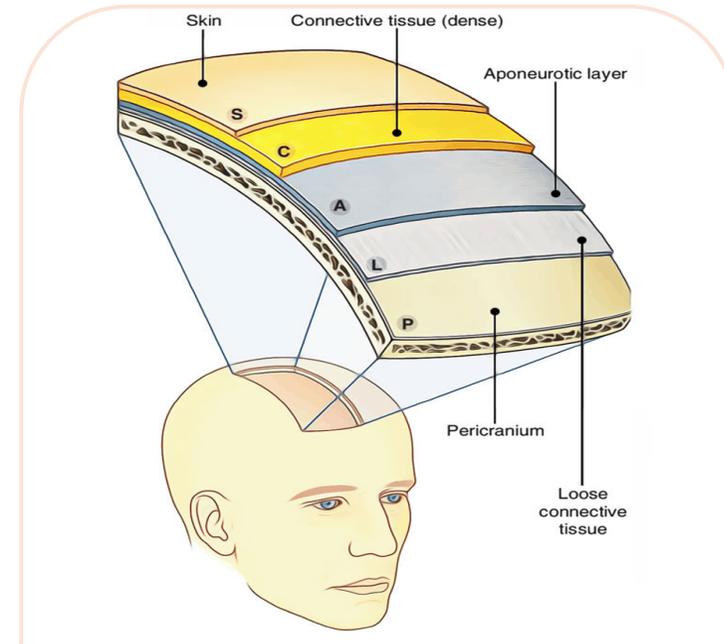


# 01 Scalp and Hair Relationship

## *Scalp Condition Impacts Hair Growth*



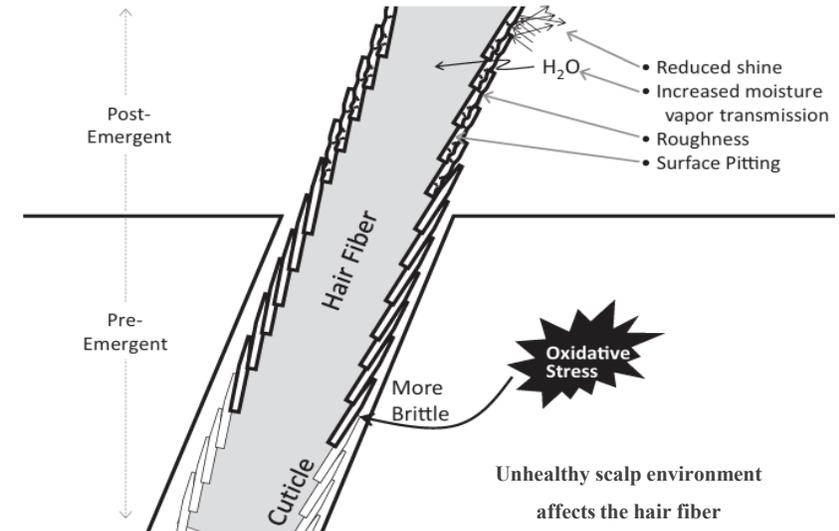
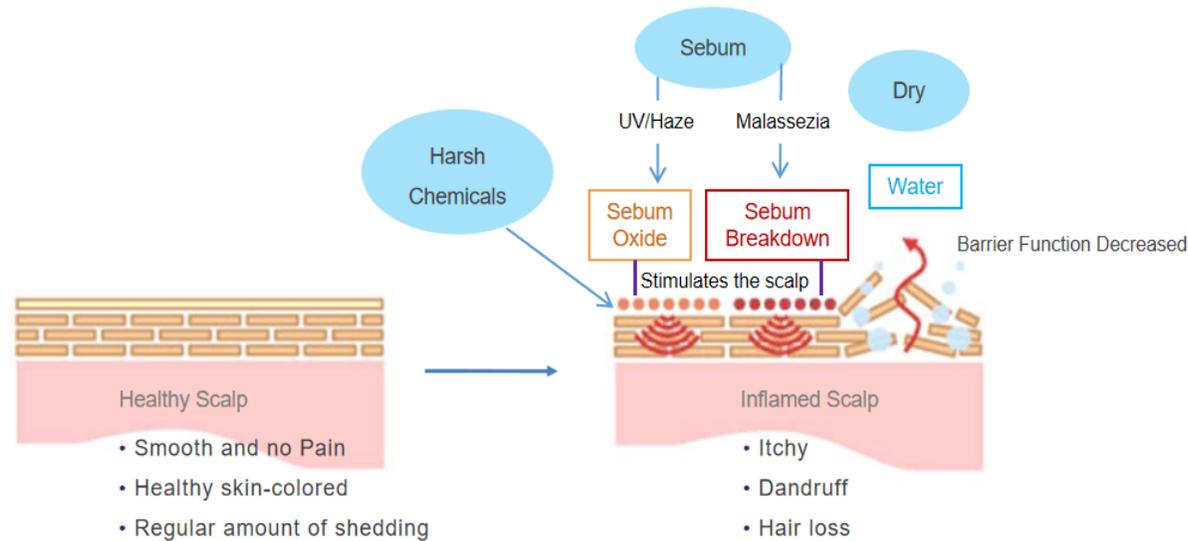
## *5 distinct layers of Scalp*



- Like plants need good soil, the hair needs a healthy scalp, a damaged scalp can make the hair unhealthy.
- The growth of hair is closely related to the scalp, the scalp provides the "soil", a healthy scalp provides the nutrients for hair growth and retention.

# 01 Scalp Health & Healthy Hair

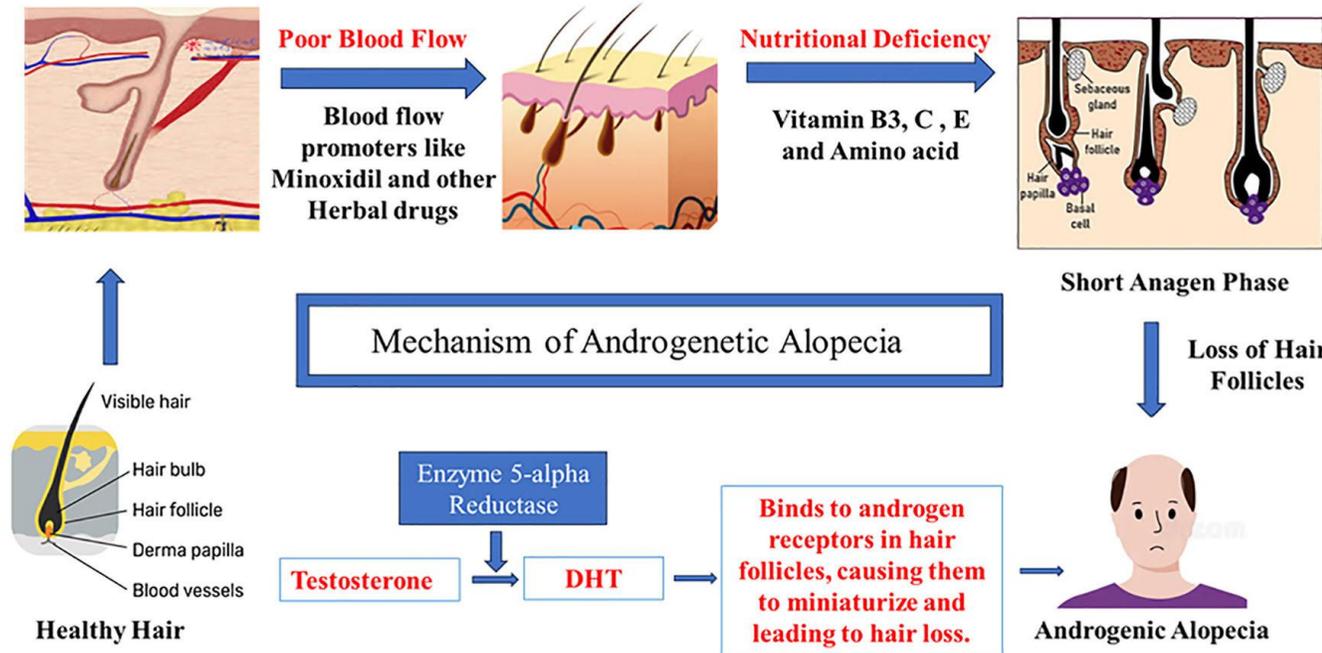
*Scalp health is important for healthy hair*



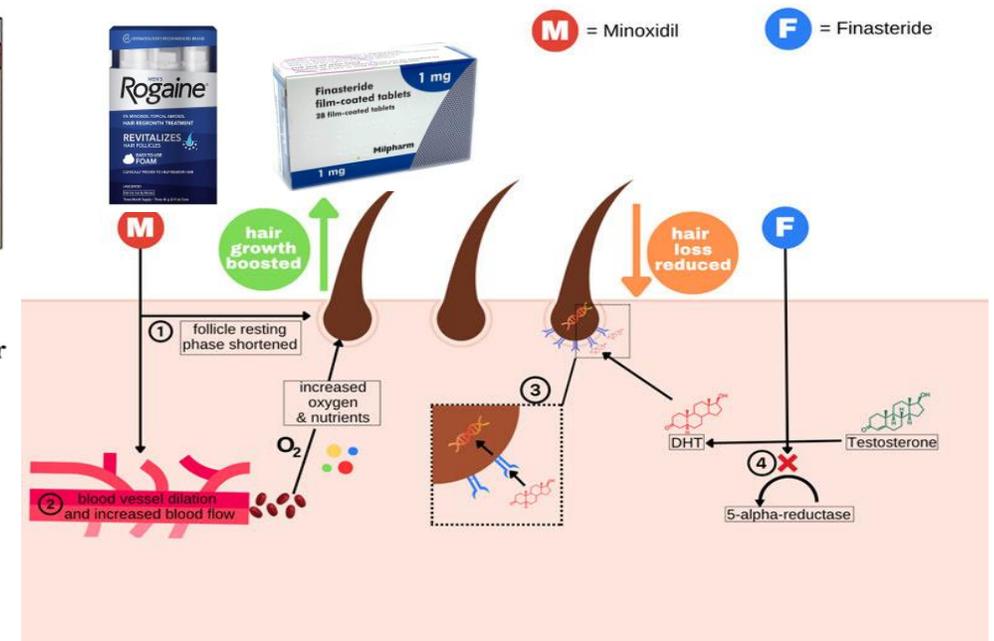
- Human scalp has the highest hair follicle density throughout the body (200 hairs/cm<sup>2</sup>). It also has a dense and specific microflora. In addition, it produces a large amount of sebum (causal level of 150 μg/cm<sup>2</sup>), the skin of the scalp is thinner than that of the face (cheek:1.533mm/scalp:1.476mm).
- The scalp is barely visible, but it can be very sensitive and requires care. Improvement in scalp health has been shown to be able to reverse these detrimental impacts to the hair by reducing oxidative stress thereby normalizing the environment from which it emerges.

# 01 Androgenetic Alopecia & Therapy

*Androgenetic alopecia (AGA) is the most common nonscarring alopecia*



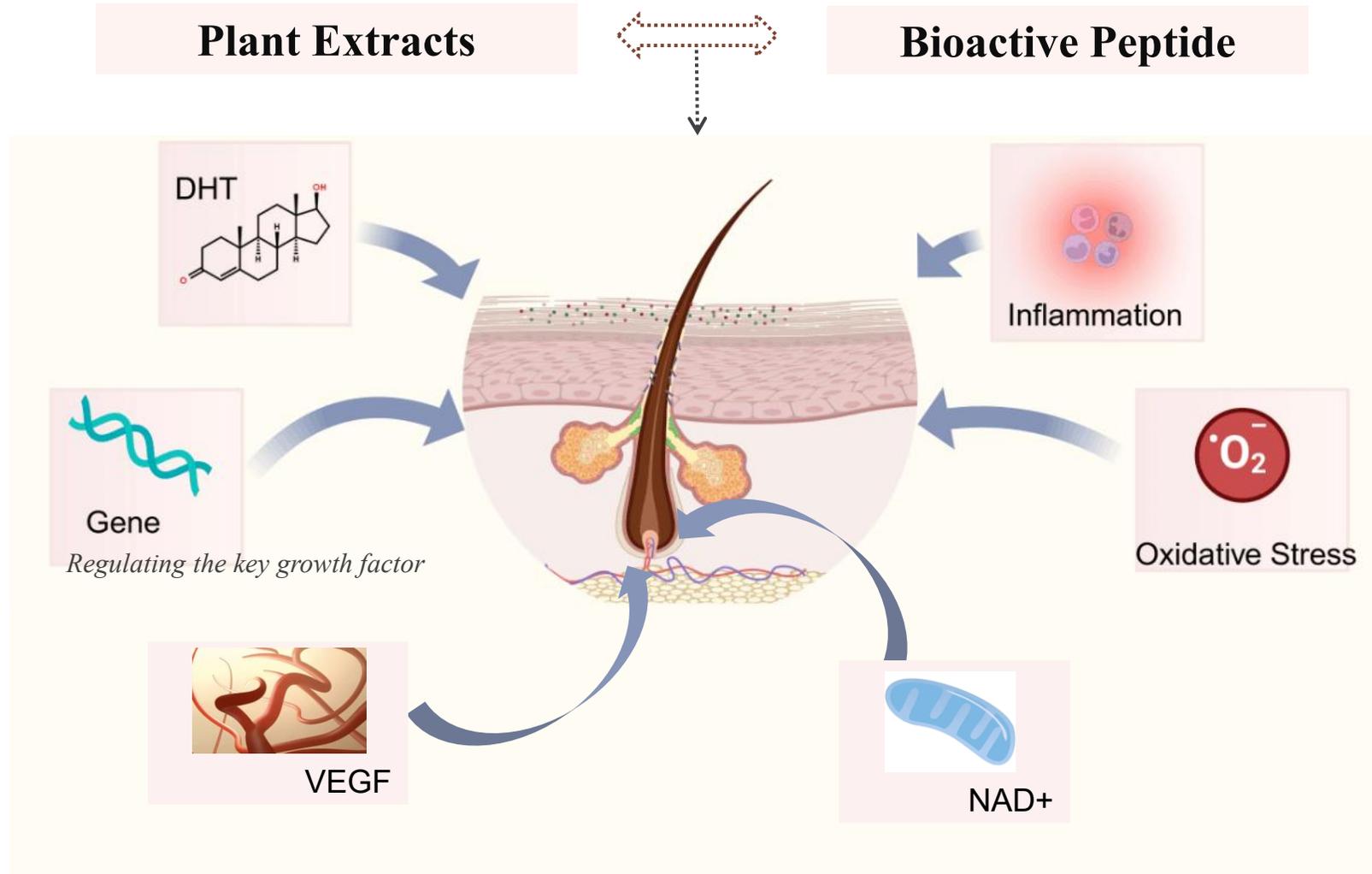
*Commercially available drugs*



- Androgenetic alopecia (AGA) is a condition of scalp hair growth characterized by progressive miniaturization of hair follicles and a reduction in the number of active follicles. FDA in the United States and EMA in Europe have approved drugs to treat hair loss, such as Minoxidil and Finasteride.
- Minoxidil is converted to its active metabolite, minoxidil sulfate, and functions as a potent arteriolar vasodilator that activates potassium channels on the smooth muscles of the peripheral artery, inducing cell proliferation. Finasteride is a member of a class of drugs known as 5-alpha-reductase inhibitors.

# 01 Novel Strategies for Androgenetic Alopecia Therapy

## SpecKare® HV 201

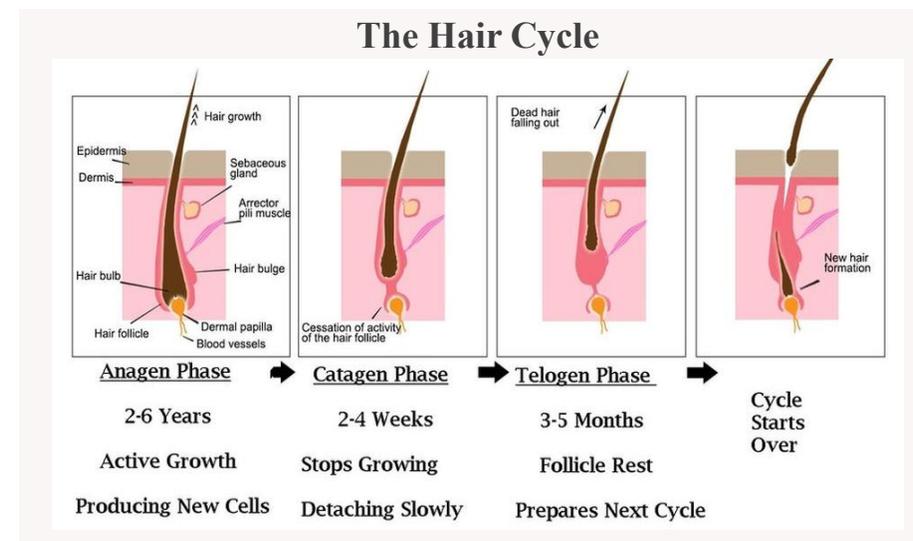


# 02 SpecKare® HV 201 Product Information

<b>Product Name</b>	SpecKare® HV 201
<b>Product Code</b>	17003501
<b>INCI Name</b>	<b>Poria Cocos Sclerotium Extract, Ginkgo Biloba Leaf Extract, Decapeptide-4, Water, Butylene Glycol</b>
<b>Appearance</b>	Yellow to Brown Clear Liquid
<b>pH(100%)</b>	2.5-5.5
<b>Specific gravity (20°C)</b>	1.000-1.030
<b>Refractive index (20°C)</b>	1.300-1.500
<b>Rec. use level</b>	1.0-5.0%
<b>Application</b>	Scalp Care, Hair Care
<b>Usage</b>	Water soluble, Added at the post-production stage

## Product Function

- Promoting dermal papilla cell proliferation
- Regulating the growth cycle of hDPC
- Regulating the growth factors in the hDPC
- Alleviating the adverse effects of androgens
- Activating hair follicle, antioxidation and anti-aging



# 03 SpecKare® HV 201 Benefits for Scalp and Hair Care



## SpecKare® HV 201

Plant Extracts



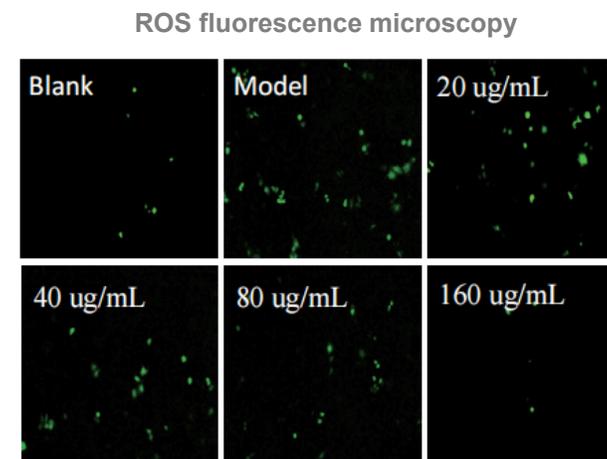
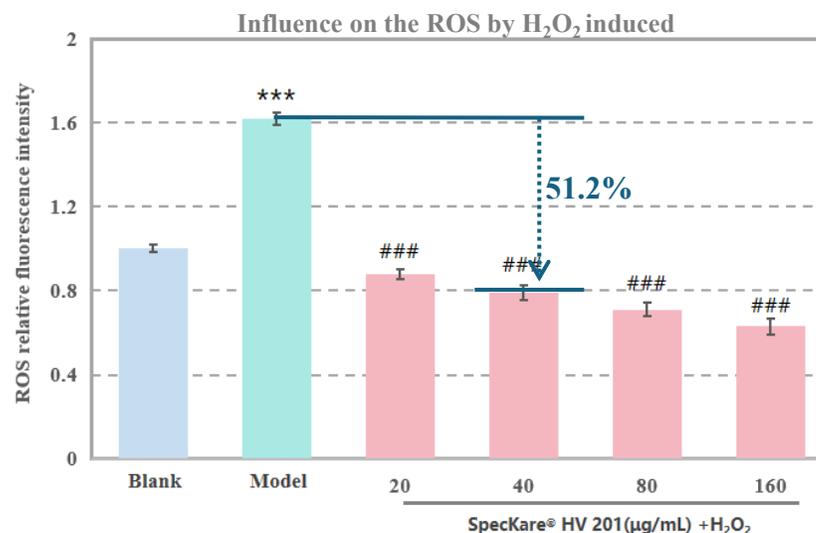
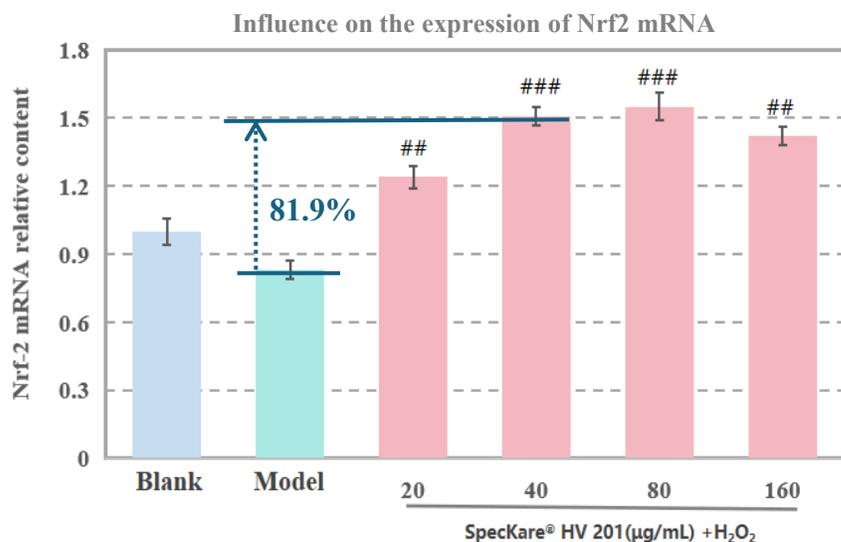
Bioactive Peptide

### Triple Efficacy

- Hair follicle activation - anti-oxidation and anti-aging, improving hair follicle energy metabolism and blood circulation
- Promoting the proliferation of dermal papilla cells, improving cell cycle, regulating growth factors
- Reducing adverse effects caused by androgens, having the effect to improve androgenetic alopecia (AGA)

# 02 SpecKare<sup>®</sup> HV 201 Product Performance

Enhancing antioxidant capacity---Activate the signaling pathway of Nrf2, relieve cellular oxidative stress



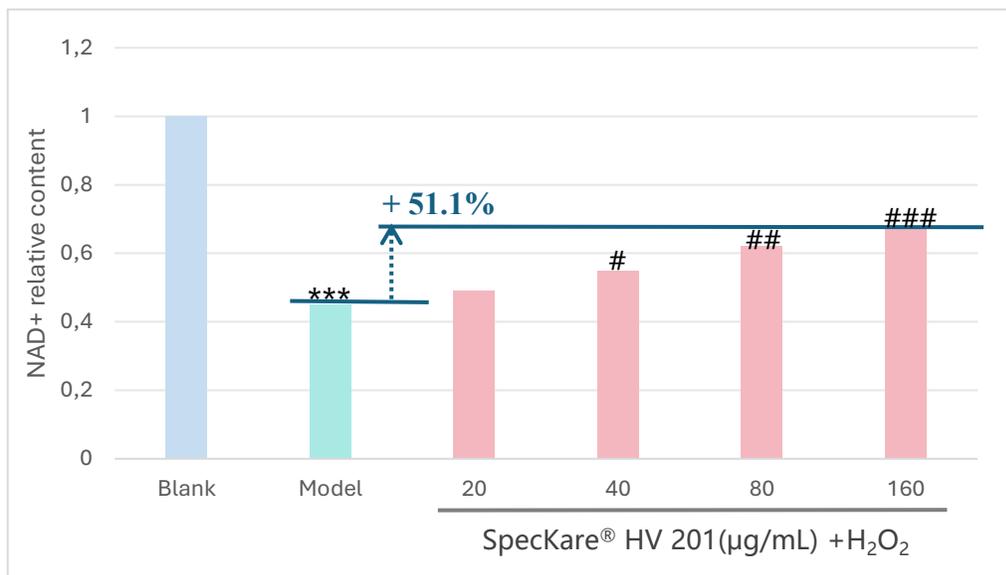
## Test Result:

- Compared with H<sub>2</sub>O<sub>2</sub> induced model, after SpecKare<sup>®</sup> HV 201 treatment, the expression of Nrf2 mRNA significantly increased, the production of ROS significantly decreased, \*\*\*p<0.001 vs. blank, ### <0.001, ##<0.01 vs. model.
- SpecKare<sup>®</sup> HV 201 can significantly inhibit the production of ROS, and reduce oxidative stress in hair follicle cells.

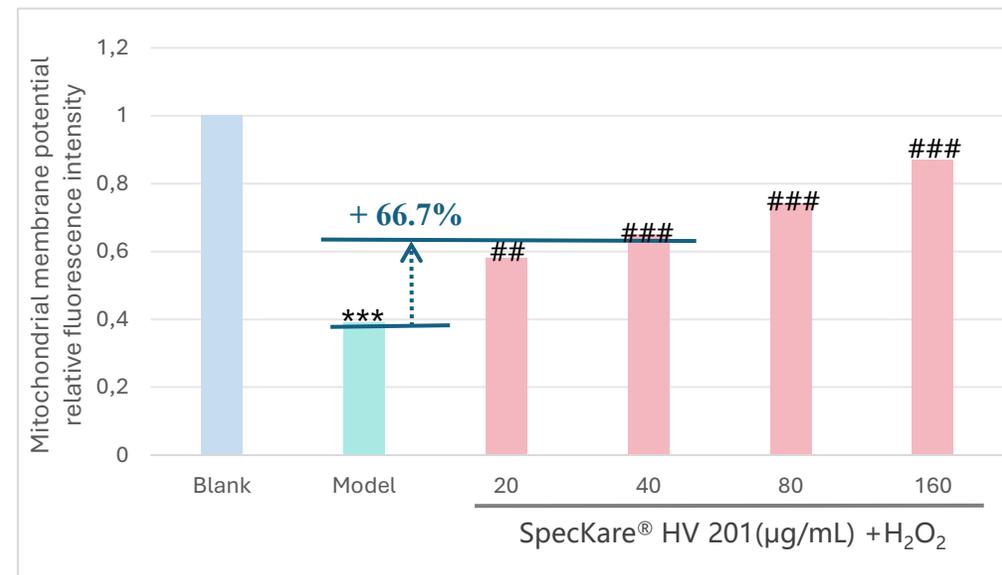
# 02 SpecKare® HV 201 Product Performance

**Enhancing hair follicle cells vitality---Increase the NAD<sup>+</sup> level and mitochondrial membrane potential in the hDPC**

**Influence on the NAD<sup>+</sup> level in the hDPC**



**Influence on the mitochondrial membrane potential in the hDPC**

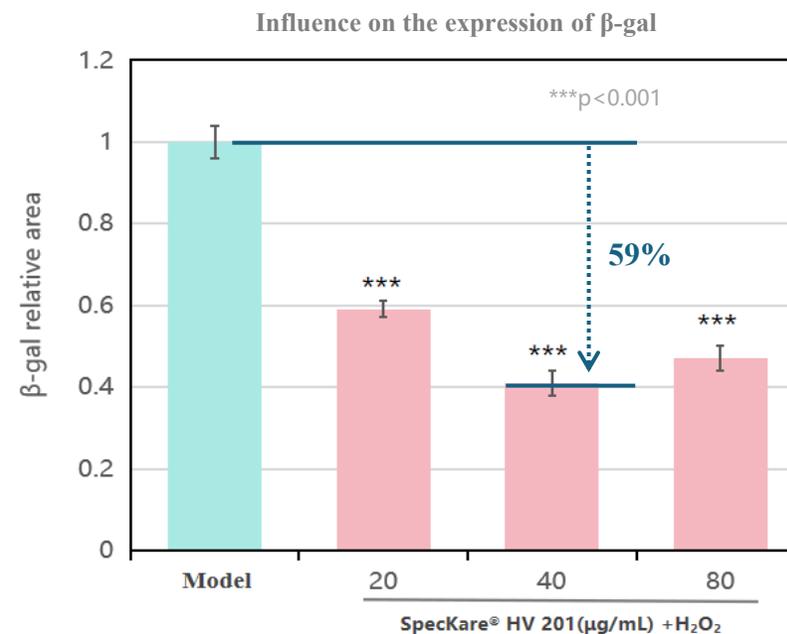
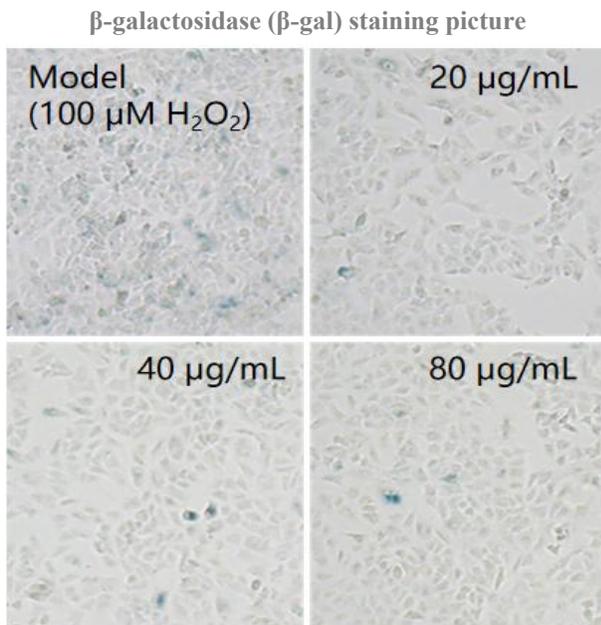


## Test Result:

- Compared with H<sub>2</sub>O<sub>2</sub> induced model, after SpecKare® HV 201 treatment, the NAD<sup>+</sup> level and mitochondrial membrane potential in the hDPC (human Dermal Papilla Cells) significantly increased, \*\*\*p<0.001 vs. blank, ###p<0.001, ##p<0.01, #p<0.05 vs. model.
- SpecKare® HV 201 can significantly enhance the hair follicle cells vitality, activate hair follicle and prevent the hair loss.

# 02 SpecKare® HV 201 Product Performance

Delaying hair follicle cells senescence---Inhibiting the activity of  $\beta$ -galactosidase ( $\beta$ -gal), preventing hair loss



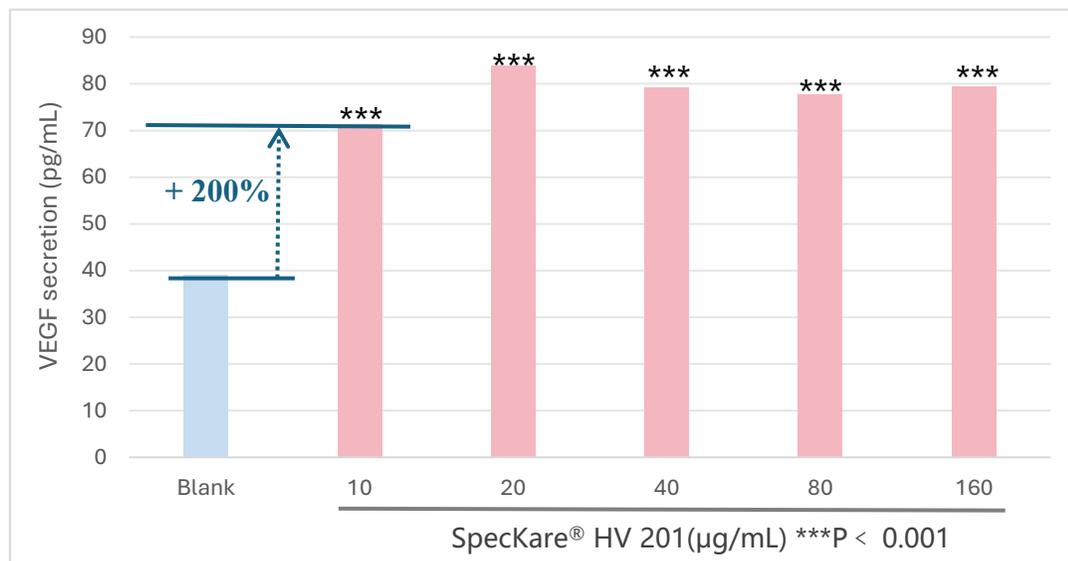
## Test Result:

- Compared with  $H_2O_2$  induced model, after SpecKare® HV 201 treatment, the content of cells aging marker  $\beta$ -galactosidase significantly reduced, .
- SpecKare® HV 201 can significantly delay the hair follicle cells senescence and anti-hair loss.

## 02 SpecKare® HV 201 Product Performance

### Promoting the supply of nutrients to hair follicles---Promoting VEGF secretion in the hDPC

Influence on the secretion expression of VEGF in the hDPC



The main pathological feature of androgenetic alopecia is the progressive miniaturization of hair follicles, which is closely related to vascular changes around hair follicles. Vascular endothelial growth factor(VEGF) interacts with dermal papilla cells and hair follicle stem cells to promote the formation of blood vessels around hair follicles, and to increase the nutrient supply to hair follicles, thereby promoting hair growth.

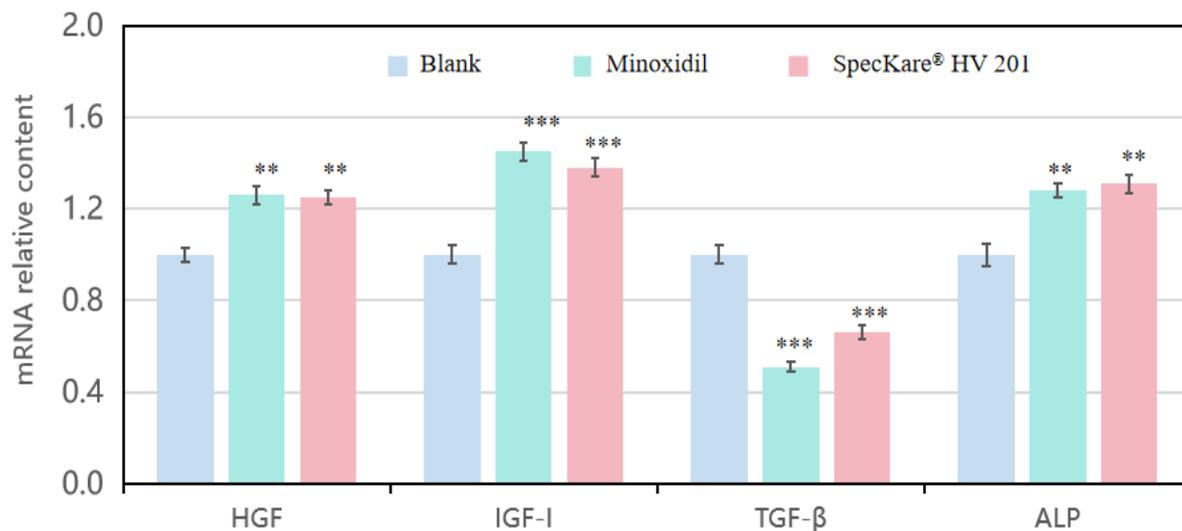
#### Test Result:

- Compared with blank, SpecKare® HV 201 can significantly increase the VEGF level, with the effective concentration ranging from 20 to 160 ug/mL, the VEGF expression level was twice that of the control group.

# 02 SpecKare® HV 201 Product Performance

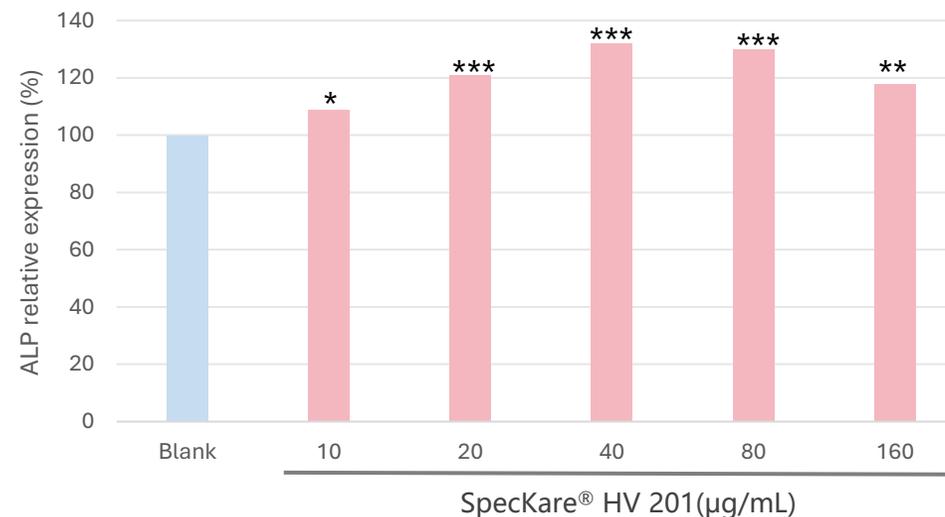
## Regulating the expression of key growth factor mRNA and alkaline phosphatase in the hDPC

Influence on the key growth factor (HGF/IGF-1/TGF- $\beta$ ) in the hDPC



\* HGF: hepatocyte growth factor, IGF-1: insulin like growth factor, TGF- $\beta$ : transforming growth factor- $\beta$

Influence on the alkaline phosphatase (ALP) in the hDPC



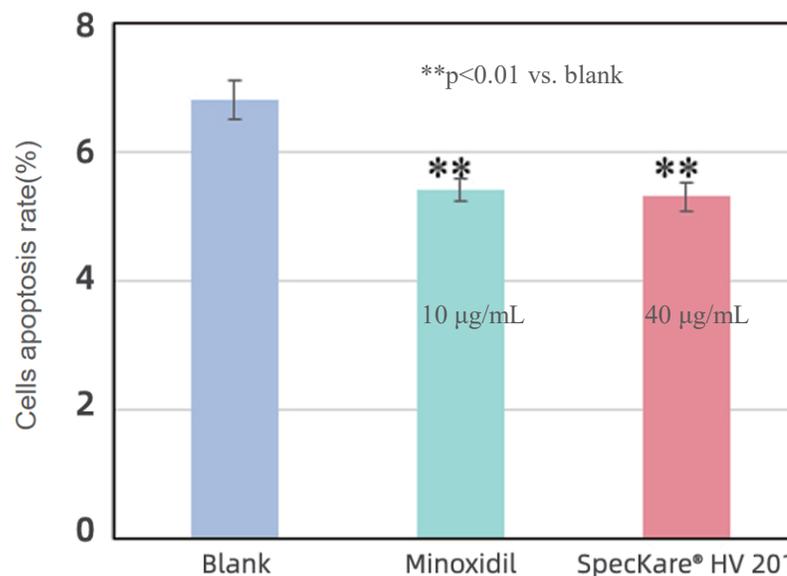
### Test Result:

- Compared with blank group, SpecKare® HV 201 (40  $\mu$ g/mL) can upregulate the mRNA expressions of growth factors HGF and IGF-I in hDPC(positively regulating hair follicle hair growth), downregulating TGF- $\beta$ 1 (TGF- $\beta$ 1 is related to hair growth or apoptosis of degenerated hair follicle cells), which can prevent hair loss; SpecKare® HV 201 can significantly increase the expression of ALP activity, which can help maintain the dermal papilla cell hair follicle induction ability, \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$  vs. blank.

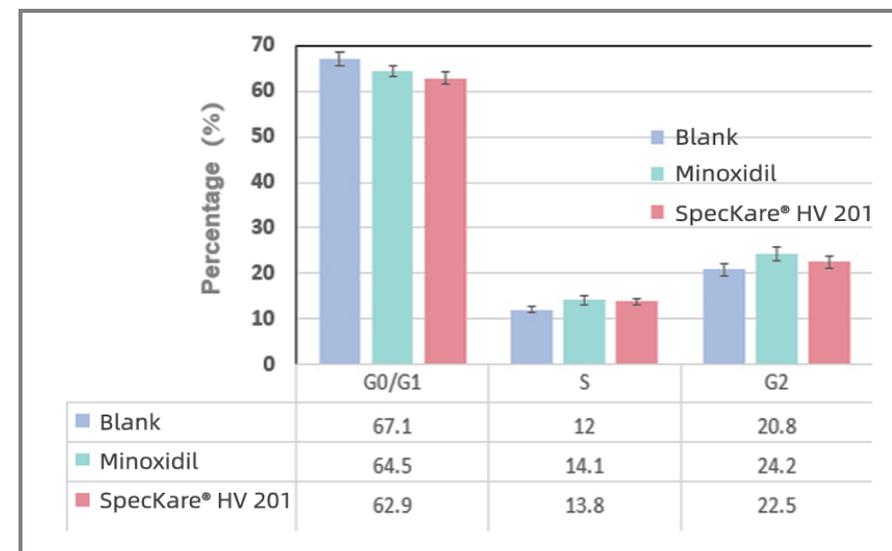
# 02 SpecKare® HV 201 Product Performance

## Regulating the cell growth cycle of hDPC

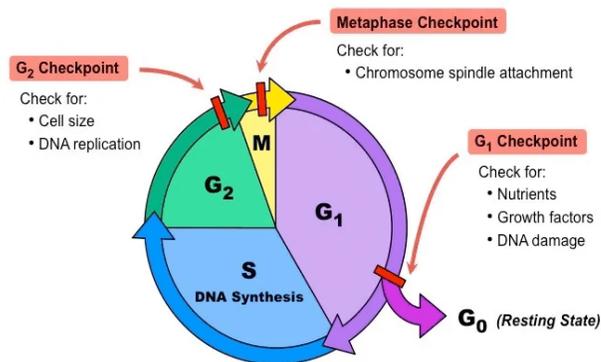
Influence on the cells viability in the hDPC



Influence on the growth cycle of hDPC



### The stages of the cell cycle

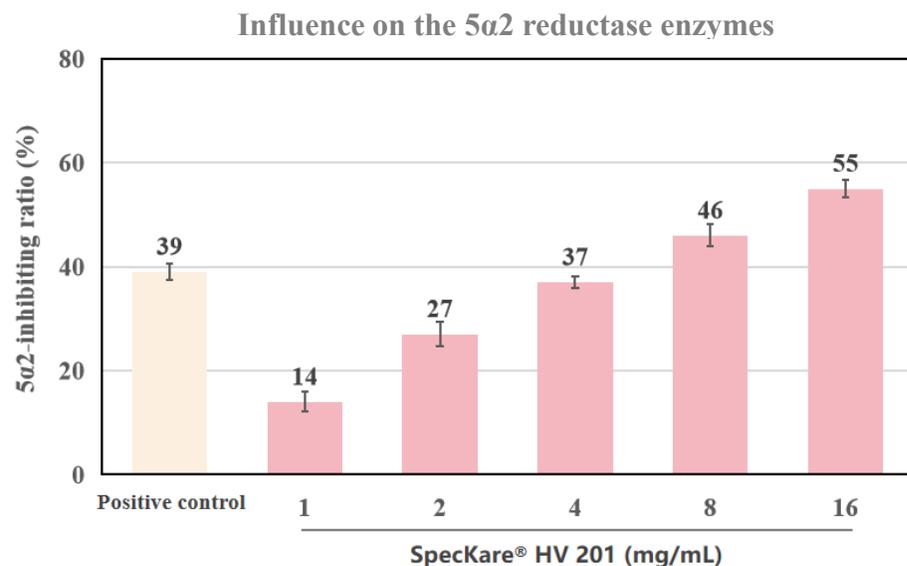


### Test Result:

- Compared with blank group, at 40 µg/mL, SpecKare® HV 201 can inhibit the occurrence of cell apoptosis; SpecKare® HV 201 can reduce the cells number of G0/G1 phase, and promote the cells transition of stationary G1 phase to S and G2 phases (G1: early DNA synthesis; S: DNA synthesis phase; G2: Post-DNA synthesis).
- The results show that SpecKare® HV 201 can stimulate the mitosis of dermal papilla cells and promote cell proliferation.

## 02 SpecKare® HV 201 Product Performance

### Balanced oil secretion--- Inhibiting 5 $\alpha$ 2 reductase enzymes, treatment and prevention of androgenetic alopecia (AGA)



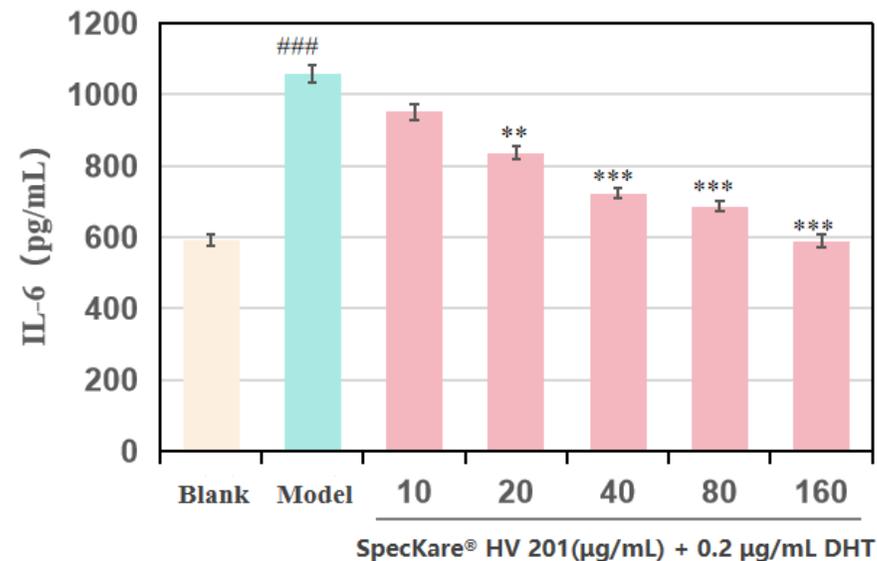
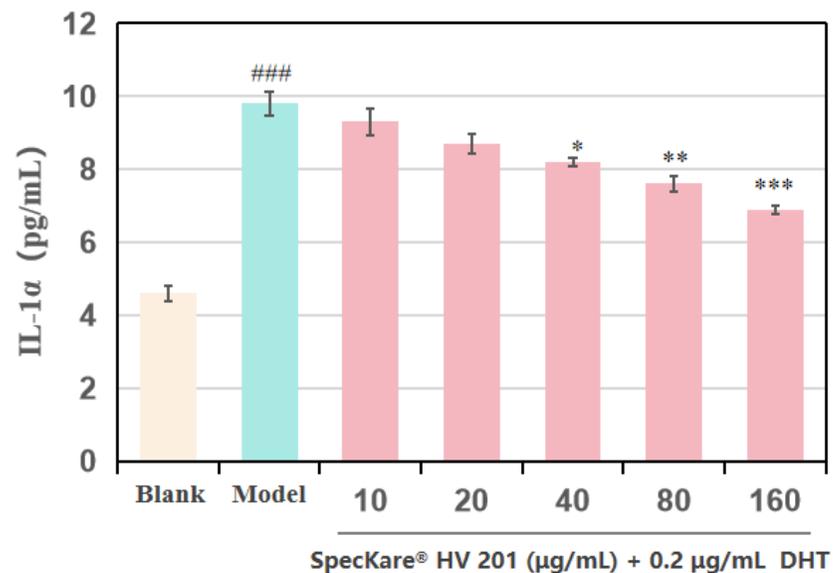
- Dihydrotestosterone, the main pathogenic androgen in AGA, is produced by conversion of testosterone, which is catalyzed by the 5-alpha reductase (5-AR) isoenzyme family.
- Inhibiting the activity of the 5 $\alpha$ -reductase enzyme is one of the targets for treating and preventing androgenic alopecia.

#### Test Result:

- Compared with positive control group, at 4 mg/mL, the inhibitory effect on 5 $\alpha$ -reductase of SpecKare® HV 201 was comparable to that of the positive control group (1  $\mu$ g/mL finasteride, the inhibitor of 5-AR enzymes), and the inhibitory rate increased as the concentration increased.

# 02 SpecKare® HV 201 Product Performance

## Anti-inflammation---Inhibitory effect on DHT-induced inflammation in hDPC

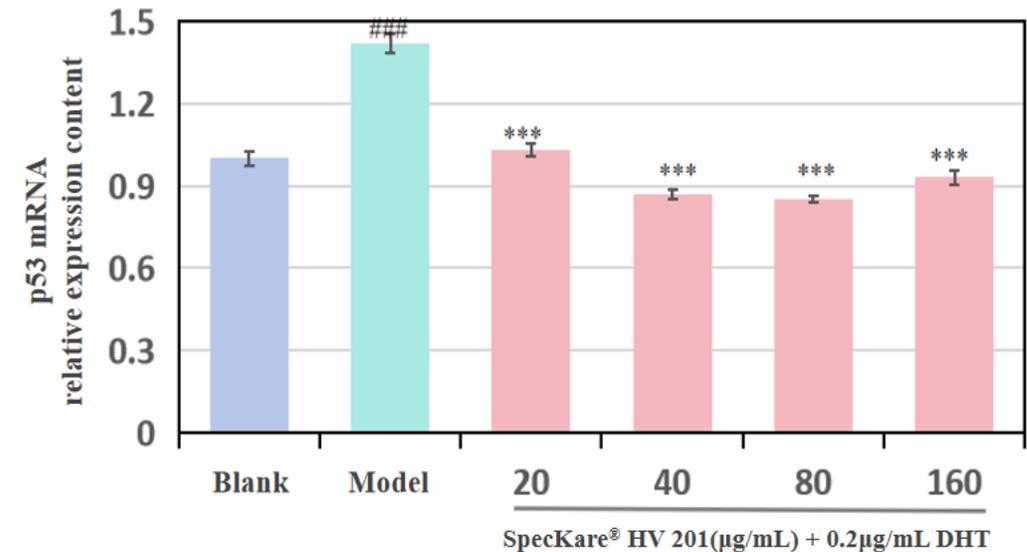
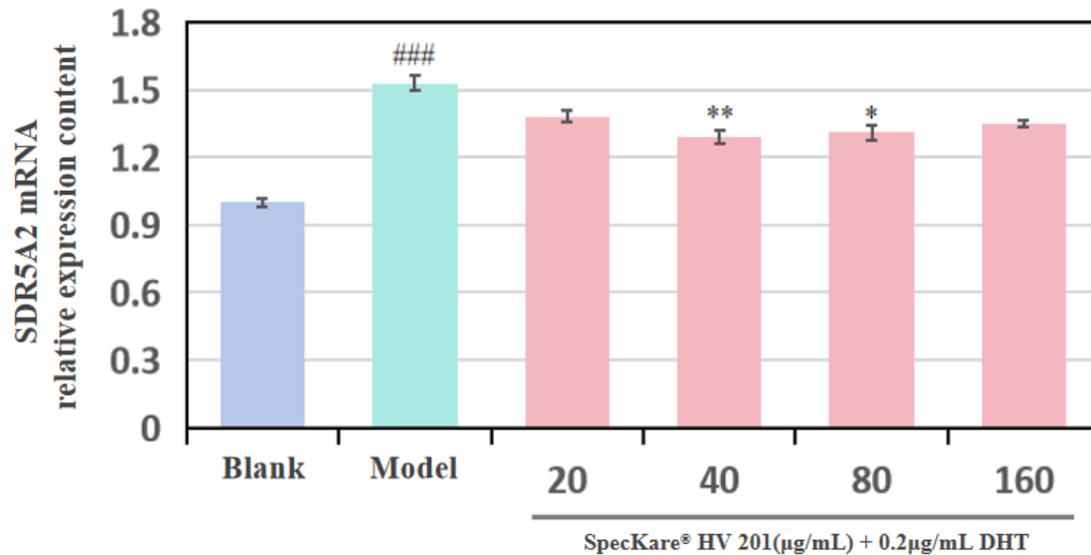


### Test Result:

- DHT stimulates the production of inflammatory cytokines IL-1 $\alpha$  and IL-6 by hDPC, affects the levels of extracellular matrix and intracellular cAMP, regulates hair follicle growth, inhibits stromal cell proliferation and hair axis elongation in hair follicles.
- Compared with model group, at 40  $\mu\text{g/mL}$ , the inhibitory effect on IL-1 $\alpha$  and IL-6 of SpecKare® HV 201 was 29.6% and 44.3%, respectively (### $p < 0.001$  vs. blank, \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$  vs. model).

# 02 SpecKare® HV 201 Product Performance

Improve androgenetic alopecia- Inhibits the expression of genes associated with typical male pattern hair loss induced by DHT



## Test Result:

- High expression of type II 5 $\alpha$ -reductase (SRD5A2) can lead to an increase in local DHT concentration, which inhibits hair growth. AGA is related to the P53 signal transduction pathway and it is involved in the apoptosis of cells during the hair follicle degeneration period.
- Compared with model group, SpecKare® HV 201 can inhibit the expression of typical genes related to androgenetic alopecia induced by DHT, down-regulate the expression levels of SRD5A2 mRNA and p53 mRNA, promote hair growth, and improve androgenetic alopecia (AGA), (###p<0.001 vs. blank, \*p<0.05, \*\*p<0.01, \*\*\*p<0.001 vs. model).

# 02 SpecKare® HV 201 Product Performance

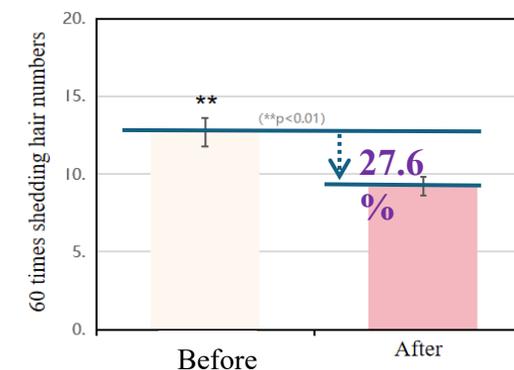
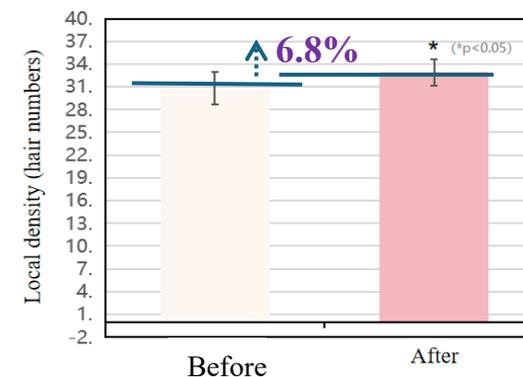
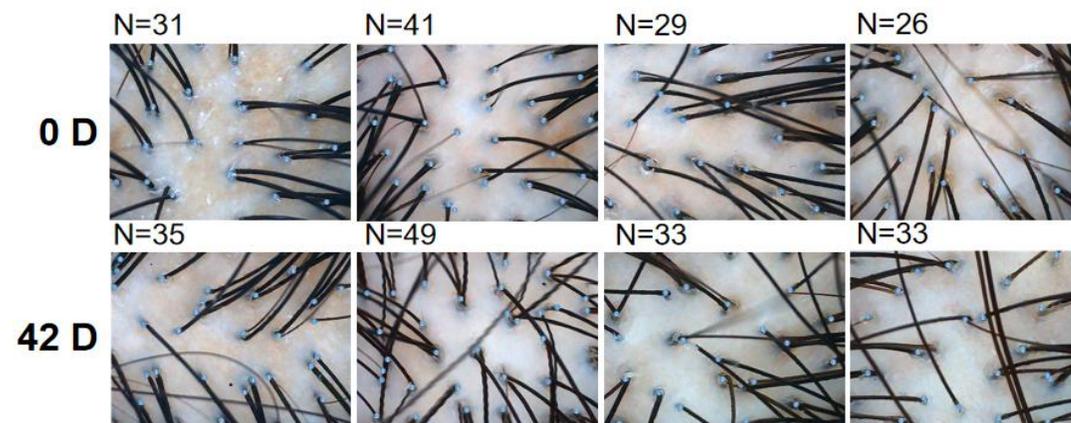
## Clinical test--Reducing hair loss and preventing hair loss (1.5% Scalp care serum)

### Test Method:

- Subjects: 46 females, 4 males
- Age Range: 20–30 years old
- Subject Criteria: Hair length between 5–40 cm; experiencing significant hair loss or mild hair thinning, with hair shedding count exceeding 10 strands per 60-stroke comb test and remaining above 10 strands after a 2-week wash-out period
- Test Site: Scalp
- Test Timepoints: Day 0, Day 42
- Evaluation Parameters: Hair shedding count, hair density assessment, and photographic documentation

### Test Result:

- After using the serum, a comparative analysis of the number of hair strands falling out was conducted through the 60-comb method. There was a significant reduction in hair loss (reduction ratio of 27.6%). The local density at the same position did not decrease (the density slightly increased, with an increase ratio of 6.8%).
- These results showed that SpecKare® HV 201 reduces hair loss and has anti-hair loss properties.



# 03 SpecKare® HV 201 Product Application

## Clinical test formula

## Scalp Care Serum

	Trade Name	INCI Name	Function	w/w%
<b>A</b>	Water	Water	Solvent	To 100
	Glycerin	Glycerin	Humectant	0.5
<b>B</b>	PrzvFree® 4HAP	Hydroxyacetophenone	Preservative	0.5
	PrzvFree® HLG	1,2-Hexanediol	Humectant	0.5
<b>C</b>	<b>SpecKare® HV 201</b>	<b>Poria Cocos Sclerotium Extract, Ginkgo Biloba Leaf Extract, Decapeptide-4, Water, Butylene Glycol</b>	<b>Skin Conditioning Agent</b>	<b>1.5</b>
	Sodium Citrate	Sodium Citrate	pH Adjuster	q.s

### ➤ Procedure:

1. Mix Part A and heat to 85°C, stir until the system is uniform.
2. Cool down to 65°C, add Part B (pre-dissolved PrzvFree® 4HAP with hot water)
3. Cool down to 45°C, add Part C, stir until the system is uniform and discharge

### ➤ Properties:

Appearance: Light yellow  
transparent liquid  
pH: 6.0±0.5



IMPROVE WEAK AND  
LOOSE SCALP



# PrzvFree<sup>®</sup> SL 415

- COSMOS approved preservative
- Natural anti-dandruff
- Acne care
- Assisting deodorization

# 01 Natural Preservative Market Trends

At present, preservatives added to many cosmetics are mostly of **chemical synthetic origin** (such as benzoic acid and sorbic acid), and chemical synthetic origin preservatives are **slightly more irritating and have a high sensitization rate to the skin**. Long term use will cause harm to the human body.

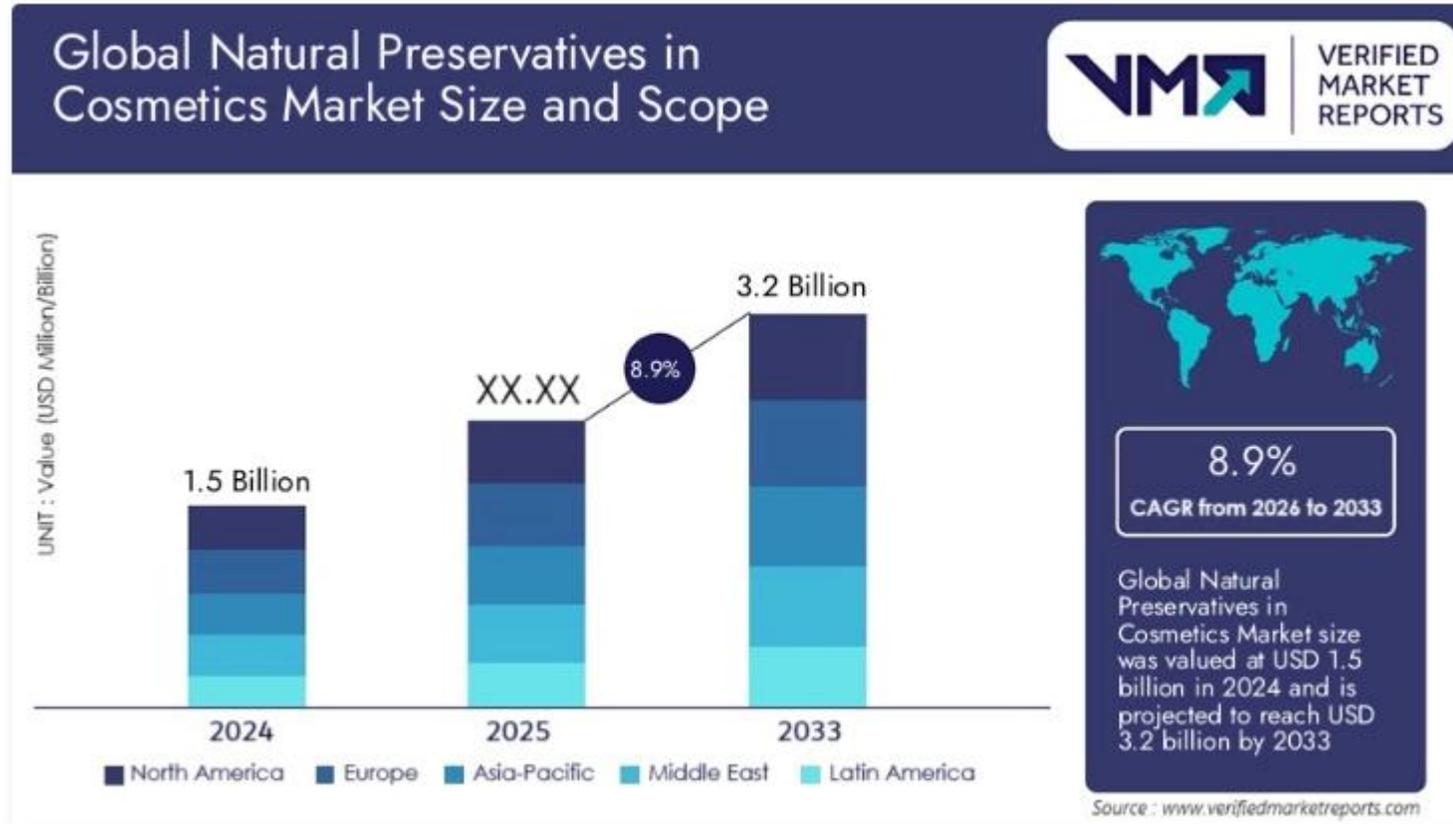
The concept of **Clean Beauty** is constantly strengthening. A new concept for beauty on range, two mandatory standards are requested.

**Non-toxic Ingredients:** In nature, clean beauty never uses ingredients with any possible toxic issues; they must be 100% safe.

**Label Transparency:** As a brand oriented to clean beauty, that means their product labels have to be transparent, clear and unambiguous to consumers. Clean beauty represents no secretly hiding materials, never do false or overestimated claims.

With increasing consumer demand for **clean and sustainable** beauty products, **natural, non-toxic, non-irritating, non-skin-allergic, safe and efficient** antibacterial active substances have become a new development direction for the antiseptic and antibacterial properties of daily chemical products, and have **good development prospects. Make natural preservatives the focus of innovation.**

# 01 Natural Preservative Market Size and Scope



The increasing awareness of potential health risks associated with synthetic preservatives is the main driving force behind the growth of the natural preservatives market in cosmetics. Consumers actively seek 'clean label' products.

## 02 PrzvFree® SL 415 Product Information

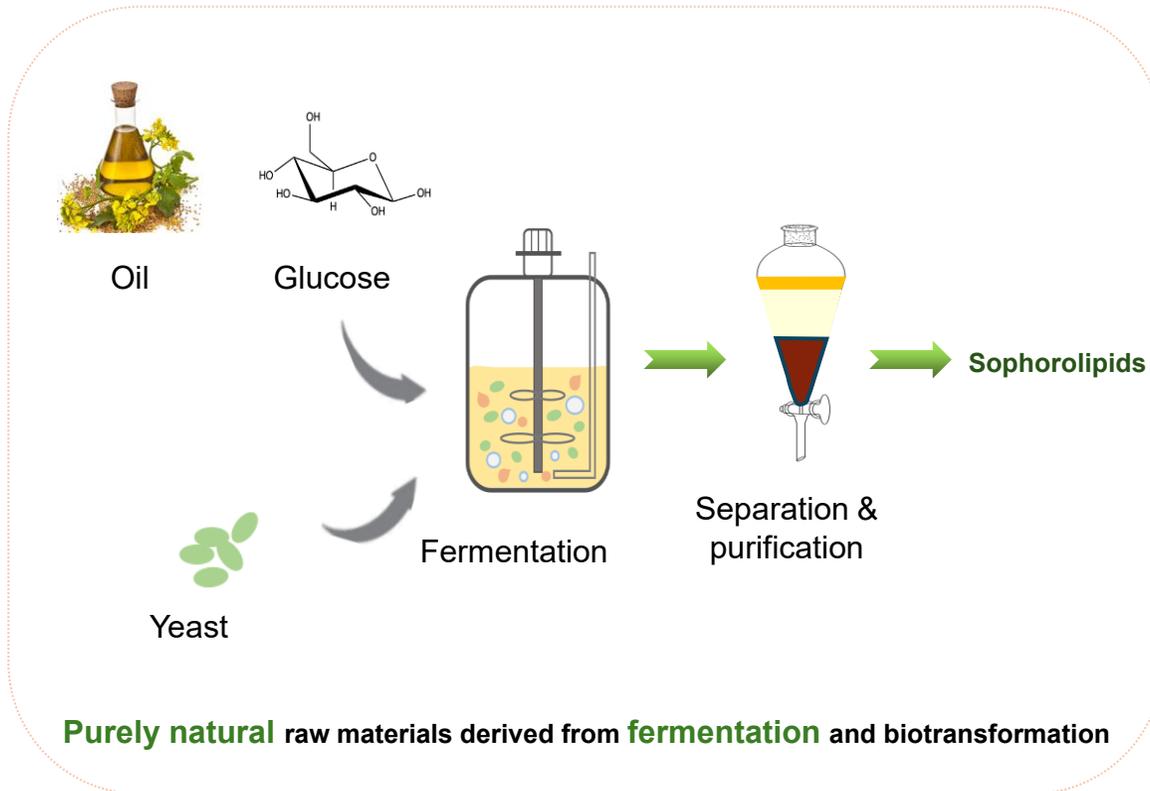
Product Name PrzvFree® SL 415 Patent Pending	
Product Code	15004700
INCI Name	Yeast Ferment Extract, Water, Pentylene Glycol, Keihi Yu
CAS No.	--, 7732-18-5, 5343-92-0, --
Appearance	Red-brown liquid
Odor	Characteristic
pH (100%)	4.5 - 6.5
Solubility	Soluble in polyols
Rec. use level	0.5 - 1.0%
Application	Face/body/hair care and cleaning: toner, serum, lotion, cream, shampoo, soap, etc.
Storage	Store at room temperature. Keep container tightly closed in a dry and well-ventilated place.
Shelf life	2 years
Package	1Kg, 5Kg, 10Kg, 25Kg



### Features:

- ✓ Natural sources
- ✓ Safe and mild
- ✓ Broad spectrum and efficient
- ✓ Natural Anti-dandruff
- ✓ Newly Acne Care
- ✓ Wide range of applications
- ✓ Comply with global regulations
- ✓ Patent Pending
- ✓ Comply with COSMOS standards

## 02 PrzvFree® SL 415 Product Information



### Sophorolipid--Fermented products

- Unique antibacterial properties
- Natural sources
- Green production
- High environmental compatibility
- Good biodegradability

Make it a good choice for **Natural Preservative Booster**

### Keihi Yu--Extracted from the dried bark and leaves of cinnamon

- Significant antibacterial effect, inhibit the growth of microorganisms on the skin surface
- Powerful antioxidant effect, eliminate free radicals, delay aging
- Significant anti-inflammatory effect, effectively relieve skin inflammation

Create a favorable environment for **Natural Preservatives**.

# 02 PrzvFree® SL 415 Safety

## Cytotoxicity--IN VITRO

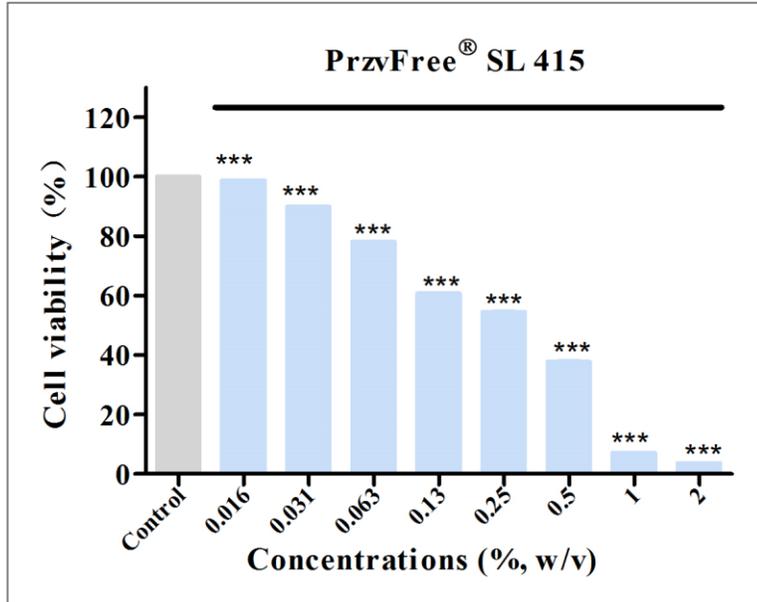


Fig.1 Cell viability under different concentrations of PrzvFree® SL 415 (\*\*P<0.001 vs control)

Test cell: NIH/3T3 cell line

Test method: SN/T 2328-2009 and MTT method

### Conclusion:

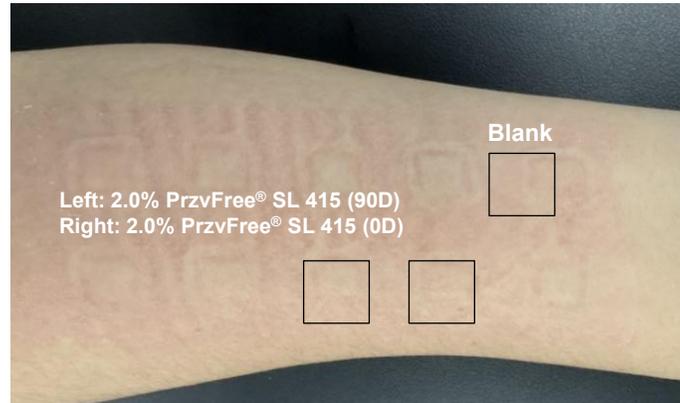
According to SN/T 2328-2009 and MTT method, the IC<sub>50</sub> of PrzvFree® SL 415 was 0.23% on the NIH/3T3 cell line. PrzvFree® SL 415 had no toxicity on NIH/3T3 cell line when the concentration was not more than 0.088%. The acute oral toxicity LD<sub>50</sub> of PrzvFree® SL 415 was 1857 mg/kg (rat).

**Safer and gentler** than other preservatives.

# 02 PrzvFree® SL 415 Safety

## Human Skin Occlusive Patch--*IN VIVO*

**Subject 1**



**Subject 2**

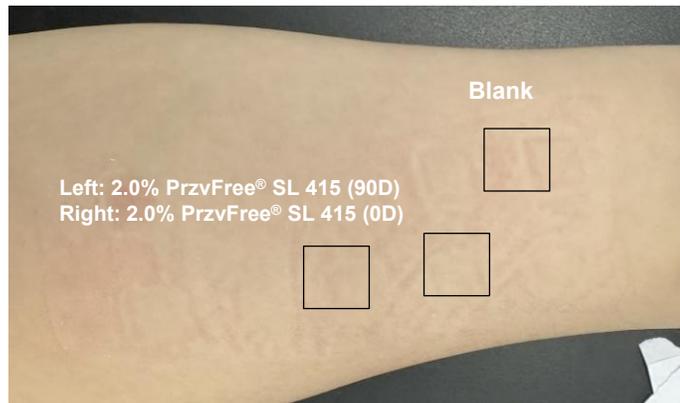


Fig.1 After removing the patch for 30min (negative)

Fig. 2 After removing the patch for 24h (negative)

Fig. 3 After removing the patch for 48h (negative)

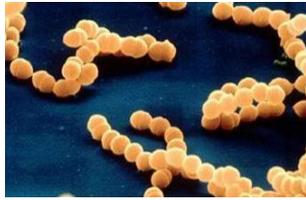
### Conclusion:

In 20 cases of skin occlusive patch test, 2.0% PrzvFree® SL 415 (0D & 90D) showed negative reaction and did not cause any adverse skin reactions.

# 03 Efficacy Experiments Related

## ➤ Minimal Inhibitory Concentration (MIC)

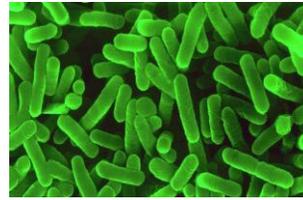
Test Method: Agar dilution method



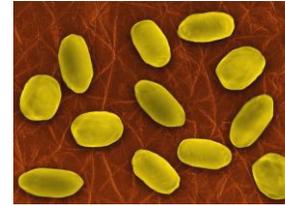
Staphylococcus aureus



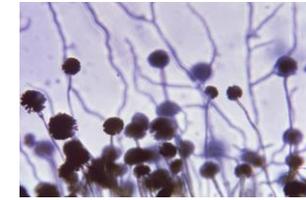
Escherichia coli



Pseudomonas aeruginosa



Candida albicans



Aspergillus niger

## ➤ Microbiological Challenge Test

Test Method: ASTM E640-06 (2019), Standard Test Method for Preservatives in Water-Containing Cosmetics

### Evaluation criteria:

**Bacterias:** should show at least a 99.9 % (3 log) reduction within seven days following each challenge and no increase thereafter for the remainder of the test within normal variation of the data.

**Yeast and Molds:** should show at least a 90 % (1 log) reduction within seven days following each challenge and no increase thereafter for the remainder of the test within normal variation of the data.

# 02 PrzvFree® SL 415 Efficacy

## Minimum Inhibitory Concentration (MIC) Test

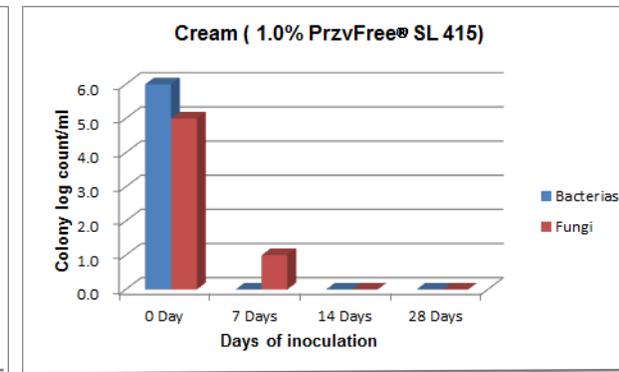
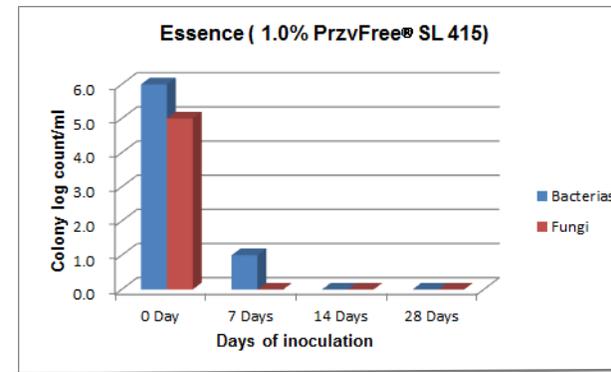
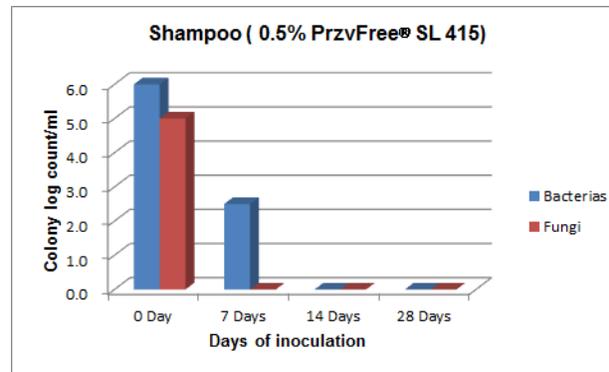
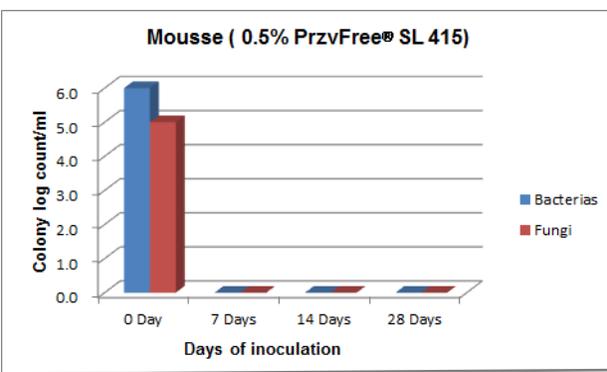
MIC							
Staphylococcus aureus (ATCC6538)	Escherichia coli (ATCC8739)	Pseudomonas aeruginosa (ATCC9027)	Candida albicans (ATCC10231)	Aspergillus niger (ATCC16404)	Corynebacterium xerosis (ATCC 373)	Malassezia furfur (ATCC44344)	Propionibacterium Acnes (ATCC 6919)
0.1250%	0.2500%	0.5000%	0.1250%	0.1250%	0.0625%	0.0625%	0.0625%

### Conclusion:

- PrzvFree® SL 415 showed excellent inhibitory effects on broad spectrum bacterias and bacterias with specific application directions.
- MIC of the sample did not change after 90 days.

# 02 PrzvFree® SL 415 Efficacy

## Microbiological Challenge Test



### Conclusion:

0.5% PrzvFree® SL 415 passed the challenge test in mousse/shampoo at 28 days.

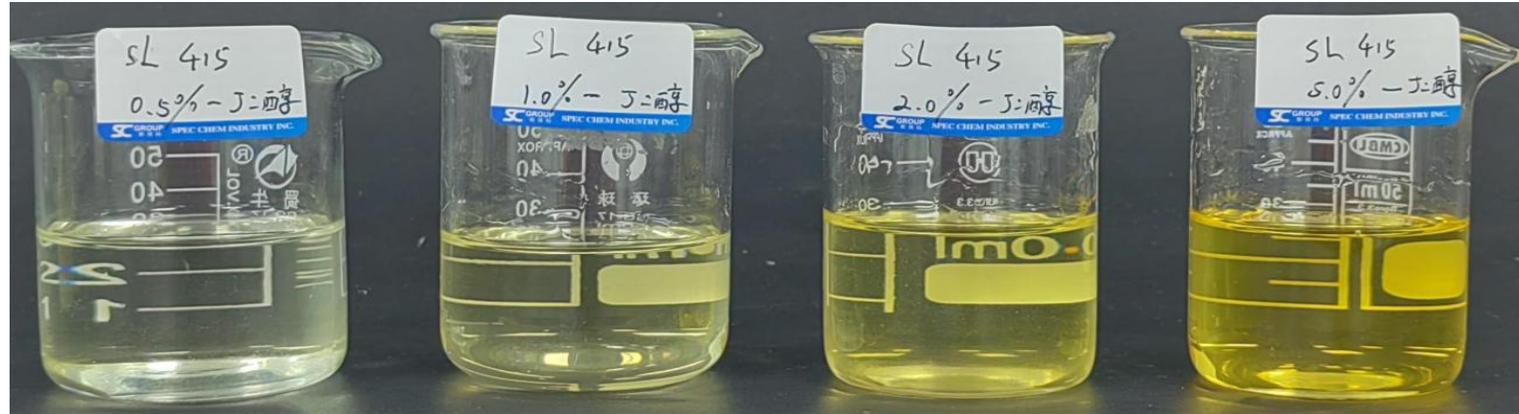
### Conclusion:

1.0% PrzvFree® SL 415 passed the challenge test in essence/cream at 28 days.

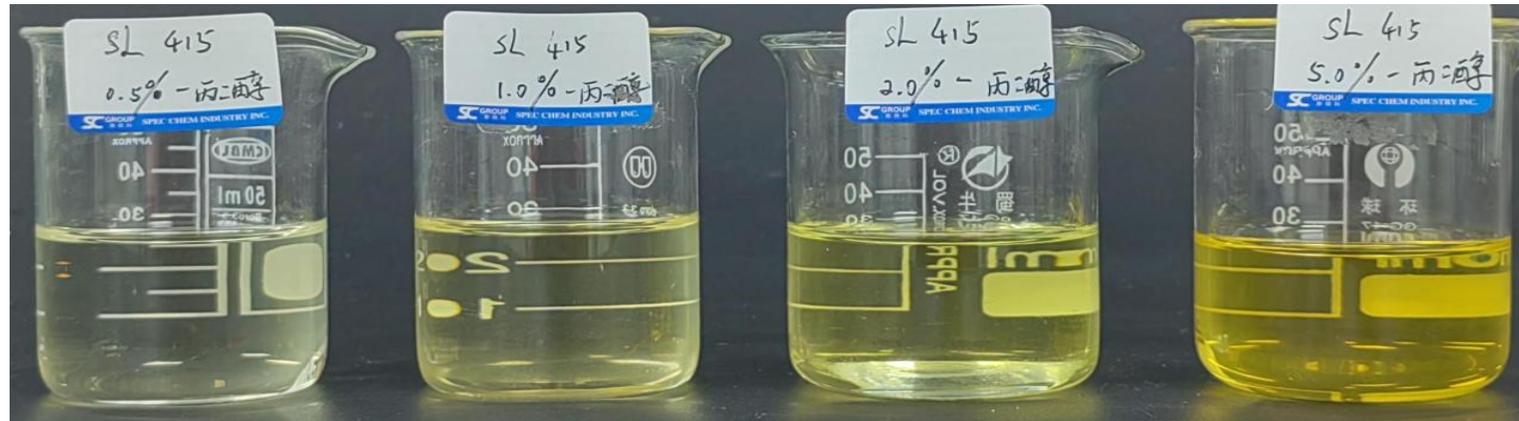
# 03 PrzvFree® SL 415 Application

Solubility (water insoluble, soluble with polyols)

Butylene Glycol



Propylene Glycol



0.5%

1.0%

2.0%

5.0%

# 03 PrzvFree<sup>®</sup> SL 415 Application



## Usage:

- ✓ Solubility: Difficult to dissolve in water, can be pre-dissolved with polyols, such as Butylene Glycol, Propylene Glycol, Pentylene Glycol.
- ✓ Adding process: It is necessary to pre-dissolve with polyols, and add it at low temperature in the post-production stage.
- ✓ Rec. use level: 0.5 - 1.0%
- ✓ Rec. system: Emulsification system, water-based system, surfactant cleaning system.

## Note:

- ✓ Recommended for use in colored formulas.
- ✓ Appearance may change during storage or formula use, but does not affect the anti-corrosion effect.

# 03 PrzvFree® SL 415 Application

## Formulation Example 1--Moisturizing Nourishing Cleansing Mousse

SC-AC2506018-0.5% PrzvFree® SL 415

	Trade Name	INCI Name	Function	w/w%
A	Water	Water	Solvent	To 100
	Disodium EDTA	Disodium EDTA	Chelating Agent	0.05
	Glycerin	Glycerin	Humectant	2.0
	Butylene Glycol	Butylene Glycol	Humectant	3.0
	Glycereth-26	Glycereth-26	Humectant	4.0
	<b>SpecKare® HAL</b>	<b>Sodium Hyaluronate, Water, Sodium Hydroxymethylglycinate, Propylene Glycol</b>	<b>Humectant</b>	<b>3.0</b>
	<b>SpecKare® DPA 98</b>	<b>Panthenol</b>	<b>Humectant</b>	<b>0.5</b>
	<b>SpecSufc® CAB</b>	<b>Cocamidopropyl Betaine, Water</b>	<b>Surfactant</b>	<b>5.0</b>
	Sodium Cocoyl Alaninate	Sodium Cocoyl Alaninate, Water	Surfactant	10.0
	<b>SpecSufc® LS30</b>	<b>Sodium Lauroyl Sarcosinate, Water</b>	<b>Surfactant</b>	<b>10.0</b>
B	<b>PrzvFree® SL 415</b>	<b>Yeast Ferment Extract, Water, Keihi Yu, Pentylene Glycol</b>	<b>Preservative</b>	<b>0.5</b>
	<b>SpecPure® CAD</b>	<b>Citric Acid</b>	<b>pH Adjuster</b>	<b>q.s</b>

### ➤ Procedure:

1. Mix Part A and heat to 85°C, stir until the system is uniform
2. Cool down to 40°C, add Part B, stir until completely uniform
3. Cool down to room temperature

### ➤ Properties:

Appearance: Light yellow transparent liquid

pH: 6.0±0.5



0d

30d

# 03 PrzvFree® SL 415 Application

## Formulation Example 2--Moisturizing Smoothing Shampoo

SC-AC2506019-0.5% PrzvFree® SL 415

	Trade Name	INCI Name	Function	w/w%
<b>A</b>	Water	Water	Solvent	To 100
	Disodium EDTA	Disodium EDTA	Chelating Agent	0.05
	<b>SpecSufc® SLES</b>	<b>Sodium Laureth Sulfate, Water</b>	<b>Surfactant</b>	<b>12.0</b>
	<b>SpecSufc® CAB</b>	<b>Cocamidopropyl Betaine, Water</b>	<b>Surfactant</b>	<b>10.0</b>
	<b>SpecSufc® APG0814</b>	<b>Coco-Glucoside, Water</b>	<b>Surfactant</b>	5.0
	Cocamide MEA	Cocamide MEA	Thickening Agent	1.5
<b>B</b>	<b>SpecKare® PQ-7</b>	<b>Polyquaternium-7</b>	<b>Softener</b>	<b>2.0</b>
	<b>SpecPure® HK</b>	<b>Hydrolyzed Keratin</b>	<b>Humectant</b>	<b>0.1</b>
<b>C</b>	<b>PrzvFree® SL 415</b>	<b>Yeast Ferment Extract, Water, Keihi Yu, Pentylene Glycol</b>	<b>Preservative</b>	<b>0.5</b>
	Fragrance	Fragrance	Flavoring Agent	0.15
	<b>SpecPure® CAD</b>	<b>Citric Acid</b>	<b>pH Adjuster</b>	<b>q.s</b>
	Sodium Chloride	Sodium Chloride	Thickening Agent	q.s

### ➤ Procedure:

1. Mix Part A and heat to 85°C, stir until the system is uniform
2. Cool down to 40°C, add Part B, stir until completely uniform
3. Add Part C, stir until completely uniform
4. Cool down to room temperature

### ➤ Properties:

Appearance: Light yellow viscosity liquid

pH: 6.5±0.5

Viscosity (25°C, 2#, 30 rpm, mPa·s): 3500±500



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Good Quality Comes  
From Qualified Materials

# Questions & Answers

## THANK YOU

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