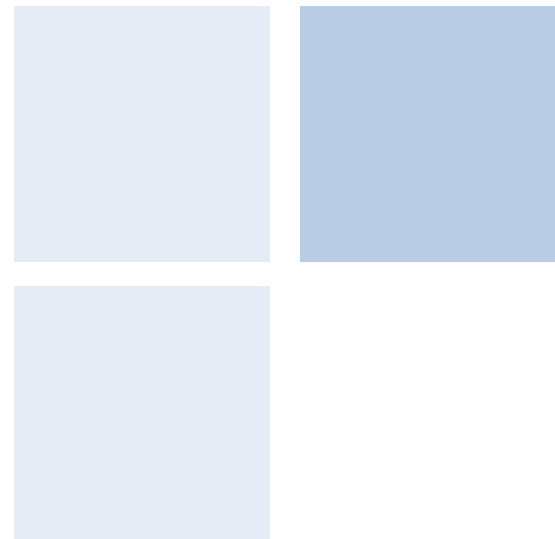




# Sericin 4.5 CL



*Sochibios*  
Nature, Science & Life

# Sericin 4.5 CL is....



**Sericin 4.5 CL** is a high molecular weight and water soluble sericin isolated from the silk cocoon for anti-aging cosmetic applications.

✓ INCI Name : Sericin

✓ Efficacies : Moisturizing

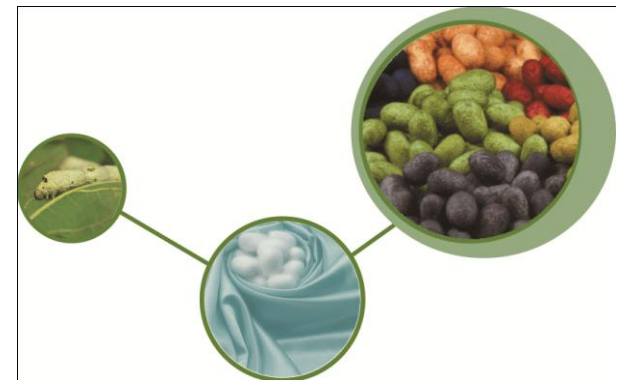
Cell proliferation and migration

**Collagen synthesis promotion**

Hair coating and nutrition

Scalp care

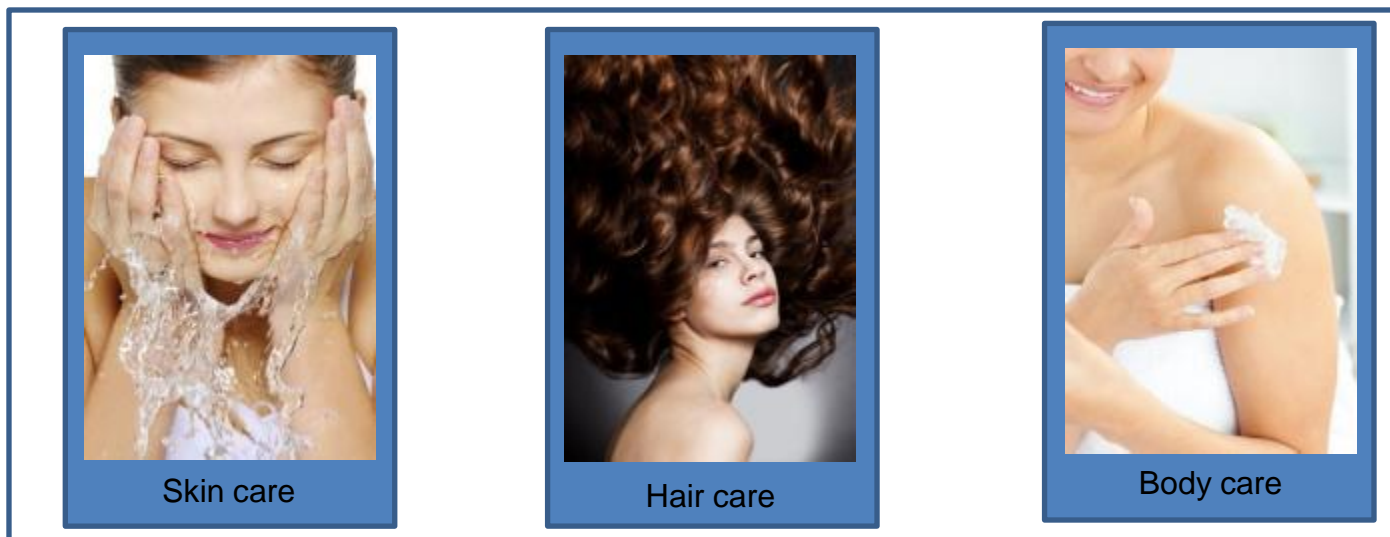
✓ Recommend dosage : 0.5 ~ 5%



# Sericin 4.5 CL is....

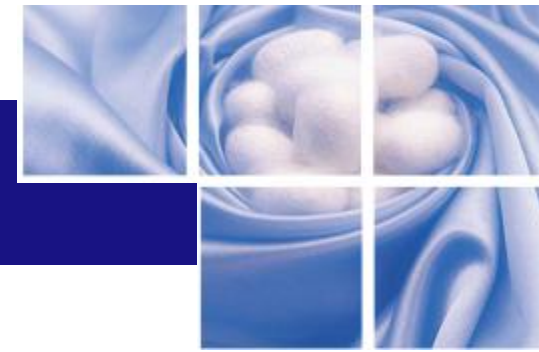


- Water-binding capacity
- Protective film formation on skin and hair
- Nutrition to skin and hair

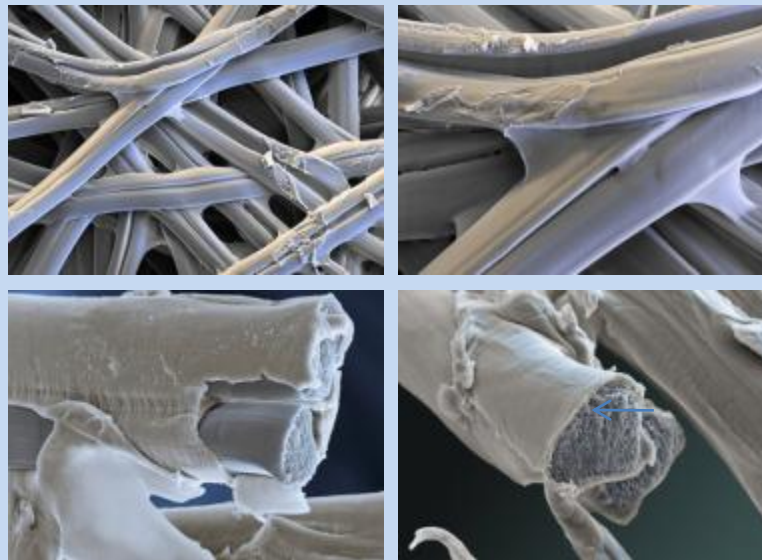


- Healthy and glossy hair
- Smooth, soft and moist skin

# Cocoon Bave and Silk



- ❖ Silk cocoon, the source of Sericin 4.5%, is from silkworm which is also called as “the worm of sky” in the orient. Silk cocoon is an oval-shaped cocoon made from the silk of silkworm.
- ❖ There are 2 fibroins in a strand of cocoon bave and each fibroin is wrapped in sericin.
- ❖ Silk cocoon itself is a natural protein composed of various amino acids.



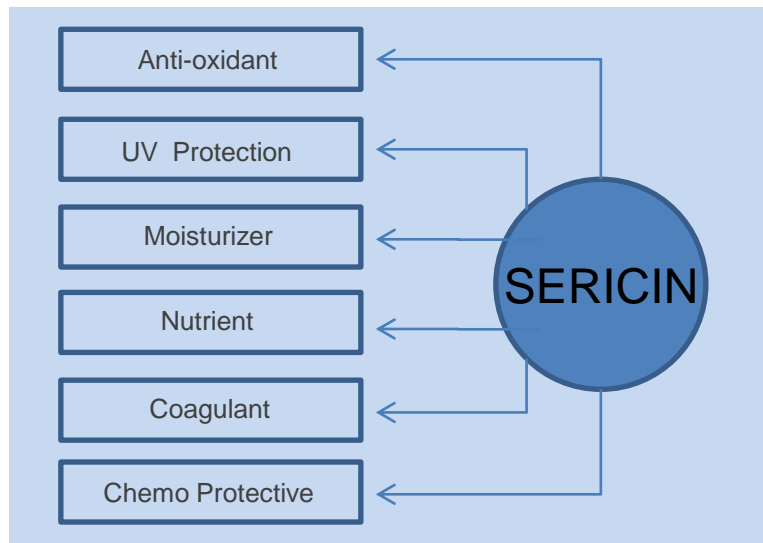
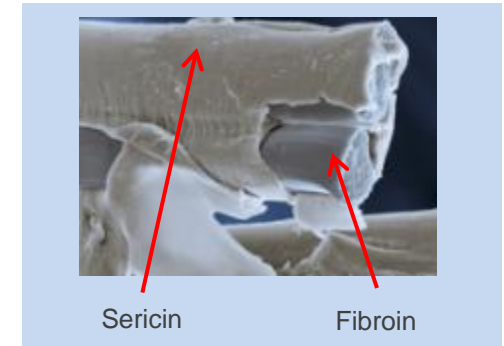
Composition of silk

Component	Contents(%)
Fibroin	70 ~ 80
Sericin	20 ~ 30
Wax & Fats	0.4 ~ 0.8
Carbohydrate	1.2 ~1.6
Pigment	≐0.2
Inorganic matter	≐0.7

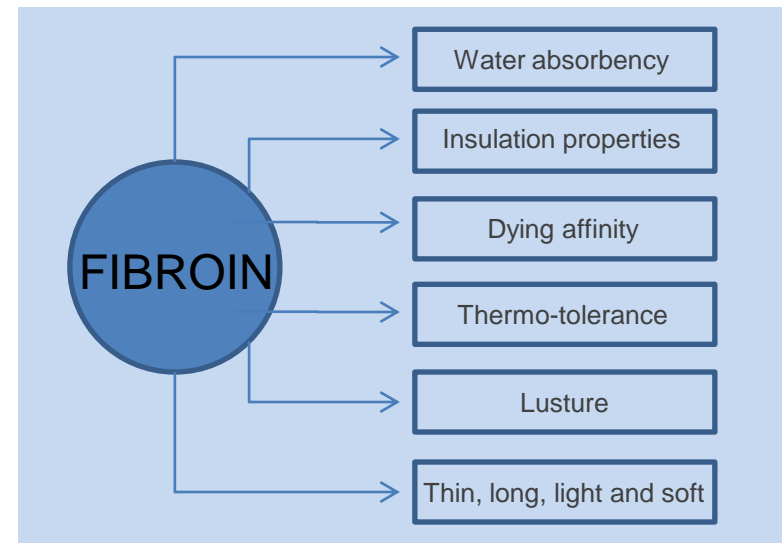
# Sericin and Fibroin in silk



- ❖ Silk consists of two types of proteins, fibroin and sericin. Fibroin is the structural center of the silk while sericin is the sticky material surrounding fibroin.
- ❖ Sericin is a type of protein created by *Bombyx mori*(silkworms) in the production of silk. Sericin contributes about 20-30% of total cocoon weight. It is characterized by its high content of serine and 18 amino acids, including essential amino acids.
- ❖ Sericin has similar characteristics as the keratin protein in our skin which allows to be bound very effectively to the keratin of skin and hair, to form a multifunctional protective film.



Attributes of Sericin



Attributes of Fibroin

# Amino acids content in Sericin 4.5 CL



## ❖ Amino acids in Sericin 4.5%

Amino Acids	Contents		Amino Acids	Contents	
	(mg/100g)	Percentage		(mg/100g)	Percentage
Aspartic Acid	777.79	19.02%	Leucine	33.56	0.82%
Threonine	273.47	6.69%	Isoleucine	26.92	0.66%
<b>Serine</b>	<b>1,271.50</b>	31.09%	Tyrosine	41.72	1.02%
Glutamic Acid	437.6	10.70%	Phenylalanine	7.59	0.19%
Proline	28.32	0.69%	Lysine	206.5	5.05%
Glycine	363.69	8.89%	Histidine	76	1.86%
Alanine	166.77	4.08%	Arginine	150.95	3.69%
Valine	82.46	2.02%	Cysteine	0.57	0.01%
Mehionine	143.73	3.51%	Tryptophan	-	0.0%

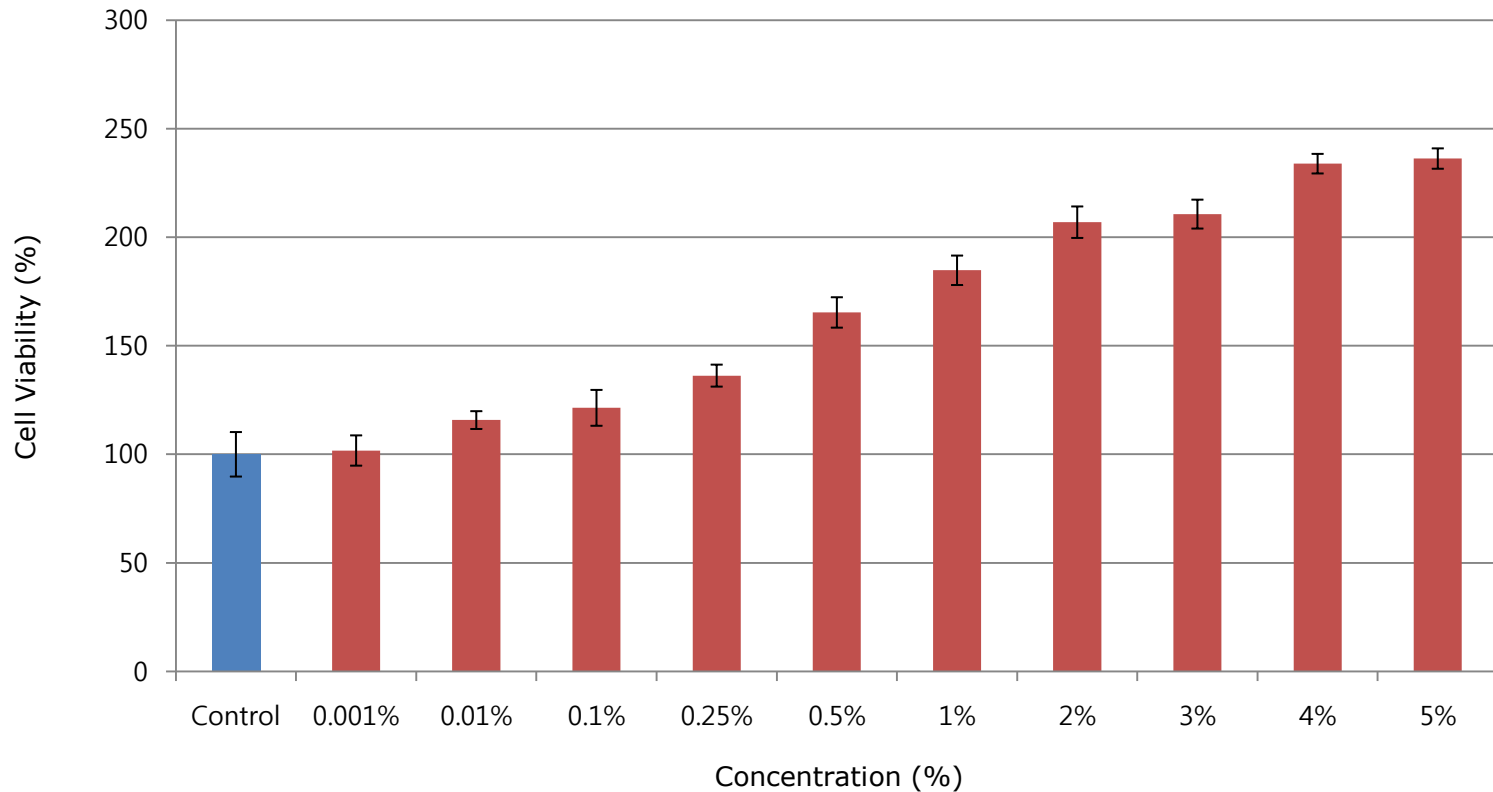
In our Sericin 4.5%, Sericin content is about 4.5% and the content of amino acids are about 4%.

# Efficacies of Sericin 4.5 CL



## 1. Cell Proliferation Effect

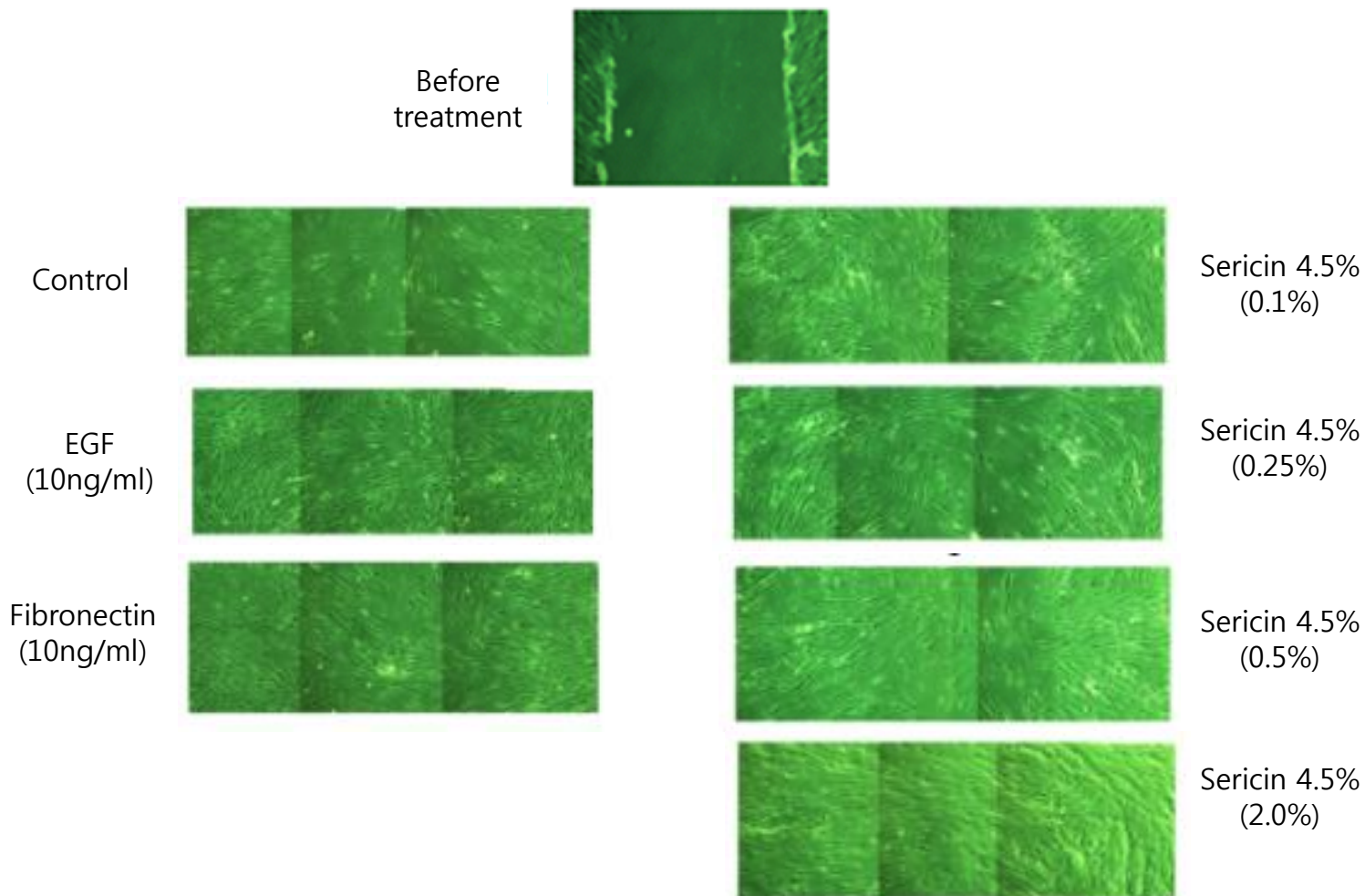
On human fibroblast ATCC 2076, 3 days



# Efficacies of Sericin 4.5 CL



## 2. Cell Migration Effect (Wound Healing)

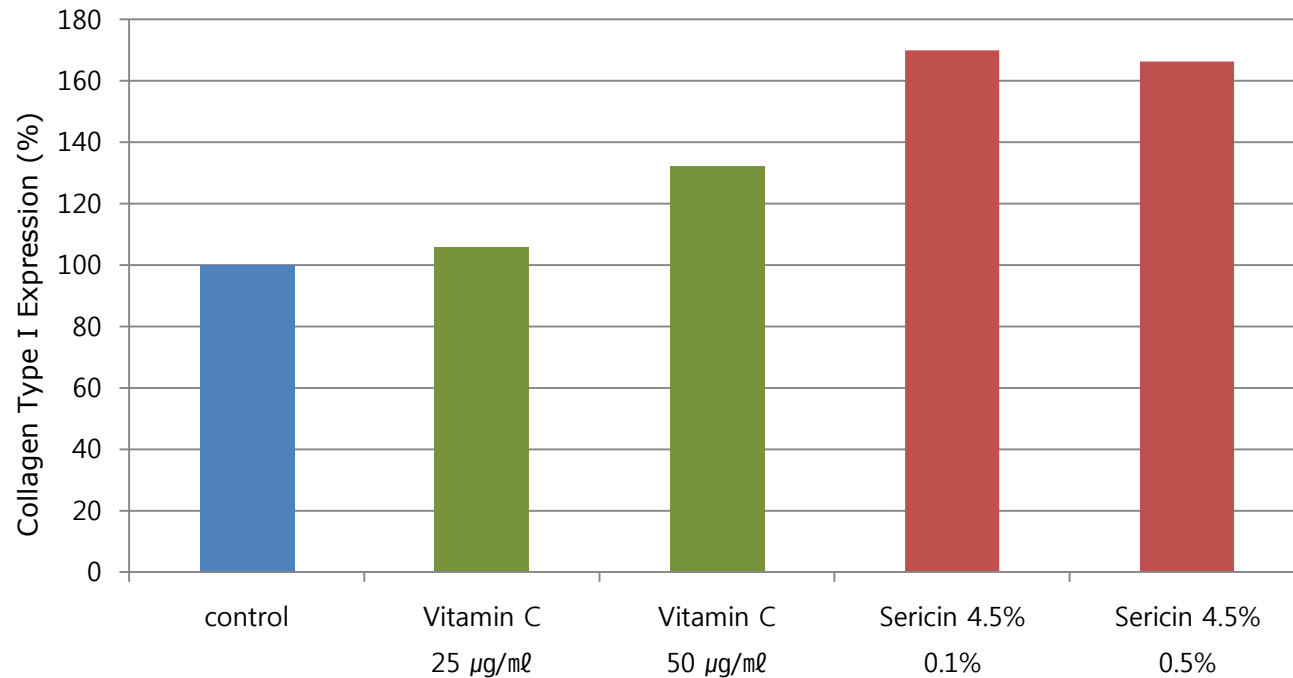




# Efficacies of Sericin 4.5 CL

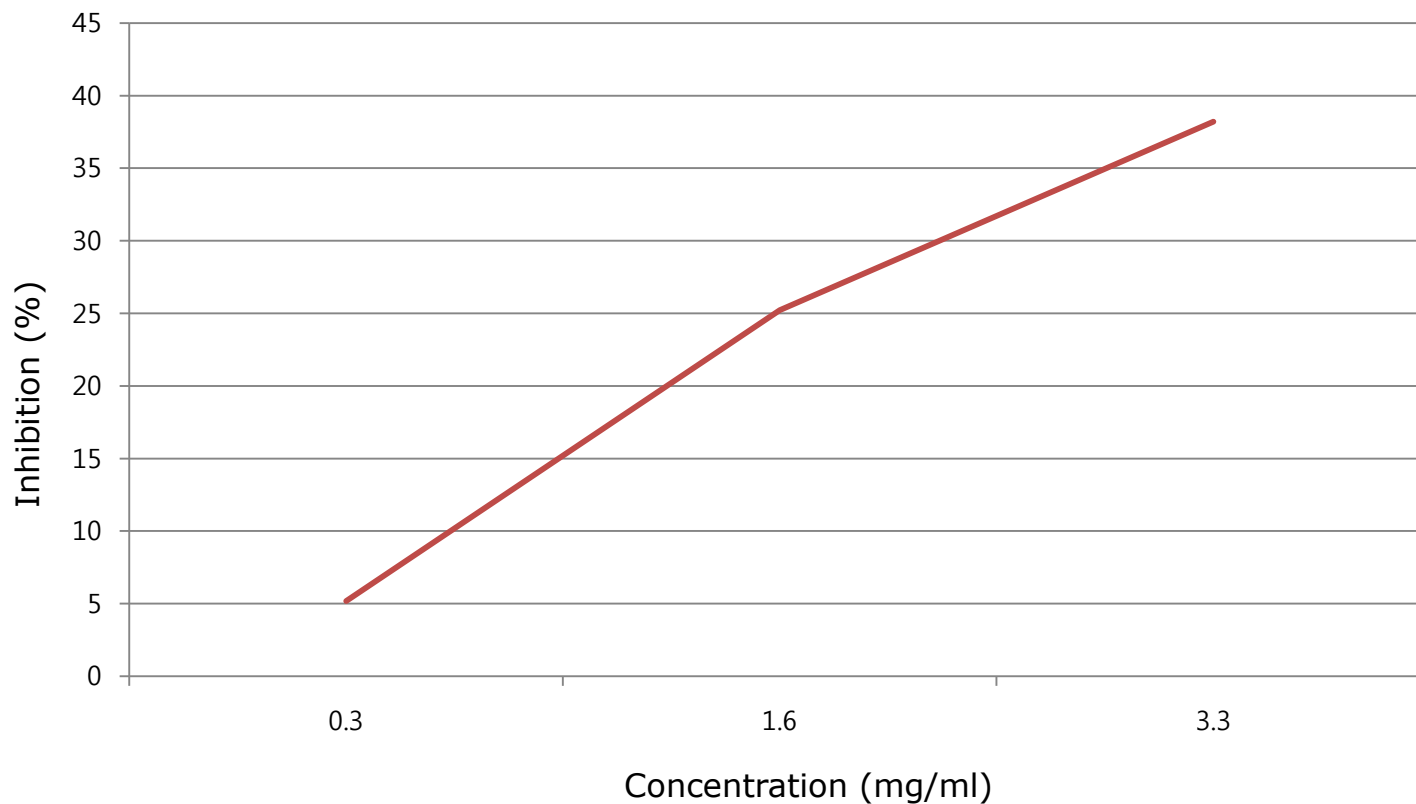


## 3. Collagen Type I mRNA Expression (RT-PCR)



# Efficacies of Sericin 4.5 CL

## 4. Elastase Activity Inhibition

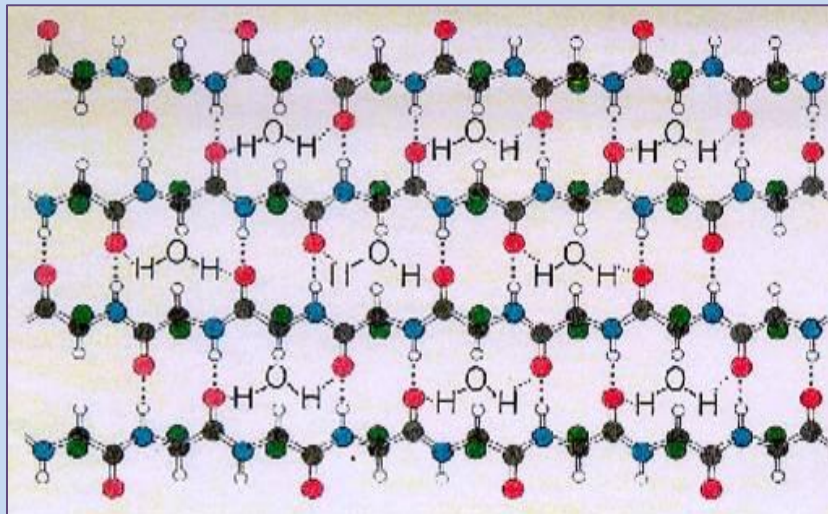


# Efficacies of Sericin 4.5 CL



## 4. Moisturizing Effect

- ❖ Sericin 4.5% consists of 17 amino acids, of which serine is the most interesting one because of its excellent moisture preservation characteristics. Water absorption of serine is 50 times higher than that of glycerin.
- ❖ The Amino acid composition of Sericin found in silk is very similar to that of the NMF(Natural Moisturizing Factors) found in human skin
- ❖ Sericin 4.5% contains a lot of amino acids with polar group and as this polar group and Amino group have hydrophilic bonding (Hydrogen bonding) with  $H_2O$  molecule.



<Interaction between Amino Acid in Sericin and  $H_2O$  molecule>

# Efficacies of Sericin 4.5 CL

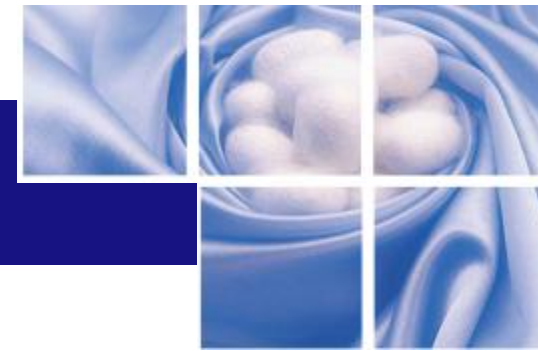


## Moisturizing Effect (Simple Clinical Test)

### 1. Test Method

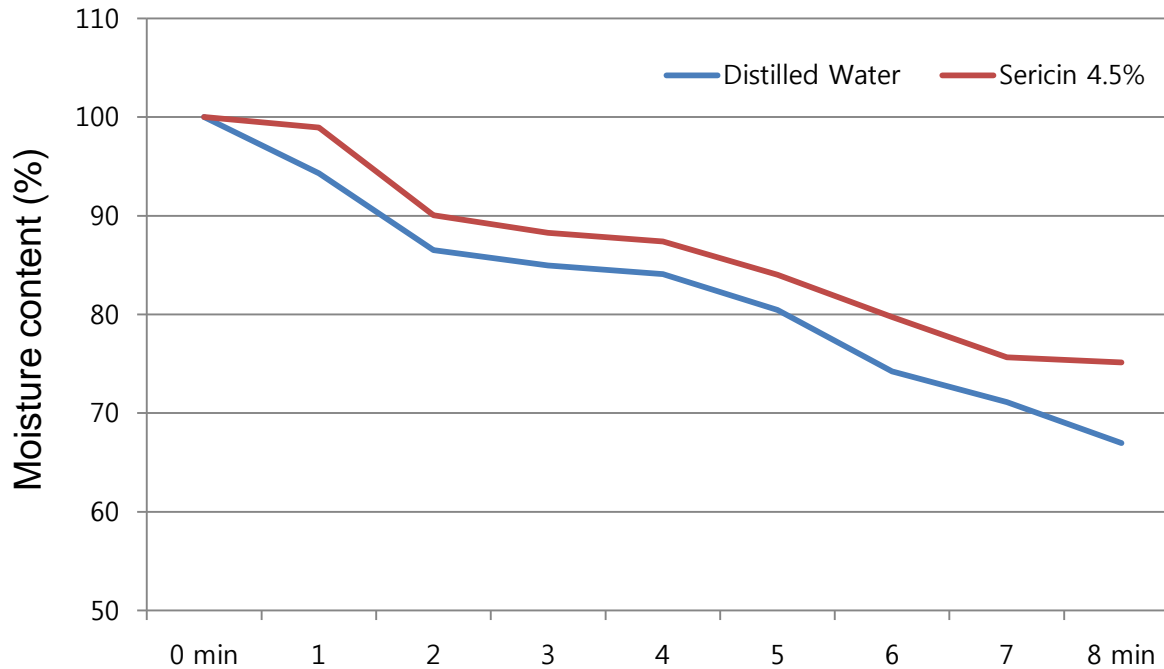
<b>Test by</b>	<b>Bioland R&amp;D Center, Korea</b>
<b>Test materials</b>	<b>Sericin 4.5%</b>
<b>Volunteer</b>	<b>5 people (aged between 24 and 29)</b>
<b>Treatment</b>	<b>20<math>\mu</math>l/2cm<sup>2</sup> of test material was applied on each arm until the test material was absorbed and waited until test materials were dried. After the test parts were dried, 20ul of purified water was applied on the site and wiped out by Kim-Wipes. The content of moisture in test areas was measured every 1 minute by Corneometer (CM825).</b>

# Efficacies of Sericin 4.5 CL



## Moisturizing Effect

### 2. Test Result

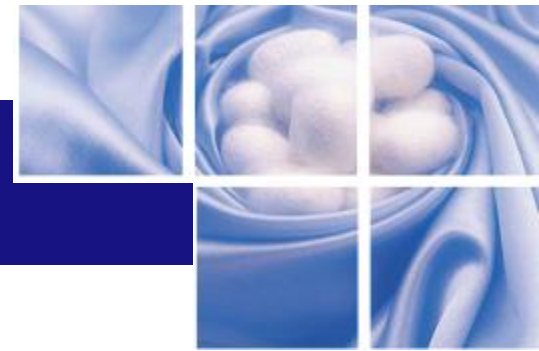


$$\text{Moisture content (\%)} = \frac{[C_x]}{[C_0]} \times 100$$

$C_x$  : Measurement results of each minute  
(Average value)

$C_0$  : Measurement result of 0 minute

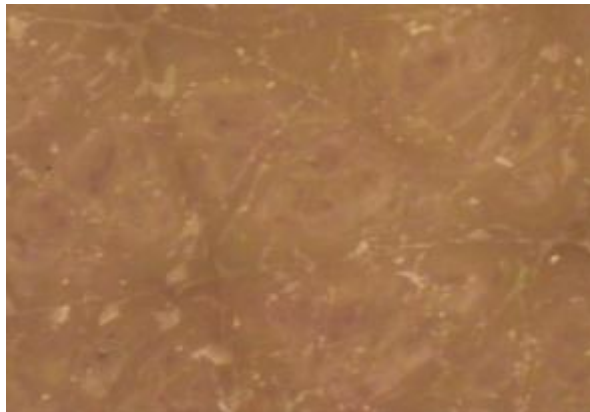
# Efficacies of Sericin 4.5 CL



## 5. Skin Desquamation Reduction

Volunteer 1

Control  
(Water)

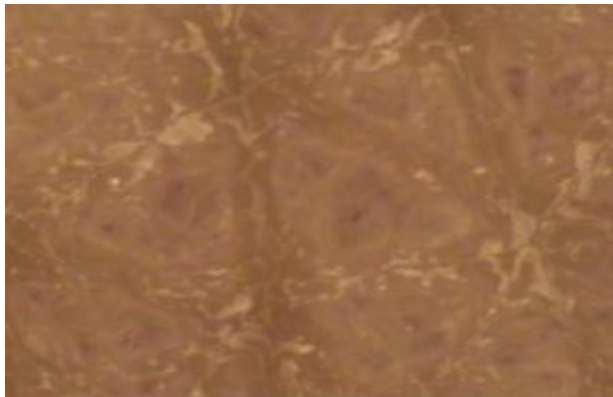


Day 0

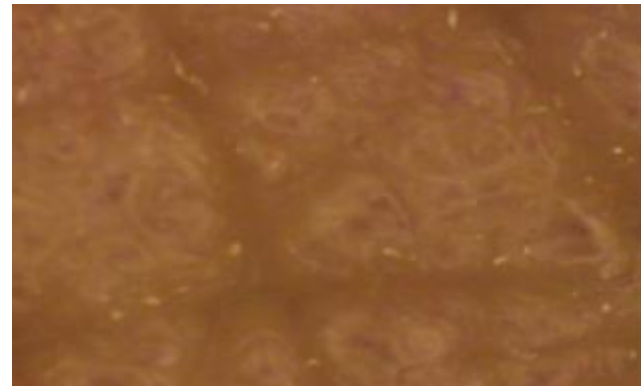


Day 3

Sericin  
4.5%

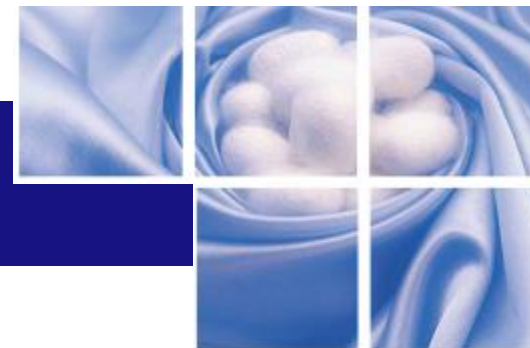


Day 0



Day 3

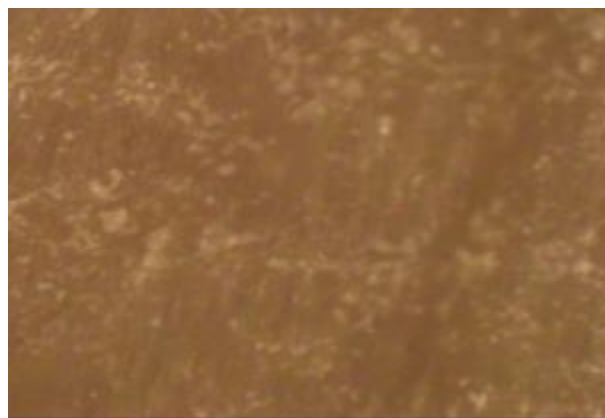
# Efficacies of Sericin 4.5 CL



## 5. Skin Desquamation Reduction

Volunteer 2

Control  
(Water)



Day 0

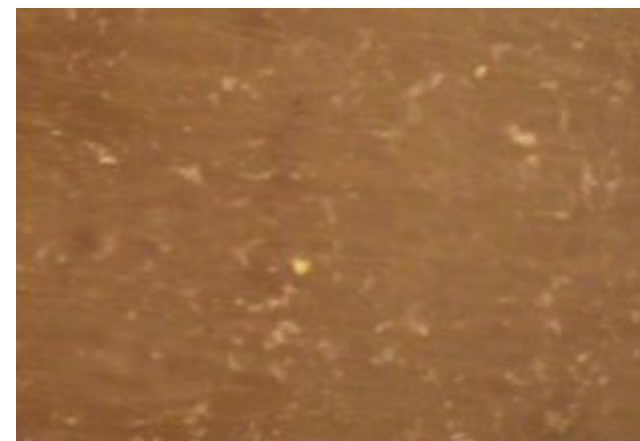


Day 3

Sericin  
4.5%



Day 0

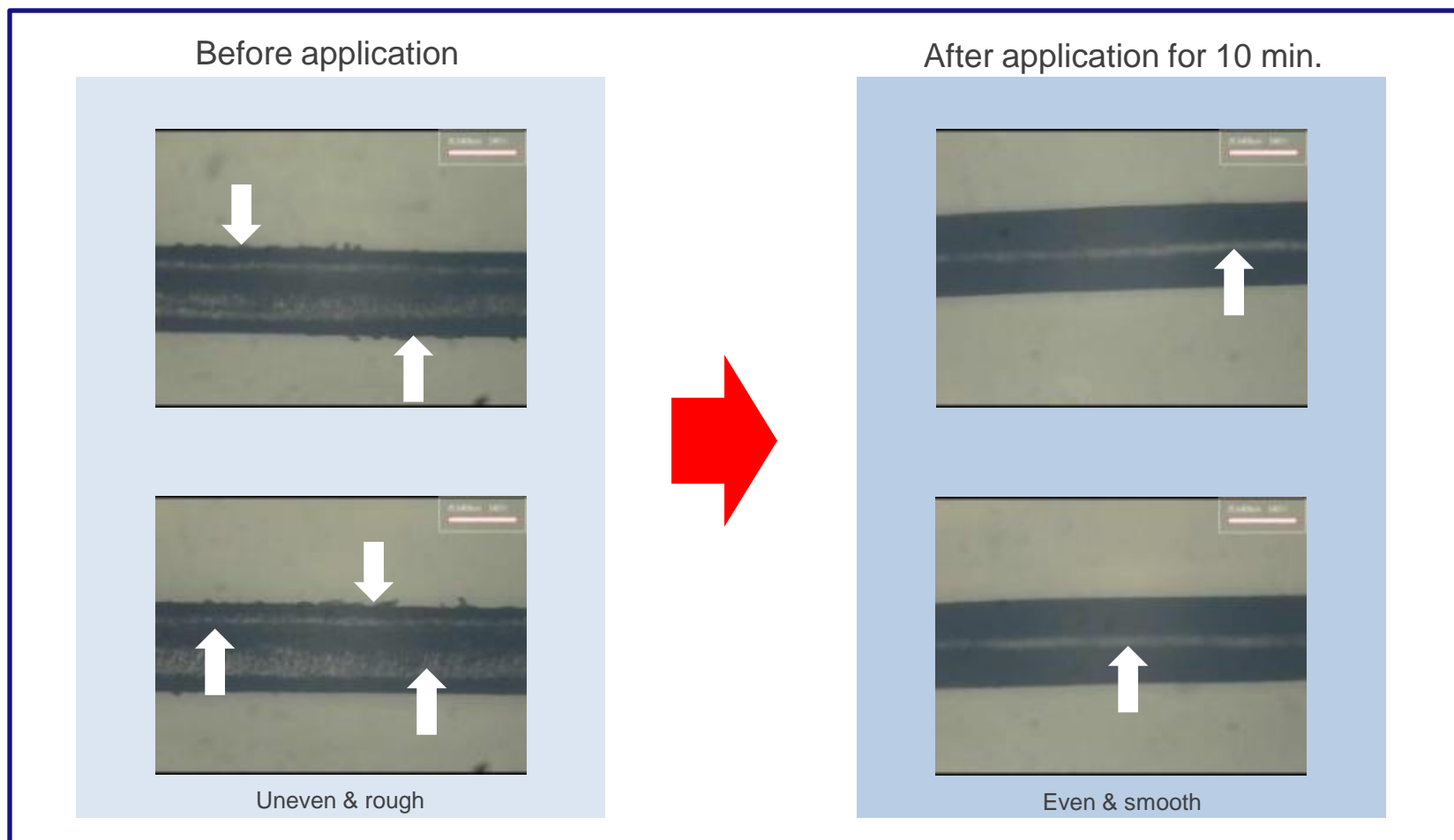


Day 3

# Efficacies of Sericin 4.5 CL



## 6. Hair coating & Nutrition (Optical Microscope Images – x600)



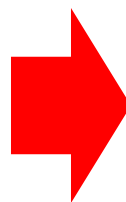
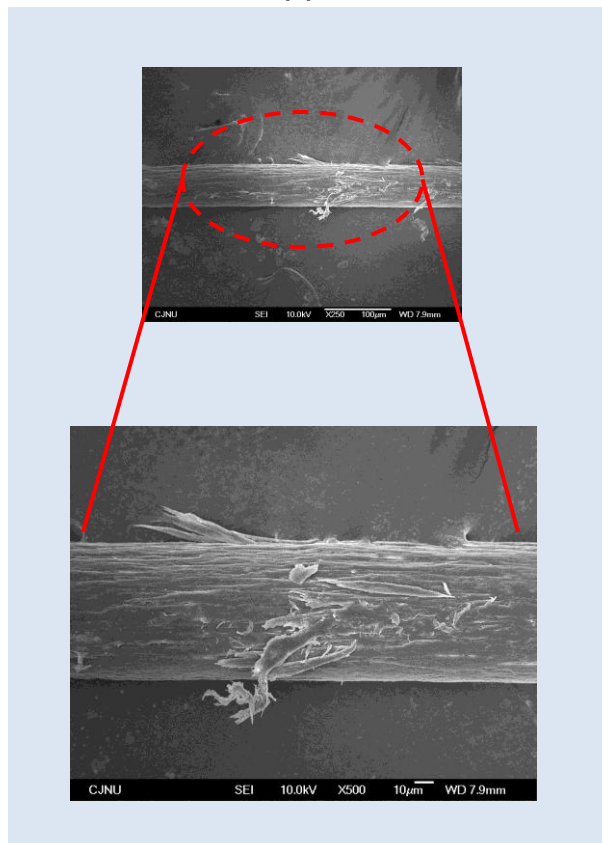


# Efficacies of Sericin 4.5 CL

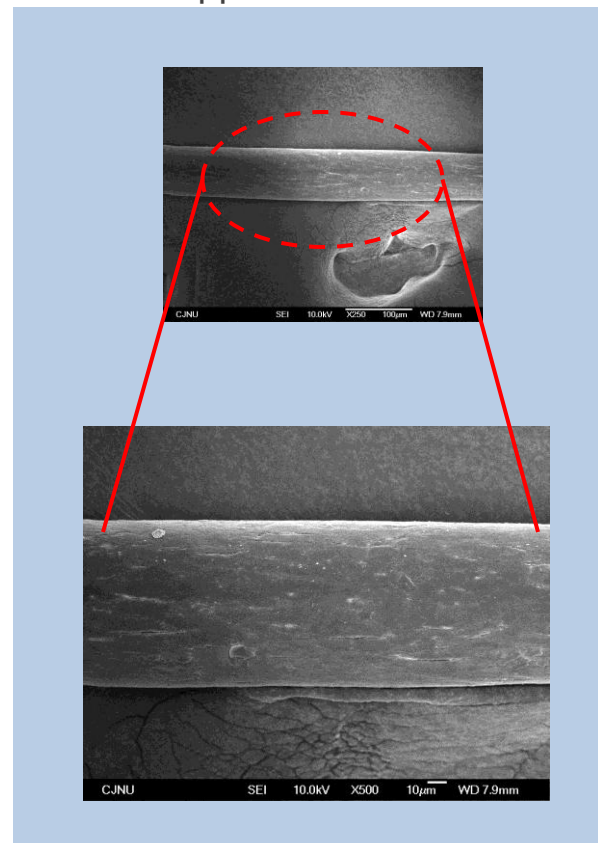


## 6. Hair coating & Nutrition (FE-SEM Images I)

Before application



After application for 10 min.

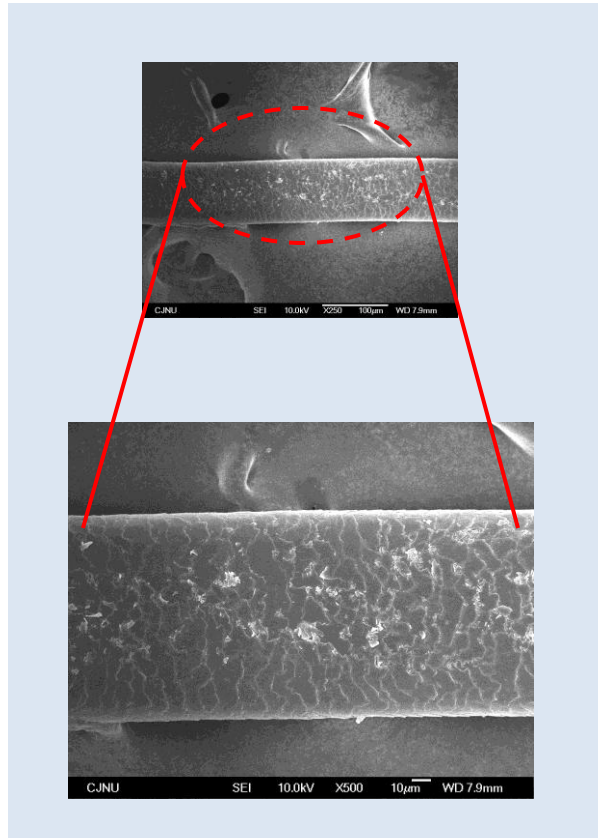


# Efficacies of Sericin 4.5 CL

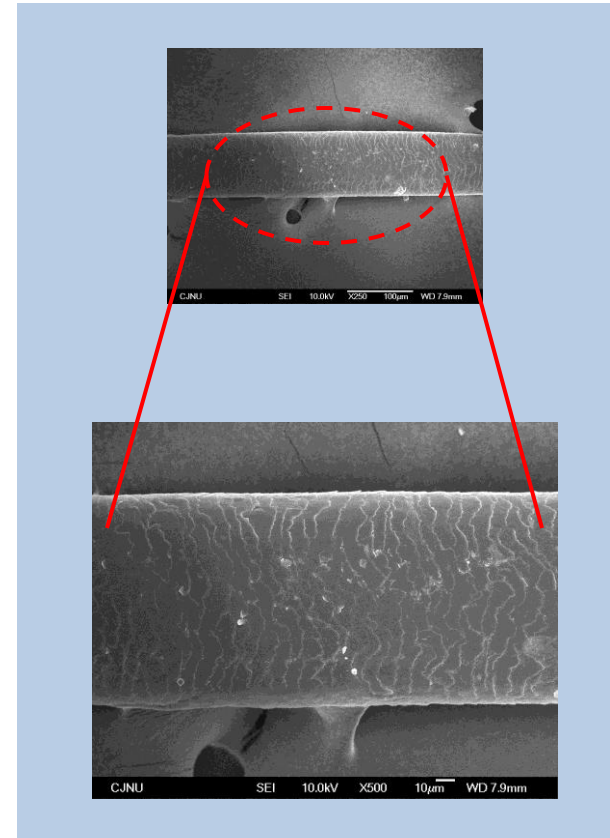


## 6. Hair coating & Nutrition (FE-SEM Images II)

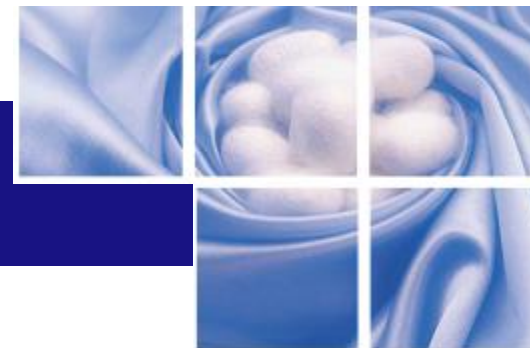
Before application



After application for 10 min.

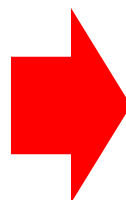


# Efficacies of Sericin 4.5 CL



## 7. Scalp Care (Optical Microscope Images x600)

Before application



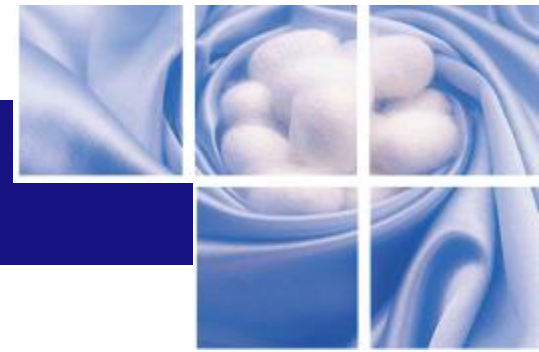
After application for 10 min.



# Specification of Sericin 4.5 CL



Analytical Tests	Specifications
INCI Name	WATER SERICIN POTASSIUM SORBATE
DESCRIPTION	Transparent liquid of yellowish-brown
pH	5.0 - 7.0
RESIDUE ON DRYING	5.0 - 6.5%
TOTAL NITROGEN (TN)	0.60 - 0.80%
SERICIN CONTENT (TN X 6.5)	3.9 - 5.2%
RELATIVE DENSITY(20°C)	1.015 - 1.025
REFRACTIVE INDEX(25°C)	1.341 - 1.346
POTASSIUM SORBATE	0.8 - 1.2%
TOTAL PLATE COUNT	Not more than 100 cfu/ml



THANK YOU !!

*Sochibios*  
*Nature, Science & Life*