

# HS TKM 24

Protect Your Scalp against Thermal Stress



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# How to keep your healthy Scalp from Thermal Stress

## The importance of hair

The importance of hair in our lives cannot be overstated. Men or women lose their hair, and they will lose more than their natural and youthful appearance. Also, people lose their self-esteem and self-confidence related to healthy hair. Hair loss, called alopecia, is a common problem affecting both men and women.



## The causes of hair loss

The causes of hair loss are very diverse and complex.

Medically, hair loss refers to a state in which hair appears to be dislodged by various internal and external factors that cause damages to the scalp and hair follicle. Damaged scalp stops the activity of the hair follicle and hair papilla in anagen phase and causes an imbalance in the hair growth cycle. These symptoms mainly occur in the parietal region.

In recent years, due to environmental pollution, excessive stress, and changes in the living environment that have accompanied the industrialization, and the complicated social structure, the scalp disease and alopecia are becoming serious problems for people.

According to Korean traditional medicines, it is reported that the scalp heat generated by the internal and external thermal stress weakens the metabolic activity of the scalp and blood circulation of the scalp and causes the imbalance of hair growth cycle and the degeneration of follicular cells.

## Attention to 'The Care for Thermal Hair Loss'

Under the hot sun, the scalp receives as much heat as the skin. So, heat is accumulated in follicle and the pores, and the scalp loses its protective function. As a result, hair loss is occurring.

We refer to the weakened scalp condition due to heat stress in modern terms as 'thermal hair loss'.

If you have a lot of body heat and are sensitive to the heat, special care must be taken to prevent hair loss.

Therefore, it is important to keep a healthy scalp from heat stress.

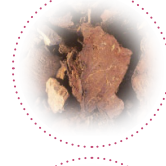
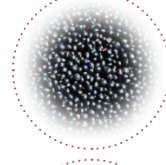
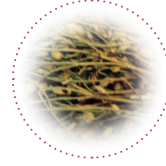
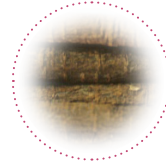
## How can we protect the healthy scalp from thermal stress?

The solution is **HSTKM 24**.

**HSTKM 24** is a synergistic botanical complex combining Traditional Korean Medicines (TKM).

It is composed of 24 oriental medicinal herbs selected with their complementary abilities to remedy the cause of hair loss based on traditional remedies and certified by modern science.

In order to get the better scalp improvement effect, HSTKM 24 is made by decoction method after fermentation for 24hrs.



# Traditional Korean Medicines for Healthy Scalp

In Korea, Traditional Korean Medicines (TKM) has been used for thousands of years as an important traditional skin care method that follows the oriental medicinal book. Generally, TKM is unique in its use as it reflects the characteristics of Korean history, culture and natural resources.

## MECHANISM

### [ Approach to Thermal Hair Loss ]

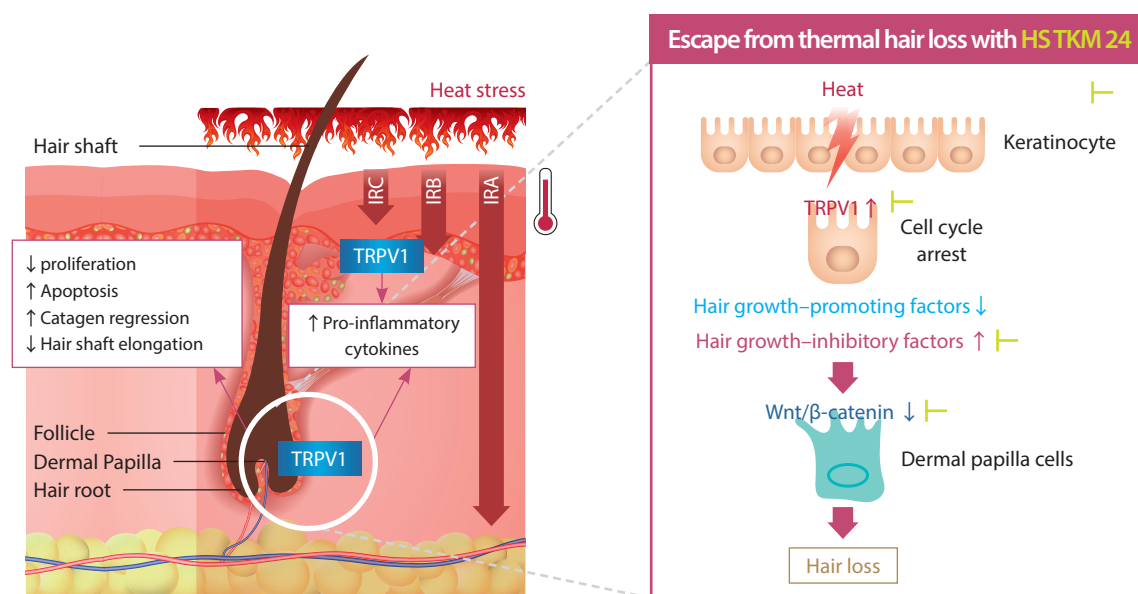
Transient receptor potential vanilloid 1 (TRPV1) is a protein which detects and regulates body temperature. And also, it provides a sensory feeling for scald and pain.

This thermal receptor, TRPV1, is expressed in sensory neurons and keratinocyte in epidermis and hair follicle by noxious stimuli such as temperature above 43°C, irritant agents and some lipolytic enzymes.

In hair follicle keratinocytes, TRPV1 activation induces hair follicle regression (catagen) and apoptosis. And also increases the expression of hair growth inhibitors (transforming growth factor- $\beta$ 2, dickkopf-related protein-1, etc.).

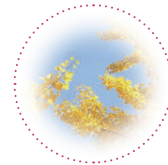
Hair growth inhibitors secreted in hair follicle keratinocytes reduce the Wnt/ $\beta$ -catenin signaling pathway which plays an important role in hair growth. These steps lead to hair loss.

HSTKM 24 makes the way for anti-hair loss, as it improves damaged scalp caused by heat stress.



HSTKM 24 helps to improve the appearance of hair quality and scalp health.

1. HSTKM 24 defends sensitive scalp against daily stress factors.
2. HSTKM 24 relieves scalp damage due to heat-styling.
3. HSTKM 24 prevents hair loss by rebalancing the hair cycle.



# IN-VITRO TEST

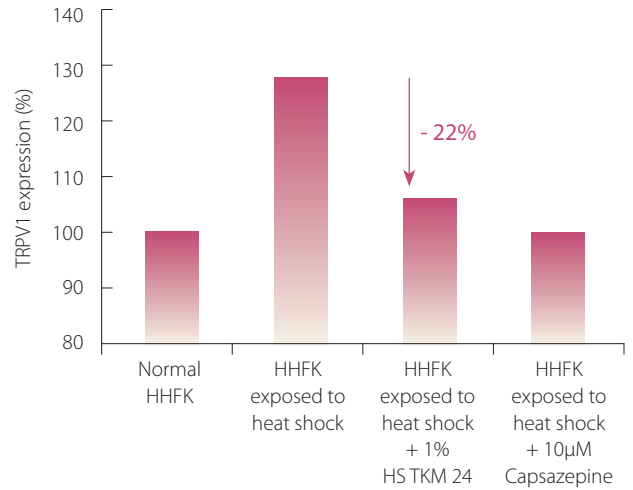
## THERMAL FACTOR CONTROLLING EFFECT

### HS TKM 24 INHIBITS THE ACTIVATION OF TRPV1

The TRPV1 (Transient receptor potential vanilloid 1), which is activated by heat, low pH and capsaicin, promotes hair follicle regression (catagen) and hair matrix keratinocyte apoptosis.

-22% TRPV1

**Protocol:** Human Hair Follicular Keratinocytes (HHFK) cultures were incubated during 24 hours (at 37°C, 5% CO<sub>2</sub>) in presence of 1% HS TKM 24, and then treated with heat shock at 43°C for 3 hours. The expression levels of mRNA were analyzed by RT-PCR.



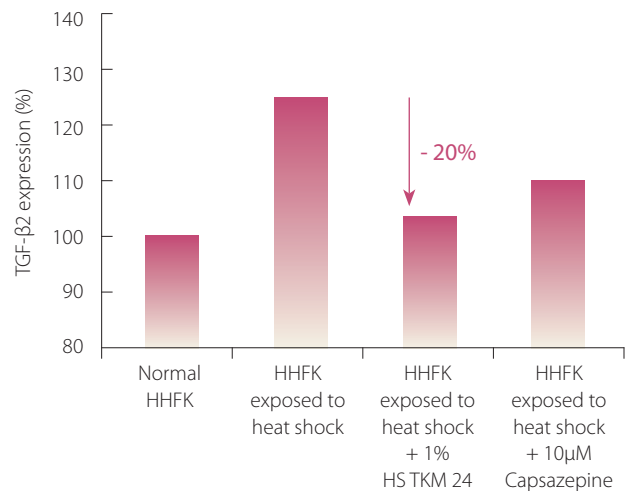
## REGULATION EFFECT ON HAIR GROWTH INHIBITORS

### HS TKM 24 DECREASES THE EXPRESSION OF TGF-β2

TGF-β2 (Transforming growth factor-β2) is a well-known inhibitor of hair shaft elongation and inducer of both apoptosis and catagen in hair follicles.

-20% TGF-β2

**Protocol:** Human Hair Follicular Keratinocytes (HHFK) cultures were incubated during 24 hours (at 37°C, 5% CO<sub>2</sub>) in presence of 1% HS TKM 24, and then treated with heat shock at 43°C for 3 hours. The expression levels of mRNA were analyzed by RT-PCR.

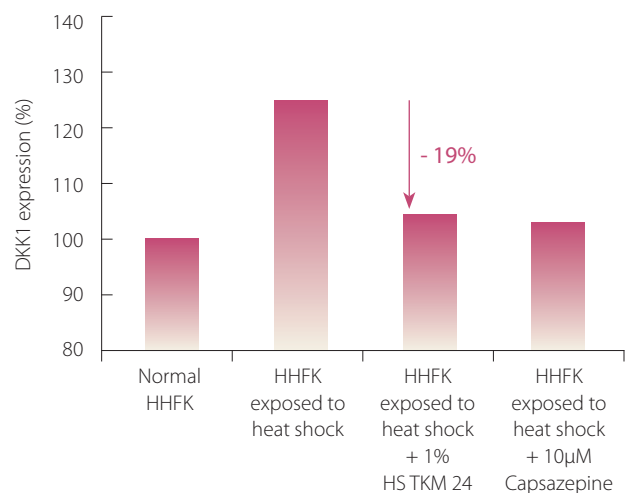


### HS TKM 24 DECREASES THE EXPRESSION OF DKK-1

DKK-1 (Dickkopf-1), the Wnt/ β-catenin inhibitor, promotes regression of hair follicles.

-19% DKK1

**Protocol:** Human Hair Follicular Keratinocytes (HHFK) cultures were incubated during 24 hours (at 37°C, 5% CO<sub>2</sub>) in presence of 1% HS TKM 24, and then treated with heat shock at 43°C for 3 hours. The expression levels of mRNA were analyzed by RT-PCR.



# IN-VITRO TEST

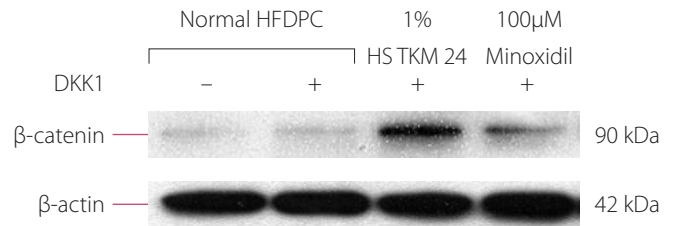
## ENHANCEMENT EFFECT ON $\beta$ -CATENIN ACTIVITY

### HS TKM 24 ENHANCES THE $\beta$ -CATENIN signaling pathway

Wnt/  $\beta$ -catenin pathways play an important role in hair growth by anagen induction.

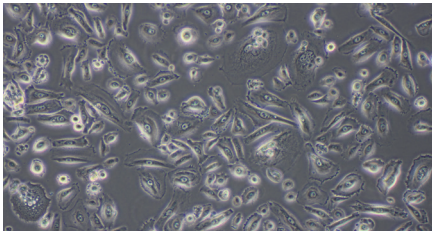
$\beta$ -catenin, the transducer of Wnt signaling, is important for the development and growth of hair follicles.

**Protocol:** Hair Follicle Dermal Papilla Cells(HFDPC) cultures were incubated during 24 hours (at 37°C, 5% CO<sub>2</sub>) in presence of 1% HS TKM 24 with 0.5 ng DKK1 (Sigma-aldrich, Germany). The expression levels of protein were analyzed by western blot.

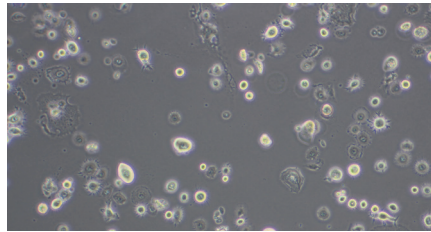


## CELL PROTECTING EFFECT

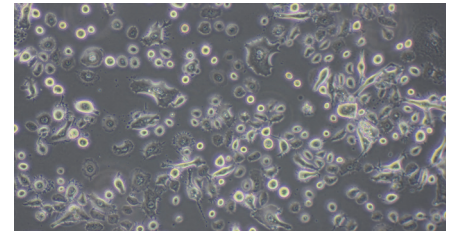
### HS TKM 24 PROTECTS CELLS AGAINST HEAT STRESS



Normal HHFK



HHFK exposed to heat shock



HHFK exposed to heat shock + 1% HS TKM 24

**Protocol:** Human Hair Follicular Keratinocytes (HHFK) were incubated during 24 hours (at 37°C, 5% CO<sub>2</sub>), and then treated with heat shock at 43°C for 5 hours. Images were observed using inverted microscopy (OLYMPUS, Japan).

# IN-VIVO TEST

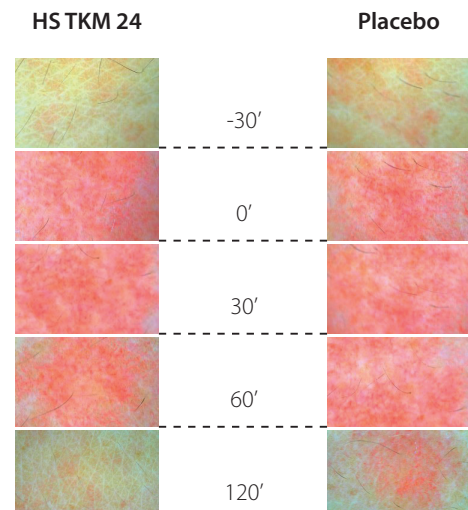
## SCALP CALMING EFFECT

### HS TKM 24 CALMS SCALP FROM IR-INDUCED HEAT STRESS.

**Method:** Measurement of skin reddening (Images by APM-300) upon IR exposure.

single application of hair mist containing 1% HS TKM 24 and placebo after 30 minutes exposure to IR-radiator and measurements.

**Result:** HS TKM 24 effectively calms against IR-induced heat stress. It reduces the reddening intensity.





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<b>Cosmetic activities</b>	<ul style="list-style-type: none"><li>• Suppression of TRPV-1 activation</li><li>• Down regulation of Hair growth-inhibitory factors</li><li>• Stabilization of Wnt/ <math>\beta</math>-catenin signaling pathway</li><li>• Enhancement of Cell Proliferation</li><li>• Scalp Protecting Effect</li></ul>
<b>INCI name</b>	Water & Butylene Glycol & 1,2-Hexanediol & Hydroxypropyl Cyclodextrin & Angelica Gigas Root Extract & Camellia Sinensis Leaf Extract & Curcuma Longa (Turmeric) Root Extract & Eclipta Prostrata Extract & Polygonum Multiflorum Root Extract & Scutellaria Baicalensis Root Extract & Swertia Japonica Extract & Thuja Orientalis Leaf Extract & Carthamus Tinctorius (Safflower) Flower Extract & Forsythia Suspensa Fruit Extract & Ginkgo Biloba Leaf Extract & Glycine Soja (Soybean) Seed Extract & Glycyrrhiza Uralensis (Licorice) Root Extract & Panax Ginseng Root Extract & Schizandra Chinensis Fruit Extract & Zingiber Officinale (Ginger) Root Extract & Acorus Gramineus Extract & Artemisia Princeps Leaf Extract & Chrysanthemum Zawadskii Extract & Cornus Officinalis Fruit Extract & Ficus Carica (Fig) Fruit Extract & Ganoderma Lucidum (Mushroom) Extract & Houttuynia Cordata Extract & Sophora Flavescens Root Extract & Aspergillus Ferment
<b>Recommended % of use</b>	1% ~