

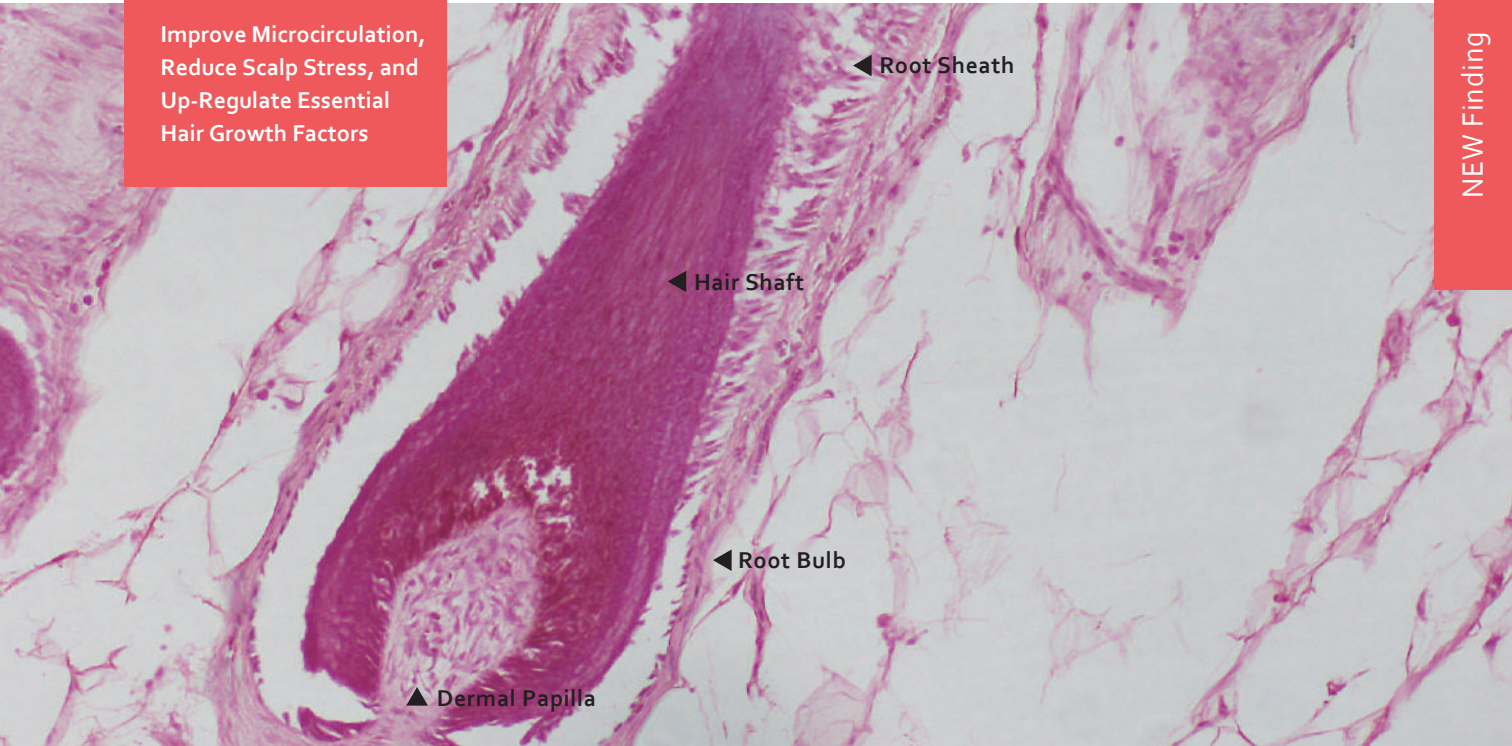
# HotFlux<sup>®</sup>

Improve Microcirculation,  
Reduce Scalp Stress, and  
Up-Regulate Essential  
Hair Growth Factors

## New Mechanism!

HotFlux<sup>®</sup> for Healthy Scalp and Hair

NEW FINDING



## HotFlux<sup>®</sup>

### INCI Declaration

Vanillyl Butyl Ether  
香兰基丁基醚

### Benefits

Impart exotic warming  
sensation  
Enhance microcirculation  
Help stimulate hair growth

### Applications

Massage  
Slimming  
Spa  
Pain relief  
Intimacy  
Hair

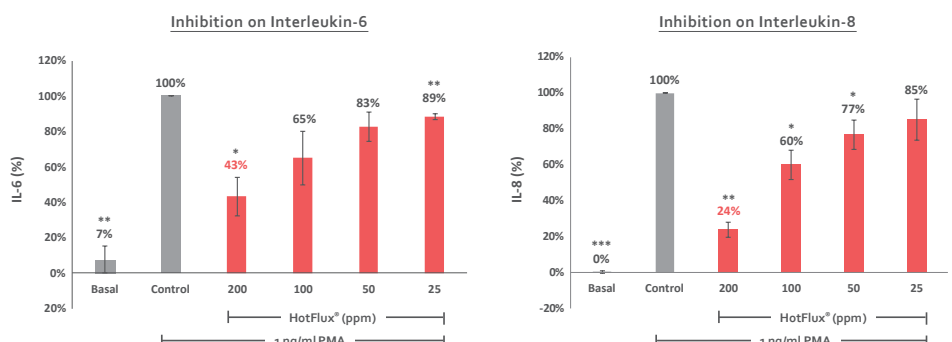
### Hair Loss : The Most Distressing Problem of the Scalp

Approximately 1.8% of the world population is experiencing hair loss, which is a common phenomenon troubling both male and female throughout their lifetime. Common causes of hair loss include stress, genetics, drugs, disease, pollution and extensive hair styling. As hair contributes to an individual's physical attractiveness and body image, hair loss could be an emotionally distressing condition that makes those affected particularly vulnerable by lowering their self-esteem and overall quality of life.

### Inflammation as a Key to Interrupt Healthy Hair Growth

About 95% of hair loss in men can be attributed to androgenetic alopecia (male pattern baldness), which is caused by the predominance of dihydrotestosterone (DHT), a derivative converted from testosterone by the enzyme 5 $\alpha$ -reductase. While DHT has been considered the main cause to hair loss, inflammation to the scalp is also known as one of the major factors that exacerbate the balding process. It is reported that DHT, as a paracrine mediator from the dermal papilla, can induce inflammatory factors such as IL-6. These cytokines would therefore suppress the proliferation of matrix cells and inhibit proper hair shaft growth, which may limit the healthy hair cycle.

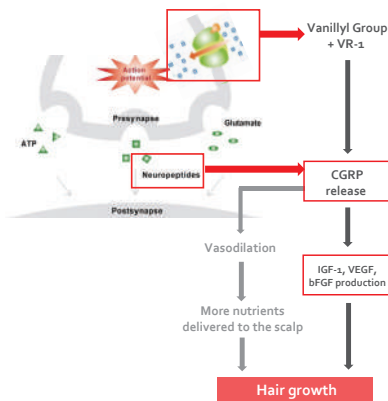
To better understand the role of HotFlux<sup>®</sup> in the hair loss mechanism, studies were carried out to investigate the effect on inflammatory cytokines using dermal papilla cells. Results reveal that both IL-6 and IL-8 levels were dose-dependently reduced upon treatment, suggesting the potential potency of HotFlux<sup>®</sup> in attenuating hair loss by restraining inflammatory factors.



## Perifollicular Microcirculation for Proper Nutrient Delivery

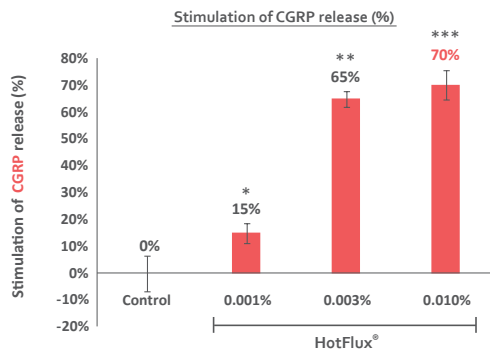
Diminished peripheral circulation is known as a major cause to senescent- or age-related hair thinning. A study of male patients diagnosed with androgenetic alopecia showed that the blood flow to the scalps was on average 2.6 times lower than the normal control group, as their follicles had been deprived of blood and nutrients over an extended period of time. Therefore, formulating hair products with ingredients that can effectively enhance microcirculation may be helpful to improve anti-hair loss effect in hair/ scalp treatments.

The Mechanism of HotFlux® in Hair Growth



## HotFlux® Enhances Peptide Vasodilator (CGRP) in Sensory Neurons

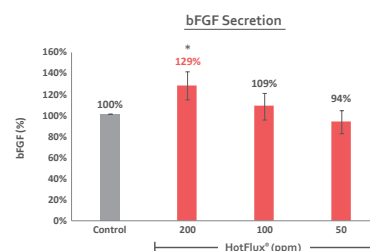
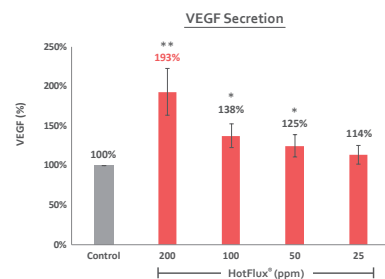
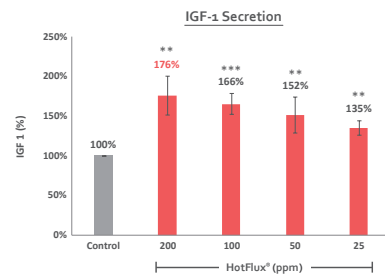
Literature has reported that oral administration of capsaicin can improve hair growth in patients with alopecia. HotFlux®, which contains the same vanillyl group as capsaicin, was studied using *in-vitro* primary sensory neuron to understand if similar effect exists. Data show that HotFlux® not only can stimulate microcirculation, but also induce a concentration-dependent release of calcitonin gene-related peptide (CGRP), a neurotransmitter known for promoting vasodilation. This experiment demonstrates the potential benefit of HotFlux® in improving the perifollicular circulation for proper delivery of nutrients needed for hair growth.



## Nourish the Scalp with Sufficient Supply of Nutrients

In addition to reducing stress and inflammation of the scalp, sufficient blood flow and an adequate supply of alimentation and oxygen to hair follicle is also crucial to healthy hair condition. While certain well-known hair loss treatments work to inhibit DHT and stimulate hair stem cells, HotFlux® not only targets blood circulation but also facilitate the delivery of nutrients to hair follicles. Results prove that this ingredient helps to increase the synthesis of hair growth factors in dermal papilla, including **insulin-like growth factor-1 (IGF-1)**, **vascular endothelial growth factor (VEGF)** and **basic fibroblast growth factor (bFGF)**. These growth factors are essential for the proliferation and differentiation of hair stem cells in a balanced and healthy hair growth environment.

Hair growth factors	
IGF-1	Strengthen hair by stimulating the proliferation and differentiation of hair follicle.
VEGF	Stimulate endothelial cells of blood vessels to proliferate and grow for supply of alimentation in hair follicle.
bFGF	Help hair blood circulation in the scalp and revitalize hair follicle by inducing anagen phase in resting hair follicles.



HotFlux® helps to rejuvenate hair growth and revitalize the scalp condition by improving blood flow for adequate nutrient delivery to the roots; it also increases essential growth factors while reducing inflammatory cytokines that may relate to hair loss.