

Topical Application of Adaptogens Modulate the Brain-Skin Axis for Holistic Well-Aging

Susan Paris – Active Concepts

The Exposome



Recognized by the World Health Organization (WHO) as a major health challenge of the 21st century, **stress** is increasingly linked to global crises and environmental factors. **The exposome**, a concept introduced in 2005, highlights the lifelong impact of environmental and lifestyle exposures on health. This framework provides key insights into how **external stressors** interact with human biology, shaping overall **well-being**.

Wellness-Focused Approach

In recent years, consumer priorities have increasingly shifted toward wellness. Consumers are now looking for products that support not only their appearance but also their **overall health** and **inner balance**.

This trend creates **new opportunities** for brands to meet the needs of older consumers who embrace well-aging and seek products and messages that promote **holistic well-being**.

Unlike anti-aging, which mainly targets visible signs of aging such as wrinkles, well-aging focuses on emotional and mental well-being, emphasizing **self-care**, balance, and quality of life.

Welcome to the world of

SKIND

skin & mind in harmony,
where science meets beauty.



Brain-Skin Axis

Based on the **two-way communication** between the skin and the nervous system through neural, hormonal, and immune pathways.

The brain and skin share a common embryonic origin, both arising from the **ectoderm**.

This shared origin is a key factor in understanding the “brain-skin axis,” a concept highlighting the bidirectional communication and interactions between the two.

Mind-Body Beauty



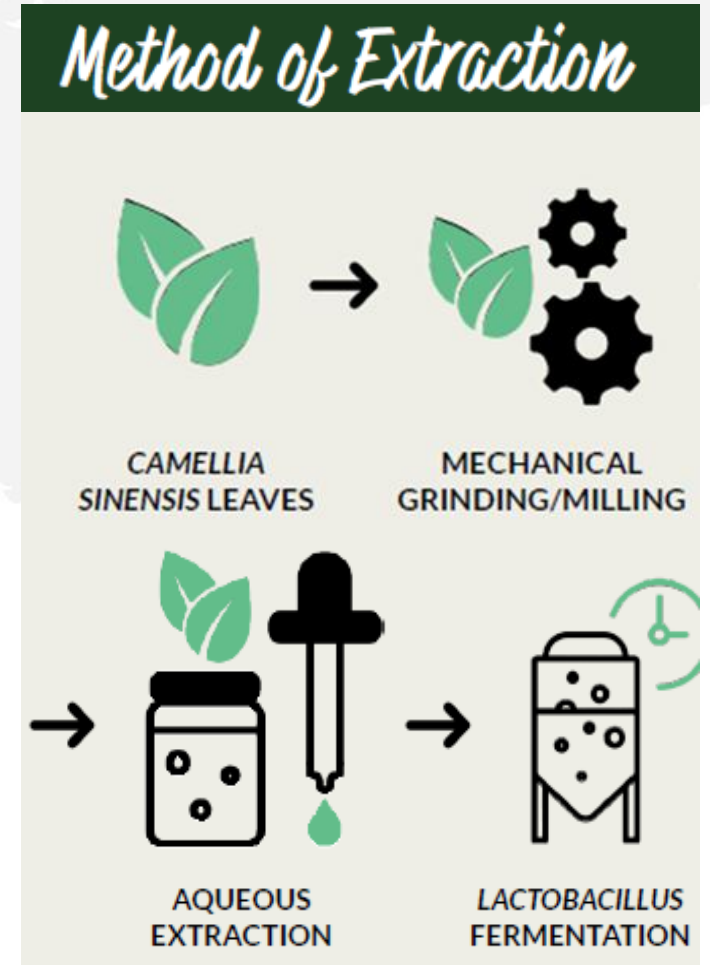
Stress, anxiety and negative emotions can trigger or exacerbate skin conditions. In a similar fashion, can a positive emotional experience reduce inflammation and result in healthy skin?

Active Concepts harnessed the power of matcha tea to create a **unique anti-stress active** capable of improving mood and promoting relaxation, exploring the link between **mood** and **skin**.

Magic of Green Tea 🍵

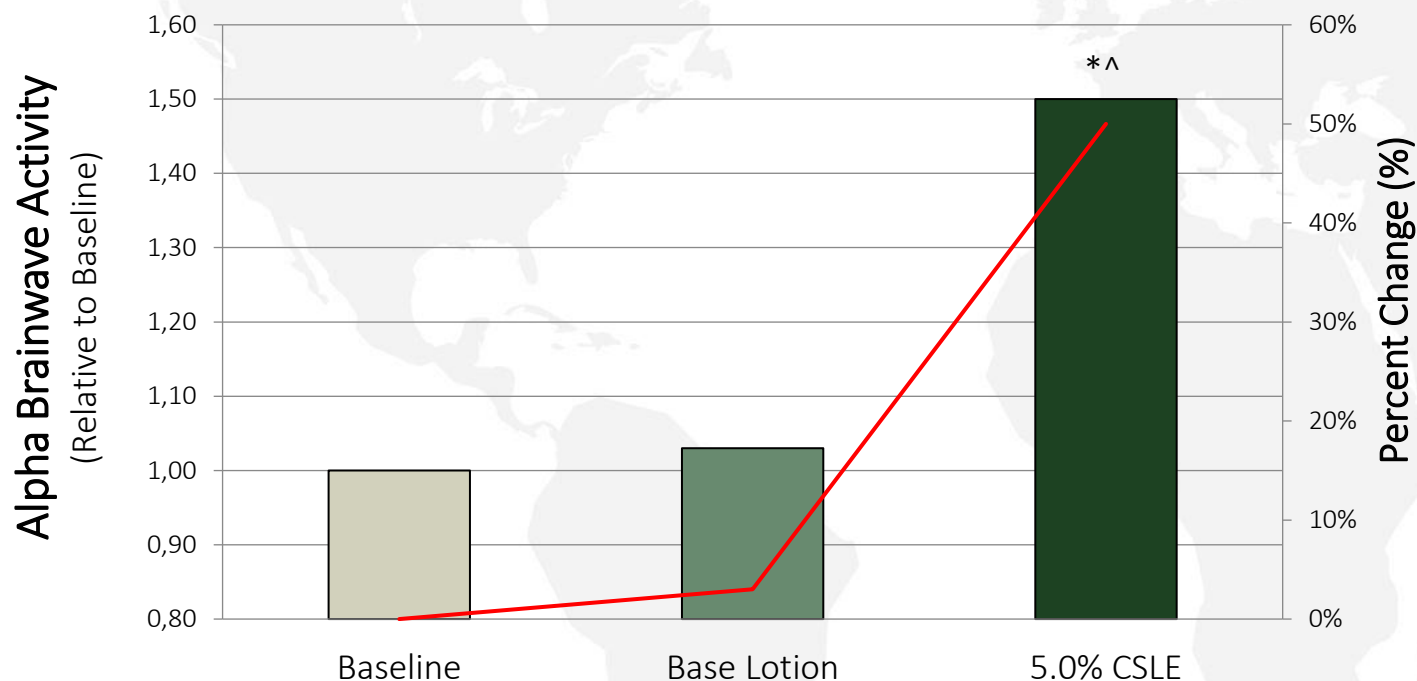
Green tea extracts - *Camellia sinensis* - are widely valued for their health and cosmetic benefits due to its bioactive compounds, such as polyphenols or caffeine, and theanine. These compounds provide antioxidant, anti-inflammatory, antibacterial, and immune-supporting effects. In cosmetics, green tea extracts are linked to **rejuvenation** and **skin hydration**.

Our study investigated the effects of *Camellia sinensis* Leaf Extract (CSLE) on skin health and well-being demonstrating benefits that go **beyond traditional beauty** enhancement.



EEG Brainwave Study

Relaxation During Application

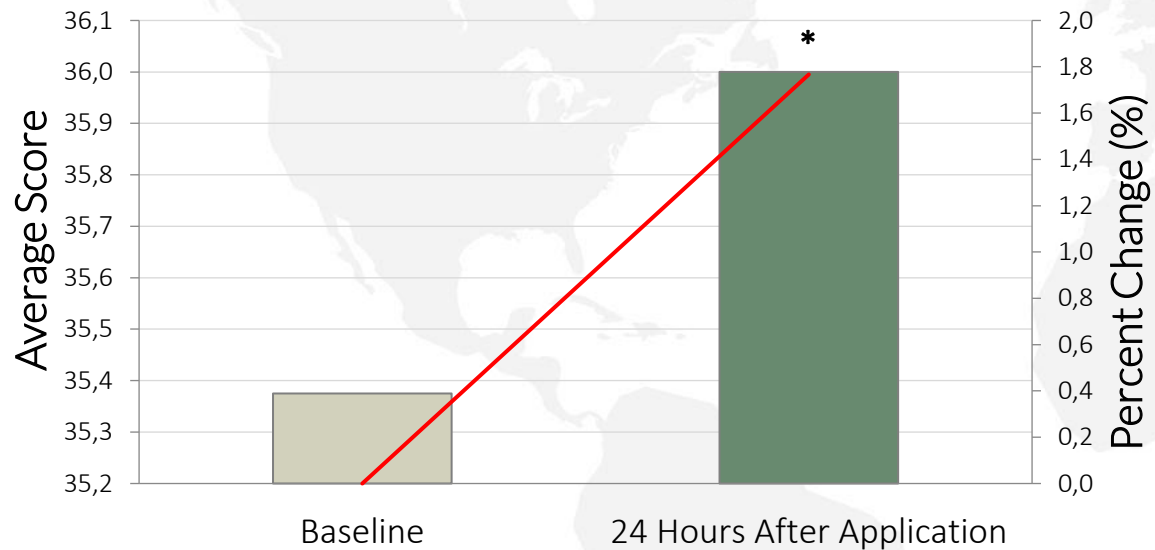


An EEG Brainwave Study was conducted to evaluate the immediate relaxation and calming properties of CSLE application. The brainwaves associated with relaxation and calmness – Alpha - are isolated and analyzed to provide insight to the psychological state during product application.

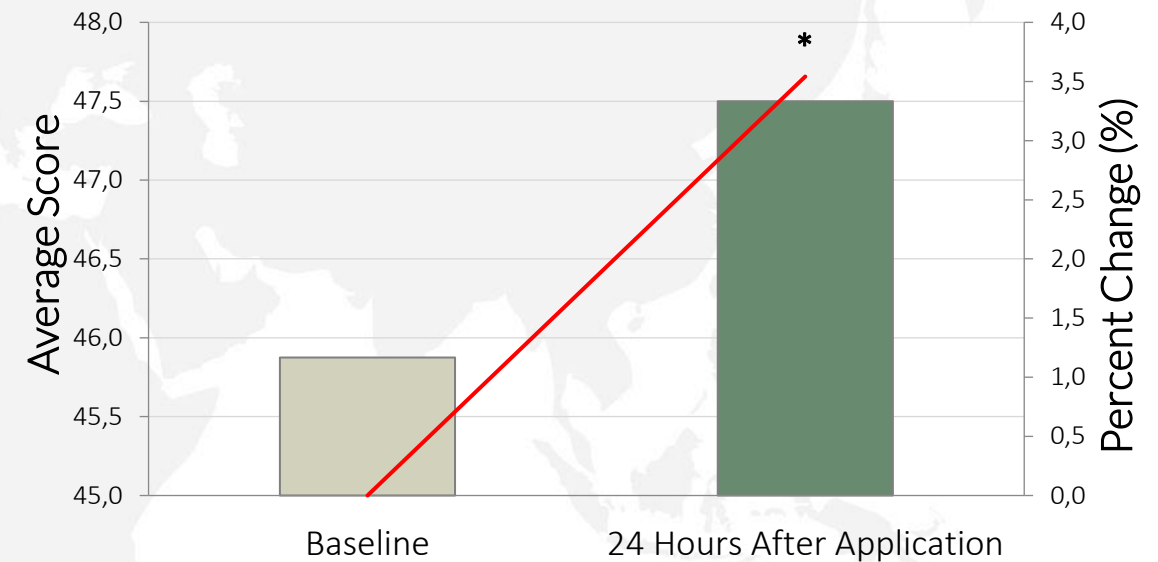
Figure 1. Alpha Brainwave Activity During Product Application Relative to Baseline. * indicates significance ($p \leq 0.05$) compared to Baseline. ^ indicates significance ($p \leq 0.05$) compared to Base Lotion.

Mood Survey

Global Self-Worth

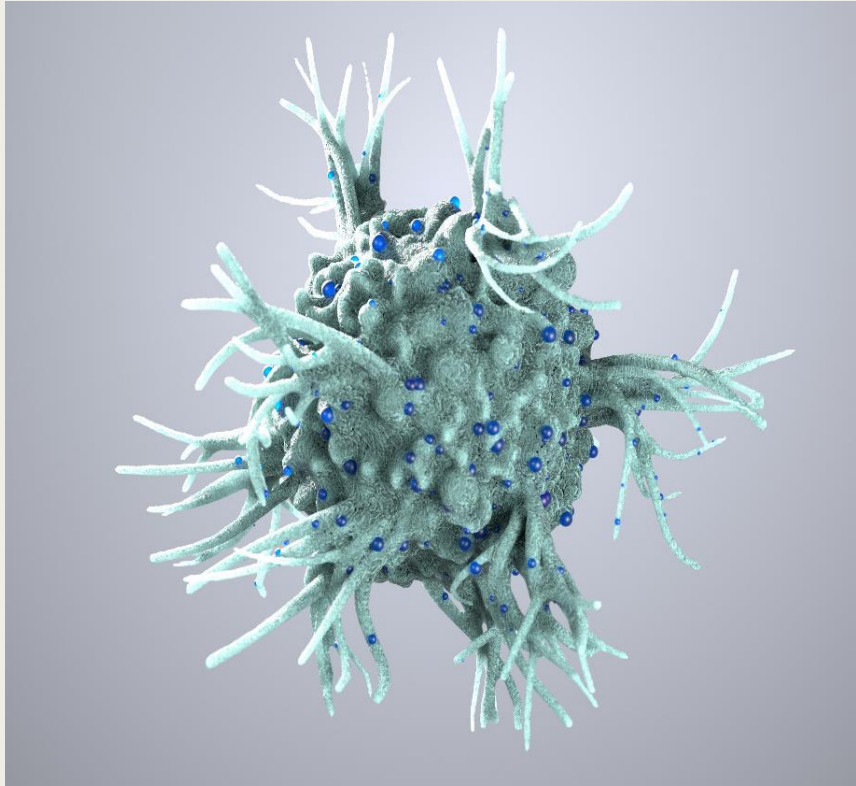


Pleasant Mood Index



A Mood Survey Analysis was conducted to evaluate the effect of applying CSLE on mood state and perceived self-esteem. Participants completed mood surveys before and 24 hours after product application to demonstrate the dynamic aspects of a product experience and the perceived effects.

Dendritic cells **Nature's Sentinels in immunity**

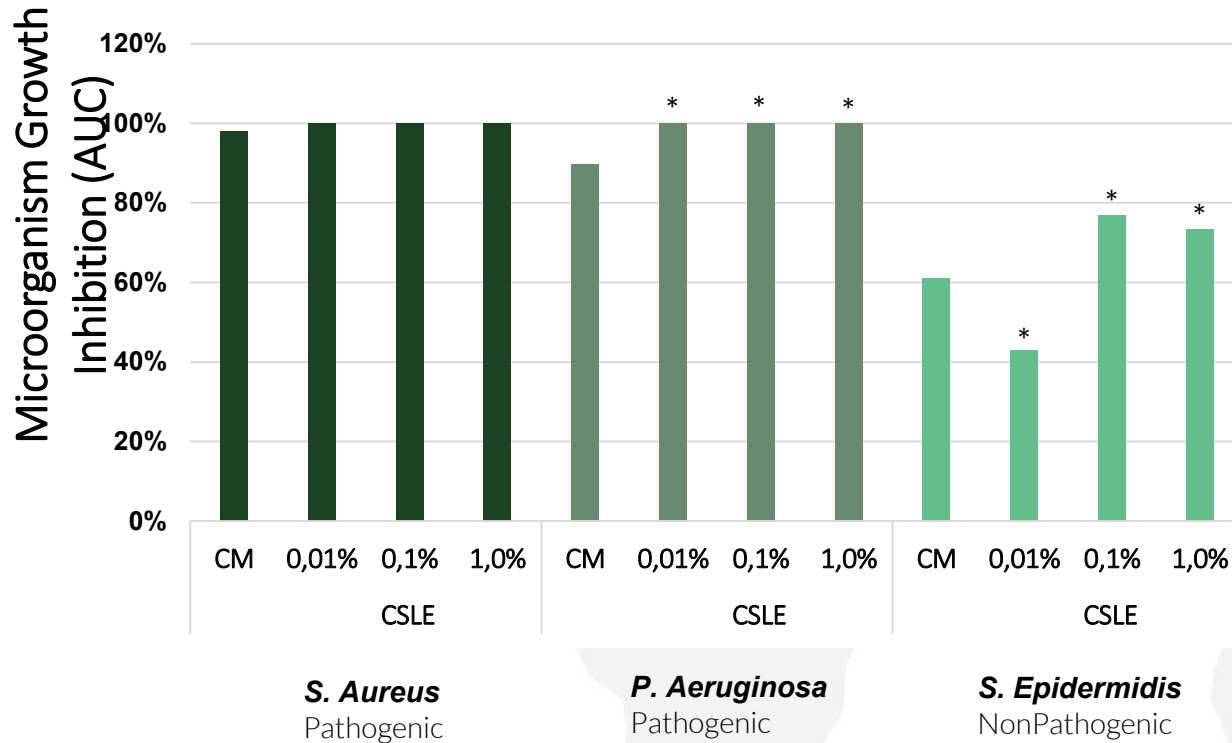


Dendritic cells, the **most abundant antigen-presenting leukocytes**, initiate immune responses. Their inactive precursors enter the bloodstream, surveilling and capturing antigens even in non-inflamed areas to prepare for pathogens.

Upon detecting invaders, dendritic cells mature, **releasing pro-inflammatory cytokines** to guide immune cells to infection sites. In lymph nodes, they present antigens to T-cells, which then target infected cells. This process helps **restore the skin barrier and skin microbiome**.

Dermal Microbiome-Immunology Assay

Cumulative Time Kill Test Results

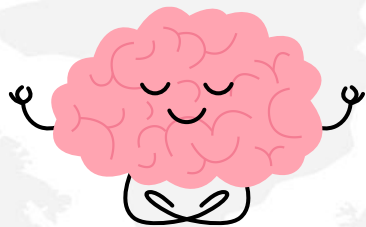


A Dermal Microbiome-Immunology Assay was conducted to assess the effect of antimicrobial-free CSLE to alter dendritic cell paracrine signaling molecules to kill detrimental microorganisms and maintain commensal microbiota commonly found on the skin.

Figure 4. Time Kill Test results for dendritic cells treated with antimicrobial-free CSLE inoculated with the tested microorganism populations across time intervals. Values indicate the percent of microorganisms killed.

* indicates significance ($p < 0.05$) compared to Complete Media within each microorganism tested.

Beauty'In



As holistic wellness gains traction, supplements like **nootropics** and **adaptogens** are in the spotlight for enhancing health from within. These natural compounds support mental clarity, stress resilience, and overall well-being, working synergistically with mindful routines for a balanced life in today's fast-paced world.



Adapto-Gems

Primarily used in herbal medicinal practices, adaptogens are natural compounds (herb, root, mushroom, ...) that help the **body manage stress** and maintain balance by regulating cortisol levels.

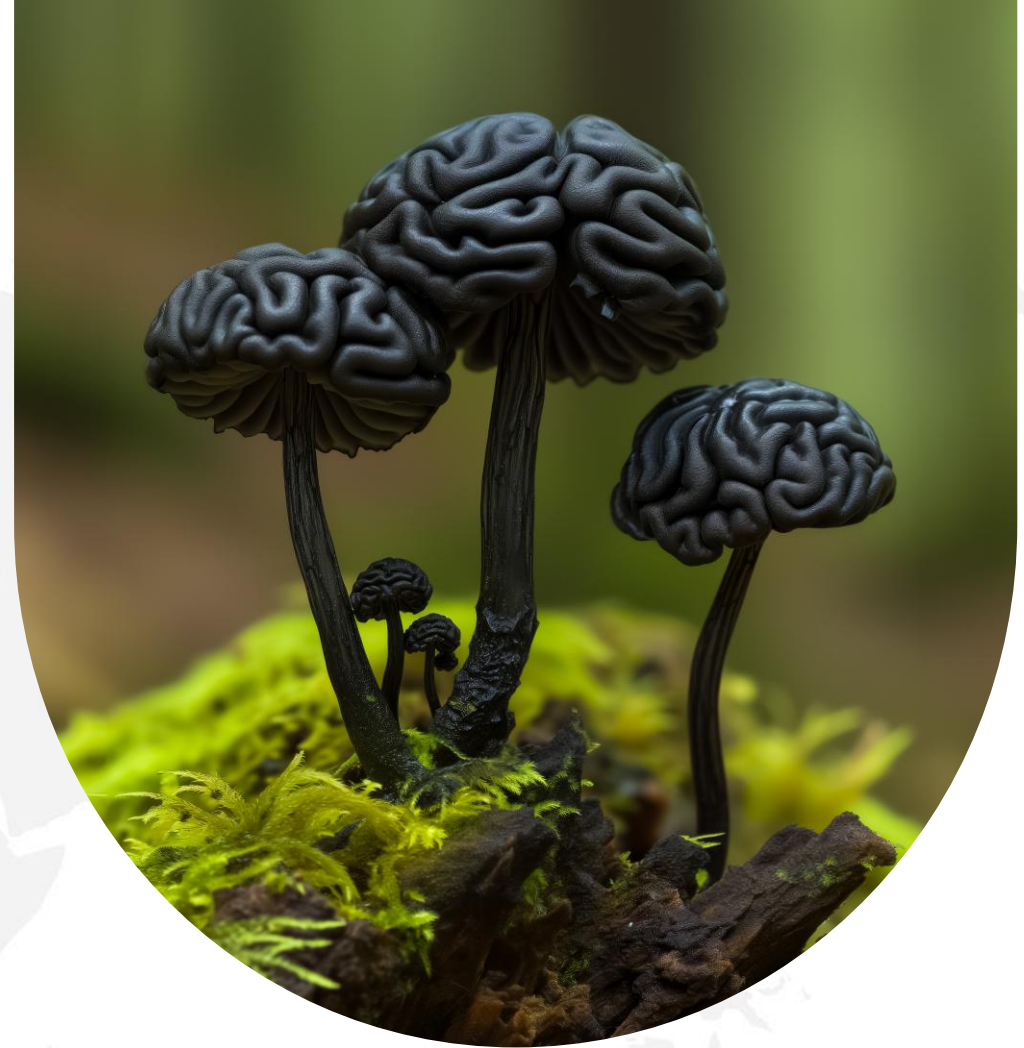
They enhance **mental clarity**, emotional resilience, and immune function, making them especially valuable in dermatology, where **stress-related conditions** and premature aging are becoming more common.



Mushrooms are more than ever gaining attention for their impressive bioactive properties across health, wellness, and beauty applications.

Rich in antioxidants, anti-inflammatory compounds, and beta-glucans, mushrooms support the immune system, enhance cellular protection, and reduce oxidative stress.

Many mushrooms are **adaptogens**, meaning they help the body adapt to stress and **maintain balance**.



Nature's Secret Wonder

An Intelligent Skin Solution

Lion's Mane

INCI. *Hericium Erinaceus Extract*

Used in traditional medicine, particularly in East Asia, for centuries due to its potential cognitive, neurological, and immune-boosting benefits. Known to stimulate Nerve Growth Factor (NGF), it works on promoting skin cell regeneration.

#ADAPTOGEN

Compound. *hericenones / erinacines / beta-glucans*

ACTIVITY. *enhances skin-neural communication, reduces neuroinflammation, anti-aging, improve skin barrier function*



COMBINATION OF UNIQUE MUSHROOM SYNERGISTIC BLEND & GREEN TEA

Cordyceps

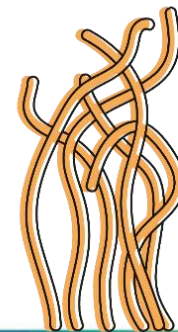
INCI. *Cordyceps Militaris Extract*

Well-known medicinal mushroom used in traditional Chinese medicine for its various health benefits. Cordyceps is known to enhance athletic performance by improving oxygen utilization and increasing ATP production, which leads to higher energy levels.

#ADAPTOGEN

Compound : *cordycepin / adenosine / amino acids / vitamins*

ACTIVITY. *energizing skin cells, modulates immune response, protects from environmental aggressors and aging.*



Gyokuro

INCI. *Camellia Sinensis Leaf Extract*

Gyokuro is a premium Japanese tea known for its unique cultivation process, which involves shading the tea plants before harvest. This method enhances the flavor profile and increases the concentration of beneficial compounds in the leaves, particularly L-theanine and caffeine.

#NOOTROPIC | Compound. *L Theanine / caffeine / catechins EGCG*

ACTIVITY. *counteracts neurogenic inflammation, hydration, skin firmness, blood circulation, lymphatic drainage*

Fungus Ferment

INCI. *Aureobasidium Pullulans Ferment*

A non-pathogenic yeast-like fungus. It is known for its unique ability to produce pullulan. The polysaccharides and other bioactive compounds found in this fungus may have immune-enhancing properties, helping to bolster the body's natural defenses.

#FUNGIFILM | Compound. *polysaccharides*

ACTIVITY. *skin-lifting & tightening, protective shield, sustained release technology*

EEG Brainwave Study

Beta Brainwave.

Psychological state : awake, thinking, alert consciousness

Active Thinking During Application

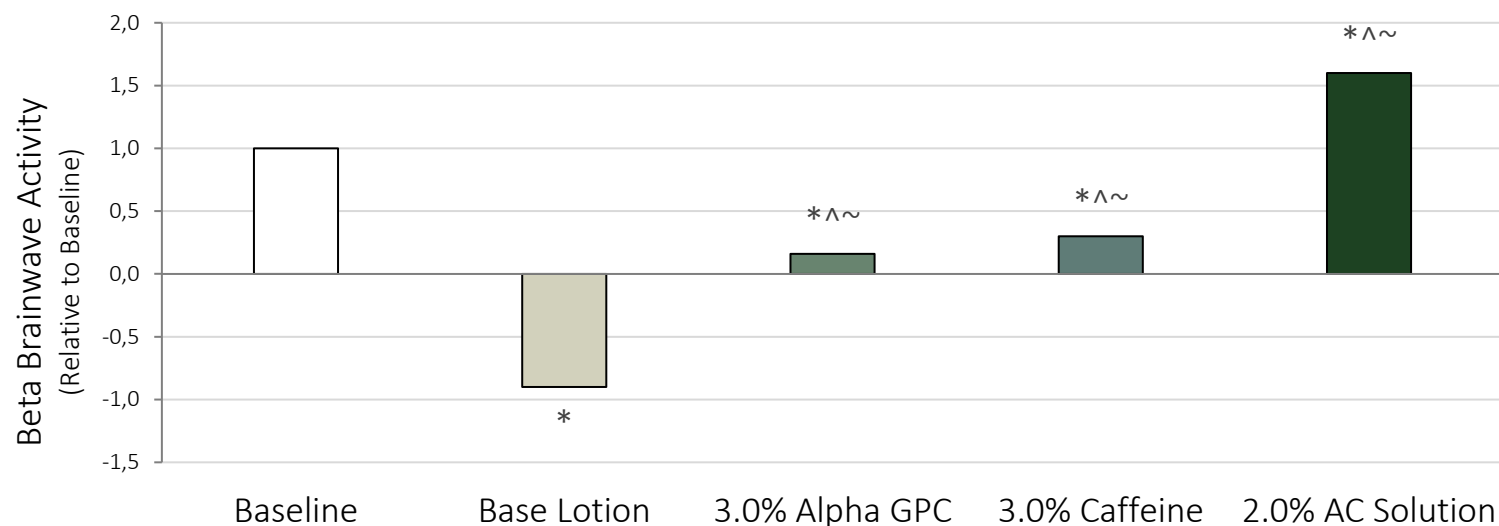


Figure 5. Beta Brainwave Activity During Product Application Relative to Baseline.

* indicates significance ($p \leq 0.05$) compared to Baseline. ^ indicates significance ($p \leq 0.05$) compared to Base Lotion.

An EEG Brainwave Study was conducted to evaluate properties of AC Solution application. A headband is placed on the forehead of participants and brainwaves are monitored as products are applied to the skin. The **Beta** brainwaves (*targeting awareness and focused mental effort*) are isolated and analyzed to provide insight to the psychological state during product application.

COX II Inhibition

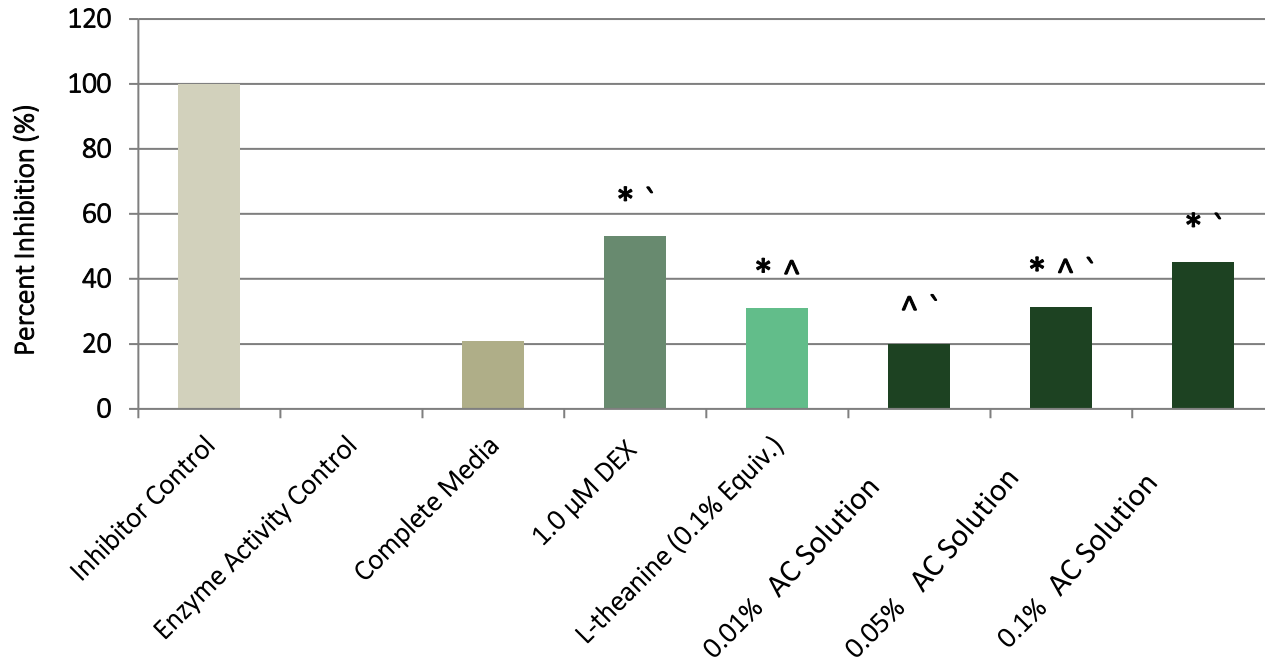
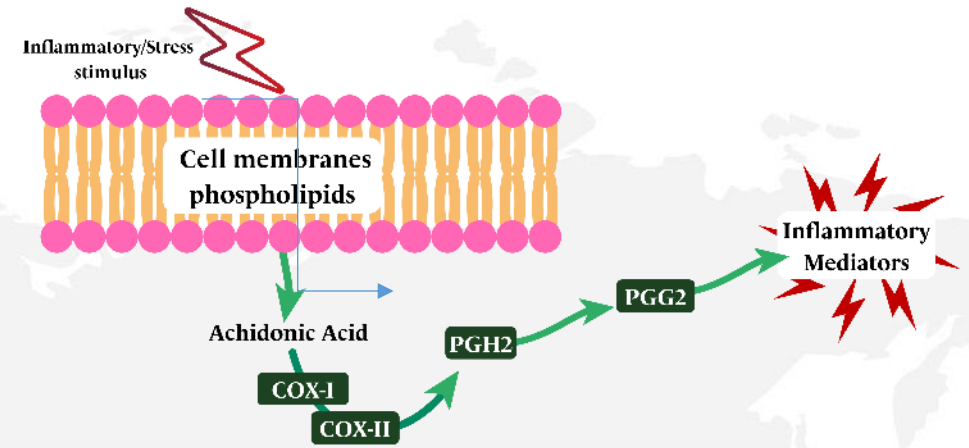


Fig 6. Effect of AC Solution on COX-II Inhibition in Keratinocytes.



COX-II is an inducible **enzyme** that drives inflammation by converting arachidonic acid into prostaglandin precursors (PGH2). Unlike COX-I, which maintains cellular homeostasis, COX-II is responsible for inflammatory mediator production. Reduced COX-II levels indicate a lower inflammatory state, which may help mitigate cellular aging linked to inflammation.



*"What if skincare is more than just
what you see? "*