



**Ingestible skincare  
powered by science:**

New research on the  
benefits of Lycoderm™

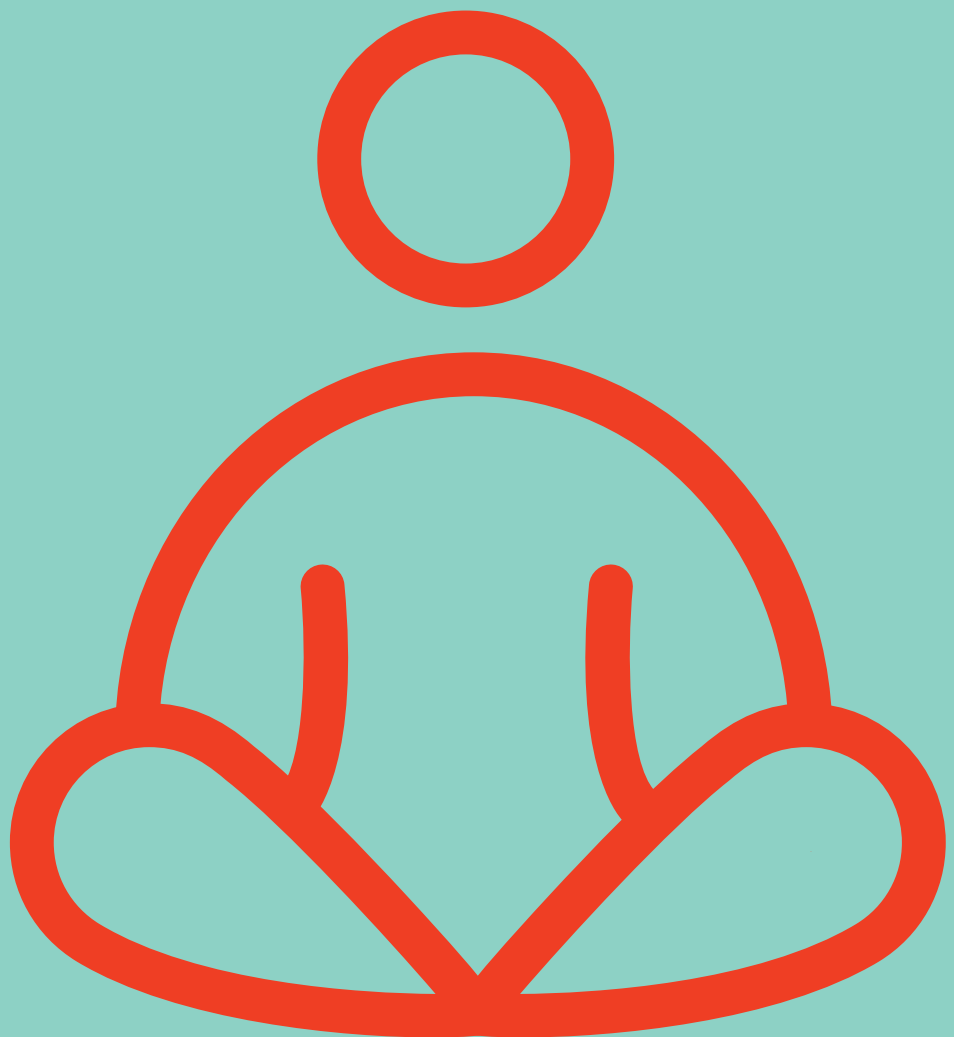


## Let us illuminate you

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When we're good to our bodies and our minds, they return the favor by giving us the strength to share our goodness with the world. Built on this philosophy, Lycored's core technologies allow the company to take a scientific approach to the pursuit of holistic wellness through nutrition and supplementation.

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# Committed to the science behind skin health

Lycored has long been dedicated to scientific research – both to increase understanding of the role of nutrition in wellness, and to ensure that its products do what they promise.

One area where this commitment is particularly clear is ingestible skincare. In recent years, research commissioned by the global wellness company – including an award-winning study – has helped build the body of evidence for the role of carotenoids in skincare.

It has also helped the company to both create and develop Lycoderm™, its proprietary blend of tomato phytonutrients and rosemary leaf for skincare supplements.

This paper introduces the results of the latest research on the benefits of Lycoderm™ in promoting a healthier relationship with the sun and calming skin **inflammation**. The ground-breaking study provides new evidence of the role of carotenoids in enhancing skin resilience at a molecular level.



## The need for solutions that balance the skin's response to environmental stress

A well rounded approach to wellness is built on more than just our diet – every facet of our lives contributes to our overall happiness and wellbeing. Through moderation and open-mindedness, we can achieve balance along our personal wellness journeys.

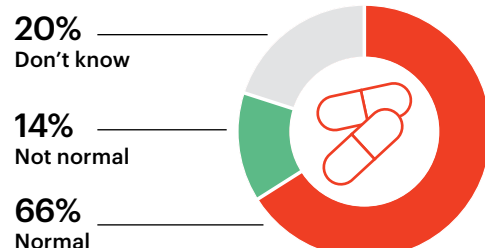
**"Time is what goes on while we mature, develop and expand. We can look at time as a friend and at aging as a set of natural changes. I actually love the opportunities that come with age. The knowledge, the calmness and, more than anything, the ability to improve my perception in a way that supports the cultivation of wellness on spiritual, mental, emotional and physical levels. Healthy aging is a wonderful idea that can and should be cherished by people. It starts with the realization that there is a lot we can do to age beautifully."**

– Golan Raz, Head of Global Health Division, Lycored

Meanwhile, consumers increasingly understand that ingestible skincare offers a path to more natural skincare. Consumer research by Lycored shows that two thirds of consumers now think the idea of taking a supplement for skin health or beauty is normal while only 14% think it is not.<sup>2</sup>

Therefore, there is a growing market for nutritional skin health solutions that address specific cellular processes and complement traditional topical and lifestyle approaches.

The idea of taking a supplement for skin health or beauty is...



## Building on existing research and portfolio

Carotenoid levels in our bodies can increase just 24 hours after supplementation but while the full benefits of carotenoid supplementation take time to cultivate, some effects, such as reduced redness in the skin, can be seen after just a few weeks.<sup>3,5</sup>

Antioxidants like lycopene and other carotenoids help balance our skin's response to environmental stressors such as UV rays.<sup>4</sup> They build up, like a "reservoir of goodness" that is there when we need it.<sup>5,6</sup> However, this reservoir naturally depletes as we age, which is why it becomes increasingly important to help our bodies maintain healthy carotenoid levels and replenish carotenoids through diet and supplementation.

Lycopene accumulates and metabolizes in the skin, providing a first in line mechanism to cope with environmental challenges such as UV light. When combined with phytoene and phytofluene, it has been found to exhibit protective action across a broader range of UV light, including UV-A and UV-B wavelengths. In a simulated solar UV light study, this combination was found to be more effective than lycopene alone in reducing the intensity of erythema (skin redness) following UV exposure.<sup>3</sup>

Carotenoids support our overall wellness, with benefits in areas such as cardiovascular and eye health as well as for the skin. When used in conjunction with topicals, they can support and complement an active outdoor lifestyle and even help improve long-term skin health.<sup>6</sup>

Carotenoid supplementation can be used as part of a holistic skincare regimen to reduce oxidative stress balance collagen levels, support healthy blood flow<sup>7</sup>, and otherwise promote long-term, sustainable skin health.<sup>5</sup>

### Lycored's award-winning 2016 study

In 2016 Lycored commissioned new research from the Leibniz Research Institute for Environmental Medicine.<sup>8</sup>

The double-blind, placebo-controlled cross-over study included 65 subjects. It found that lycopene-rich tomato nutrient complex can protect the skin from UV-induced upregulation of molecular markers associated with oxidative stress, inflammation and aging.

The research was published in the British Journal of Dermatology in 2017 and won the Nutraingredients award for best university research in the same year.<sup>9</sup>



## Lycoderm™: the fruit of research

Therefore, there is a body of research for the skincare benefits of natural carotenoids working synergistically. This helped and inspired Lycored first to create, and then to further develop, its flagship skincare product. Lycoderm™ is a proprietary blend of standardized natural tomato extract and rosemary leaf extract.

Lycoderm™ is carefully calibrated to maximise the synergy between these natural ingredients. It contains the optimal concentrations of lycopene, phytoene and phytofluene, as well as natural vitamins from the tomato such as vitamin A and vitamin E. The tomato phytonutrients are combined with carnosic acid to help support skin health and appearance.

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**“The earth inspires us in everything we do. It’s the reason we established a vertically integrated production process, so we could truly understand and share all of the vital, synergistic phytonutrients within the tomato. This philosophy extends to Lycoderm™ which supports skin health from the inside. Yet, it was the outside of our hero fruit that truly clarified our mission. As we watched the sun gently coax the tomatoes in our fields to ripen, we realized that given the right tools, smooth, supple skin is possible.”**

– Golan Raz, Head of Global Health Division, Lycored

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### Lycoderm™ is formulated to:

- Help skin cope with environmental challenges and reveal its healthy glow to live radiantly
- Help skin detox by boosting the natural defense mechanism of skin cells (epidermis and dermis)
- Contribute to balancing the skin’s response to oxidative stress and DNA damage
- Help calm inflammation by reducing the secretion of inflammatory mediators
- Modulate expression of skin photo-aging markers
- Support reduced erythema intensity
- Boost the skin’s ability to maintain its natural radiance
- Increase carotenoid levels in the skin to reduce cellular damage caused by free radicals
- Help maintain the skin’s ability to better cope with the aging effects of environmental and endogenous challenges
- Increase skin smoothness, density and thickness
- Support maintenance of natural collagen
- Help nourish skin with rich nutrients and antioxidants designed to complement a holistic skincare routine

Lycoderm™ is currently available as an oil or softgel, with other forms like gummies and oil resin coming soon.

## This is a promise

When you add a new product to your portfolio or bring one into your home, you want to believe that it’s not only safe and effective but that it was made with the utmost care and precision. But believing isn’t the same as knowing, and that’s why we created our seal.



**Lycored Nutrient  
Complex™**  
For Skin

This symbol is a manifestation of our commitment to supplying the highest-quality carotenoid and nutrient blends to you and your consumers. It is a beacon of excellence, a clear indication that our ingredients have been carefully cultivated, studied and proven through years of research and innovation. More importantly, this badge is a rallying cry, an invitation to join a movement that puts wellness first and forever sidelines compromise.

Are you ready to join our revolution? Email [customerservice@lycored.com](mailto:customerservice@lycored.com) for further details.

# A new breakthrough study

The next stage of Lycored's research was to test the effectiveness of Lycoder<sup>TM</sup> through a well-controlled, full-scale, double-blind clinical study.<sup>5</sup>

The research, commissioned and funded by Lycored, was conducted in Dusseldorf in Germany and Dundee in the UK. The principal investigator was Professor Jean Krutmann, a leading researcher in the field. It has been published in the peer-reviewed scientific journal *Skin Pharmacology and Physiology*.

## Objectives

The aim of the study was to examine the bioavailability, safety and efficacy of Lycoder<sup>TM</sup>, and to explore its potential in enhancing skin resilience and balancing skin response to UV challenge. Specifically, it sought to evaluate the effects of Lycoder<sup>TM</sup> in a model of UV-induced photodamage in healthy subjects.

## Methodology

The study design deliberately included physiological parameters such as the intensity of erythema that are easy for consumers to relate to. It also included mechanistic biomarkers to gain new insights into the cellular mechanism.

Given that the ingestible skincare space is increasingly popular with men, the study was strategically designed to include both genders. One hundred and forty-five healthy men and women completed a double-blind, randomized, placebo-controlled parallel group study.

They supplemented for 12 weeks with softgels containing either Lycoder<sup>TM</sup> or a placebo. They were exposed to controlled local UV radiation at baseline, and again at the end of supplementation. To gain insights into physiological benefits, erythema intensity was measured following UV exposure.

Additionally, to gain insight into mechanism of action at the cellular level, biopsies from UV-exposed and control areas were collected and gene expression analysis was performed.

Finally, to verify the causative relationship between treatment and effect, Lycoder<sup>TM</sup>'s bioavailability was evaluated.

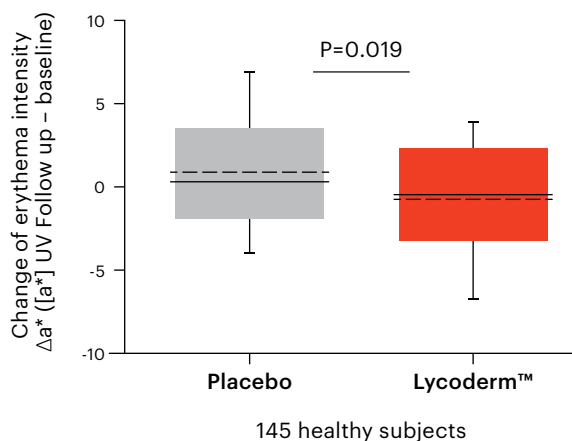
## Results and conclusions

Lycoder<sup>TM</sup> was found to be safe and well tolerated.

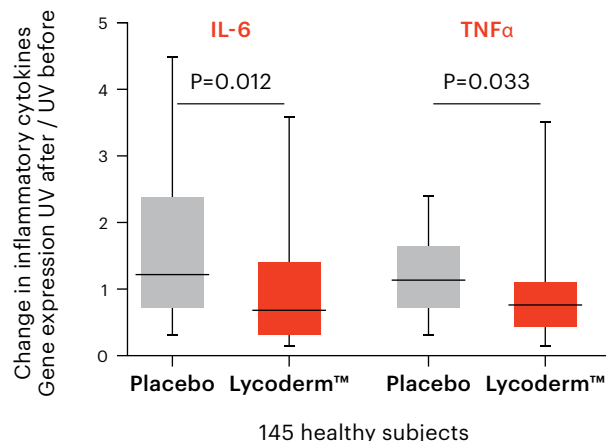
A statistically significant decrease in erythema formation was observed in the group taking the supplement compared to the placebo group. At the molecular level there was a reduction in pro-inflammatory cytokines. This more balanced complexion was reflected in reduced erythema, or redness of the skin. (Fig 1)

The results provide specific evidence for the mechanism of action of Lycoder<sup>TM</sup>, demonstrating a significant effect on pro-inflammatory cytokines induced by controlled UV exposure. They also provide definitive proof of the effect on physiological parameters such as reduction of the intensity of erythema caused by UV exposure. These parameters were correlated to a significant increase in levels of the different carotenoids, supporting a causative relationship between supplementation with Lycoder<sup>TM</sup> and benefits for the skin.

**Fig 1) Lycoder<sup>TM</sup> significantly decreased erythema formation after UV exposure**

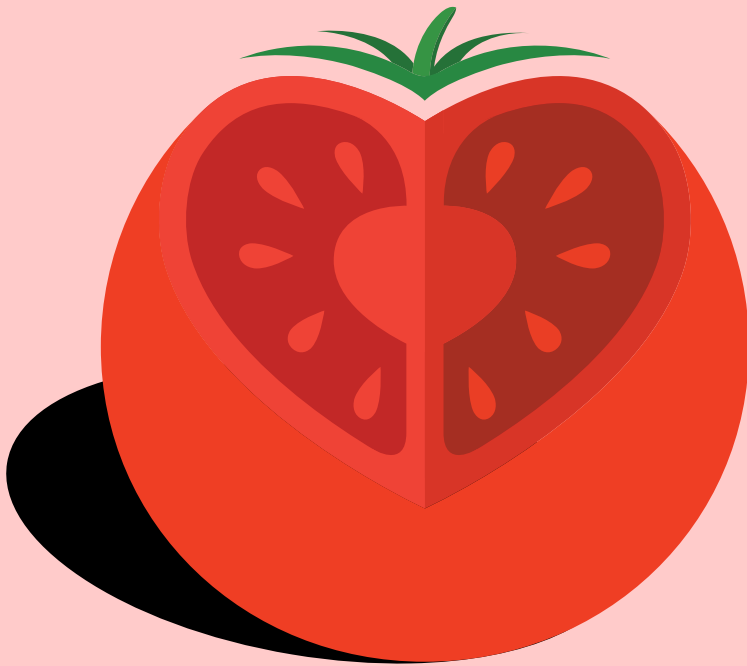


**Lycoder<sup>TM</sup> significantly decreased UV response in IL-6 and TNFα biomarkers**





## Lycored's Holistic Wellness Journey



### Building for the future

Cultivating wellness doesn't happen overnight and studies have shown that while supplementation with carotenoids produced notable improvements – from reduced redness to cellular and molecular skin support<sup>7</sup> – these improvements grow more pronounced over time.<sup>5</sup>

The results of the current study represent an important milestone in the development of Lycored's ingestible skincare platform. They have provided the foundation for Lycored to apply for a new patent application. They allow the company to offer consumers Lycoder<sup>™</sup> – a unique and holistic solution for skin wellness.

Most importantly, they increase scientific knowledge of the value of carotenoids in supporting the skin and enhancing its natural resilience. Due to the success of the current study, Lycored is continuing its ingestible skincare journey with new studies further exploring the link between carotenoids and skin beauty and glow.





## About Lycored™

Committed to 'Cultivating Wellness', Lycored, part of Adama Group, is an international company at the forefront of unearthing and combining nature's nutrition potential with cutting edge science to develop natural ingredients and products. Established in 1995 in Israel, Lycored is the global leader in natural carotenoids for food, beverage and dietary supplement products. For more information visit [www.lycored.com](http://www.lycored.com).

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