

# ANTEOXIDANT MICAH®

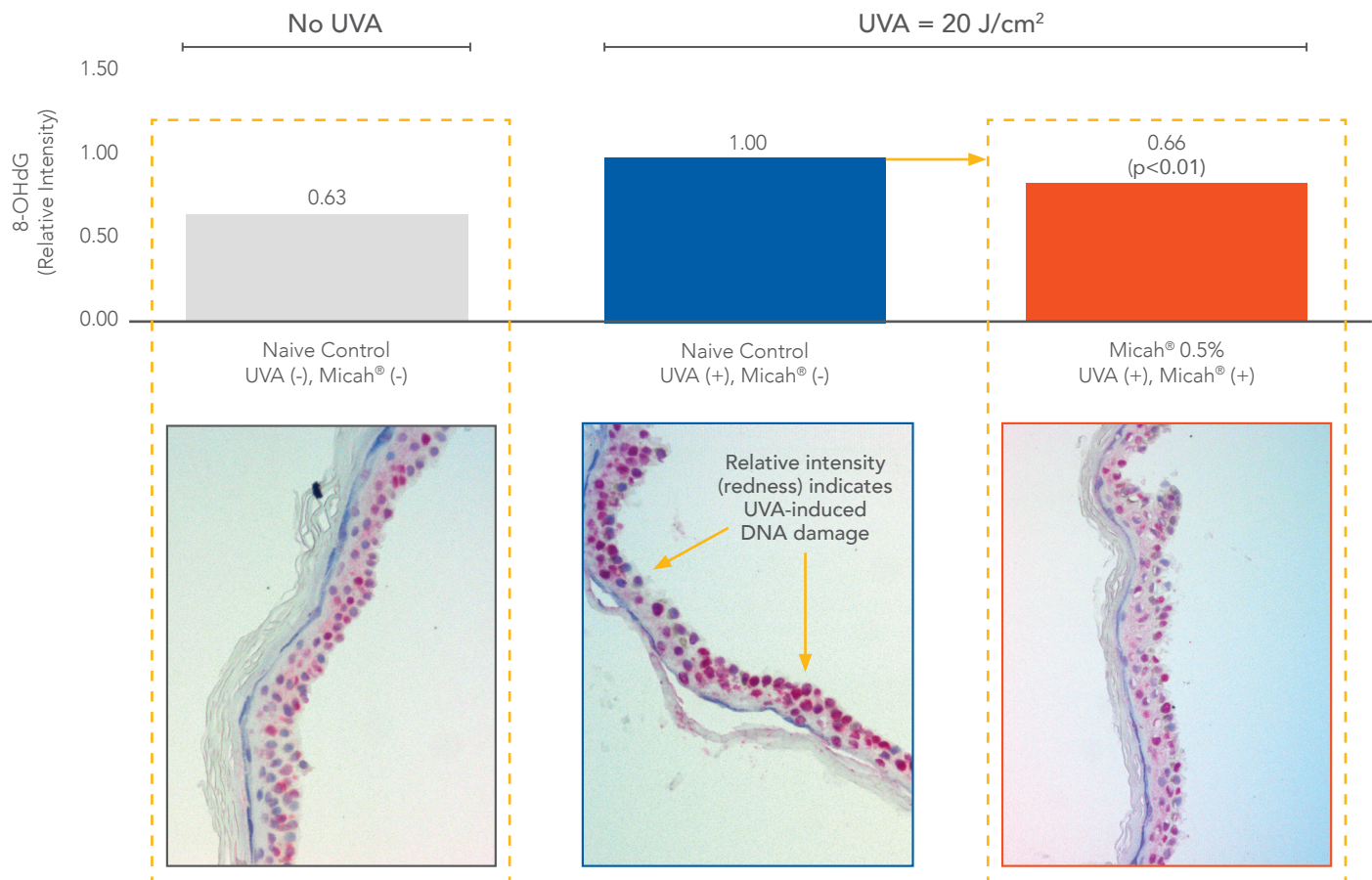
New *in vivo* clinical data on UVA and Visible Light

UVA *in vivo* clinical studies on human patients were held in Hamburg, Germany, to look at Micah®'s impact on irradiation response in skin via three different markers: DNA Damage (8-OHdG), MMP-1, and IL6 response.

- 10 subjects
- Skin types I – III
- Age: 30 years +/- 8.2 years
- Testing structure: 2 ml/cm<sup>2</sup> applied 2x per day (AM/PM) for 14 days
- Three formulations tested: untreated skin; irradiated untreated skin; irradiated skin treated with 0.5% Micah®

## DNA DAMAGE – 8-OH-dG

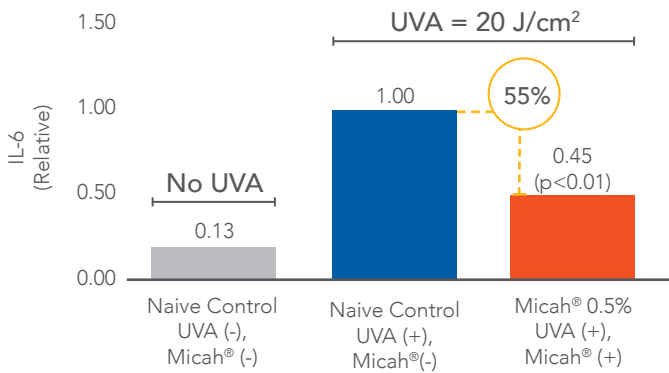
At a use level of 0.5%, Micah® significantly reduced the presence of UVA-induced DNA Damage, as measured by presence of the DNA lesion 8-OH-dG, a marker associated with photoaged skin.



8-OH-dG levels returned to baseline with Micah®.

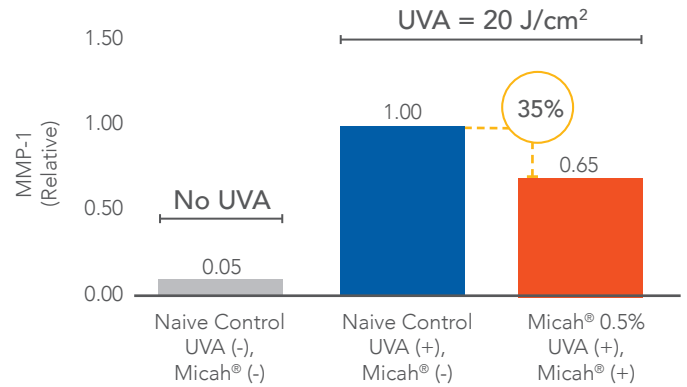
## UVA CLINICAL STUDY: IL-6

At a use level of 0.5%, Micah® demonstrated a 55% reduction in the presence of IL-6, a marker associated with skin inflammation, redness, irritation and barrier function.



## UVA CLINICAL STUDY: MMP-1

At a use level of 0.5%, Micah® demonstrated a 35% reduction in the presence of MMP-1, a marker associated with the breakdown of the extracellular matrix.

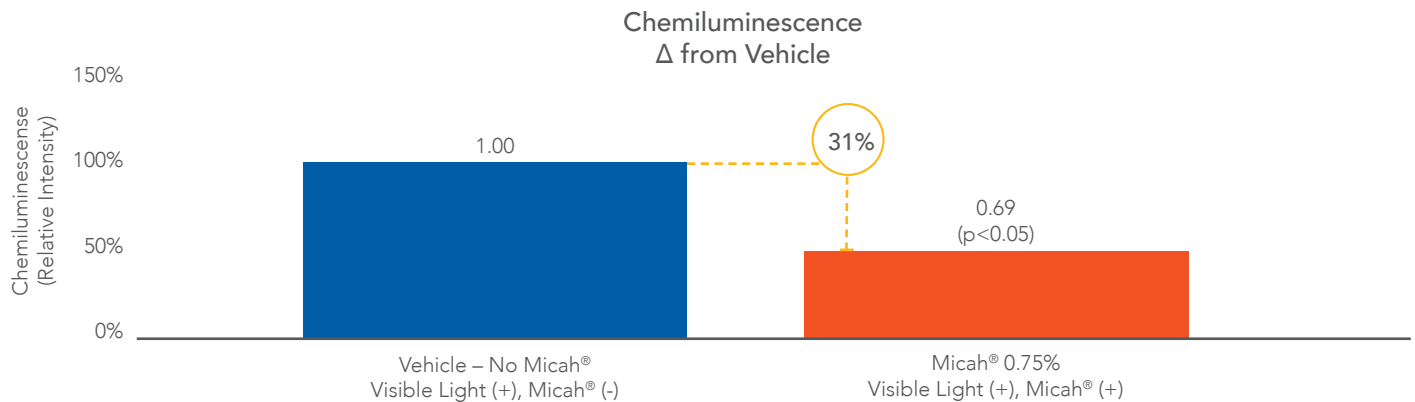


*In vivo* clinical studies on human patients to look at Micah®'s impact on Visible Light-induced ROS and free radicals.

- 10 subjects
- Skin types I – II
- Two formulations tested: vehicle (no Micah®) and Micah® at 0.75%
- Light source and responses:
- Testing structure: 2 ml/cm2 applied 2x per day (AM/PM) for 4 days

## VISIBLE LIGHT CLINICAL STUDY: RESULTS

At a use level of 0,75%, Micah® demonstrated a 31% reduction in visible light-induced oxidative stress.



# ANTEOXIDANT MICAH®

A disruptor for the anti-aging market



with expert  
Dr. Paolo Giacconi

When launching revolutionary anti-aging technology Micah® in 2017, Hallstar spoke with international anti-aging expert and skin care consultant Dr. Paolo Giacconi for an independent perspective on the new chemistry. To further verify Micah's claims, Hallstar recently conducted new *ex vivo* and *in vivo* clinical trials, and spoke with Dr. Giacconi a second time about the scientific significance of these latest results.

## WHAT ARE YOUR THOUGHTS ON THE NEW CLINICAL RESULTS?

This *in vivo* data confirms our earlier expectations about Micah®. You can tell a lot from *in vitro* or *in tubo* testing – for example, if something would be harmless – but only *in vivo* gives you the full picture. It has the greatest possible relevance to the in-use situation.

## YOU ARE NOT SURPRISED THAT MICAH® PREVENTS 100% OF PHOTO-INDUCED DNA DAMAGE?

That's what Micah® is designed to do. From the beginning, Hallstar has rightly focused on how to stop the generation of reactive oxygen species (ROS), which happens whenever skin molecules absorb ultraviolet or visible light and transfer energy to oxygen. Once that process starts, the photo-induced aging damage has begun. It is like an ocean tanker – after it's on course, it is virtually impossible to change its direction. Better to not even start. Keep in mind, Micah® chemistry doesn't

repair already-damaged DNA – which is the result of multiple environmental and behavioral factors, not just sun exposure – but it hinders the excitation of photosensitizers that provoke the formation of dangerous singlet oxygen and the ROS from which other damage follows. When it comes to the generation of ROS, using Micah® keeps the skin in "cruise mode," as if it had not been exposed to UV light in the first place.

## WHY IS SINGLET OXYGEN SUPPRESSION SO IMPORTANT?

Singlet oxygen is an extraordinarily reactive molecule. When singlet oxygen attacks cell membranes, it can create leakage, cell death, and most visibly, peroxidation. When we leave a book out in the sun, the book cover becomes photobleached (i.e., color molecules are destroyed) in a matter of days. But it is singlet oxygen's impact on cell DNA that is especially catastrophic for skin. There is a cause-effect relationship between DNA damage and the onset of inflammation. We also know that the inflammatory response is the single most effective mechanism for accelerating skin aging. One singlet oxygen molecule can introduce one single 8-OH-dG (or lesion) in one DNA molecule and that alone will trigger what is called the NFkB cascade – the onset of inflammation that entails a chain reaction of thousands of molecular modifications in the cell membrane, as well as the over-expression of MMP-1 which destroys collagen and other elastic fibers. Given this reality, Micah®'s ability to prevent virtually 100% of UVA-induced 8-OH-dG lesions is the most significant finding of the new *in vivo* tests – and it puts Micah® in a category all its own.

## ARE UV FILTERS AND ANTI-OXIDANTS STILL RELEVANT?

I see value in having sunscreens and antioxidants work in concert with Micah® to provide the best protection from the elements. Sunscreens are a useful first line of defense as they can filter off more than 90% of incoming photons, but that might still be insufficient. By preventing the production of UVA-induced inflammation-provoking molecules by 55% as well as the formation of the enzymes responsible for collagen destruction by 35%, Micah® can certainly be said to be the most efficient of the antioxidants. Yet other antioxidants are necessary to mop up the few ROS that might be formed despite the presence of a sunscreen or Micah®. And new antioxidants that fight specific types of damage from, for example, infrared and blue light are always being developed.

**“Micah®'s ability to prevent virtually 100% of UVA-induced 8-OH-dG lesions is the most significant finding of the new *in vivo* tests ...”**

## WHAT ABOUT HARM TO THE ENVIRONMENT?

The environmental impact of sun care products is in the spotlight these days. One important aspect of the science that is rarely discussed in the news is the pertinence of an active ingredient's volume to potential environmental damage. It is significant that the new Micah® data was collected at use levels between 0.2% and 0.5%, when typical sunscreens might use 15% to 25% of a sun-filter in their formulation. That means 30 to 100 times less concentrated, 30 to 100 times less potential contribution to pollution.

## HALLSTAR CALLS MICAH® AN ANTEOXIDANT. DO YOU AGREE?

Considering that “ante” means “before,” and Micah® does prevent the UV- and light-induced process that generates singlet oxygen, I like this new word very much. It describes why Micah® is such a unique and powerful anti-aging technology. As long as your audience knows their Latin, “antioxidant” is perfect.

*Dr. Giacomoni has published more than 100 scientific studies in biochemistry, cellular biology, photobiology and skin aging. He previously served as Estée Lauder's Executive Director of Research and was the lead scientific speaker on behalf of the Clinique brand. Prior to this, he led the Department of Biology for L'Oréal.*

## Want to learn more?

Micah can transform sun, skin and cosmetic formulations, and is proven to stop the aging process before it starts.

Contact Varun Mathur at [vmathur@hallstar.com](mailto:vmathur@hallstar.com).

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