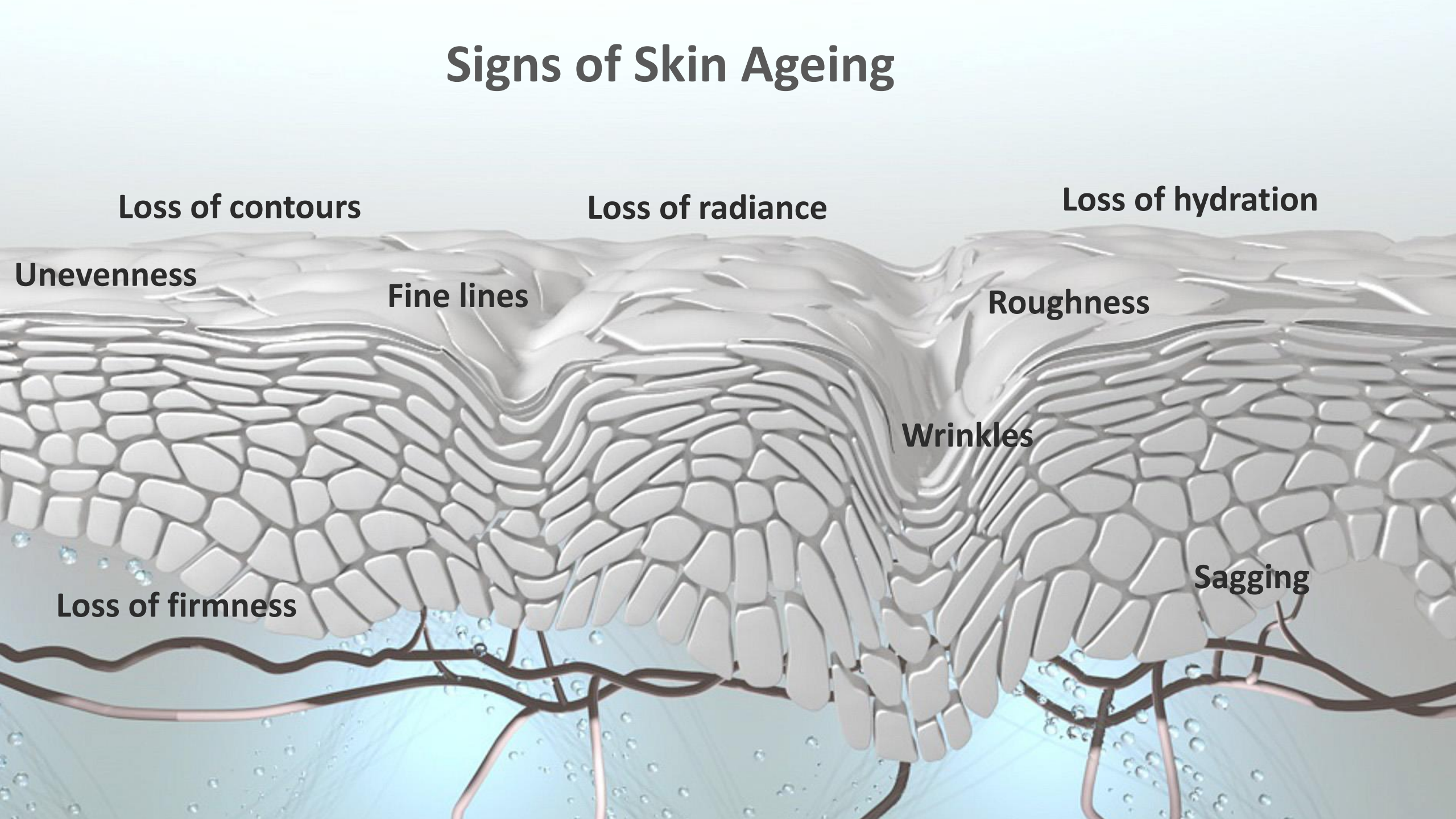
# Groundbreaking
# **ANTI-AGING**
# With Epigenetic Innovation

Krittaya Rattanakorn, MD
Chiangrai Prachanukroh Hospital

# Signs of Skin Ageing



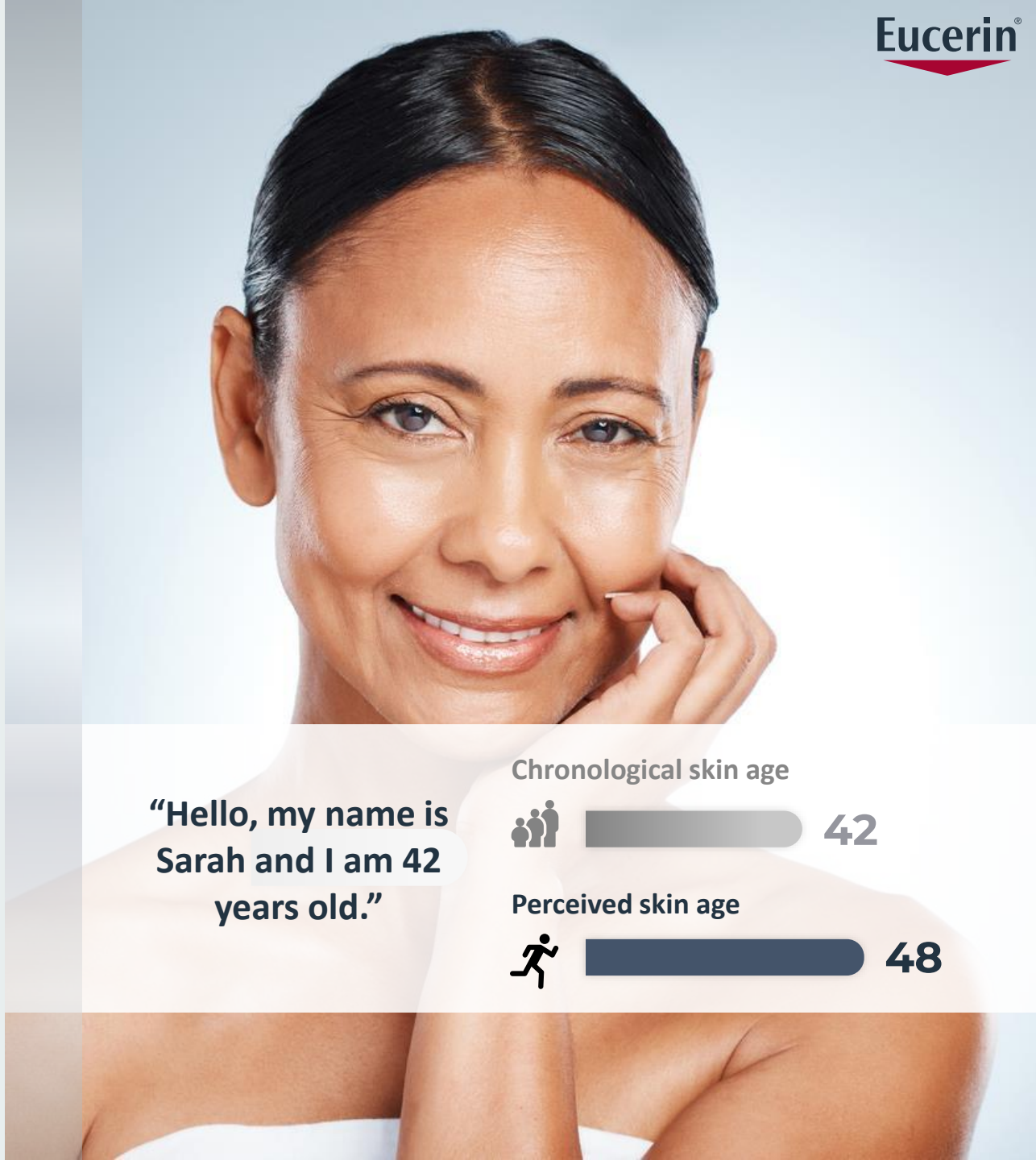

*The best compliment is*
**“to look younger than your true age”**

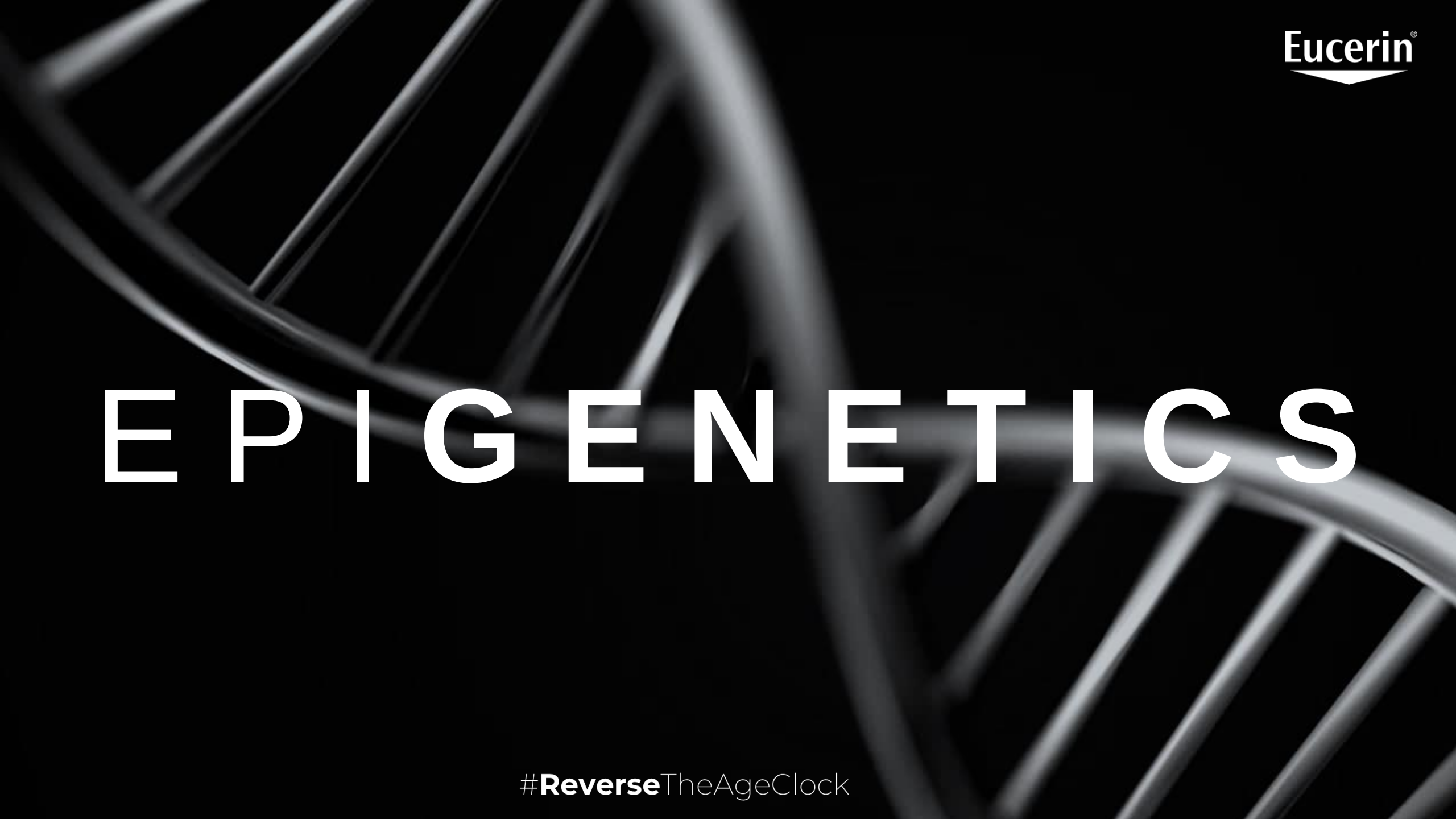

# Did you ever notice that some people seem to age faster than others?

… take a guess!

This is Sarah.

How old do you think she is?



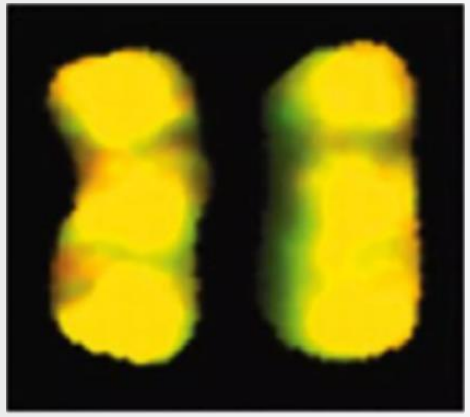

Eucerin®
EPIGENETICS
#ReverseTheAgeClock

# TWINS SHARE SAME DNA…

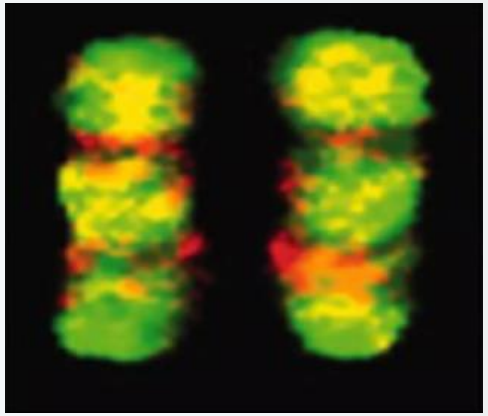
## …BUT SHOW DIFFERENT SKIN AGING JOURNEY

# Identical Twins start life with similar epigenome

## Yellow regions indicate shared epigenetic tags



***Chromosomes of 3 year old identical twins***



***Chromosomes of 50 year old identical twins***

***Different expression***

Fraga et al., Epigenetic differences arise during the lifetime of monozygotic twins. PNAS 2005

Christensen K et al., Perceived age as clinically useful biomarker of ageing: cohort study, 2009 (adapted)

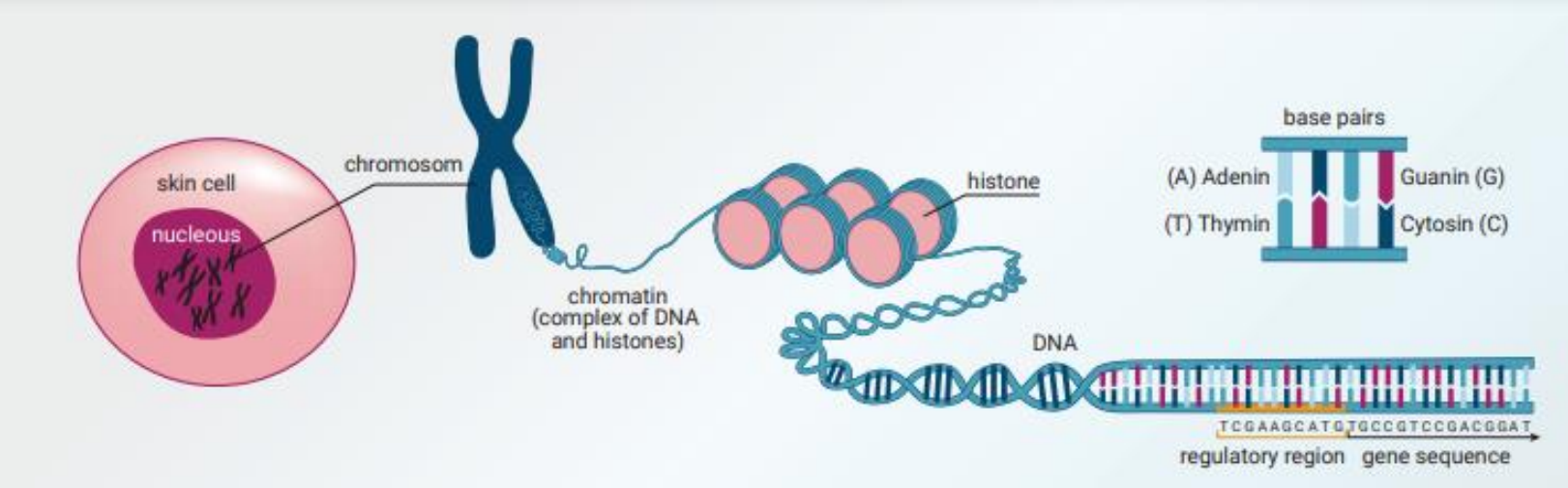
## Epigenetic markers

- **DNA Methylation**
- **Histone modification**
- **Non-coding RNAs**

EUCERIN PIONEERING EPIGENETIC RESEARCH

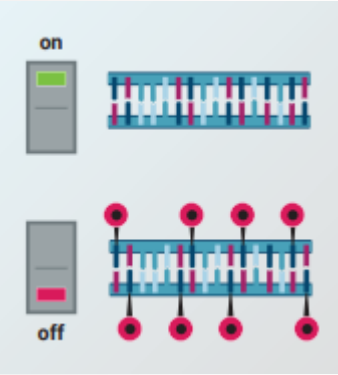
# DNA methylation = Epigenetic marks

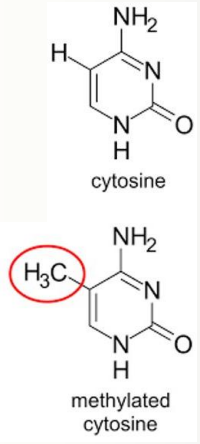
**REVERSIBLE "Post-its"** on the DNA, guides the cell which information has to be read and used at the moment → switch on/off genes




DNA methylation in gene regulatory regions

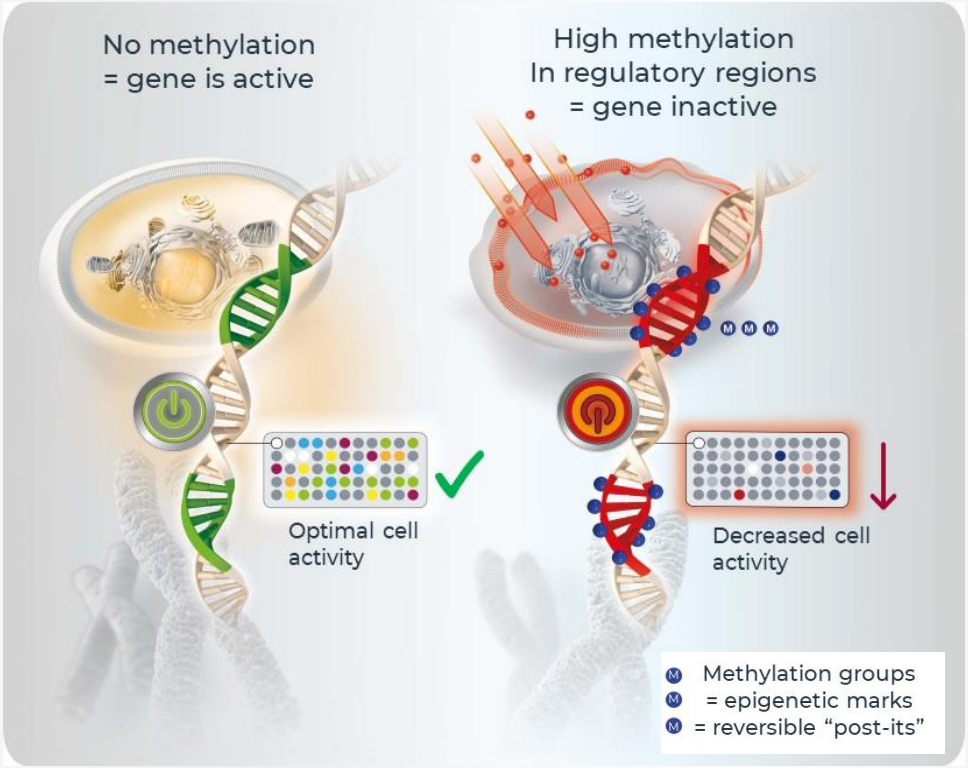
→ **decreases gene expression**



# Epigenetic marks regulate gene activity

***Different expression***




Christensen K et al., Perceived age as clinically useful biomarker of ageing: cohort study, 2009 (adapted)


Eucerin®
DNA METHYLATION
MAIN DRIVER
FOR AGING

Eucerin®

# EUCERIN pioneers epigenetic research of skin aging

**15 years of Research**
PIONEERING EPIGENETIC SKIN SCIENCE

**20 SCIENTISTS**
INTERDISCIPLINARY TEAM

**Peer-reviewed scientific publications**
ON EPIGENETICS & **SKIN AGING**

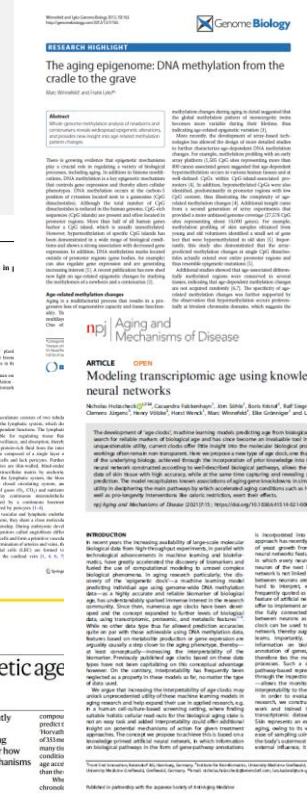

Aging and Chronic Sun Exposure Cause Distinct Epigenetic Changes in Human Skin


Implications of epigenetic mechanisms for vascu development and disease


Aging is associate changes in the human epidermis

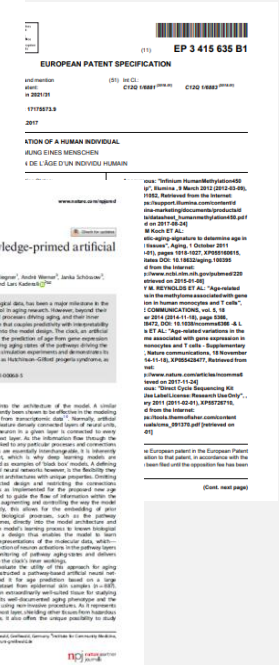

Multi-omics network analysis reveals distinct stages in the human aging progression in epidermal tissue


Development of an epigenetic clock to predict visual age progression of human skin


The aging epigenome: DNA methylation from the cradle to the grave


Modeling transcriptomic age using knowledge-primed artificial neural networks


Comment
Targeting epigenetic age


EP 3 415 635 B1
EUROPEAN PATENT SPECIFICATION

Eucerin®

# Eucerin identified epigenetic changes in skin aging in 2010

## DNA hypermethylation in aged skin

OPEN ACCESS Freely available online

PLoS GENETICS

### Aging and Chronic Sun Exposure Cause Distinct Epigenetic Changes in Human Skin

**Elke Grönniger[1], Barbara Weber[2], Oliver Heil[3], Nils Peters[1], Franz Stäb[1], Horst Wenck[1], Bernhard Korn[3], Marc Winnefeld[1], Frank Lyko[2]***

**1** Research and Development, Beiersdorf AG, Hamburg, Germany, **2** Division of Epigenetics, DKFZ-ZMBH Alliance, German Cancer Research Center, Heidelberg, Germany, **3** Genomics and Proteomics Core Facility, German Cancer Research Center, Heidelberg, Germany

**Abstract**

Epigenetic changes are widely considered to play an important role in aging, but experimental evidence to support this hypothesis has been scarce. We have used array-based analysis to determine genome-scale DNA methylation patterns from human skin samples and to investigate the effects of aging, chronic sun exposure, and tissue variation. Our results reveal a high degree of tissue specificity in the methylation patterns and also showed very little interindividual variation within tissues. Data stratification by age revealed that DNA from older individuals was characterized by a specific hypermethylation pattern affecting less than 1% of the markers analyzed. Interestingly, stratification by sun exposure produced a fundamentally different pattern with a significant trend towards hypomethylation. Our results thus identify defined age-related DNA methylation changes and suggest that these alterations might cont
associated with skin aging.

**Citation:** Grönniger E, Weber B, Heil O, Peters N, Stäb F, et al. (2010) Aging and Chronic Sun Exposure Cause Di
Genet 6(5): e1000971. doi:10.1371/journal.pgen.1000971

**Editor:** Wolf Reik, The Babraham Institute, United Kingdom

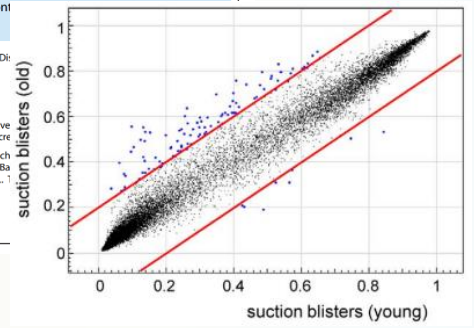
**Received** December 1, 2009; **Accepted** April 26, 2010; **Published** May 27, 2010



**Funding:** This work was supported by the Cooperation Program in Cancer Research of the Deutsches Krebsforsch
and Technology (project Ca 121) and by a grant from the Ministerium für Wissenschaft, Forschung und Kunst Ba
Forschungsverbund Molekulare und biomedizinische Grundlagen von Alterungsvorgängen, project D2) to FL. T
collection and analysis, decision to publish, or preparation of the manuscript.

**Competing Interests:** The authors have declared that no competing interests exist.

* E-mail: f.lyko@dkfz.de




Grönniger E et al. Aging and chronic sun exposure cause distinct epigenetic changes in human skin. PLoS Genet. 2010 May 27;6(5):e1000971.

## Epigenetic changes are connected with altered and reduced gene expression

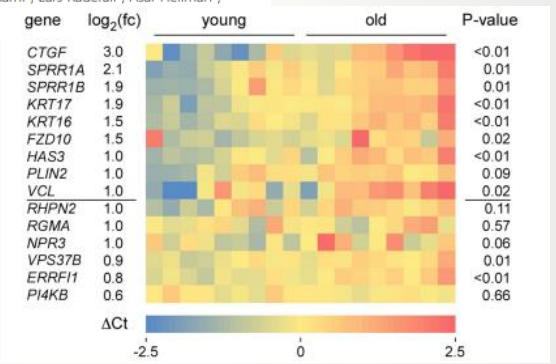
Raddatz *et al. Epigenetics & Chromatin* 2013, **6**:36
http://www.epigeneticsandchromatin.com/content/6/1/36

*Epigenetics & Chromatin*

RESEARCH Open Access

### Aging is associated with highly defined epigenetic changes in the human epidermis

Günter Raddatz[1], Sabine Hagemann[2], Dvir Aran[3], Jörn Söhle[2], Pranav P Kulkarni[4], Lars Kaderali[4], Asaf Hellman[3], Marc Winnefeld[2] and Frank Lyko[1*]




Raddatz G, et al. Aging is associated with highly defined epigenetic changes in the human epidermis. Epigenetics Chromatin. 2013 Oct 31;6(1):36.

# 1st SKIN SPECIFIC

PATENTED AGE CLOCK • TECHNOLOGY •

Eucerin®

**You can only optimize,**

**what you can measure!**

EUCERIN PIONEERING EPIGENETIC RESEARCH

# 1st skin specific age clock developed by EUCERIN

**SKIN SAMPLES**


**850,000 DATA POINTS ANALYSIS**


frontiers | Frontiers in Aging

TYPE Original Research
PUBLISHED 11 January 2024
DOI 10.3389/fragi.2023.1258183

Check for updates

OPEN ACCESS

EDITED BY
Sigrid Le Clerc,
Conservatoire National des Arts et Métiers (CNAM), France

REVIEWED BY
Mayumi Komine,
Jichi Medical University, Japan
Florence Debacq-Chainiaux,
University of Namur, Belgium

## Development of an epigenetic clock to predict visual age progression of human skin

Agata Bienkowska[1,2]*, Günter Raddatz[3], Jörn Söhle[1], Boris Kristof[1], Henry Völzke[4], Stefan Gallinat[1], Frank Lyko[3], Lars Kaderali[2], Marc Winnefeld[1], Elke Grönniger[1]* and Cassandra Falckenhayn[1]

Bienkowska, A., Raddatz, G.,..., Groenniger E &. Falckenhayn, C.. Development of an epigenetic clock to predict visual age progression of human skin. Frontiers in Aging, 2024

EUCERIN PIONEERING EPIGENETIC RESEARCH

# 1st skin specific age clock developed by EUCERIN

## SKIN SAMPLES


## 850,000 DATA POINTS ANALYSIS

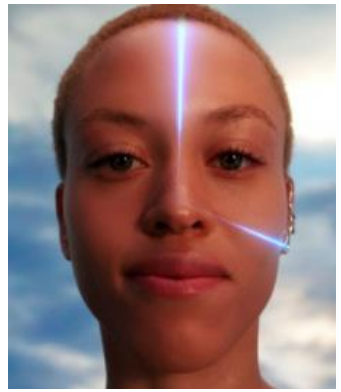
## PATENTED SKIN AGE CLOCK TECHNOLGY


**Tool to measure biological SKIN AGE**

## SKIN CLOCK PREDICTS VISUAL AGE

| | | |
|---|---|---|
| chron. age | 44 years | 44 years |
| visual age | 39 years | 55.5 years |

## ACTIVE INGREDIENT SEARCH



***! More precise than state-of-the-art Horvath clock !***

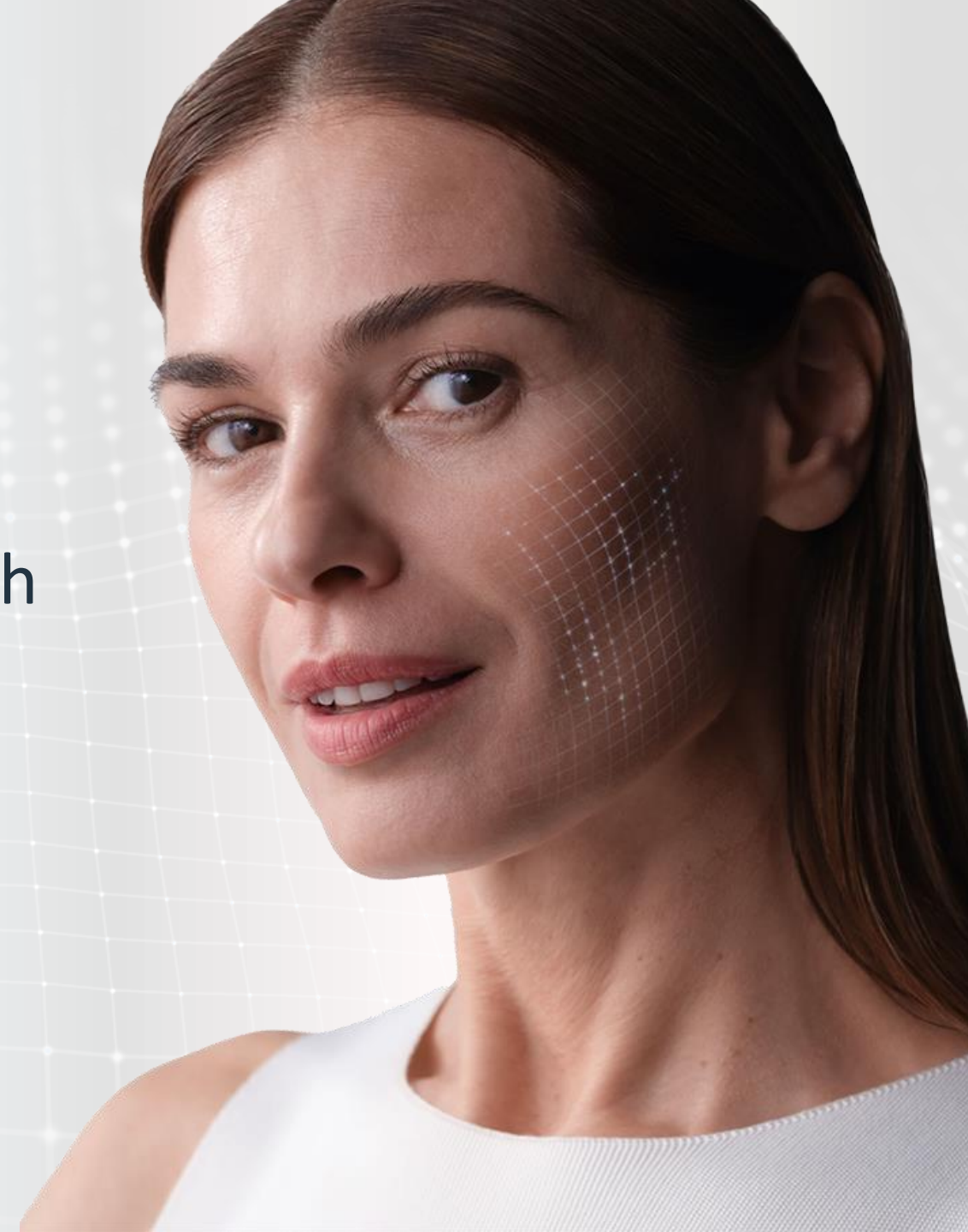
Bormann F et al. Reduced DNA methylation patterning and transcriptional connectivity define human skin aging. Aging Cell. 2016 Jun;15(3

Bienkowska A et al, Development of an epigenetic clock to predict visual age progression of human skin. Front Aging. 2024 Jan 11;4:1258183.

# What if, …

… we could reverse epigenetic changes of skin aging and reactivate deactivated youth genes?

Could we then **TURN BACK THE TIME?**



## Discovery of EPICELLINE®

**15** years of research
Scientific publications

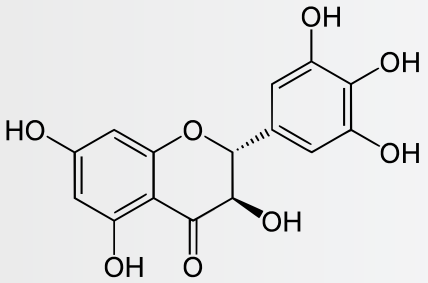
**50,000** ingredients tested

**1** groundbreaking ingredient to
**#PatentedAgeClock**


Eucerin®
Epicelline®

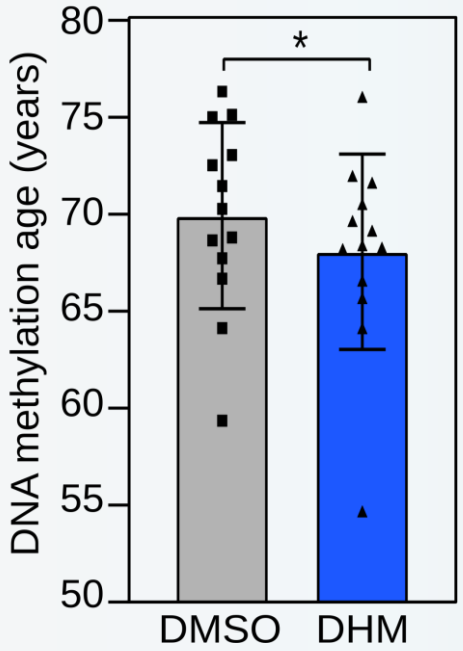
Eucerin®

# EPICELLINE® restores age-dependent DNA methylation changes and thus the skin spec. age clock *in vitro*




**Epicelline®:**
Dihydromyricetin (DHM), extracted from vine tea

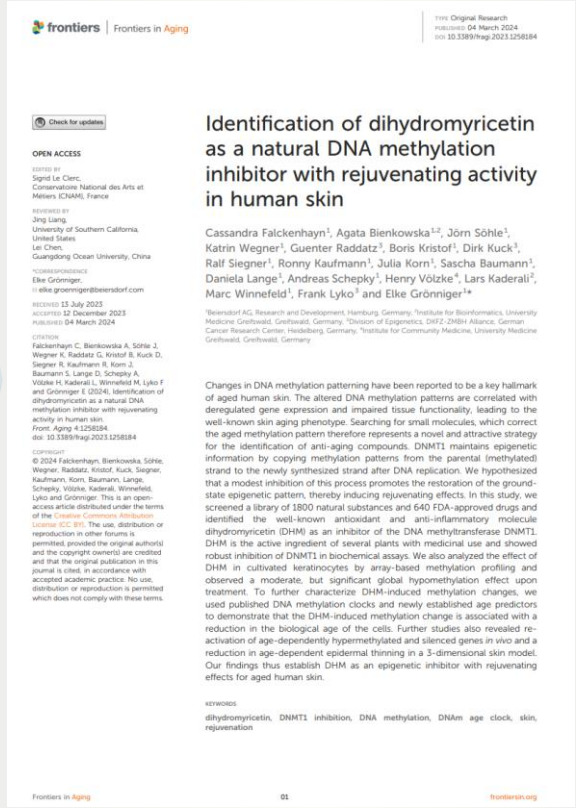
Proven very high biosafety[1]




Keratinocytes have been treated with 20 µM EPICELLINE® for 3 days [2]

PATENTED AGE CLOCK • TECHNOLOGY •

**EPICELLINE®** restored the epigenetic youthful pattern and reduces the biological age of skin cells (right) *in vitro.*



frontiers | Frontiers in Aging

Identification of dihydromyricetin as a natural DNA methylation inhibitor with rejuvenating activity in human skin

Cassandra Falckenhayn[1], Agata Bienkowska[1,2], Jörn Söhle[1], Katrin Wegner[1], Guenter Raddatz[3], Boris Kristof[1], Dirk Kuck[3], Ralf Siegner[1], Ronny Kaufmann[1], Julia Korn[1], Sascha Baumann[1], Daniela Lange[1], Andreas Schepky[1], Henry Völzke[4], Lars Kaderali[2], Marc Winnefeld[1], Frank Lyko[3] and Elke Grönniger[1]*

Changes in DNA methylation patterning have been reported to be a key hallmark of aged human skin. The altered DNA methylation patterns are correlated with deregulated gene expression and impaired tissue functionality, leading to the well-known skin aging phenotype. Searching for small molecules, which correct the aged methylation pattern therefore represents a novel and attractive strategy for the identification of anti-aging compounds. DNMT1 maintains epigenetic information by copying methylation patterns from the parental (methylated) strand to the newly synthesized strand after DNA replication. We hypothesized that a modest inhibition of this process promotes the restoration of the ground-state epigenetic pattern, thereby inducing rejuvenating effects. In this study, we screened a library of 1800 natural substances and 640 FDA-approved drugs and identified the well-known antioxidant and anti-inflammatory molecule dihydromyricetin (DHM) as an inhibitor of the DNA methyltransferase DNMT1. DHM is the active ingredient of several plants with medicinal use and showed robust inhibition of DNMT1 in biochemical assays. We also analyzed the effect of DHM in cultivated keratinocytes by array-based methylation profiling and observed a moderate, but significant global hypomethylation effect upon treatment. To further characterize DHM-induced methylation changes, we used published DNA methylation clocks and newly established age predictors to demonstrate that the DHM-induced methylation change is associated with a reduction in the biological age of the cells. Further studies also revealed re-activation of age-dependently hypermethylated and silenced genes *in vivo* and a reduction in age-dependent epidermal thinning in a 3-dimensional skin model. Our findings thus establish DHM as an epigenetic inhibitor with rejuvenating effects for aged human skin.

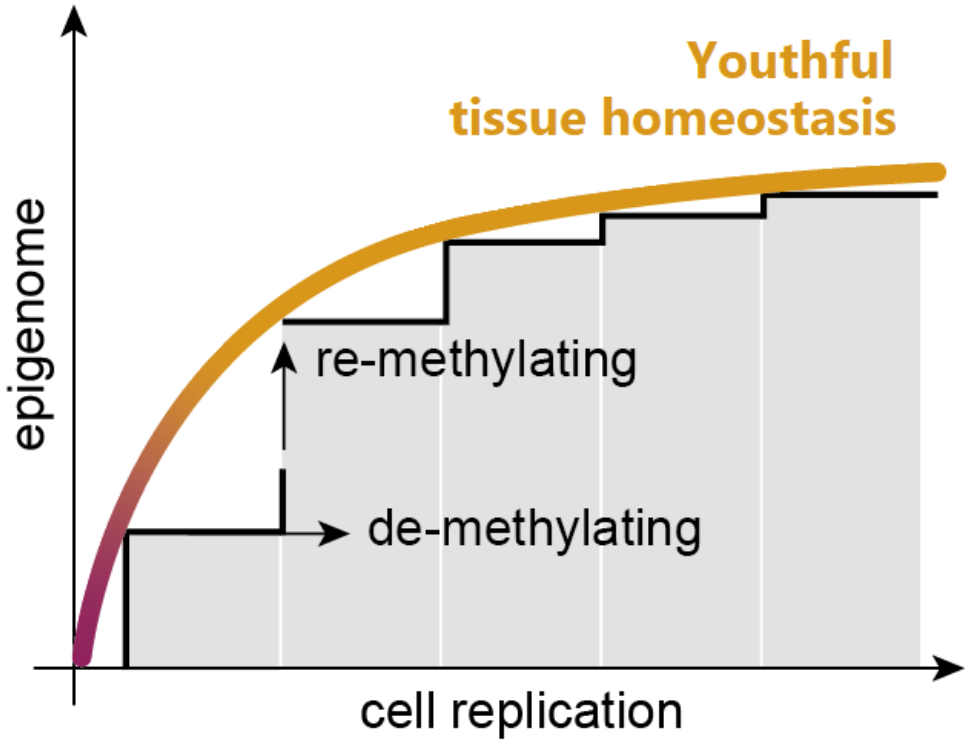
dihydromyricetin, DNMT1 inhibition, DNA methylation, DNAm age clock, skin, rejuvenation

[1] He et al, Dihydromyricetin: an emerging compound with comprehensive effects on multiple systems. Front. Pharmacol., 03 January 2025

[2] Falckenhayn C et al, Identification of dihydromyricetin as a natural DNA methylation inhibitor with rejuvenating activity in human skin. Front Aging. 2024 March

# MODE OF ACTION OF EPICELLINE®

## Epicelline optimizes the epigenetic pattern to a youthful state




Partially inhibiting the epigenetic enzyme (de-methylation) and cellular re-methylation result in the selective erasure of age-related methylation changes.

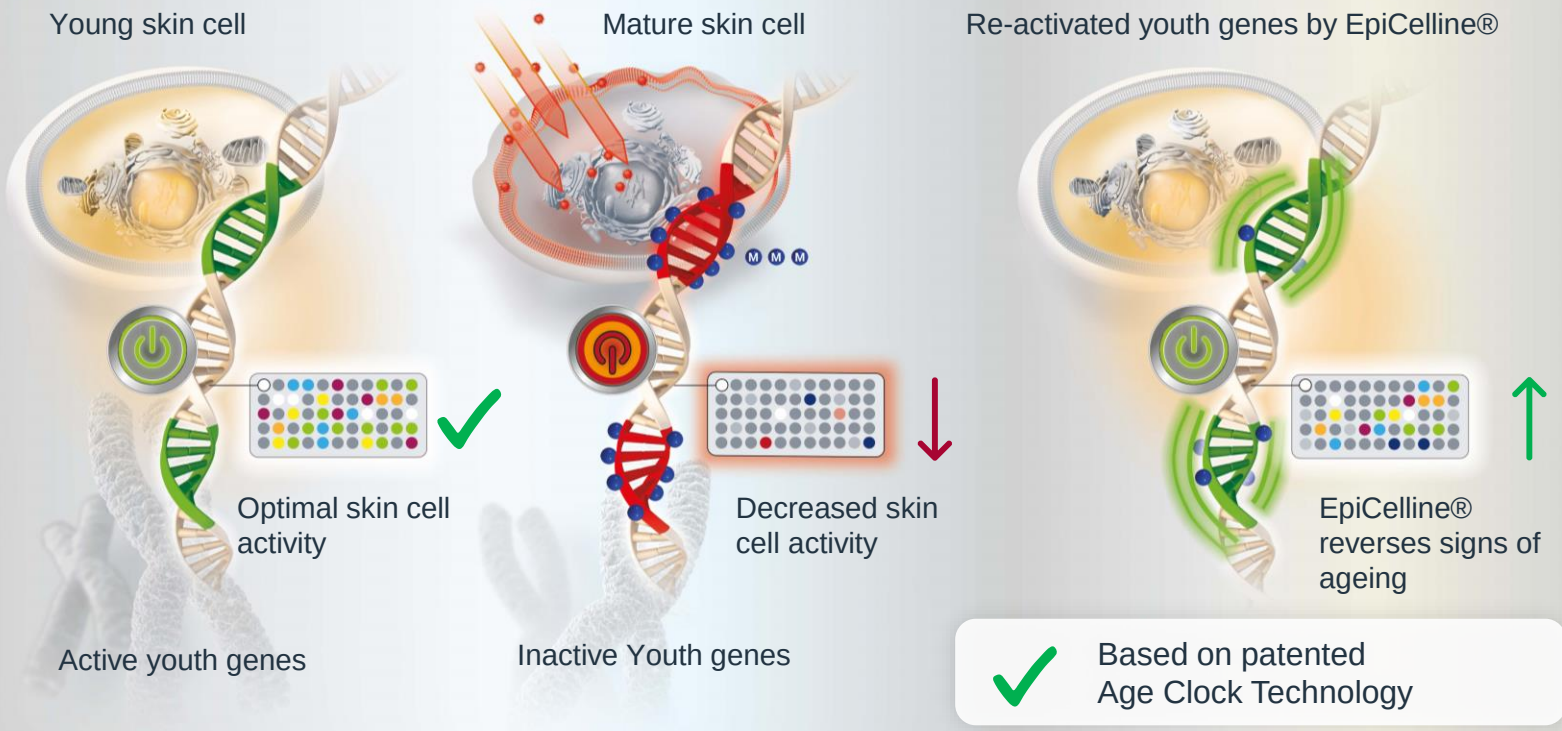
**Proven to induce**
**no hypomethylation at critical genes[1]**

Grönniger et al, 2024: Skin Rejuvenation by Modulation of DNA Methylation. Experimental Dermatology. 2024 October
[1] Falckenhayn C et al, Identification of dihydromyricetin as a natural DNA methylation inhibitor with rejuvenating activity in human skin. Front Aging. 2024 March

HYALURON-FILLER EPICELLINE SERUM

# EPICELLINE®
# the 1st active proven to reverse the Skin Age Clock

## Eucerin Epigenetic Skin Science




EPICELLINE®

**REVERSES** signs of age visibly:

- **REACTIVATES** silenced genes
- **REVERSES** epigenetic changes
- **REJUVENATES** the skin cells

# Revolutionary Discovery in Skin Aging

**EPIGENETICS**
IS THE MAIN DRIVER
OF SKIN AGING

**1st SKIN SPECIFIC**
PATENTED
**AGE CLOCK TECHNOLOGY**

**EPICELLINE®**
**1st ACTIVE PROVEN TO**
**REVERSE THE AGE CLOCK**

PATENTED AGE CLOCK • TECHNOLOGY •

Eucerin®

# READY FOR A REVOLUTION IN ANTI-AGING?


Eucerin®

## Our breakthrough epigenetic innovation

# EPICELLINE SERUM

PATENTED AGE CLOCK TECHNOLOGY

With EPICELLINE ®
developed using patented
Age Clock Technology

Eucerin®

# **Fight 10 signs**
# of skin aging visibly

## Look Up to 5 Years Younger

**Results** in

**4** weeks*


NEW

*Clinical studies & Product-in-use test over 4 weeks with 43 and 160 volunteers respectively.

HYALURON-FILLER EPICELLINE SERUM

# Holistic ingredient concept

## EPICELLINE®

- **Reverses** epigenetic changes
- **Reactivates** silenced youth genes
- **Rejuvenates** the skin cells

- **Reduces HA degradation**: Inhibits enzymatic HYAL1 degradation >50% [3]
- Promotes **DNA repair**

## ENOXOLONE

## HYALURONIC ACID

- Macro-HA (2000kDa) **hydrates** the skin
- Micro-HA (52kDa) **bio-stimulates** epidermal HA production by +209%[2]

**Bio-stimulates**

- dermal HA +256%[4]
- collagen +49%[5]
- Elastin +19% [6]

## GLYCIN SAPONIN


(2) Induction of endogenous, cellular Hyaluronan synthesis by applied exogenous Hyaluronic acid fragments of different molecular sizes. S. Hiddeman, U. Koop, C. Rauscher, S. Saladin (3) Determination of Enoxolone efficacy of HYAL1 enzyme inhibition. Cell-free in vitro-assay; comparing the active ingredient vs. solvent control, calculating relative change of Vmax after 24 h incubation of low molecular weight hyaluronic acid with HYAL1 and Enxolone (N=6), using specific colorimetric complex binding reaction and analysis of the data according to Michaelis-Menten kinetics (4) Saponins – A New Generation of Hyaluronan-Stimulating Actives for Human Skin S. Gallinat, F. Rippke, C. Keppler, J. Mergell, A. Bürger, F. Stäb, H.Wenck Beiersdorf AG, Hamburg, Germany (5) Determination of test sample efficacy vs. control (without active ingredient) in a cell-based in vitro assay. Incubation of human dermal fibroblasts (n=9) with the test samples in one concentration for 72 h (6) Julia Weise – quantitative measurement of elastin deposition of cultured human skin cells by using a cell western

HYALURON-FILLER EPICELLINE SERUM

# Fight 10 signs of skin aging


**10 SIGNS OF SKIN AGING**

1 Firmness
2 Lifting effect
3 Wrinkle reduction
4 Fine line reduction
5 Contours
6 Hydration
7 Radiance
8 Rejuvenation
9 Evenness
10 Smoothness

HYALURON-FILLER EPICELLINE SERUM

# Clinically proven: Reverses 10 signs of skin aging


10 SIGNS OF SKIN AGING

1 **Firmness**
2 **Lifting effect**
3 **Wrinkle reduction**
4 **Fine line reduction**
5 **Contours**
6 **Hydration**
7 **Radiance**
8 **Rejuvenation**
9 **Evenness**
10 **Smoothness**

**In 4 weeks**

UP TO **78%** **WRINKLE VOLUME REDUCTION[1]**

**88%** of participants **FIRMNESS[2]**

**94%** of participants **SMOOTHNESS[3]**

UP TO **81%** of participants **FINE LINE REDUCTION[3]**

**95%** of participants **HYDRATION[4]**

**81%** of participants **EVENNESS[3]**

**74%** of participants **CONTOURS SHARPENED[3]**

**74%** of participants **LIFTING EFFECT[3]**

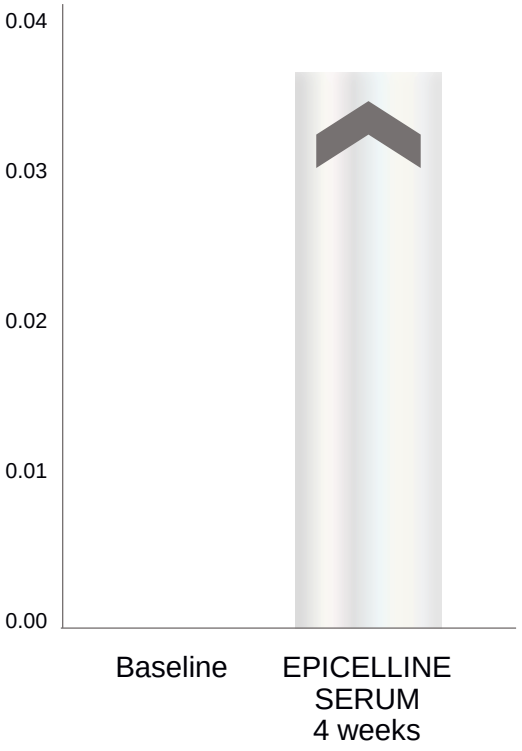
**60%** of participants **RADIANCE[3]**

**84%** of participants **REJUVENATION[3]**

[1] Clinical study with 43 subjects, application 2x daily for 4 weeks, instrumental measurement [2] Clinical study with 43 subjects, application 2x daily for 4 weeks, instrumental measurement, displayed is improvement rate (% subjects) compared to baseline [3] Clinical study, 43 women with moderate to deep lines and wrinkles. Application 2x daily for 4 weeks, Self-grading on a 10-step scale, displayed is improvement rate (% subjects) [3] Clinical study with 43 subjects, application 2x daily for 4 weeks, instrumental measurement [4] Clinical study with 43 subjects, application 2x daily for 4 weeks, instrumental corneometer measurement, Improvement Rate (% subjects) compared to baseline

# Significantly increases skin firmness

## CUTOMETRY[2]



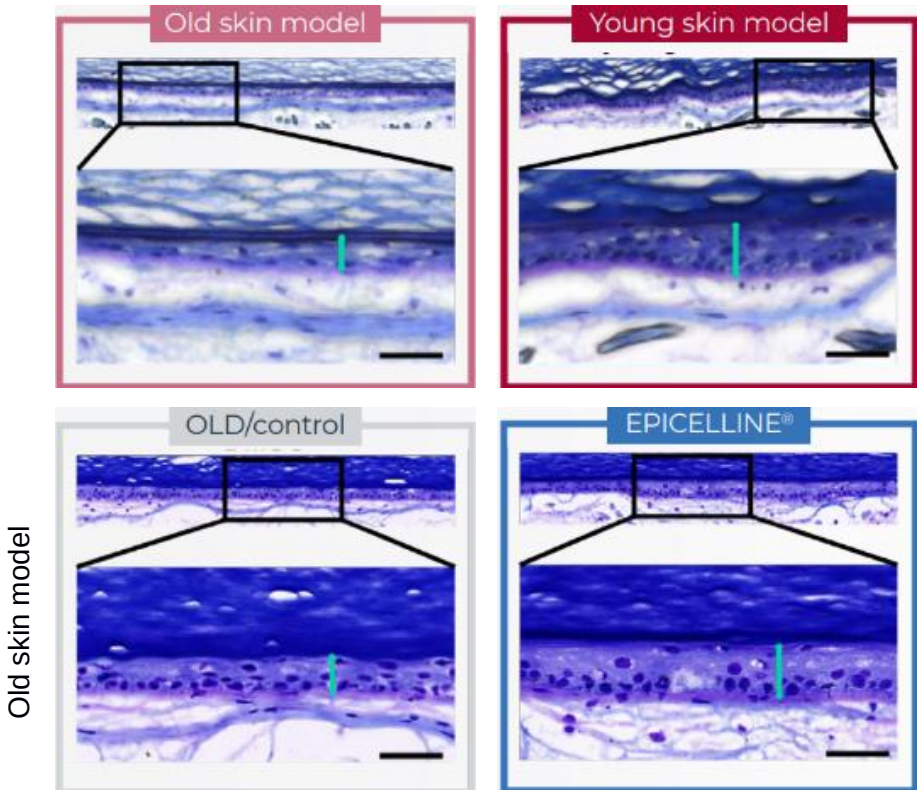

**88%**

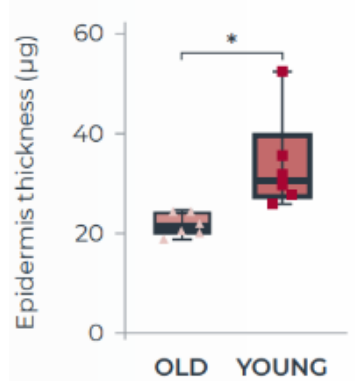
of participants

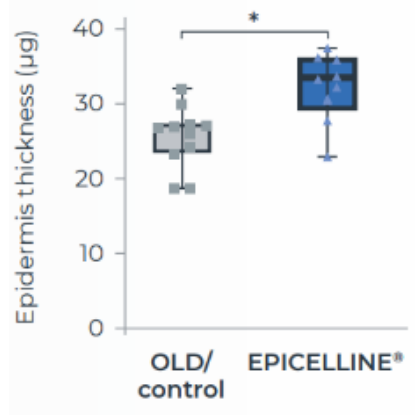
**FIRMNESS**

improvement[1]

## INCREASE THE EPIDERMAL THICKNESS[3]



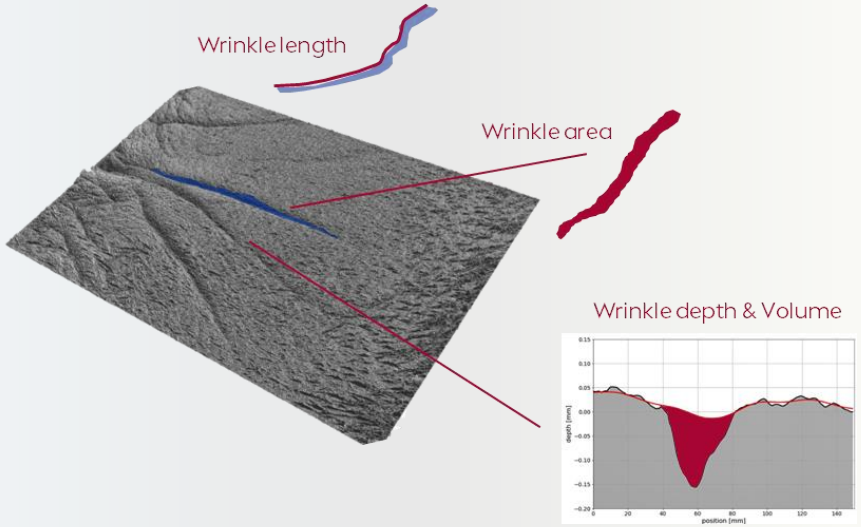




[1] ] Clinical study with 43 subjects, application 2x daily for 4 weeks, instrumental measurement, displayed is improvement rate (% subjects) compared to baseline [2] ] Clinical study with 43 subjects, application 2x daily for 4 weeks, instrumental measurement, data on file. [3] Falckenhayn C et al, Identification of dihydromyricetin as a natural DNA methylation inhibitor with rejuvenating activity in human skin. Front Aging. 2024 March

Eucerin®

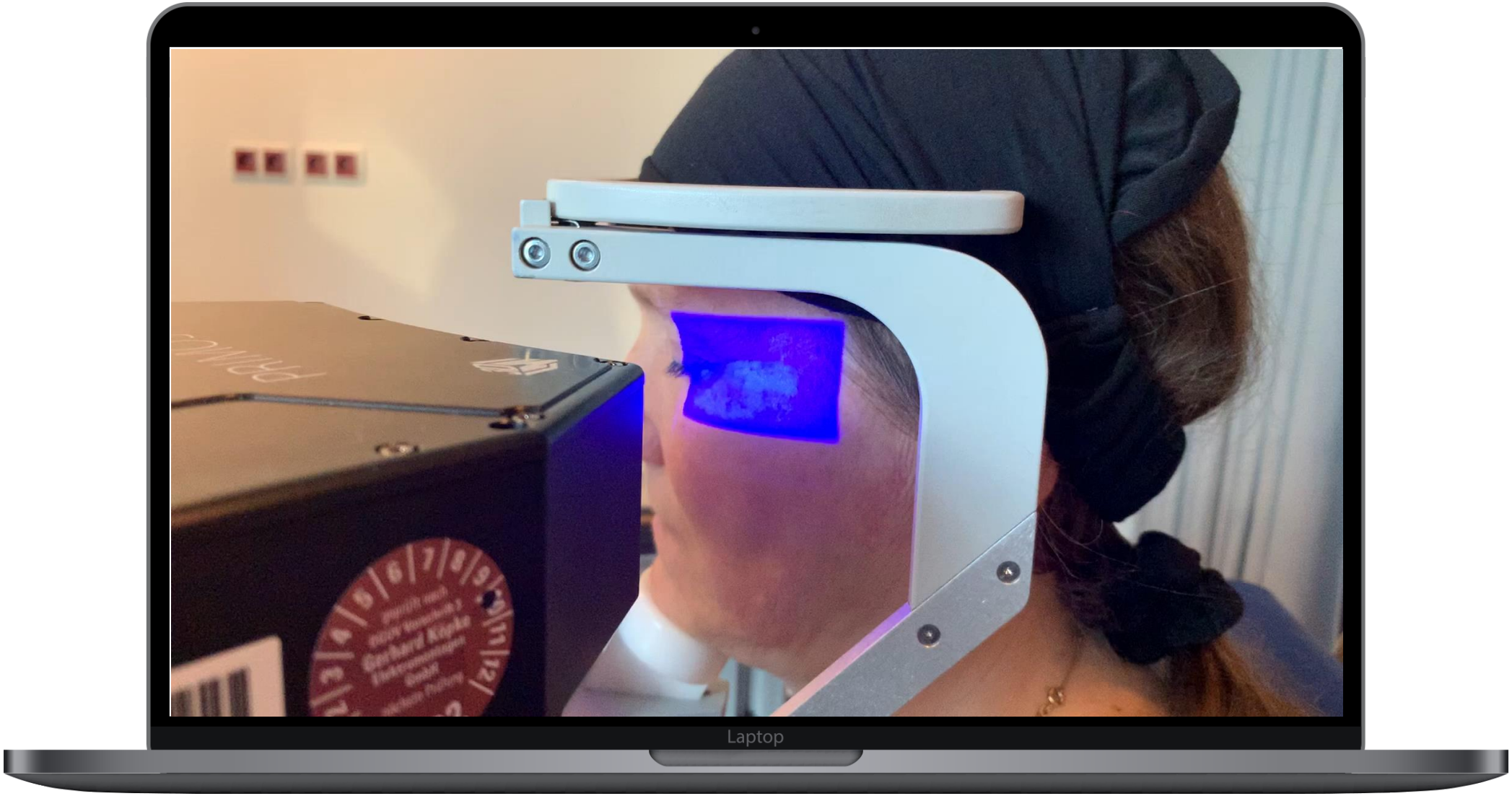
# EPICELLINE SERUM visibly reverses signs of aging

- Forehead wrinkles
- Eye wrinkles
- Wrinkles underneath eyes
- Nasolabial fold
- Cheek & mouth wrinkles



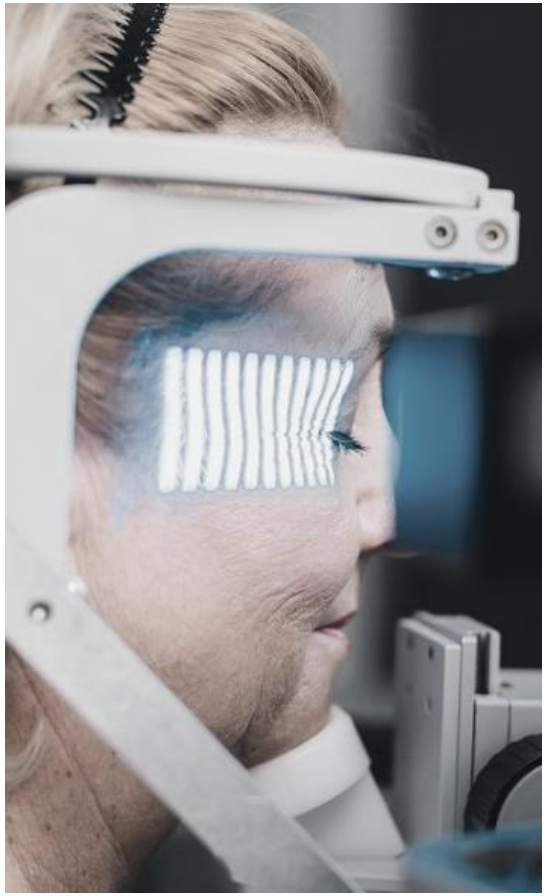
# WRINKLE MEASUREMENTS

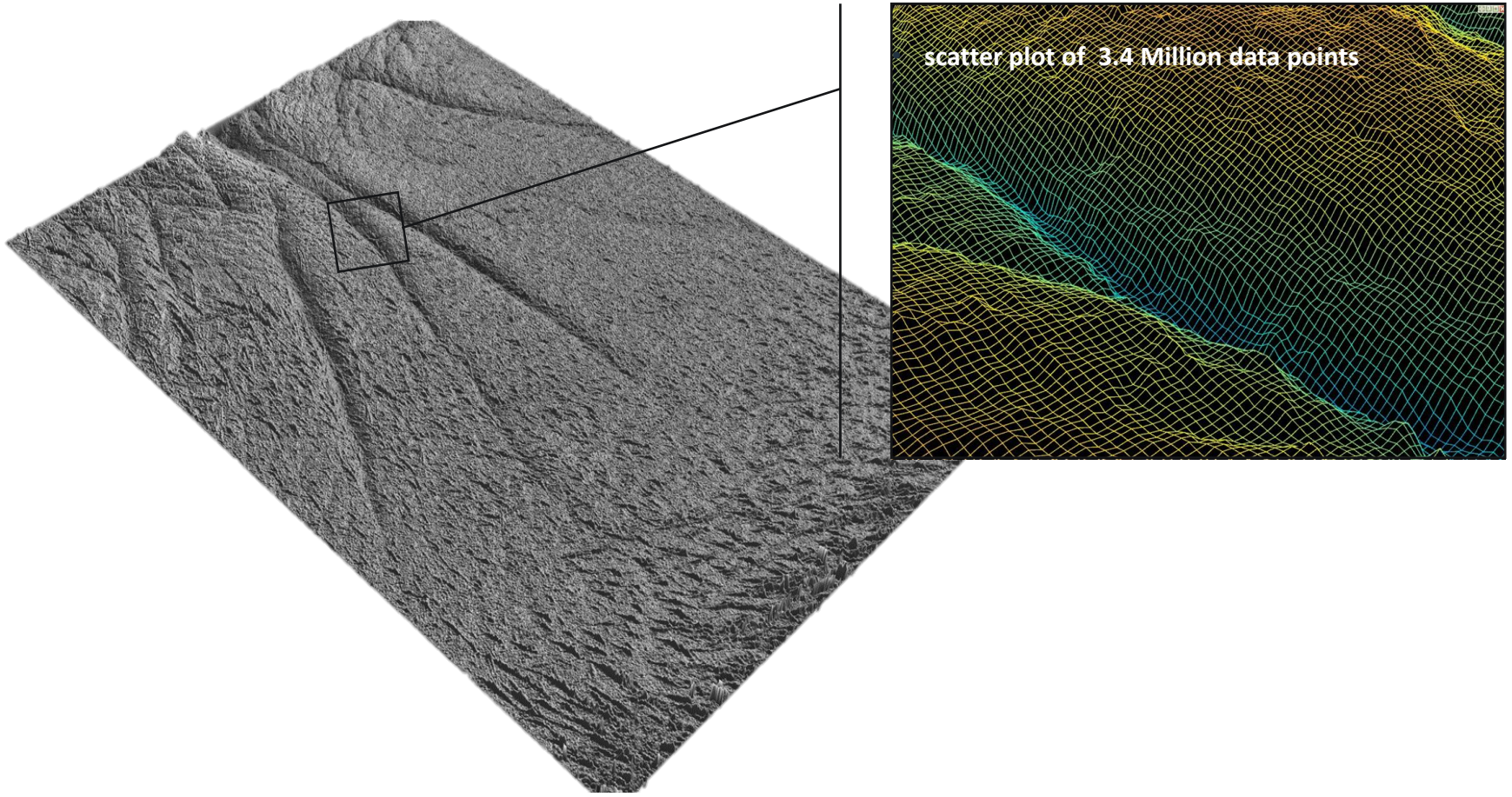
ON THE MIKROMETER SCALE



# THE MEASUREMENT PROVIDES A 3D SCATTER PLOT

OF THE EYE WRINKLE AREA IN HIGH-RESOLUTION






Beiersdorf

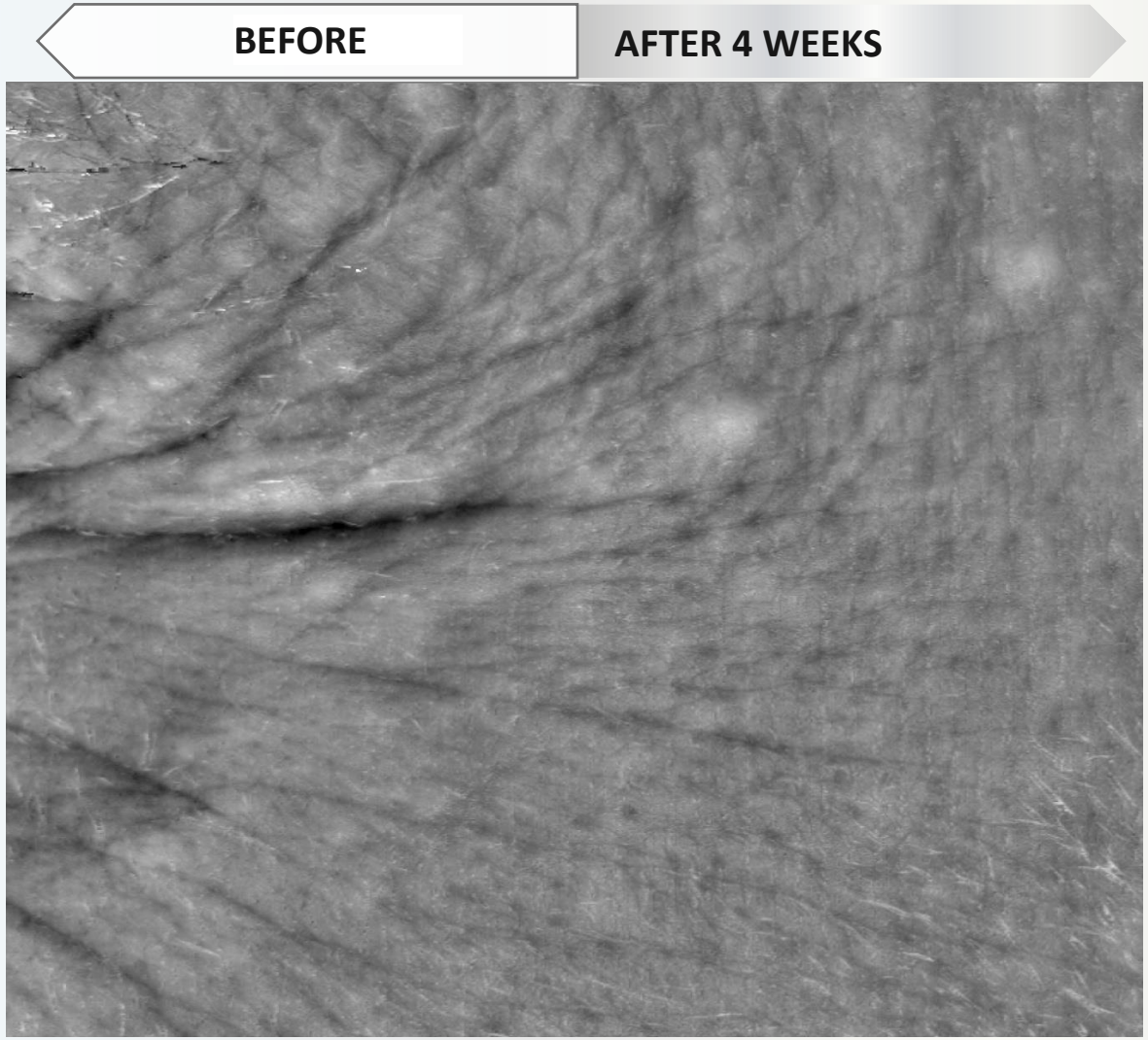
Eucerin®

# EPICELLINE SERUM visibly reverses signs of aging


**Up to**

**78%**

**wrinkle volume reduction**




Clinical study with 43 subjects, application 2x daily for 4 weeks, Phase-Shifting Rapid In vivo Measurement Of Skin eye area, original slider. Example shown, individual resulty may vary

Eucerin®

# From Lab to Clinic –Cases


HASSAN GALADARI, MD FAAD

ASSOCIATE PROFESSOR OF DERMATOLOGY

COLLEGE OF MEDICINE AND HEALTH SCIENCES

UAE UNIVERSITY


# Background

20 PATIENTS, 4 WEEKS FOLLOW UP, OPTIONAL 8 WEEKS FOLLOW UP

TOPICAL (SOLITARY APPLICATION); 5

CHEMICAL PEEL; 5

MICRONEEDLING; 5

INJECTABLES; 5

# Clinical cases

# MONOTHERAPY

**Patient information:**

- 32 year old female
- Skin type IV
- No procedure performed

*"Clear results mainly in **luminosity and radiance**"*

*"Her sun damage has become **noticeably better**"*

Courtesy of Prof. Dr. Galadari

# IN COMBINATION **WITH CHEMICAL PEEL**

**Patient information:**

- 36 year old female
- History of Adult acne
- Skin type III
- 20% Salicylic Acid peel

"*Results show a* ***decrease in redness and Telangiectasia***"

Courtesy of Prof. Dr. Galadari

# IN COMBINATION **WITH MICRONEEDLING**

**Patient information:**

- 29 year old female
- Skin type IV
- Microneedling RF (Radiofrequency)

"*Significant **clearance of solar damage and smoothness** of her face*"

"*In addition, the patient describes her skin being '**tighter**'*"

Courtesy of Prof. Dr. Galadari

# IN COMBINATION **WITH BOTULINUM TOXIN**



**Patient information:**

- 48 year old female
- Skin type IV
- Injectable

*"Result are visible in **wrinkles reduction** as well as a more **natural, relaxed look**"*

Courtesy of Prof. Dr. Galadari

Eucerin®

# EPICELLINE SERUM visibly fights signs of aging

Baseline

After 8 weeks

„Significant **wrinkle reduction.**

Overall **more even skin** tone and **increased skin quality**.“

HYALURON-FILLER EPICELLINE SERUM

# Patient Feedback

**98%**

Of women confirm[1]

**VISIBLY REVERSES**

Signs of age

- **Rejuvenated**
  Skin after 4 weeks
- **Reduced**
  wrinkles
- **Younger**
  Looking skin
- **Healthy**
  Looking skin all day long

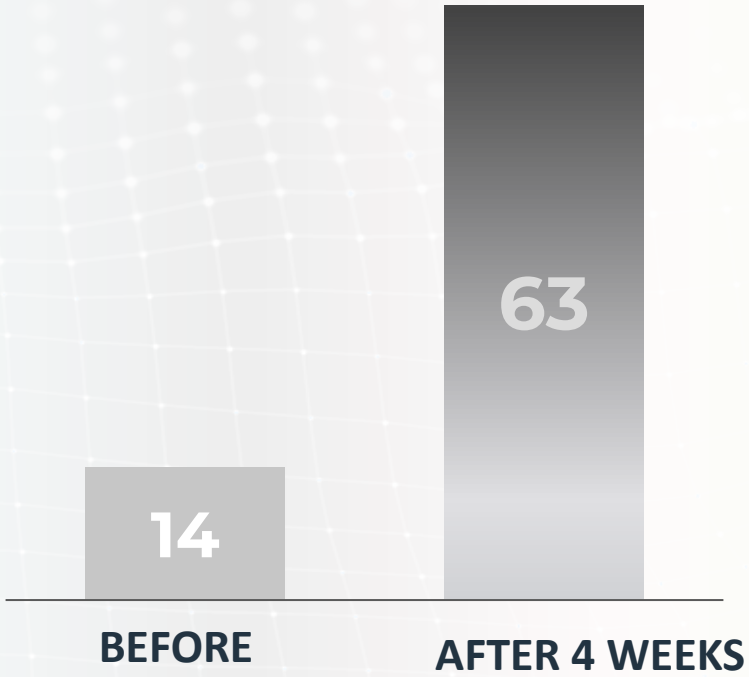
MAKES YOU LOOK UP TO 5 YEARS YOUNGER

*Product-in-use test over 4 weeks with 160 volunteers

HYALURON-FILLER EPICELLINE SERUM

# EPICELLINE SERUM improves quality of life

"My skin appearance gave me the impression of being attractive"




Eucerin Life Quality Index, Product-in-use test over 4 weeks with 160 volunteers

# How to use the EPICELLINE SERUM


## The serum can be used …

... in the morning & evening

**As a base/ starting point of your skin care routine**

... in combination with all products of the Hyaluron-Filler range and SUN Photoaging Control


... as integrated skin care after aesthetical treatments

**After Micro Needling, injectables (Bio-stimulators, Botox), Peeling, etc.**


Eucerin®

# THANK YOU

PATENTED AGE CLOCK TECHNOLOGY

Eucerin®

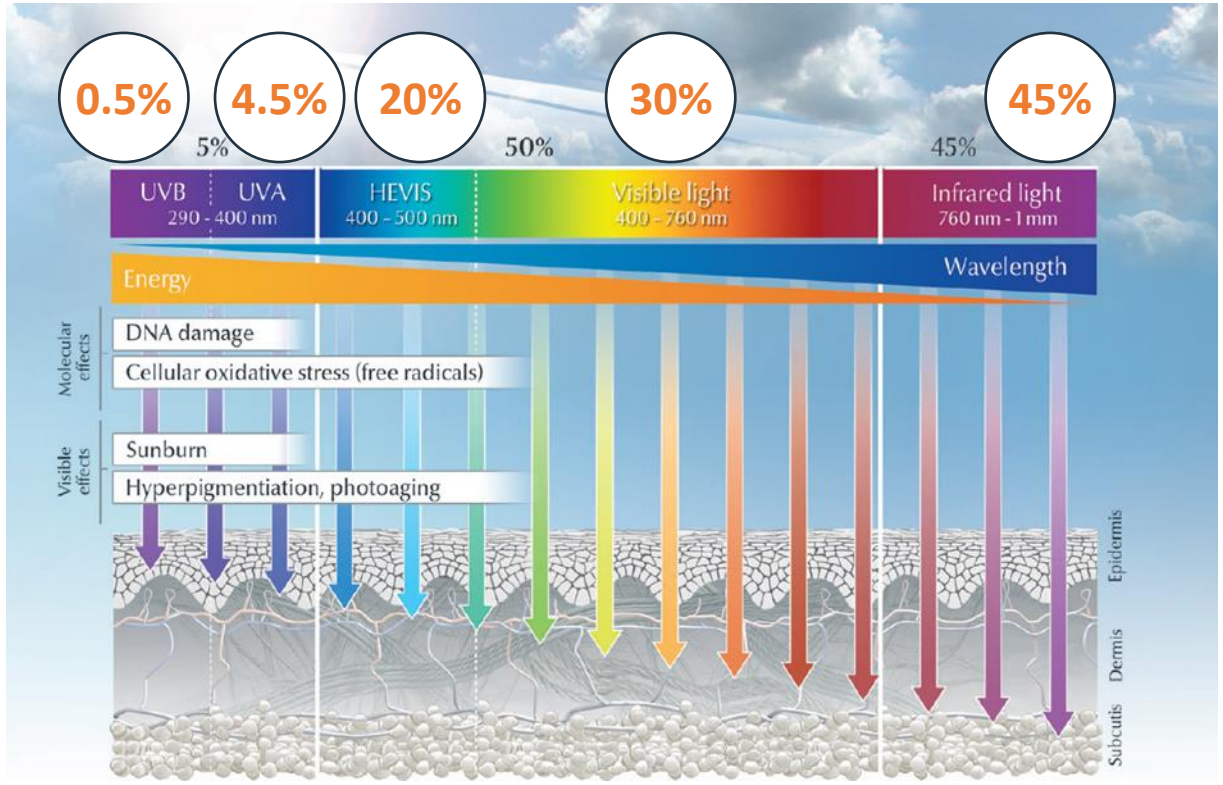
# Beyond UV Protection

## Protect & Repair

# Sunlight spectrum

## UV and HEVIS sunlight are majorly causing skin damage

### Different light types exposed by the sun




**UVC (100-290 nm) is highest energy (most hazardous), absorbed by the atmosphere, stopped by ozone**

**UVB + UVA + HEVIS + IR have different effects due to different energy + different sites of action in the skin (penetration)**

- Skin is exposed to solar radiation, thus oxidative stress every day
- Moderate dose of solar radiation is indispensable for our health
- UVB stimulates the vitamin D synthesis in skin, essential for bone, nerve & muscle growth
- Solar radiation positively influences circulatory system & psychological well-being
- Excessive exposure to solar radiation, however, these positive effects turn detrimental
- Repeated exposure to excessive doses of radiation can lead to
  - Photoaging
  - Immunosuppression
  - Development of skin cancer
- Key cause is formation of free radicals in skin -measure for oxidative stress

1. Effects on detection of radical formation in skin due to solar irradiation measured by EPR spectroscopy, Stephanie Albrecht et al, Methods Volume 109, 2016, P 44-54
https://www.sciencedirect.com/science/article/abs/pii/S1046202316301608

## Effect of UVB and UVA on exposure skin

# UVB

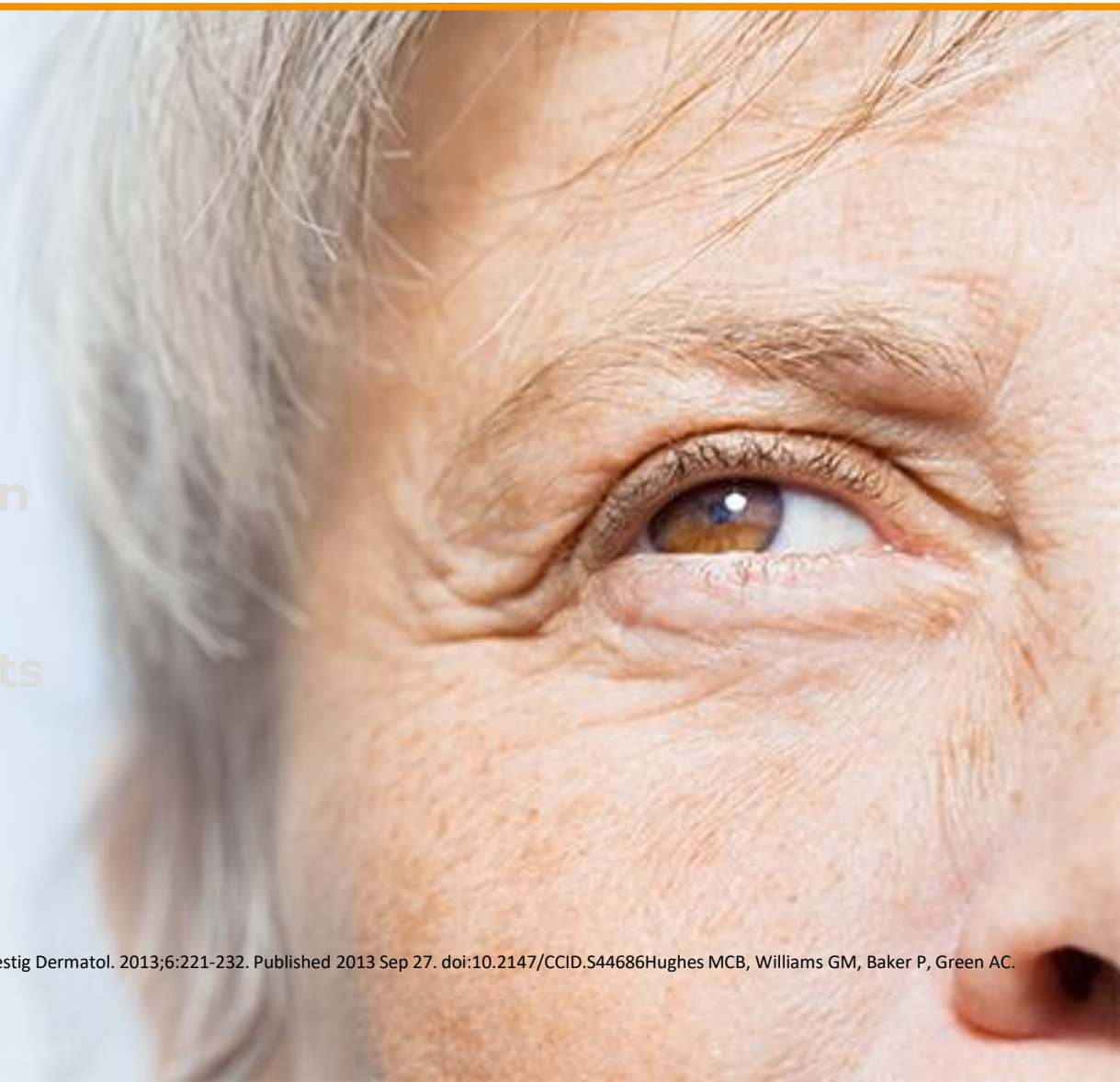
- Induces **SUNBURN**: Redness, burning, heat, blisters
- Occurs if sun exposure longer than minimal erythema dose (MED)
- Delayed **pigmentation** (melanogenesis)

Lehmann, Percy. "Photodermatoses." *Braun-Falco´s Dermatology* (2020): 1-28.

## Effect of UVB and UVA on exposure skin

# UVA

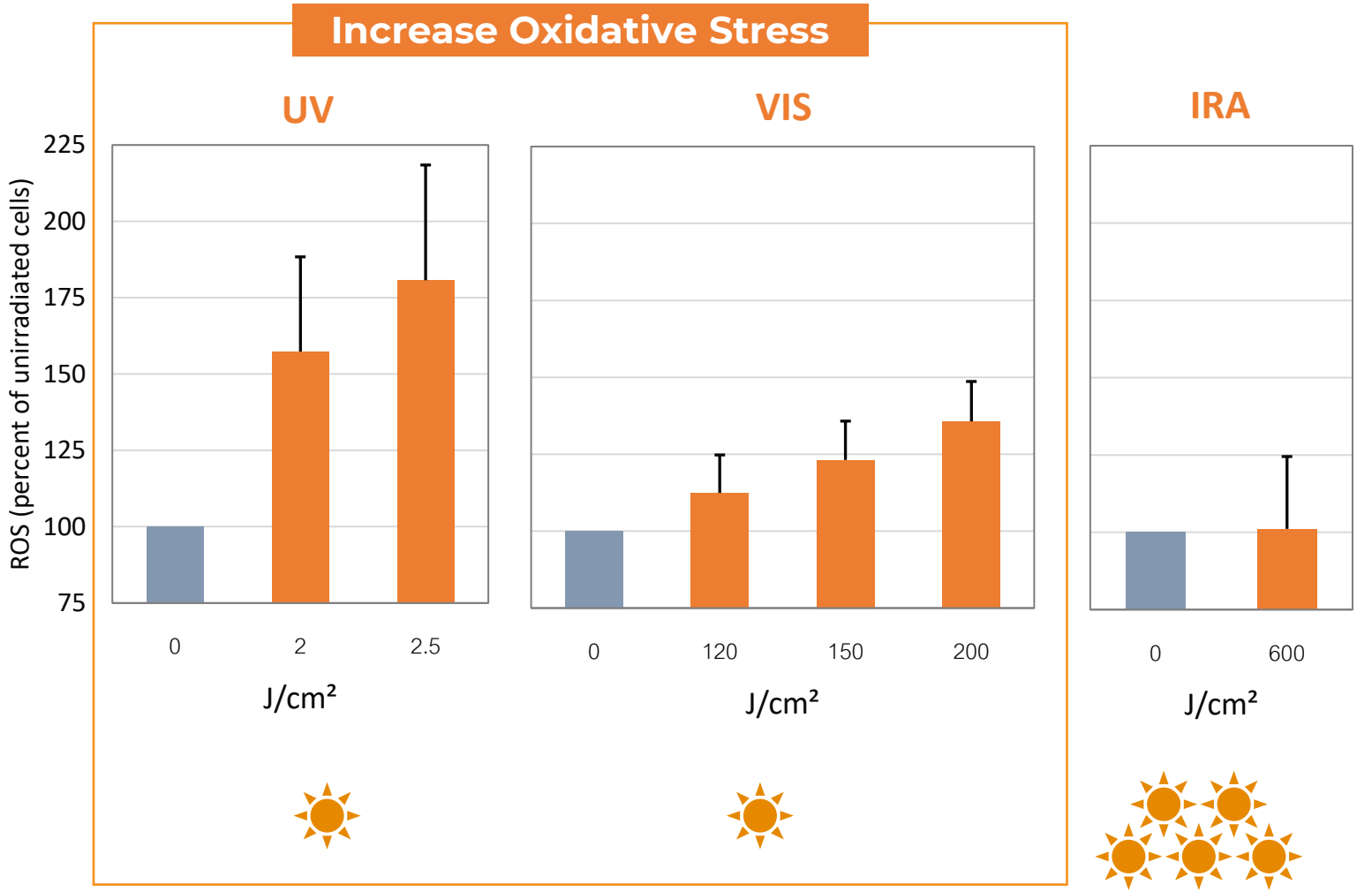
- Induces Reactive Oxygen Species **(ROS)**
- **AGING**: destruction of collagen/ elastin in dermis
- Immediate **PIGMENTATION** and age spots



1. Flament F, Bazin R, Laquieze S, Rubert V, Simonpietri E, Piot B. Effect of the sun on visible clinical signs of aging in Caucasian skin. Clin Cosmet Investig Dermatol. 2013;6:221-232. Published 2013 Sep 27. doi:10.2147/CCID.S44686Hughes MCB, Williams GM, Baker P, Green AC. Sunscreen and prevention of skin aging: a randomized trial. *Ann Intern Med* 2013; 158(11):781-790.
2.Godar DE, Urbach F, Gasparro FP, van der Leun JC. UV doses of young adults. Photochem Photobiol 2003; 77(4):453-7

# Sunlight spectrum

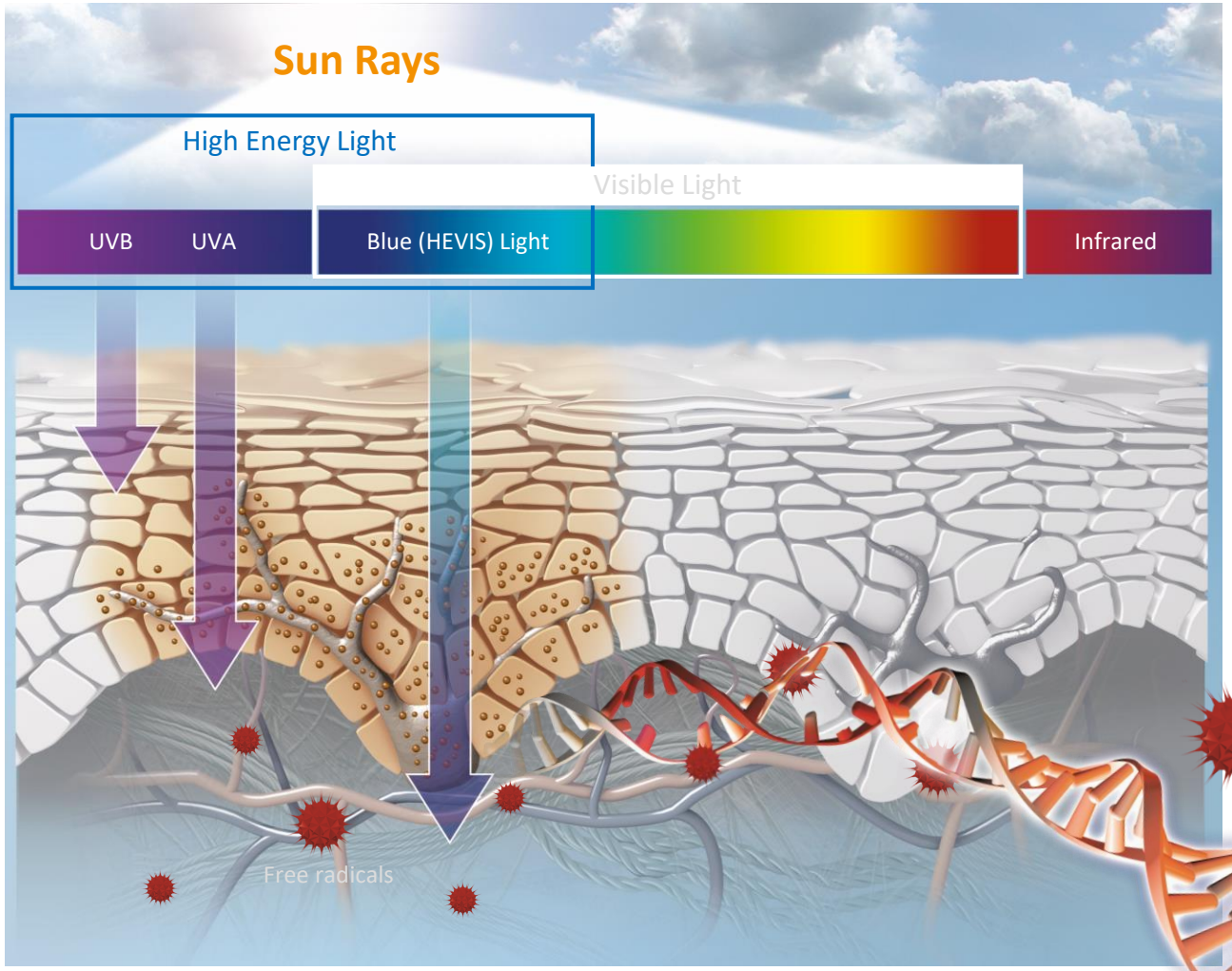
## IRA generates lower Oxidative Stress than UV and Visible Light




1 - Mann T et al., High-energy visible light at ambient doses and intensities induces oxidative stress of skin-Protective effects of the antioxidant and Nrf2 inducer Licochalcone A in vitro and in vivo. Photodermatol Photoimmunol Photomed. 2020 Mar;36(2):135-144.

Sunlight spectrum

# Blue high energy visible (HEVIS) sunlight and its impact on skin



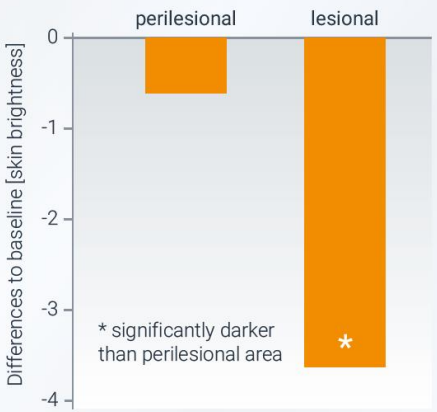

**BLUE** (HEVIS) sunlight promotes hyperpigmentation and photoaging

Photoaging

Hyperpigmentation

## VISIBLE LIGHT WORSENS HYPERPIGMENTATION[1]

Skin brightness 24h after irradiation with 200 J/cm² visible light




[1] 6 subjects with facial hyperpigmentation were irradiated with 200 J/cm2 visible light. Clinical photography was performed directly and 24h after irradiation. Skin brightness was assessed via image analysis. Skin brightness 24h after irradiation was compared to baseline for the pigmented lesion (lesional) and the surrounding skin (perilesional).

**50%** of free radicals are generated by Blue(HEVIS) light[2,3]

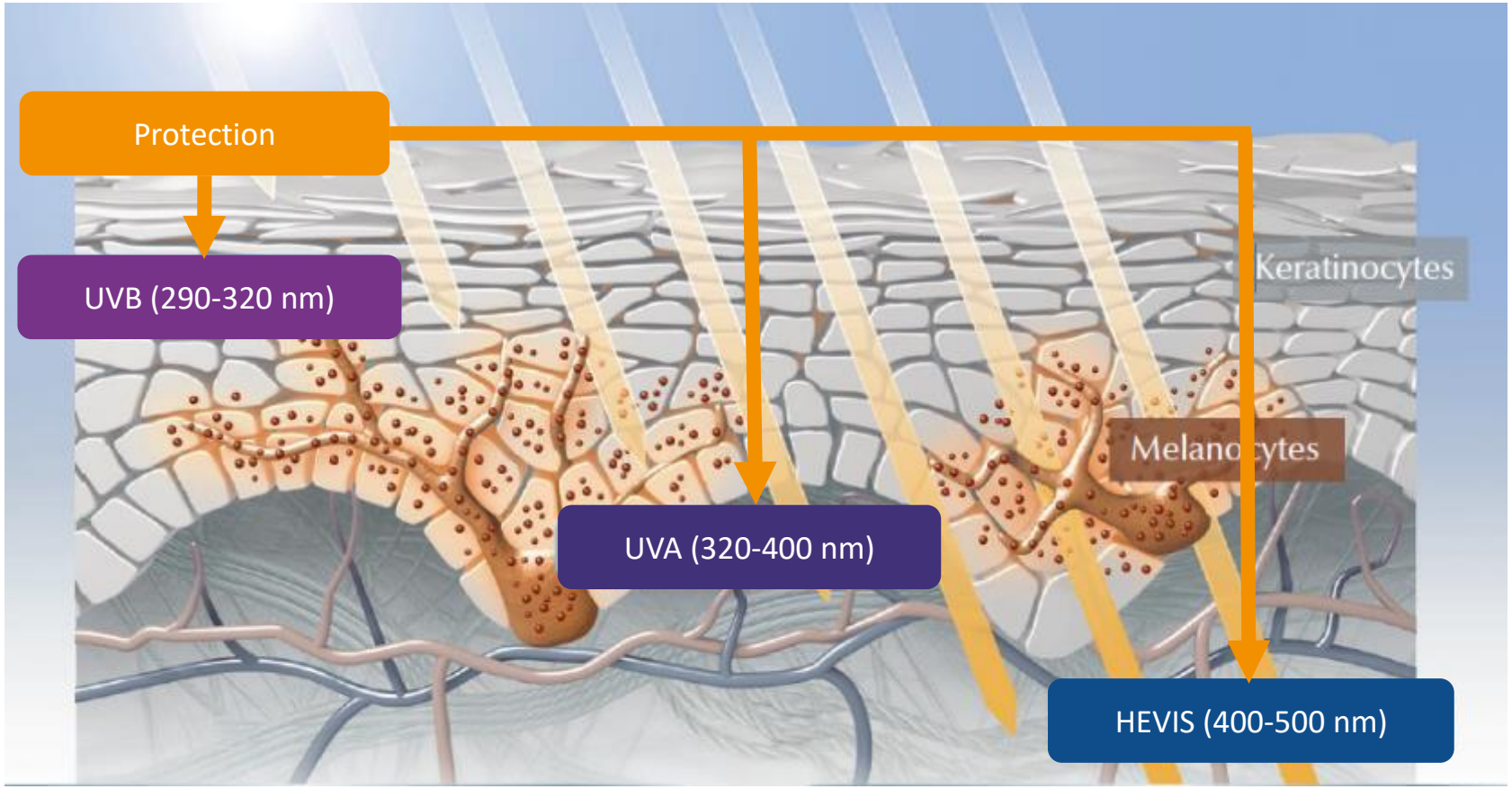
**25%** from sun exposure is derived from Blue(HEVIS) light[2,3]

[2] Albrecht S et al., Skin type differences in solar-simulated radiation-induced oxidative stress. Br J Dermatol. 2019 Mar;180(3):597-603 |
[3] Zastrow L et al., Themissing link-light-induced (280-1,600 nm) free radical formation in human skin. Skin Pharmacol Physiol. 2009;22(1):31-44

Ideal sunscreen

# UV and HEVIS light protection is essential

- Broad UV spectrum 290-400nm (UVB, UVA) and HEVIS(400-500 nm)
- **Biological Cell Protection (High Potent Anti-Oxidant)**
- Environmentally responsible

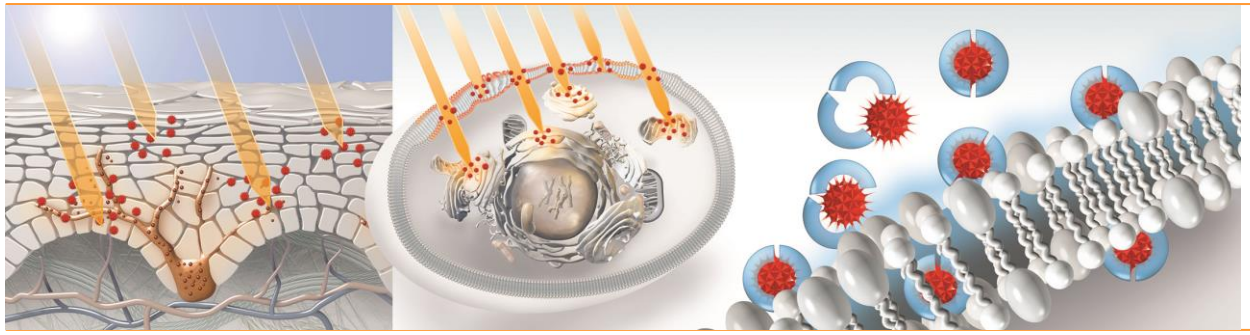


# BLUE (HEVIS) Light

## PROTECT & REPAIR

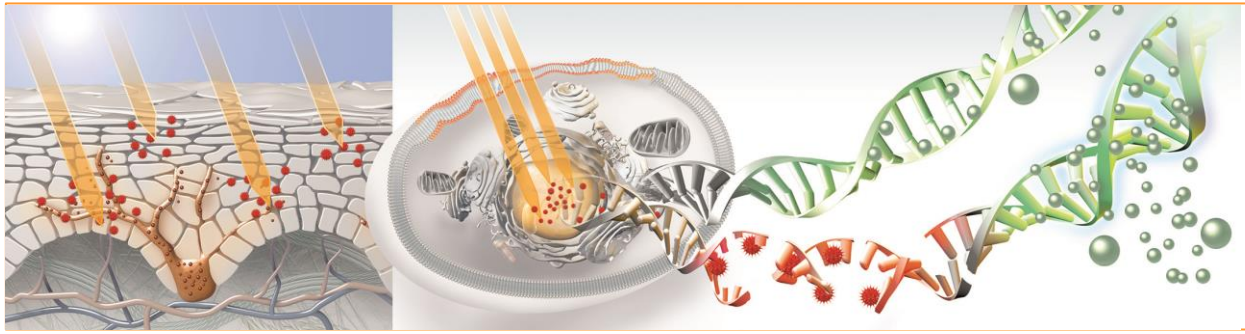
# Synergistic effects of Antioxidants

## PROTECT Licochalcone A



**Protection** from sun-induced **oxidative stress** from UV & HEVIS

## REPAIR Glycyrrhetinic acid (GA)

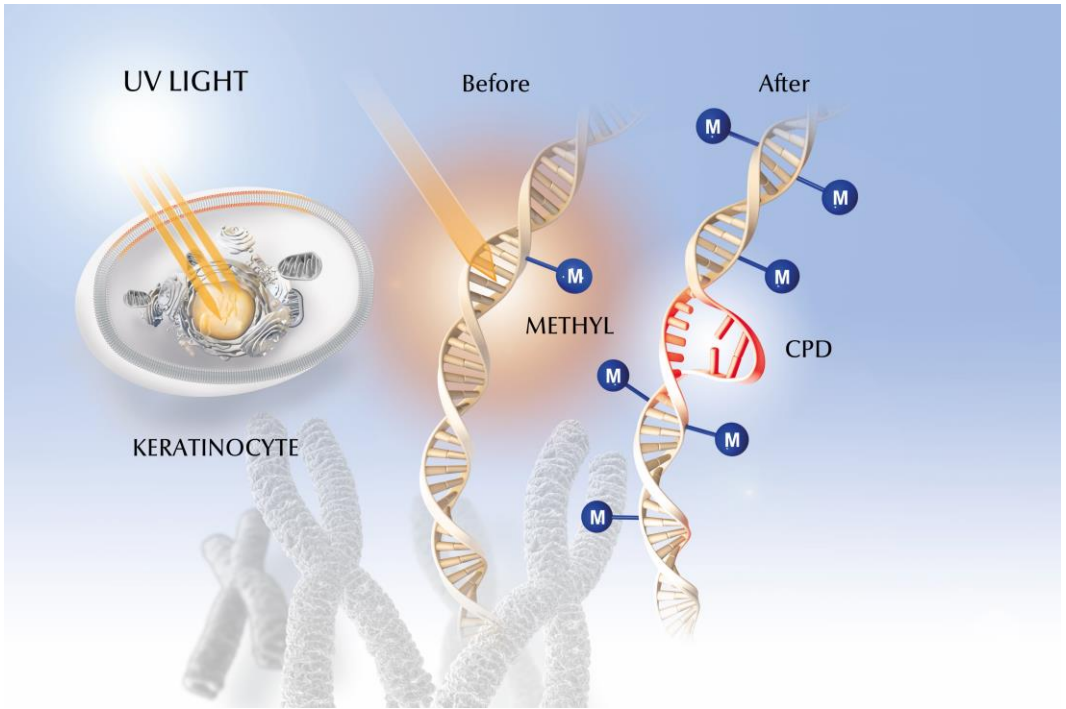


**38% REPAIR** DNA damage induced by UV

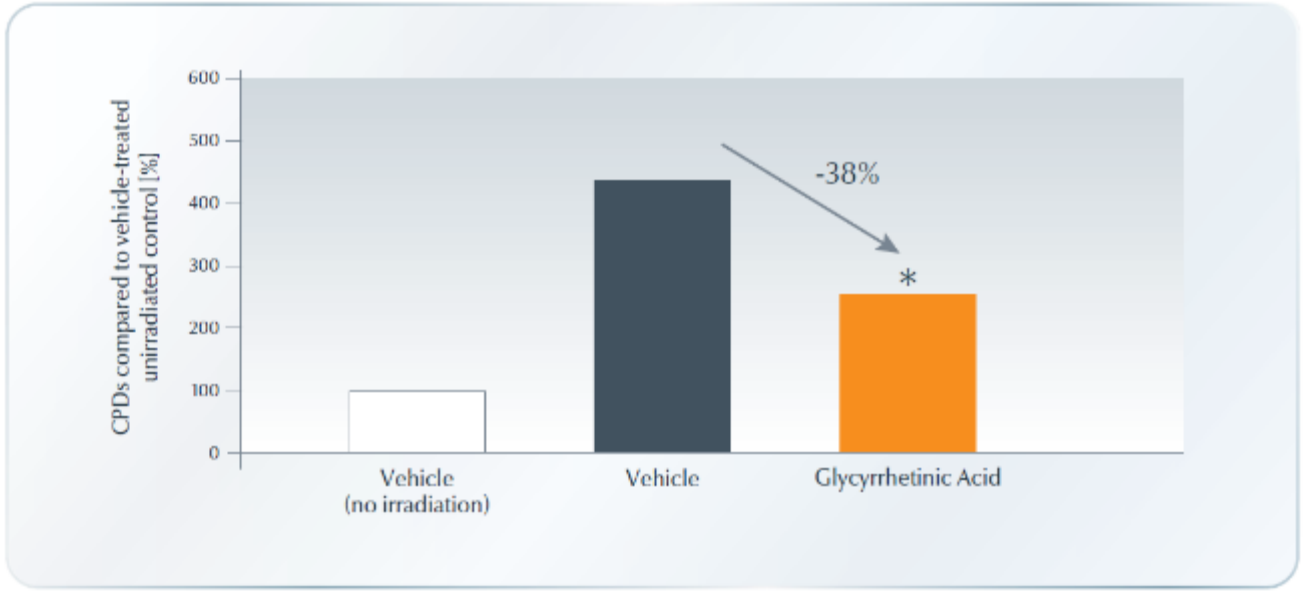
REPAIR Glycyrrhetinic acid (GA)

# Supports skin's own DNA repair mechanism

## Glycyrrhetinic Acid reduces 38% UV-dependent formation of CPD[1]



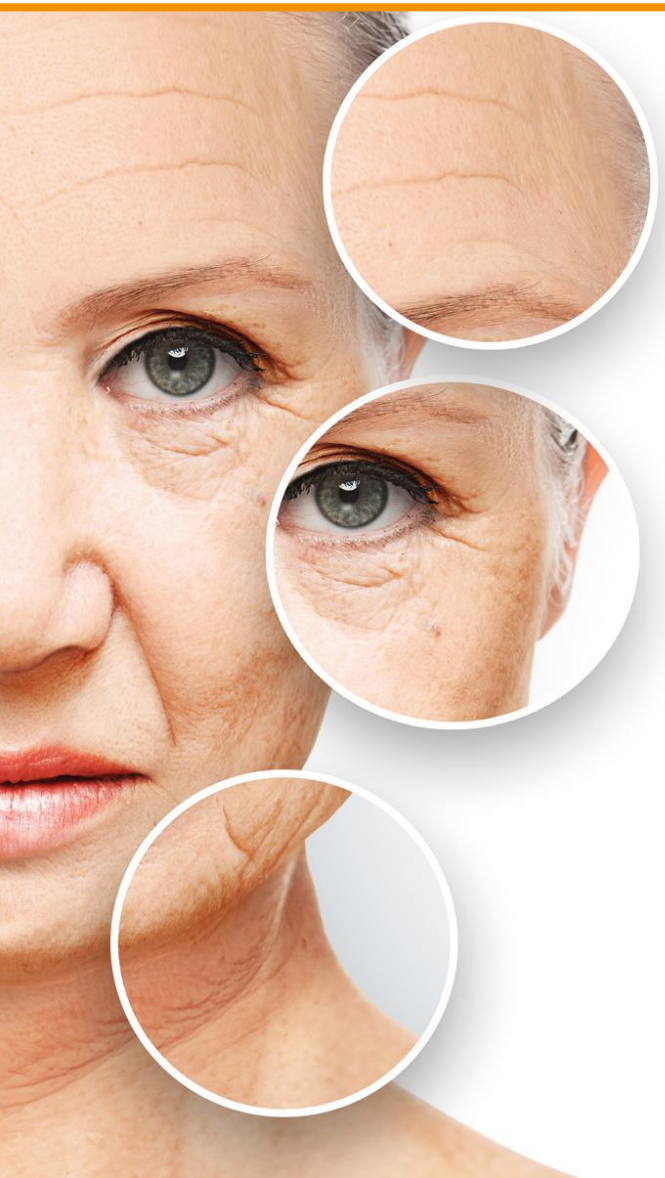

Reduces UV-dependent formation of Cyclobutane Pyrimidine Dimers (CPD) *in vivo*[2]



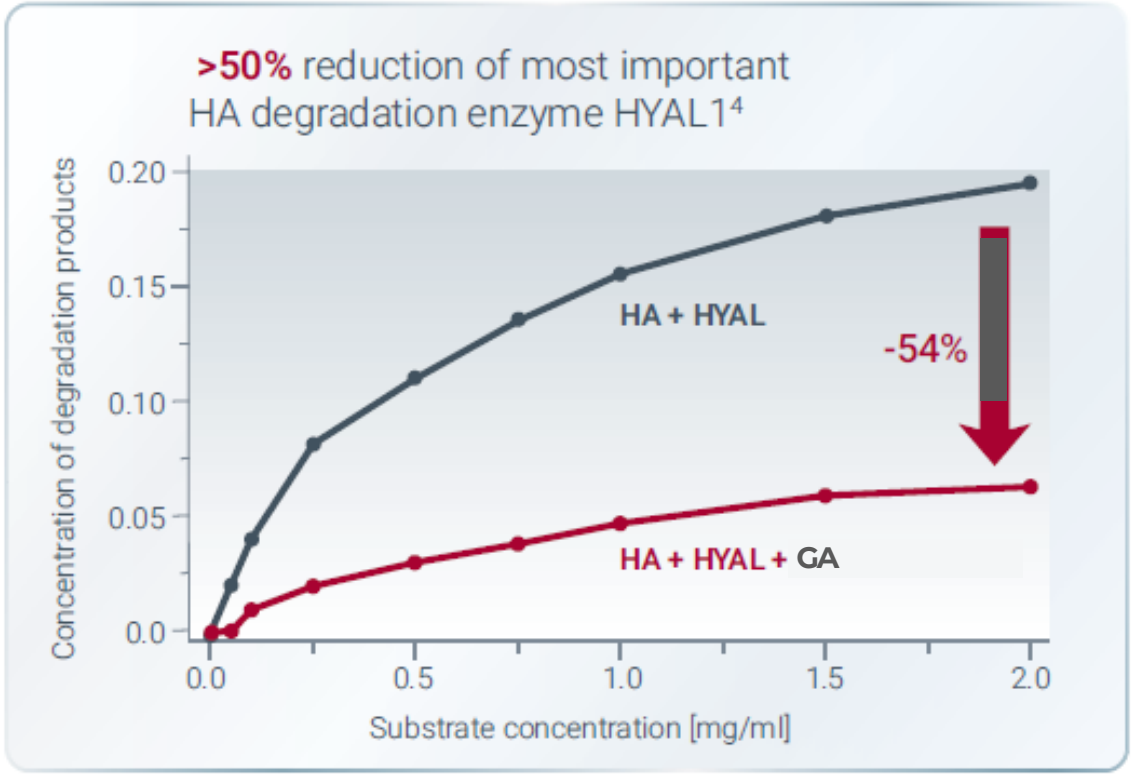

1 - Glycyrrhetinic acid significantly enhances the repair of UV-induced cyclobutane-pyrimidine-dimers in human skin; poster EADV 2011. Study design: Formulation with Glyccyrhetitinic acid (0.1%) and vehicle control were applied twice daily on the back of 14 volunteers. After 18 applications, Glycyrrhetinic acid and vehicle-treated areas were irradiated with 0.75 MED of simulated solar light. 18 hours after UV irradiation, epidermis was taken off by suction blister approach and analyzed for CPDs by FACS analysis.

REPAIR Glycyrrhetinic acid (GA)

# >50% Inhibition of Hyaluronidase



## Glycyrrhetinic acid (GA) inhibits >50% of Hyaluronidase




**Design:** determination of the test sample´s efficacy in a cell-free in vitro-assay; comparison of the active ingredient vs. solvent control

**Test Sample:** active ingredient Glycyrrhetinic acid (GA)

**Treatment:** 24 h incubation of low molecular weight hyaluronic acid with hyaluronidase 1 and GA (N=6)

Eucerin®

# Beyond UV Protection

Make every day an extra care for acne and hyperpigmentation

## Sun Dry Touch DP60

# Suitable for Acne patients


## 12 HR* Sebum Control

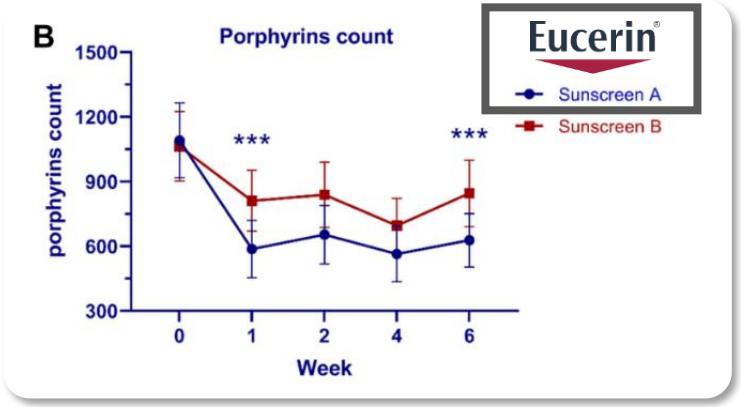
### L-Carnitine

**OIL CONTROL AND ANTI-SHINE TECHNOLOGY:**
Sebum-regulating L-Carnitine^ and mattifying pigments^^


*Product in use testing in 174 volunteers aged 25 – 45, during Jun – Jul 2021 by OPINION Market Research & Consulting GmbH, Germany
^Peirano et al. Topically applied L-carnitine effectively reduced sebum secretion in human skin. Journal of Cosmetics Dermatology, 2012, 11, 30-36 ^^Silicon resin, starch and amorphous silica

## Reduce Porphyrin Count and Prevent PIH in split-face trial after Picosecond Laser[1]

the porphyrin of the side with **Sun Dry Touch DP60 (Sunscreen A)** was significantly less compared to the side with control sunscreen (Sunscreen B)





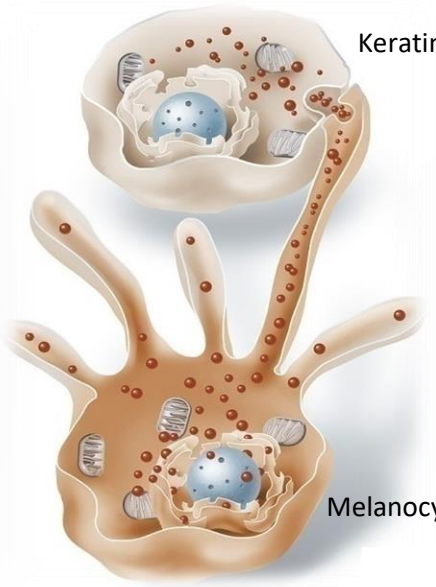
Only 1 patient develop PIH in both side of the face, **Sun Dry Touch DP60** treated side showed less intensity of PIH

**(A)** Baseline,
**(B)** 1-week 1, **(C)** 2-week,
**(D)** 4-week, and
**(E)** 6-week follow-up visit.

**1** - Puaratanaarunkon T, Asawanonda P. A Randomized, Double Blinded, Split-Face Study of the Efficacy of Using a Broad Spectrum Sunscreen with Anti-Inflammatory Agent to Reduce Post Inflammatory Hyperpigmentation After Picosecond Laser. Clin Cosmet Investig Dermatol. 2022 Feb 27;15:331-337. doi: 10.2147/CCID.S355329. PMID: 35250287; PMCID: PMC8894080.

Sun Spotless Brightening

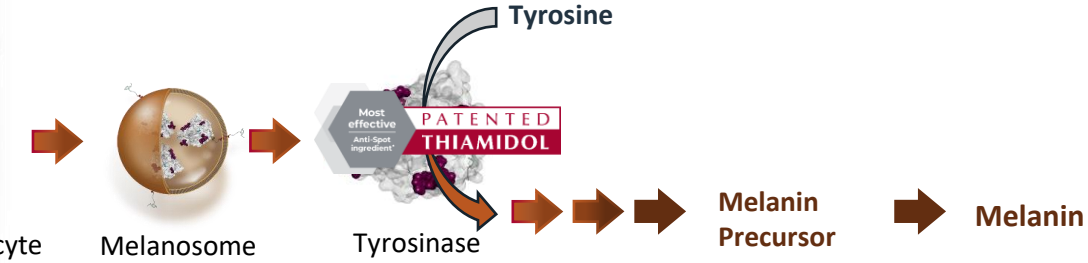
# Extra care for hyperpigmentation with Thiamidol


**Tyrosinase Inhibitor:** Inhibit Melanin Formation

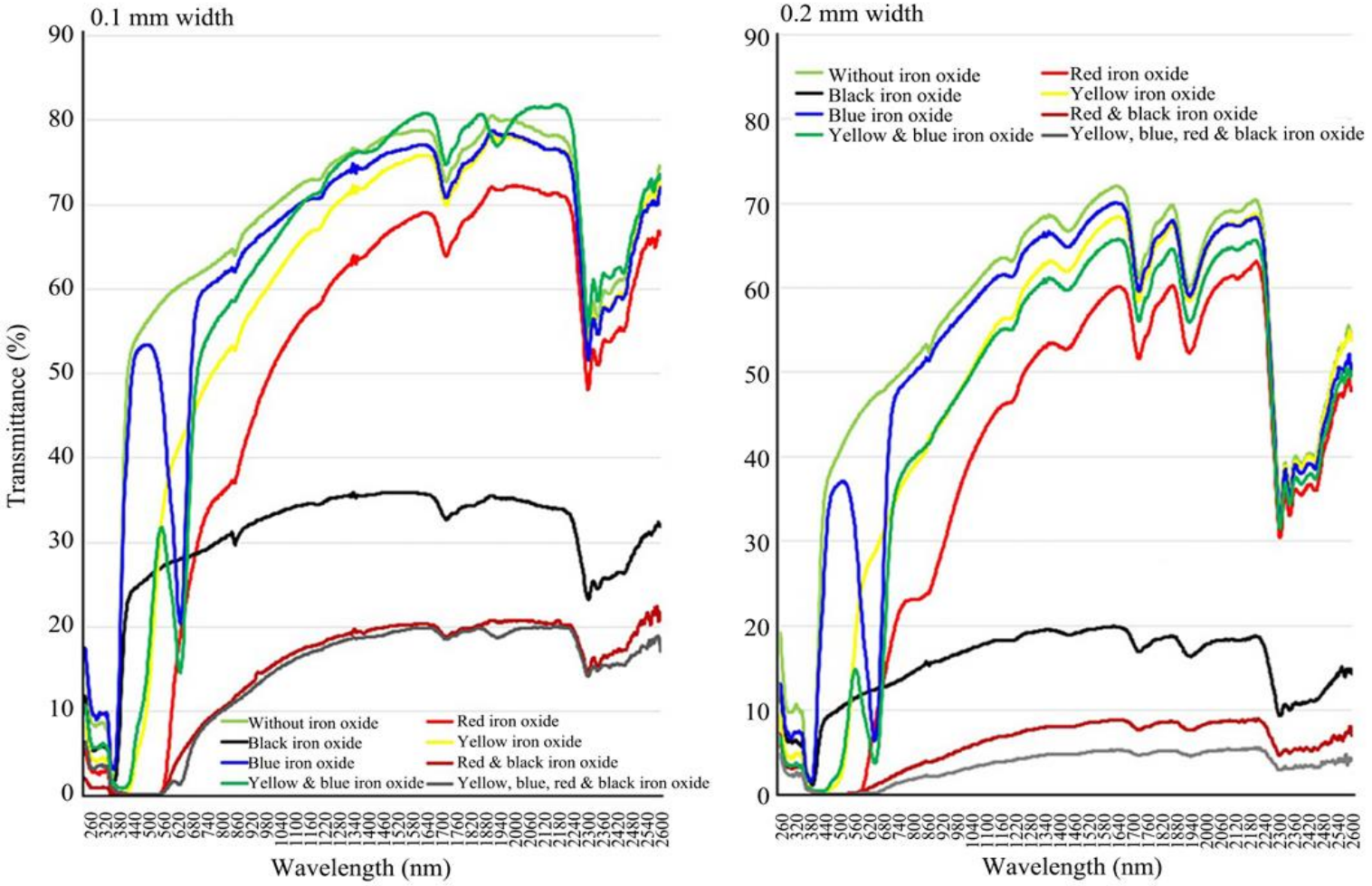
## The Most Important Step

- Specific
- Safe
- Most effective*



Tinted Sunscreen

# Extra protection for HEVIS Light

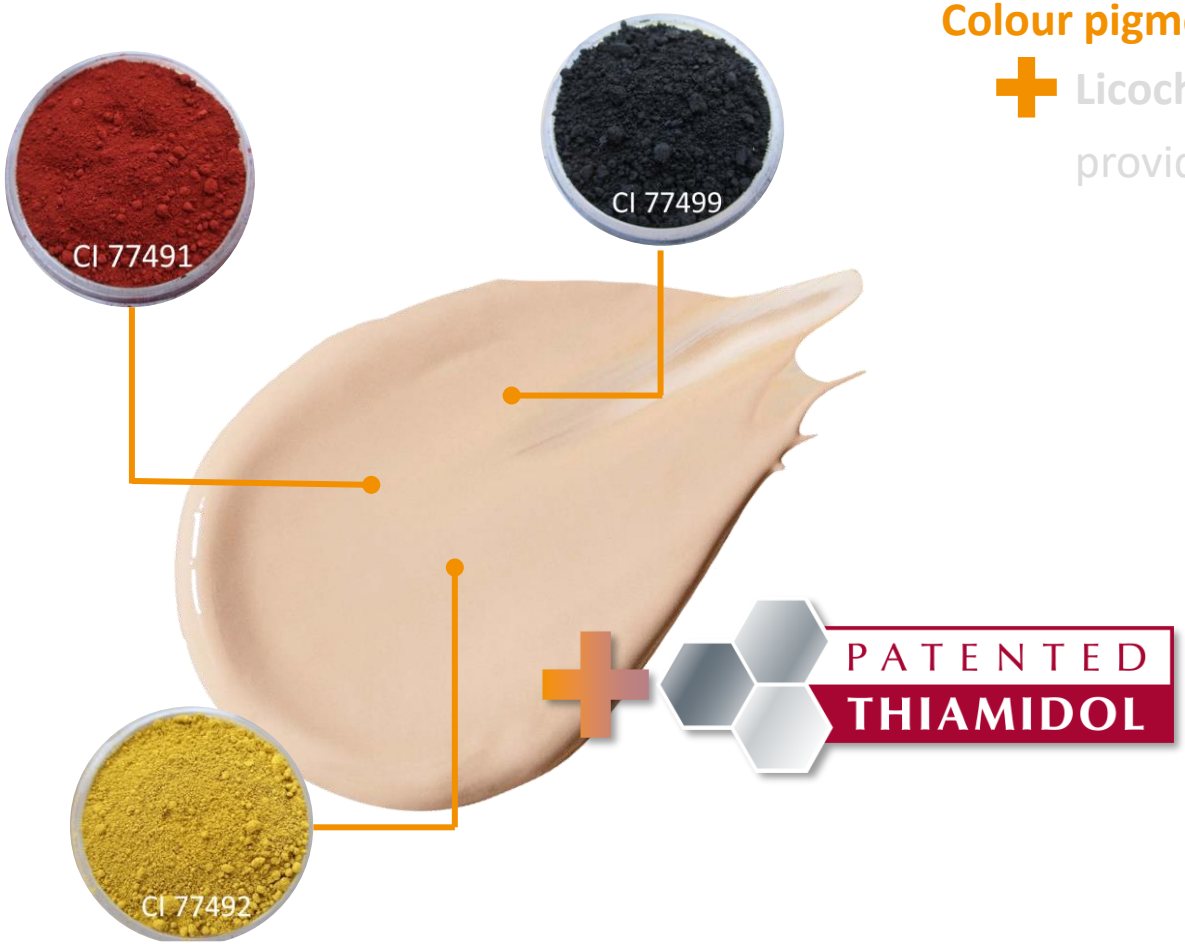




Tanaka Y, et al Optics and Photonics Journal. 2023 Sep 5;13(8):199-208.

Extra care for Hyperpigmentation

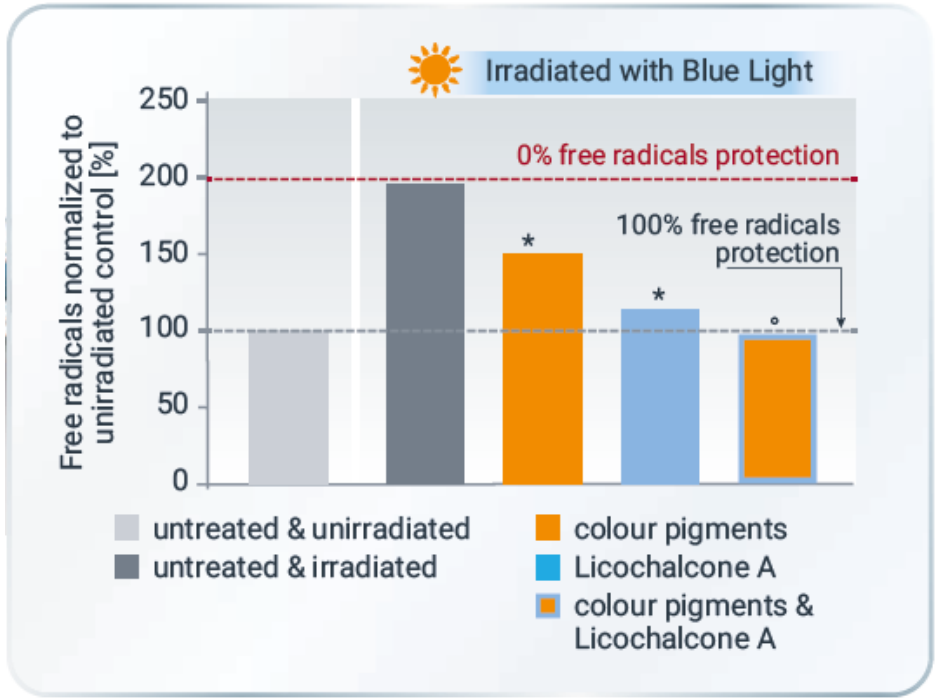
# Extra Protection from colour pigments




**Colour pigments** block **BLUE Light**

**Licochalcone A** scavenges free radicals,

providing **100% ROS protection**[1]

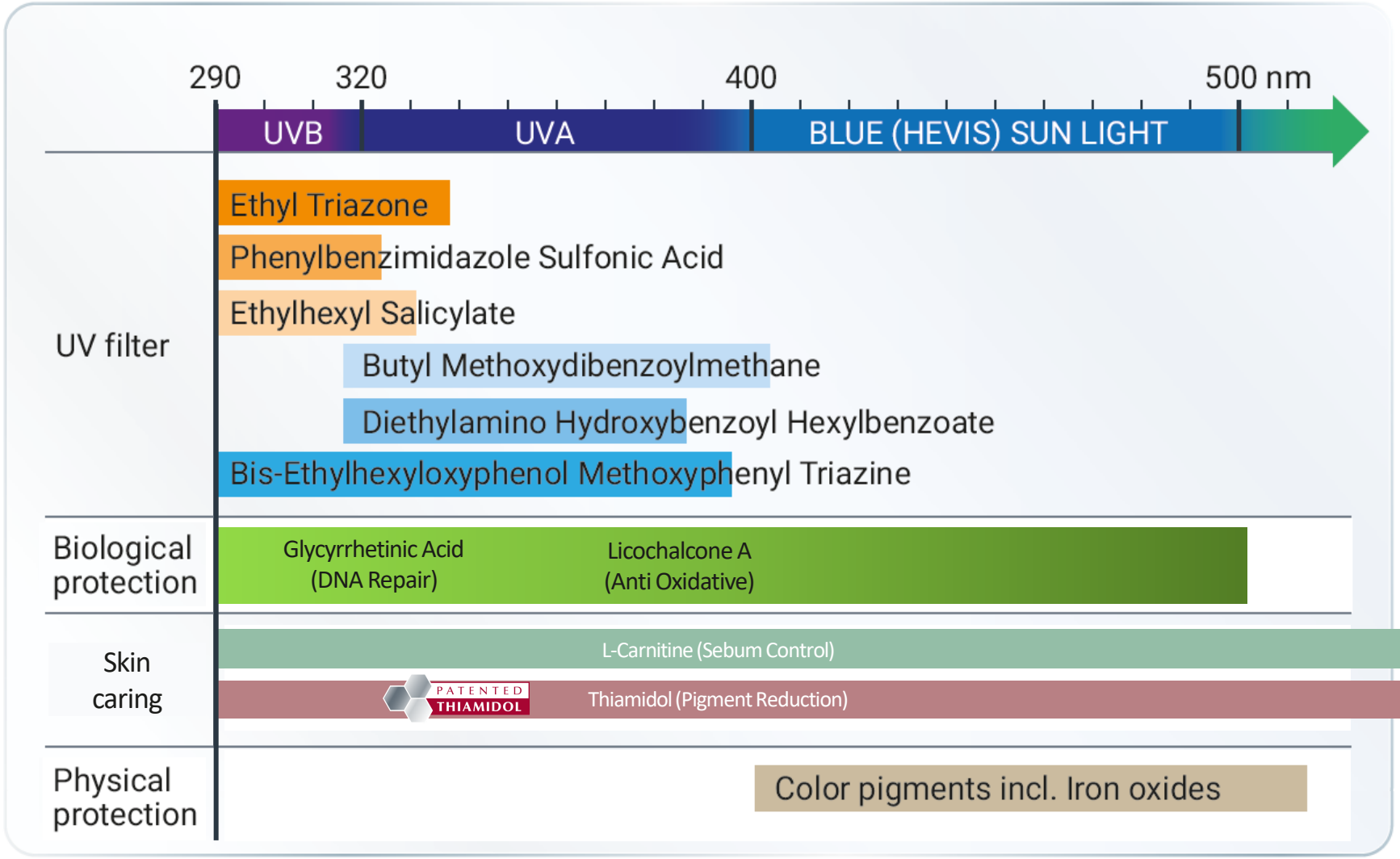




1 - Human dermal fibroblasts were left untreated or pre-treated with 2 µM LicA or solvent control (*in vitro*). Oil Control tinted was applied on a plate between the cell culture and irradiation source. Cells were irradiated with 150 J/cm² HEVIS (400–500nm), and oxidative stress was assessed via DCF assay. *significant improvement compared to untreated; ºSignificant imprvement compared to Licochalcone A/Oil Control irradiated.

Eucerin Sun Protection

# High standard Sunlight Filters




Eucerin®

# Ultra Protection and Repair

## Highest Sun Protection*

**Chemical and Physical UV Filter**

Very High UVB/UVA protection

**Licochalcone A & Glycyrrhetinic Acid**

Protect & Repair sun damage


*From Eucerin

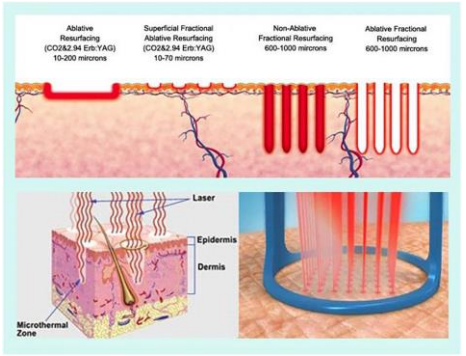
# Who needs more protection?

## Photodermatoses

are a group of skin disorders caused by exposure to sunlight

## Chronic Sun Exposed

: Outdoor Athletes, Prolonged sun exposure activities e.g. Diving, Beach activities.




## Aesthetic adjunctive

: for those who seek best protection for themselves and those who undergo aesthetic procedure to prevent undesired outcomes

# Who needs more protection?

## Photodermatoses

are a group of skin disorders caused by exposure to sunlight

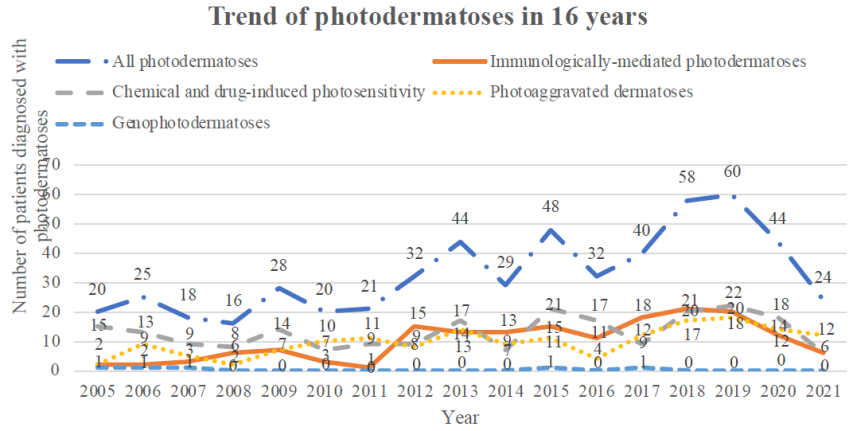
In Thailand, a retrospective study from Siriraj Hospital during Jan'05 – Sep'21, there were 189,806 dermatology OPD visit cases, 561 cases **(0.3% prevalence)** were diagnosed as photodermatoses[1]

**16.8%** Were reported as Drug-induced photosensitivity

e.g. Retinoids, Simvastatin, fenofibrate and thiazides[1] HIV-positive individuals[2]

**15.5%** Were reported as Phytophotodermatitis

Overall trend of photodermatoses showed a **steady increase**




> Protection of **photosensitive** patients by sunscreen products play an important role with equally effective against **UVA and UVB** and **high SPF**[3]

1 - Likittanasombat, Surachanee, et al. "Prevalence and Trend of Photodermatoses in Thailand: A 16-year Retrospective Study at Siriraj Hospital." *Siriraj Medical Journal* 75.2 (2023): 106-114.
2 - Sharma, Vinod Kumar, Kanika Sahni, and Ashok Roopchand Wadhwani. "Photodermatoses in pigmented skin." *Photochemical & Photobiological Sciences* 12 (2012): 65-77.
3 - Schaefer, Hans, Dominique Moyal, and Anny Fourtanier. "State of the art sunscreens for prevention of photodermatoses." *Journal of Dermatological Science* 23 (2000): S62-S74.

# Who needs more protection?

## Chronic Sun Exposed

: Outdoor Athletes, Prolonged sun exposure activities e.g. Diving, Beach activities.

With a cloudless sky, in midsummer, at around midday, a MED is roughly reached in about 20 min, so that a day at the beach can produce more than a **20x MED of exposure and sunburn**[1]

> **SPF50 up to SPF100** was recommended for snow sports and water sports[2]

1 - Lehmann, Percy. "Photodermatoses." *Braun-Falco´s Dermatology* (2020): 1-28.
2 - Gracia-Cazaña, Tamara, et al. "New trends on personalized sunscreens." *Photodermatology, photoimmunology & photomedicine* 40.3 (2024): e12967.

# Eucerin Ultra 100

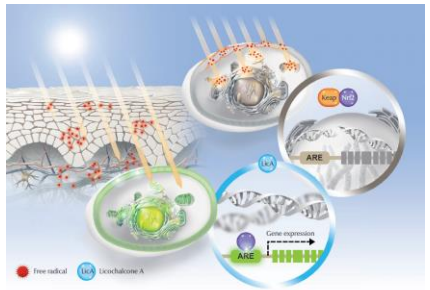
## Ultra protection and Ultra Repair

Eucerin®

## ULTRA PROTECTION

### SPF 112 / UVAPF34

**PROTECT** Licochalcone A




**BLUE** (HEVIS) sunlight protection

Protection from sun-induced **oxidative stress** from UV & HEVIS


### UVB

- EthylhexylTriazone
- Ethylhexyl Salicylate
- Phenylbenzimidazole Sulfonic Acid

### Broad Spectrum

- Bis-Ethylhexyloxyphenol Methoxyphenyl Triazine

### UVA

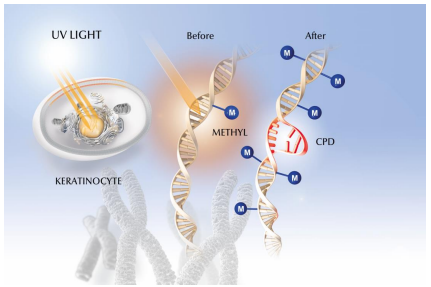
- Butyl Methoxydibenzoylmethane
- Diethylamino Hydroxybenzoyl Hexyl Benzoate

### Mineral Filter

- Titanium Dioxide (Micronized)

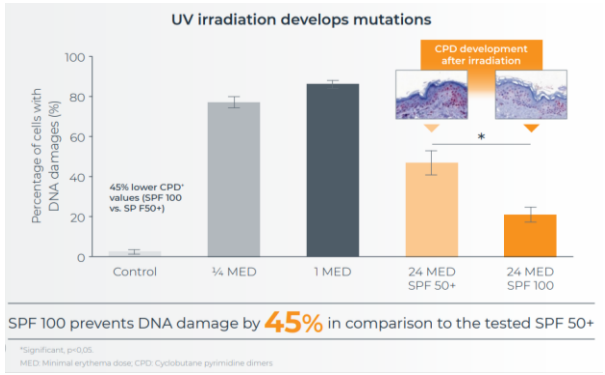
## ULTRA REPAIR

**REPAIR** Glycyrrhetinic acid (GA)



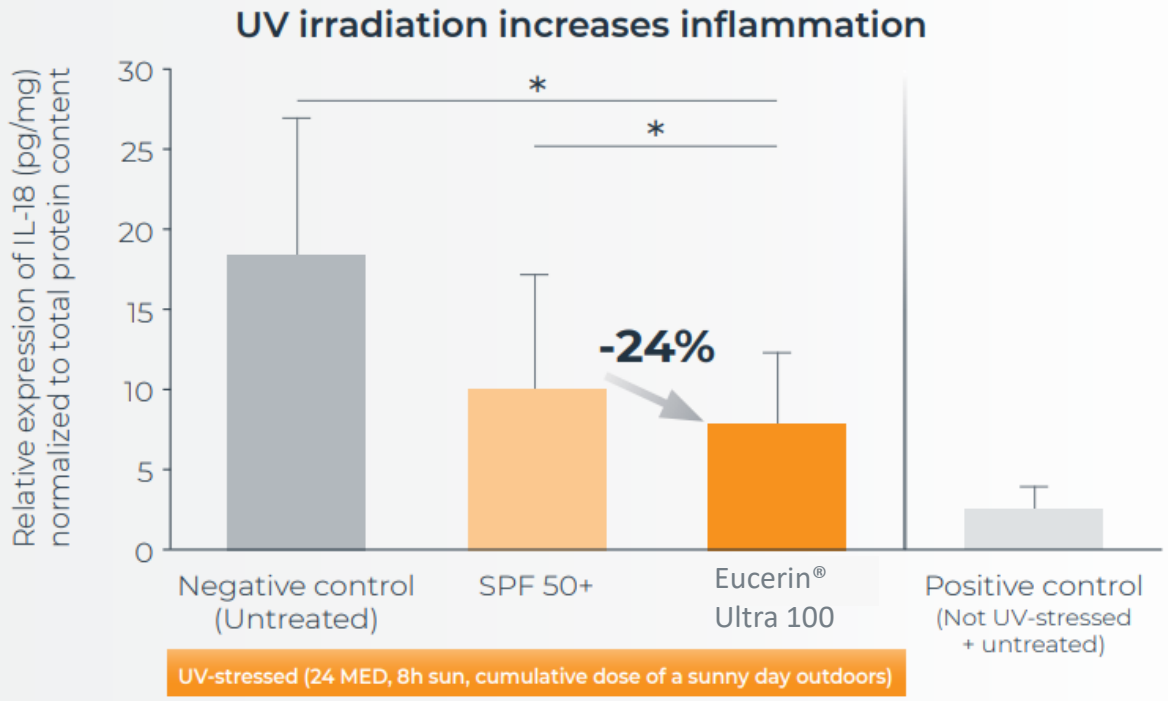

- Reduce **CPD** Forming
- >50% Inhibition of **Hyaluronidase**

**45% More preventive** of DNA Damage



# Why SPF50+ is not enough

## MANAGE INFLAMMATION




## STUDY DESIGN

### Objective:

An in-vitro experiment was performed to demonstrate the superiority of an Ultra 100 compared to an SPF 50+. IL-18 is expressed by keratinocytes after UV irradiation.

### Method:

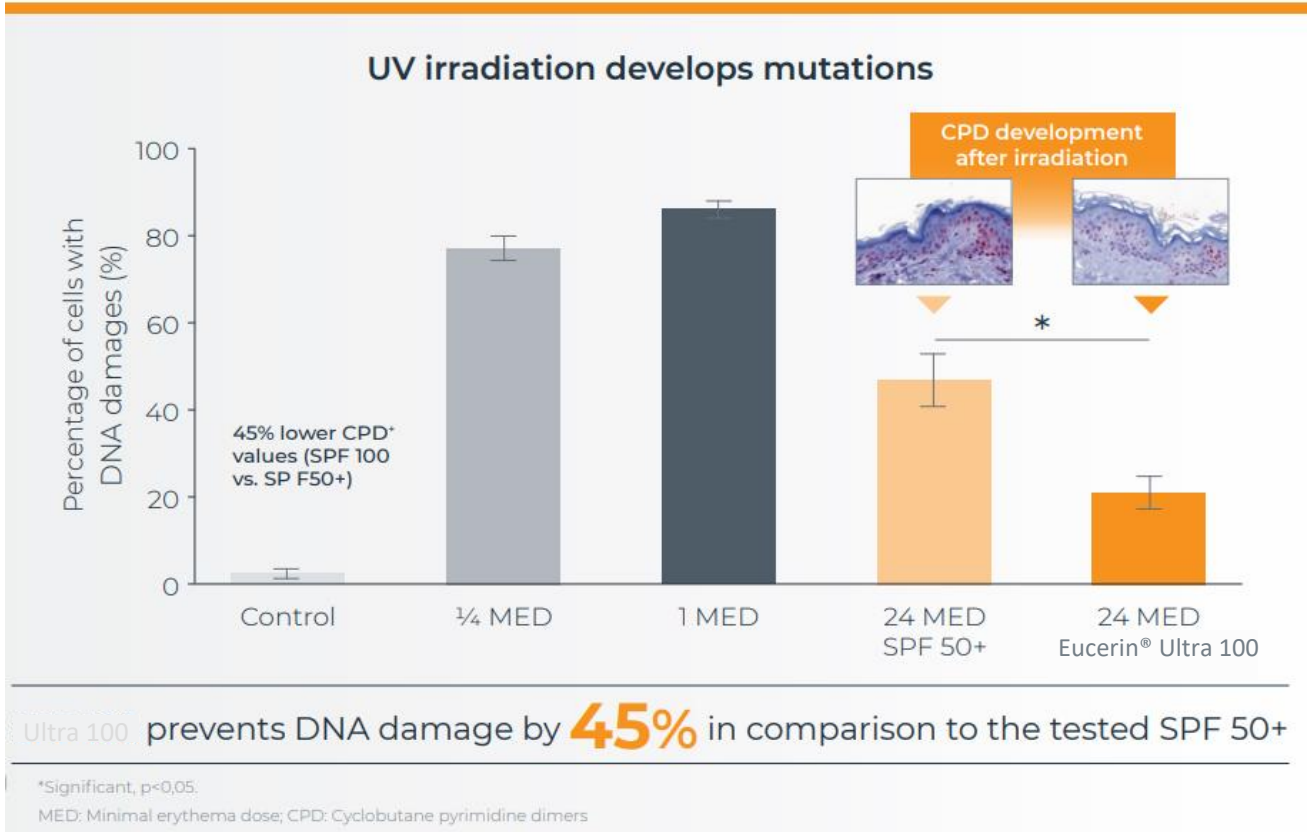
Human primary keratinocytes were UV stressed with a maximal daily dose of 24 MED (8h sun, cumulative dose of a sunny day outdoors) after which cells were incubated for additional 24h before cell supernatant and cells were used for IL-18 analysis. IL-18 levels were normalized to total protein content. Before irradiation with UV light, the cultured keratinocytes were covered with a sunscreen-product-coated plate compared to a glycerin-coated control plate and an unirradiated control covered with aluminum foil.

### Assessment:

In-vitro experiment with human keratinocytes. Detection of IL-18 within cell supernatants.

Eucerin®

# IMPROVE GENOMIC INSTABILITY




Ultra 100 prevents DNA damage by **45%** in comparison to the tested SPF 50+

*Significant, p<0,05.

MED: Minimal erythema dose; CPD: Cyclobutane pyrimidine dimers

## STUDY DESIGN

### Objective:

The *ex-vivo* experiment was performed to demonstrate the superiority of an Ultra 100 compared to an SPF 50+. Comparison of DNA damages after irradiation.[1]

### Method:

To assess DNA damage on the skin, a UVB lamp also containing a small UVA fraction was applied to induce 0.25, 1 and 24 Minimal Erythema Dose (MED) (8h sun, cumulative dose of a sunny day outdoors) in excised human skin.

The following examinations were performed per excised piece of skin: non-irradiated, 0.25 MED (7.5 mJ/cm²), 1 MED (30 mJ/cm²), 24 MED (720 mJ/cm²). The analyzed skin pieces irradiated with the 24 MED dose were covered with sun protection formulations (SPF 50+ and SPF 100). The cream was applied according to DIN ISO 24444: 2 mg/cm².

To evaluate the protective effect of the different sun protection formulations on the skin, DNA damage was detected immunohistochemically via expression of cyclobutane pyrimidine dimers (CPD+) on 1-2 µm paraffin sections. The histological evaluation of the stained skin section was done by a published AI-algorithm[2] (AI: area), which enables the inclusion of the whole skin section into evaluation. To classify the DNA damage, the ratio of negative (healthy) and positive (unhealthy) stained cells was calculated. In addition, the results were also confirmed by classical evaluation and a further published AI-algorithm (AI: nuclei).

1. van Bodegraven et. al. Redefine photoprotection: Sun protection beyond sunburn. Experimental Dermatology, 2024.
2. Wagner et al. Semantic modeling of cell damage prediction: a machine learning approach at human-level performance in dermatology. Sci Rep, 2023.

# Eucerin Sun Ultra 100

## Highest Sun protection from Eucerin

### Sun Ultra 100 Provide more protection vs SPF 50+

- **24% Less inflammation**
- Prevent more DNA damage with **45% less CPD formation**

### Sun Ultra 100 suitable for

- Photodermatoses
- Chronic sun exposed
- Aesthetic Adjunctive


# SPF 112 / UVAPF34

# Product in Use Testing results*

Protects me from **SUNBURN 100%**

**99% NO STINGING** or burning around the eyes

Does not feel **HEAVY** on the skin **98%**

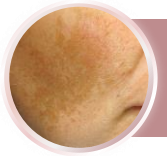
**97% GREASY** Does not feel on the skin


*Product in Use (PIU) testing of Eucerin® Sun Ultra 100 in 100 participants aged 25 - 55 years old (50% female, 50% male) in Thailand for 2 weeks

# Eucerin Sun protection assortment

## By indication and skin types

Skin types



**Melasma/ Hyperpigmentation**

**Acne/ Oily prone skin**

**Severe Melasma/ Hyperpigmentation**

**Photosensitive**

After Procedure

## After Laser Care
### Energy-Based Devices


Sun Brightening

Sun Brightening CC


Sun Dry Touch DP60


Sun Ultra 100

# Eucerin Sun protection assortment

By filters and protection

| | Sun Dry Touch DP60 | Sun Brightening | Sun Brightening CC | Sun Ultra 100 |
|---|---|---|---|---|
| |  |  |  |  |
| Skin types | Acne/Oily prone skin | Melasma/Hyperpigmentation | | Severe Melasma/ Hyperpigmentation<br>Photosensitive |
| After Procedure | After Laser Care | | | After Laser Care |
| UVB Filters | Ethylhexyl Triazone (Uvinul T®) | | | |
| | Phenylbenzimidazole Sulfonic Acid (Ensulizole) | | | |
| | | | Ethylhexyl Salicylate (Octisalate) | |
| UVA Filters | Butyl Methoxydibenzoylmethane (Avobenzone) | | | |
| | Diethylamino Hydroxybenzoyl Hexyl Benzoate (Uvinul® A) | | | |
| Board Spectrum Filters | Bis-Ethylhexyloxyphenol Methoxyphenyl Triazine (Tinosorb® S) | | | |
| Physical Filters | | | Iron Oxide | Titanium Dioxide (Nano) |
| Actives | Licochalcone A and Glycyrrhetinic acid (GA) | | | |
| | L-CARNITINE | PATENTED THIAMIDOL | | |
| Sticker Prices | 1,450 THB | 1,400 THB | 1,500 THB | 1,650 THB |

Eucerin®

We believe in the life-changing power of dermatological skin care

# Thank you