

¿Cómo afecta el exposoma a nuestra piel?

Ana María Molina Ruiz. Fundación Jiménez Díaz.
Universidad Autónoma de Madrid.



EXPOSOMA



EXPLSOMA

*Concepto
Exposoma*





**"Suma total de los
múltiples factores de
exposición que
llenan la vida de una
persona"**

C. Wild, 2005

EXPO-SICIÓN





**LA
RED**





CONSTANTE CAMBIO

Qué es el exposoma humano: el "aura viviente" individual que nos rodea (y qué dice de nuestra salud)

Jorge Carrasco
BBC News Mundo

© 19 octubre 2018

[f](#) [m](#) [t](#) [✉](#) [Compartir](#)



GETTY IMAGES





#SOUL
FY





GENOMA + EXPOSOMA

"FIEBRE GENÓMICA"





The Human Genome Project

The Human Genome Project (HGP) was one of the great feats of exploration in history. Rather than an outward exploration of the planet or the cosmos, the HGP was an inward voyage of discovery led by an international team of researchers looking to sequence and map all of the genes -- together known as the genome -- of members of our species, *Homo sapiens*. Beginning on October 1, 1990 and completed in April 2003, the HGP gave us the ability, for the first time, to read nature's complete genetic blueprint for building a human being.

acacgggcgctgggtcgggttacggccaggacgcgaattattttt
tacgcgccggagaaaaccgcctcgcggtgatggtgctgcgt
aggatatgtggcggatgagcggcattttccgtgacgtctcgt
cgatttcccatgttgccactcgctttaatgatgatttcagccgc
taccctacgggtaacagtttctttatgg

HUMAN EXPOSOME PROJECT





The exposome represents
a concept that
incorporates the complex
exposures we face as
humans.

LEARN MORE



¿Innovación
o Marketing?

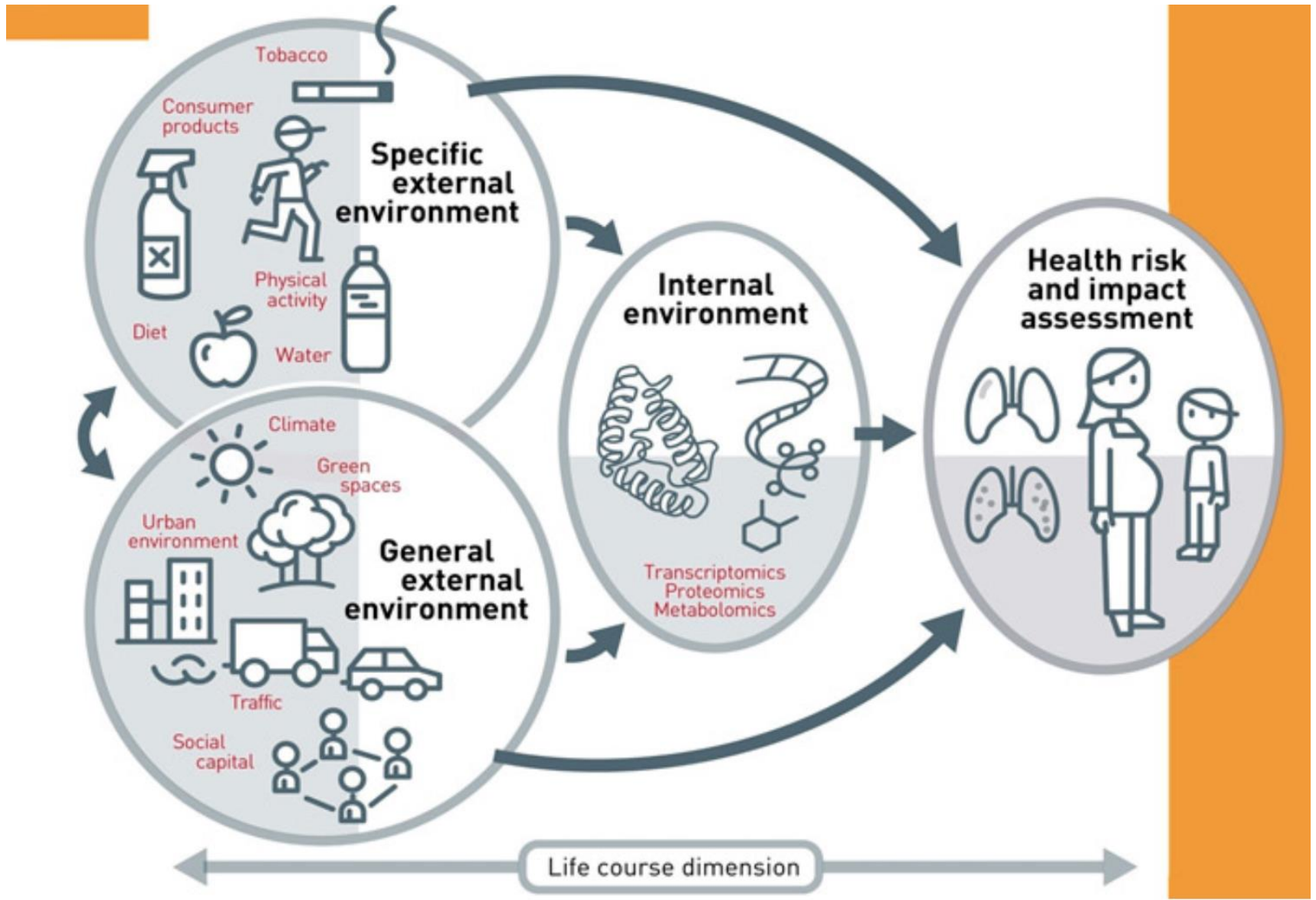
A portrait of Christopher Wild, a middle-aged man with short, graying hair, smiling. He is wearing a dark suit jacket, a light-colored striped shirt, and a red patterned tie. In the background, to the left, is the blue and white logo of the International Agency for Research on Cancer (IARC), which features a stylized caduceus. To the right, a wooden desk is partially visible.

*Christopher
Wild*

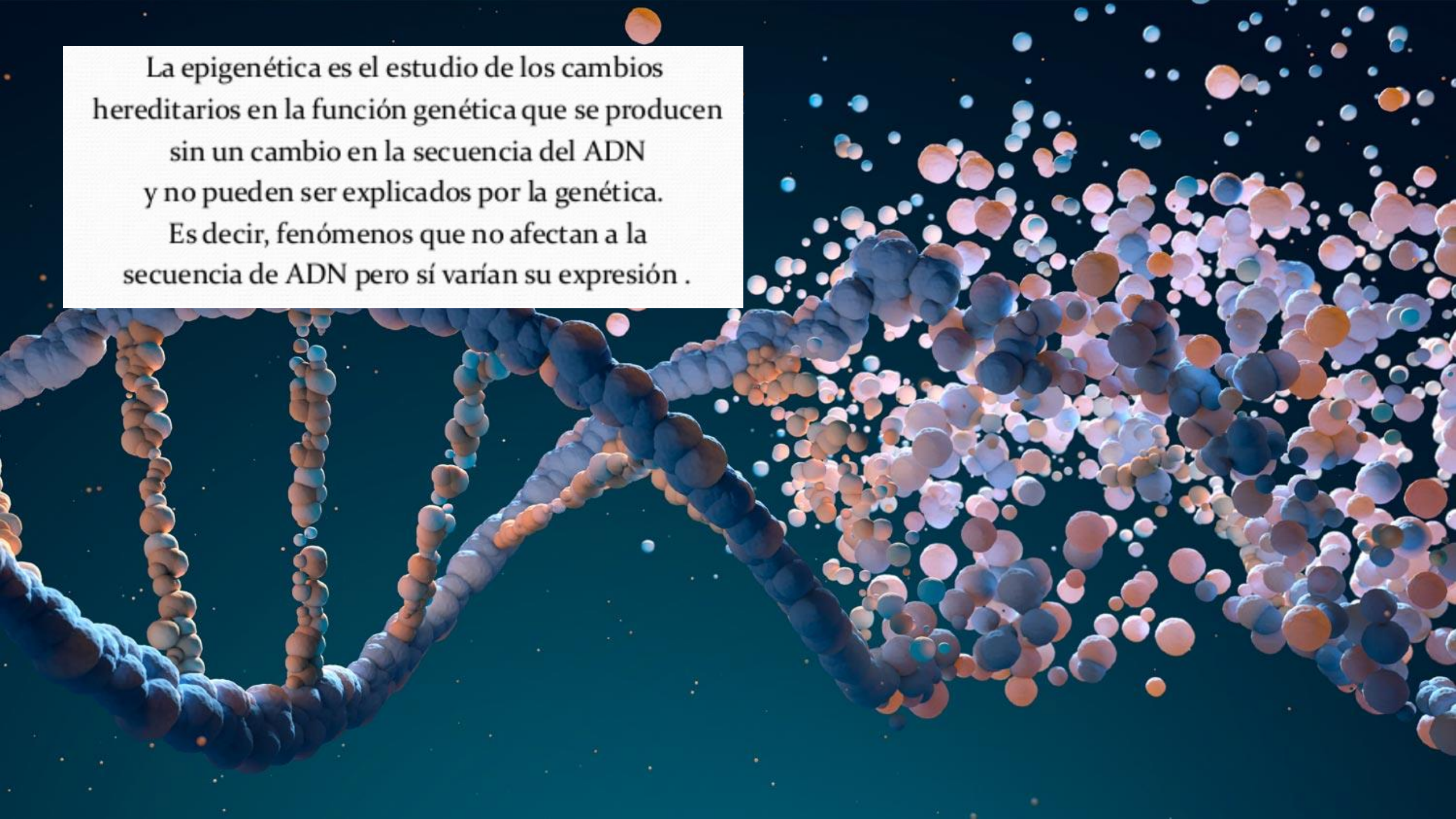
DIRECTOR DE LA AGENCIA
INTERNACIONAL PARA LA
INVESTIGACIÓN DEL CÁNCER
DE ESTADOS UNIDOS



**SALUD
PÚBLICA**



La epigenética es el estudio de los cambios hereditarios en la función genética que se producen sin un cambio en la secuencia del ADN y no pueden ser explicados por la genética. Es decir, fenómenos que no afectan a la secuencia de ADN pero sí varían su expresión .




"SOMOS LO QUE HABITAMOS"

PSICOGEOGRAFÍA

**"EL LUGAR EN EL QUE
VIVIMOS DETERMINA EL
RIESGO DE CÁNCER, DE
ENFERMEDADES
CARDIOVASCULARES,
METABÓLICAS –COMO LA
DIABETES Y LA
OBESIDAD"**

Martine Vrijheid





**"SE TRATA DE DESENMARÑAR
LA RED MÁS INTRINCADA A LA
QUE SE HAYA ENFRENTADO
LA HUMANIDAD. VISTO EN FRÍO,
EL EMPEÑO PARECE IMPOSIBLE:
EXPLICAR EL CAOS Y LA
ENTROPÍA QUE ENVUELVEN AL
SER HUMANO"**

C. Wild

Las carambolas exposómicas son casi infinitas

$$q_{X_{min}}(R) = \sum_{j=1}^{\ell(X_{min})} q_j \delta^3(R - R_j)$$



A person's hands are shown from the chest up, holding a glowing, translucent orb. The orb is filled with numerous small, circular icons of people's heads and shoulders, rendered in a sketchy, white line-art style. The background is dark and out of focus, showing the person's torso and a patterned shirt. The overall tone is hopeful and aspirational.

¿Lo conseguiremos?

BIG DATA



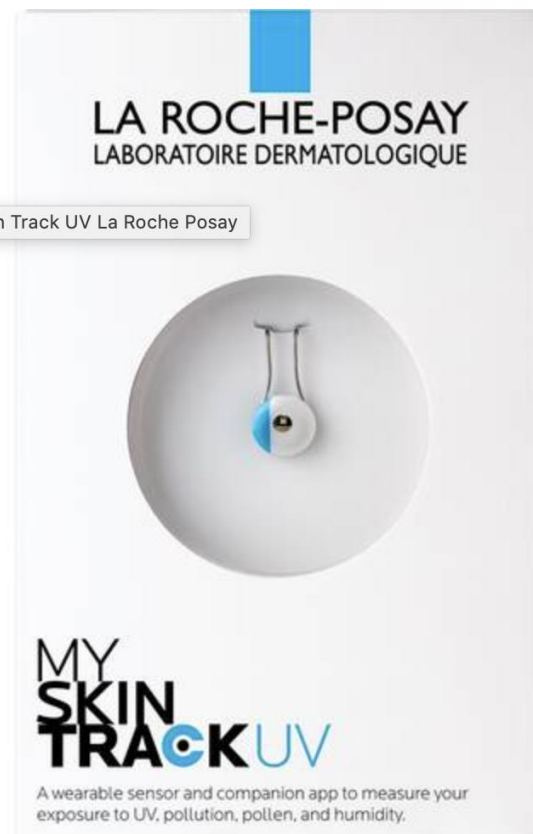
TRAILER VITAL







My Skin Track UV La Roche Posay



MY SKIN TRACK UV

Wearable Technology and Companion App

★★★★☆ 2.9 (13)

[Refer a Friend](#)

BETTER LOOKING SKIN STARTS WITH HEALTHY SKIN HABITS: My Skin Track UV and its companion app measures your exposure to environmental aggressors including UV, pollution, pollen and humidity and provides personalized advice and product recommendations to help improve your healthy skin habits.

[LEARN MORE](#)

\$59.95

1 Piece

01 ▼

Add to Cart

Share



Google Street View car pureed at Spanish tomato-throwing festival



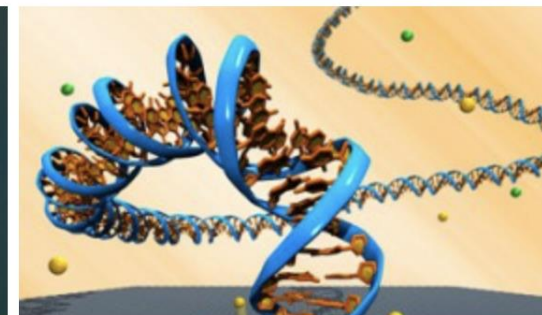


Welcome Letter

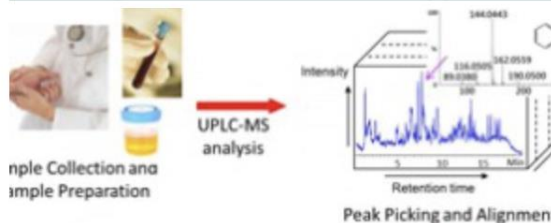
HEALS represents a comprehensive applied methodology focusing on the different aspects of individual assessment of exposure to conventional and emerging environmental stressors and on the prediction of the associated health outcomes. For the first time, HEALS will try to reverse the paradigm of “nature versus nurture” and adopt one defined by complex and dynamic interactions between [...]



News



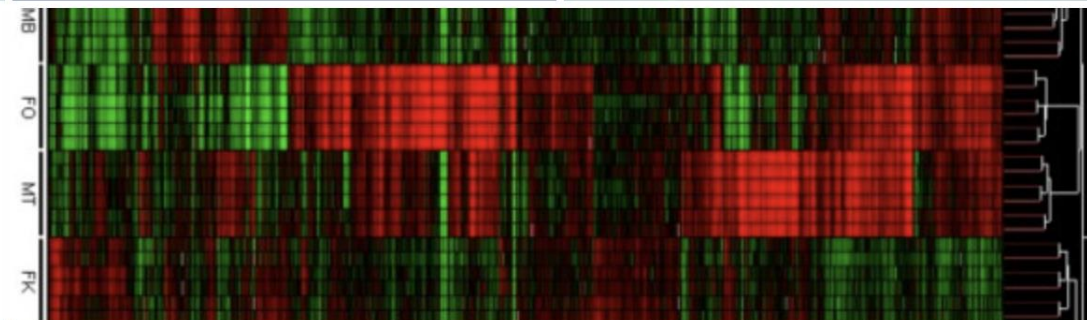
Deliverables



Publications



Participants List



Focus Areas



HEALS is a Project, funded by the [7th Framework Programme](#) of the European Commission

ASSESSING INDIVIDUAL EXPOSURE TO ENVIRONMENTAL STRESSORS AND PREDICTING HEALTH OUTCOMES - PAVING THE WAY FOR AN EU-WIDE ASSESSMENT



FOCUS

Early-life and pregnancy

Multiple exposures and child health

Development of innovative, integrative tools & methods

Strengthening knowledge base for European Policy



A close-up photograph of a woman's face. A large, dark, irregular shadow is cast across her eyes and nose, resembling a handprint or a large shadow from an object. The shadow is dark brown or black, contrasting with her fair skin. She has light-colored eyes and is looking directly at the camera. The background is plain white.

EXPOSOMA Y PIEL

Article types

Clinical Trial

Review

Customize ...

Text availability

Abstract

Free full text

Full text

Publication
dates

5 years

10 years

Custom range...

Species

Humans

Other Animals

[Clear all](#)

[Show additional filters](#)

Format: Summary ▾ Sort by: Best Match ▾ Per page: 20 ▾

Send to ▾ Filters: [Manage Filters](#)

Search results

Items: 19

☐ [The skin aging exposome.](#)

1. Krutmann J, Boulloc A, Sore G, Bernard BA, Passeron T.
J Dermatol Sci. 2017 Mar;85(3):152-161. doi: 10.1016/j.jdermsci.2016.09.015. Epub 2016 Sep 28.
Review.

PMID: 27720464 **Free Article**

[Similar articles](#)

☐ [External exposome and allergic respiratory and skin diseases.](#)

2. Cecchi L, D'Amato G, Annesi-Maesano I.
J Allergy Clin Immunol. 2018 Mar;141(3):846-857. doi: 10.1016/j.jaci.2018.01.016. Review.

PMID: 29519451

[Similar articles](#)

☐ [The influence of exposome on acne.](#)

3. Dréno B, Bettoli V, Araviiskaia E, Sanchez Viera M, Boulloc A.
J Eur Acad Dermatol Venereol. 2018 May;32(5):812-819. doi: 10.1111/jdv.14820. Epub 2018 Feb 15.
Review.

PMID: 29377341 **Free PMC Article**

[Similar articles](#)

Sort by:

Best match

[Most recent](#)

Find related data

Database:

Find items

Best match search information

MeSH Terms: skin

[See more...](#)

Recent Activity



Review article

The skin aging exposome

Jean Krutmann, M.D.^{a,*}, Anne Boulloc, M.D., Ph.D.^b, Gabrielle Sore, Ph.D.^c,
Bruno A. Bernard, Ph.D.^d, Thierry Passeron, M.D., Ph.D.^{e,f}

^a IUF – Leibniz Research Institute for Environmental Medicine, Düsseldorf, Germany

^b Vichy Laboratoires Asnières, France

^c L'Oréal Research and Innovation, Chevilly Larue, France

^d L'Oréal Research and Innovation, Clichy, France

^e Department of Dermatology, University Hospital Center of Nice, France

^f INSERM U1065, team 12, C3M, Nice, France



ARTICLE INFO

Article history:

Received 25 August 2016

Received in revised form 19 September 2016

Accepted 26 September 2016

Keywords:

Ultraviolet radiation

Visible light

Infrared radiation

Air pollution

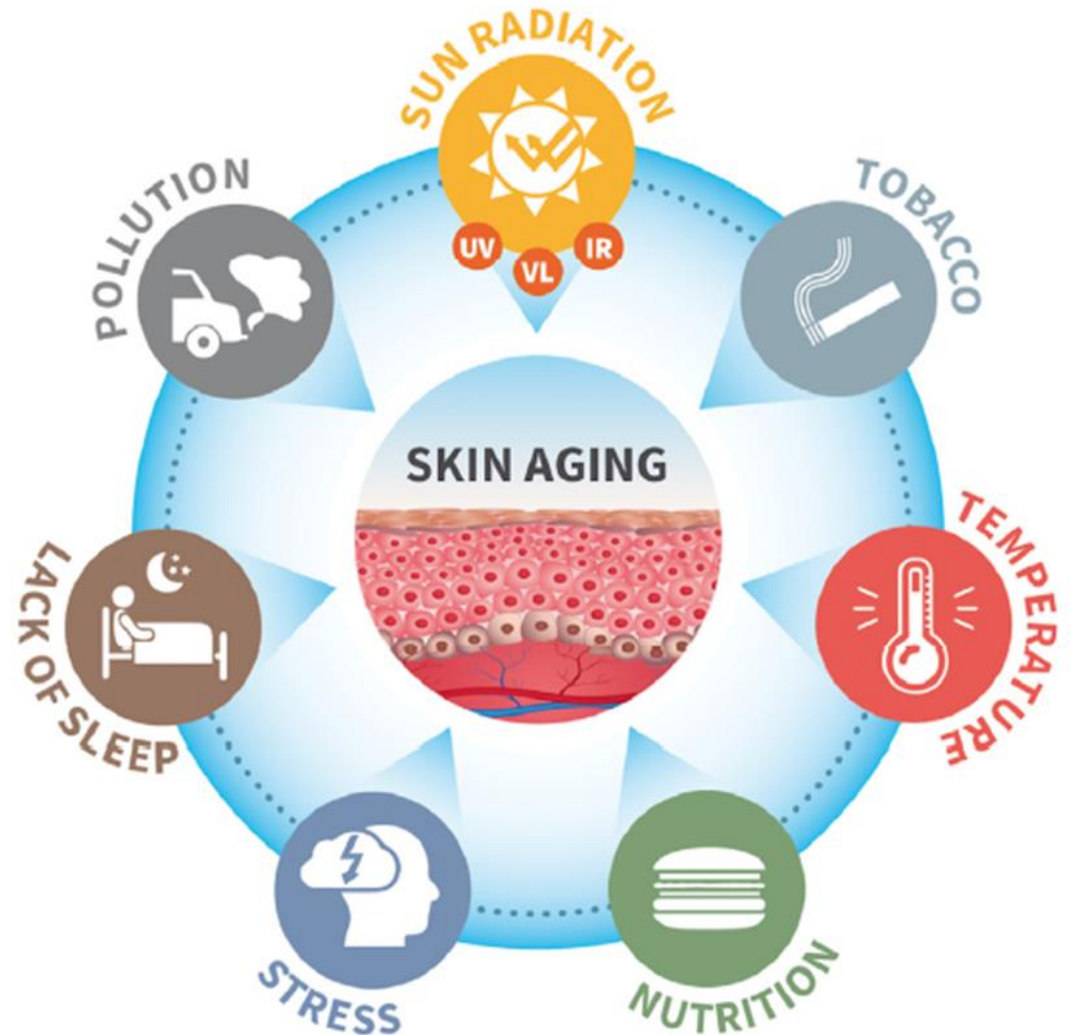
Nutrition

Cosmetic strategies

ABSTRACT

The term "exposome" describes the totality of exposures to which an individual is subjected from conception to death. It includes both external and internal factors as well as the human body's response to these factors. Current exposome research aims to understand the effects all factors have on specific organs, yet today, the exposome of human skin has not received major attention and a corresponding definition is lacking. This review was compiled with the collaboration of European scientists, specialized in either environmental medicine or skin biology. A comprehensive review of the existing literature was performed using PubMed. The search was restricted to exposome factors and skin aging. Key review papers and all relevant, epidemiological, *in vitro*, *ex vivo* and clinical studies were analyzed to determine the key elements of the exposome influencing skin aging. Here we propose a definition of the skin aging exposome. It is based on a summary of the existing scientific evidence for the role of exposome factors in skin aging. We also identify future research needs which concern knowledge about the interaction of distinct exposomal factors with each other and the resulting net effects on skin aging and suggest some protective measures.

© 2016 The Authors. Published by Elsevier Ireland Ltd on behalf of Japanese Society for Investigative Dermatology. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).





VICHY
LABORATOIRES

¿SABES CÓMO LA
POLUCIÓN AFECTA
TU PIEL?

Radiación Solar



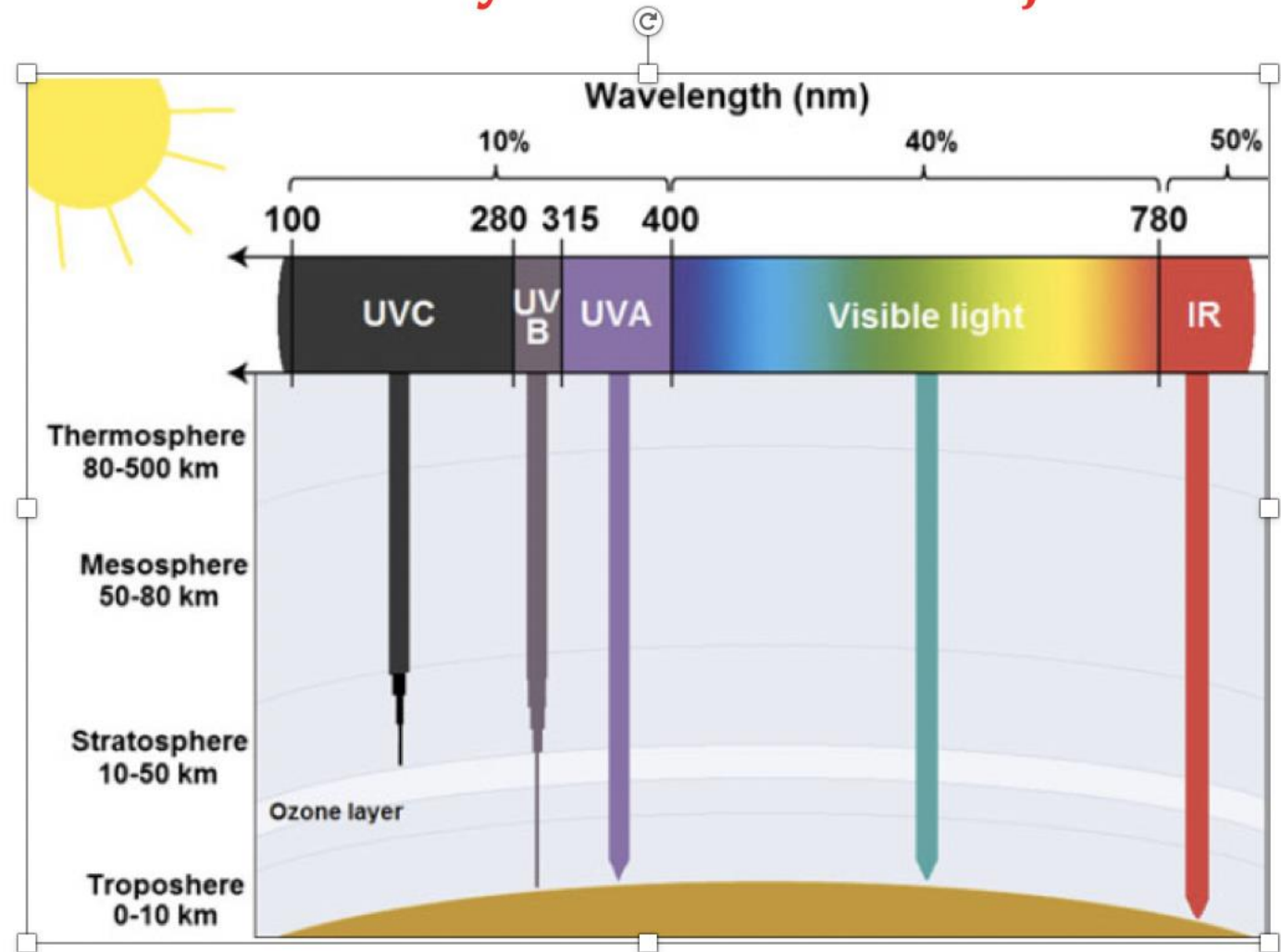
- Sol → luz visible, radiación ultravioleta y radiación infrarroja.

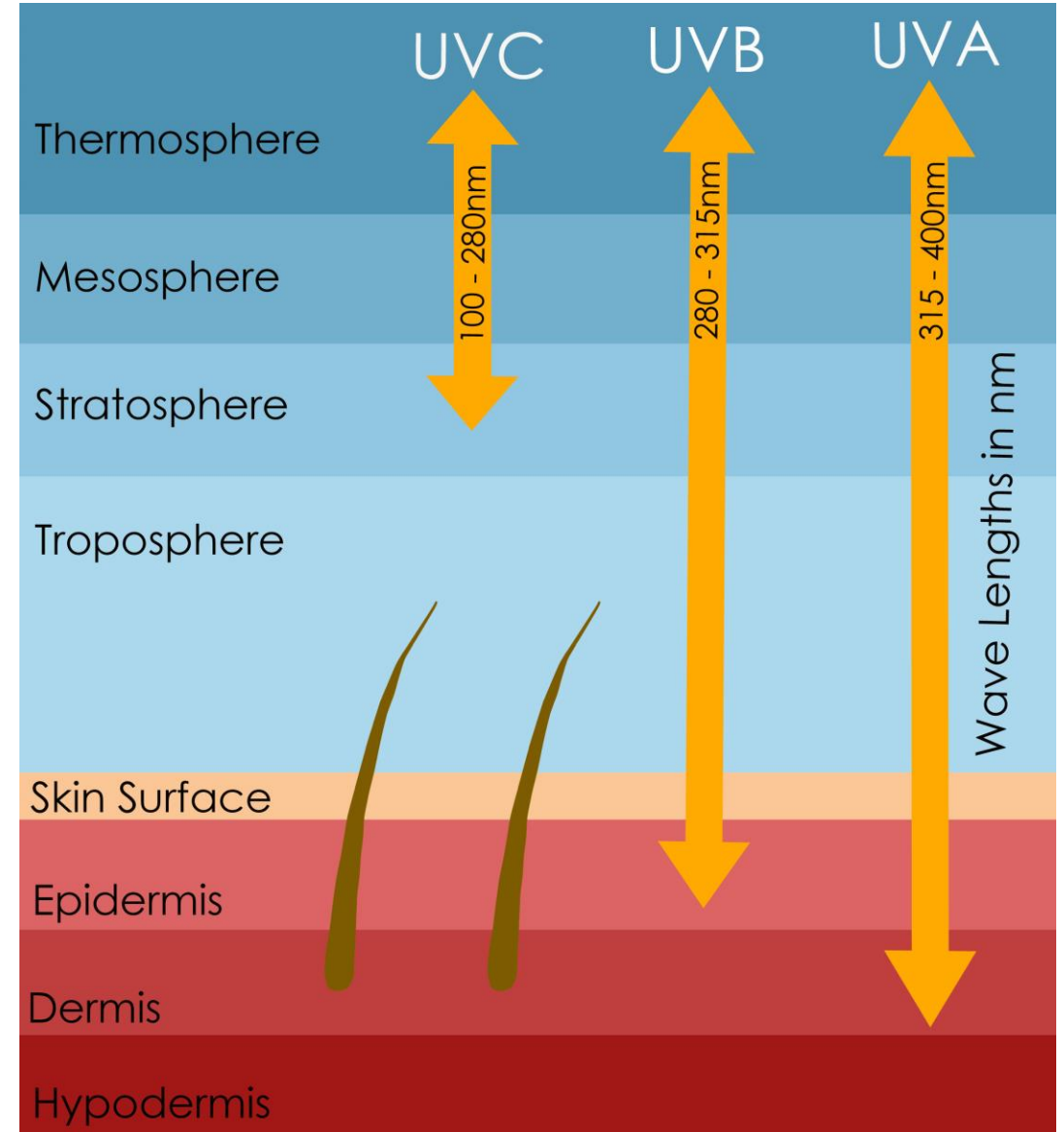
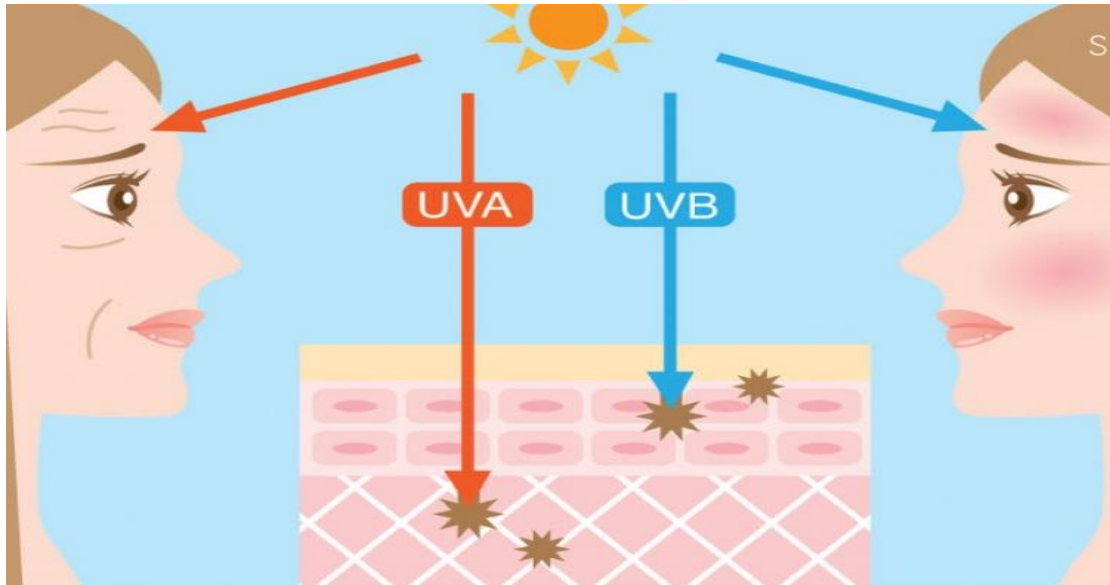
- Radiación UV:

- UVA (320- 400 nm).
- UVB (280-320 nm).
- UVC (200- 280 nm).

- Radiación IR:

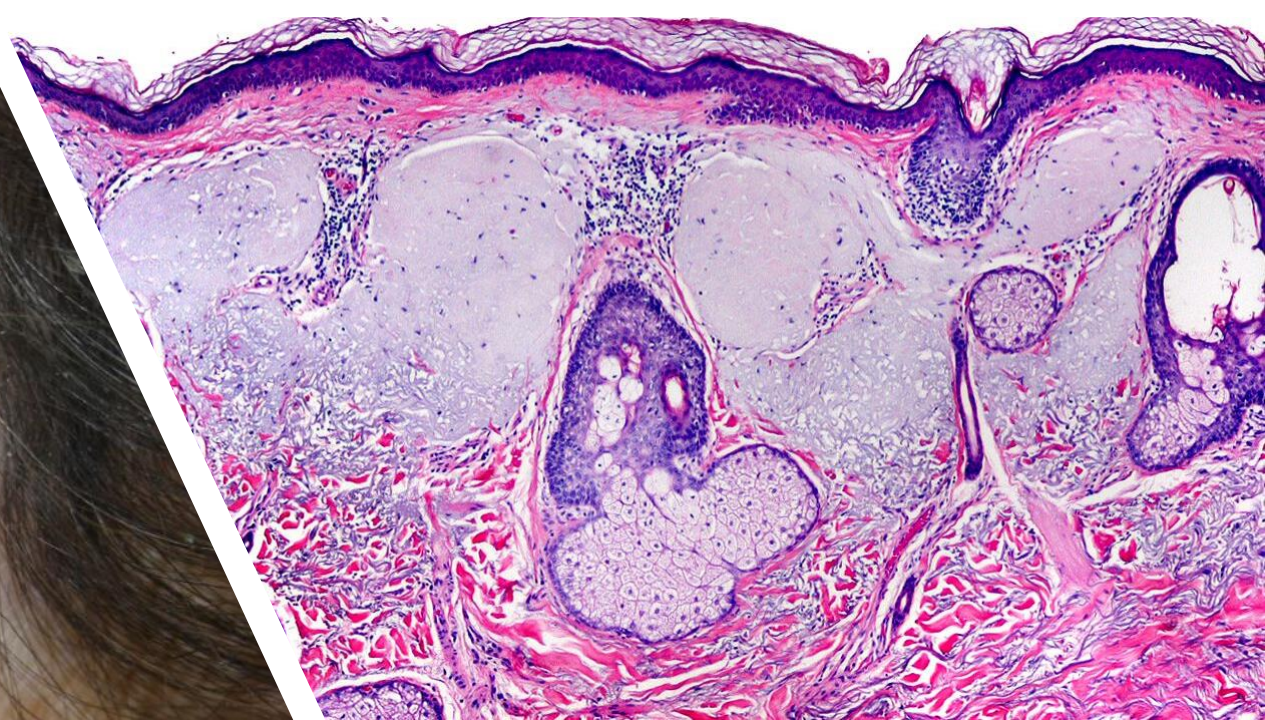
- IRA (760-1440 nm).
- IRB (1440-3000 nm).
- IRC (3000 nm-1 mm).





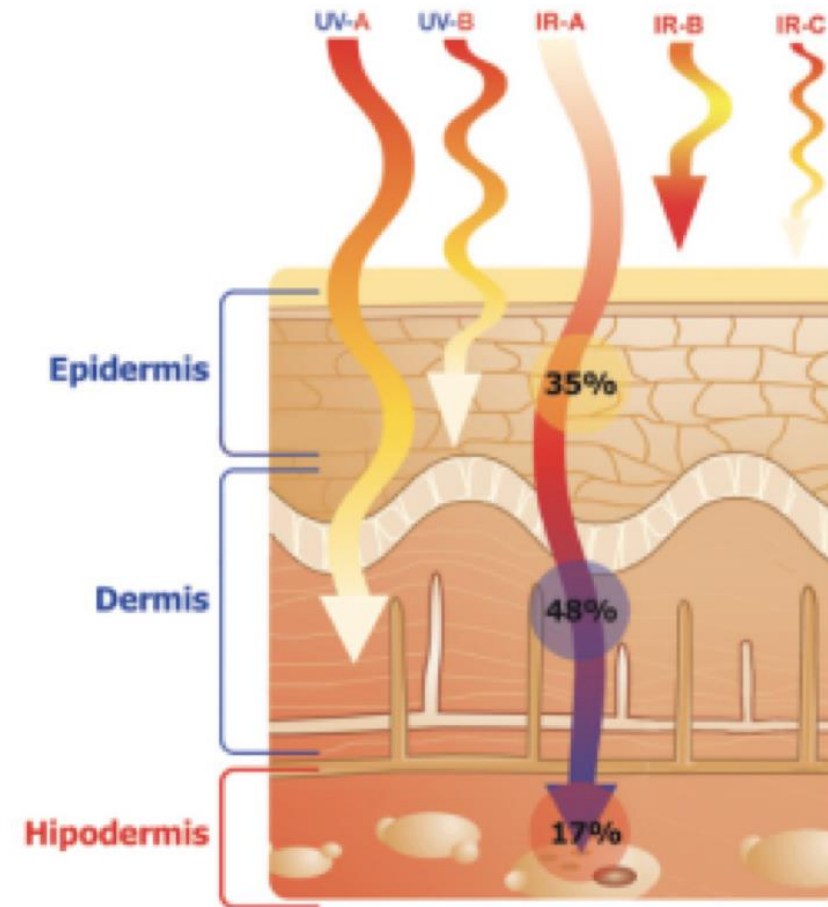


FOTOENVEJECIMIENTO



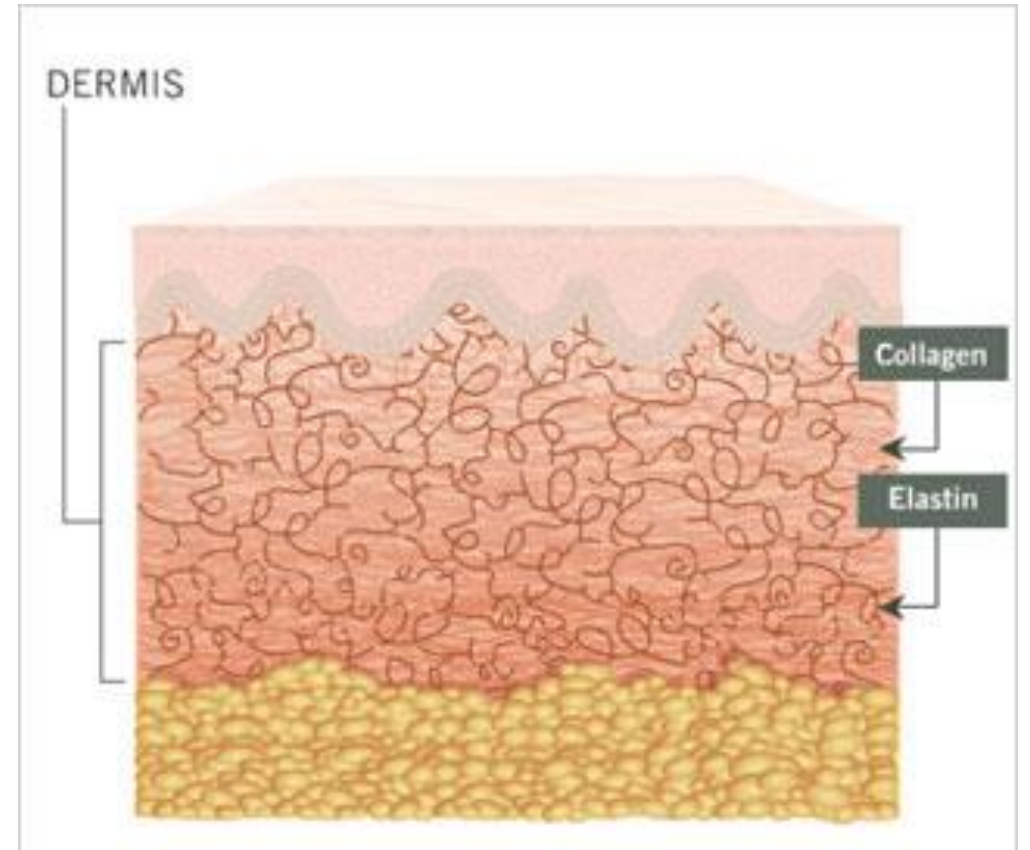
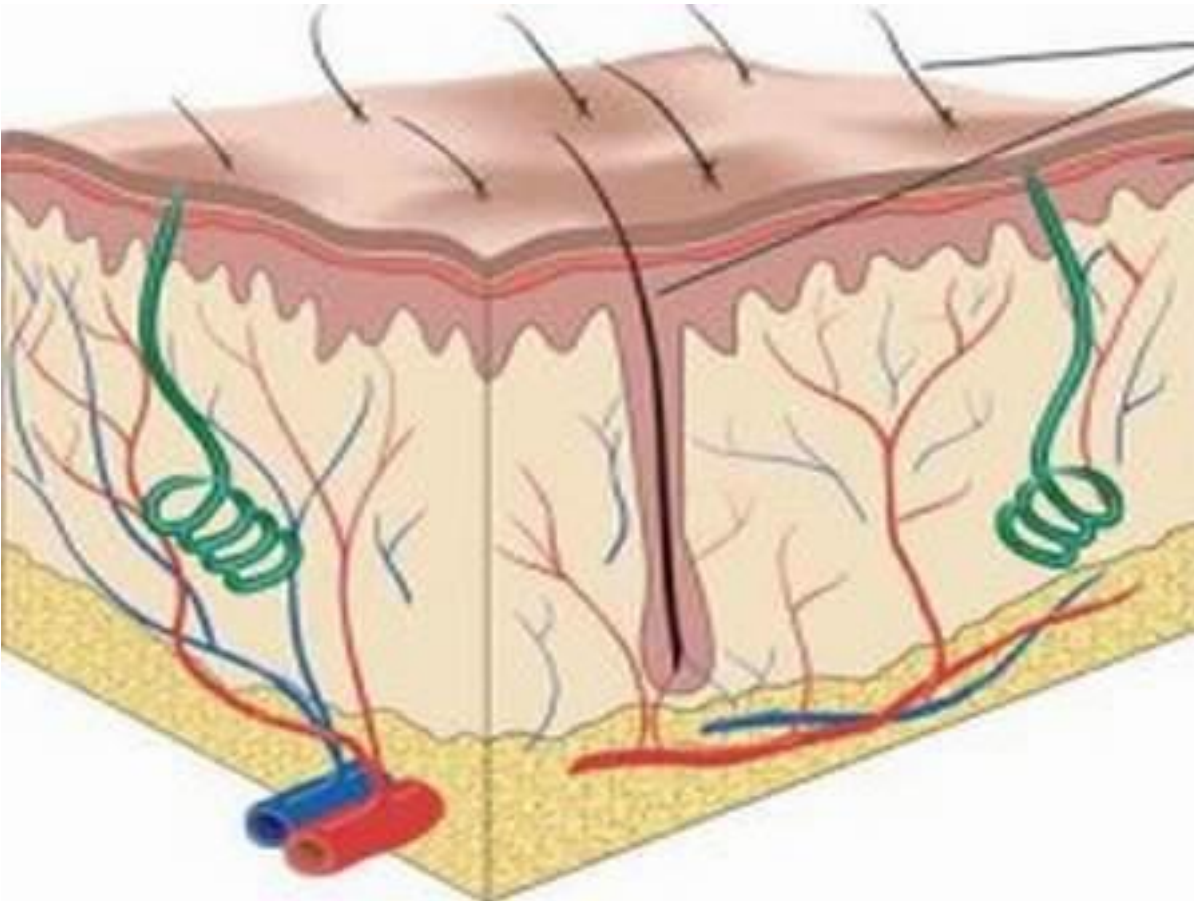
Radiación infrarroja

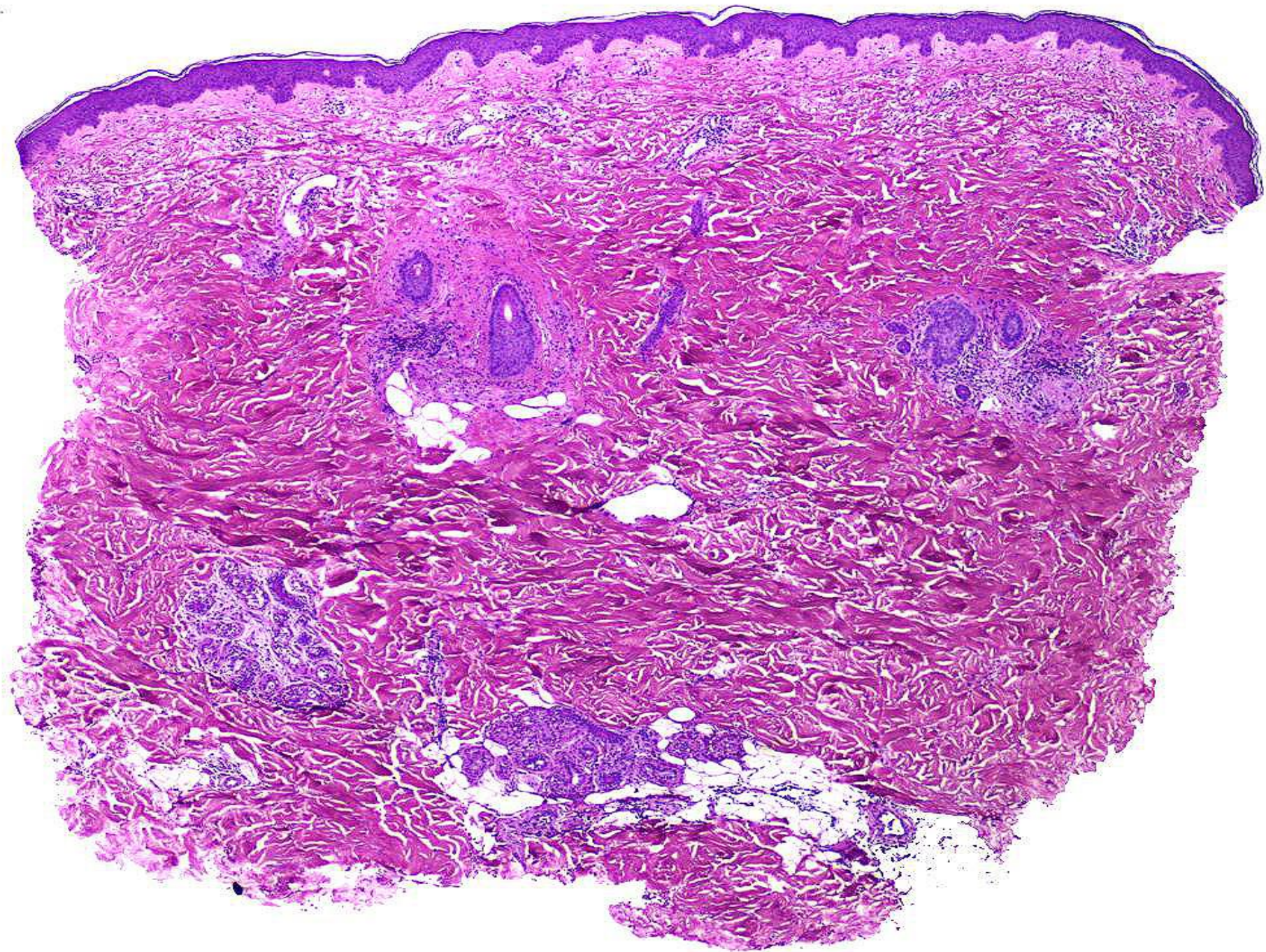
- Trasmite energía en forma de calor
→ aumento T^a de la piel.
- 50% energía solar que alcanza piel.
- Se divide en IRA, IRB, IRC.
- Cambios piel → eritema,
hiperpigmentación, elastosis y telangiectasias.
- Fotoprotección frente IR mediante
antioxidantes.
- **Tests estandarizados** para medir
índice de protección IR
(controversia) → medición calor.



40 veces más gruesa que la epidermis:

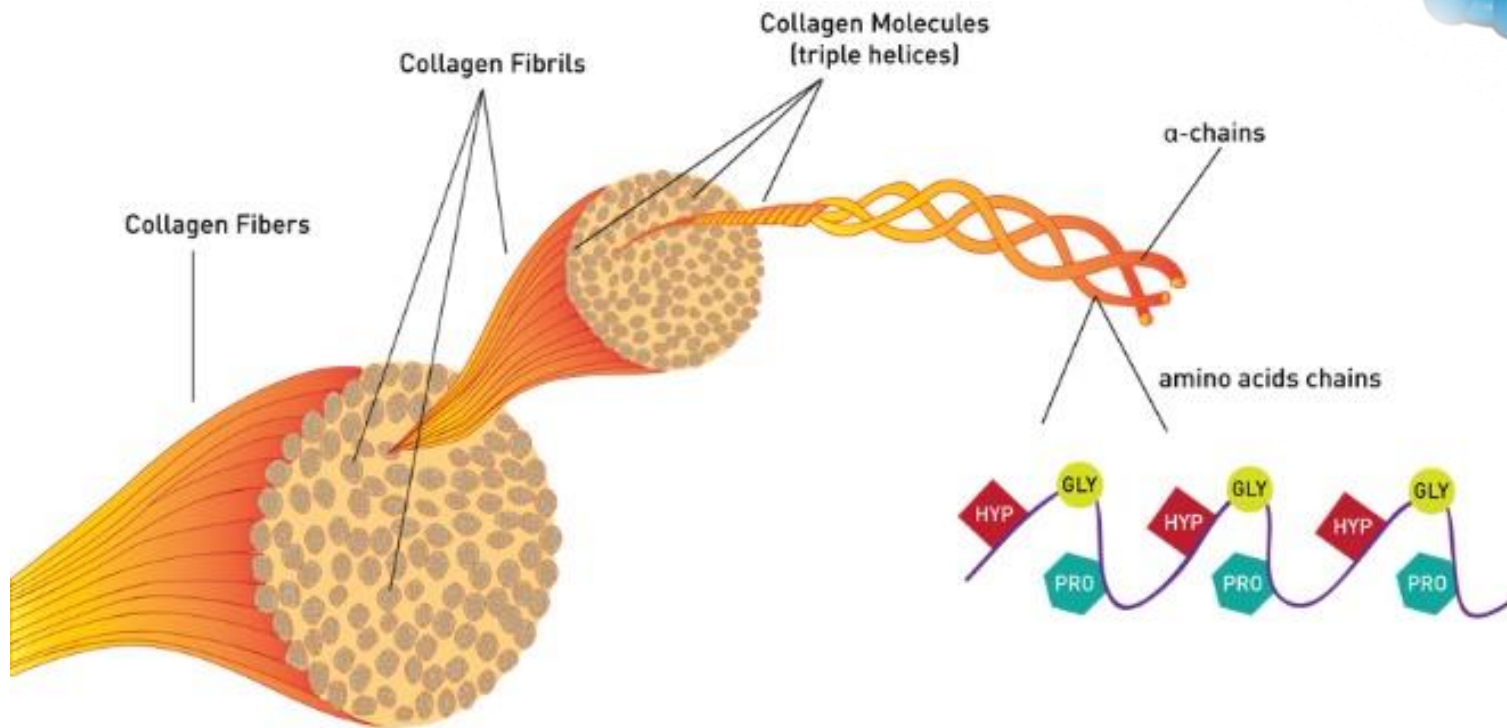
- Colágeno**
- Fibras elásticas: elastina**
- Matriz de GAGS**

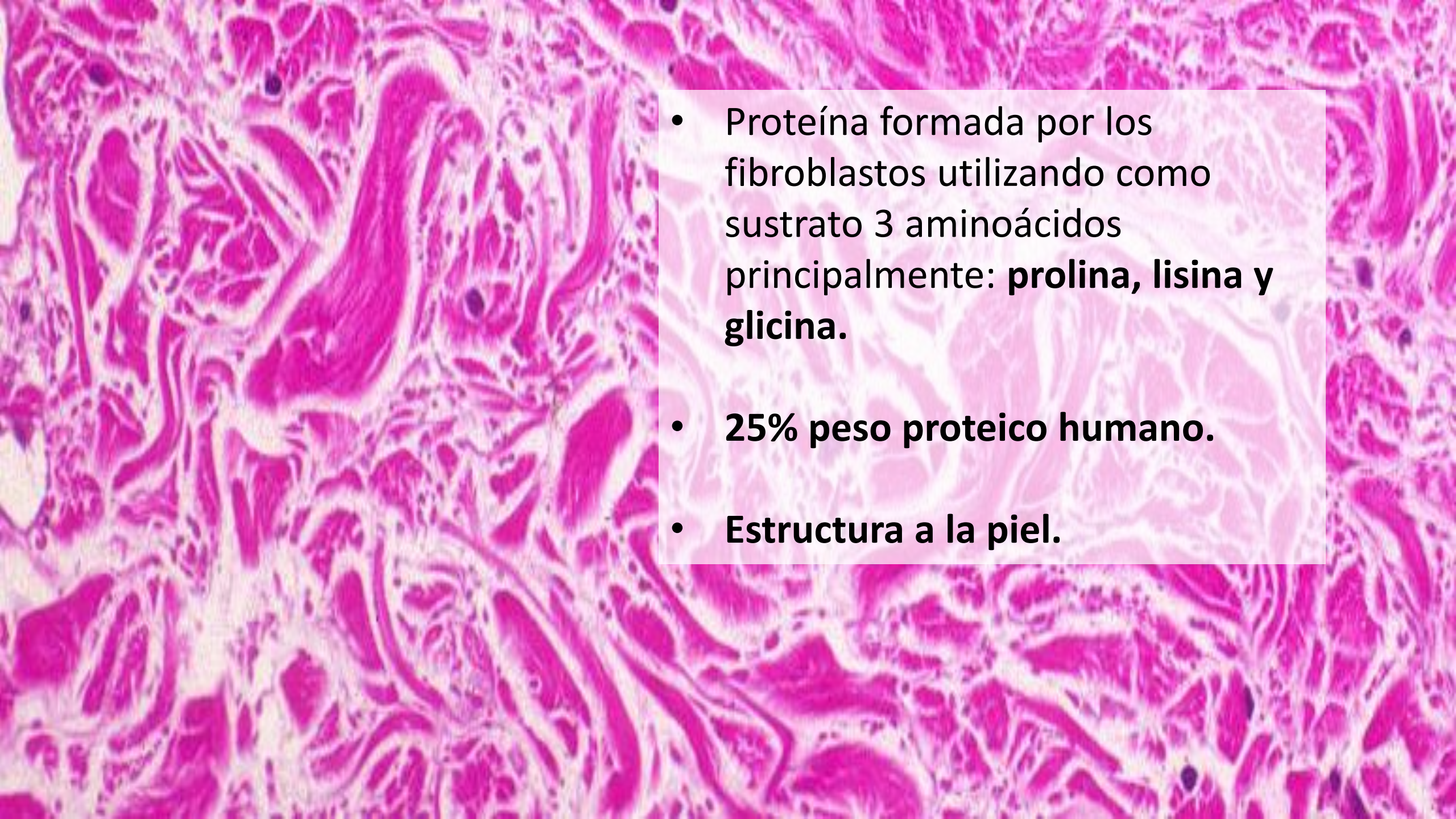


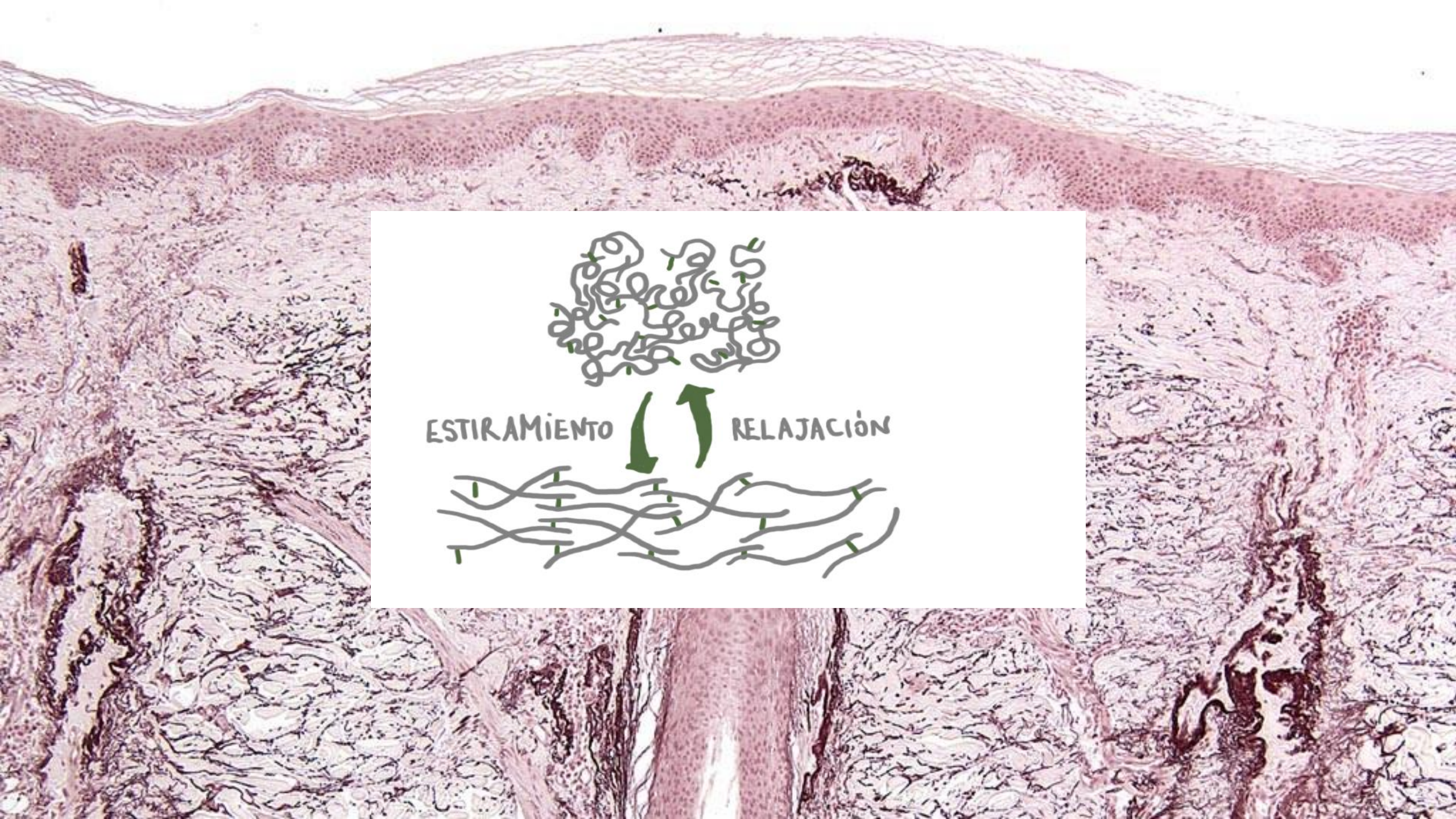


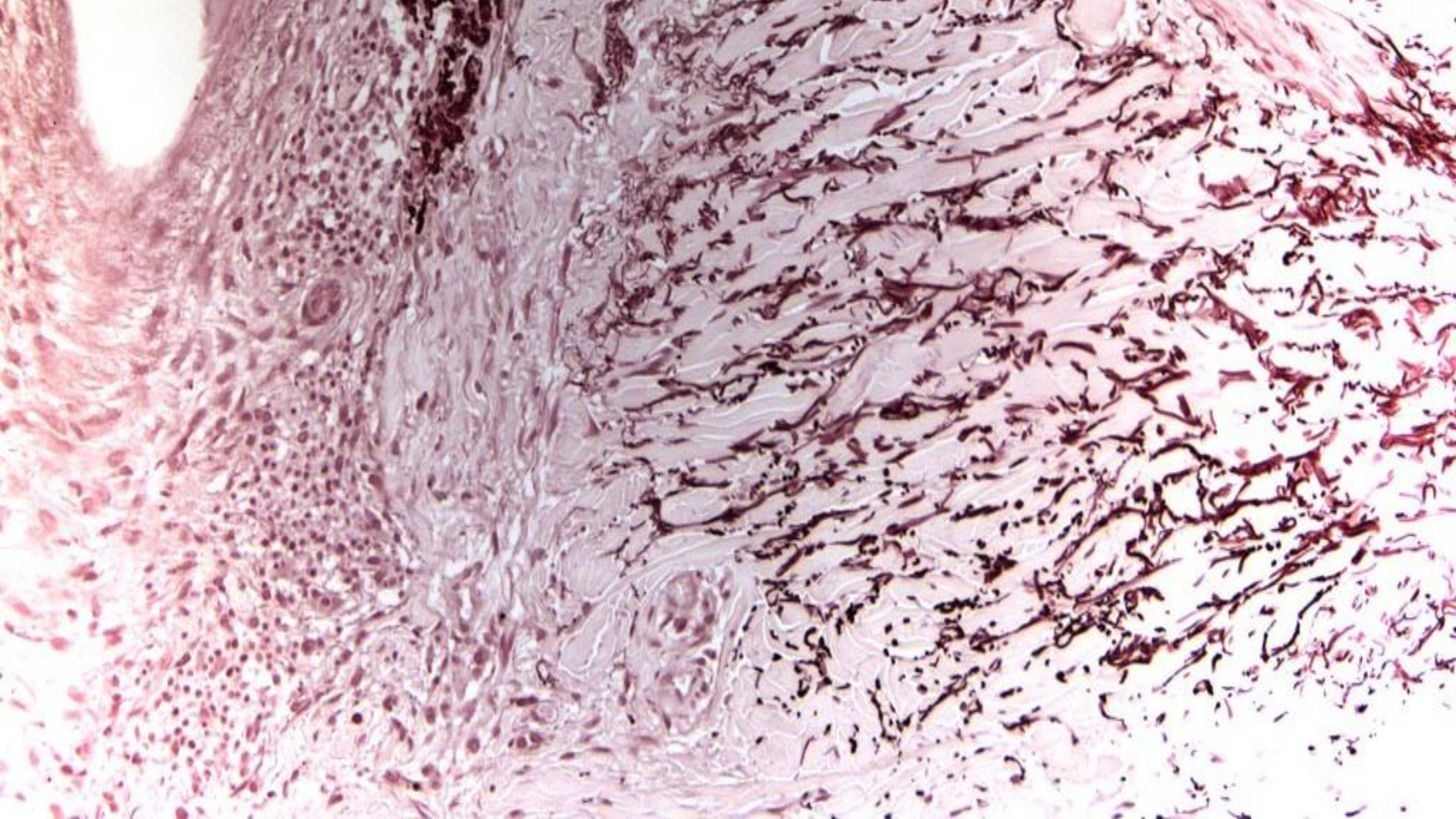
COLÁGENO

- 23 tipos de tipos de colágeno
- Los más importantes **Tipo I y tipo III.**



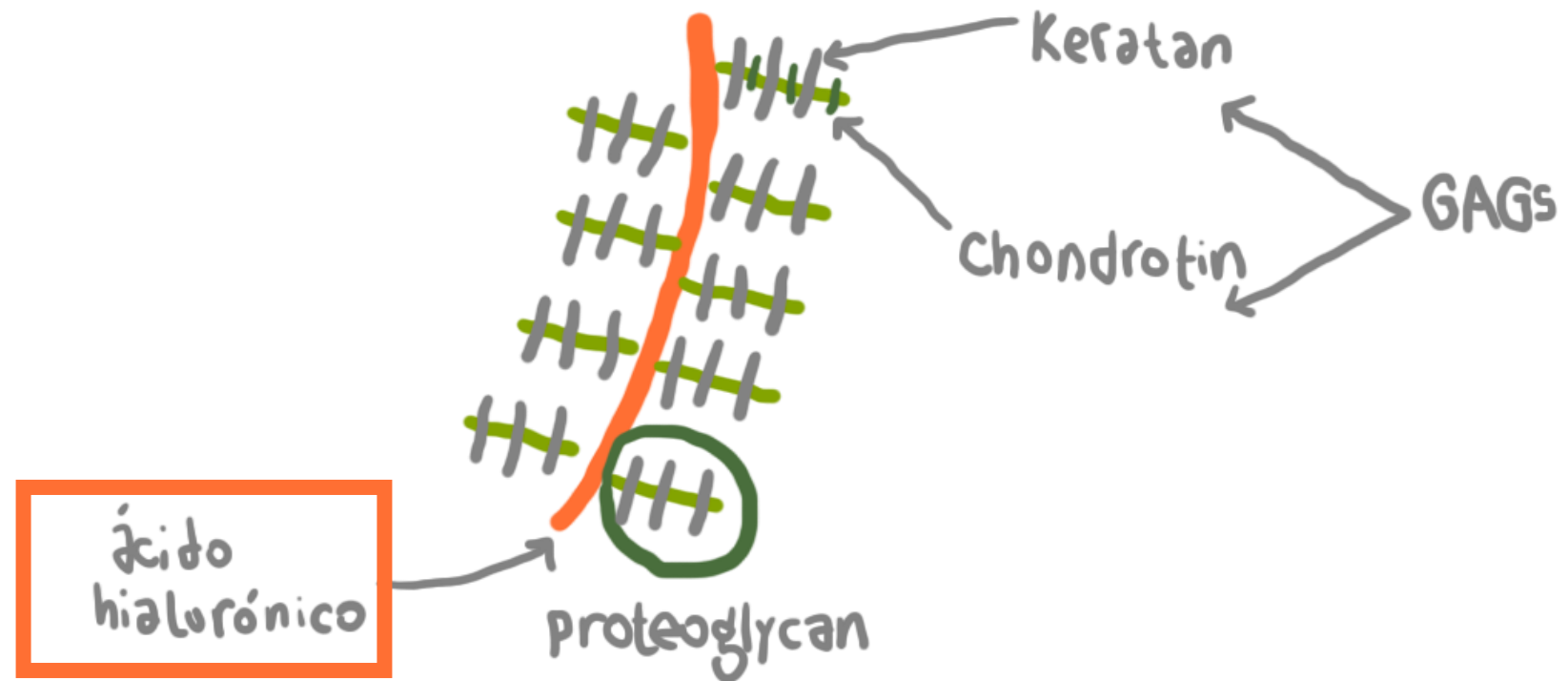
- 
- A microscopic image of skin tissue, likely stained with Masson's trichrome, showing a dense network of collagen fibers in blue and pink. The fibers are arranged in a complex, interwoven pattern, with some areas showing more organized bundles. The background is a mix of light and dark pink, representing the cellular and extracellular matrix.
- Proteína formada por los fibroblastos utilizando como sustrato 3 aminoácidos principalmente: **prolina, lisina y glicina.**
 - **25% peso proteico humano.**
 - **Estructura a la piel.**



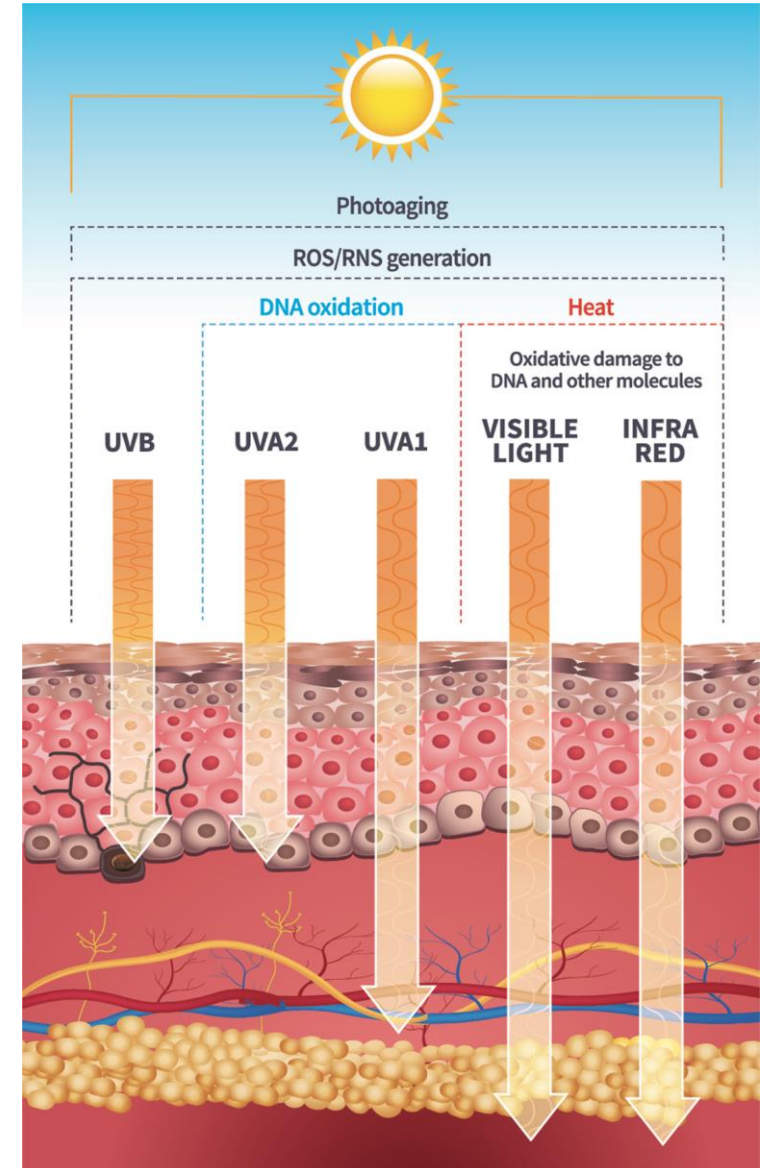


MATRIZ: GLICOSAMINOGLICANOS

- Homeostasis y humectación
- Mantenimiento del colágeno y elastina



Luz visible



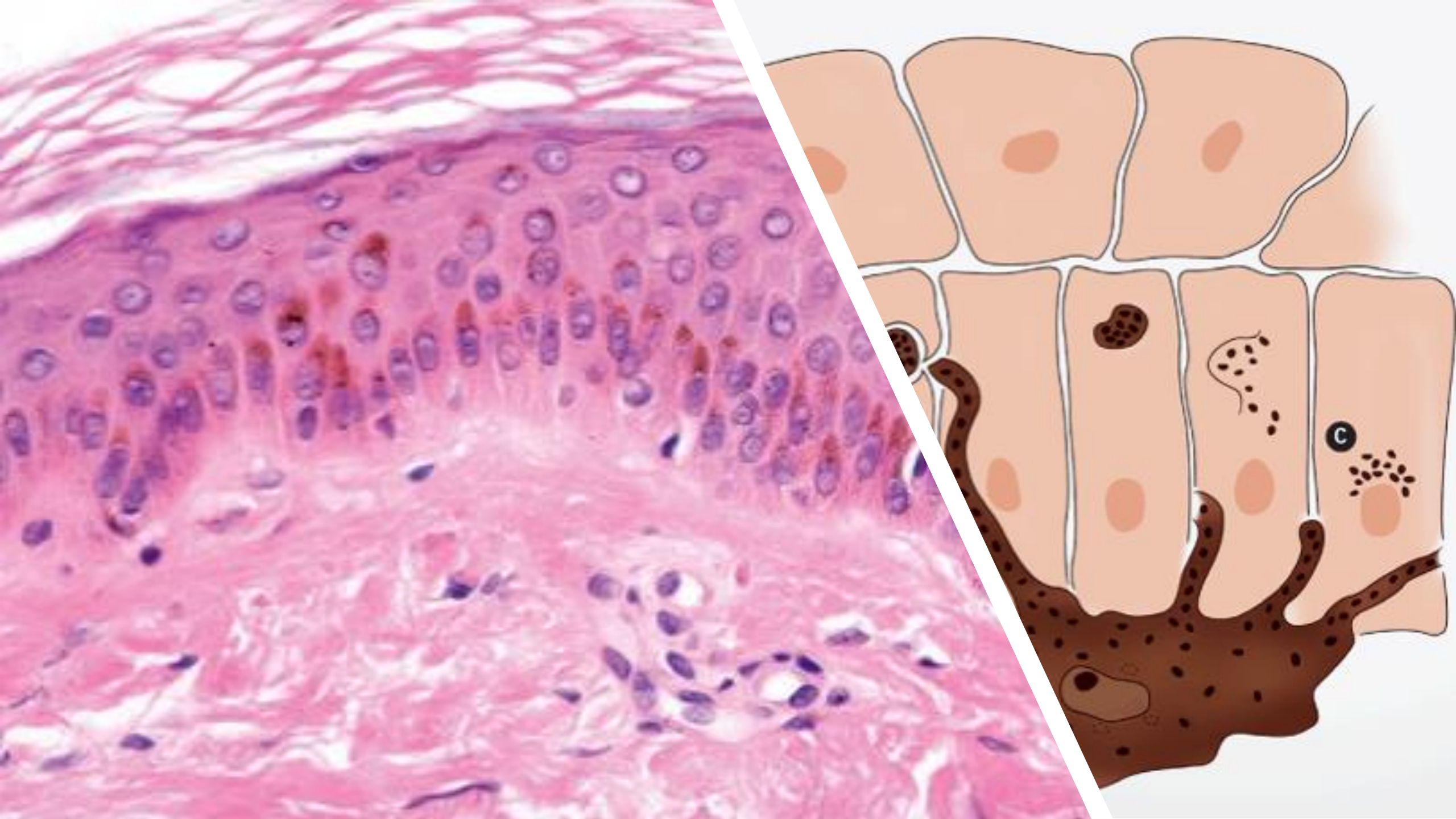
LUZ AZUL

- Natural
- Artificial









FR- Exposición solar insuficiente y mortalidad global: ¿debemos recomendar o desaconsejar la exposición solar a nuestros pacientes?

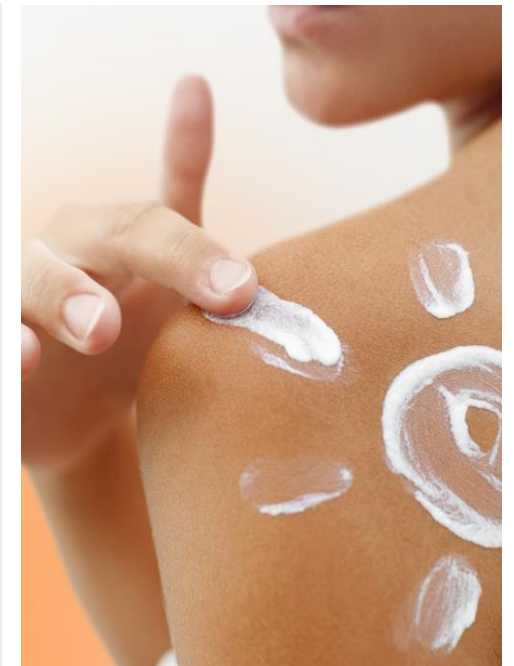


RF- Insufficient Exposure to Sunlight and Global Mortality: Should We Advise Against or Recommend Sun Exposure?

M.T. Monserrat-García*, A. Ortiz-Prieto, P. Martín-Carrasco y J. Conejo-Mir-Sánchez

Actas Dermosifiliogr. 2017;108(3):257-258

- **Estudio con 20.000 mujeres suecas → doble de mortalidad** en las que evitaban exposición solar por patología cardiovascular y otras causas.
- Falta exposición solar → factor de riesgo en expectativa vida **igual a tabaquismo**.
- **Dermatólogo → visión integral del paciente →** valorar beneficio exposición en enfermedades alta mortalidad (HTA, DM, ECV, fractura osteoporótica cadera) versus cancer cutáneo (alta prevalencia, menor impacto mortalidad).



Piel

Daño en el ADN
Melanogénesis
Síntesis de vitamina D
Estrés oxidativo
Elastosis
Inmunotolerancia

Fotoenvejecimiento
cáncer cutáneo

Esquelético

Homeostasis Ca/P en
sangre
Mineralización ósea

↓ Raquitismo
osteomalacia
osteoporosis

Endocrino

Melatonina

Regulación del
ritmo circadiano

Estado de ánimo

↑ POMC,
betaendorfinas

Sensación de
bienestar
antidepresivo

Cardiovascular

Vasodilatador directo
↑ niveles de óxido
nitríco

Antihipertensivo
↓ Enfermedad CV
↓ Mortalidad CV

Autoinmunidad

Inmunomodulador

↓ Riesgo de
esclerosis múltiple
↓ Riesgo de DM
tipo 1

Enfermedades infecciosas

Alteración en
quimiotaxis,
fagocitosis
↑ Catelicidina,
defensina β4
Especies reactivas de
oxígeno
IL-1
VDR, CYP27B1,
CYP24A1
Diferenciación
macrofágica

Tuberculostático
↓ Infecciones
Respiratorias

Cáncer

Alteración en
reparación ADN
Apoptosis
Estrés oxidativo
Antiinflamatorio

↓ Varios tipos
de CA (mama,
colon,
próstata)
↓ Mortalidad
por CA

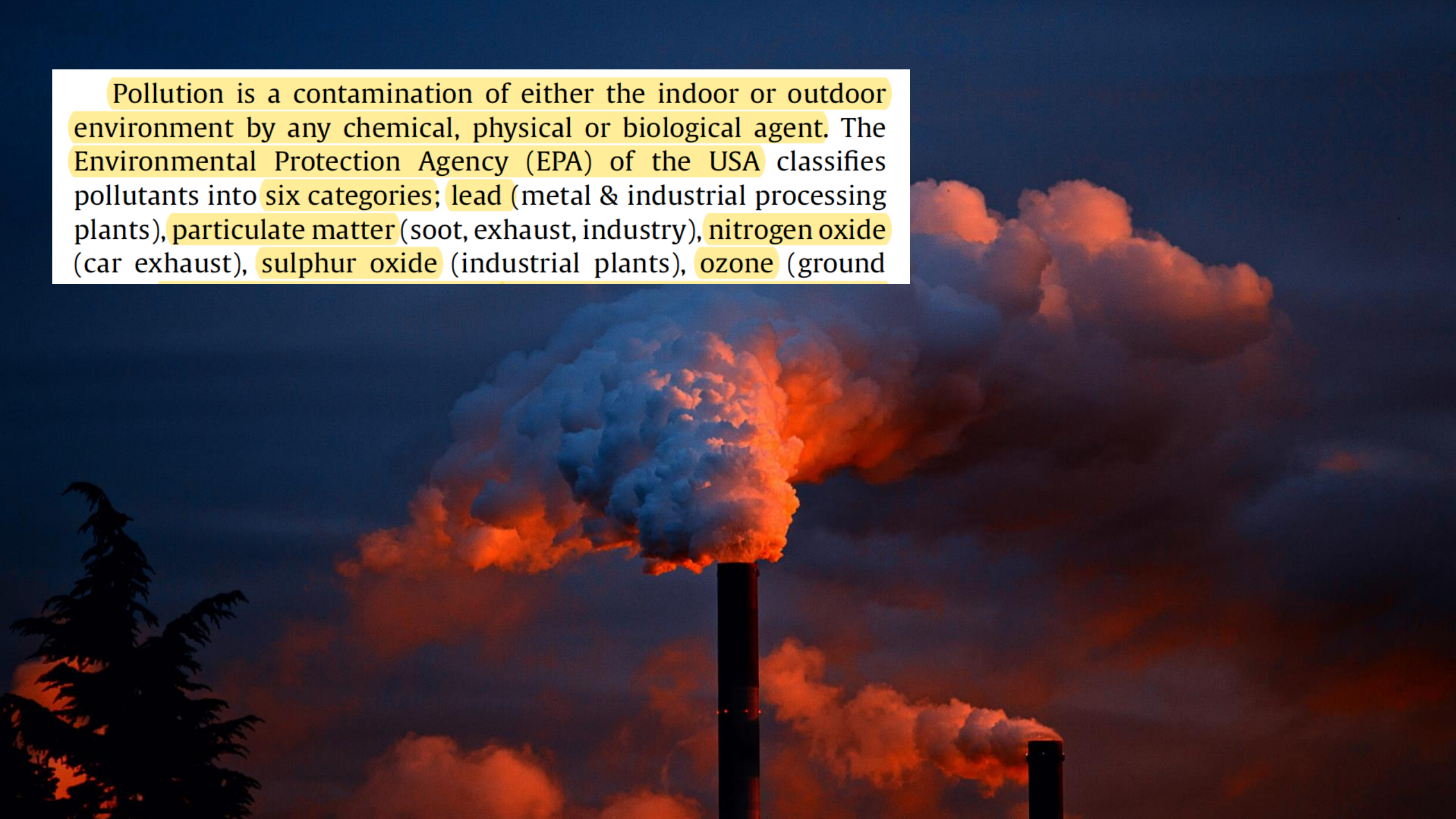




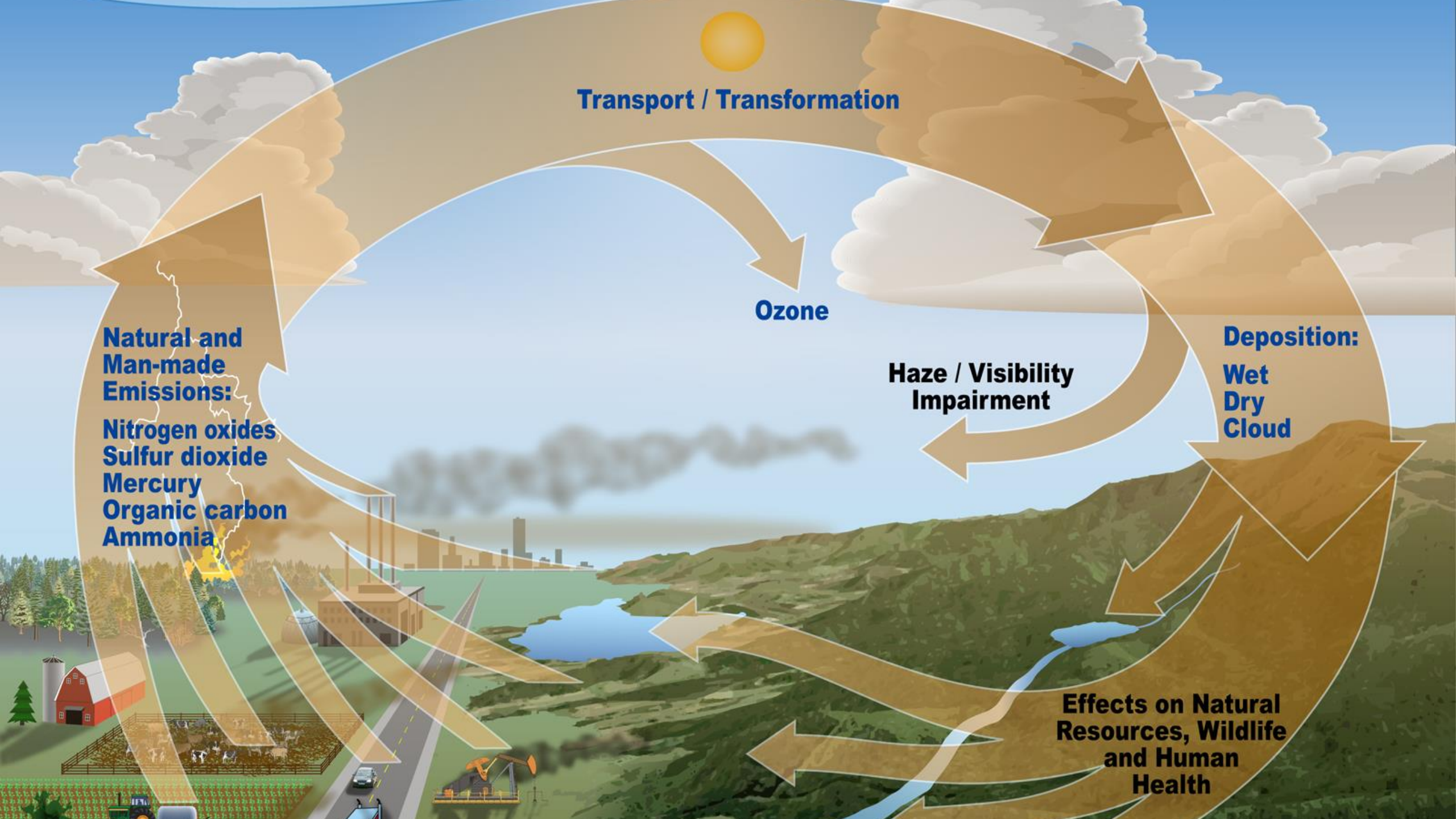




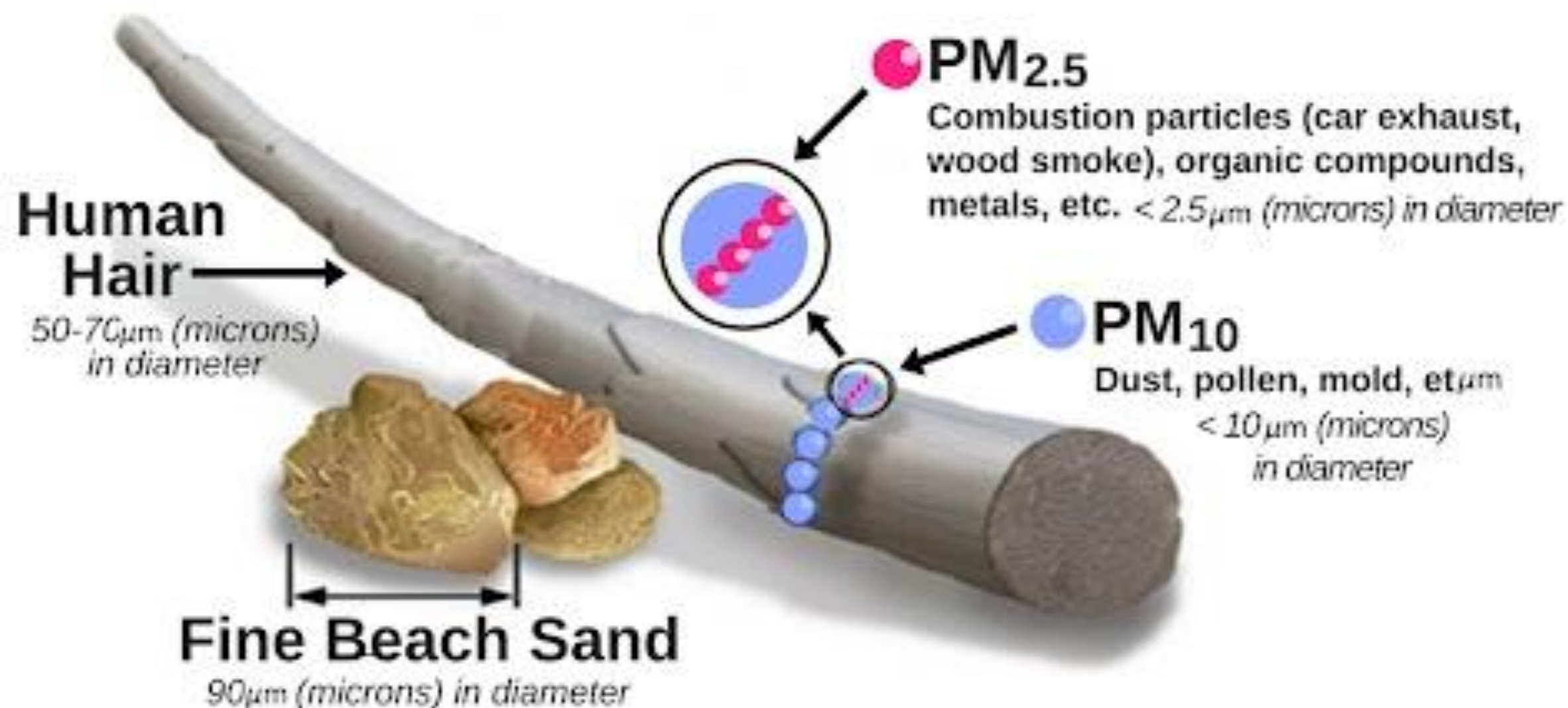
Pollution is a contamination of either the indoor or outdoor environment by any chemical, physical or biological agent. The Environmental Protection Agency (EPA) of the USA classifies pollutants into six categories; lead (metal & industrial processing plants), particulate matter (soot, exhaust, industry), nitrogen oxide (car exhaust), sulphur oxide (industrial plants), ozone (ground







Relative Size of Particulate Matter

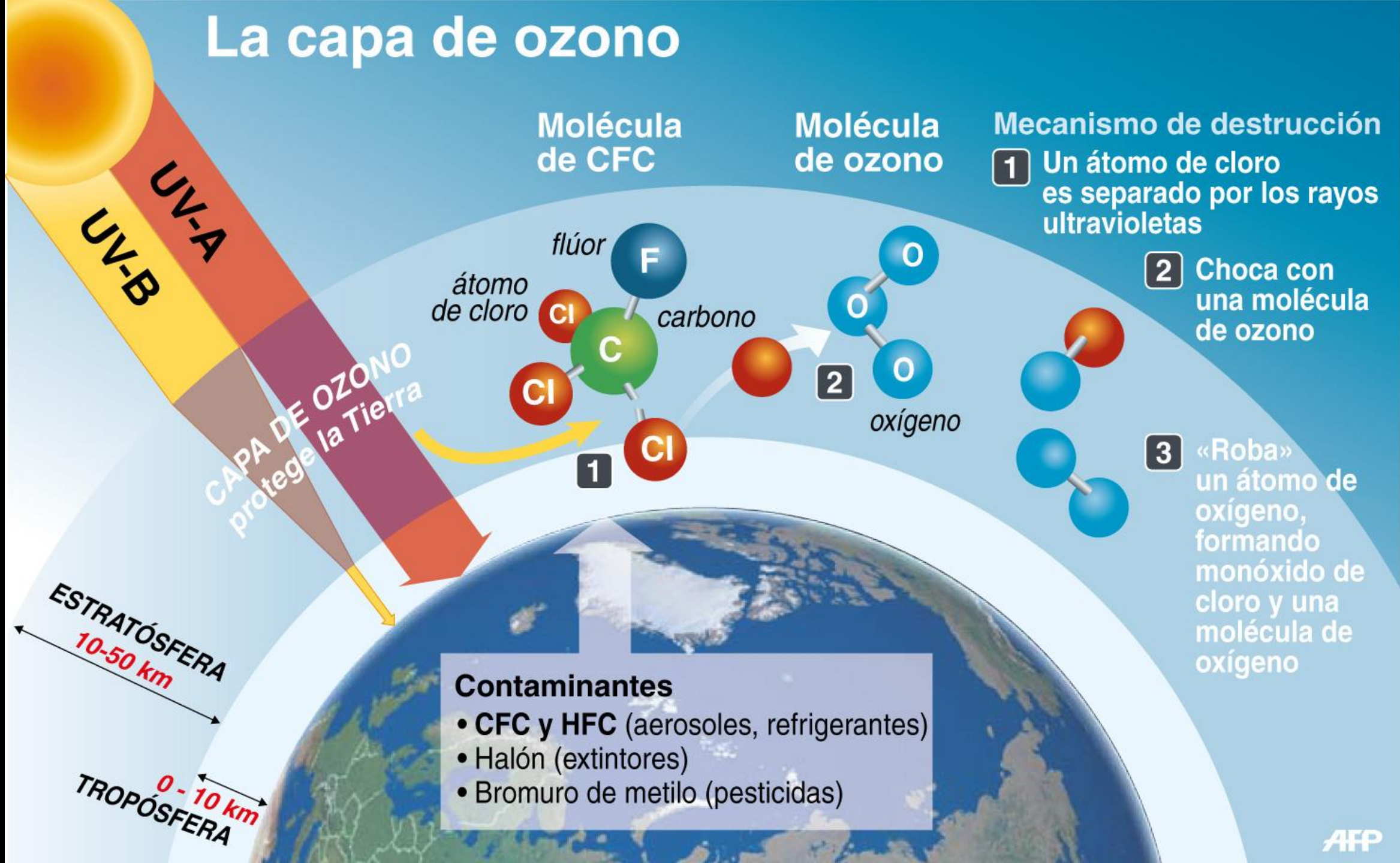


In conclusion there is now good epidemiological evidence that exposure to traffic-related air pollution including PM, NO₂ and

ground level ozone is associated with pigment spot and wrinkle formation in Caucasians and East Asians and preliminary evidence suggests that at least some of these effects may be mediated via AhR signaling in human skin.



La capa de ozono



A person wearing a purple long-sleeved shirt and black leggings is walking a brown dog on a blue leash. The dog is looking towards the camera with its tongue out. The background is a lush green forest with ferns and other foliage.

*Relación con
esperanza de
vida*



**SHINRIN
YOKU**



Tabaquismo

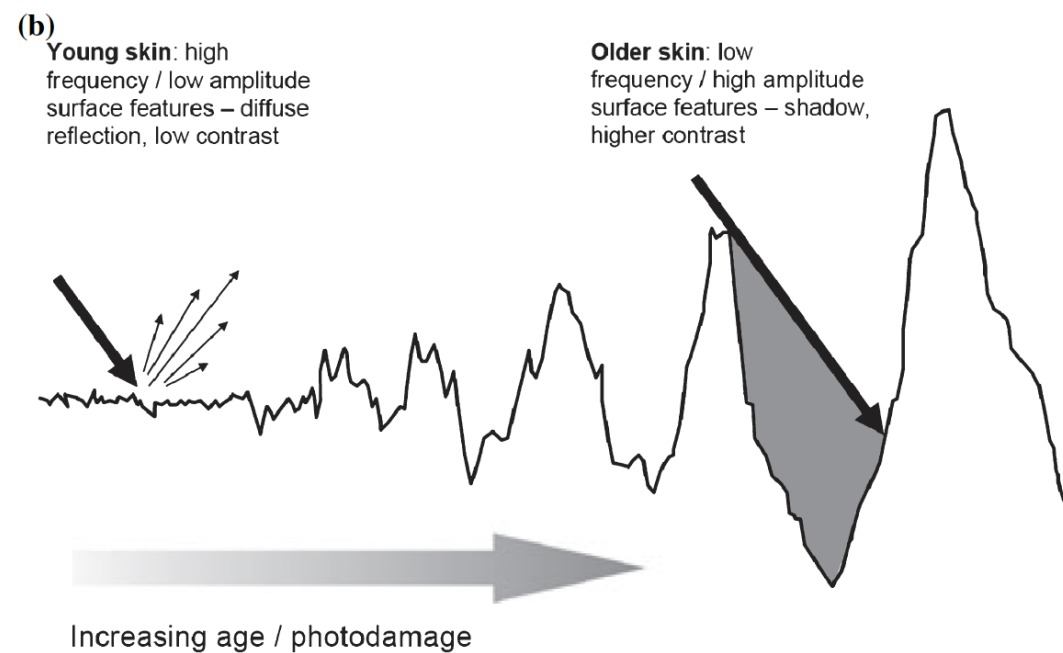
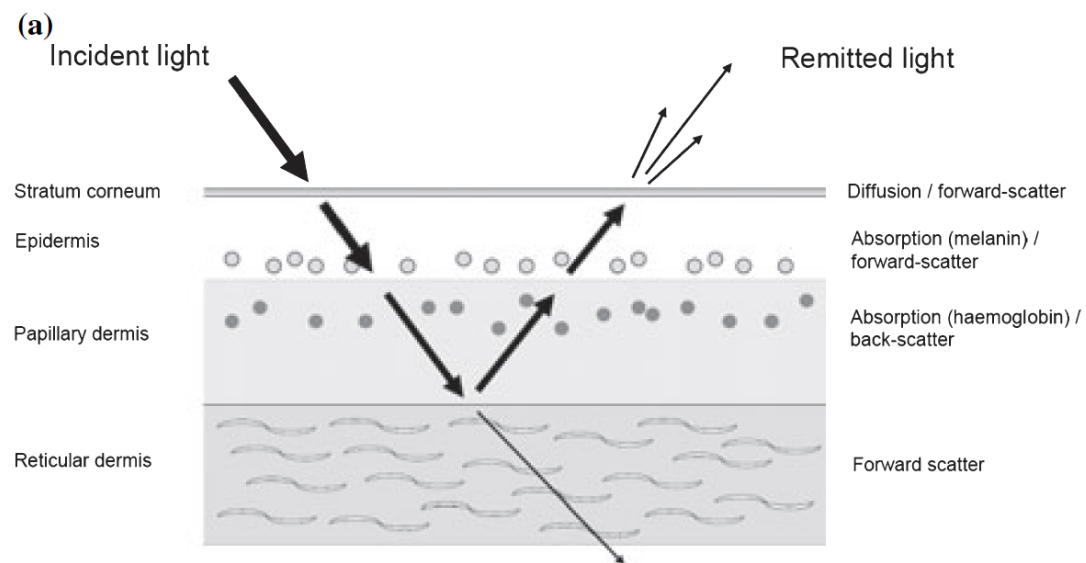






LUMINOSIDAD

- Color
- Superficie
- Hidratación
- Firmeza
- Elasticidad



1

2

3

4



Nonsmoker



Smoker



Smoked 14 years
longer than his twin



Smoked 17 years
longer than her twin



Nonsmoker



29-year smoker




Nutrición



ORIGINAL ARTICLE

The influence of exposome on acne

B. Dréno,^{1,*} V. Bettoli,² E. Araviiskaia,³  M. Sanchez Viera,⁴ A. Boulloc⁵

¹Service de Dermatologie, CIC 1413, CRCINA Inserm 1232, University Hospital Nantes, Nantes, France

²Department of Clinical and Experimental Medicine, Azienda Ospedaliero-Universitaria di Ferrara, Ferrara, Italy

³Department of Dermatology, First Pavlov State Medical University of St. Petersburg, St. Petersburg, Russia

⁴Skin Health, Aging and Cancer, Institute for Dermatology, Madrid, Spain

⁵Laboratoires Vichy, Levallois Perret, France

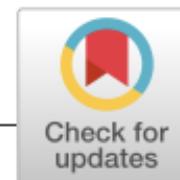
*Correspondence: B. Dréno. E-mail: brigitte.dreno@wanadoo.fr

Received: 29 January 2019

Revised: 27 May 2019

Accepted: 5 June 2019

DOI: 10.1111/all.13946



REVIEW



WILEY

The exposome in atopic dermatitis

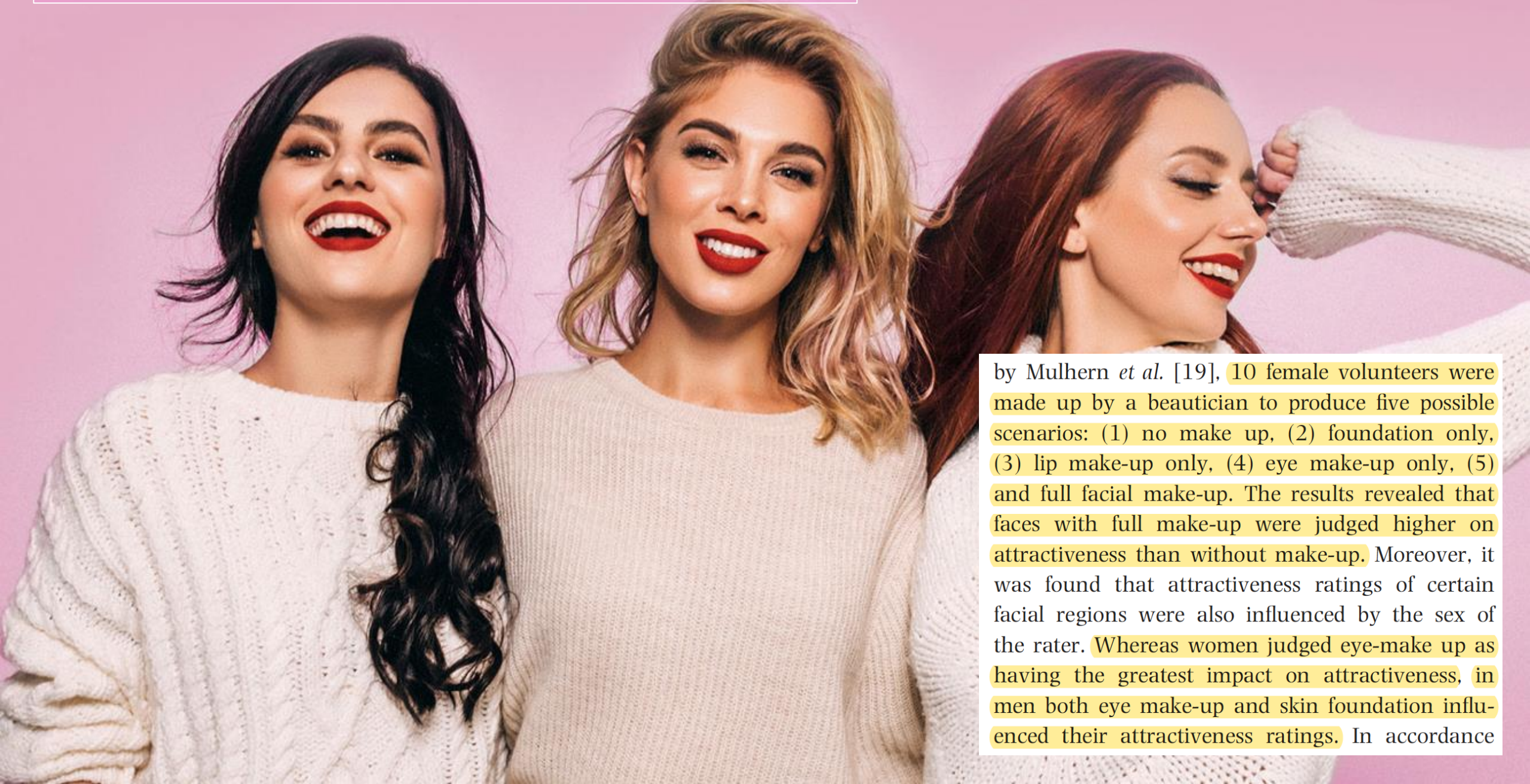
Nicholas Stefanovic¹ | Carsten Flohr² | Alan D. Irvine^{3,4} 





*Azúcar
glicación*

“Men seem to prefer women with facial make-up”



by Mulhern *et al.* [19], 10 female volunteers were made up by a beautician to produce five possible scenarios: (1) no make up, (2) foundation only, (3) lip make-up only, (4) eye make-up only, (5) and full facial make-up. The results revealed that faces with full make-up were judged higher on attractiveness than without make-up. Moreover, it was found that attractiveness ratings of certain facial regions were also influenced by the sex of the rater. Whereas women judged eye-make up as having the greatest impact on attractiveness, in men both eye make-up and skin foundation influenced their attractiveness ratings. In accordance



Review Article

Visible skin condition and perception of human facial appearance

N. Samson*, B. Fink* and P. J. Matts†

*Department of Sociobiology/Anthropology, University of Goettingen, D-37077 Goettingen, Germany and †The Procter & Gamble Company, Rusham Park Technical Centre, Whitehall Lane, Egham, Surrey KT15 2HT, U.K.



MELANINA

[45–48]. The colouration of human skin is determined by only four major pigments: carotenoids of exogenous origin (yellow) and endogenously produced melanin (brown) in the epidermis, oxygenated haemoglobin (red) and reduced haemoglobin (red-blue) in the capillaries and the venules of the dermis [49–51]. Of these, the chromophores melanin and haemoglobin are the major determinants of differences in skin colour between individuals, with melanin playing the primary role [48, 52, 53].

HEMOGLOBINA

CAROTENOIDES



MELANINA

Tonos de piel según Fototipos

Fototipo I



Fototipo II



Fototipo III



Fototipo IV



Fototipo V



Fototipo VI

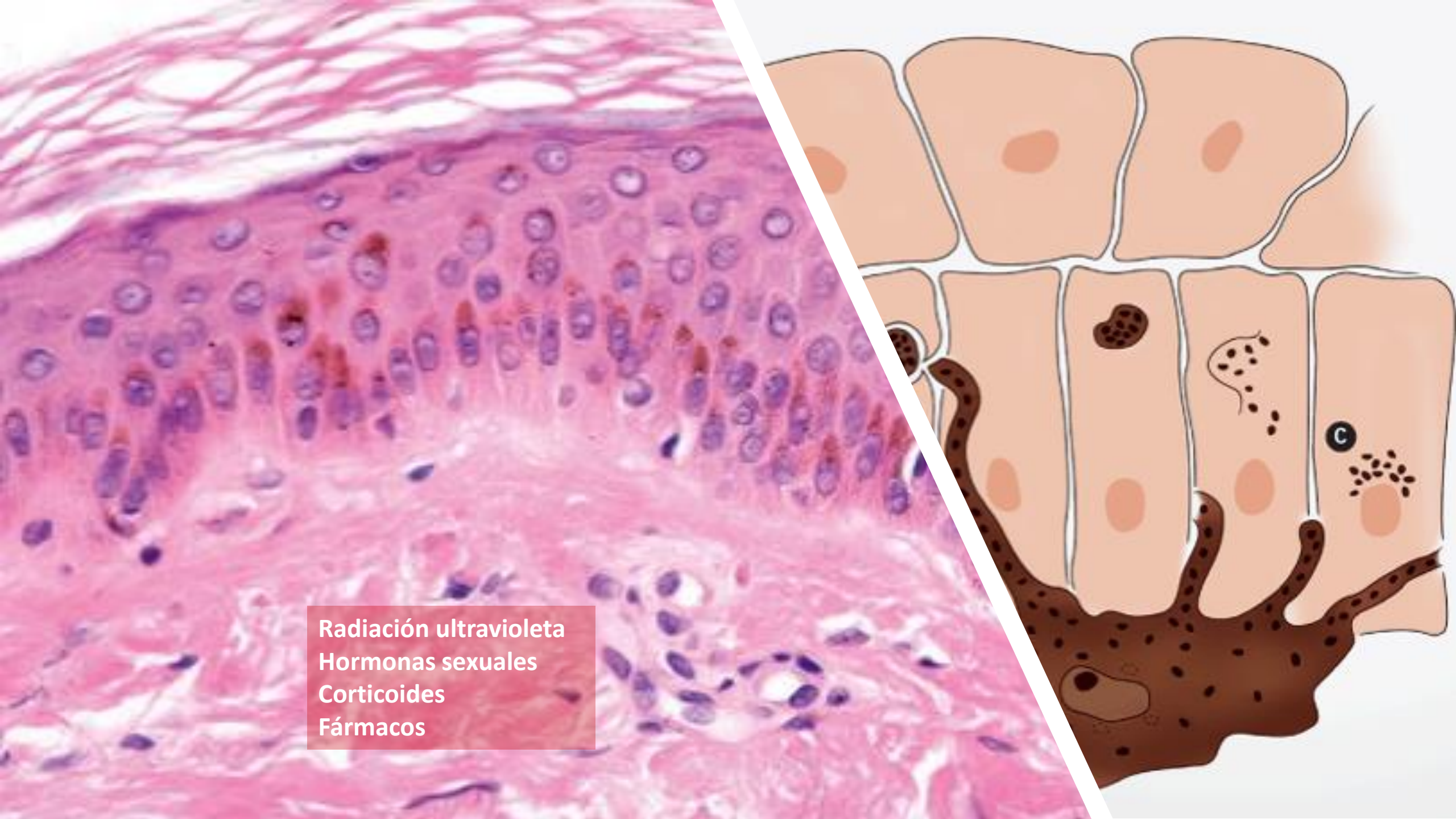


Tono claro

Tono medio

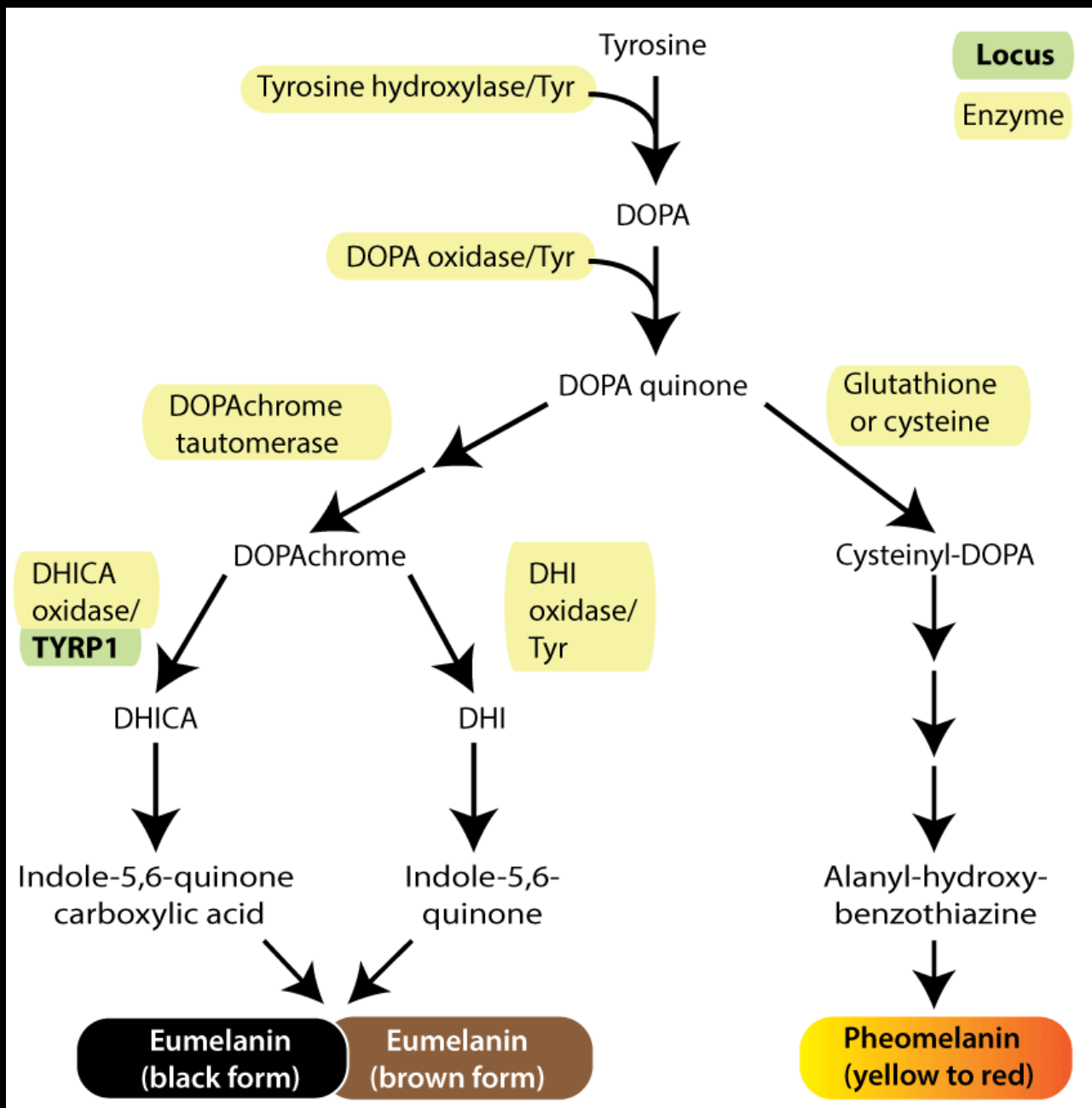
Tono oscuro

Próximamente
Tono Étnico



Radiación ultravioleta
Hormonas sexuales
Corticoides
Fármacos





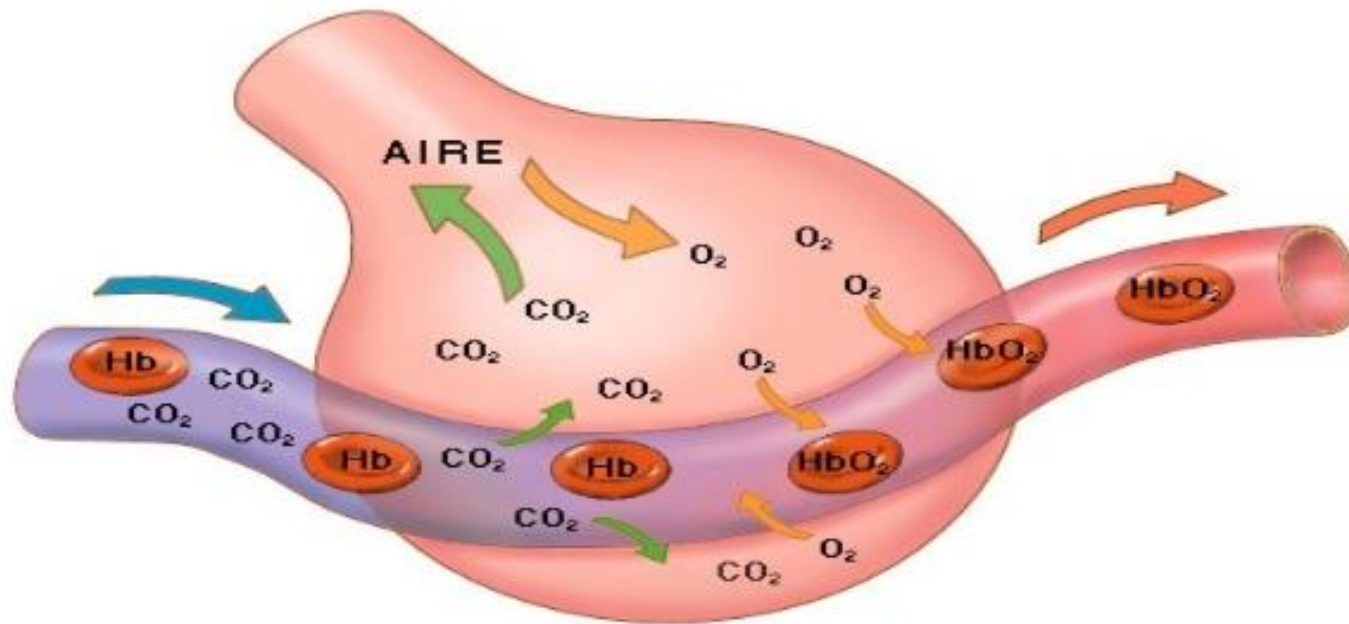
A microscopic view of several red blood cells, which are biconcave and reddish in color, set against a dark background. A semi-transparent grey rectangular box is centered over the image, containing the word "HEMOGLOBINA" in white, bold, uppercase letters. A thin white vertical line is positioned to the left of the text box.

HEMOGLOBINA

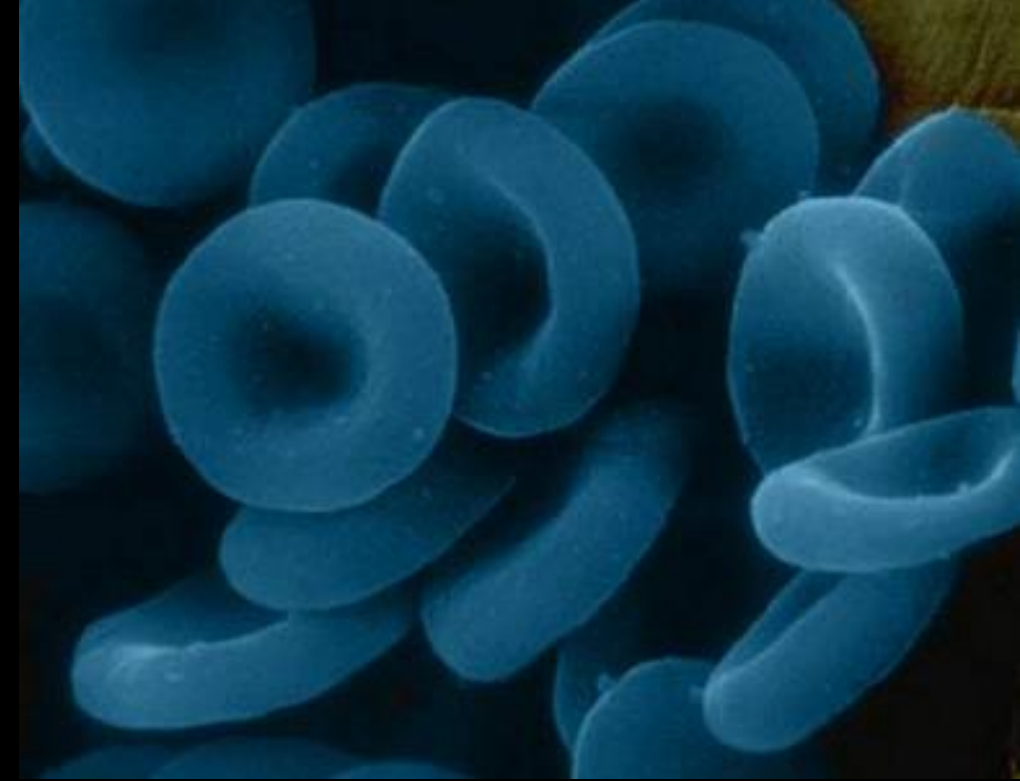
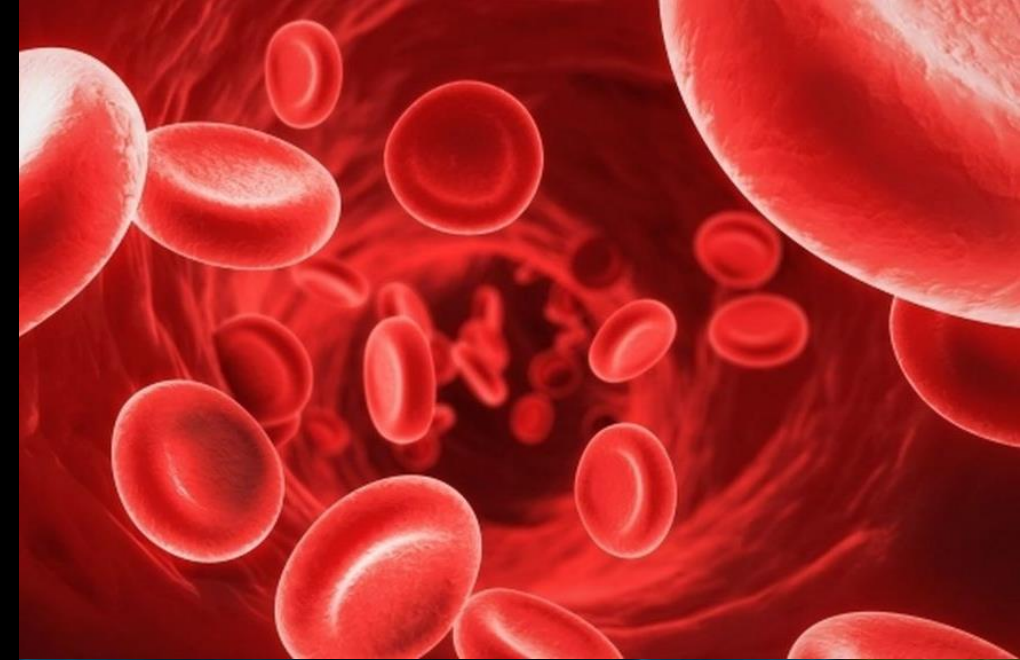
La hemoglobina se encuentra en dos estados :

Estado T (desoxihemoglobina)

Estado R (oxihemoglobina)



Desoxihemoglobina + 4O₂ \longrightarrow Oxihemoglobina





CAROTENOIDES



OPEN ACCESS Freely available online

PLoS one

You Are What You Eat: Within-Subject Increases in Fruit and Vegetable Consumption Confer Beneficial Skin-Color Changes

Ross D. Whitehead^{1*}, Daniel Re¹, Dengke Xiao¹, Gozde Ozakinci², David I. Perrett^{1*}

¹ School of Psychology, Perception Lab, University of St Andrews, St Andrews, Fife, Scotland, ² School of Medicine, University of St Andrews, St Andrews, Fife, Scotland

**color difference between these 2 images
thus represents a difference in daily
consumption of 13 portions of fruit and
vegetables.**

- Cambio de bajo consumo a alto consumo de frutas y verduras (<2 a 8 porciones/día).
- Piel más amarilla, más roja y menos oscura.
- Cambios estables con el tiempo (menos perceptibles).
- Cambios indirectos en la percepción belleza (atractivas).



The value of facial attractiveness for encouraging fruit and vegetable consumption: analyses from a randomized controlled trial

Katherine M. Appleton^{1*} , Alanna J. McGrath², Michelle C. McKinley², Claire R. Draffin², Lesley L. Hamill², Ian S. Young² and Jayne V. Woodside²

Abstract

Background: An effect of increased fruit and vegetable (FV) consumption on facial attractiveness has been proposed and recommended as a strategy to promote FV intakes, but no studies to date demonstrate a causal link between FV consumption and perceived attractiveness. This study investigated perceptions of attractiveness before and after the supervised consumption of 2, 5 or 8 FV portions/day for 4 weeks in 30 low FV consumers. Potential mechanisms for change via skin colour and perceived skin healthiness were also investigated.

Methods: Faces were photographed at the start and end of the 4 week intervention in controlled conditions. Seventy-three independent individuals subsequently rated all 60 photographs in a randomized order, for facial attractiveness, facial skin yellowness, redness, healthiness, clarity, and symmetry.

Results: Using clustered multiple regression, FV consumption over the previous 4 weeks had no direct effect on attractiveness, but, for female faces, some evidence was found for an indirect impact, via linear and non-linear changes in skin yellowness. Effect sizes, however, were small. No association between FV consumption and skin healthiness was found, but skin healthiness was associated with facial attractiveness.

Conclusions: Controlled and objectively measured increases in FV consumption for 4 weeks resulted indirectly in increased attractiveness in females via increases in skin yellowness, but effects are small and gradually taper as FV consumption increases. Based on the effect sizes from this study, we are hesitant to recommend the use of facial attractiveness to encourage increased FV consumption.

Trial registration: Clinical trial Registration Number [NCT01591057](https://www.clinicaltrials.gov/ct2/show/study/NCT01591057) (www.clinicaltrials.gov). Registered: 27th April, 2012.

Keywords: Fruit and vegetables, Facial attractiveness, Skin colour, Public health, Effect sizes



- Intervención en Salud Pública bien ideada. Belleza ++++ motivación.
- Efectos leves/variables no suficientes para generar adherencia primer mes.



DIETA
DERMOSALUDABLE

DIETA SALUDABLE



NUTRICOCOSMÉTICA

OVER 200,000 COPIES SOLD WORLDWIDE

'A must-read for everyone who cares
about driving customer engagement'

ERIC RIES, author of *The Lean Startup*

HOOKED

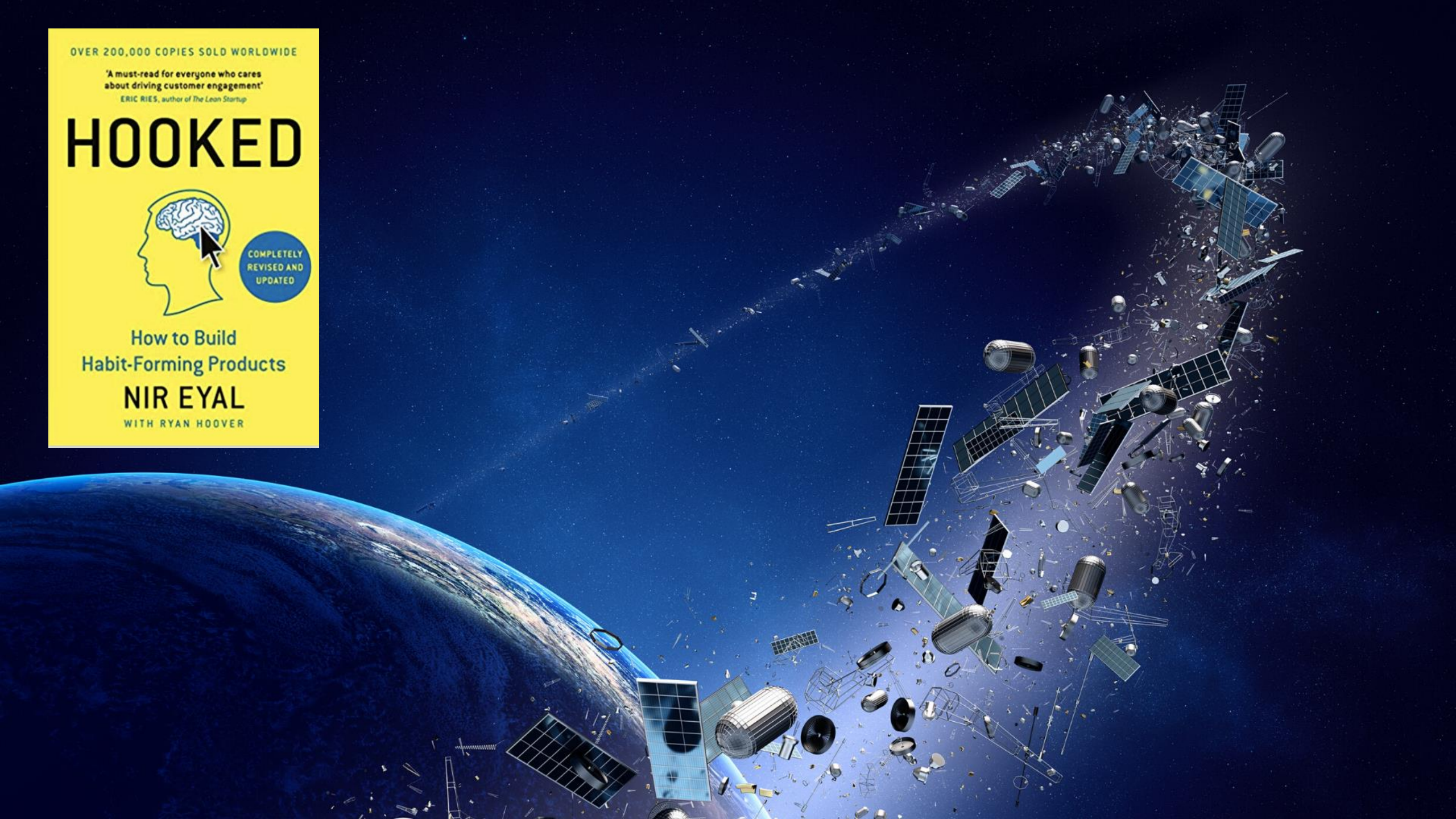


COMPLETELY
REVISED AND
UPDATED

How to Build
Habit-Forming Products

NIR EYAL

WITH RYAN HOOVER



Relación estresores y piel

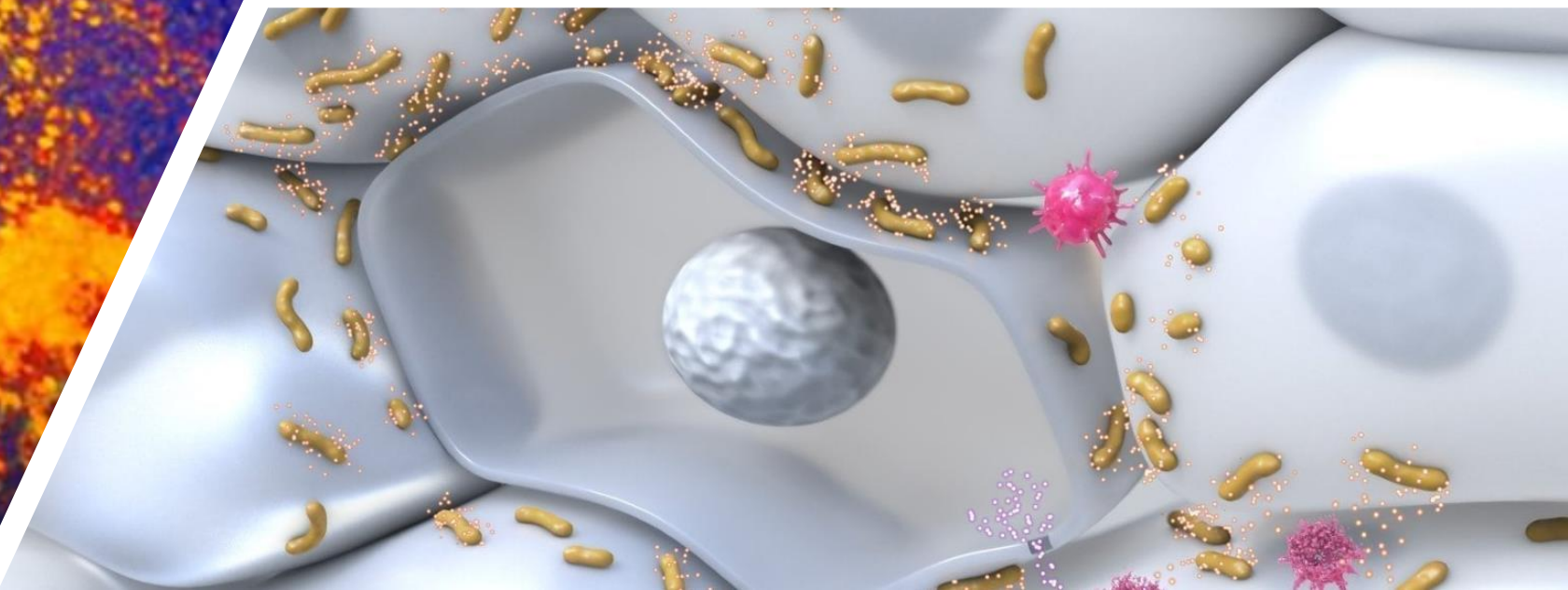


Falta de sueño



Temperatura

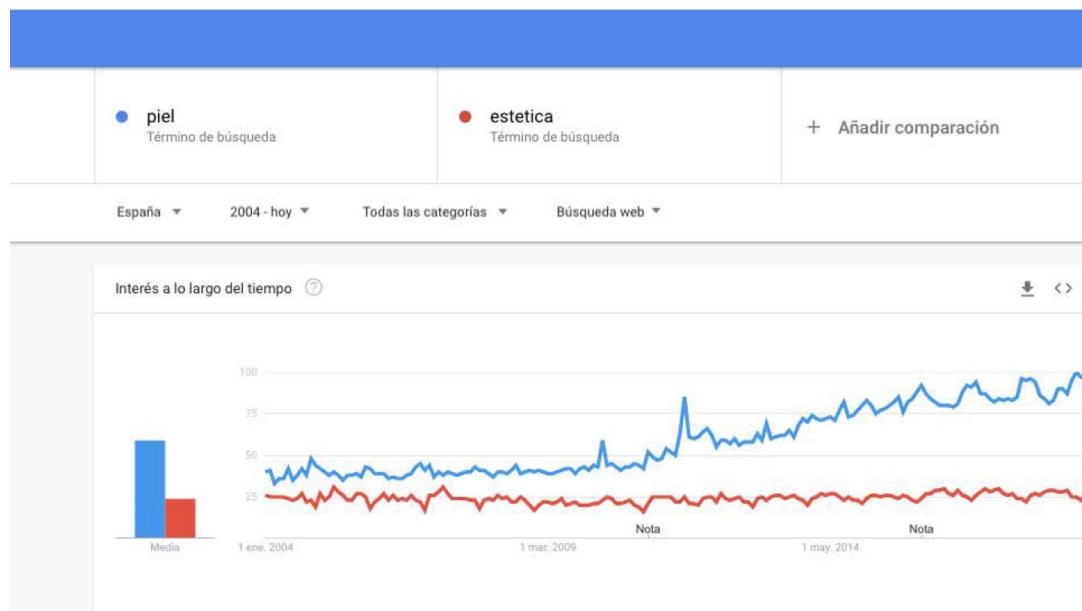




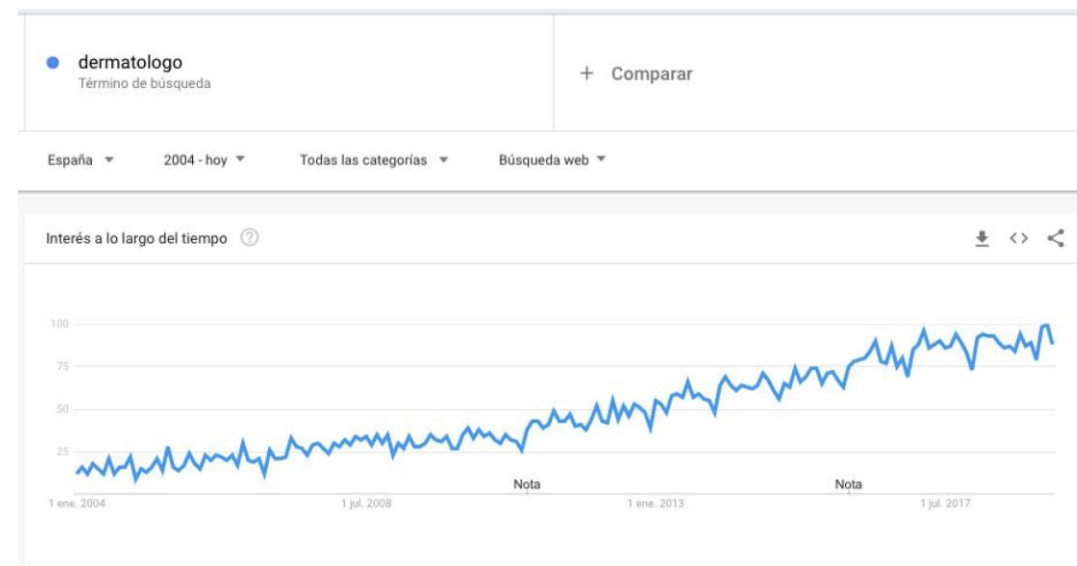


DERMOCOSMÉTICA

Google Trends



Google Alerts



ARTÍCULO DE OPINIÓN

Necesidades y demandas en dermatocosmética

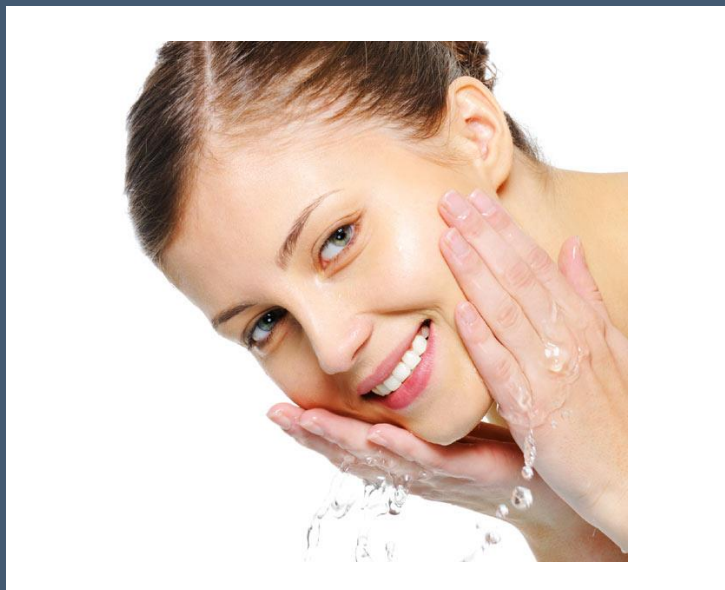
A. Buendía-Eisman

Área de Dermatología. Facultad de Medicina. Granada. España.

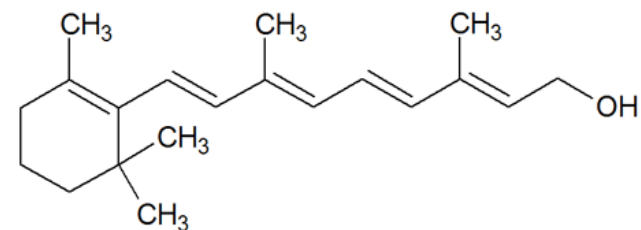
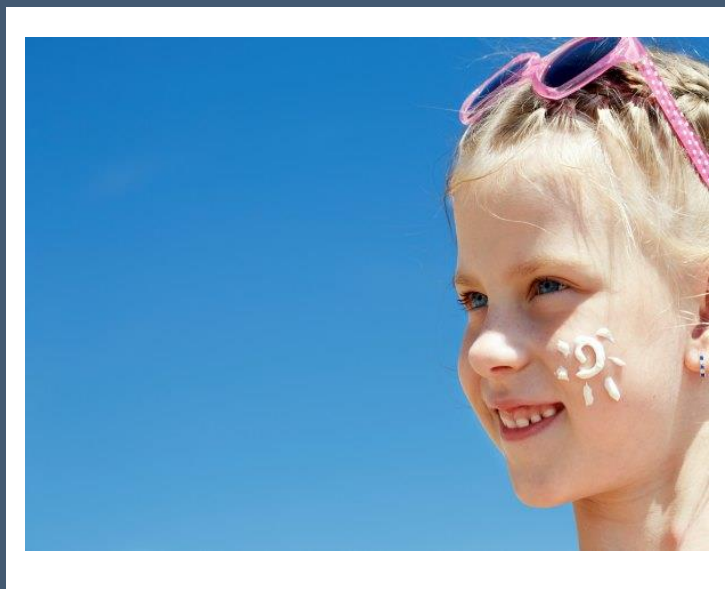
- Mercado millonario.
- Gran Demanda
- Formación Reglada.



- Cosmética personalizada.
- Cosmecéutica.
- Falsos Mitos.



#MENOSMÁS







PIEL
ASFÍCTICA

A man with a beard and white face paint is holding two cucumber slices. The word "LIMPIEZA" is written in white capital letters across the center of the image. The background is a solid light gray.

LIMPIEZA



HIDRATACIÓN



FOTOPROTECCIÓN

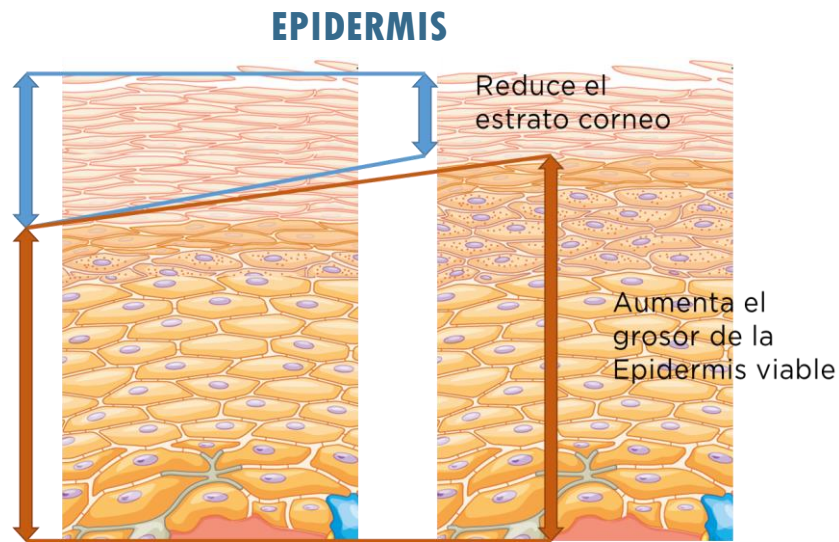


TRANSFORMACIÓN

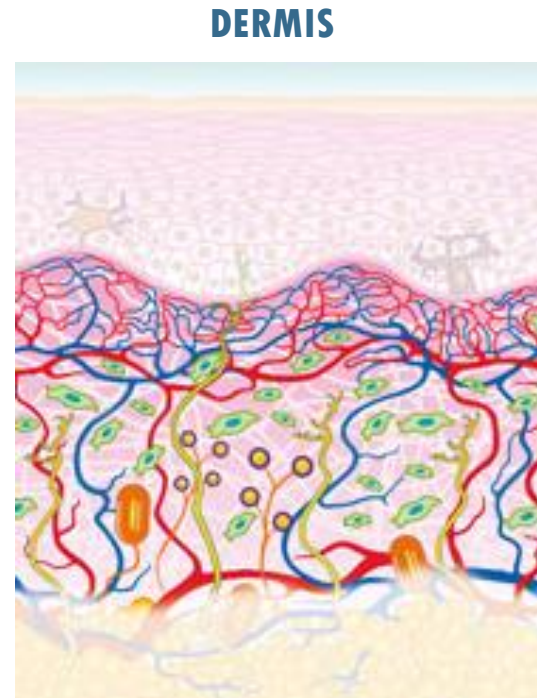
α hidroxiácidos

Ácidos orgánicos con grupo hidroxilo en el $C\alpha$

→ Ácido glicólico, cítrico, láctico, málico, tartárico



- Normaliza la maduración de los queratinocitos
- Disminución de arrugas y cicatrices
- Mayor turgencia de la piel
- Estimula la descamación natural



- Aumenta funcionalidad fibroblastos dérmicos
 - ✓ Favorecen síntesis colágeno I y III
 - ✓ Mejora calidad fibras elásticas
- Aumenta síntesis sustancias intercelulares
 - ✓ Glicosaminoglicanos
 - ✓ Ácido hialurónico

Table 1
General recommendations.

1/General measures <ul style="list-style-type: none">• Avoid smoking.• Avoid artificial UV exposures (indoor tanning).• Avoid intentional UV exposure for cosmetic purposes. When outdoors, seek shade whenever possible. Use protective clothing in addition to skin photoprotective care.• Maintain a healthy life-style, with a diet rich in fruits and vegetables, limited alcohol intake, and enough sleep.
2/Recommendations for daily skin care regimen
A/In the morning: <ul style="list-style-type: none">• Avoid over washing the skin as it may damage the natural skin barrier function. Use a gentle cleanser, avoid soap.• Use cosmetic products to improve skin barrier function and use cosmetics with topical antioxidants to reduce harmful effects of ozone and IRA on skin aging.• Use photo protective measures: broad spectrum UVA-UVB sunscreen to block UV radiation and to prevent photo reactive compounds to being produced under UV exposure.• For darker skinned individuals consider adapted sunscreen to protect the skin from shorter wavelength visible light in addition to well-balanced UVA/UVB protection.
B/In the evening: <ul style="list-style-type: none">• Use rinse-off products (gels, shampoos) to clean off pollution on the skin surface and to reduce particle load.• Use cosmetic products to improve skin barrier function and to repair aging signs.

Futuro del exposoma



LOS CAMBIOS DEL EXPOSOMA SON A-DISCIPLINARIOS







GREEN INDEX

**¿BENEFICIO
LINEAL?**



A black and white photograph of Jonas Salk, a man with glasses and a white lab coat, administering a vaccine to a young child. Salk is holding a syringe and looking down at the child's arm. The child is looking down at the injection site. In the background, there are laboratory glassware and equipment. The text "SALUD PLANETARIA" is overlaid in large, white, bold, sans-serif capital letters. The name "Jonas Salk" is overlaid in a smaller, white, italicized serif font.

SALUD PLANETARIA

Jonas Salk



NATURE EXTINTION EXPERIENCE

AMNESIA GENERACIONAL AMBIENTAL



**"PUT SIMPLY THERE IS NO HUMAN
HEALTH WITHOUT PLANETARY HEALTH"**



Vocalía Nacional
de **Dermofarmacia**



Farmacéuticos

Consejo General de Colegios Farmacéuticos