

ZOOM #29



Édito

Skinobs wishes you a happy New Year 2024 with successful and enthusiastic testing projects. This year we will continue to share with you and all evaluation managers of the Beauty industry, trends and news about actives and finished products evaluation whether it is in-silico, in-tubo, in-vitro, ex-vivo or on human studies. We look forward to giving great testing panorama through the 3 Zoom, the 2 Focus, the weekly Testing Cosmetics Newsletter and to meeting you at Cosmetagora, and in-cosmetics Global in Paris, NYSCC in New York, in-cosmetics Korea or in-cosmetics Brazil... Cosmetotest, the international testing symposium organized in collaboration with Cosmet'in Lyon is coming back in Lyon on May 29th and 30th. This 29th ZOOM issue, presents information about the in-vitro and in-vivo evaluation of the skin pigmentation. As always we are thrilled to give you the latest news of our partners: IEC, Mérieux Nutrisciences, CIDP, Ellead, Pixience, Microfactory, Validated Claim Support, Helioscreen, SGS Proderm.



Happy reading ! Anne Charpentier, CEO

Did you know?

Skinobs platforms are **2 international databases** renowned as a reference in the testing field of actives and personal care. It represents, with users from 84 nationalities, a unique tool for **preclinical assays and clinical studies** giving qualified information. You can find classical or innovative methods connected to the testing laboratories around the world.

The Preclinical Testing categories you can find:

- **Consulting**
 - Toxicology
 - Regulatory
 - Efficacy testing
 - Cosmetovigilance
- **In-silico**
- **Physico-chemical**
- **Microbiology**
- **Safety**
- **Penetration**
- **Ecotoxicology**
- **Interaction container-content**
- **Efficacy: skin**
- **Efficacy: hair**
- **UV Protection**
- **Data Analysis**

The Clinical Testing categories you can find:

- **Tolerance**
- **Consumer tests**
- **In-vivo efficacy on**
 - Skin
 - Scalp
 - Hair
 - Nails
- **Efficacy on hair strands**
- **Sensory Analysis**
- **In-vivo efficacy: oral care**
- **Consulting for testing**

Log in now, www.skinobs.com, for free, to access the search or send us your specific request directly at contact@skinobs.com. We will be happy to provide you special advice to help you in your evaluation projects.

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2023 KEY FIGURES

6 300
Users

34 700
Pages consulted

61 830
Articles read

84
Users nationalities

“ Trusting User Testimonial ”

« It's just so convenient to have an extensive range of testing methods listed in one place, with detailed descriptions and strengths of each, and links to the specific organisations that conduct the testing.»

Teresa Hryniewiecka

McPherson's Consumer Products

PRECLINICAL TESTING

400 Methods
55 Skin mechanisms
204 CRO's

CLINICAL TESTING

500 Methods
200 Claims
214 CRO's





SKIN COLOR IN-VIVO EVALUATION AND CLAIMS SUBSTANTIATION

On the platform

- 21 devices
- 99 testing labs
- 32 countries

The skin pigmentation attention is one of the most shared skin characteristics in the world. It evolves over time in various ways according to the several **ethnic, social and cultural communities**. And when it's time to consider external influences, such as UV or pollution conditions associated with whitening or lightening activities, skin color becomes a real **challenge** for the evaluation managers.

What are the present technologies available to in-vivo objectivate the skin color changes?

You can find in the **Clinical Testing platforms**, all the instrumentation dedicated to the color measure of the skin, scalp, hair, nails, or teeth. The claims related to the pigmentation or color are numerous depending on the type of cosmetics purposes. Four main categories of analysis have specific ways to be evaluated; let's have a look:

PIGMENTATION ASSESSMENT

Color and erythema

Chromameter, Spectro-colorimeter, Colorimeter, Mexameter MX 1 (C+K), SkinColorcatch, DermaLab colorimeter (Cortex), SiaScope, TiVi 70 Skin Colour (Wheelsbridge)...

Skin surface

C-Cube (Pixience), Antera 3D [Miravex], SkinCam and DigiCam [Newtone]...

Global face

Aeva-HE, EvaFace 5 (Eotech), HeadScan Dynamics, V05 Research (Orion), VisioFace (C+K), Visia-CR...

1. Skincare and color parameters are linked to the skin conditions and its surface imperfections. It is summarized by the following claims per type of mechanisms:

- For **global imperfections**: anti-blemish, healthy skin, stretch-marks...
- For **microcirculation**: anti-couperose, anti-rosacea, anti-redness,
- For **ageing**: anti-brown spots, anti-dark circles,
- For **melanin and skin pigmentation or hyperpigmentation**: lightening whitening, self-tanner, tan-activator...
- For **erythema or inflammation**: soothing effect, anti-inflammatory, CBD effect...
- For **radiance and complexion** homogeneity.

2. Makeup evaluation: long-lasting, water resistance, mattifying, transfer...

3. Hair care & dyeing: Anti-grey hair, color lasting...

4. Oral care: gums and teeth color

4 main types of technology measuring the skin color are available:

• **The direct and specific analysis of the color**. The skin color analysis is naturally implemented in the reflectance spectrum of the skin from 400 to 700

nm. The several devices use different light emission parameters: wavelengths, source of light (Xenon, Leds) and directions.

Generally, the quantity of emitted light is defined, and the quantity of light absorbed by the skin is also calculated. The color measurement is based on the evaluation of the **3 main and well-known color components** : L* (lightness from black to white), a* (green/red axe) and b* (blue/yellow axe). The ITA (Individual Typology Angle) can be also calculated.

• **The measure of the color including erythema**, hemoglobin and melanin parameters is made using specific wavelengths to avoid other color influences.

• **The direct but not specific instrumentations** that analyse the **skin surface** and characterize by HD camera the skin color among other parameters are numerous. Each instrumentation has its own image acquisition specificities such as light, probes, sensors and always a dedicated software including algorithms, I.A (or not) and illustrative results.

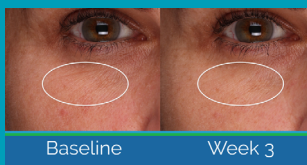
• Then other technology refers to **global evaluation of the entire face** using specific equipment that includes the measure of the skin color and erythema.

• Finally, alternatives methods are given by **high-tech visualization** of melanosomes and pigments by **confocal microscopy**, but also by **scoring from experts and auto-evaluation questionnaire** combined with biometrological measure.

The challenges of color measure are the room environments of the light but also the humidity and the temperature, and the reproducibility of the measure location, indeed, it is important to choose between measuring a small skin zone precisely and get data and analyzing a bigger zone with images analysis. The use of a specific bench guaranties the accuracy of the measurements.



Evaluation of skin pigmentation by Validated Claim Support



Evaluation of skin pigmentation involves assessing the coloration of the skin. Just a few common methods used include **visual grading, chromameter measurements and photography**. High-resolution photographs can be taken to document pigmentation changes over time. Validated Claim Support offers the highest level of **clinical imaging** in the industry including analysis. The study design and choice of evaluation methods depend on specific goals. A clinical study should involve a **combination of methods**. Validated Claim Support will advise and

partner with you to help determine the most appropriate study design based on the claims you are aiming to make, where you plan to market your product and your budget. Visia-CR5 now allows for even better imaging to illustrative claims or for image analysis.

www.validatedcs.com

What is your spot? by Mérieux Nutrisciences



Dark spots on the skin, or hyperpigmentation, occur due to an **overproduction of melanin**, especially in some areas as back of the hands, face, back and shoulders. There are several different causes of **dark spots**, as **ageing, sun damage, hormonal changes, wound healing or irritation**. For any of these spot types, cosmetic treatments can be applied in order to decrease the **pigmentation of the skin blemish**. How **Mérieux NutriSciences** can evaluate the efficacy of your product that claim for a better even skin tone?

- Skin spot evaluation: The skin imaging analyser able to follow-up of pigmentation reduction over time as the **software processes the image evaluating edges, colour and size** to assess the spot reduction.
- **End users cosmetic treatment satisfaction**. www.merieuxnutrisciences.com

Multimodal assessment of skin pigmentation by IEC Group

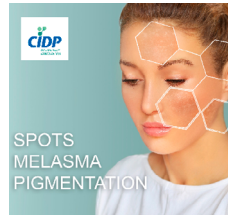
With its **9 centers** in Europe (France, Bulgaria), South Africa and Asia (Japan, Singapore, Korea and China), IEC offers expertise of mono and multicenter studies with adapted modalities to highlight product performance on **pigmentation in relation to skin tone specificities and regulatory requirements** of each country:



- **Instrumental approach** with Spectrocolorimeter (Minolta), SIAscope (MedX), C-Cube (Pixience), color image analyses with Spectroscan and Framescan softwares (Orion Concept) and multi-parameter analysis from Colorface (Newtone) available in each IEC centers.
- **Bioengineering assessment** of mechanisms of action at the epidermis basal layer level with Laser Confocal Microscopy (JC Pittet, E Camel et al., *Depigmenting effect of a cosmetic product in Asian women, SF21C communication, October 2010*)
- **Clinical approach using scoring systems** and a pantone dedicated to the skin

- **Perceived effects by trained assessors or naive subjects**, with 9 EIZO ColorEdge 27" LCD Monitors for grading photos under completely standardized conditions. www.iecfrance.com

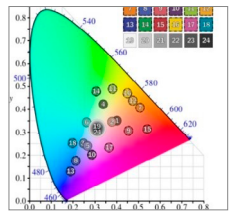
Unlocking the secrets of skin pigmentation by CIDP



Melasma, Vitiligo, Post Inflammatory hyperpigmentation, Lentigo are some of the common pigmentary disorders that has been of cosmetic concern to many. At CIDP, we propose various protocols to substantiate claims across these pathologies. **Over the past 19 years**, CIDP has conducted over **30 studies** on melasma, a skin condition characterised by light to **dark brown or brown-grey colour** patches with symmetrical distribution involving the central part of the face including forehead, cheeks, nose, and chin. Studies involving the comparative efficacy of novel treatments (including hydroquinone) or therapies in improving skin pigmentation are conducted at CIDP under regulated norms. Our **highly trained dermatologists and experts** can visually assess the intensity, size, and homogeneity of pigmentary areas through **standardised scales** (MASI, MSS, PAHPI, VAS). Furthermore, our recent investment, the new upgraded Visia-CR5 now allows for even better **imaging to illustrative claims** or for image analysis.

www.cidp-cro.com

Ellead performs accurate skin tone analysis using its ColorMap



There are many different methods of analyzing skin colors. In the case of the color analysis method using the most representative image, it is very important to obtain an image of the same quality by shooting under the **same conditions of photography**. Color is expressed as a three-dimensional space, and color distortion occurs depending on the photographing equipment or environmental conditions, Ellead operates a **specialized studio optimized for photographing to minimize such color distortion**, develops color references, and uses them for analysis. Since Ellead ColorMap

consists of **40 references including the skin color area**, the **accuracy of the skin color analysis** value can be improved. www.ellead.com

MEASUREMENT DEVICES

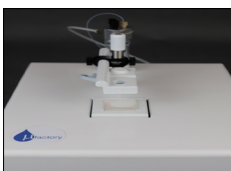
Pigmentation analysis by Pixience



Sunlight exposure, hormones, skin damage, and exposure to certain chemicals affect melanin production and brown spots or discoloration may appear with age. Using its patented lighting and a color calibration process, the C-Cube **converts image pixels into CIE L*a*b* measurements**. They are correlated with **spectrocolorimeters** ($R^2=0.97$). The pigmentation index is correlated with melanin content of the skin and represents the distance to a reference dark skin which maximizes melanin content. The calculation is done for each pixel and the result is displayed using a color map. Using ROI, the average, minimum and maximum values are processed and saved.

www.pixience.com

T-Skin: in-vitro screening test that highlights the barrier effect of skincare products by Microfactory



All cosmetic products have a **barrier effect** that is difficult to measure on volunteers. T-Skin uses microfluidics to **mimic the evaporation of water from the skin** by combining a synthetic polymer skin and a sensor measuring transepidermal water loss (TEWL). This innovation has been recently validated by the first **in-vivo/in-vitro correlation measurements**. By faithfully reproducing the human TEWL, T-skin simplifies these measurements, **discriminate objectively the**

formulations with regards to their performances and validates product claims such as **protective effect, film-forming effect** of ingredients, **absorbing effect** of ingredients and even **anti-perspirant**

www.microfactory.eu

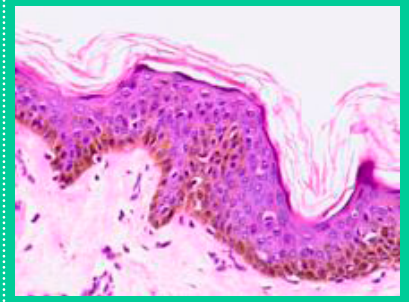
MEET SKINOBS





IN-VITRO ASSAYS TO QUANTIFY THE SKIN PIGMENTATION

Melanin and the ratio between the two types of melanic pigments -eumelanin and pheomelanin- play an essential role in skin tone evenness, in hair pigmentation and in photoprotection. The altered melanogenesis can cause **various pigmentation damages** (hair greying, vitiligo...) and **hyperpigmentation** phenomena like brown spots, melasma, acne lesions...



Human skin pigmentation is obtained by the synthesis of melanin and by its distribution in skin and in hair follicles. It is a complex process mainly managed by the melanogenesis. It is influenced by intrinsic (stress, hormone) and extrinsic factors such as UV radiation, visible light, or pollution. Melanin synthesis, is an **enzymatic process** that is catalyzed mainly by **tyrosinase, tyrosinase-related protein 1 (TYRP1) and dopachrome tautomerase (DCT)** allowing the transformation of tyrosine into melanin within melanocytes, and more particularly in **melanosomes**.

Melanin contained in mature melanosomes, specific organelles, is transported via a **microtubule network** to the **melanocyte dendritic extremities**, then the pigment is transferred to surrounding keratinocytes where they distribute uniformly to ensure a **homogeneous pigmentation and create a photoprotection** which covers the nucleus of keratinocytes.

Several biomarkers activity closely associated with cutaneous pigmentation -**melanin, tyrosinase, alpha melanocyte stimulating hormone, microphthalmia transcription Factor, melanocortin 1 receptor, endothelin-1 (ED1), peroxisome proliferator-activated receptor alpha, delta, and gamma (PPAR alpha, delta, and gamma)**- can be quantified using various method of analysis like proteic dosage, immunohistochemistry, gene expression or proteomics and metagenomics through in-vitro assays whether on **2D human cells (melanocytes) with the opportunity to get primary cells from various skin color donors**, whether **co-cultures with keratinocytes**, 3D skin models printed or not including melanocytes or ex-vivo models. These assays can be conducted under UV modulation (UVA, UVB, infrared-A, visible light), and UV associations.

Recently studies have confirmed the used 3D bio printing to control the distribution of melanin-producing skin cells or melanocytes on a biomimetic tissue substrate to create human-like skin pigmentation. Moreover, other assays demonstrate the decrease of UV-induced skin pigmentation in **keratinocytes and melanocytes showing intercellular communication** between both cells. Studies showed not only keratinocytes can play an important role in keratinocytes-melanocytes crosstalk, but also melanocytes are able to regulate keratinocyte functions via exosome-mediated communication. The modulation of **cell proliferation** appears to be a key factor of the exosomal communication from melanocytes to keratinocytes.

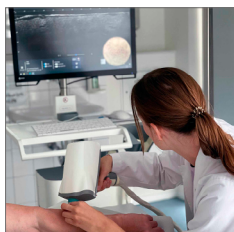
Finally, innovation in in-vitro assays related to the skin pigmentation is a challenged topic with limitless opportunities of protocol design between support, methods of analysis, biomarkers and conditions of cultures and their environment. There are many things to investigate to help the Beauty industry to understand deeper the modulation of skin pigmentation and its application in the development of **new generation of whitening agents**.

Sweat resistance is a key factor in sunscreen protection by Helioscreen



To ensure a good protection performance, sunscreens should not only protect against UV rays but also offer some **resistance to environmental elements**. Sweat is produced to ensure the **thermoregulation** of the body, during physical activity or in the case of high temperatures. In those conditions, customers are usually also exposed to sunlight, so the protection must be intact. In the last few years, HelioScreen developed a **new sweating simulator** to assess the in-vitro sweat resistance of a sunscreen product. Using **molded PMMA plates**, products can be exposed to an artificial sweat solution under specific conditions. Then the percentage of sweat resistance is obtained by calculating the ratio of the Sun Protection Factor (SPF) before and after the exposition. www.helioscreen.fr

2 day seminar: Advances in skin evaluation, measurement techniques and claims by SGS Proderm, 29/02-01/03



When creating raw materials and topical end products, it is essential to conduct studies directly on the living skin of humans. In this **two-day seminar taking place in Hamburg**, SGS proderm has extended invitations to international experts. They will provide a thorough overview of methods and technologies centered around **in-vivo skin testing aimed at generating meaningful results for dermatological studies**. Each technology will be kicked off with a lecture that aims to impart basic knowledge and highlight specific characteristics. Following the lecture, live presentations will be conducted, allowing participants to gain hands-on application experience directly. www.sgs-proderm.de

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