

IN THE MAG

Achieving Instant Gratification

Investing in the Millennial's Dream



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April 2023
Vol. No. 31

EURO COSMETICS

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By Anne Charpentier

Hair is an integral part of one's identity, and people around the world place a great deal of importance on its look and style. Consumers are now looking for more inclusive, natural, ethical, and sustainable products that can help them improve their hair grooming rituals while still providing the necessary cleansing and caring benefits.

Taking care of the scalp and hair is an essential part of any daily beauty regimen. The 3 main objectives of this routine are mainly:

- **Maintain the good condition** of this unique scalp-hair ecosystem considering the internal triggers (stress, diet ...): Exfoliation, Moisture, sebum, sweat, microbiota (*Malassezia*), acidic pH ...
- **Cure and protect** it from external aggressions such as UV, heat, and various pollution...
- **Give the hair a makeover, make it more attractive** and change its style and appearance.

Biometrological measurements to assess hair care performance.

Evaluating the efficacy and safety of hair and scalp grooming products and treatments, as well as improving them for the beauty market, is a key part of R&D. For this, clinical tests, biometrological studies, and in-vivo or hair strand tests are used. However, the challenge for evaluation managers and cosmetic chemists is to find the **right method, a reliable protocol, and a suitable testing partner.**

A multitude of benefits whatever is the type and ethnicity of hair: **Care, Volume, Anti-Frizz, Smoothing, Flat Hair, Repair, Gloss, Shine, Colour, Fine Hair, Curly Hair, straightening effect, Restore, Anti-Sebum, Anti-Dandruff, UV Protection, Anti-Breakage, Moisturising ...**



The various biometrological measurements dedicated to fibres, strands and hair testing are focusing different targets: **the scalp, the cuticle, the cortex, the hair structure** and mechanisms or the growth and can be implemented under controlled conditions of temperature, hygrometry, and humidity (Bossa Nova Humidity Chamber) ...

What are the best practices for assessing haircare products? A comprehensive approach should be taken, which includes a panel tailored to the product's claims, clinical scoring, self-evaluation, instrumental measurements, samples for analysis (such as scanning electron microscopy and microbiota), and illustrative pictures. Additionally, it is recommended to include protocols such as scoring by dermatologists or hairdressers, consumer insights via lifestyle questionnaires, sensory analysis, and emotion studies.

The study of the hair can be classified in 3 main areas:

- The analysis of the **chemical properties** with the measure of the colour and the permeability of the hair,
- The measurement of the **mechanical properties** of the hair
- The study of the **hair volume and the fibres aspect**
- The evaluation of the **scalp conditions** and the aspect of its surface

At Testing Laboratories, hair locks are tested in a controlled environment with a specific temperature and humidity. Standardised hair tresses are used to accommodate different types of hair, such as Caucasian, Asian, Brazilian, African, straight, wavy, or curly. Treatments can be done prior to product application to assess its effectiveness on weakened hair. Additionally, real-life scenarios such as sun exposure, sea exposure, swimming-pool exposure, and sports activities can be simulated to better back up innovative cosmetic claims.



1. Chemical properties

- **Colour and brightness** and permeation, Colour Fade, bleaching test using: Goniolux (*Orion*), GlossyMeter (*C+K*), SkinColor-Catch & SkinGlossMeter, Samba Hair, Mambo, Salsa and Brightness index using the Samba Hair (*Bossa Nova*), SkinCam & SpectraCam (*Newtone*), C-Cube CR (*Pixience*), OptoSurf (*Eotech*).
- **Hair permeability:** infra-red microscopy, Confocal microscopy, Scanning electron microscopy, Optical multiphoton tomography, Atomic Force Microscopy ...
- **Hair protection:** against temperature, radiation, chemicals, odour, or anti-pollution assessment. With anti-pollution end points such as Malondialdehyde (MDA), free fatty acids, the melanin and protein content, and Tryptophan degradation.

2. Mechanical properties

- **Fibre aspects** and swelling Analysis: hair cross-section by dimensional Analysis
- **Mechanical properties analysis** (Young's modulus, Extension to breakage, Stress to break), thanks to the Micro-Tensile Tester MTT675 extensometer coupled to the FDAS. This technique evaluates the impact of hair treatments on the mechanical characteristics of the treated fibers.
- **Combing and abrasion of the hair:** Friba.one, Sirtaki (*Bossa Nova*), Fibrestress. Micro-Tensile Tester MTT175 extensometer.

3. Hair volume and straightness, and anti-frizz effect: 3D reconstruction of a Bolero and Rumba (*Bossa Nova*).

4. Scalp conditions and skinification performance

Are you a R&D manager or Cosmetics chemist looking to study the scalp? If so, you can access the Clinical testing Platform for free and find all the instrumentation and tests used to analyze the scalp. These tests are adapted to the surface topology and size of the area being studied and can be conducted in-vivo on men or women. The results can be quantified and visualized to get the best results you want for your products or actives. How do the

methods used to study the scalp compare to those used to study the skin?

- **Moisturizing effect:** MoistureMap & Corneometer (C+K), Dermalab Hydration, Aquaflux & Epsilon (Biox), MoistureMeter SC, MoistureMeterEpi, MoistureMeterD, C-Cube (Pixience)
- **Barrier Function and scalp protection:** Vapometer, Aquaflux (Biox), pH-meter measures, or the Tewameter Nano (C+K). Scalp visualization: VisioScan (C+K), Antera 3D (Miravex), C-Cube (Pixience), Skin Damage Vizualizer and all dermoscopes ...
- **Soothing effect:** Tivi 700 & Tivi 8000 (Wheesbridge), Thermographie infrar-red, Neurometer, C-Cube (Pixience) ...
- **Seboregulation:** QuantiSeb, Dermalab Sebum, Sebumeter (C+K), SebumScale including sebum analysis: Shotgun mass spectrometry, Metabolomic MS/MS-16srDNA-PCR (Phylogene), Raman microscopy, ATR-FTIR spectroscopy (Newtone) ...
- **Anti-Dandruff** by gravimetry and imaging, DandruffMeter (C+K), C-Cube (Pixience) ...
- **Hair loss and hair growth and density** by phototrichogram, C-Cube (Pixience), Trichoscan, SkinCam (Newtone).
- **Microbiome of the scalp:** Propionibacterium acnes, Staphylococcus epidermidis, Malassezia. Metagenomic analysis such as 16s ribosomal gene sequencing (Phylogene).

As consumers become increasingly aware of the need for eco-responsibility, a new trend is emerging in the form of biodegradability and ecotoxicology tests. Additionally, tests are being developed to measure the amount of water needed to rinse both solid and liquid products.

How is the new digital era impacting the beauty lifestyle and the personalisation of the hair care experience? It is pushing hair salons into the digital age with the use of hair diagnostics and augmented reality solutions. This allows for the analysis of the fibre and scalp, making a diagnosis and personalising hair care treatment on-site based on a client's hair data.



Anne Charpentier is the founder and ceo of Skinobs, two unique and worldwide platforms for both Clinical & Preclinical testing and a news feed and press review dedicated to the evaluation field for ingredients, personal care & cosmetics. She has over 30-year experience as marketing developer in the cosmetics, firstly in the field of clinical testing and then in the field of active ingredients.

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