THE ROLE OF EFFICACY TESTING IN PERSONAL CARE PRODUCTS

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Personal care products

- Skin care: Moisturizing, antiaging, lightening, shaving products
- Bath and Body care: Soaps, syndets, shower gels, deodorants, antiperspirants
- Hair care: Shampoos, conditioners, styling products
- Oral care: Mouthwashes and rinses, toothpastes
Cosmetics and Personal care products
Cosmetic claims

• pH balanced
• moisturizing
• less irritating
• to help strengthen the skin’s barriers function
• to make hair stronger
• reducing the “appearance” of wrinkles
Hair product claims

• repairs split ends
• strengthening the hair
• manageability or efficacy in increasing combability
• moisturizing ability
• protection from heat damage
• make hair shine
• shine, smoothness, strength or volume
Efficacy testing of personal care products

In vitro tests

Ex vivo tests

In vivo tests: Evaluation on human volunteers

- Objective instrumental measurements.
- Clinical expert evaluation
- Volunteer self-assessment,
In Vitro tests

- UVA protection performance of sun care products
- 3D reconstituted epidermis model for safety/efficacy of cosmetics
- Morphological features of the 3-dimensional reconstituted EpiDerm
Ex vivo tests

• Performance tests of hair care products
  • Wet and dry combability
  • Mechanical strength
The influence of shampoos to hair volume

- The determination of silicones and hydrogenated didecenes deposited on human hair from shampoo applications is evaluated.
- Test Shampoo contains Hydrogenated Didecene
- Shampoos containing dimethicone and dimethiconol were taken from the market.
- Strands of human hair were purchased from International Hair Innporters (New York).

The influence of shampoos to hair volume

• The influence of the shampoos to the volume of hair strands was determined applying an imaging system

• Relative volumes were calculated as ratio of volume after versus before shampoo application for each strand
The effect of shampoos to the volume of hair strands

Hans-Martin Haake et al, Determination of the substantivity of emollients to human hair J. Cosmet. Sci..58, 443-450 (July/August 2007)
The influence of shampoos to hair volume

• The volumes of the hair strands shampooed with the 2-in-1 product are only at about 60% of the initial volume.

• Hair strands washed with the shampoo containing the hydrogenated didecene retain their volume even after repeated application.

• The shampoo with hydrogenated didecene shows a good conditioning performance while retaining the volume of the shampooed hair strands.
In vivo tests

• Subjective tests
• Objective tests
  • Invasive techniques
  • Noninvasive techniques
In vivo tests

• **Subjective tests**: These tests are based on an appreciation of product performance made through the senses of either panellists or of experts.

• **Objective tests**: Evaluations made with techniques that are reproducible and measurable, without the influence of any personal thought.
  
  • **Noninvasive techniques** means “a procedure or instrument causing minimal and only temporary changes to structure or function, and in particular, not involving pain, incision, or loss of blood”
  
  • These tests are performed with instruments that can precisely measure given parameters, according to a defined protocol, following the application of a product on human subjects.
CORNEOMETER™ *(Courage + khazaka)*

- Determine the hydration level of the skin surface (Stratum corneum).
- The measuring principle is based on capacitance measurement of a dielectric medium.
TEWAMETER™ (Courage+Khazaka)

Transepidermal Waterloss and Skin Barrier Function
MEXAMETER (Courage+khazaka)

- Assessing Melanin Content and Erythema Level
CUTOMETER™ (Courage+Khazaka)

- The Cutometer® is destined to measure elasticity of the upper skin layer using negative pressure which deforms the skin mechanically.
Skin-pH-Meter

- pH-Measurement on Skin and Scalp
Sebumeter

• Determining sebum on the skin surface, scalp and hair
VISIOSCAN® VC 98

- Visioscan® VC 98 - Skin Topography directly from the Skin
The effect of soaps and synthetic detergents on human skin

• The aim of the study is to compare the effects of soaps and syndets on the skin by wash test.

• The wash test was evaluated by bioengineering measurements
  • TEWL (Tewameter)
  • Skin hydration (Corneometer)
  • Skin pH (Skin pHmeter)

The effect of soaps and synthetic detergents on human skin

<table>
<thead>
<tr>
<th>SOAPS</th>
<th>SYNDETS</th>
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<tbody>
<tr>
<td>A: Antibacterial soap</td>
<td>B: Syndet</td>
</tr>
<tr>
<td>E: Antibacterial soap</td>
<td>C: Semi syndet (Combo bar)</td>
</tr>
<tr>
<td>D: Soap</td>
<td>F: Antibacterial liquid syndet</td>
</tr>
<tr>
<td>G: Soap</td>
<td>H: Liquid syndet</td>
</tr>
<tr>
<td></td>
<td>I: Liquid syndet</td>
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</table>
• All soaps and syndets increased the skin pH value.
• A, D and E soaps had more effect than syndets on the skin.
Changes in TEWL

- All soaps and syndets increased the TEWL value of the skin
- Generally soaps had more irritant effect than syndets. The antibacterial soap A, was the most irritant product.
Changes in humidity

- All soaps decreased the skin hydration value.
- Among the syndets H and I decreased the skin hydration although B, C, F syndets had no significant effect on skin humidity.
The effect of soaps and synthetic detergents on human skin

• It was seen that at the end of the wash test, soaps increased the TEWL and pH values and decreased the skin hydration values.

• Especially the antibacterial soap “A”, which contains triclocarban and triclosan, had more irritant effect than other soaps and syndets.

• All syndets also increased TEWL and pH values of the skin. H and I syndets also decreased skin hydration values but other syndets (B and C) didn’t have any unwanted effects.
Safety and efficacy of personal care products containing colloidal oatmeal

• Colloidal oatmeal is a natural ingredient used in the formulation of personal care products for relief of skin dryness and itchiness.

• Chemical composition of oatmeal consists of polysaccharides, lipids, proteins, flavonoids, minerals, and vitamins.

• Colloidal oatmeal is preferred due to its moisturizing, cleansing, antioxidative and anti-inflammatory properties.

Safety and efficacy of personal care products containing colloidal oatmeal

• Oatmeal-containing personal care products:
  • bath products
  • shampoos
  • moisturizers
  • shaving foams

• A total of 47 subjects completed the study

• Skin hydration was assessed using a Corneometer®

• The desquamation index and the surface area of dead epithelial cells were assessed using adhesive disc stripping (D-squame®) with subsequent digital image analysis.
Safety and efficacy of personal care products containing colloidal oatmeal

• Clinical efficacy was assessed by a dermatologist. Assessments included visual examination of skin dryness and appearance of epithelial squamae, as well as tactile evaluation of skin roughness.

• Subject self-assessment involved a questionnaire with a five-point scale ranging from 1 ("agree") to 5 ("disagree").

• Statistical analysis was performed using SPSS software.
Skin hydration increases during and after use of oatmeal-containing cream.
Surface area of dead cells and desquamation index diminish with use of oatmeal-containing cream.
Clinically assessed parameters improve with use of oatmeal-containing cream.

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ICPC 2016
Subjective evaluation of effect on signs of skin dryness

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ICPC 2016
Safety and efficacy of personal care products containing colloidal oatmeal

• In this study, safety of personal care products containing oatmeal (creams, cleansers, lotions) were evaluated.

• Skin moisturizing and repair properties of an oatmeal-containing skin care cream for dry skin were tested.

• It was found that oatmeal-containing personal care products had very low irritant potential as well as a very low allergenic sensitization potential.

• Sustained skin moisturizing was documented in subjects with dry skin that lasted up to 2 weeks after product discontinuation.
CONCLUSION

• Last steps in the performance evaluation of the cosmetic/personal care products are subjective and objective tests

• Subjective and objective tests based on scientific data are carried out to determine the actual performance of the product

• In the evaluation of the cosmetic/personal care products, subjective tests and objective tests are used as complementary to each other