TRICHOGEN® VEG LS 8960

Trichogenic complex
Anti-hair loss active and conditioner
Physiology of hair

- Stratum corneum
- Epidermis
- Basal layer
- Dermis
- Sebaceous gland
- Arrector muscle
- Zone of permanent hair
- Keratogenous zone
- Area of differentiation and biological synthesis
- Germinative bulb
Hair stem

- Protofibril
- Microfibril
- Macrofibril
- Exocuticle
- Endocuticle
- Cell membrane complex
- Cortex
- Cuticule

Dimensions:
- 70 Å
- 50 µ
- 0.7 µ
The hair follicle is the living part of the hair:

- **the bulb**
  - Made of cells, similar to basal epidermal layers
  - Metabolic activity is important

- **the papilla**
  - Median invagination
  - High vascularization
Physiology of hair follicle

Hair follicles have a periodic and cyclic activity of growth.
Cyclic activity can be evaluated by a trichogram.
Anagen phase

The anagen phase is an active phase of growth, it lasts 3 - 4 years.

★ = keratogenous area
ES = epithelial sheath
IES = inner epithelial sheath
OES = outer epithelial sheath
g = germinative cells
p = dermal papilla
The hair formula

The trichogram determines: the **Hair Formula**

- **Anagen hair**: 84%
- **Telogen hair**: 15%
- **Catagen hair**: 1%

The ratio

\[
\frac{A}{T} = \frac{\text{Anagen hair \%}}{\text{Telogen hair \%}}
\]

- Normal situation: \( \frac{A}{T} = 4 \)
- Pathological ratio: \( \frac{A}{T} < 3 \)
Androgenic or seborrheic alopecia on man

Classification according to Hamilton
Androgenic or seborrheic alopecia on women

Ludwig classification (on women)

Androgenic alopecia is partly linked to the action of androgens on the papilla
Origin of androgenic alopecia

• Inner factors
  - receptivity to male hormones
  - genetic tendency
  - psychic factors

• Nutritional factors
  - deficiencies
    • in proteins
    • sulfur amino acids
    • in vitamins
  - general deficiencies

• Seborrhea
Definition

TRICHOGEN® VEG LS 8960 is an unique trichogenic complex. It consists of a selection of synergistic components of botanical, biotechnological and synthetic origin.
## Composition and mode of action

<table>
<thead>
<tr>
<th><strong>Sulfopeptides of soy (glycine max)</strong> (MW ~ 15,000 Da)</th>
<th>Regulators of cellular nutrition and growth. Supply in bioavailable sulfur, stimulation of protein biosynthesis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Amino-acids</strong>: tyrosine, arginine, ornithine, citrulline</td>
<td>Precursors of proteins and melanin pigments</td>
</tr>
<tr>
<td><strong>Aminosaccharide glucosamine</strong></td>
<td>GAG precursor for strengthening the extracellular papillary / peribulbar matrix</td>
</tr>
</tbody>
</table>
## Composition and mode of action

<table>
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<tr>
<th>Vitamins of B group (PP, B5, biotin)</th>
<th>Regulation of cellular nutrition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zinc salt</td>
<td>Seboregulation</td>
</tr>
<tr>
<td>Panax Ginseng extract</td>
<td>Stimulation of microcirculation</td>
</tr>
<tr>
<td>Arctium Majus extract</td>
<td>Antimicrobial effects</td>
</tr>
<tr>
<td>Silicone and quaternium</td>
<td>Hair conditioner</td>
</tr>
</tbody>
</table>

**Illustrations:**
- Panax Ginseng extract
- Arctium Majus extract
**Efficacy test** (clinical test)

**Anti-hair loss activity**

**40 male volunteers**
with androgenetic alopecia (I to III) A/T ratio < 4

**D0:** sensorial and clinical appraisal - Trichogram

Treatment every two days 10 ml of hair lotion containing **10% TRICHOGEN® VEG LS 8960**

**D56 - D112**
- Sensorial and clinical appraisal by the volunteers and a dermatologist
- Trichogram - Phototrichogram
Efficacy test (clinical test) – Evaluation by the volunteers

Improvement of aesthetic qualities of hair and scalp
Sensorial evaluation

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Improvement (% subjects) after:</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>56 days</td>
<td>112 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>Quite good</td>
<td>Good</td>
</tr>
<tr>
<td>Shape, volume</td>
<td>42.5</td>
<td>5</td>
<td>52.5</td>
</tr>
<tr>
<td>Spring</td>
<td>45</td>
<td>7.5</td>
<td>52.5</td>
</tr>
<tr>
<td>Shine</td>
<td>52.5</td>
<td>5</td>
<td>42.5</td>
</tr>
<tr>
<td>Silk</td>
<td>42.5</td>
<td>2.5</td>
<td>50</td>
</tr>
<tr>
<td>Seborrhea</td>
<td>42.5</td>
<td>6</td>
<td>33</td>
</tr>
<tr>
<td>Irritation</td>
<td>37</td>
<td>29.5</td>
<td>48.5</td>
</tr>
</tbody>
</table>
Efficacy test (clinical test) – Evaluation by the volunteers

Decrease of hair loss

Semi-quantitative appraisal by volunteers of hair loss

Statistics:
- Student's t test
- (*** p ≤ 0.001)
- (**) p ≤ 0.01
- (*) p ≤ 0.05
- (°) p ≤ 0.10
- (NS) = not significant
**Efficacy test** (clinical test) – Evaluation by the volunteers

**Improvement of hair growth**

**Lower hair loss**
- 5%: No effect
- 10%: Medium
- 25%: Good
- 50%: Quite good

**Faster hair growth**
- 5%: No effect
- 30%: Medium
- 40%: Good
- 25%: Quite good

- D56
- D112
Efficacy test (clinical test) – Evaluation by the volunteers

The volunteers have observed:
- an improvement of the aesthetic qualities of hair and scalp,
- a lower hair loss,
- a faster hair growth
Efficacy test (clinical test) – Evaluation by a dermatologist

Improvement of the aesthetic qualities of hair and scalp

- Dull hair
- Lack of suppleness
- "Fly away" effect
- Thin hair
- Splitted hair
- Volume
- Hair being hard to comb
- Oily hair
- Irritated scalp

- 100% of satisfied subjects
- 50% of satisfied subjects
- 0% of satisfied subjects

- D56
- D112
**Efficacy test** (clinical test) – Trichogram evaluation

**Visualization**

![Image of hair visualization](image)

- **Telogen hair**
- **Anagen hair**

(X 40)
Efficacy test (clinical test) – Trichogram evaluation

Quantification

Anagen hair / Telogen hair ratio (A/T)

Statistics:
Student's t test

- *** p ≤ 0.001
- ** p ≤ 0.01
- (*) p ≤ 0.05
- (°) p ≤ 0.10
- (NS) = not sign.

(Alopecia threshold)
Efficacy test (clinical test) – Phototrichogram evaluation

Same area after 4 months of treatment: new hairs appear compared to before treatment, each one in anagen phase
Anti-hair loss activity

After 4 months of treatment, TRICHOGEN VEG LS 8690 clearly:

- Slows down hair loss.
- Improves hair regrowth: the growth is more important, and faster, on the parietal, occipital and frontal zones.
- Improves the aesthetic quality of hair and scalp.
- These effects are quantified, and visible on pictures and by the users.
Other tests available

• Strengthening effect on damaged human hair (*traction test*)

• Film-forming, bio-conditioning and repairing effect on dry hair (*confocal microscopy*)

• Conditioning effect

• Photo-protection of human hair, against UV-B induced damage (*dansyl chloride*)

• Stimulation of oxygen consumption (*epithelial cells*)
Efficacy tests

Strengthening effect on damaged human hair (*Traction test*)

**Protocol**

Hair - Sodium Lauryl Sulfate at 15%

Permanent wave Mercaptoacetate at 6% + H₂O₂ at 2% + rinsing
2 cycles of permanent have been done

Once or 5 times

- Without treatment
- Placebo lotion
- Lotion with 5% TRICHOGEN® LS 8960
  3 ml of lotion on hair tress during 30 min + rinsing

24 h after the last treatment
Traction test: after 1 treatment and after 5 successive treatments
Efficacy tests

Strengthening effect on damaged human hair (*Traction test*)

The strengthening activity of **TRICHOGEN® VEG LS 8960 at 5%** on damaged hair is clearly demonstrated: the increase of hair mechanical parameters is significant even after only one application.
Efficacy tests

Film-forming, bio-conditioning and repairing effect on dry hair

Confocal microscopy

Hair was damaged by an acetone/ether blend and then treated with

**TRICHOGEN® VEG LS 8960** at 10%

**TRICHOGEN® VEG LS 8960** at 10% has clearly improved the surface of hair, and shows a good hair conditioning / repairing effect.
Efficacy tests

Conditioning effect

Quantitative evaluation of the conditioning effect of a lotion containing 10% TRICHOGEN® VEG LS 8960

TRICHOGEN® VEG LS 8960 at 10% has significantly improved combing parameters of hair. It has a good conditioning property.
Efficacy tests

Photo-protection of human hair, against UV-B (dansyl chloride)

Results

**TRICHOGEN® VEG LS 8960** has shown a strong photo-protective effect of hair (increasing the fluorescence intensity by **+28.8%**)

- **Untreated control hair**
  - No UV
  - UV
- **Reaction with dansyl chloride**
- **Fluorescence quantification**
- **Standard washing with Sodium Lauryl Sulfate (= SLS) at 5%**
- **Treatment with a hair lotion containing 10% of TRICHOGEN® VEG LS 8960**
- **Hair lock**

**Fluorescence intensity (Arbitrary units)**

**Statistics:**
Mann Whitney's U test (*) significant/corresponding control

* UV-B 270 J/cm²

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Efficacy tests

Stimulation of oxygen consumption

Polarographical measurements on homogenate of epithelial cells

% increase of oxygen consumption

Concentration of TRICHOGEN® VEG LS 8960 (%)

Significant and dose-dependent increase of oxygen consumption by epithelial cells.

TRICHOGEN® VEG LS 8960 clearly improves cell vitality.

Statistics:
- Average of 5 trials ± SEM
- Kruskal Wallis's test: Significant
- A posteriori test: Mann Whitney U test
  (*) significant difference in comparison to 0.5 %
Cosmetodynamic properties

Decrease of hair loss and stimulation of hair growth
  cellular metabolism and oxygenation are increased

Improvement of the aesthetic qualities of hair
  improvement of hair softness, vitality, combability,
  suppleness, health

Improvement scalp condition
  the scalp is healthier
  sebaceous secretion is regulated
  dandruff, itchings are decreased
Cosmetic uses

- Anti-hair loss preparations
- Anti-age hair care

Formulations

- **leave-on preparations:** aqueous, hydro-alcoholic tonics
- **rinse-off preparations:** shampoos, conditioners
Technical data

Aspect: limpid light yellow liquid with a characteristic odor

Dose of use: Anti-hair loss courses: 10%
As complementary hair care: shampoos: 3 - 5%

Solubility: soluble in water, in hydroalcoholic solutes and insoluble in oils

TRICHOGEN® VEG LS 8960
The effective active ingredient against hair loss