



# MORE ENERGY FOR HAIR FOLLICLES

**Ingredient** | Hair and especially the hair follicles react when they are exposed to bad and harmful influences on a daily basis. A shortening of important hair growth phases can be the result. A new active ingredient based on Yerba Santa has a stimulating effect, which Dr Christina Pickel explains.



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**N**ot only the skin, but also the hair and scalp are exposed to a range of harmful factors every day. Many of these cause the formation of reactive oxygen species (ROS), which further damage cellular proteins and lipids, but also cause oxidative DNA damage in the sensitive hair follicle cells.

The intrinsic defence mechanism against ROS involves the protein

Nrf2, a so-called transcription factor. This master regulator of the oxidative stress response activates the synthesis of cell protecting enzymes that fight oxidants and replenish used cellular antioxidants such as glutathione. However, this cellular self-protection system is unable to cope with excess oxidative stress and its activity was shown to decline with age.

**Specifics of the scalp**

In the scalp in particular, Nrf2 was shown to be activated upon stress, to decrease ROS levels, and to prevent lipid peroxidation. Thereby, Nrf2 activation reduces the premature progression to the catagen growth regression phase and ultimately ameliorates hair growth inhibition caused by oxidative stress.

To support the cellular self-protection system, to prevent UV-induced oxidative damage and to energise the hair follicles, Mibelle Biochemistry has developed a new active ingredient (SantEnergy). It is a distinct, polyphenol-rich extract of Yerba Santa (*Eriodictyon californicum*), a plant native to the pacific coast regions of North America. The leaves of this plant have traditionally been used to treat upper respiratory infections as well as asthma and have numerous recorded health benefits including anti-oxidant, anti-inflammatory, anti-bacterial and neuroprotective effects.

**Antioxidant effect**

In vitro studies showed that the novel active has a caffeine-like energising effect by **engaging the adenosine receptor** which is also targeted by caffeine. Moreover, it increases the movement score of *Caenorhabditis elegans*, a model organism which reacts similarly to caffeine. In cellular assays, treatment with this active ingredient resulted in a reduction of ROS both inside the cell and at the cell membrane.

The antioxidant activity of the Yerba Santa extract was shown to be in the same order of magnitude as quercetin, one of the most powerful and well-known antioxidants. These beneficial effects were further assessed in isolated human hair follicles, a model culture ideally suited for such investigations in the context of a full mini organ.

**Influence of UV radiation**

While UVB irradiation led to the depletion of Nrf2 in various areas of

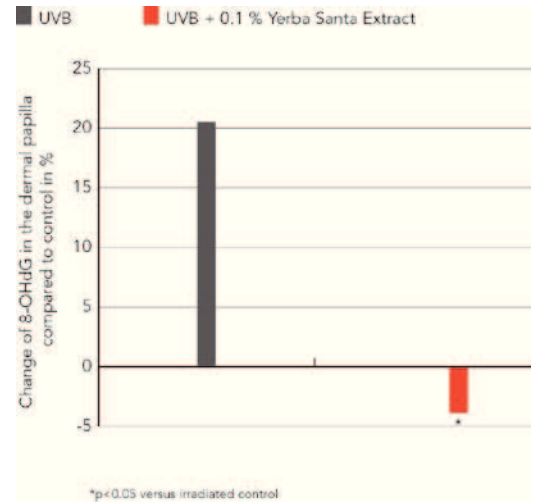


figure 1: Reduction of oxidative DNA damage in the dermal papilla, as assessed through the formation of 8-hydroxy-2'-deoxyguanosine (8-OHdG).

the hair follicle, treatment with the active ingredient significantly reduced this depletion, therefore supporting the hair follicles in protecting themselves from oxidative stress. Moreover, oxidative DNA damage ▶

figures: Mibelle Biochemistry

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The extract of Yerba Santa (*Eriodictyon californicum*) forms the basis for the active ingredient that energizes the hair follicles.

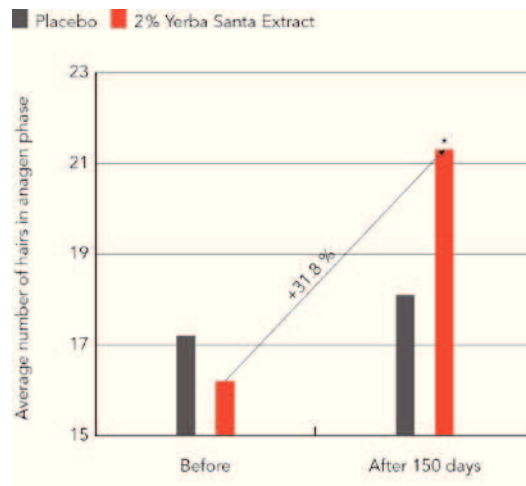


figure 2: Increase in the number of anagen hairs after five months of treatment with the active ingredient “SantEnergy”.

“THE ANTIOXIDANT ACTIVITY OF THE YERBA SANTA EXTRACT WAS SHOWN TO BE IN THE SAME ORDER OF MAGNITUDE AS QUERCETIN.”

Dr Christina Pickel, Mibelle Biochemistry

caused by the UVB irradiation in the dermal papilla was also prevented by the treatment (figure 1).

As a result of the oxidative stress caused by the UV radiation, the hair follicles had prematurely transitioned to the mid to late catagen phase of the hair growth cycle when compared to non-irradiated control follicles. The treatment prevented this premature transition to the regression phase.

**Results proved by a study**

In order to prove the efficacy, the novel active ingredient to reduce hair

loss, a clinical study was performed. For this, 56 volunteers suffering from hair loss (45 women and 11 men; aged 18 to 68 years) were enrolled and separated into two groups: one group applied a hair serum containing 2 % of the active ingredient “SantEnergy” once daily on the scalp for five months, while the other group used a corresponding placebo product.

The results of a cosmetic trichogram analysis showed that the active ingredient induced a **reduction of telogen hair by 20% and an increase of anagen hair by 31.8%** (figure 2). This

resulted in an increase of the hair growth coefficient, the anagen to telogen ration (A/T ratio), by 68%. As the A/T ratio is a direct indicator of the proportion of actively growing hair follicles, it directly impacts on the hair density.

**Conclusion**

Taken together, the new active ingredient is a powerful active ingredient, that energises the hair follicle cells, supports the cellular antioxidant system, and thereby protects the hair from oxidative damage and photo-ageing, starting at the hair root. □

► **GLOSSARY**

- ROS** Reactive Oxygen Species
- Nrf2** Nuclear factor erythroid 2-related factor 2
- Trichogram** Examination method of medicine that is supposed to determine the current hair root status or the hair distribution pattern.
- Eriodictyon californicum** Species of the Boraginaceae family, also known as Yerba Santa (sacred herb), is said to have a natural medicinal effect.

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Christian Eisen, Vice President  
Global Sales & Innovation,  
Faber-Castell Cosmetics

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