

HairRevive **MM + Zn**

Extending the hair growth cycle

NÆOLYS
NATURE EXPANDED



NAOLYS ACTIVE SHELLS

HairRevive

MM + Zn

Extending the hair growth cycle

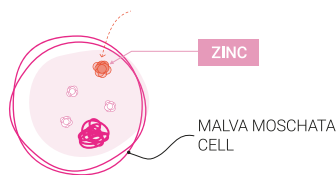
The appearance of our hair deteriorates in various ways with age: it gradually becomes thinner, weaker and grey; it is possible to slow these signs by acting on the key mechanisms involved in the growth cycle.

For thicker, stronger hair and longer-lasting natural colour.

A VEGETAL STORY

An active plant shell
Musk mallow (*malva moschata*,
malvaceae) and zinc

*Musk mallow (*malva moschata*, malvaceae) and zinc are the two components of the new active shell created by Naolys. Specially dedicated to the fight against hair ageing, it combines the active molecules of musk mallow cells, a perennial with pale pink flowers also known for its medicinal properties, with zinc, one of the nutrients essential to the human body's needs for cell growth but which it cannot produce by itself.*



PRODUCT BENEFITS

Anti Hair Ageing

Anti-ageing effect on hair and natural shine

Slows down the hair cycle by extending the lifespan of hair and enhancing its shine and smoothness.

Regenerating, revitalizing

Increases cell regeneration and renewal.

Restructuring

Helps the hair bulb cells to develop, and slows down the phenomenon of hair miniaturisation.

Hair repigmentation

Helps maintain the amount of melanin in hair. Slows down hair depigmentation.

Antioxidant

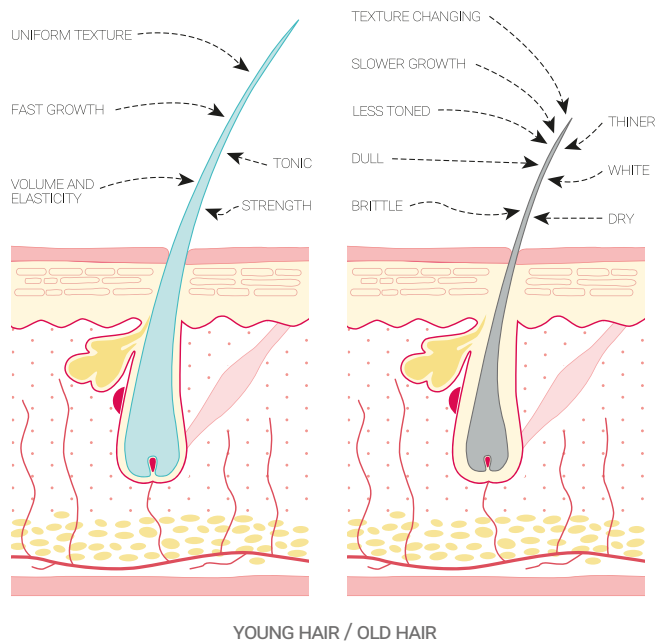
Reduces oxidative stress and the damage it causes. Preserves cellular functions.

NAOLYS

HOW IT WORKS

HairRevive [MM+Zn]: from the hair growth cycle to hair ageing

Just as the epidermis is constantly regenerating, our hair is constantly renewing itself, in a three-stage cycle: growth / transition / rest, also known as anagen, catagen and telogen. 85% of our hair is in the anagen phase, i.e. the growth phase, and given that hair can grow up to 10cm per year, you might wonder why we don't all have hair like Rapunzel. In fact, only 100,000 to 150,000 hairs are visible. 2% of our hair is in the catagen phase and is no longer growing, as the hair follicle retracts by 1.6% of its normal length. Then comes the telogen phase when the hair eventually falls out: 4% to 24% of hair is in this phase. The anagen phase constitutes 90% of the total cycle; it is the longest phase, lasting from two to six years, and is the one in which biochemical activity is most intense.



This cycle only occurs 20 times in our lifetimes, and the later cycles are not as vigorous as the earlier ones. The cycle becomes shorter with age: hair no longer grows back, grows back less quickly, and deteriorates on several levels, becoming finer, sparser, dull, limp, drier, more fragile, more brittle, losing its colour (greying) and volume, and falling out permanently.

All this change originates in the living part of the hair: the hair follicle, from the bulb to the bulge, and also affects the scalp which becomes drier and more sensitive.

This programmed ageing, and the accompanying decline in the appearance of our hair, can be slowed down by acting on several key mechanisms in the hair cycle with a view to prolonging it, thereby lengthening the lifespan of healthy hair.

HairRevive [MM+Zn]: acts on the key factors in hair ageing: renewal, vigour, density and colour

First, by keeping more hair growing, healthy and naturally coloured for longer. The first signs of hair ageing are a reduction in hair quality and greying, the onset of which can vary with ethnic origin. However, it is often said that 50% of the population has about 50% grey hair by the age of 50.

To remedy these two phenomena, which take place during the anagen phase,

through the activation of a growth factor in the hair bulb and stimulating the supply of melanin to the hair bulb keratinocytes through a key factor in molecular signalling, **HairRevive [MM+Zn] helps maintain cell proliferation and development in hair matrix keratinocytes, while decreasing melanin production.**

In addition to greying and poor hair quality, the hair becomes shorter, and more spaced out, eventually becoming visibly thinner on the scalp.

To remedy this miniaturisation of the hair, which ultimately leads to baldness, and concerns the entire hair cycle,

HairRevive [MM+Zn] helps reduce the creation of a key factor in this phenomenon: DHT, a byproduct of testosterone, produced by 5 α -reductase.

Finally, because environmental and internal factors can also lead to a decrease in hair pigmentation, and hair growth itself results in the creation of free radicals, HairRevive [MM+Zn] protects hair follicle cell functions from both natural and induced oxidation.

Thanks to these targeted actions on the entire hair growth cycle, particularly the anagen phase, HairRevive [MM+Zn] repairs the hair, making it shinier and softer, and restoring a more youthful appearance.

CLINICAL TEST RESULTS

Hair repaired and shinier
in 28 days

Declaration of the panel

- **80%** of women said their hair was thicker
- **85%** of women said their hair was less damaged
- **75%** of women said the product had a restorative effect

At the concentration of 0.5%

IN VITRO TEST RESULTS

Rejuvenating effect
on the hair bulb

Regenerating, revitalizing action

- Due to a **18%** increase in VEGF synthesis
- Due to a **27%** decrease in 5 α -reductase activity

Repigmentation effect

- Due to a **20%** increase in cAMP synthesis

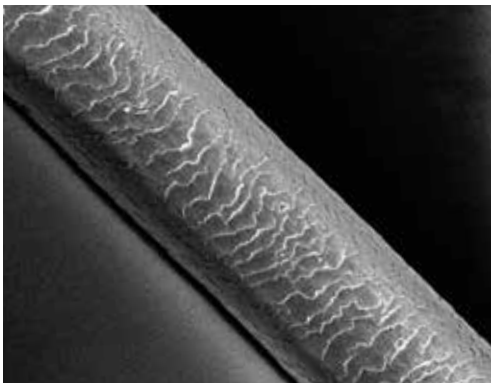
Antioxidant effect

- Due to a decrease in free radicals demonstrated by a reduction of **20%** in endogenous lipid peroxidation and of **25%** in UVB-induced lipid peroxidation (decrease in malondialdehyde)

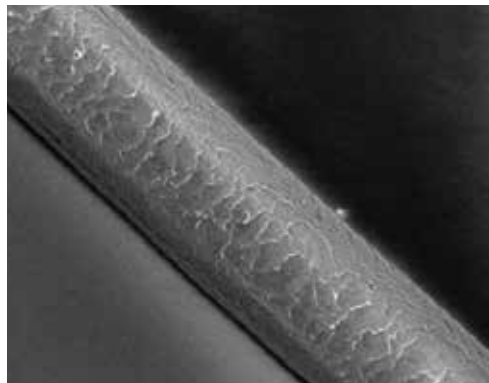
At the concentration of 0.5%

Clinical test results

Restorative effect on hair after 28 days



DAY 0



DAY 28

Clinical study conditions:

- Tested for 28 days on 20 women aged 25 to 45 with naturally dry and damaged hair
- Applied once a day to the hair and scalp
- Emulsion containing 0.5% HairRevive [MM+Zn]

Technical information on the formulation of Serene Skin Sage

INCI name of of the Active plant shells

Water (and) Malva moschata callus extract (and) zinc chloride

form

shells (20%) in glycerin or sunflower oil (80%)

aspect

liquid

concentration

starting at 0.5%

dispersible or soluble

in any formulation (emulsion, lotion, fluid)

In vitro tests results

Extending the hair growth cycle

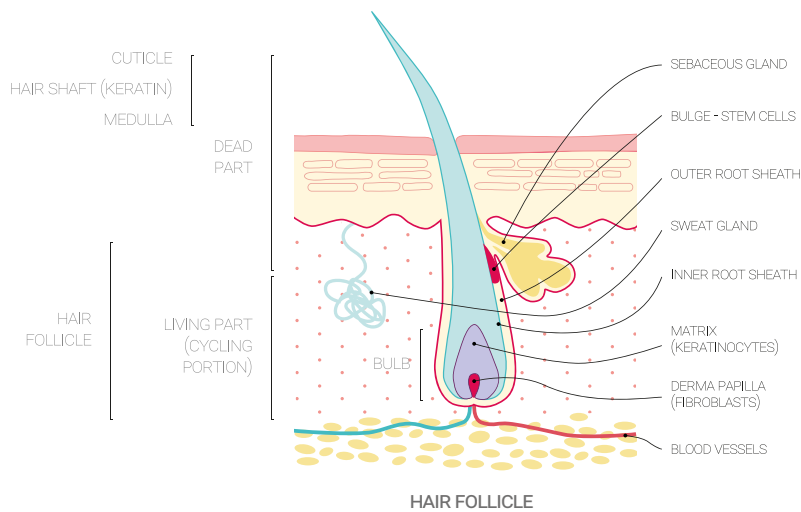
All tests were performed on the hair bulb

By stimulating cell proliferation and growth during the anagen phase

The hair follicle is an organ in the human body capable of autonomous and cyclic regeneration with a complete break between cycles.

It looks like a small oblong pocket in the epidermis, where the hair is produced. It contains three different types of cells, each with a specific role in the hair growth phase.

The hair creation process starts with the stem cells in the dermal papilla. They send signals to the stem cells in the bulge (epithelial stem cells), which are stored in a reservoir under the sebaceous gland (the bulge), and which develop into keratinocytes (matrix progenitor cells); these divide from mother cells into daughter cells, which move up the follicle, becoming increasingly loaded with keratin (keratogenesis), finally forming the hair shaft at the surface. Each cell line has a lifespan of two to six years.

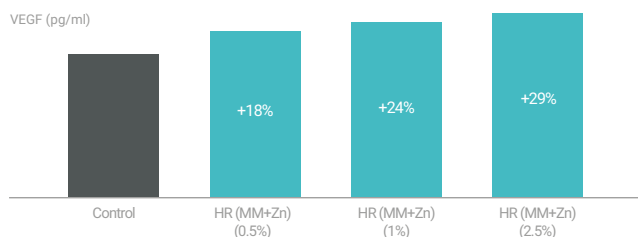


It has been shown that the length of the anagen phase depends on the presence of a growth factor called VEGF (vascular endothelial growth factor). The VEGF synthesized by the dermal papilla cells is a marker of angiogenesis (the creation of new blood vessels), which stimulates the supply of nutrients to the hair follicle, determining the vascularization necessary for hair growth.

Local production of VEGF is therefore crucial in the anagen phase for the development of matrix progenitor cells in the hair follicle and ultimately for the growth of the hair shaft.

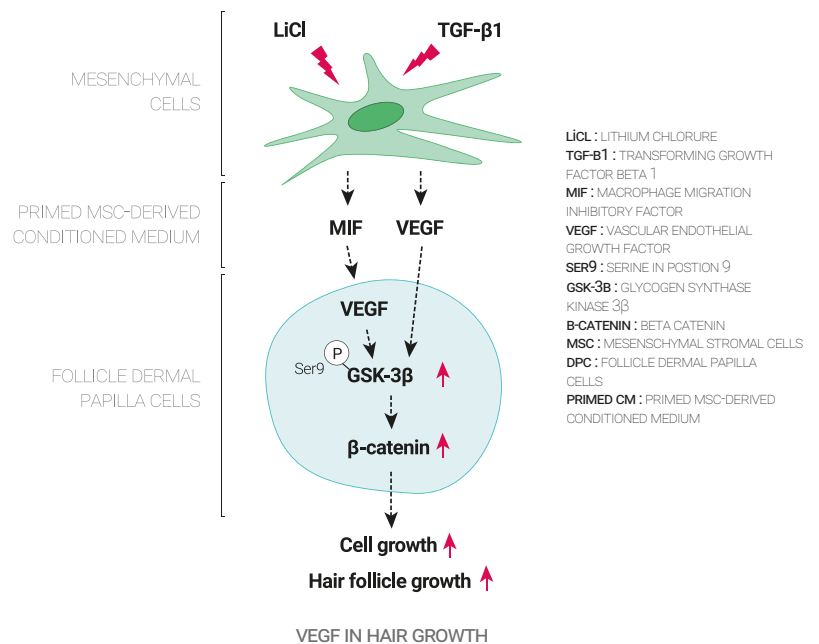
Naolys therefore studied the action of HairRevive [MM+Zn] on VEGF synthesis in the hair bulb.

Study of the VEGF synthesis



Increase of the VEGF

→ At concentrations of 0.5%, 1% and 2.5%, results show a significant increase of the VEGF release by 18%, 24% and 29% compared to the negative control.

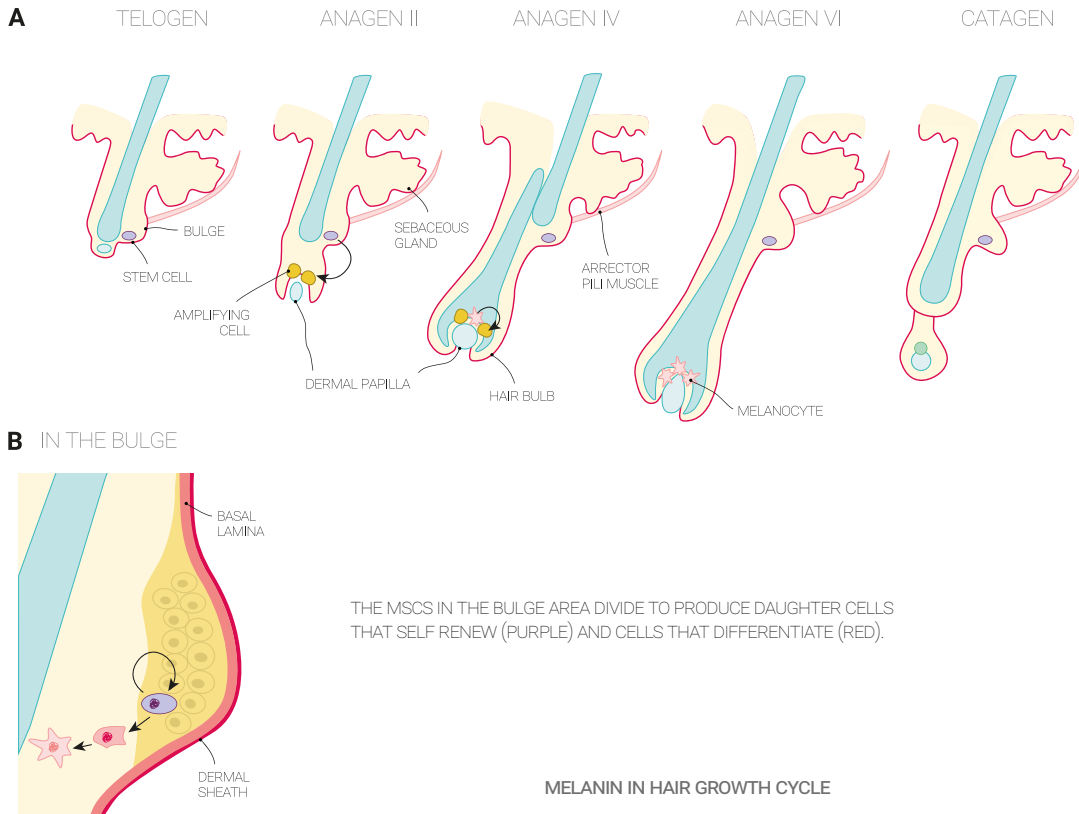


After growth and hair quality, we want to preserve natural colour. Hair depigmentation or canities is the most visible sign of hair ageing, regardless of hair type.

By reducing the depigmentation of the hair fibre during the anagen phase

Hair pigmentation only takes place during the anagen phase.

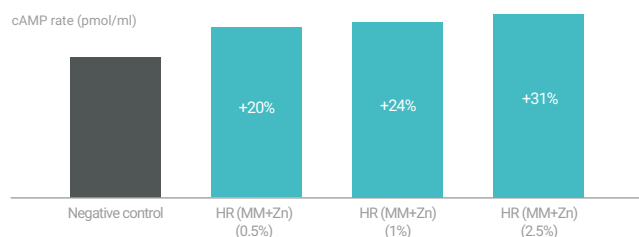
It includes active melanogenesis and the transfer of melanin to keratinocytes in the matrix. The entire mechanism is not yet fully understood. The control of melanogenesis in hair follicles is complex, as it involves a regulatory network and signalling pathways that rely on extensive interactions and interconnections between loosely identified follicle cell subpopulations associated with numerous factors. Melanocyte stem cells are located in the bulge. Controlled by the hair bulb cells, they differentiate, producing melanin and distributing pigment granules to the keratinocytes. We know that follicular melanocytes that complete their differentiation in the hair bulb synthesize melanosomes that are generally larger than those of the epidermal melanocytes. In keratinocytes, large melanosomes are distributed individually while small melanosomes form clusters. In the hair follicles, the melanosomes are distributed individually. Melanocytes die at the beginning of the catagen phase in a way that has yet to be explained.



Similarly, the molecular mechanisms regulating melanocytes and melanin production are relatively poorly understood. Research has shown that, in response to UV radiation, keratinocytes and melanocytes secrete the peptide α -MSH (alpha melanocyte stimulating hormone) which regulates the pigmentation activity of melanocytes. To do this, α -MSH binds with MC-R (melanocortin receptors) inducing activation of the cAMP/PKA transduction pathway and the Ser/Thr kinase PKC pathway leading to de novo synthesis of tyrosinase, and the synthesis of eumelanin, a precursor of melanin.

This is the activation that Naolys focused on, studying the effect of HairRevive [MM+Zn] on cAMP synthesis.

Study of cAMP



Increase of cAMP

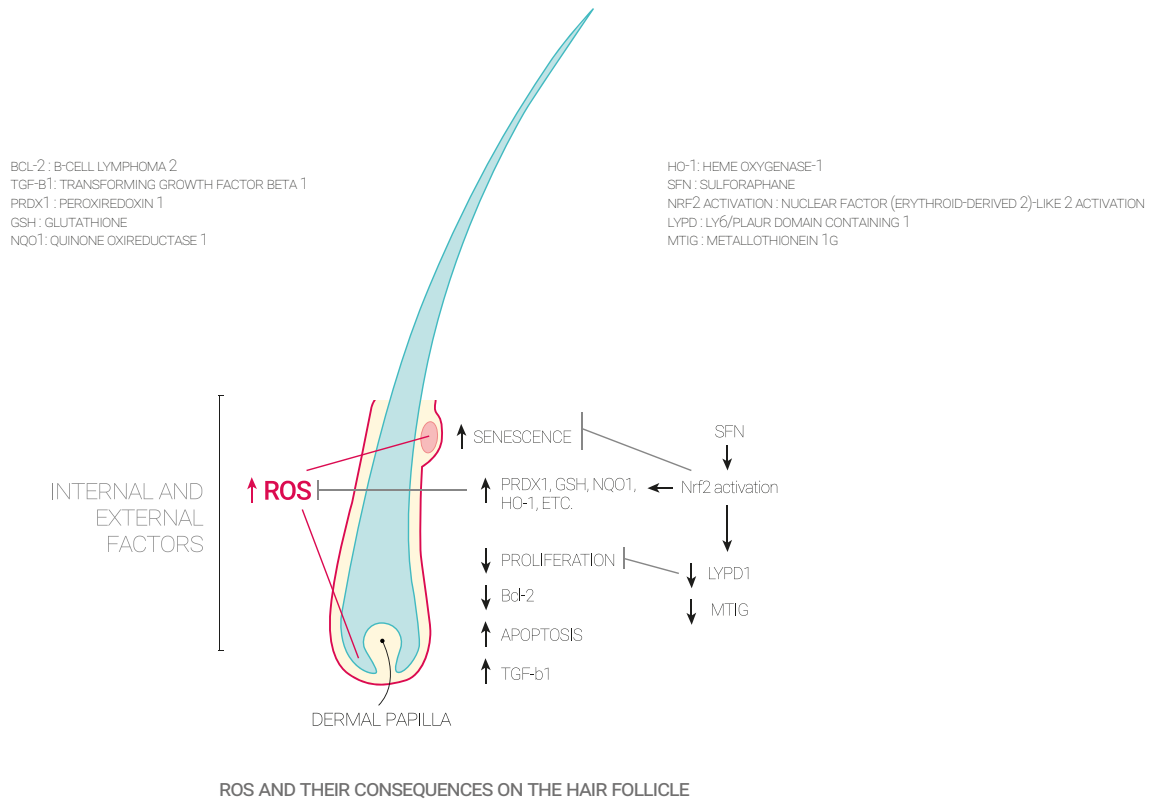
→ At the concentrations of 0.5%, 1% and 2.5%, results show that the product which was incubated with cultured human keratinocytes induced a significant increase of cAMP rate by 20%, 24% and 31%.

Currently, there are four main theories to explain the phenomenon of canities: a reduction in the number of differentiated and active hair bulb melanocytes; poor maintenance of melanocyte stem cells in the bulge and dermal stem cells in the hair follicle; an increase in active hair growth with age, which would lead to increased production of ROS and depletion of active melanocytes and the melanoblast reservoir; and finally, the free radical or redox imbalance theory, in which melanocytes are exposed to a high degree of oxidative stress from multiple sources.

By generally protecting cellular functions from ROS oxidation during the entire hair cycle

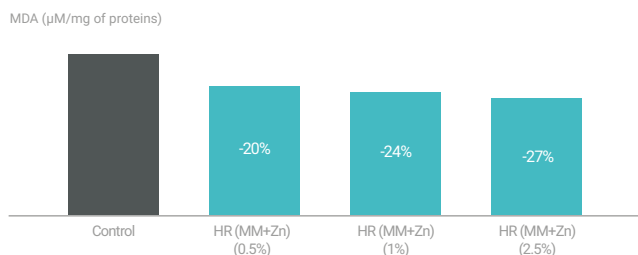
The production of free radicals has many consequences on hair ageing, in particular, it accelerates canities, as it leads to the reduction and apoptosis of melanocytes in the hair bulb.

This ROS production has multiple origins due to internal and external factors. There are environmental factors (UV, psycho-emotional stress and inflammation or intoxication due to the use of dyes) and endogenous factors (abundant production of H₂O₂ and other free radicals during melanin synthesis and other mechanisms). They affect all the hair bulb cells, from their proliferation to their functioning, and also the cells in the scalp.



Naolys therefore studied the release of MDA (malondialdehyde) produced during physiological and induced lipid peroxidation. Endogenous production of free radicals (physiological lipid peroxidation) is usually counterbalanced by various defence mechanisms. But the production of ROS causes them to fail.

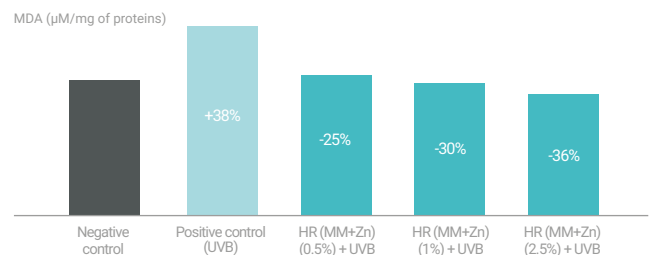
Study of lipid peroxidation In physiological conditions



Decrease of MDA

→ At the concentrations of 0.5%, 1% and 2.5%, results show a significant protection of the product against the physiological lipid peroxidation by 20%, 24% and 27% respectively compared to the negative control.

Study of lipid peroxidation In induced conditions by UVB



Decrease of MDA

→ At the concentrations of 0.5%, 1% and 2.5%, results show a significant protection of the product against the UVB induced lipid peroxidation by decreasing the MDA by 25%, 30% and 36% respectively compared to positive control (+38%).

While oxidation is a general factor in hair ageing, there is another strictly internal one: the hormonal factor, which affects both men and women.

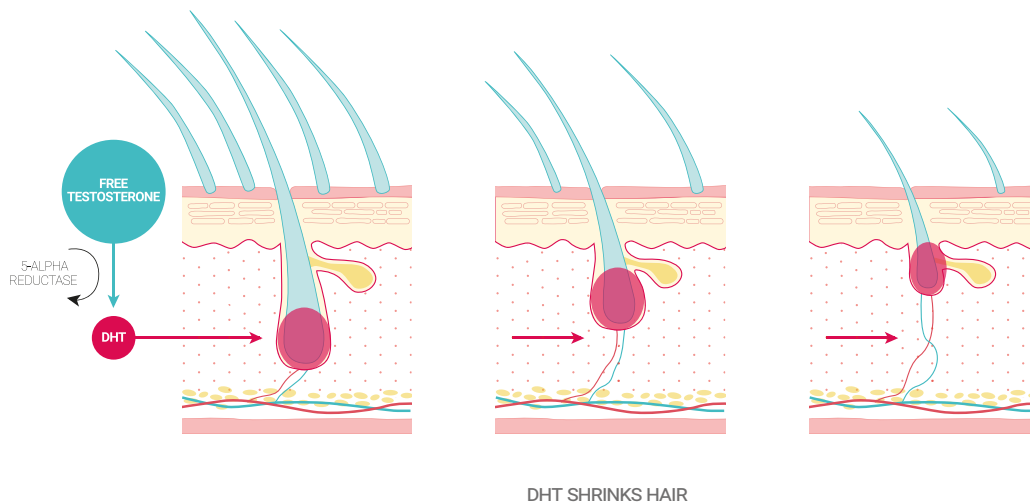
By reducing the effect of an essential agent of hair loss, DHT, via the reduction of 5 α -reductase

The hormone in question is testosterone, the sex hormone that belongs to the androgen group of hormones.

In men, testosterone, produced in the testicles, is the hormone of masculinity: it enables the appearance of certain specific male characteristics such as the growth of body hair, the development of the male genitalia and muscles, libido, the change in the tone of voice, etc. It also plays a role in the adolescent growth spurt during puberty. It generally makes bones stronger.

In women, testosterone is produced in smaller quantities (10 times less) partly by the ovaries and partly by the adrenal glands. It may help maintain libido, but this has not been proven.

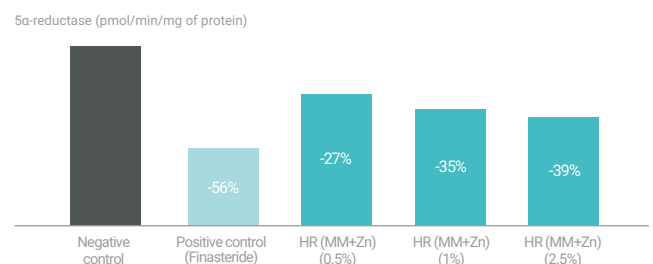
Testosterone is converted into dihydrotestosterone (DHT) by the enzyme 5 α -reductase, in the so-called target organs - for example in the prostate, epididymides or seminal vesicle, and hair follicles. It is also a useful hormone, responsible for hair growth on the back, face (beard), legs and chest, and the functioning of the sebaceous glands and the development of the prostate. Unfortunately, with general ageing, DHT concentration can become too high. And, depending on one's genetic profile, hair growth can be affected.



Problems only occur if the concentration of DHT is too high or if the hair roots are very sensitive to the hormone. In this case, too much DHT binds to the receptors in the hair root, resulting in a lack of oxygen and nutrient supply, which shortens the anagen phase. The hair bulb atrophies and gradually regresses until the hair falls out, leading to baldness.

Naolys therefore studied the effect of HairRevive [MM+Zn] on 5 α -reductase.

Study of 5 α -reductase



Decrease of 5 α -reductase

→ At the concentrations of 0.5%, 1% and 2.5%, the results show that the product significantly inhibited the 5 α -reductase respectively by 27%, 35% and 39%, compared to finasteride, the positive control inducing a 56% inhibition.

The combined action of HairRevive [MM+Zn] on four factors involved in the hair growth cycle allows to limit hair ageing.



See also

Healthy Shine Lilac
EtHAIRReal Peppermint



