

**RESEARCH SUMMARY
FOR HAIRDREAMS PHT-COMPLEX EFFECTIVENESS STUDY,
CONDUCTED BY THE UNIVERSITY OF LÜBECK'S
DERMATOLOGY DEPARTMENT**

1. Concept and Scope of the Study

- Implementation

- Participating institutions:
 - University of Schleswig-Holstein, Campus Lübeck/ Clinic for Dermatology, Allergology and Venerology
 - University of Lübeck / Ratzeburger Allee 160 / 23538 Lübeck
 - Department of Experimental Dermatology
 - AG Hair Biology, Melatonin and Photo Dermatology
 - Overseen by: Priv. Doz. Dr. med. Tobias W. Fischer
- Study timeframe: 2013 – 2014

- Subject and Goal of Analysis

- Hairdreams has developed a new formula for the treatment of genetic hair loss in collaboration with scientists and research institutes. The formula, called PHT-Complex, is supposed to reduce excessive hair loss and stimulate the growth of new hair, and has an international patent pending.
- The University of Lübeck's department of dermatology conducted a scientific study of the new Hairdreams formula's effectiveness, and compared it "Minoxidil", the hair growth substance that is currently most widely used.
- The goal was to examine and establish the effectiveness and competitiveness of the new substance.
- Most importantly, the study was meant to determine to what extent the substance was capable of "waking up" hair roots from their "telogen" resting phase and increasing the number of "anagen", or active, roots in order to enhance natural hair volume.

- Methodology

- The analysis was conducted in the form of an in-vitro study. Hair roots and tissue samples were taken from the scalps of individuals suffering from androgenetic (hereditary/hormonal) hair loss, and examined in laboratory tests.
- The root samples were alternately treated with Hairdreams PHT-Complex and Minoxidil, then compared to a control group receiving no treatment at all.
- The criteria of analysis were as follows:
 - Cell activity (proliferation of Matrix-Keratinocytes / Apoptosis-inhibition)
 - Analysis of the effect on activity and life span of those cells that are responsible for hair growth.
 - Such cell activity is a strong indicator of hair roots future ability to actively produce new, strong hairs.

- Hair root activity (anagen conservation / suppression of catagen induction)
 - Proportion of “anagen” hair roots, which actively produce new hairs, to “telogen”, or resting, hair roots.
 - Background: Individuals suffering from hair loss have a decreasing number of active, “anagen” hair roots. The more roots that can be switched to an active anagen state with the help of the analyzed products, the more pronounced the resulting effect on study participants’ hair volume.
- Effect on “hair shaft elongation“
 - Refers to the speed of hair growth
 - Hair growth speed, in conjunction with an increase in active hair roots, determines how quickly hair volume will increase and lead to a successful treatment of hair loss.

2. Study Results

- Effect on the activity of the cells that are responsible for hair growth
 - Use of Hairdreams PHT-Complex increased cell activity by 32% compared to the untreated control group.
 - Hairdreams PHT-Complex gave a strong boost to those cells that are responsible for hair growth. This suggests that hair growth will increase as a result.
 - When using the conventional active substance “Minoxidil”, cell activity increased by only 5.5%.
 - Hairdreams thus increased hair growth cell activity six times more than would have been the case with Minoxidil!
- Effect on hair growth and hair volume
 - There are two main phases to the hair growth cycle: the anagen phase (actual hair growth) and the telogen phase (hair roots rest and do not produce new hair).
 - On average about 80% of hair roots are in their anagen growth phase, and 20% in their telogen resting phase at any given time.
 - Study participants were individuals whose proportion of anagen hair roots was reduced to only 61%
 - For those same individuals, treatment with Hairdreams PHT increased the proportion of anagen hair roots to 75%.
 - For the average person with approx. 100,000 hair roots, this corresponds to a 23% increase in anagen hair roots, from 61,000 to 75,000 roots. In other words, 14,000 additional hairs!
 - In comparison, treatment with Minoxidil only increased the proportion of anagen hair roots to 63%.
 - For an average study participant, treatment with Minoxidil is thus expected to increase hair volume by only approx. 3.3%, or by 2,000 actual hairs from 61,000 to 63,000 hairs.
 - Hairdreams PHT is thus 7 times more effective than Minoxidil.

- In addition, these findings show that by stimulating hair roots, treatment with Hairdreams PHT results in a significant reduction in hair loss at the very least.
- Effect on hair growth speed
 - Hairdreams PHT-treated hair roots resulted in 12% faster hair growth than that of the control group. Hair thus grew longer faster; about 10% faster than it would if left untreated.
 - Minoxidil only resulted in a 5% hair growth speed increase. Hairdreams PHT's effect on hair growth speed is thus twice as strong!

3. Summary of results

- The study showed that Hairdreams PHT effectively stimulates the hair cells that are responsible for hair growth. It thus has a significant and positive impact on the root growth of individuals who are suffering from genetic and hormonal hair loss.
- Treatment with Hairdreams PHT-Complex increased the proportion of active, anagen hair roots from 61% to 75%, very close to the 80% value that is normal for healthy people without any hair loss at all.
- An average person who has 100,000 hair roots but suffers from hair loss can thus experience an increase in actual hair volume by about 14,000 individual hairs after approx. 3 months.
- On top of that, hair volume is visibly enhanced by the proven approx. 10% increase in hair growth speed.
- When compared to the currently most widely used hair growth product Minoxidil, Hairdreams PHT Complex clearly showed superior effectiveness across all criteria that were examined. The highlight was the approx. 7-fold activation of "resting" hair roots.
- In summary, these results lead to the conclusion that the Hairdreams PHT-Complex is an extremely effective substance to combat hair loss and stimulate hair growth in people suffering from excessive hair loss.

Hairdreams, May 2015