

EVBC  
Dr. Eckart Voss  
Geschäftsführer

Weissenseestr. 21  
D-51375 Leverkusen

phone: +49 (0) 214 5009068  
mobile: +49 (0) 163 96 11 995  
mail: [evoss1@web.de](mailto:evoss1@web.de)

VAT-Nr. DE 24 314 3050

Postbank Frankfurt, BLZ 50010060, BIC PBNKDEFF  
Kto Nr. 9 433 601, IBAN DE66 5001 0060 0009 4336 01

## Final report "Stimulation of hair growth with magnetic spin"

Summary of the results:

Leverkusen, 27.3.2011

In a study of 19 subjects, the effect of MBST - nuclear spin - devices on the stimulation of hair growth was investigated. Eyelashes and scalp hair were assessed. In both cases, average improvements of about 30% were achieved. If an error probability of 5% is taken as a basis, the result in both evaluations is significant.

### 1. background

Nuclear spin has long been known in clinical diagnostics (MRI) as a gentle procedure for precise imaging of the body.

For several years, a modified procedure that uses much less energy (approx. 1/30,000th of an MRI) has proven itself for the treatment of complaints caused by connective tissue degeneration. In well over 100,000 treatments, reconstruction of cartilage and connective tissue was achieved and, for example, joint arthrosis was reduced (Lit.1). Obviously, cartilage growth is stimulated again under the influence of the magnetic field. The spins of the hydrogen atoms are excited.

The structure of the devices is complex: a static basic field aligns the nuclear spins and an alternating field adjusted exactly to the resonance frequency of the respective tissue type allows the nuclei of the target tissue to absorb energy, they are saturated. During the subsequent relaxation, this energy is transferred to the surrounding tissue, thereby stimulating it.

The success in orthopaedics suggested transferring this approach to other tissue types, e.g. the skin or hair. After all, the structures of cartilage and skin and hair are similar. Since attempts to smooth wrinkles with this method had shown positive results, it was obvious to transfer the approach to hair stimulation as well. This study examines the hypothesis that MRI is also suitable for improving hair growth.

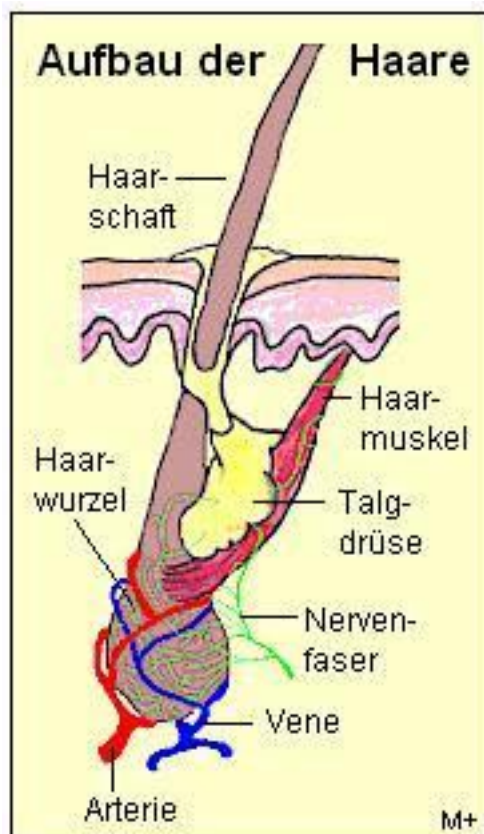
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The following control parameters were collected:

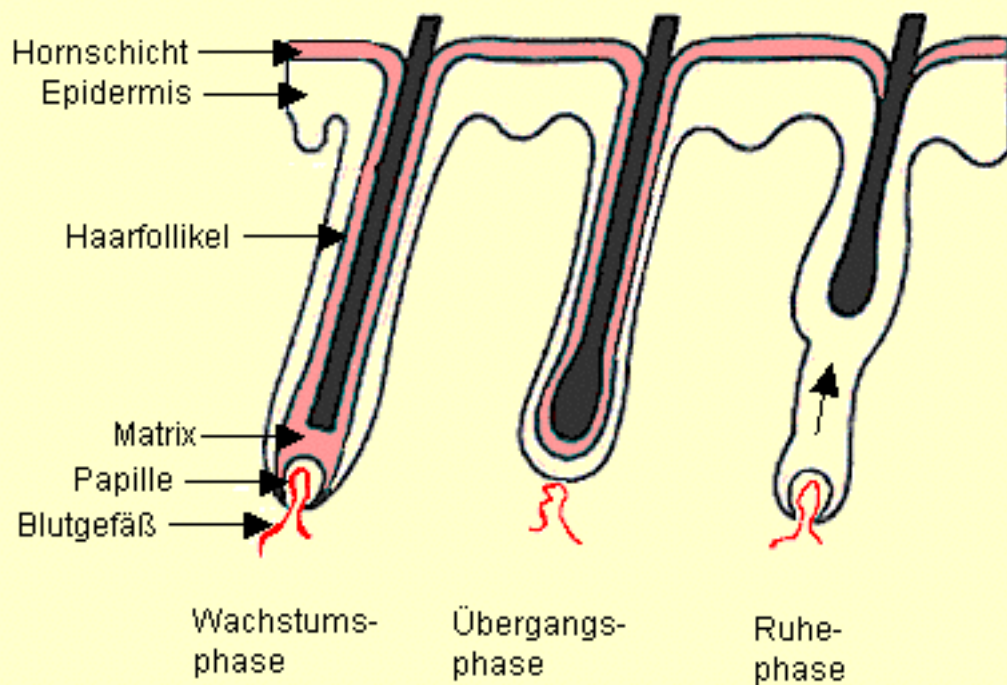
Number of head hairs per measuring area "by video camera before and after 2-3 months of treatment

optical comparison of lash length / density, lash thickness by photography and area evaluation of the lash area.

Since the hair grows approx. 1 cm in 1 month, a positive effect on hair growth should be clearly visible in an experiment lasting 3 months.



## Wachstumsphasen des Haares



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2nd test setup

2.1: General information

The MBST nuclear spin method relies on a highly hydrated environment because water is the energy transfer medium in this method.

Therefore, special products have been developed for the optimal use of this method, which are applied before and between treatments with the aim of providing the target tissue with the strongest and deepest possible water supply.

These cosmetics are based on highly concentrated hyaluronic acid formulations consisting of

long, medium and short chain hyaluronic acids in order to reach all hair surrounding compartments (epidermis to dermis) down to the papilla.

19 subjects of both sexes with clear symptoms of low hair were treated in the cosmetics studio "Bel-Etage" in Leverkusen from August to December 2011. The test subjects received the test products for the previous application (2 days) and were then invited to an initial measurement. The test products were then used throughout the entire course of the test.



Two measurements were made for each treatment period:

2.2: Measurement of lashes with the Visioscope from Courage & Khazaka.

This unit takes high-resolution photos of the facial region under constant and uniform exposure conditions at all times. The second photo is superimposed on the image created at the time  $T=0$  with the help of the software and both images are then displayed side by side for evaluation.





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### 2.3: Measurement of the head hair with a video camera

Using a video camera, areas of the scalp measuring approx. 1 cm<sup>2</sup> are photographed and the hairs are counted. In addition, the hairs in the observation area are shaved off and after 1-2 days the regrown hair shafts are counted.



Measurements were taken at baseline (T0), after approximately 6 weeks (T1) and at the end of the study after 3 months (T2).

7 MRI treatments were performed approximately 2 days apart within 2-3 weeks at baseline, followed by a further 3 treatments directly after T1.

Treatment with hyalurongel was carried out over the entire duration of the study.

### 3. results

#### 3.1 Compliance:

Subjects were extremely hostile to the shave of the small hair area, although this had been agreed before the start of the study. This went as far as complete refusal and exclusion from the study. Therefore, only 19 of the original 26 subjects were able to complete and evaluate the study. For this reason, the intermediate shave on T1 was deleted.

#### 3.2 Evaluation head hair:

Here, as already mentioned, unexpected aversions against shaving made the evaluation considerably more difficult. Therefore, often smaller areas had to be evaluated than intended, sometimes without shaving had to be evaluated, which made counting difficult due to the superimposed top hair.

The evaluable photos are documented in the enclosed Powerpoint presentation. The counter values are shown in the following table:

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Evaluation of scalp hair:

The values are predominantly positive, i.e. there were predominantly increases in the number of hair shafts.

Although the statistics are not outstanding, the lowest confidence range at the 95% confidence interval is also positive. The result is therefore significant.

The subjective assessment of the subjects via questionnaires was more or less in line with the measurement results. TP 14 not only has the best measurement result, it also subjectively evaluates this.

Probnr	Number T0	Number T2	Diff in % T0
• 1	42	52	48%
• 2	29	39	34%
• 3	29	41	41 %
• 4	35	56	57%
• 5	32	36	13 %
• 6	31	33	5%
• 7	22	32	45%
• 8	24	34	42%
• 10	21	25	19%
• 11	30	27	-10%



- 12 26                      32                      23%
- 13 35                      52                      49%
- 14 42                      47                      12%
- 15 12                      30                      150%
- 16 14                      22                      57%
- 17 27                      32                      19%
- 18 52                      48                      -8%
- 19 28                      32                      14%

Diff in% v. Anzahl T2 T0

Diff in% of T2 T0

Median 28.8%

Average value 34.0

pcs: 35% off

Conf. interval 95%

16% top Range of sales 50

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Questionnaire head hair:

Head hair (school grades)

NO.	Grade	quicker TP -	NO Grown	heftier	more -outlay	Satisfied	Would recommend
1	3	3	3	3	3	3	3
2	5	5	4	5	5	5	5
3	1	1	1	2	2	2	2
4	2	2	2	2	2	2	2
5	3	2	2	3	2	3	3
6	2	3	4	3	3	4	4
7	2	2	3	1	2	3	3
8	3	3	2	2	2	3	3
10	2	3	2	2	3	3	3
11	2	3	3	3	3	3	3
12	2	2	3	2	3	3	3
13	2	3	3	3	3	3	3
14	2	2	2	2	2	2	2
15	1	1	1	1	1	1	1
16	2	2	2	3	3	3	3
17	4	4	5	3	5	5	5
18	3	3	3	2	2	3	3
19	2	1	2	1	1	1	1
Mean Value	2.39	2.44	2.83	2.11	2.71	2.78	

We've already done other eyelash growth studies. The effect is almost never very obvious. However, the test persons usually determine the results most reliably themselves

As already mentioned above, we had planned an objective photographic comparison of the effect with the visiometer. The original aim was to see the lash lengths in this way and possibly measure them semiquantitatively by superimposing the photos.

However, this proved difficult in practice, as the lashes were rarely in the same position as at the start of the experiment. Even careful combing did not lead to success.

We have therefore developed a method to determine the total area of the lashes.

For this purpose, the eye areas in the photos were cut out and the eyelashes selected with the help of Adobe Photoshop. This is particularly promising for test subjects whose lash colour stands out well from the skin colour.

A lack of contrast due to e.g. dark skin colour or light eyelashes is therefore disturbing. In these cases the eyelash selection could not be done with the "magic wand" of Photoshop alone, but had to be supported manually (e.g. by cutting out with the "magnetic lasso")





Eyelash growth, increase in area pixels :

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T0 T2 TP Red pixel Red pixel

1 18037 19468 2 9506 12465 3 21304 23354 4 18038 15524 5 18260 21763 6 2811

5121 7 23441 50847 8 36579 47801

10 5915 12019 11 11528 11864 12 21673 23158 13 27248 29857 14 16670 16968 15

10728 13914

16 9562 10335 17 8464 14236 18

19 5309 12476

1.431 2.959 2.050 2.514 3.503 2.310  
27.406 11.222 6.104 336 1.485 2.609 298 3.186  
773 5.772  
- 7.167

eyelashes

longer thicker slightly longer+more longer+thicker nothing to be seen thicker,longer  
longer

longer

longer and thicker much longer+thicker longer+more longer+thicker longer

not anything

more .longer, thicker

longer

image bad longer+thicker

brows

rather less plucked?

a little more

not anything

not recognizable more, longer, thicker not recognized

more

nothing to see not to see longer+thicker bushier+longer more

more

a little more

nothing to see not to see

much more+longer

PX- Diff abs T2-T0

-

Diff. in % of RT0

(T2-T0)/T0

7,9% 31,1% 9,6% -13,9% 19,2% 82,2% 116,9% 30,7% 103,2% 2,9% 6,9% 9,6% 1,8%

29,7%

8,1% 68,2%

135,0%

19,2% 38,2% 44% 20%

58% 18%

appraisement

Median mean value St.abw:

Conf.interval 95% Highest contract range

undermost

Here, too, the differences T2-T0 are usually positive and result in respectable increases in percentage terms of the initial value. If the confidence interval 95% is used again, the lowest confidence interval is clearly positive and the result is therefore significant

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Evaluation of eyelashes questionnaire:

The survey at the end of the study was predominantly positive, although not enthusiastic. The test persons liked the low effort of the treatment best (2.1), faster hair growth led to stronger hair but not to more hair from the view of the test persons:

#### 4. summary of results

The evaluation of the treatment of scalp hair and eyelashes showed clearly positive increases. Considering that the nuclear spin method is slow, i.e. many effects still increase after 3 months, the method is an interesting alternative to classical hair growth agents.

This was also the view of the test persons, most of whom had already tried all other methods. Head hair (school grades) outgrown you

Evaluation of eyelashes questionnaire:

The survey at the end of the study was predominantly positive, although not enthusiastic. The test persons liked the low effort of the treatment best (2.1), faster hair growth led to stronger hair but not to more hair from the view of the test persons:

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*E. Weiss*