

SILVERFREE™

FREEDOM TO BE AUTHENTIC



Before



After 3 months applying SILVERFREE™ 1.5 %

volunteer #7

FORMULATION Water soluble.

Check our formulation examples on www.crodapersonalcare.com

RECOMMENDED USE LEVEL 1.5 %

PATENT pending

INCI NAME Glycerin – Water (Aqua) – Palmitoyl Dipeptide-52

NATURALNESS according to ISO 16128 Natural content 29.4 %, natural origin content 99.4 %



2-0024-06-100-00

FUNCTION Fights against hair greying.

DEFINITION Hydroglycerin solution of Palmitoyl-prolyl-proline (Pal-PP) titrated at 6000 ppm.

BENEFITS SILVERFREE™ re-educates hair bulbs to progressively restore the authentic hair pigmentation while offering protection against oxidative damage caused by cell activity and the exposome. It helps everyone maintain their identity and embrace with pride the individuality of their own hair colour.

CHARACTERISTICS SILVERFREE™ stimulates the whole process of hair pigmentation from the genes (CREB, MITF and TYRP1) to melanosome transfer. It also restores the melanocyte inner defence and maintains the redox balance to fight against extrinsic and intrinsic oxidative stress.

POINT OF INTEREST SILVERFREE™ is a biomimetic lipopeptide based on the proline aminoacid known for its role in stress response.

APPLICATIONS SILVERFREE™ can be incorporated at the end of the formulation in all types of hair care products. It is suitable for cold process.

HAIR

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CLAIM SUBSTANTIATION

in vivo

4 independent clinical studies - 84 volunteers, 8 females and 76 males - 42 years old mean age - White hair level 5 to 55%

EFFECT ON WHITE HAIR DENSITY

Application of a hair lotion containing 1.5% SILVERFREE™ for 3 months.

3 clinical studies: 59 male and 4 female volunteers, 5 to 40% of white hair.

White hair density.....**-32.43 %/T0**

.....down to **-86 %/T0, 81 %** respondents

1 study: 21 male volunteers, 20-40% of white hair.

White hair density - temple.....**-37.5 %/T0, p<0.01**

.....down to **-70 %/T0, 100 %** respondents

White hair density - nape.....**-31.9 %/T0, p<0.01**

.....down to **-70 %/T0, 95 %** respondents

REMNANT EFFECT

Assessment of the persistent pigmenting effect at 3 and 4 months after the end of use of SILVERFREE™ 1.5%.

2 studies: 17 male and female volunteers, 15 to 55% of white hair).

3 months after the last application.....**-39.9 %/T0, p<0.01**

.....down to **-60 %/T0, 100 %** respondents

4 months after the last application.....**-22.2 %/T0, p<0.05**

.....down to **-45 %/T0, 80 %** respondents

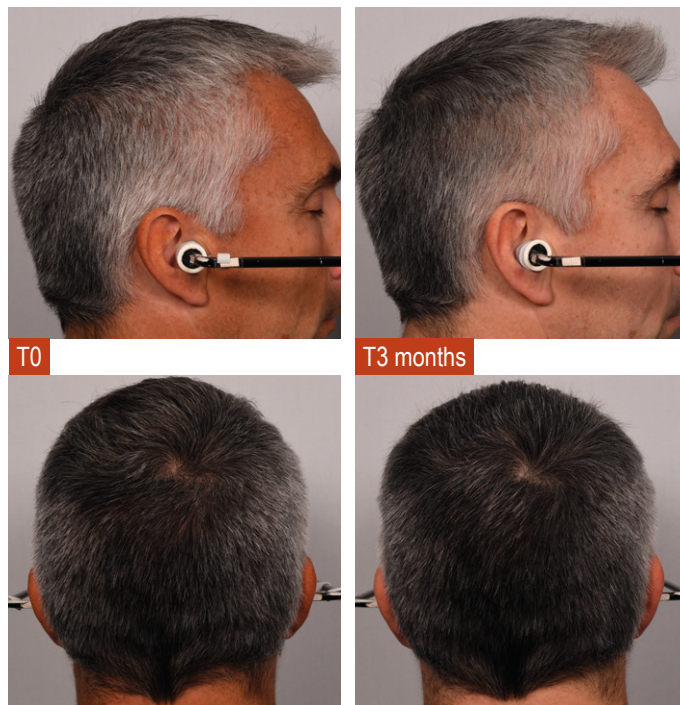


T0

T4 months

T8 months

#1



T0

T3 months

#1s

By favouring hair melanisation, SILVERFREE™ reduces the white hair density to visibly reveal the authentic hair pigmentation. SILVERFREE™ helps to harmonise hair colour and provides a remnant effect that remains for at least 4 months after the last application.

in vitro

GENOMIC CONTROL

Melanogenesis occurs under the control of several transcription factors. CREB regulates the expression of the transcriptional factor MITF which induces TYR and TYRP1 production.

CREB-gene expression⁽¹⁾

SILVERFREE™ eq. 0.167%.....**+46 %/control, p<0.01**

SILVERFREE™ eq. 0.205%.....**+56 %/control, p<0.01**

MITF-gene expression⁽¹⁾

SILVERFREE™ eq. 0.167%.....**+39 %/control, p<0.01**

SILVERFREE™ eq. 0.205%.....**+42 %/control, p<0.01**

TYRP1-gene expression⁽¹⁾

SILVERFREE™ eq. 0.167%.....**+42 %/control, p<0.01**

SILVERFREE™ eq. 0.205%.....**+54 %/control, p<0.01**

CELLULAR DEFENCE BOOSTER

Cells inner defence⁽²⁾

Catalase.....**+31 %/control, p<0.01**

GSH.....**+27.7 %/control, p<0.05**

Bcl-2.....**+64 %/control, p<0.01**

ROS production⁽³⁾

Control + H₂O₂.....**+1062 %/control**

SILVERFREE™ eq. 0.167% + H₂O₂.....**-25 %/control, p<0.01**

SILVERFREE™ eq. 0.208% + H₂O₂.....**-33 %/control, p<0.01**

INCREASE IN MELANIN PRODUCTION

Tyrosinase activity⁽⁴⁾

SILVERFREE™ eq. 0.083%.....**+115 %/control, p<0.05**

SILVERFREE™ eq. 0.167%.....**+175 %/control, p<0.01**

DENDRICITY AND MELANOSOME TRANSFER

Melanosome transfer⁽⁵⁾

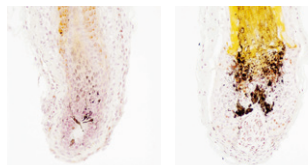
SILVERFREE™ eq. 0.083%.....**+50 %/control, p<0.05**

SILVERFREE™ eq. 0.167%.....**+283 %/control, p<0.01**

Dendrite length⁽⁶⁾

SILVERFREE™ eq. 0.083%.....**+20 %/control, p<0.01**

SILVERFREE™ eq. 0.167%.....**+57 %/control, p<0.01**



X11.7, p<0.01

Test performed by BIO EC (France), female donor, dark blond low pigmented hair explant, 51 years old

TECHNOLOGIES
1 NHM culture + qRT-PCR, SILVERFREE™
2 NHM culture + qRT-PCR, SILVERFREE™ eq. 0.167 %
3 NHM culture + DCFH-DA fluorescence assay, SILVERFREE™
4 NHM culture + bicinchoninic acid assay, SILVERFREE™
5 NHK culture + fluorescence, transfer simulation using melanosome-like structures, SILVERFREE™
6 NHM culture + immunofluorescence, SILVERFREE™

SILVERFREE™ induces an overexpression of the key pigmenting genes and reactivates melanocyte function. It also promotes hair re-pigmentation by stimulating dendrite elongation, improving melanosome recruitment into keratinocytes. By boosting cells inner defence, SILVERFREE™ protects the cells against oxidative damage induced by the cellular metabolism and the exposome, ensuring melanocyte function integrity.

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