

PURICARE® LS 9727

***Moringa oleifera* proteins
for hair care**

Moringa oleifera

Beauty Creations
The Passion for Beauty

 **BASF**
The Chemical Company



- Native to India
- Cultivated in all tropical and sub-tropical areas: Asia, Africa, South America.
- Fast growing tree
- 5-10 meters high



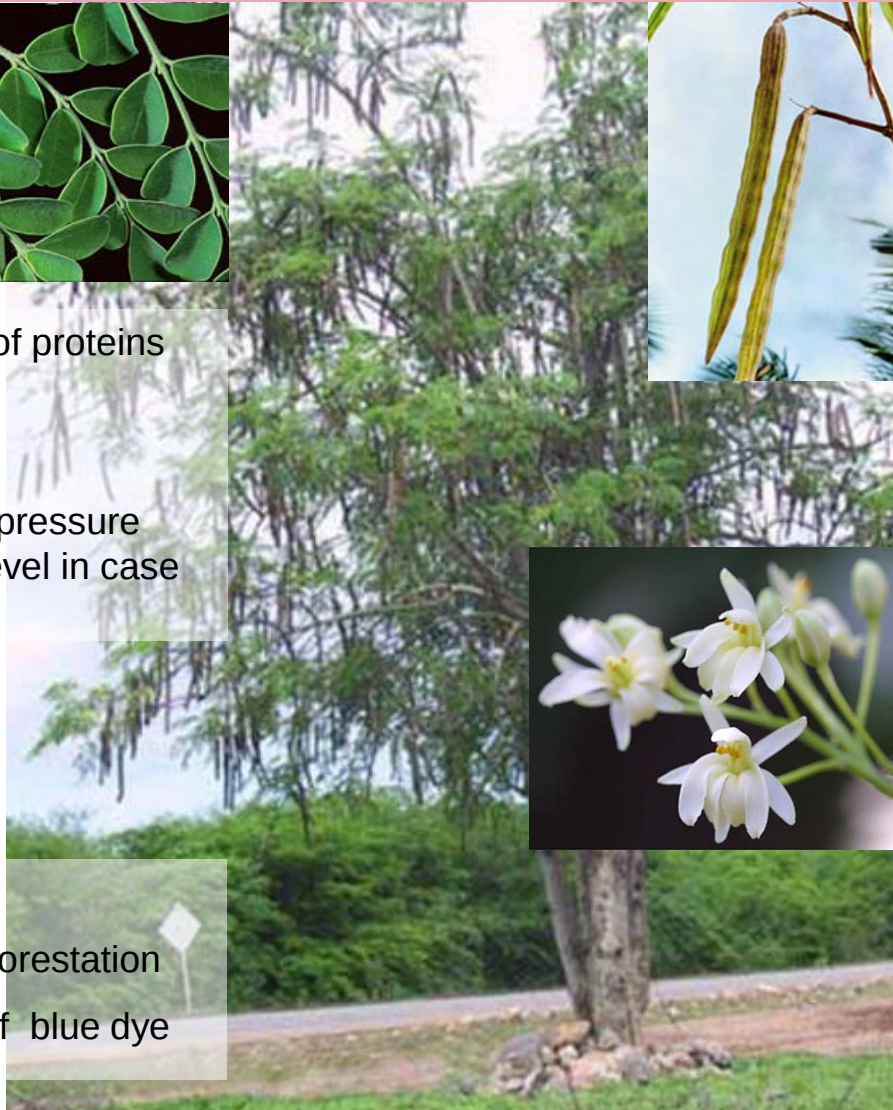


Moringa oleifera is also known as:

- *Nebeday*
- *Horseradish tree*
- *Drumstick tree*
- ***Miracle tree***



- Important source of proteins and vitamins
- Skin antiseptic
- Control the blood pressure and the glucose level in case of diabetes



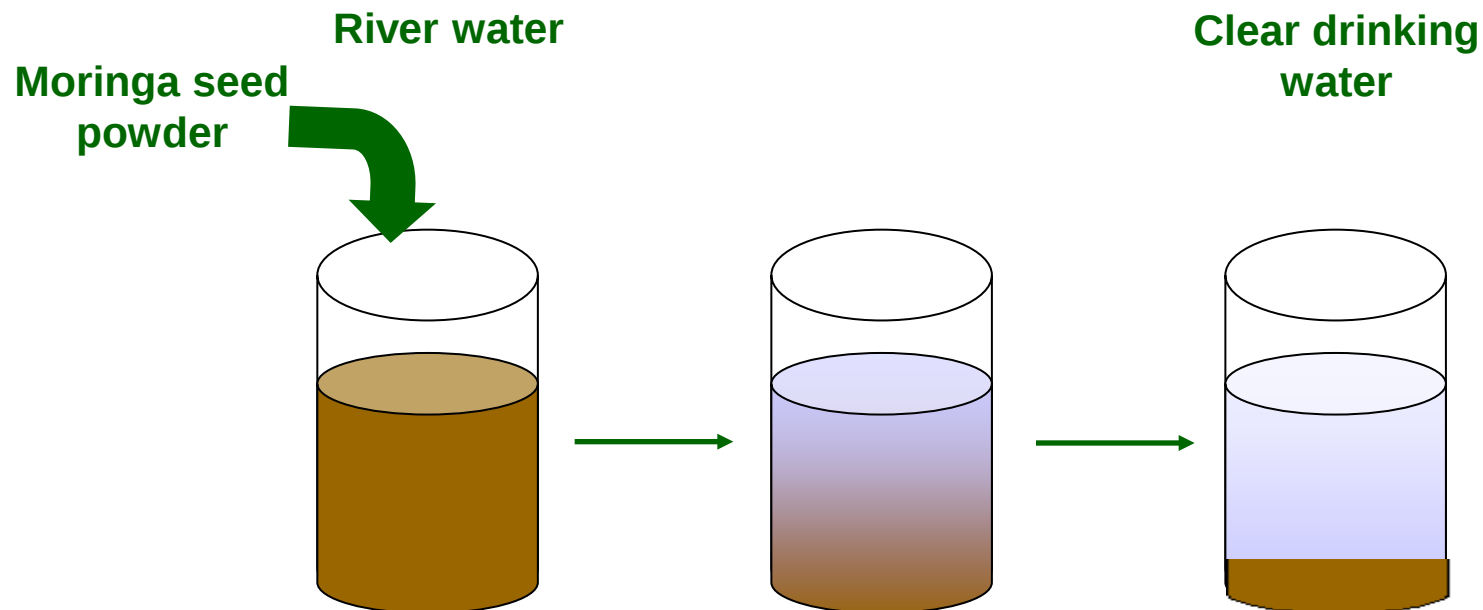
- Soil conservation
- Contribution to reforestation
- Fuel and source of blue dye

- Cooked and eaten as green beans and as condiment
- Treatment of joint pain
- Tonic and diuretic
- Cure inflammation
- Eyewash



Fruits: long pods (20 to 50 cm) containing 7 to 20 spherical seeds.

- Seeds crushed into powder: used to purify drinking water



Seeds: source of oil and proteins

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Oil:

- 35% “Behen oil” in the seeds
(available as LIPOFRUCTYL® MO)
- Traditionally used for:
 - Beauty care
 - Medicine
 - Religious ointments

Proteins:

- Active fraction of PURISOFT® and PURICARE™

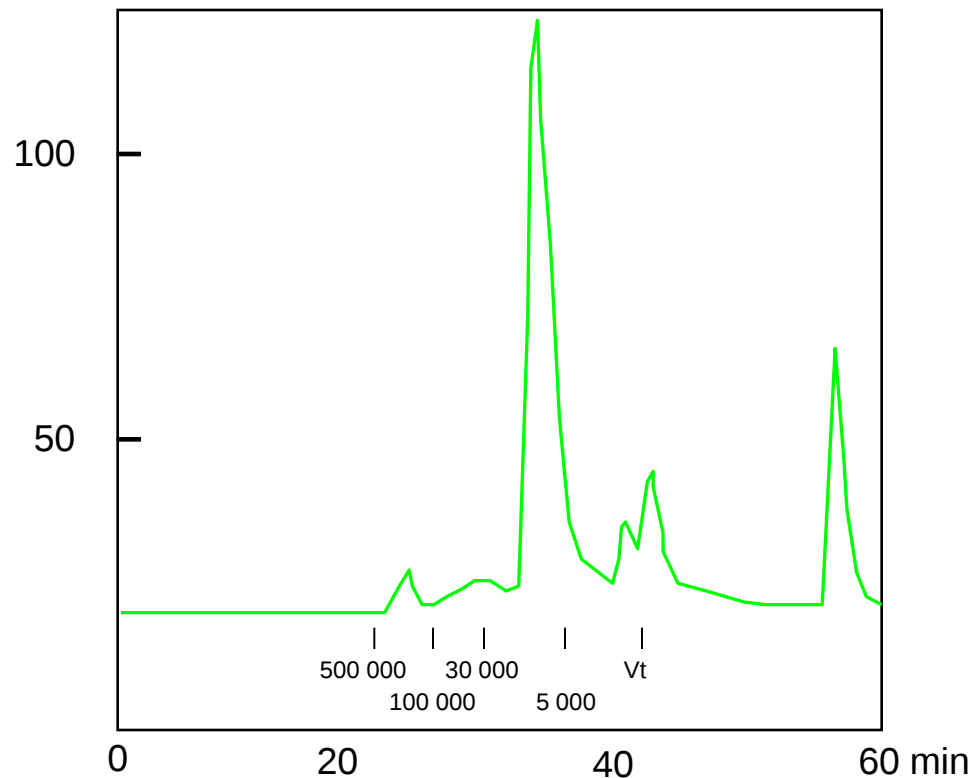


Analytical characteristics

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Absorbance at 280 nm



**Natural cationic protein of
low molecular weight**

Distribution:

20%: average molecular weight: **6 000** daltons

80%: average molecular weight: **13 000** daltons

Environmental stress

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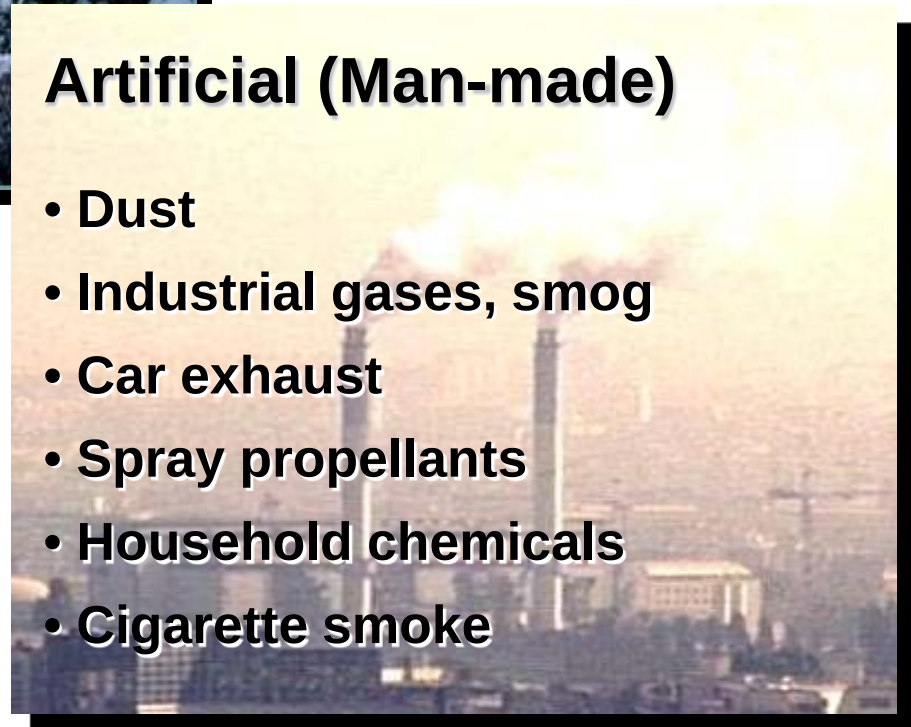
Natural (Climate)

- Sun radiation
- Cold
- Mechanical



Artificial (Man-made)

- Dust
- Industrial gases, smog
- Car exhaust
- Spray propellants
- Household chemicals
- Cigarette smoke



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**The new "2 in 1" anti-stress,
anti-pollution active for hair**



Hair and pollution

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- Negative effects of pollution on hair are known
- Never studied
- Hair: no self-defense systems for protection and reparation
- LS: fundamental research
 - Development of new test models

PURICARE^(TM) LS 9727

Efficacy tests on hair

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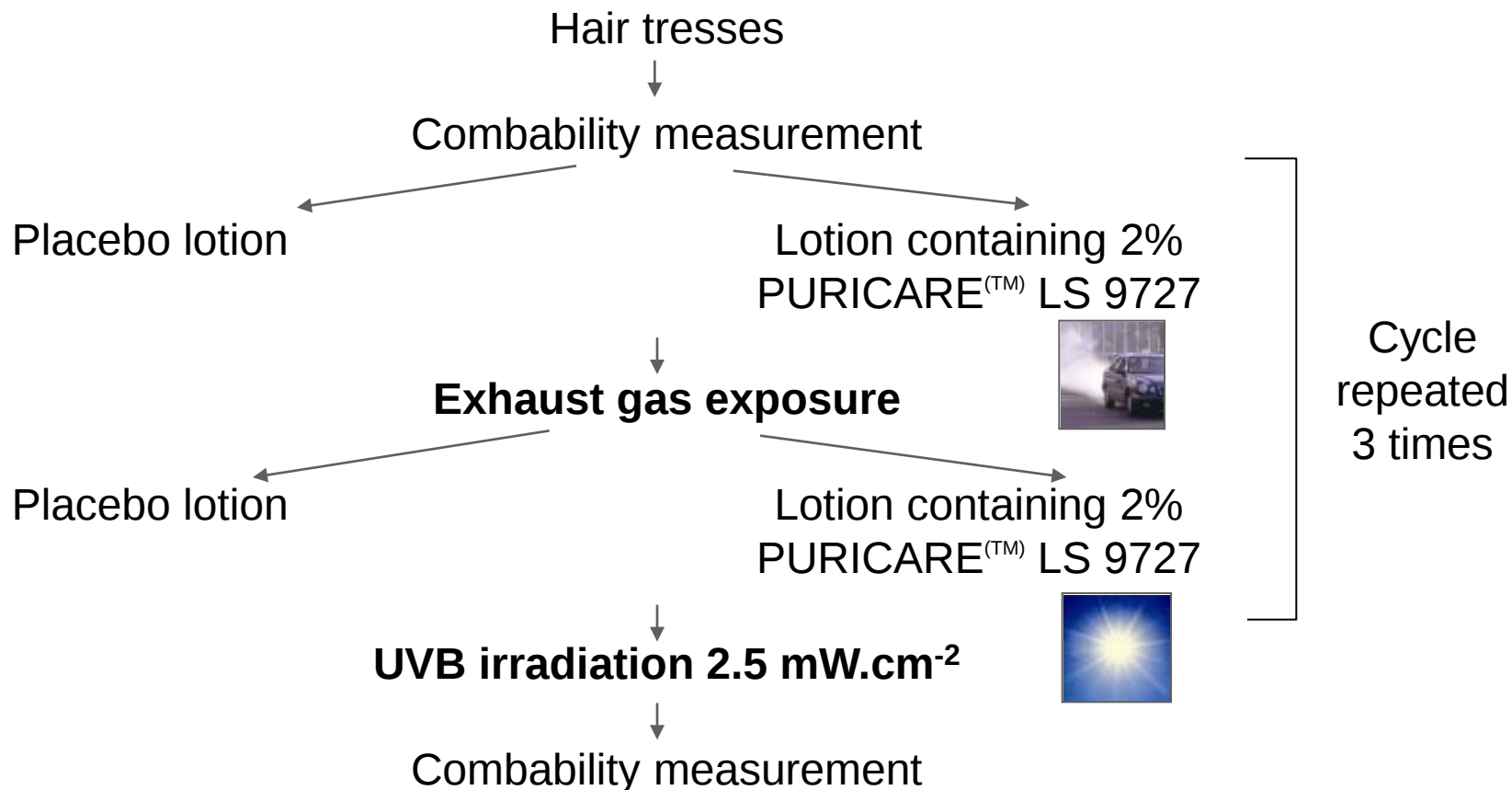


- **Anti-pollution activity**
 - "City pollution"
 - "Dust particle"
- **Anti-odor effect**
- **Conditioning / repairing effect**
 - Scanning Electron microscopy
 - Interferometry
- **Photo-protective activity**
- **Hair strengthener**
- **Anti-free radical activity**
- **Substantivity**
- **Anti-greasy hair effect**

"City pollution" test on human hair

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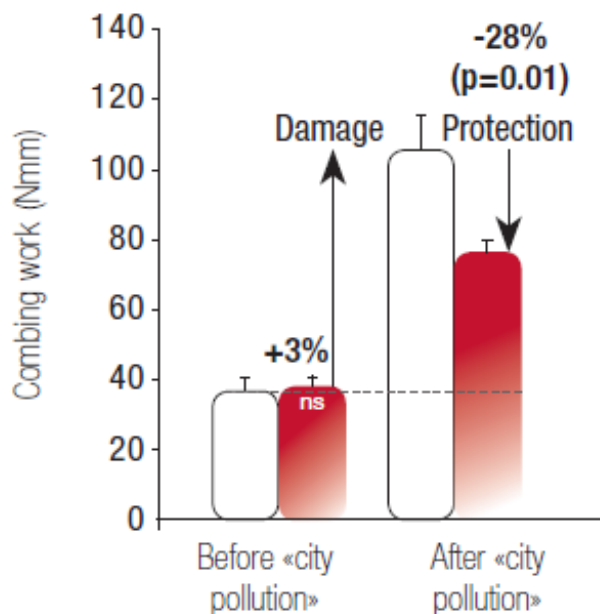


"City pollution" test on human hair

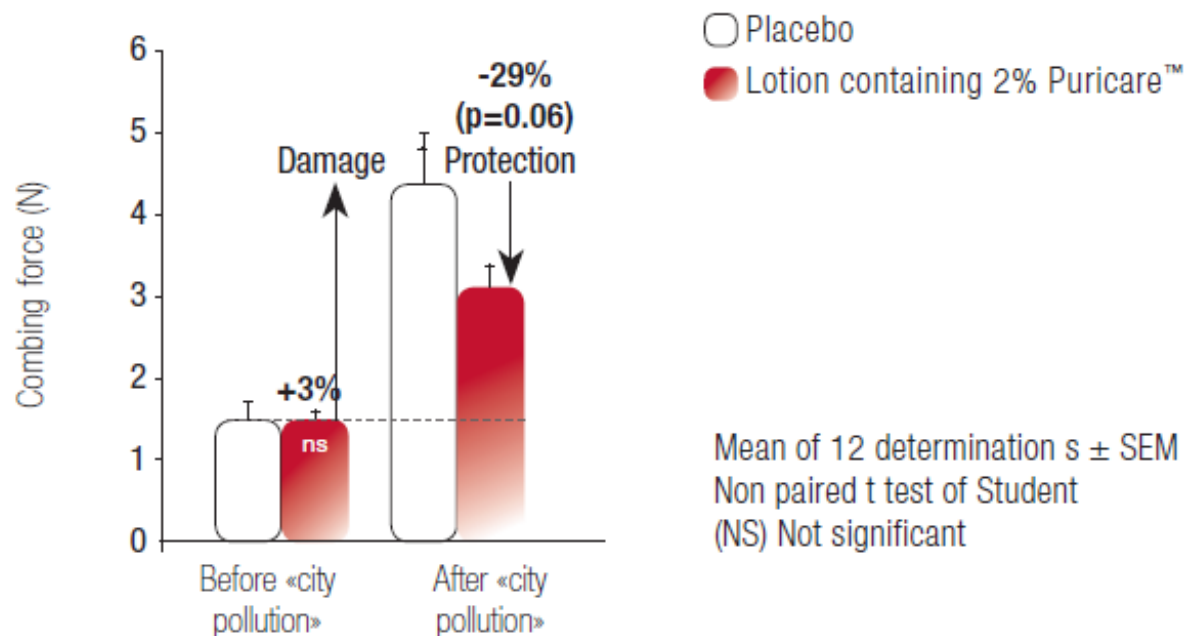
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Combing work (Nmm)



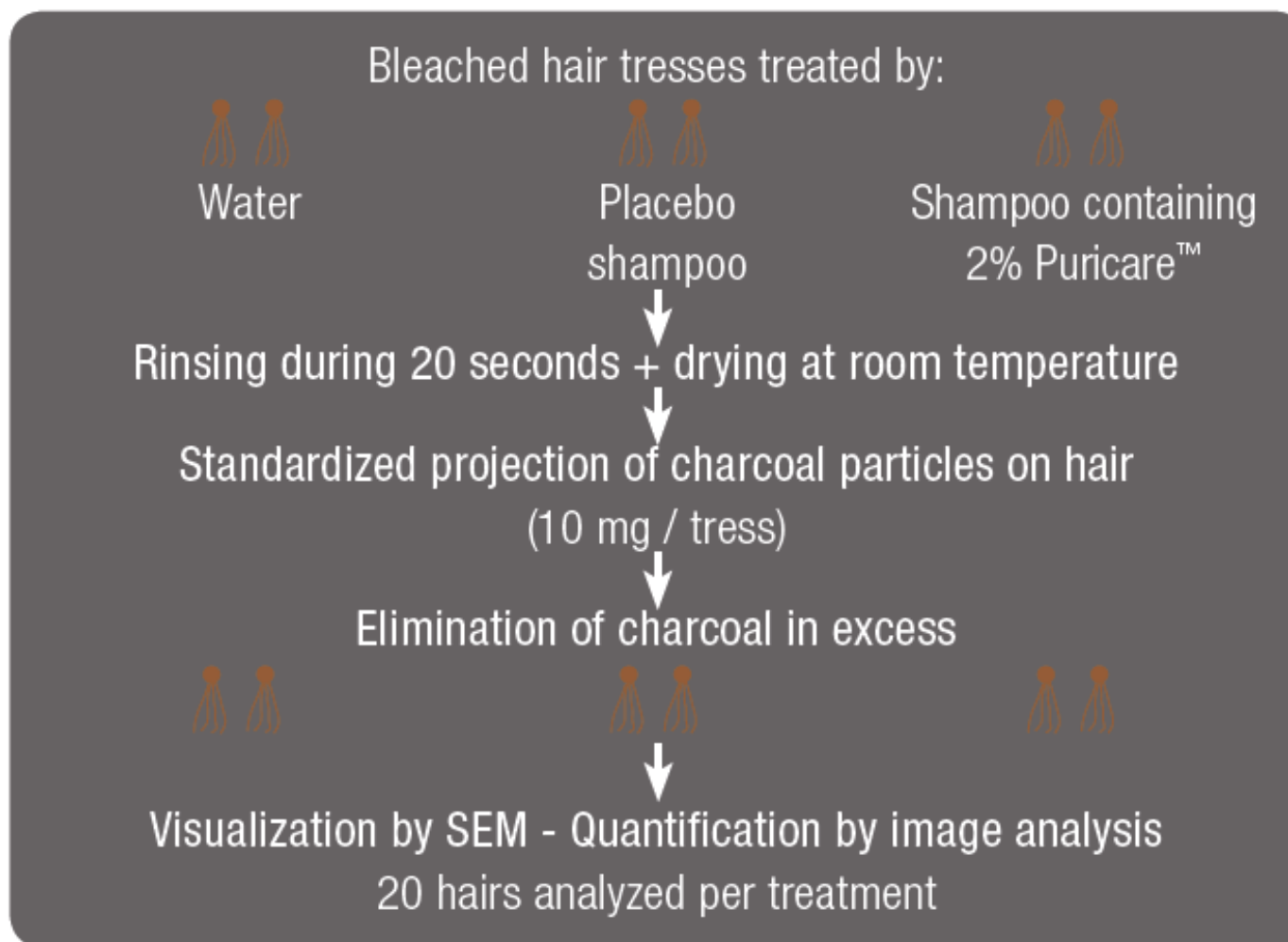
Combing force (N)



"Dust particle" test on human hair

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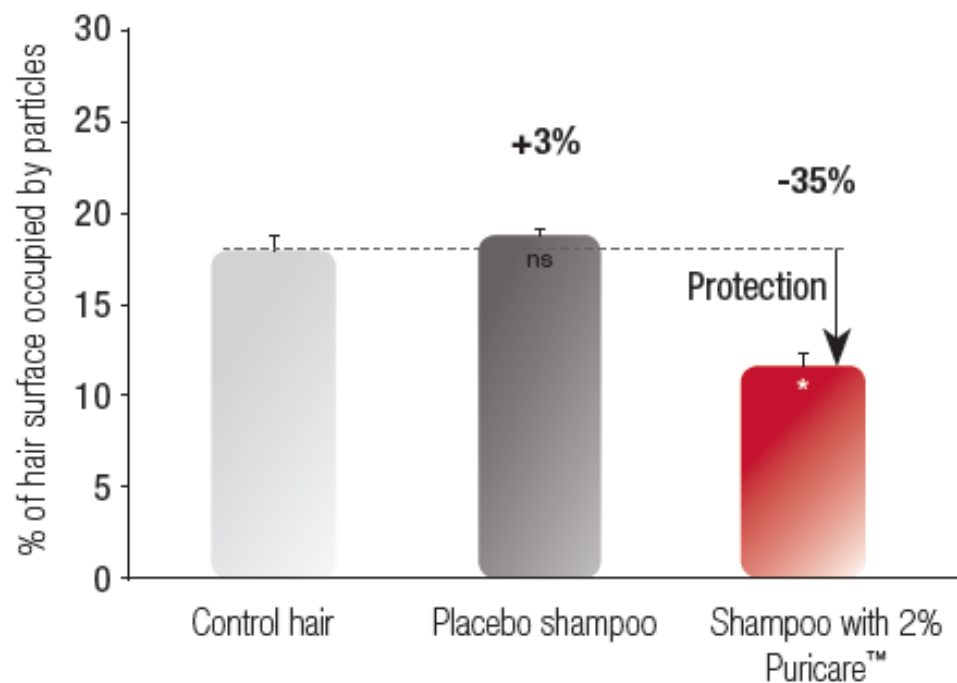


"Dust particle" test on human hair

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Results



Mean of 20 hairs $\pm$ SEM
1 factor ANOVA
and PLSD of Fisher
(NS) not significant / control
(*) significant / control and placebo

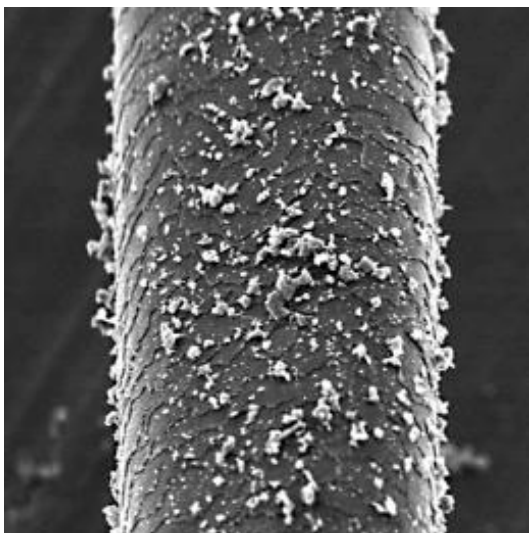
"Dust particle" test on human hair

Visualization by SEM

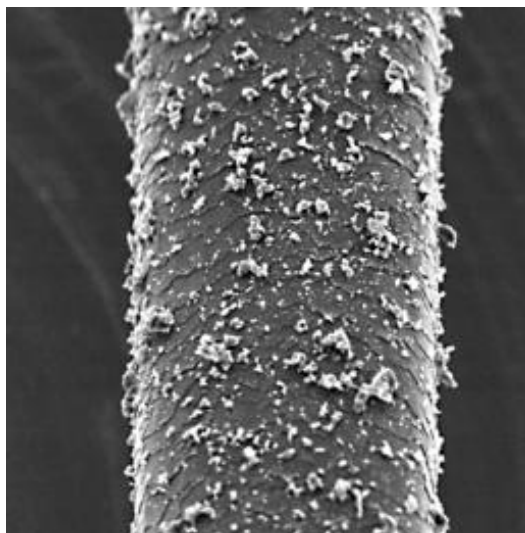
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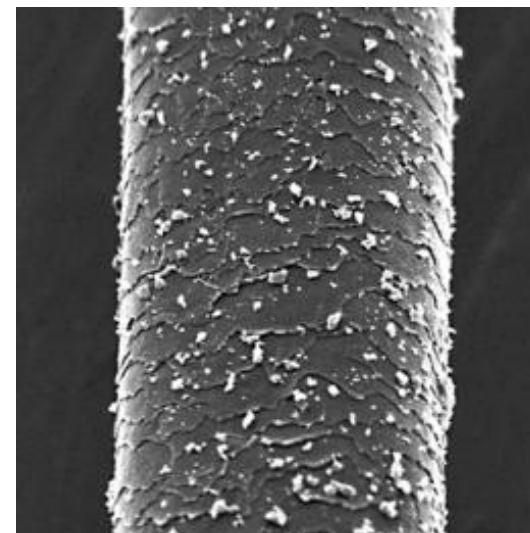
Visualization (SEM) + quantification of the surface occupied by coal particles on hair



Control hair



Placebo shampoo



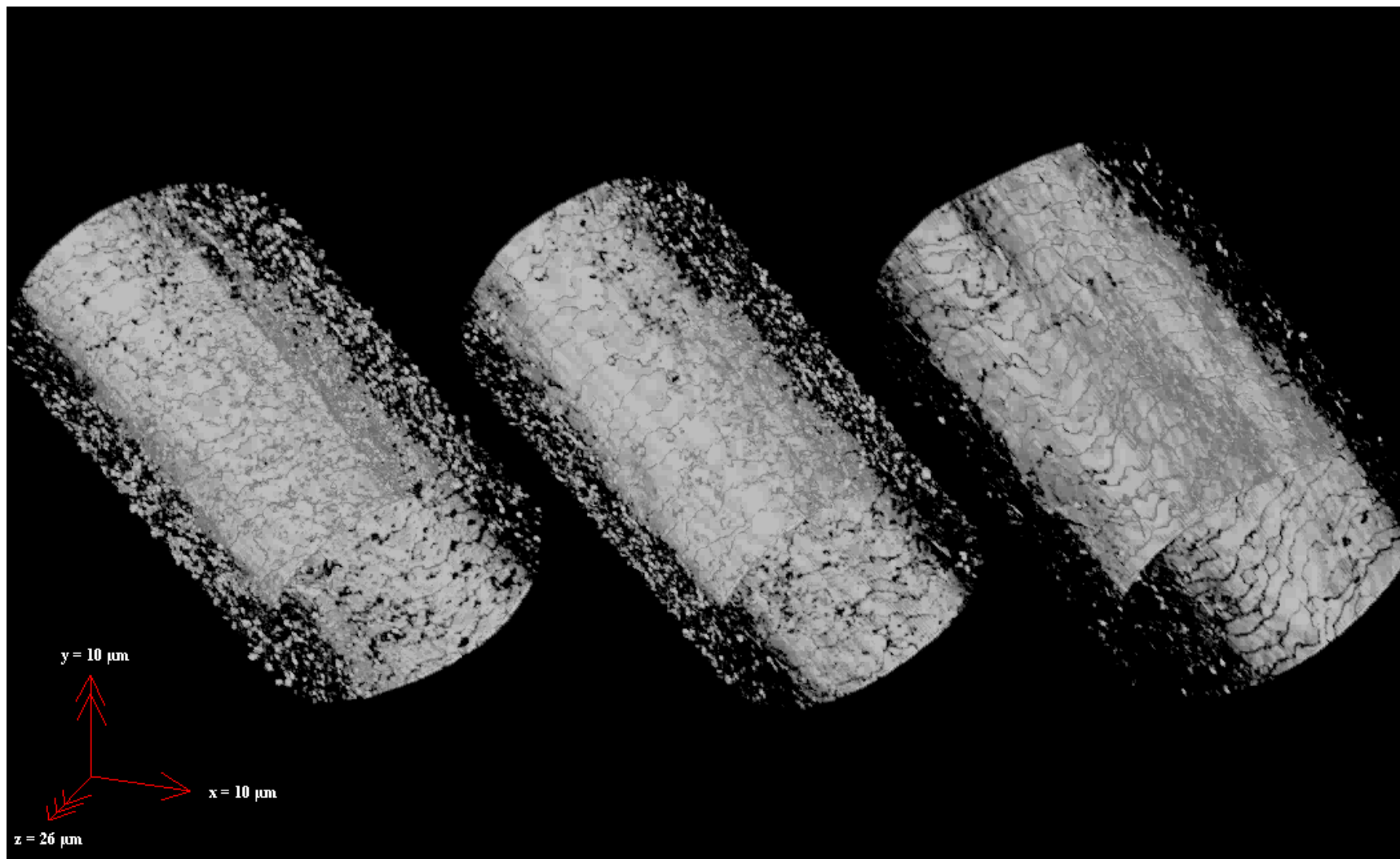
**Shampoo with 2%
PURICARE™ LS 9727**

Hair previously treated with a shampoo containing 2% Puricare™ attracts less particles than hair treated by placebo or untreated hair. Puricare™ protects hair against pollution by particle deposition and adhesion.

Control hair

Placebo

PURICARE

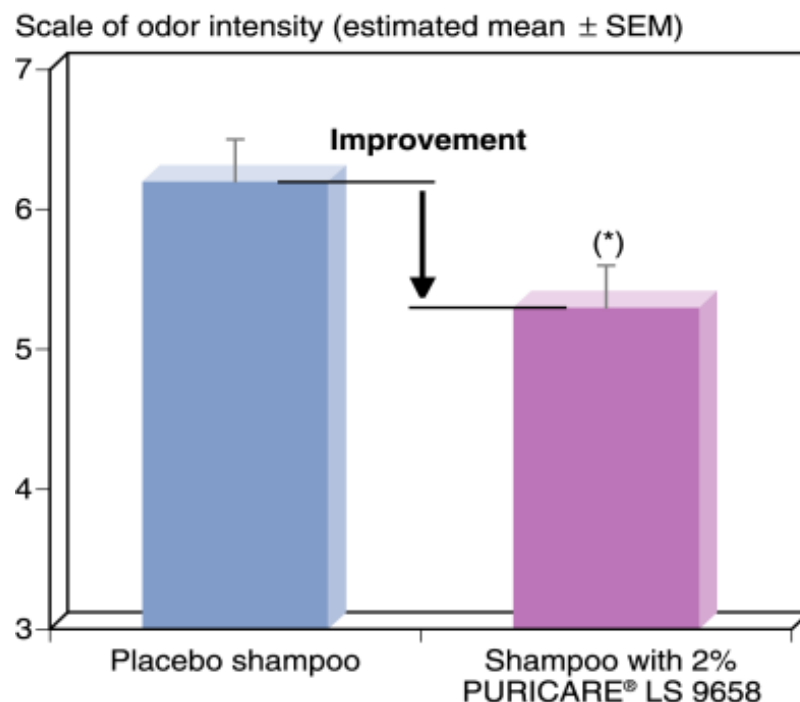


Anti-odor effect on hair

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Results



Statistics:
Estimated means $\pm$ SEM
(Pannel composed from 5 judges)
Mann-Whitney test
(*) significant ($p = 0.01$)

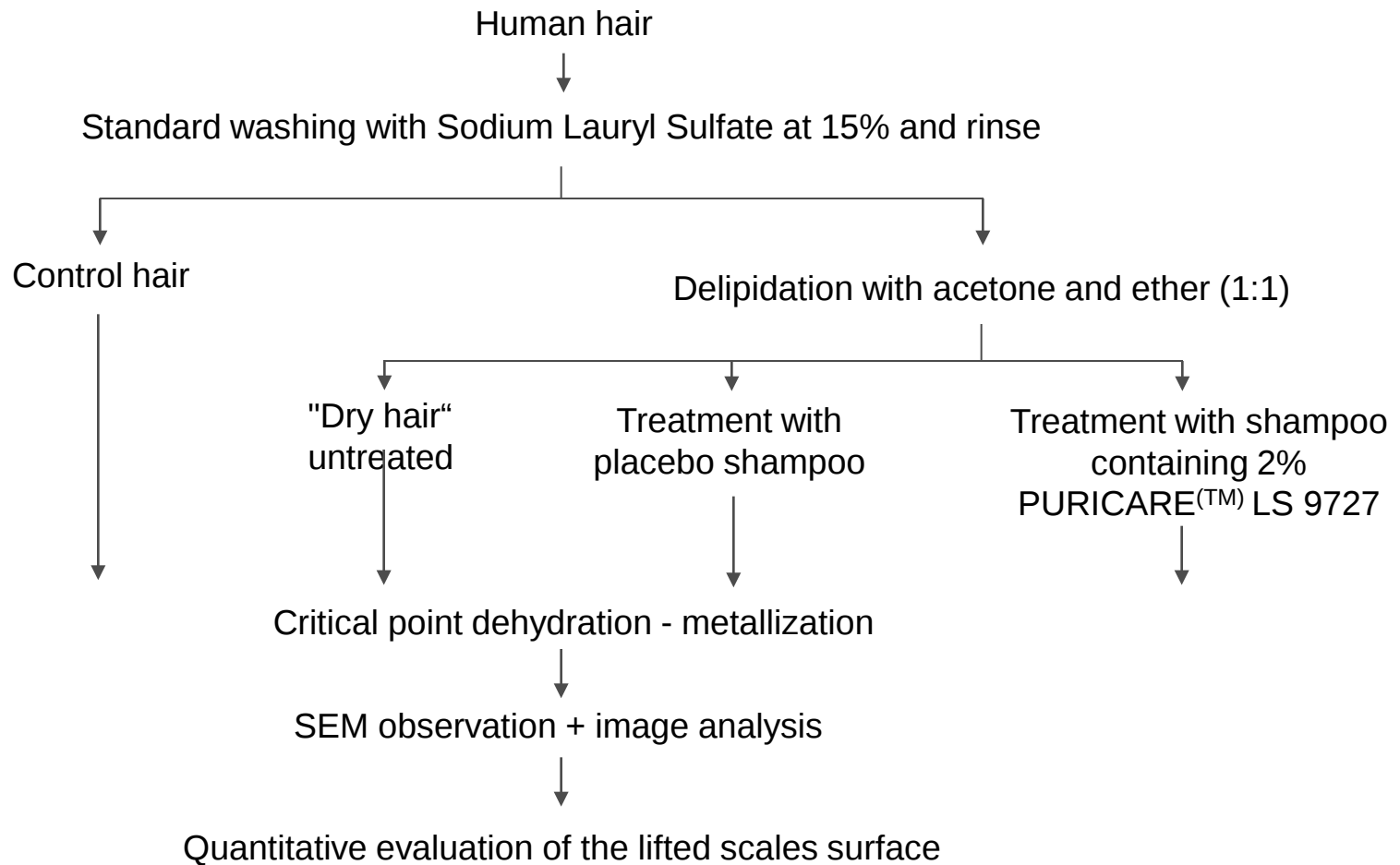
- Test on hair tresses – Hair washing with Shampoo (placebo, or + 2 % Puricare)
- Exposure to cigarette smoke 2h
- Sniff test 15 mn later

The "smoke" odor of hair previously treated with PURICARE[™] LS 9727 is significantly lower than that of hair treated by placebo.

Conditioning / repairing effect

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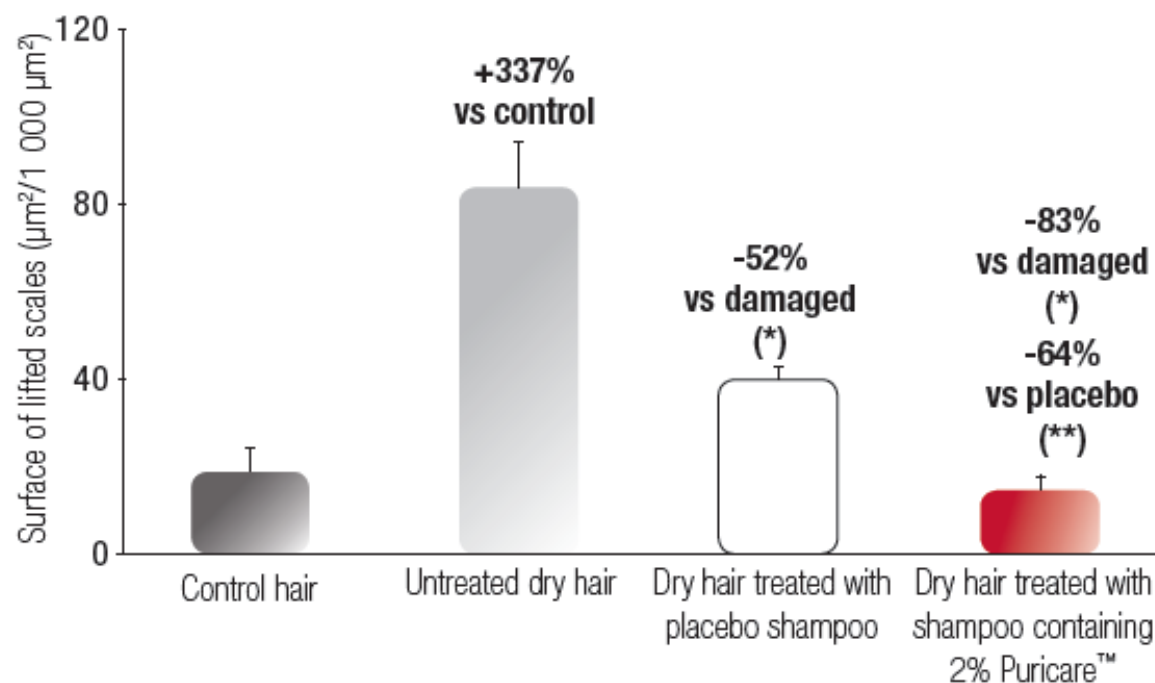


Conditioning / repairing effect

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Results



Mean of 10 hairs $\pm$ SEM

1 factor Anova

A posteriori test: PLSD of Fisher

(*) Significant / dry hair ($p < 0.0001$)

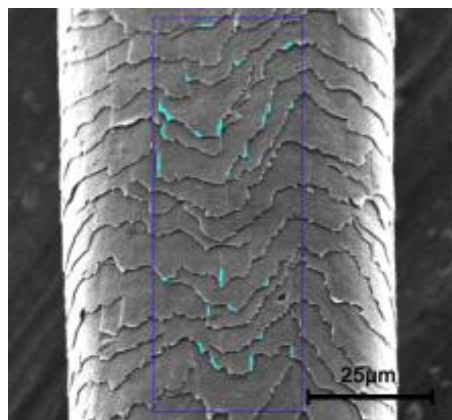
(**) Significant / placebo ($p = 0.003$)

Conditioning / repairing effect

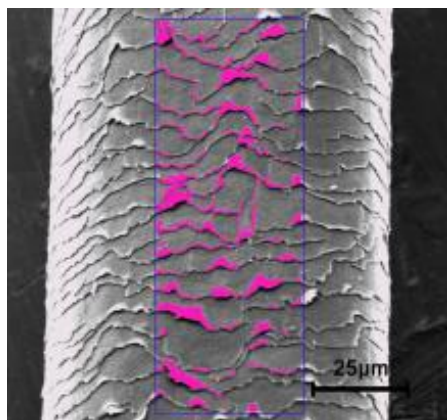
Scanning electron micrographs

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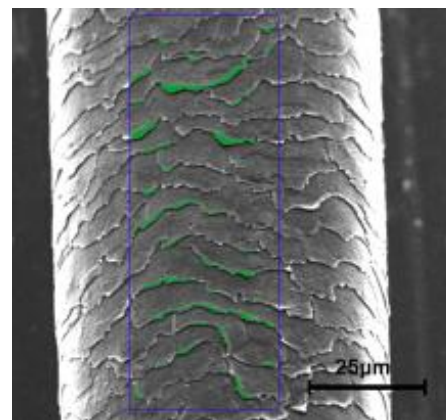
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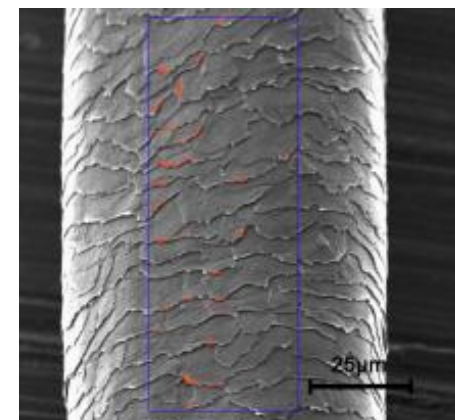
Control hair



"Dry hair" obtained by
treatment with
acetone/ether



"Dry hair" treated with
placebo shampoo

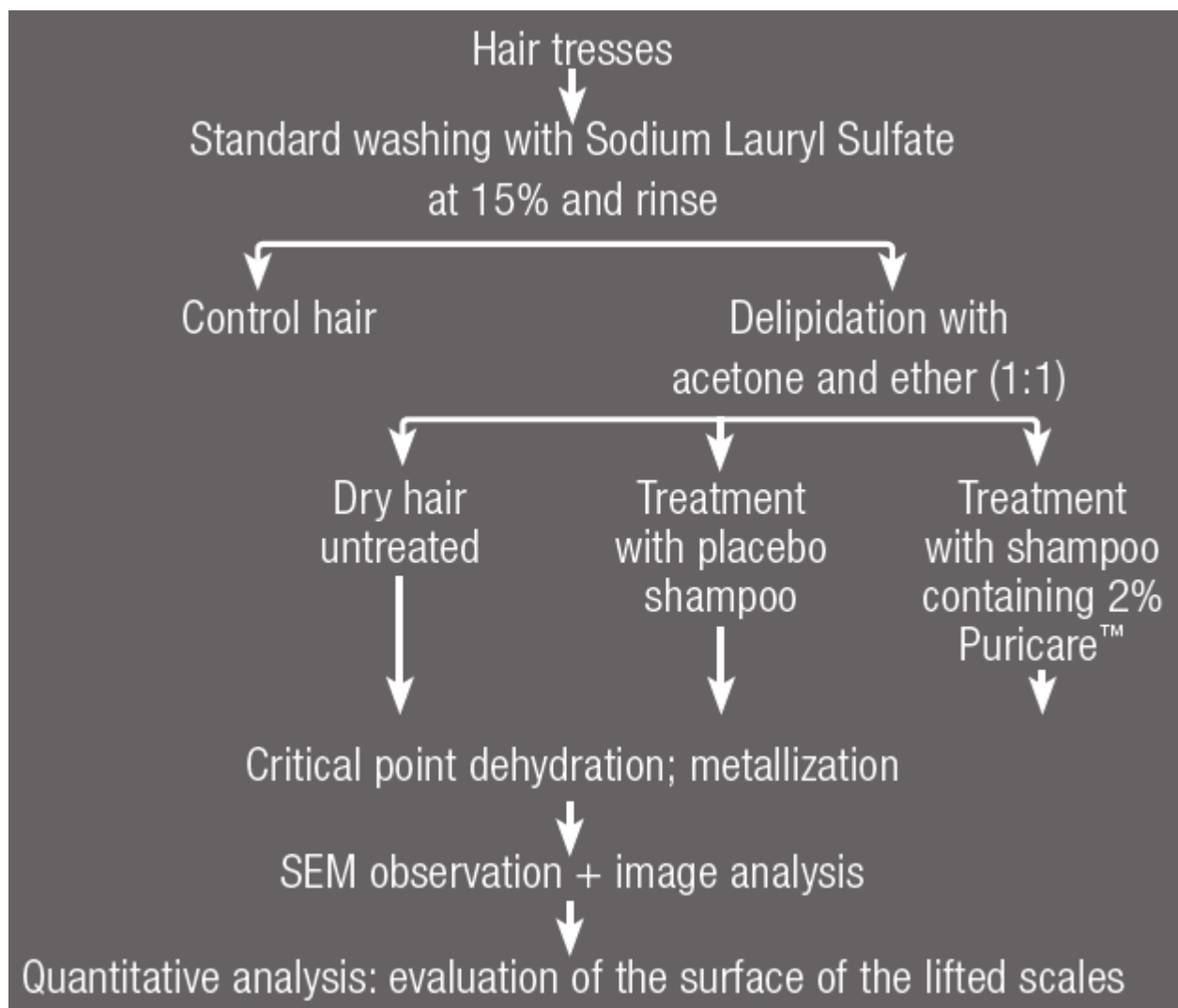


"Dry hair" treated with a
2% PURICARE[™]
LS 9727 shampoo

Conditioning / repairing effect

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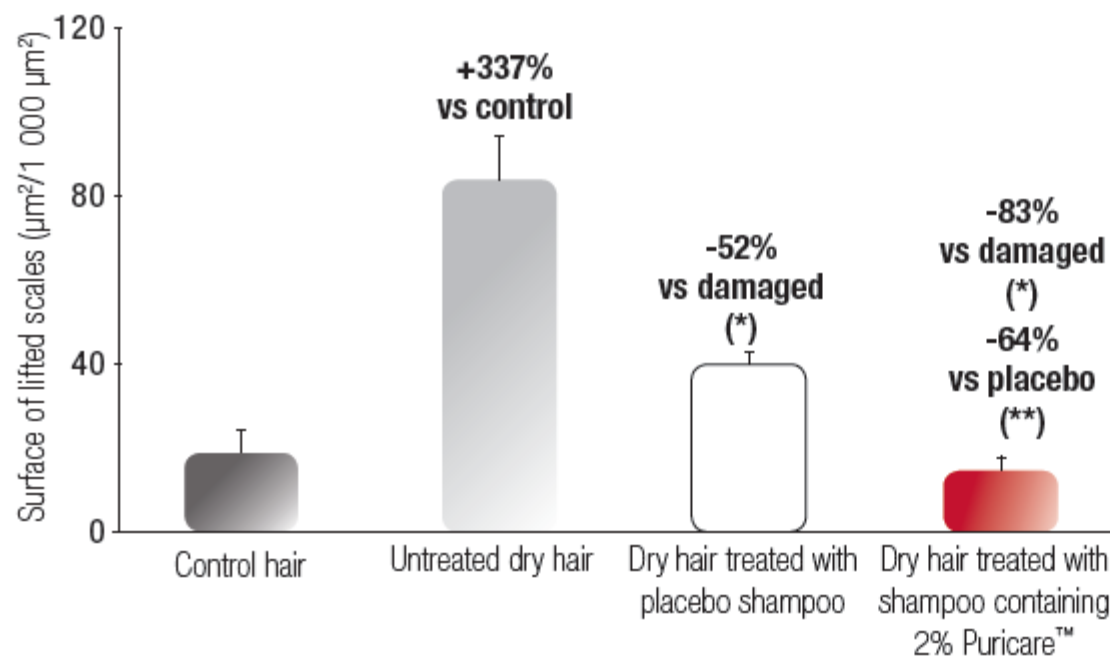


Conditioning / repairing effect

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Results



Mean of 10 hairs $\pm$ SEM

1 factor Anova

A posteriori test: PLSD of Fisher

(*) Significant / dry hair ($p < 0.0001$)

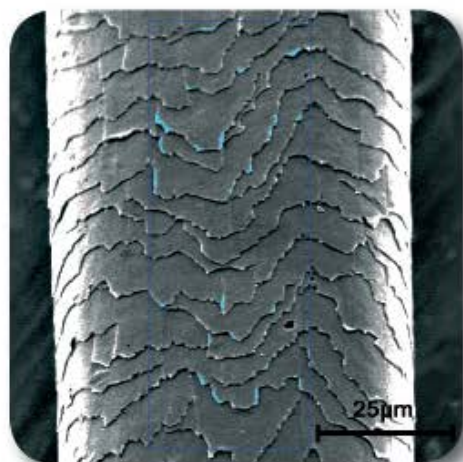
(**) Significant / placebo ($p = 0.003$)

Evaluation of the lifted hair surface

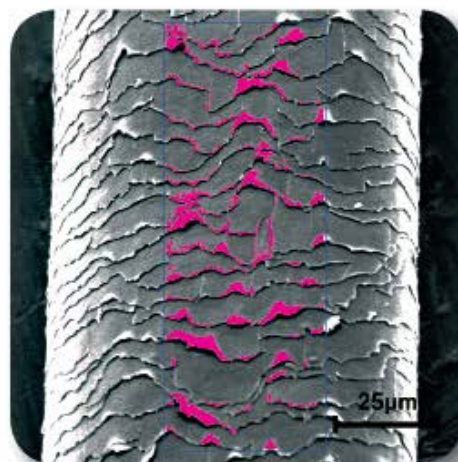
Conditioning / repairing effect

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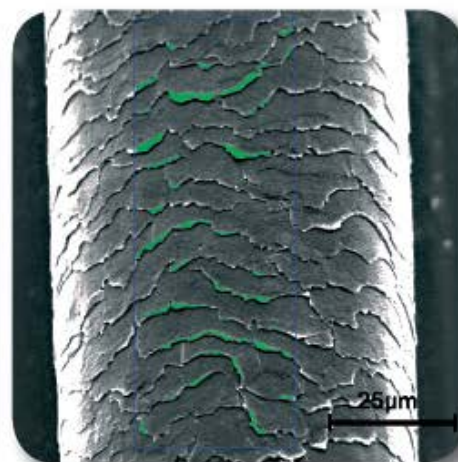
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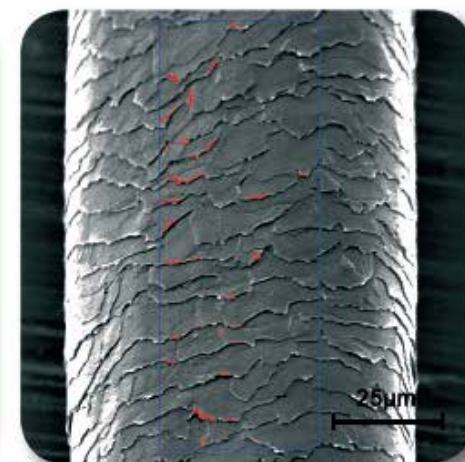
Control hair



Dry hair



Dry hair treated with placebo
shampoo



Dry hair treated with shampoo
containing 2% Puricare™

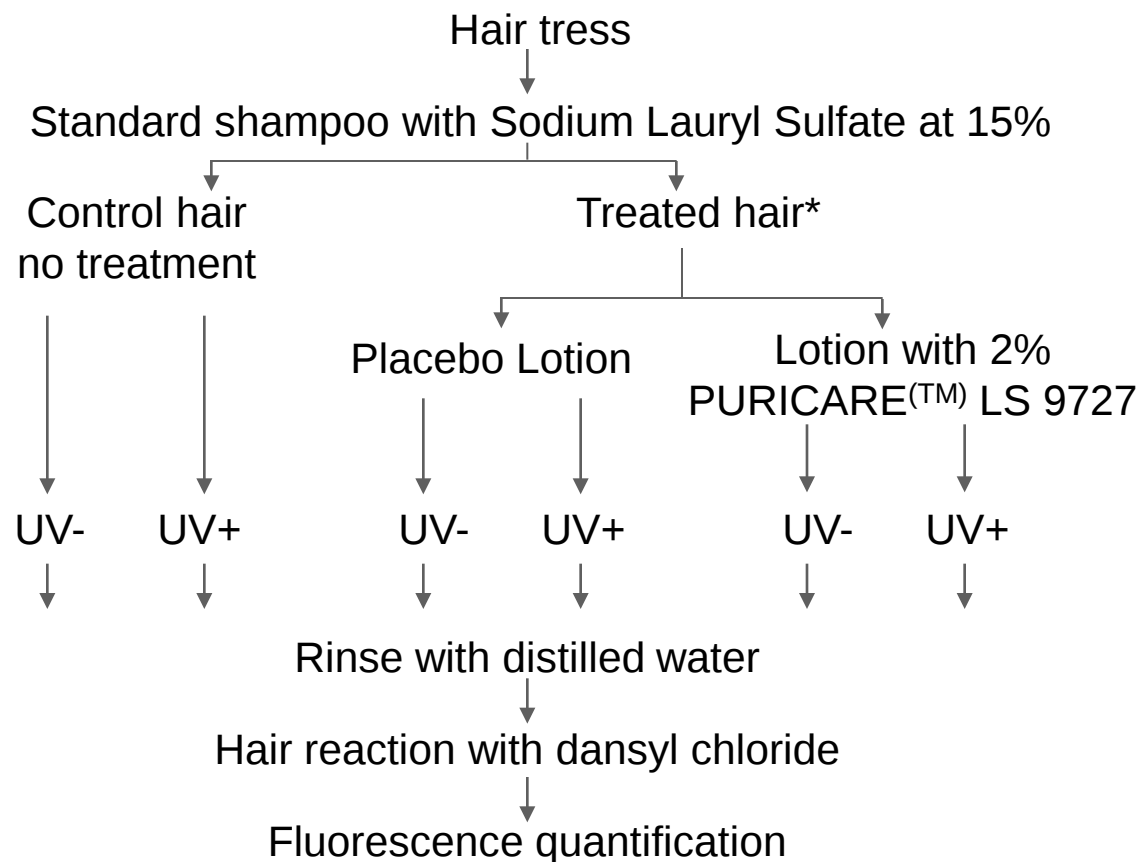
Scanning electron micrographs of
Puricare™ repairing activity on damaged hair

Photo-protective activity

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Protocol



* Treatment: twice in 48 hours, 30 minutes before irradiation. The hair was not rinsed before UV-B exposure

UV-: without UV-B

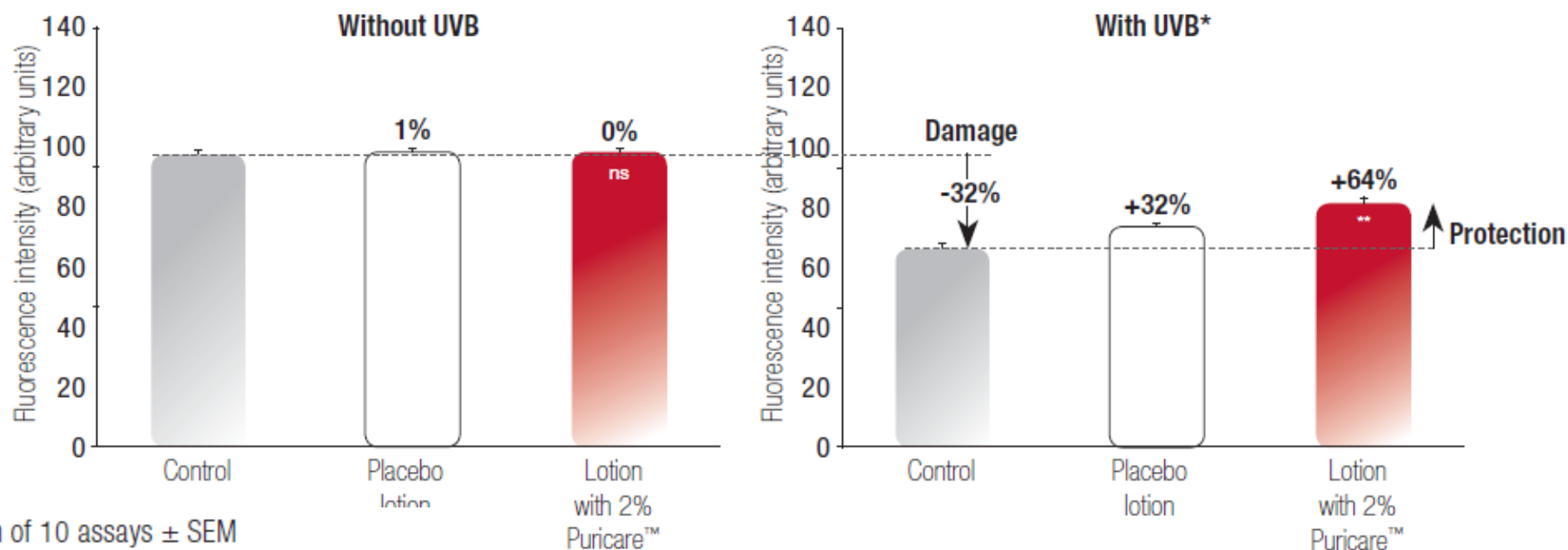
UV+: fluorescence lamps, energy 2.5 mW/cm², duration of irradiation 48 hours, total dose of irradiation 430 J/cm²

Photo-protective activity

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Results



Mean of 10 assays $\pm$ SEM

1 factor ANOVA

A posteriori test: PLSD of Fisher

(*) significant / control ($p < 0.01$)

(**) significant / control and placebo ($p < 0.01$)

(NS) not significant

* UVB : 4 fluorescence lamps
during 48 hours (430 J/cm^2)

After UVB irradiation:

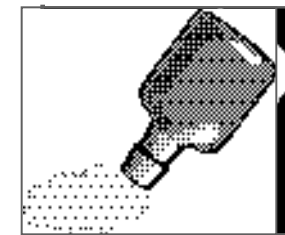
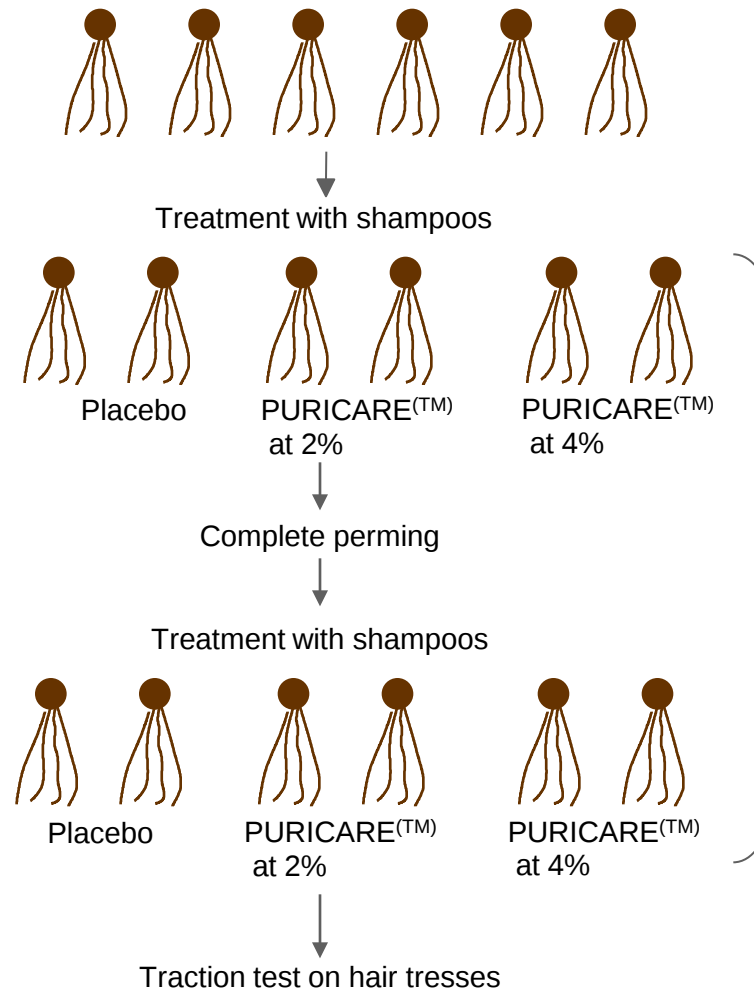
- control hair is strongly damaged, fluorescence is decreased (- 32%),
- for hair tresses treated with the lotion containing 2% Puricare™, the intensity of the fluorescence is increased. Hair damage is 64% inferior to the control irradiated hair.

Strengthening effect on hair

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Protocol



2 cycles washing
and perming



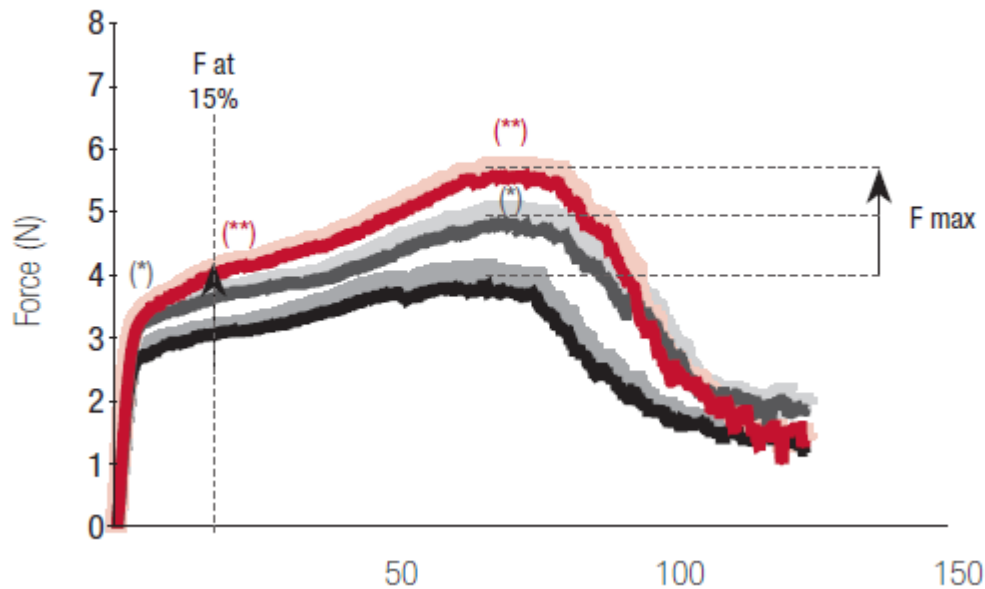
Traction device

Strengthening effect on hair

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Results



— Placebo shampoo
— Shampoo with 2% Puricare™
— Shampoo with 4% Puricare™

Mean of 20 bundles $\pm$ SEM

Non paired t test

(*) Significant / placebo shampoo
($p < 0.05$)

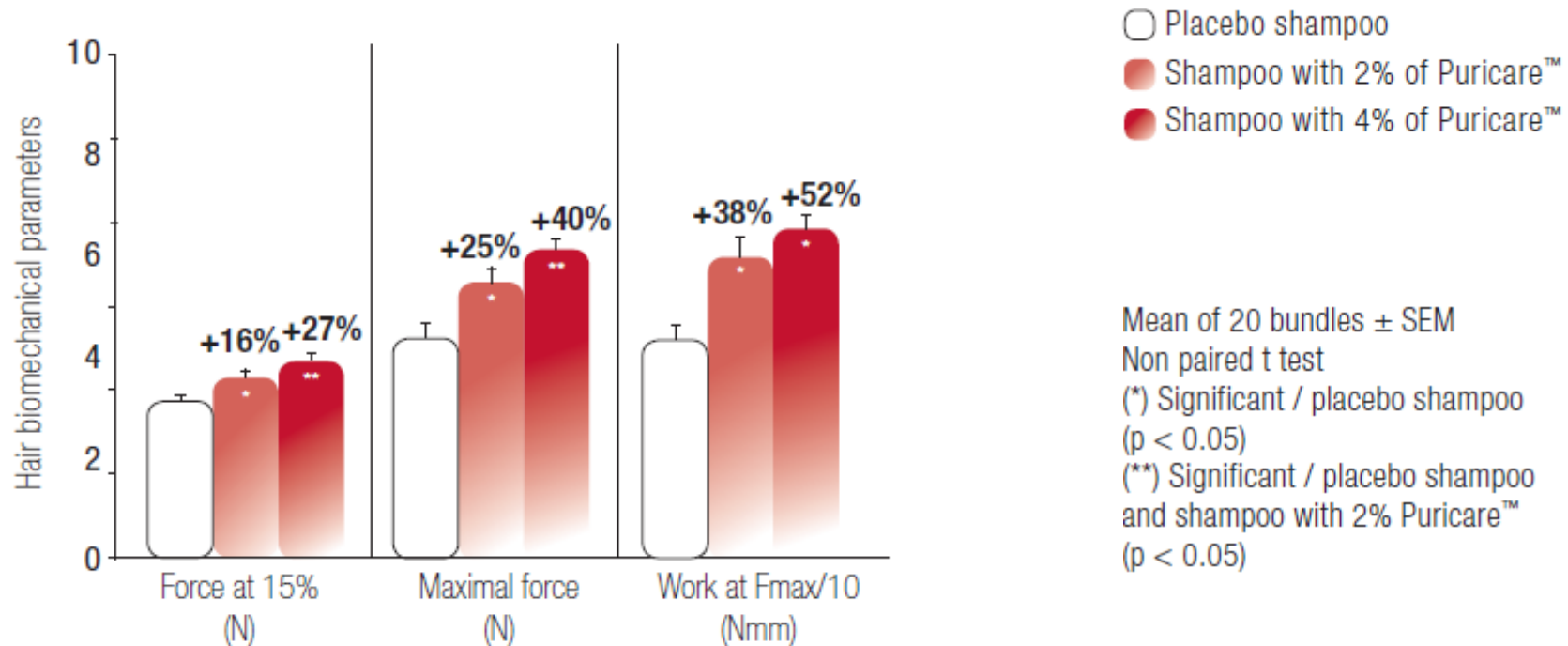
(**) Significant / placebo shampoo
and shampoo with 2% Puricare™
($p < 0.05$)

Strengthening effect on hair

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Hair biomechanical properties



Strengthening effect on hair

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Conclusion

Compared to placebo, hair treated with a shampoo containing Puricare™ shows a significant increase of the 3 parameters:

- force at 15%: + 10% for 2% Puricare™
+ 27% for 4% Puricare™
- maximal force: + 25% for 2% Puricare™
+ 40% for 4% Puricare™
- work at Fmax : + 38% for 2% Puricare™
+ 52% for 4% Puricare™

Puricare™ has significantly improved the mechanical properties of hair (strength, resistance) compared to placebo.

The effect is dose-dependent.

Puricare™ has a good strengthening effect on damaged hair.

Anti-free radical activity on hair

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Aim

UV radiation of hair lead to an important release of free radicals.

They participate to the photodegradation of hair, including alteration of:

- keratine,
- melanine (cortex and medula),
- minor lipid quantity associated to keratin.

The target of this test is to show the protective effect on hair of PURICARE® LS 9727 against free radicals.

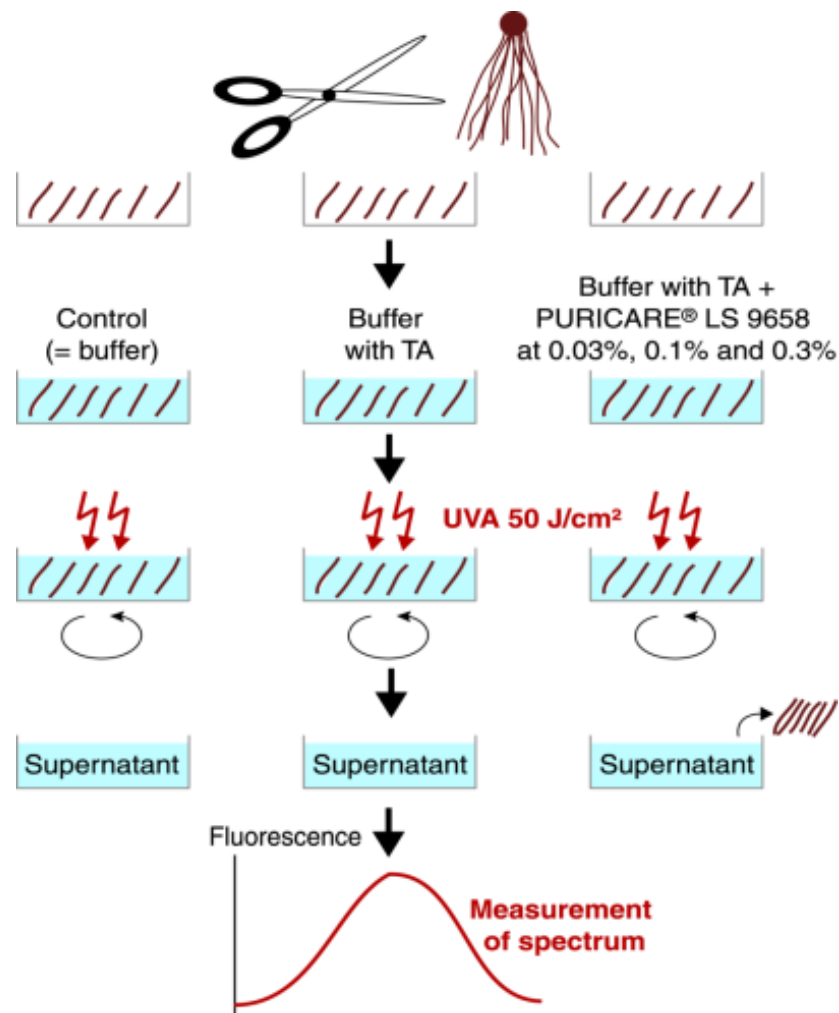
The fluorescence technique is based on the measurement of the oxidation product of terephthalic acid dianion (TA) by OH radicals.

Anti-free radical activity on hair

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Protocol

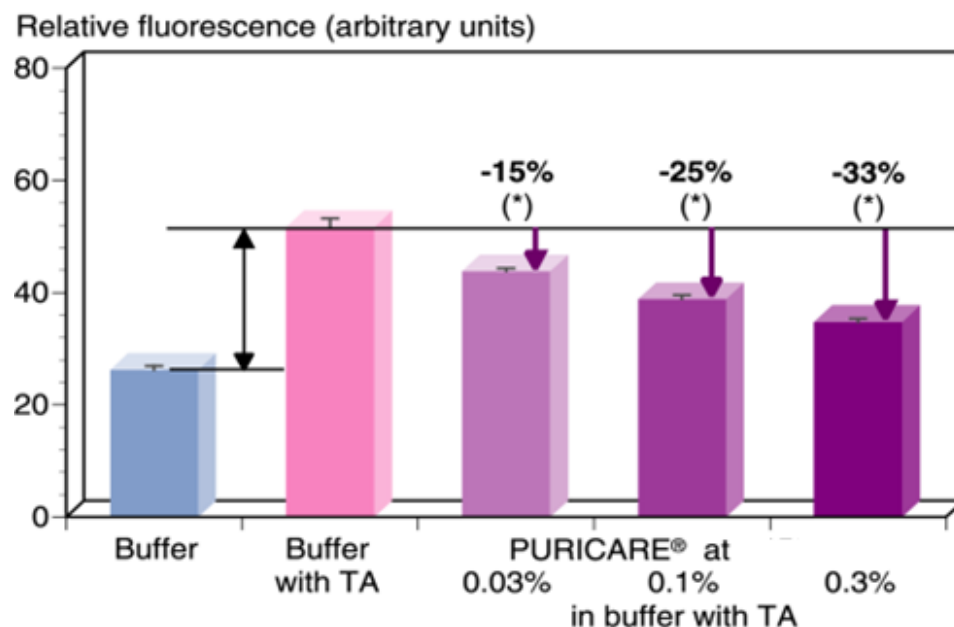


Anti-free radical activity on hair

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Results



↕ Oxygen radical formation during hair irradiation

↓ Protection against oxygen radical formation during hair irradiation

All samples contained 0.3 g of hair
UVA irradiation: 50 J/cm²

Statistics:

Mean of
12 determinations

± SEM

ANOVA

Test a posteriori:

PLSD Fisher

(*) significant PURICARE /
Buffer with TA

The relative fluorescence detected is significantly decreased in presence of PURICARE®. This effect is dose-dependent.

PURICARE® significantly reduces the oxidative damages on hair either by prevention / reduction of free radicals formation, or by scavenging existing free radicals.

Substantivity test by FITC technique

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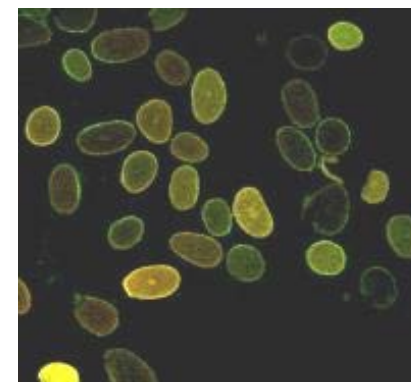
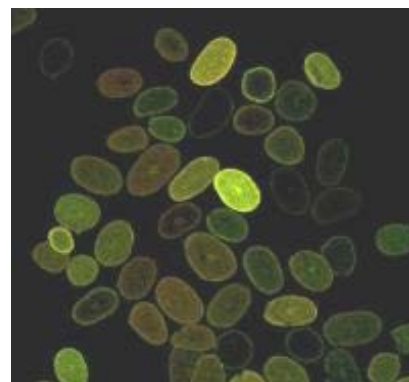
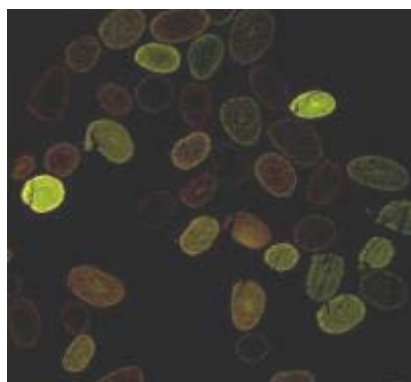
Results on hair cross sections

Placebo

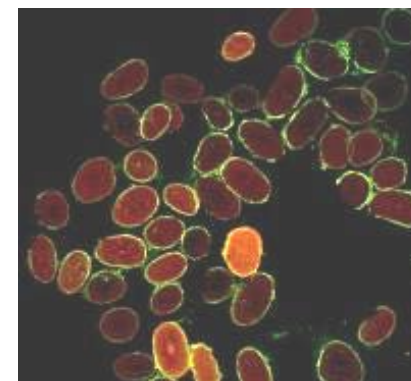
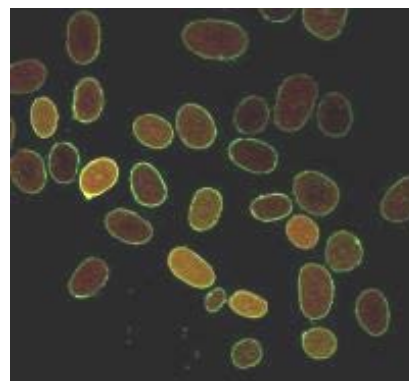
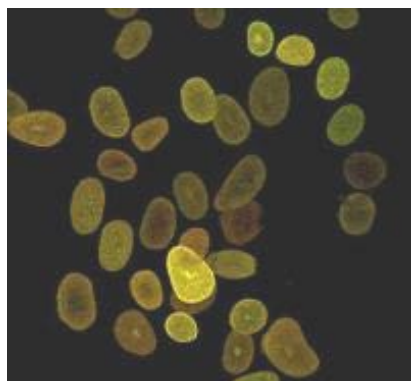
PURICARETM
30 min.

PURICARETM
24 hours

Normal
hair



Damaged
hair



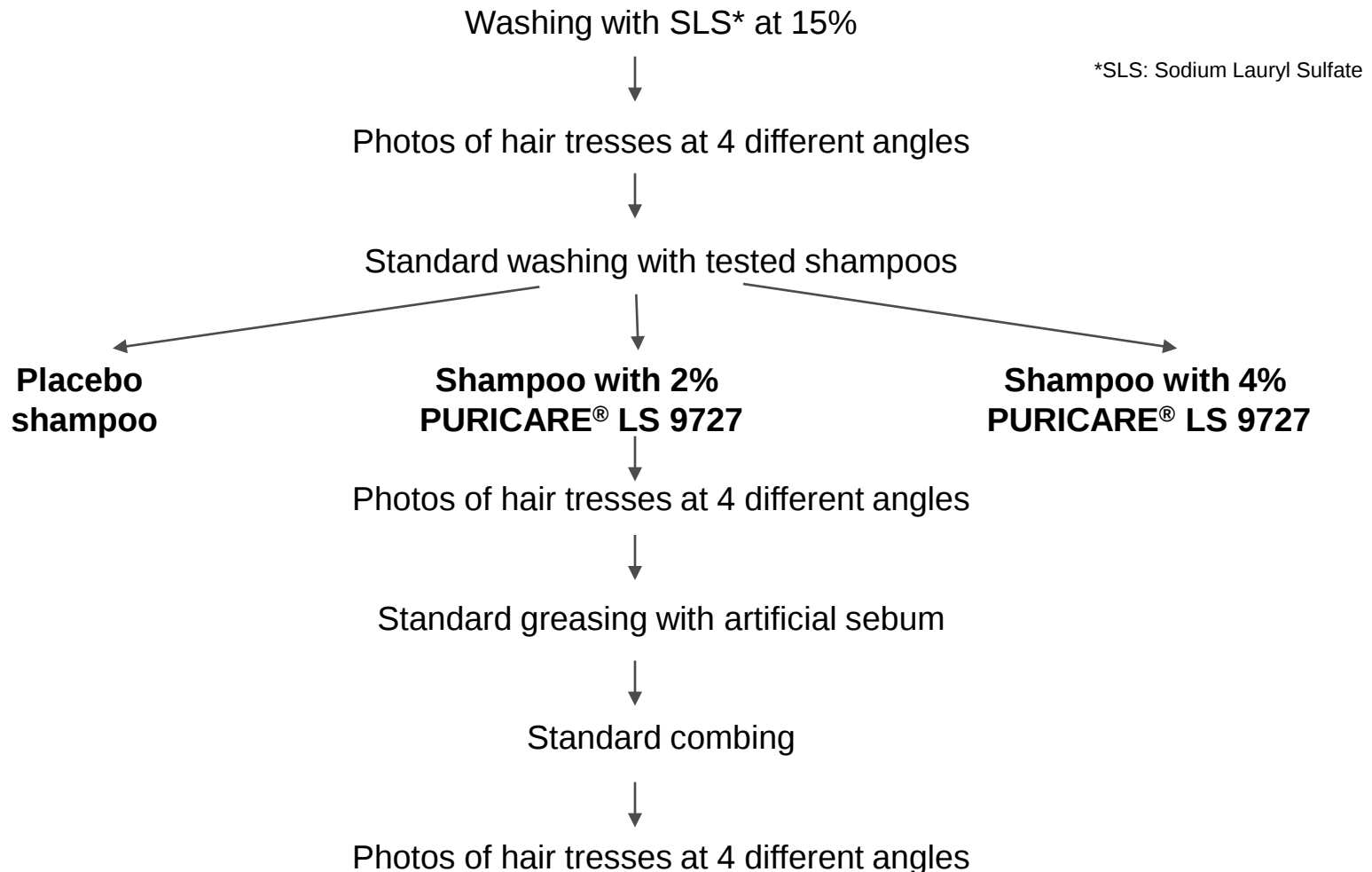
PURICARETM shows a good film-forming effect, especially on damaged hair.

Greasy hair treatment : complement to traditional anti-seborrheic care

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Protocol



Greasy hair treatment

complement to traditional anti-seborrheic care

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Results

Placebo

Shampoo with 2%
PURICARE® LS 9727

Shampoo 4% with
PURICARE® LS 9727

Before
treatment



After shampoo
treatment



After shampoo +
artificial sebum
and combing



The optical aspect of greasy hair tresses treated with PURICARE (™) LS 9727 is clearly improved.

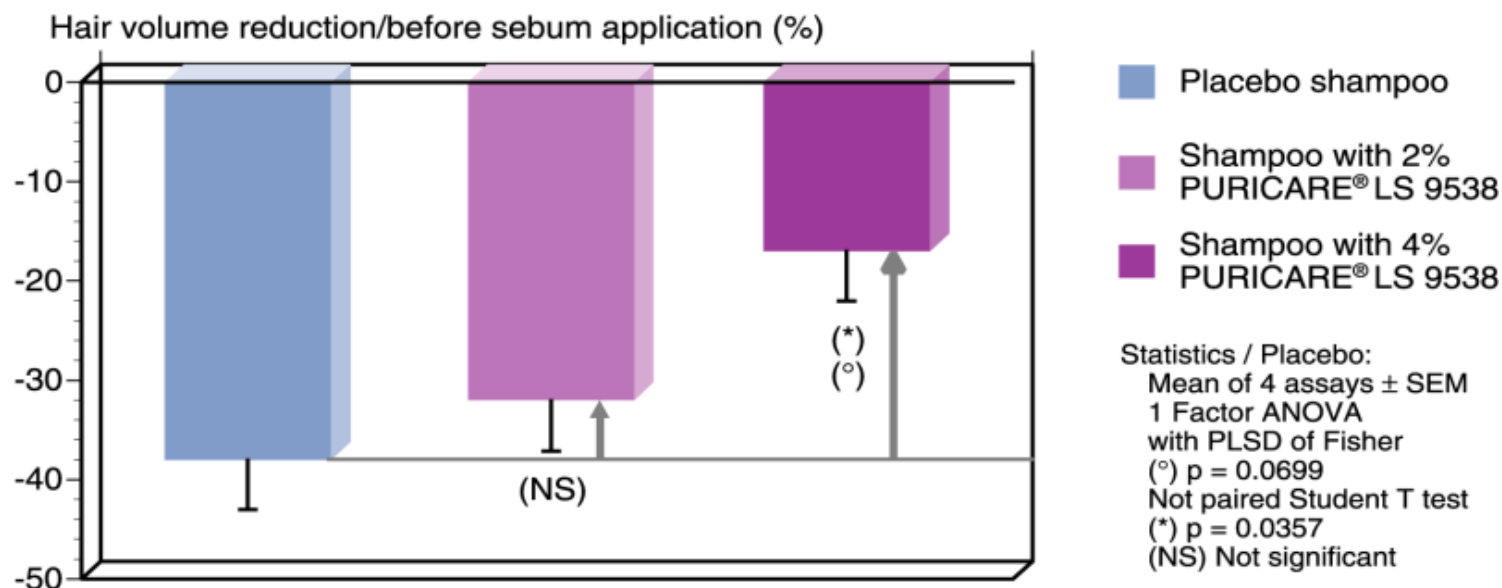
Greasy hair treatment

Complement to traditional anti-seborrheic care

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Results



The reduction of hair volume due to sebum was decreased in case of treatment with PURICARE[™] in a dose dependent manner.

Hair look cleaner, and less stuck together.

PURICARETM LS 9727

Cosmetic properties

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- **Anti-pollution activity**
 - "City pollution"
 - "Dust particle"
- **Anti-odor effect**
- **Conditioning / repairing effect**
 - Scanning Electron microscopy
 - Interferometry
- **Photo-protective activity**
- **Hair strengthener**
- **Anti-free radical activity**
- **Substantivity**
- **Anti-greasy hair effect**

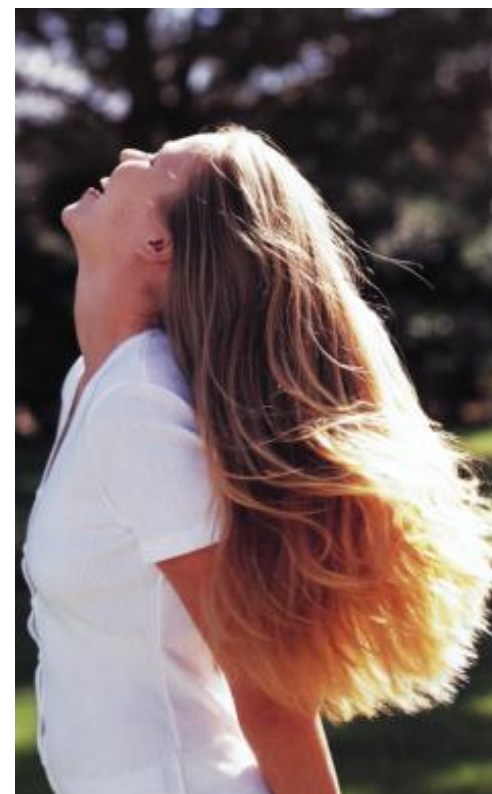
PURICARE™ LS 9727

Cosmetic applications

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- Anti-pollution shampoos
- Shampoos for dry hair
- Hair care for hair damaged by UV pollution, perms, colors
- Conditioners
- Leave-on gels
- Tonics
- Puricare™ can be formulated in crystal-clear shampoos.



PURICARE™ LS 9727

Technical data

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INCI Name : Water (and) Glycerin (and) Moringa
Pterygosperma Seed Extract

Dose of use : 2 - 4%

Aspect : yellow liquid with a weak characteristic odor

Solubility : soluble in water, insoluble in oils and fats

Conclusion

Beauty Creations
The Passion for Beauty



- A global and original solution based on the "miracle tree" for skin and hair care.
- Original activities.
- Renewable resource
- Sustainability - Equitable trade.
- Innovative products and concepts respecting ecological and human values.

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