



A protective shield
against the 3 types of pollution:

- ▶ Atmospheric
- ▶ UV
- ▶ Domestic

GLYCOFILM® POLLUSTOP®

Biosaccharide gum-4

[The Shield]

PCHI Award 2016

获奖名单
Winners List



*Screen against
pollution*



CONTEXT



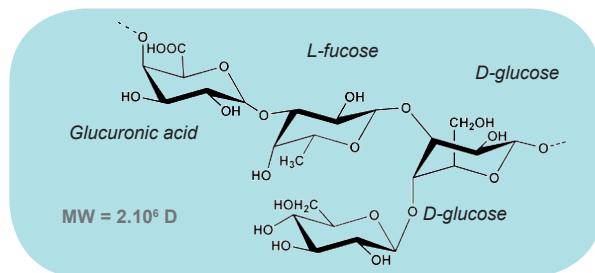
The pollutants which constitute our daily, inside and outside environment, must be rightly considered as important sources of cutaneous stresses, even if they were underestimated for a long time. The evolution of our lifestyles and the increasing urbanization during these past years amplify the risks, making the pollution one of the major sources of concern for the health and beauty. **Cells, their lipid and protein components but also their DNA are the targets of pollutants, generators of oxidation and inflammation. Dry skin, reactive and sensitive skin, acne and more particularly premature and accelerated aging are so many consequences known for the pollution.**

It is their nature which determines the degree of penetration and damages of pollutants but also the integrity of the Stratum corneum. Unfortunately its protective function is not unlimited and the prolonged and repetitive exposure to high levels of pollutants overtakes its natural defense capacity, until the barrier weakened and the damages increase. **At hair level, pollution is responsible for dry, brittle and dull hair, because of induced lipid peroxidation, damaging the structure of hair fiber.**

If biologically stimulating the natural defenses is an answer to fight against pollution at long term, it is also possible to **act immediately and physically, to increase the skin and hair capacity of protection by applying a «breathing» non-occlusive shield, which will make screen for the penetration of pollutants and reduce the induced damages.**

DEFINITION

Created to form a film on the skin and hair surface, GLYCOFILM®/ POLLUSTOP® is an anionic polysaccharide of high molecular weight, obtained by biotechnology.

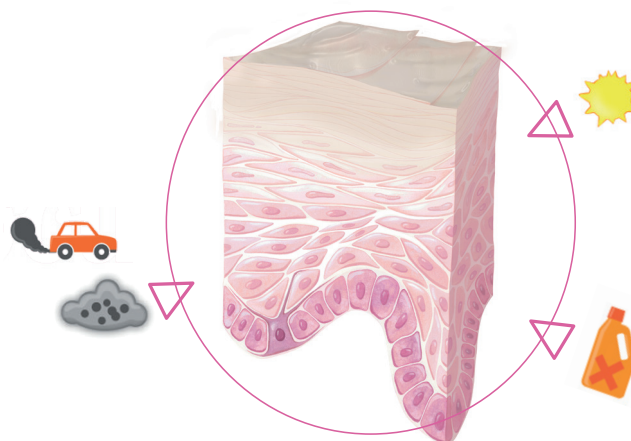


MODE OF ACTION

Thanks to its matrix-forming property, GLYCOFILM®/POLLUSTOP® makes barrier to the 3 types of pollution stresses:

- **Atmospheric (carbon particles, particulate matter and heavy metals)**
- **UV**
- **Domestic (chemicals)**

and so limit the skin extra and intracellular induced damages (oxidative stress, inflammation, cellular and mitochondrial toxicity, etc.), but also prevent the alteration of hair fiber by oxidative pollution.



ADDITIONAL INFORMATION

INCI/CTFA name:

GLYCOFILM® 1.5P: Biosaccharide gum-4

POLLUSTOP®: Biosaccharide gum-4 (and) 1,2-hexanediol

Preservative system:

GLYCOFILM® 1.5P: 1.5% phenoxyethanol

POLLUSTOP®: **preservative free**

Regulatory status: authorized for use in EU, USA, China (IECIC 2015, IECSC), Japan, Australia and Canada subject to conditions

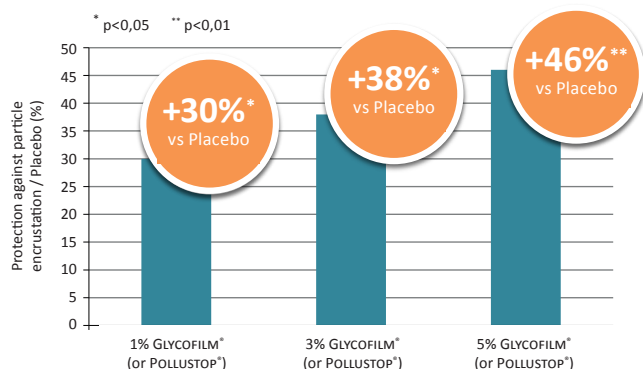


PROTECTION AGAINST ATMOSPHERIC POLLUTION

1. PROTECTION FROM POLLUTION PARTICLES ENCRUSTATION ON SKIN



In vivo study realized on 10 volunteers. Application of a cream containing GLYCOFILM® 1.5P (or POLLUSTOP®) (1%, 3% and 5%) vs. Placebo and then application of a carbon particles solution (size up to 149µm, main particles between 1 to 125µm). Visualization by videomicroscopy and quantification of particles by image analysis before and after rinsing.



Up to +96% protection vs. Placebo
100% positive response



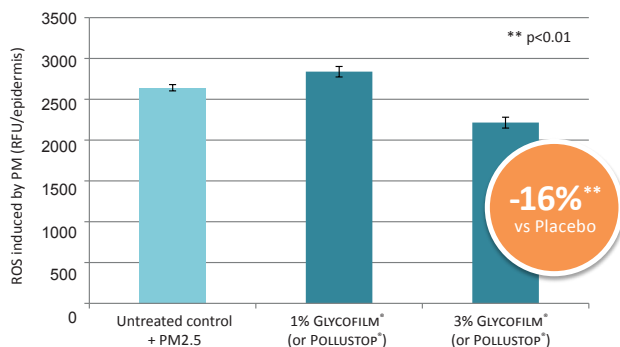
Thanks to the shielding effect, the skin is protected from particles encrustation. GLYCOFILM® (or POLLUSTOP®) limits the risk of biological damages caused by atmospheric pollution! Skin can breathe!

2. PROTECTION AGAINST PM-INDUCED OXIDATIVE STRESS



In vitro study

Treatment of reconstructed epidermis by **topical application** with GLYCOFILM® 1.5P (or POLLUSTOP®) at 1% and 3% in an aqueous solution vs. Untreated control. Exposition to non cytotoxic dose of **PM2.5** (4.375 mg/ml in dichloromethane) during 18 hours. Intracellular oxidative stress is revealed by dichlorofluoresceine (DCFH) and measured by fluorimetry.



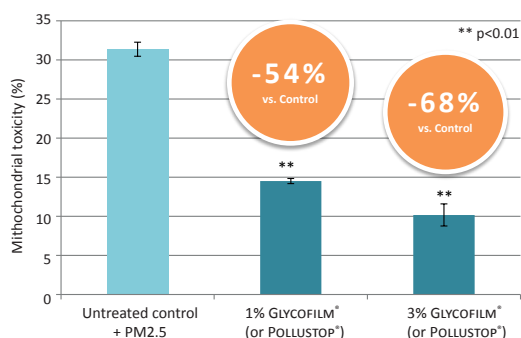
Thanks to the shielding effect, GLYCOFILM® (or POLLUSTOP®) protects the cells from pollution-induced oxidative stress, thus preserving epidermis function.

3. PROTECTION AGAINST PM-INDUCED MITOCHONDRIAL DAMAGE



In vitro study

Treatment of reconstructed epidermis by **topical application** with GLYCOFILM® 1.5P (or POLLUSTOP®) at 1% and 3% in an aqueous solution vs. Untreated control. Exposition to cytotoxic dose of **PM2.5** (10.5 mg/ml in dichloromethane) during 48 hours. Mitochondrial toxicity was evaluated by MTT test and measured by spectrophotometry.



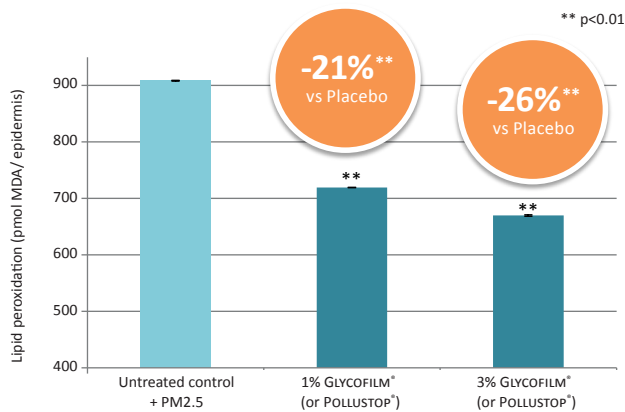
Thanks to the shielding effect, GLYCOFILM® (or POLLUSTOP®) protects the mitochondria from pollution-induced toxicity, thus preserving key cellular metabolism.

4. PROTECTION AGAINST PM-INDUCED LIPID PEROXIDATION



In vitro study

Treatment of reconstructed epidermis by **topical application** with GLYCOFILM® 1.5P (or POLLUSTOP®) at 1% and 3% in an aqueous solution vs. Untreated control. Exposition to cytotoxic dose of **PM2.5** (10.5 mg/ml in dichloromethane) during 48 hours. The lipid peroxidation level is revealed by the MDA level measured by TBARS test and spectrophotometry.



Thanks to the shielding effect, GLYCOFILM® (or POLLUSTOP®) protects lipids from pollution-induced oxidation, thus preserving the structure and function of skin and also hair as lipids are major components of these latter.

5. PROTECTION AGAINST HEAVY METALS ENCRUSTATION ON SKIN



In vivo study realized on 20 smokers (women and men). Strippings were performed on the 2 cheeks. Application on half-face of a cream containing 3% GLYCOFILM® 1.5P (or POLLUSTOP®) vs. Placebo. Then, volunteers were asked to spend 6h outside in a city area (atmospheric pollution >50µg of particles (PM10)/m3) and smoked at least 5 cigarettes. At T6h, strippings were performed. Heavy metals were assayed.

TEST UNDER ACTUAL URBAN LIVING CONDITIONS (EUROPE)!

	Placebo	3% GLYCOFILM® (or POLLUSTOP®)
Concentration in IRON vs. T0	+102.8%***	+3.3%
Concentration in LEAD vs. T0	+190.3%***	+7.1%
Concentration in CHROMIUM vs. T0	+178.5%***	+2.6%

*** p<0.001 increase not significative

More than 95% of anti-adhesion action vs. Placebo (p<0,001)

GLYCOFILM® (or POLLUSTOP®) provides a very significant shield, which is physical and immediate, to the encrustation of heavy metals in skin, thus limiting the risk of biological damage caused by this pollution.

Protective effect proved in vitro : +56% protection against cadmium-induced cellular toxicity

6. PROTECTION AGAINST POLLUTION AND ITS HARMFUL EFFECTS ON THE SKIN



In vivo study realized on 25 volunteers living in Beijing. Daily application on the whole face of a cream containing 3% GLYCOFILM® 1.5P (or POLLUSTOP®) during 7 days. Self-evaluation of product benefits just right after the first application, at the end of the first day and after one week.

TEST UNDER ACTUAL URBAN LIVING CONDITIONS (ASIA)!



72%

"MY SKIN IS BETTER PROTECTED FROM ENVIRONMENTAL POLLUTION"
 "I FEEL A SENSATION OF A PROTECTIVE MATRIX OVER MY SKIN"
 "MY SKIN IS SMOOTHED"
 "MY SKIN IS BRIGHTER"





76% "MY SKIN LOOKS HEALTHY"

88% "MY SKIN IS SOOTHED"
"MY SKIN IS MOISTURIZED"

GLYCOFILM® (or POLLUSTOP®) forms a protective physical shield on the surface of the skin, perceptible by the users from the application and throughout the day. Thanks to this matrix, users feel that the skin is better protected against environmental pollution and that induced consequences are reduced (the skin is brighter, soothed, moisturized, etc.) and this from the first day!

7. PROTECTION AGAINST PM ENCRUSTATION ON HAIR

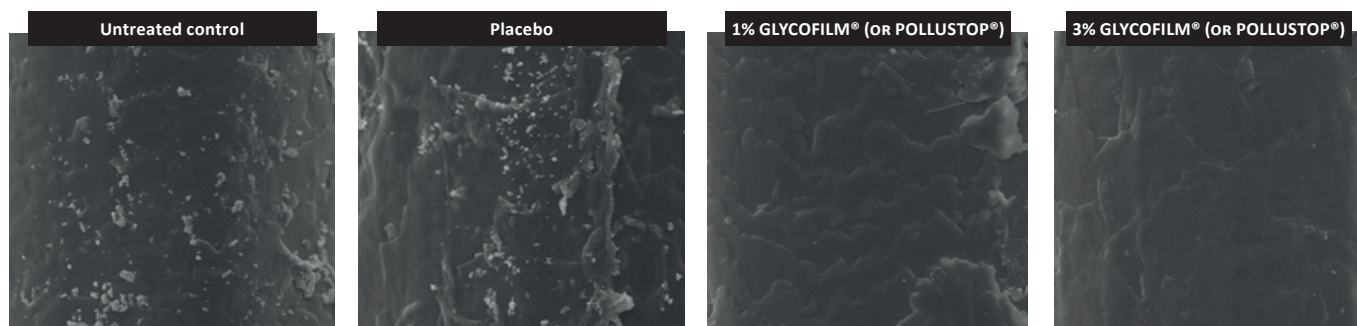
Ex vivo study



On hair locks application of a spray containing GLYCOFILM® 1.5P (or POLLUSTOP®) at 1% et 3% vs. Placebo and vs. Untreated control. Application of a solution of **PM1**. Visualization by videomicroscopy and quantification of particles by image analysis before and after rinsing.



Up to +84% protection vs. Untreated control (+48% on average, $p < 0.0001$)
100% positive response



Thanks to the shielding effect, GLYCOFILM® (or POLLUSTOP®) significantly prevents fine particles encrustation in the hair vs. Untreated control and vs. Placebo, thus limiting the risk of induced oxidative damage. The structure of the hair fiber is protected!

8. "CLEANSING" ACTION OF PM ON HAIR

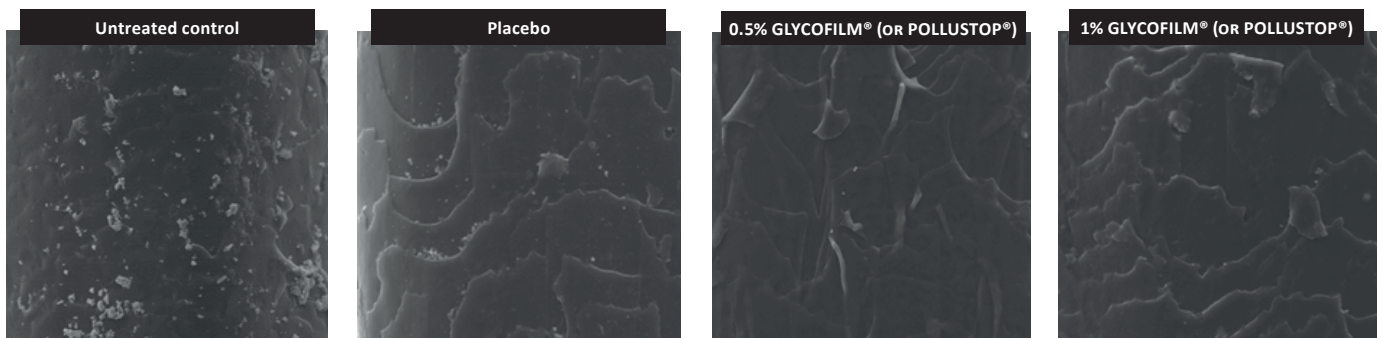


Ex vivo study

On hair locks application of a solution of PM1. Locks are cleansed with a shampoo containing GLYCOFILM® 1.5P (or POLLUSTOP®) at 1% et 0.5% vs. Placebo and vs. Untreated control. Visualization by videomicroscopy and quantification of particles by image analysis before and after treatment.



Up to +91% "cleansing" action vs. Untreated control (+60% on average, $p < 0.0001$)
100% positive response



GLYCOFILM® (or POLLUSTOP®) significantly facilitates the elimination of fine particles adhered on hair vs. Untreated control and vs. Placebo, thus releasing hair fiber from atmospheric pollution that asphyxiate, flatten and oxide. The structure of the hair fiber and its shine are preserved!

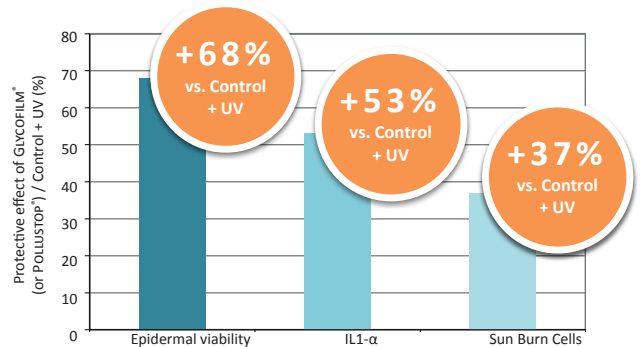
PROTECTION AGAINST UV

1. PROTECTION AGAINST UV-INDUCED DAMAGE



In vitro study

Treatment of reconstructed epidermis by topical application of GLYCOFILM® 1.5P (or POLLUSTOP®) at 5% vs. Untreated control. UV irradiation. Viability evaluated by dosage of lactate dehydrogenase (enzyme testifying of membrane alteration) and of IL-1 α released in culture medium (Elisa kit). Coloring, visualization on histological section and enumeration of Sun Burn Cells.

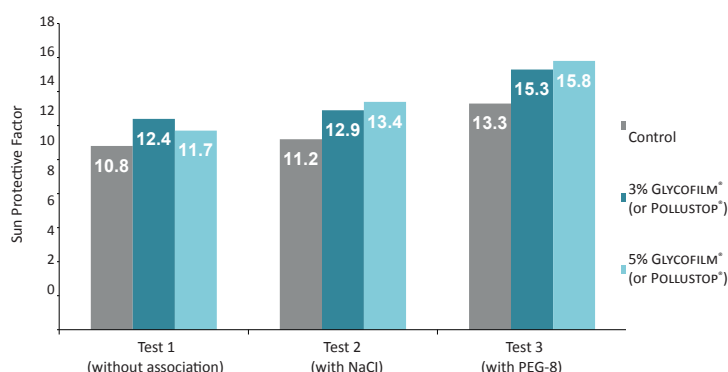


GLYCOFILM® (or POLLUSTOP®) significantly protects cells from damage due to UV pollution, preserving viability and limiting inflammation of the epidermis.

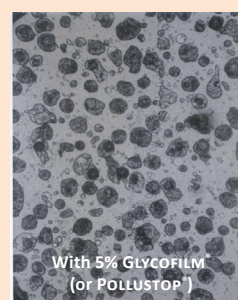
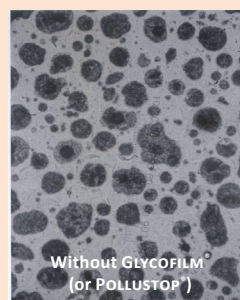
2. PROTECTION OF SKIN AGAINST UV: SPF IMPROVEMENT



In vivo study study realized on 10 volunteers. Application on back of creams containing GLYCOFILM® 1.5P (or POLLUSTOP®) (3 and 5%) associated or not to matrix co-activators (NaCl, PEG8) vs. Placebo. UV irradiation. Evaluation and measure of GLYCOFILM® 1.5P (or POLLUSTOP®) interactivity via the SPF (Sun Protection Factor) calculation.



Better dispersion of filters!



Enlargement (x 200)

Increase of SPF: +1 to +3 points

GLYCOFILM® (or POLLUSTOP®) combined with co-activators forms a matrix with a gelled structured that improves the dispersion of pigments in the formula and provides a more homogeneous application on skin that improves sun protection.

3. PROTECTION AGAINST UV-INDUCED OXIDATIVE STRESS ON HAIR



Ex vivo study

On hair locks application of GLYCOFILM® 1.5P (ou POLLUSTOP®) at 1%. Incorporation of a fluorescent labelling and irradiation of hair locks (UVA-UVB). Measure by fluorescence of the free radicals produced.

+76% protection against free radicals

GLYCOFILM® (or POLLUSTOP®) significantly decreases the UV-induced oxidative stress, thus protecting against lipid peroxidation responsible for dry and brittle hair.

PROTECTION AGAINST DOMESTIC POLLUTION

PROTECTION AGAINST DAMAGE INDUCED BY SULFATES USED IN HYGIENE/HOUSEHOLD PRODUCTS



In vitro study

Treatment of reconstructed epidermis by **topical application** of GLYCOFILM® 1.5P (or POLLUSTOP®) at 5% vs. Untreated control. Treatment with a solution of 8% SDS (Sodium Dodecyl Sulfate). Viability evaluated by spectrophotometric assay of lactate dehydrogenase (enzyme testifying of membrane alteration).

+37% protection against cellular toxicity

GLYCOFILM® (or POLLUSTOP®) protects skin from the harsh surfactants, thus limiting the weak of barrier function and permeability to other types of pollution.

APPLICATIONS

Usage dose: from 0.5% to 5%

Everyday protective skin and hair care

Anti-pollution

Anti-aging

Sun care

Formulation with residual film / "shield" effect

FORMULATION

pH stability: 3.0 to 9.0

Thermostability: incorporation at high or low temperature

Soluble in water, glycerin, glycol, 20% ethanolic solution

Formulation example:

UNDER'COVER SHIELD

ref.: 198501/1

"Formulation tips"

GLYCOFILM® (or POLLUSTOP®) interacts positively with salts, glycols, alcohol, PEG... to form organized gelled structures, thereby increasing its matrix effect and texturizing properties



Face



Primer



O/W

	INGREDIENTS	INCI NAME	%
A	DEMINERALIZED WATER	<i>Aqua</i>	QSP 100
	PRESERVATIVE	/	QSP
	ETHANOL	<i>Alcohol</i>	1.00
	ULTREZ 21 (LUBRIZOL)	<i>Acrylates/C10-30 alkyl acrylate crosspolymer</i>	0.15
	GLYCERIN	<i>Glycerin</i>	3.00
	SOLAGUM TARA (SEPPIC)	<i>Caesalpinia spinosa gum</i>	0.30
B	ABIL CARE XL 80 (EVONIK)	<i>Bis PEG / PPG-20 / 5 PEG / PPG-20 / 5 Dimethicone, Metoxy PEG / PPG-25 / 4 Dimethicone, Caprylic / capric triglyceride</i>	2.00
	CETIOL CC (BASF)	<i>Dicaprylyl carbonate</i>	4.00
	DUB ZENOAT (STEARINERIE DUBOIS)	<i>Propanediol dicaprylate</i>	2.00
	SKINCARE RS30544 PERFUME (TECHNICOFLOR)	<i>Parfum</i>	0.10
C	VELVESIL DM 01P (MOMENTIVE)	<i>Dimethicone / Cetearyl dimethicone crosspolymer</i>	4.00
	DC 200 V10 (DOW CORNING)	<i>Dimethicone</i>	3.00
	DC TORAY FZ 3196 (DOW CORNING)	<i>Caprylyl methicone</i>	2.00
D	GLYCOFILM 1.5P® OR POLLUSTOP® (SOLABIA GROUP)	<i>Biosaccharide gum-4 or Biosaccharide gum-4 (and) 1,2-hexanediol</i>	3.00
	SODIUM HYDROXIDE, SOL. AT 10%	<i>Sodium hydroxide</i>	Qsp pH

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