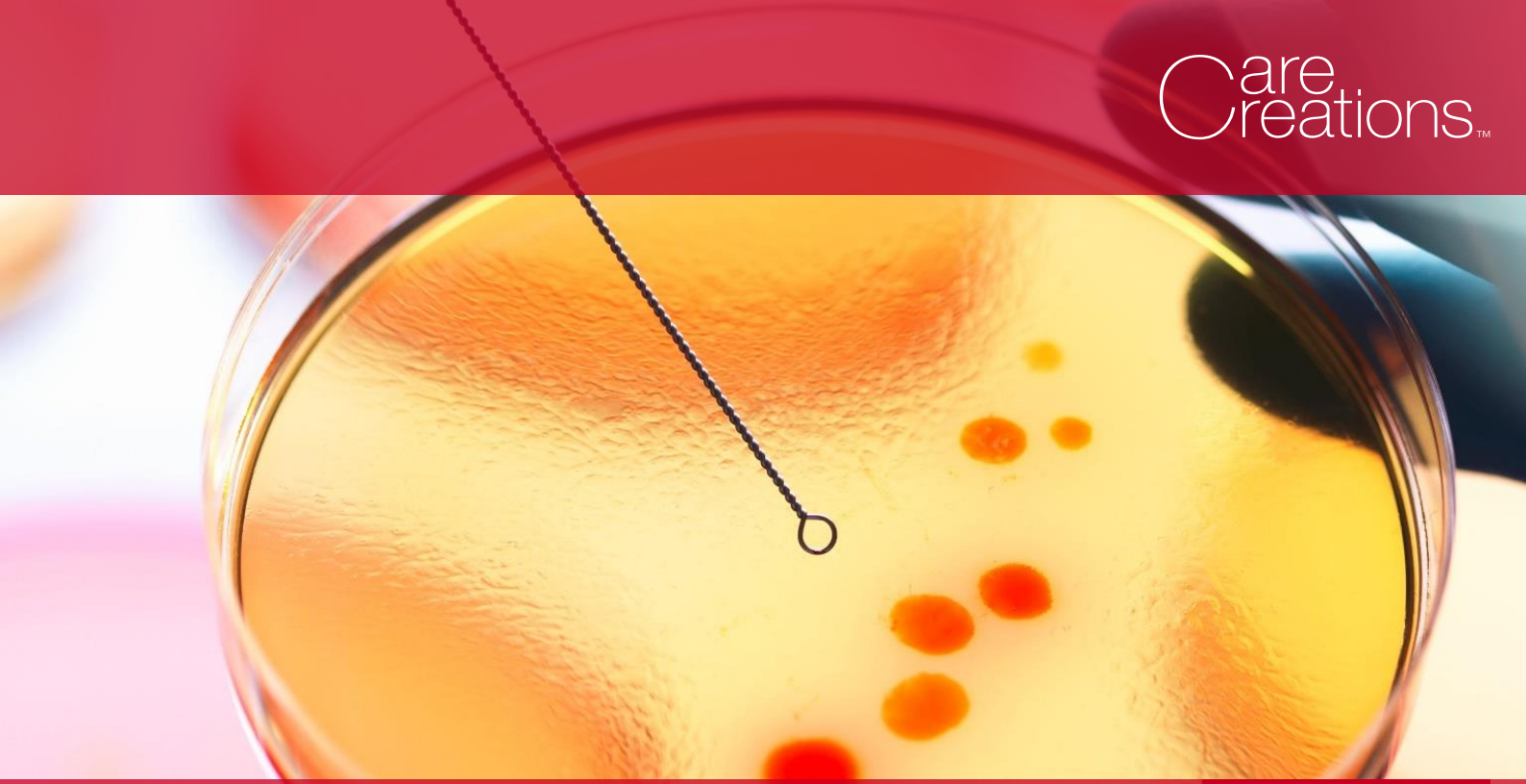
Care Creations™



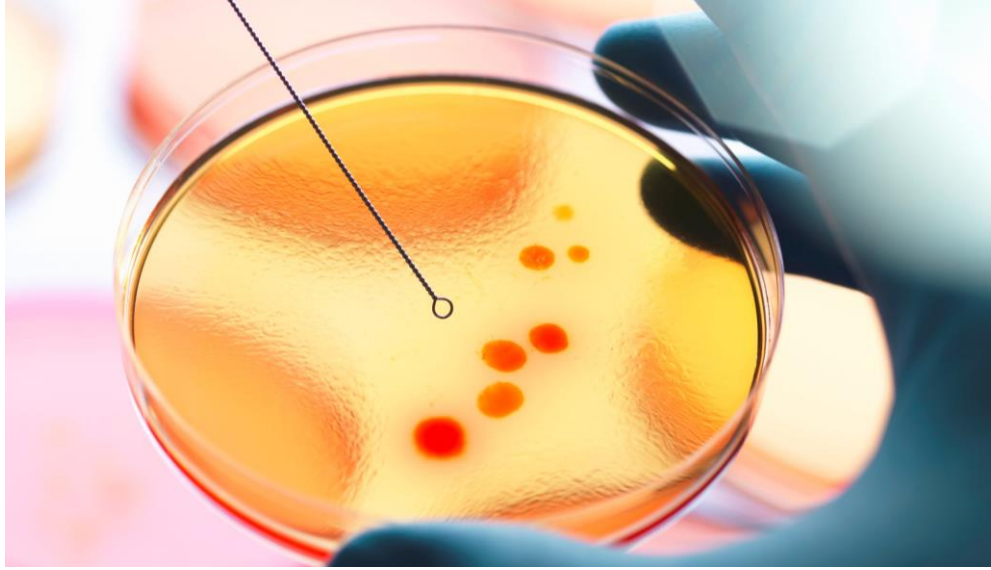
BASF Beauty Creations Microbiota Expertise

BASF
We create chemistry

Microbiota Platform

The skin is the largest human organ. From birth, its surface is colonized by the microbiota: a flora composed of bacteria, yeasts, fungi and viruses. This invisible yet abundant microbiota can reach up to one million microorganisms per cm^2.

Microbiota composition continues to evolve throughout life depending on the skin conditions (water, pH, lipids, proteins) or on the skin environment (temperature , sun exposure).



In the early 2000s, almost nothing was known about the cutaneous microbiota. As the recent advances in genomics have made it possible to reveal the mysteries of its composition, we are only now beginning to glimpse the beneficial role of this cutaneous microbiota and to establish a link with the health of our skin.

Through a platform dedicated to the study of this cutaneous microbiota, BASF is continually acquiring a deeper understanding of the interactions between the skin and its microflora to offer unique active ingredients able to rebalance cutaneous microbiota.

For an out of the box cosmetic, which regulates the cutaneous disorders by acting on the living.

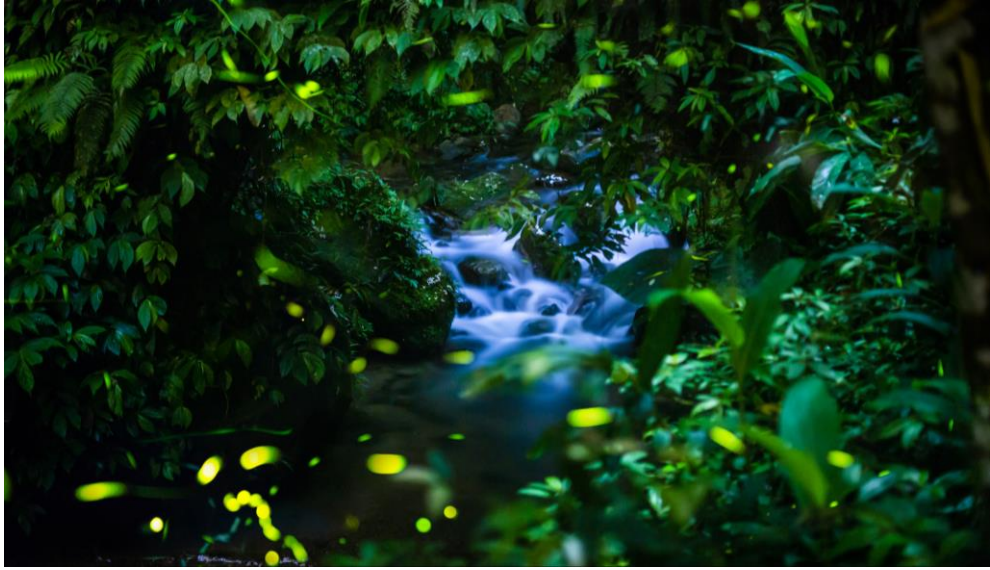
Microbiota Platform

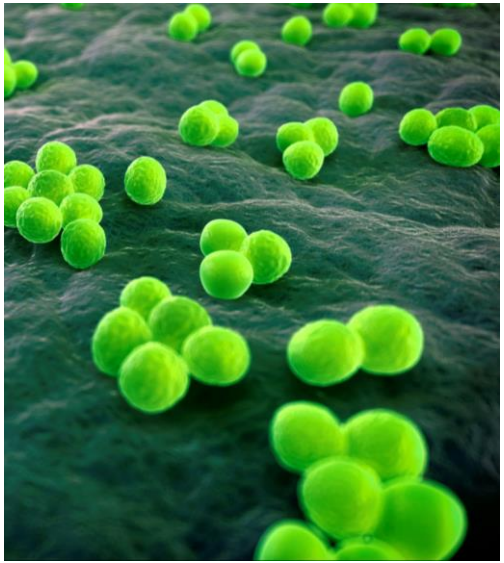
Cutaneous microbiota is defined as the set of microorganisms (bacteria, fungi, viruses) living in harmony with skin cells.

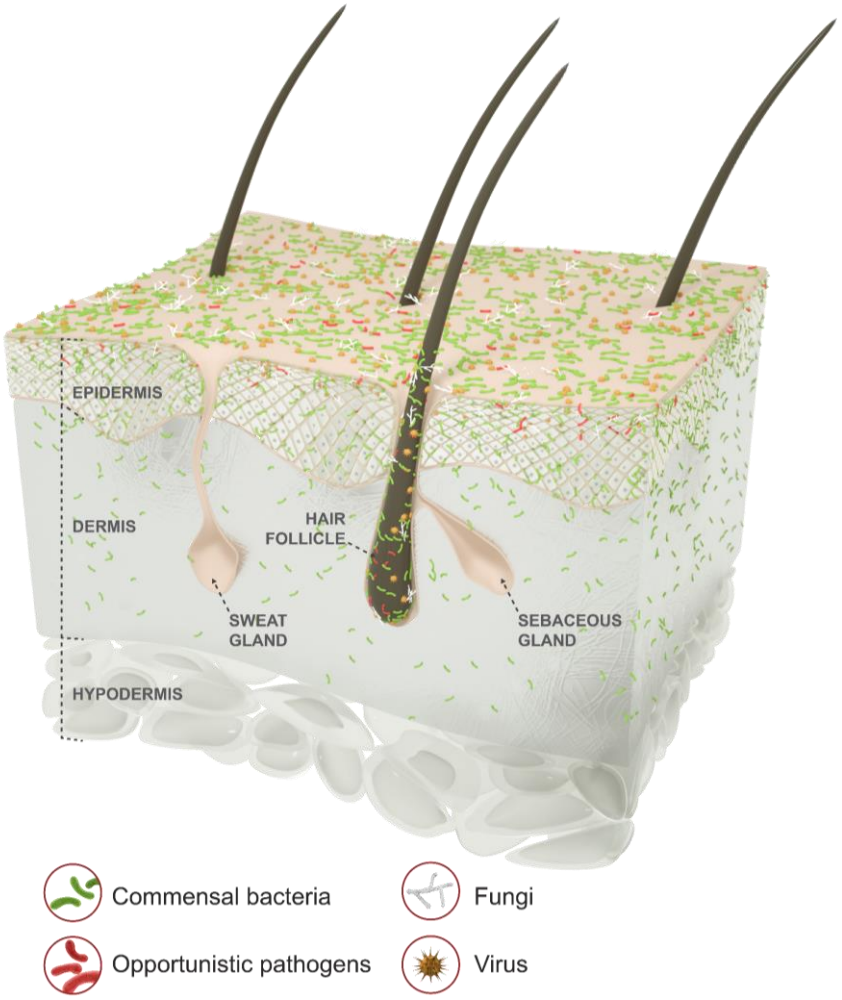
From a bacterial point of view, the microbiota consists of two types of bacteria:

- commensal bacteria
- opportunistic pathogens

Skin health is based on this vibrant and dynamic ecosystem.







A vast ecosystem

The microbiota colonizes the skin:
- on the surface of the epidermis
- in the epidermis
- in the dermis

Microorganisms are also found in deeper areas of the skin:

- in the sweat glands
- in the sebaceous glands
- in the hair follicles

The exchange area between microorganisms and host skin cells is estimated to be more than 25 m².

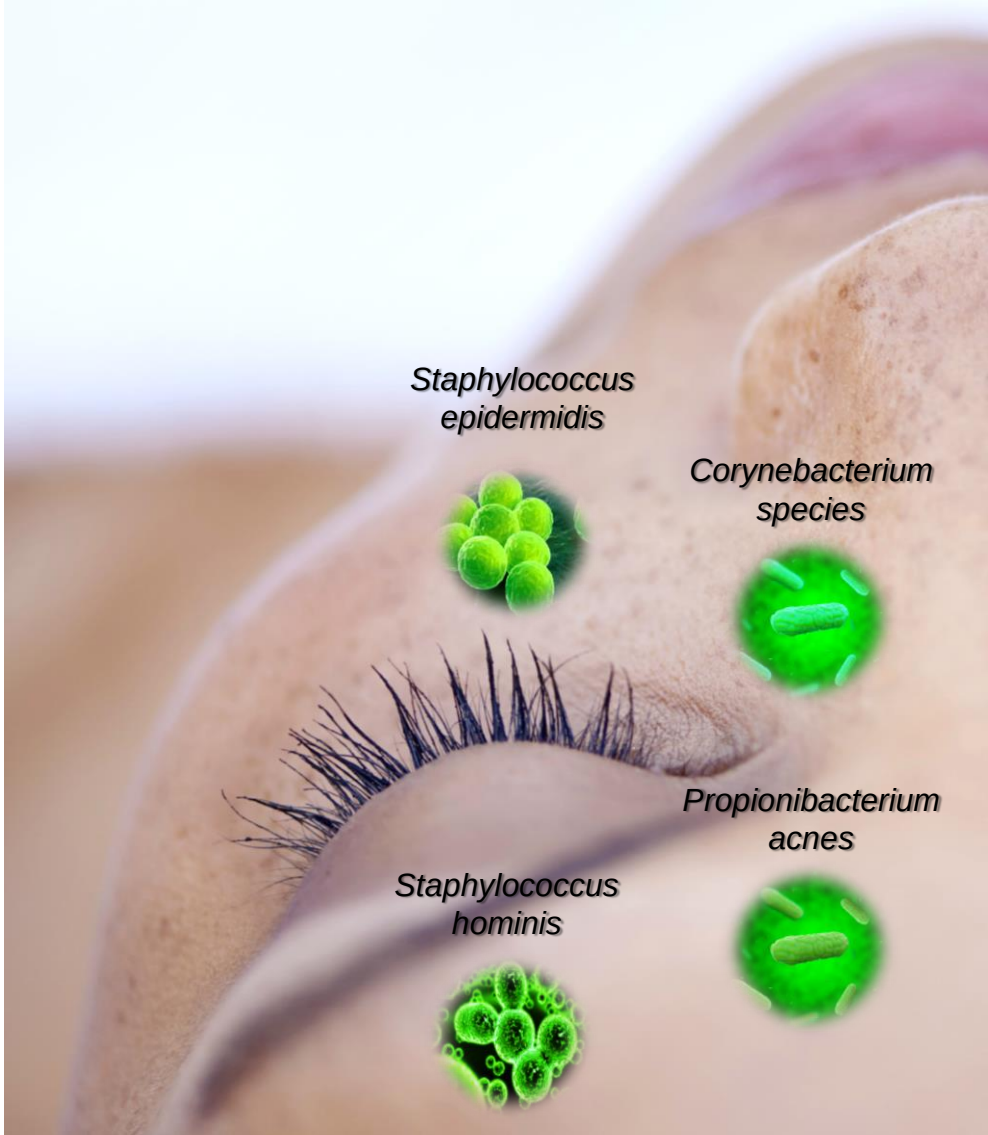
What are commensal bacteria?

Commensal bacteria correspond to the resident flora that lives in harmony with skin cells without harming them (about 300 bacterial species).

These bacteria have a beneficial role since they provide effective protection against the colonization of the skin by opportunistic pathogens.

Examples of commensal bacteria:

- *Staphylococcus epidermidis*
- *Staphylococcus hominis*
- *Corynebacterium species*
- *Propionibacterium acnes*



What are opportunistic pathogens?

Opportunistic pathogens are also present on the skin surface but in a transient way. Opportunistic pathogens replace commensal bacteria in the ecological niche since they are able to secrete virulence factors (lipase, protease, toxins) that help them evade the natural skin defenses. Their presence induces inflammation of the skin.

Examples of opportunistic pathogens:

- *Staphylococcus aureus*
- *Pseudomonas aeruginosa*
- *Propionibacterium acnes*

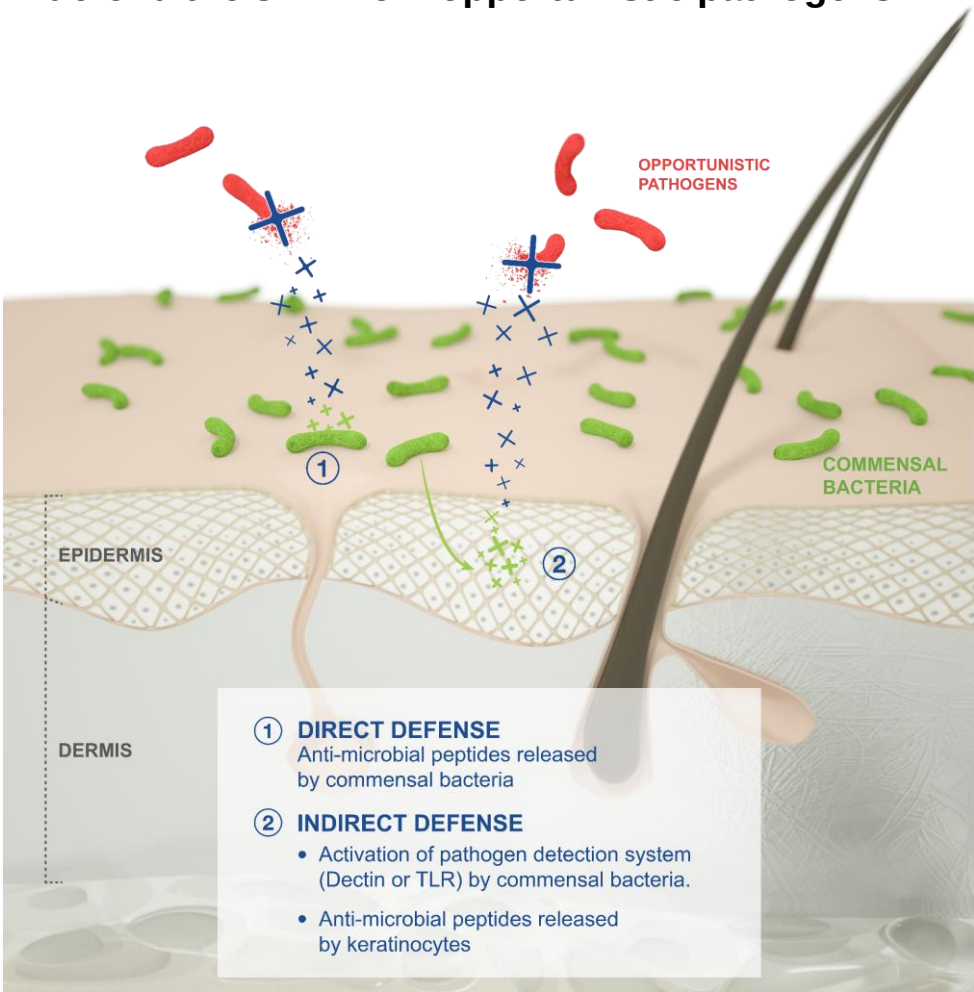
A fragile balance

Commensal bacteria live in community and in harmony with skin cells. This ecosystem is a fragile balance.

Skin cells bring nutrients and are the foundation on which commensal bacteria can multiply. In exchange, a healthy commensal flora actively prevents from the colonization of the skin by opportunistic pathogens.

By secreting anti-microbial peptides (direct defense) and stimulating the natural defenses of skin host cells (indirect defense), commensal flora forms a double line of defense against opportunistic pathogens.

How do commensal bacteria defend the skin from opportunistic pathogens?



Everybody has their own bacterial communities

Each skin area has its own bacterial community

This ecosystem is unique

The composition of the microbiota (presence and relative abundance of specific bacterial species in the commensal flora) is unique to each individual.

Like DNA, the composition of skin microbiota is a real individual signature.

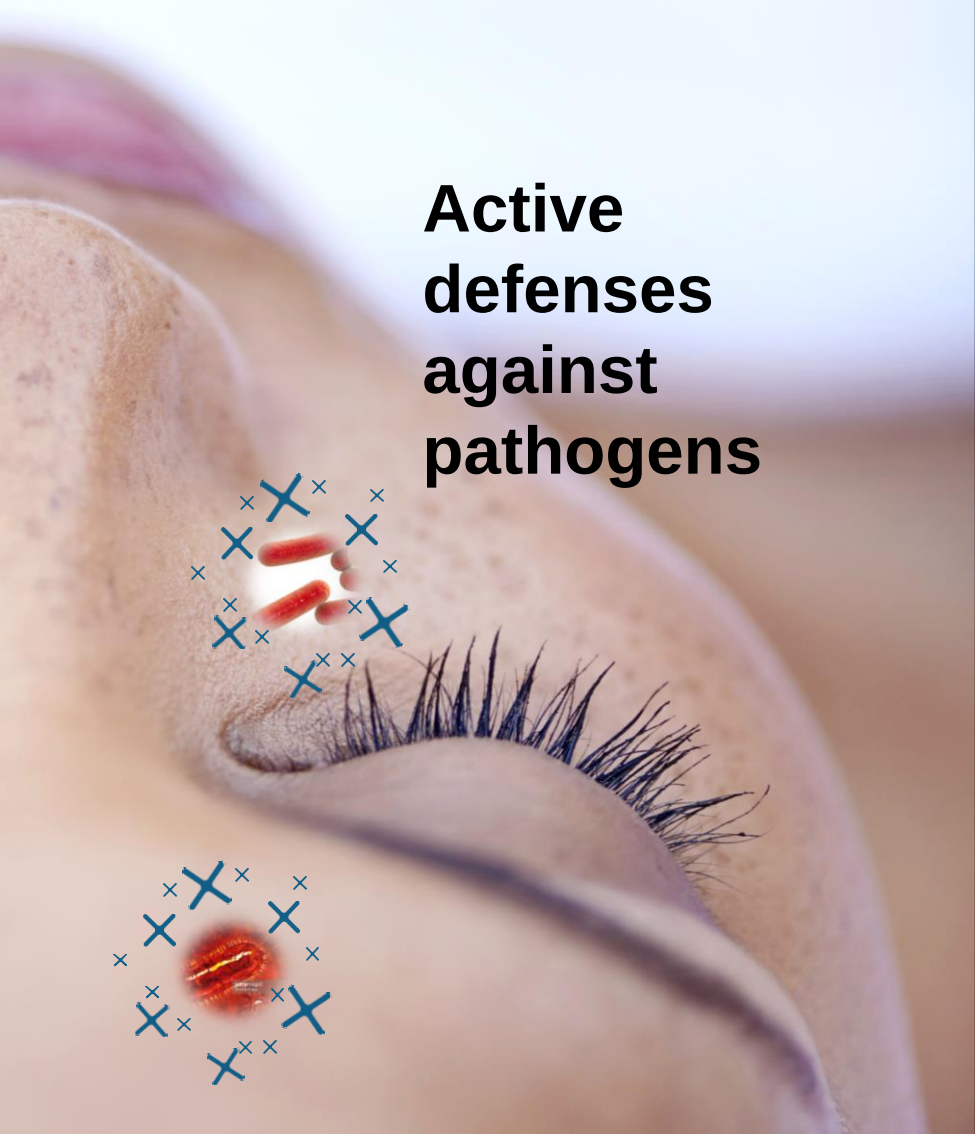
It is also important to note that this signature differs around the body.

Maintaining a balanced composition of the microbiota is essential to the preservation of skin health and beauty.

How to promote a healthy ecosystem?

Dysbiosis is due to a change in the composition of the commensal bacterial ecosystem (increase or a decrease in the bacterial diversity of commensal flora). As a consequence, opportunistic pathogens colonize the skin. Dysbiosis may lead to inflammation and/or skin disorders.

Regulating the ecosystem not only means favoring commensal bacteria over pathogens, but also protecting the bacteria against environmental factors and controlling the behavior of the bacterial population (biofilm).



Active defenses against pathogens

A harmonious commensal flora is key…

For harmonious development of the commensal flora, it is necessary to create favorable environmental conditions:

- By maintaining an effective skin barrier function and a physiological pH

- By protecting the microbiota from aggressive environmental factors (pollution, climate, UV exposure, hygiene, anxiety, nutrition)

An active defense against pathogens is required

To prevent the colonization by opportunistic pathogens, it is necessary to activate the skin's defenses against pathogens:

- By activating the production of anti-microbial peptides by commensal bacteria (direct defense)

- By stimulating skin's natural defenses (indirect defense)

Acne prone skin

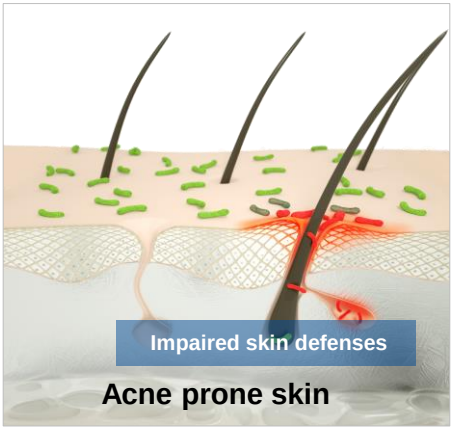
Acne-prone skin is partly due to the increased proliferation of specific virulent strains of *P. acnes* (secretion of proteases, lipases) responsible for an inflammation of the hair follicles and resulting in the appearance of comedones and papules. This inflammation can be accentuated by the presence of *S. aureus* (responsible for diffuse redness on acne prone skin).

Urban Skin

Pollution particulate matter (PM 2.5) induce cytotoxicity on commensal bacteria, such as *S. epidermidis or S. hominis*, allowing colonization by opportunistic pathogens such as *Streptococcus*, *C. albicans* or *S. aureus*. Redness appears and the skin becomes uncomfortable.

The most

frequent dysbiosis



Dry Skin

Dry skin is described as skin having a low barrier function, an increased inflammation and flaking. An impairment of the skin's barrier function disrupts the cutaneous ecosystem and alters its natural microbial biodiversity.

S. epidermidis which helps repair the skin barrier and fight inflammation becomes less abundant in the commensal flora.

S. aureus colonizes the skin and increases the rupture of the barrier due to the release of virulent factors.

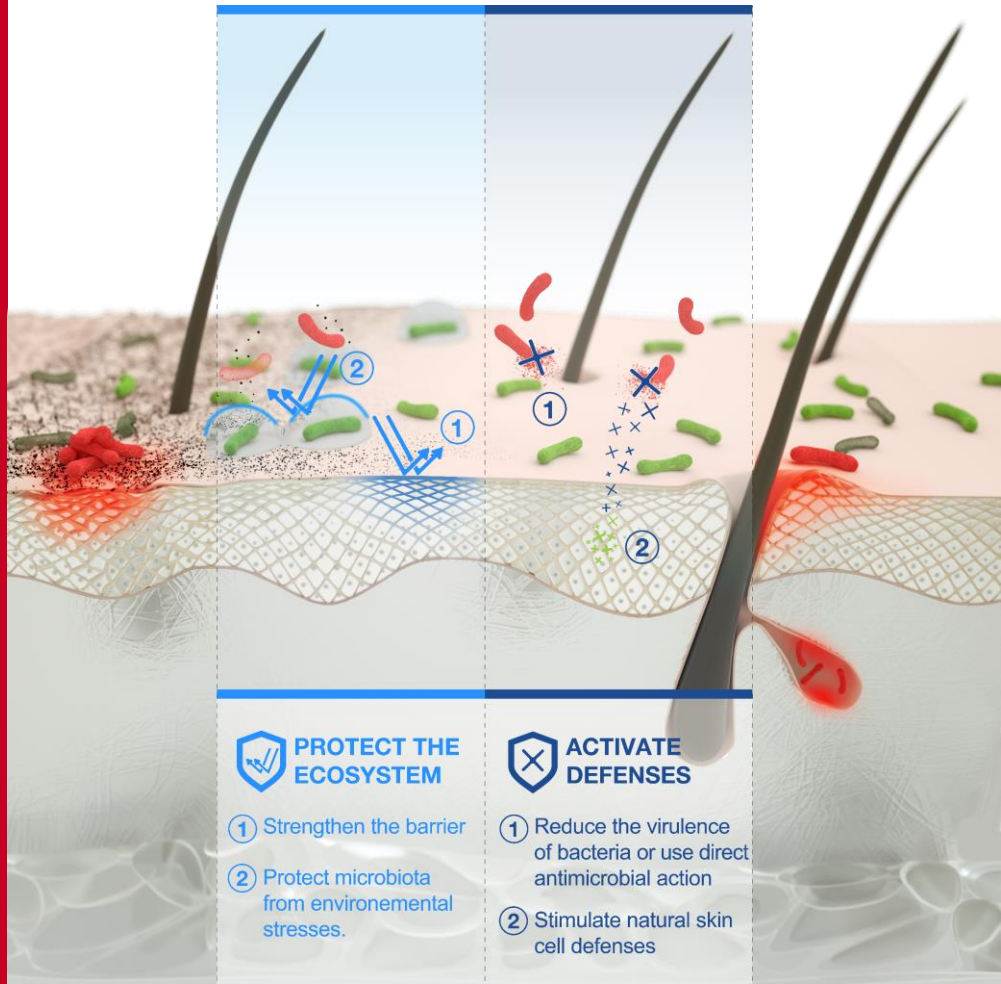
Our strategy

BASF develops ingredients enabling the optimization of the cutaneous microbiota.

The first strategy is a dual protective approach to promote a harmonious development of the ecosystem. Our ingredients strengthen the barrier and/or protect the commensal flora from the main environmental factors that may have a deleterious effect on bacteria.

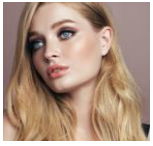
The second strategy is to actively promote innate defenses against opportunistic pathogens at both microbiota and skin cells levels.

How to preserve cutaneous microbiota?



BASF SOLUTIONS

	Betapur™	Relipidium™	PatcH2O®	Purisoft™
ECOSYSTEM				
STRENGTHENS THE BARRIER		●	●	
PROTECTS MICROBIOTA FROM POLLUTION			●	●
DEFENSES				
ANTI-MICROBIAL ACTION	●		●	
STIMULATES NATURAL SKIN CELL DEFENSE	●	●		



Double line of defense against acne

Healthy ecosystem promoter for dry skin

Comprehensive optimizer of urban skin health

Microbiota anti-pollution shield

Betapur™

Concept

Betapur™ is designed to eliminate imperfections and diffuse redness visible on acne prone skin.

The skin is the body's first line of defense against opportunistic pathogens from the environment.

How does it work?
Natural defenses actively participate in maintaining skin health by eliminating opportunistic pathogens. However, this also stimulates the inflammatory system. As a consequence, redness appears.

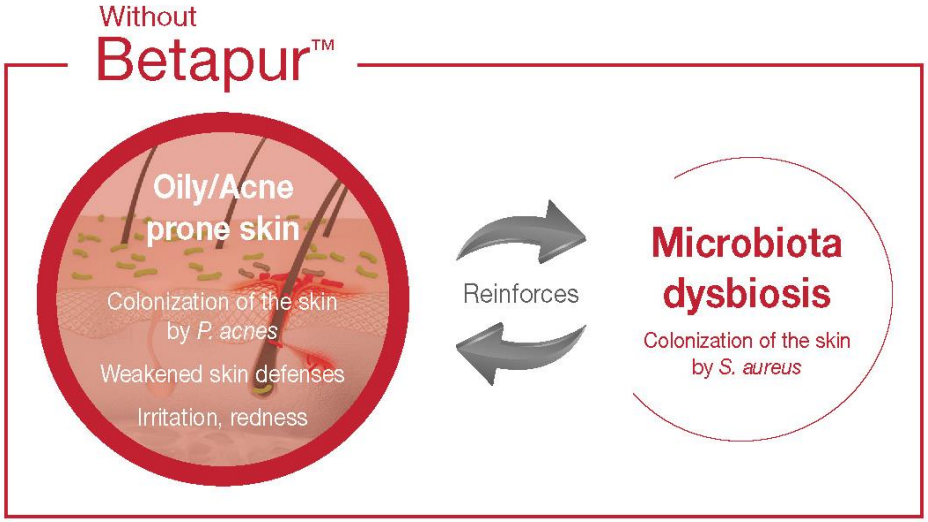
Betapur™ stimulates the skin's natural antibacterial defense system (beta-defensin hBD-3) without triggering any inflammatory reaction.

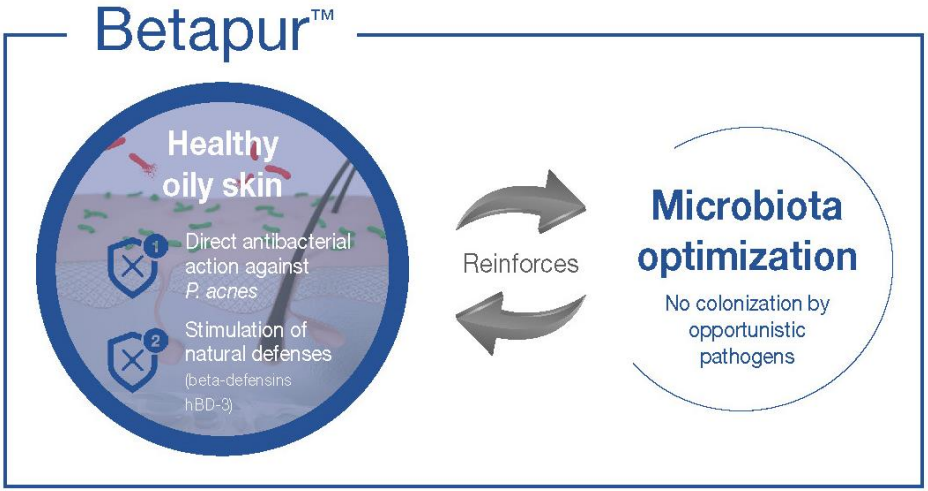
Our claim proposals

Promotes a healthy skin microbiota
Protects the skin from opportunistic pathogens (*P. acnes, S. aureus*), activates the production of antibacterial peptides

Mimics the skin's natural purification system
Stimulates the skin's natural antibacterial system (hBD-3)

Beautiful skin texture
Eliminates light diffuse redness and unsightly spots





Inspired by nature

Betapur™ is a powerful natural extract (boldo extract).

Thanks to our high throughput screening technique, we were able to evaluate capacity to activate the production of beta defensins without stimulating the cytokine cascade of 200 substance at once.

We have chosen Betapur™ due to its specific action on hBD-3, as it has broad spectrum activity against bacteria.
As a consequence, it is able to purifiy the skin of *P. acnes* which plays a major role in the development of acne and *S. aureus*, which is responsible for diffuse redness on the skin and can be considered an indicator of the severity of acne.

Betapur™
In vitro results

MICROBIOTA OPTIMIZER

50% Decrease in *P. acnes* growth (at 1%)

50% Decrease in *S. aureus* growth (at 1%) (indicator of the severity of acne)

8 x Stimulation the skin's natural antibacterial system (β-defensins hBD-3)

SOOTHES THE SKIN

32% Decrease in inflammatory cytokines (IL-8)

Betapur™
Clinical results

BASF
We create chemistry

CLARIFIES SKIN WITH IMPERFECTIONS AFTER 1 MONTH

CONSUMER TEST

80% Unified complexion and purity

84% Pore less visible

18% Reduction of color intensity of red blotches

SIGNIFICANTLY IMPROVES SKIN WITH IMPERFECTIONS AFTER 1 MONTH

33% Reduction in the number of open comedones

45% Reduction in the number of pustules

Care Creations™

Relipidium™

Concept

When exposed to environmental stressors, skin becomes more sensitive with a higher irritation potential.

An impairment of the skin's barrier function disrupts the cutaneous ecosystem and alters its natural microbial biodiversity. To reverse this vicious cycle and correct skin dryness, we have developed Relipidium™.

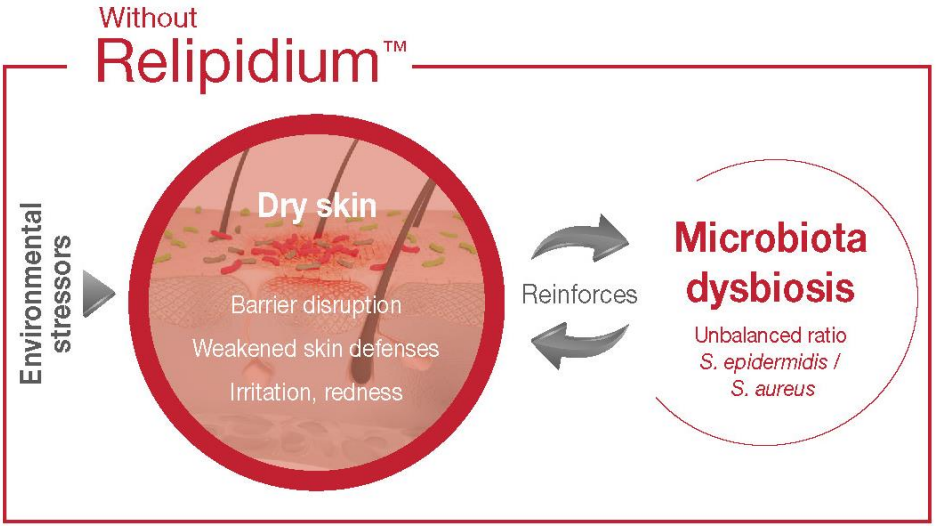
The unique peptide and short-chain fatty acid profile of Relipidium™ demonstrates moisturizing properties and delivers skin microbiota-balancing properties *in vivo*.

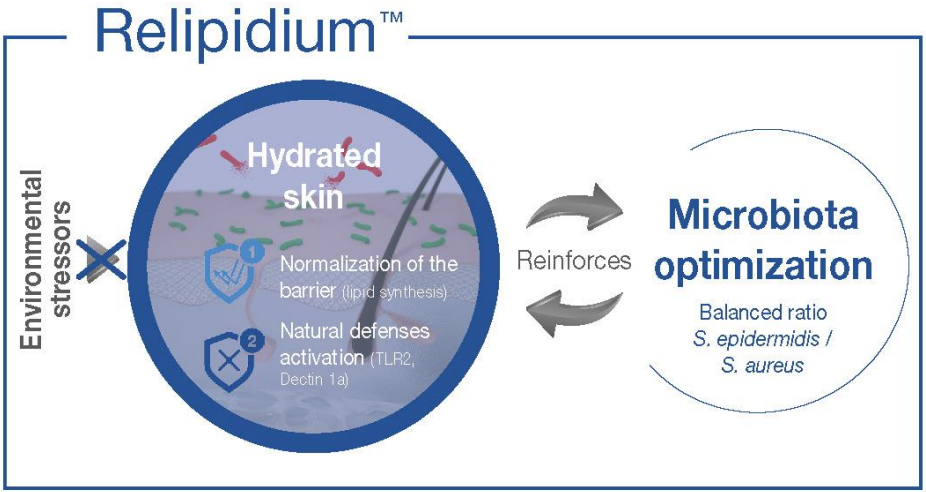
Our claim proposals

"Hydra Cocoon" Therapy
Restores the skin barrier and increases skin hydration

"Flor'happy" technology
Skin microbiota balancing properties
Corrects dry skin dysbiosis within 2 weeks

Empowers skin to reveal its youth & health
Activates natural skin defenses (TLR2, Dectin-1a)





The Microb'eauty Technology

Our biotechnology experts have selected a bio-fermented yeast extract to create Relipidium™ due to its ability to stimulate lipid synthesis. Relipidium™ restores the skin barrier and rebalances dry skin dysbiosis (normalization of the ratio *S. epidermidis / S. aureus*):

- *S. epidermidis* is a commensal microorganism
- *S. aureus* (opportunistic pathogen) is associated with low epidermal barrier function, increased desquamation and inflammation.

Relipidium™ also activates TLR-2 and Dectin-1a which act as a skin monitoring mechanism to protect the skin against opportunistic pathogens.

Relipidium™
In vitro and In vivo results

MICROBIOTA OPTIMIZER

2 x Commensal germs *S. epidermidis in 2 weeks*

2.3 x *S. epidermidis* / *S. aureus* ratio *in 2 weeks*

8 x Activation of TLR2 receptor (immunity) : opportunistic pathogen detector

10 x Activation of Dectin-1a receptor (immunity): opportunistic pathogen detector

94% Ceramides synthesis (barrier function recovery)

SOOTHES THE SKIN

54% Inflammatory cytokine (IL-8) reduction

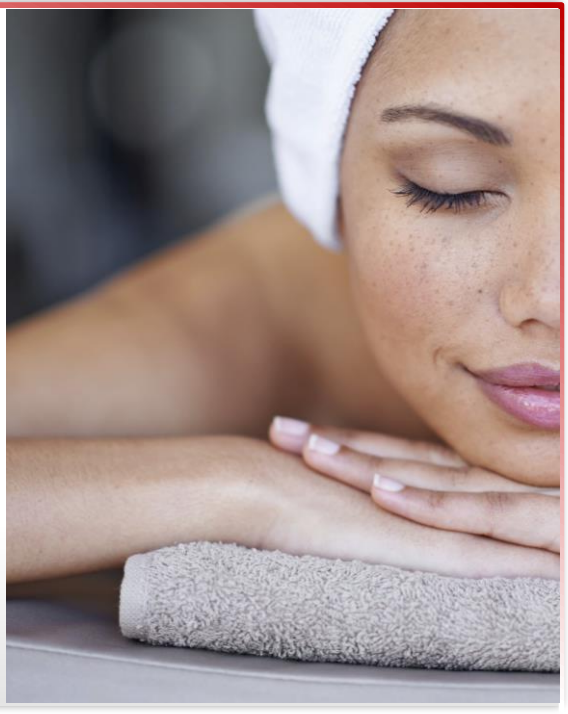
Relipidium™
Clinical results

BASF
We create chemistry

INCREASES SKIN HYDRATION

7% Improvement of TEWL versus Placebo (Transepidermal Water Loss)

11.5% Hydration versus D0 improvement (corneometry)



Care Creations™

PatcH$_2$O®

Concept

Well moisturized skin looks younger and fulfils its important role as a barrier, protecting our body against environmental pollutants.

Pollution affects skin beauty, quality and health. It induces dryness, premature aging, dull skin, skin irritation. It is also responsible for the modification of the composition of the microflora. Human skin exposure to ozone leads to a 50% reduction in resident skin microflora (bactericidal effect).

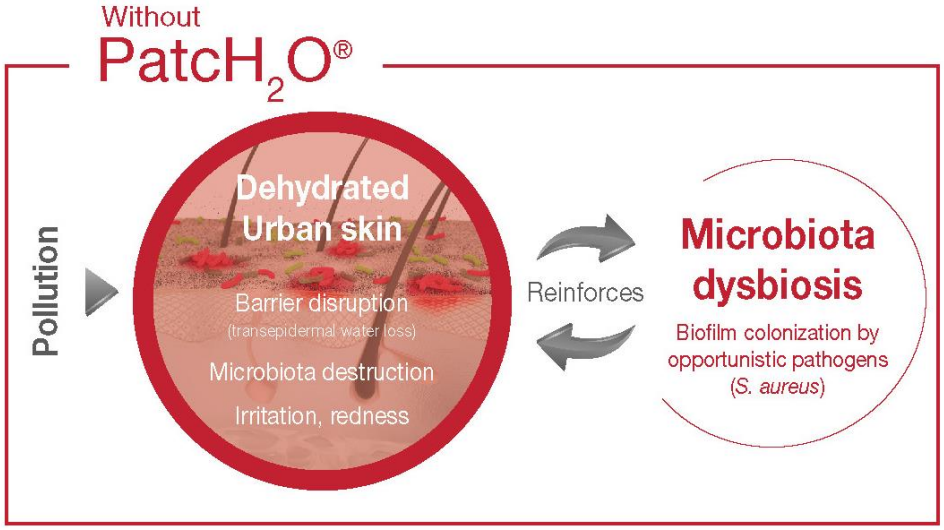
PatcH$_2$O® is a breakthrough technology with anti-pollution effectiveness and moisturizing effects.

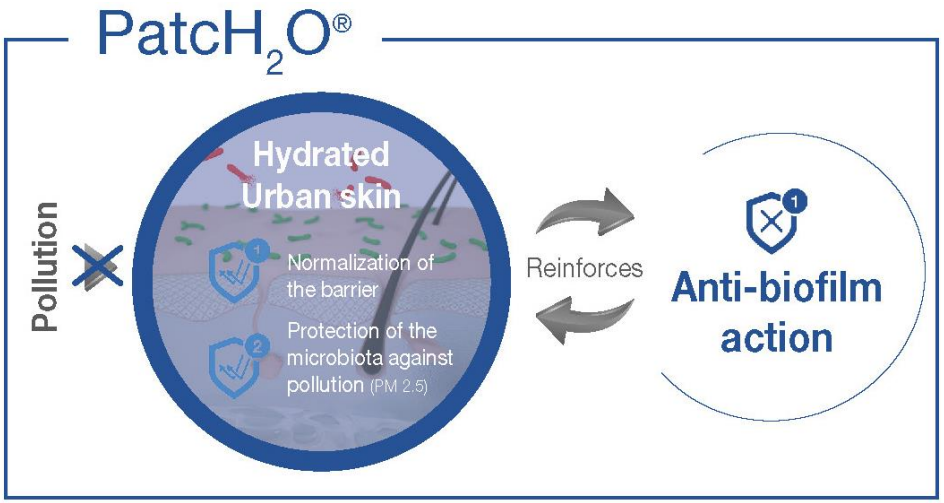
Our claim proposals

Urban microbiota optimiser
Reduction of biofilm formation from *S. aureus*

Pollu-shield Technology
Protects keratinocytes and skin microbiota against PM 2.5 (pollution particlates)

“Hydr’Absolue”
Increased and longlasting technological hydration





The hydra-protect technology

BASF Beauty Creations is a widely experienced expert in the vectorization and controlled release of cosmetic active ingredients. Patch$_2$O® is a unique combination of 3 polysaccharides with film-forming properties and a moisturizing complex (including components of NMF).

Urban skins generally suffer from dehydration. Patch$_2$O® acts both as a protective film (against pollution and water loss) and as an hydration reserve.
Dehydrated skin is prone to colonization by *S. aureus*. Patch$_2$O® prevents the formation of this harmful biofilm to preserve skin beauty.

PatcH$_2$O®
In vitro Results

MICROBIOTA OPTIMIZER

1.5 x Preservation of beneficial skin microbiota against pollution (*S. epidermidis* / PM 2.5)

43% Increased protection from pollutant deposition on the skin (pollution removal)

48h Barrier function recovery (limits evaporation of water)

33% Reduction of opportunistic bacterial virulence (biofilm formation from *S. aureus)*

PROTECTS SKIN AGAINST OXIDATIVE STRESS

23% Lipid peroxidation reduction

SOOTHES THE SKIN

80% Reduction of inflammatory cytokine (IL-8)

PatcH$_2$O®
Clinical results

BASF
We create chemistry

EPIDERMIS HYDRATION

71 % Improvement in hydration vs placebo (*in vivo*)

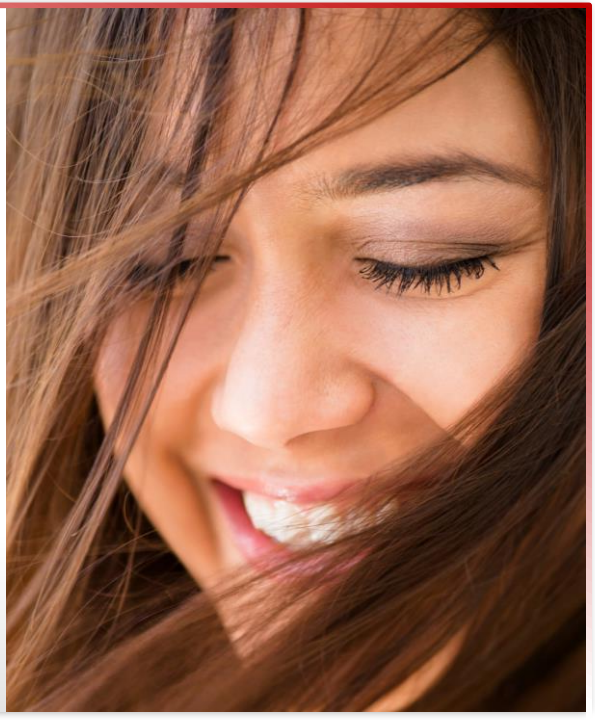
5 Days Comfort and moisturization after discontinuation of treatment (Long-term moisturizing effect)

CONSUMER TEST

88% Hydrated and soft skin

84% Elastic skin

80% Nourished skin



Care Creations™

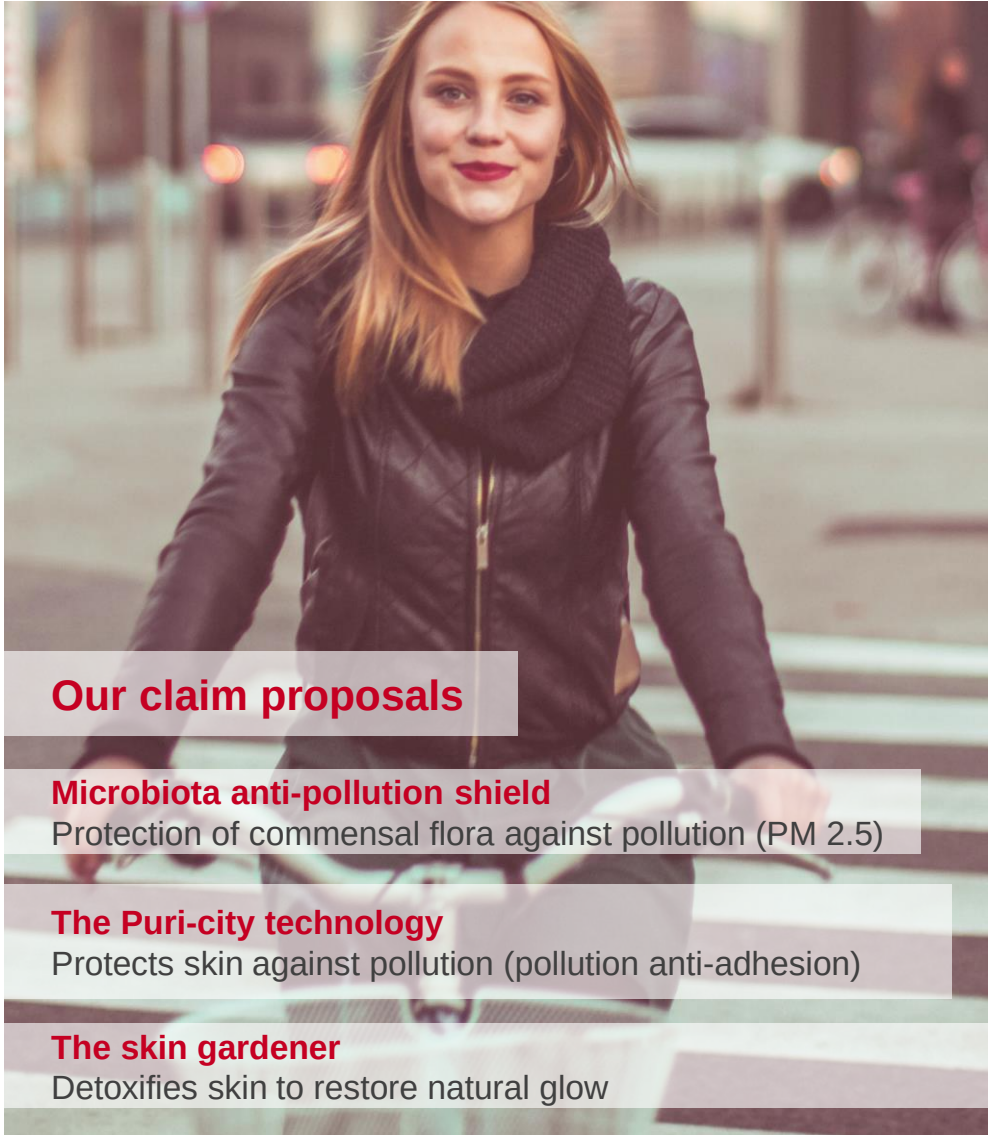
Purisoft™

Concept

In our modern world, the lifestyle of active people may lead to unexpected skin problems caused by pollution.

Day after day, our skin is directly exposed to regular environmental attacks. Pollution particles cover the skin with an invisible veil and asphyxiate it. The effects are dull, dry, wrinkled skin with loss of tonicity and firmness.

Purisoft™ has been developed to purify skin an to provide an essential defense against the effects of pollution.

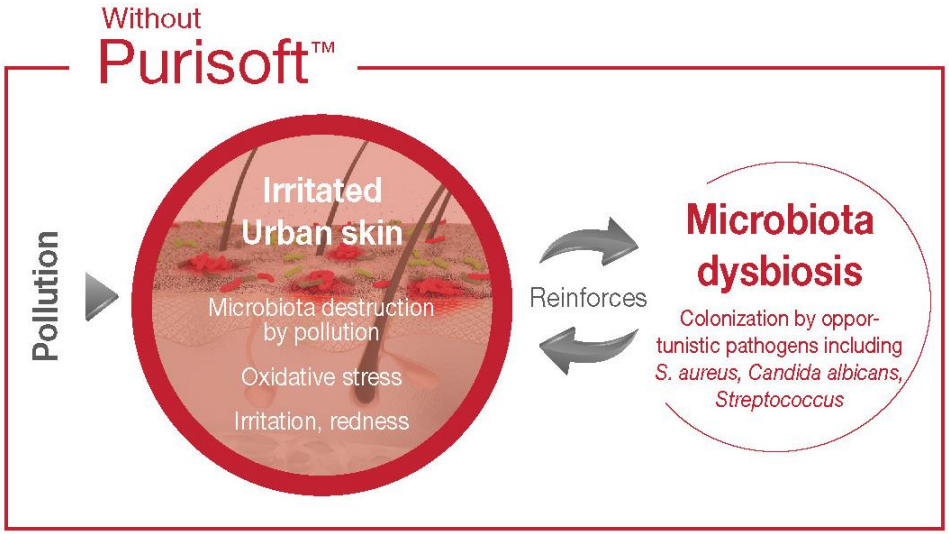


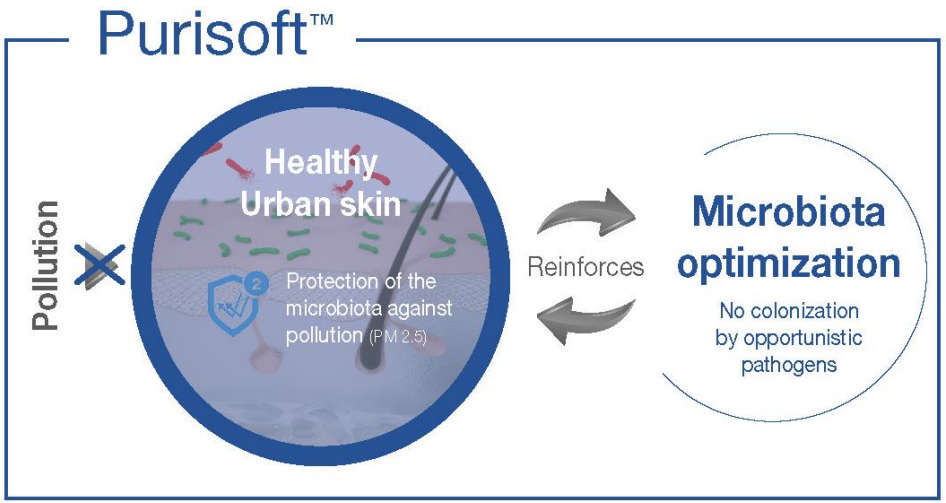
Our claim proposals

Microbiota anti-pollution shield
Protection of commensal flora against pollution (PM 2.5)

The Puri-city technology
Protects skin against pollution (pollution anti-adhesion)

The skin gardener
Detoxifies skin to restore natural glow





The miracle proteins

Enriched with the cationic proteins of Moringa seeds, Purisoft™ delivers anti-pollution benefits to skin and helps maintain urban skin beauty and homeostasis.

It helps preserve beneficial skin microbiota from the deleterious effect of pollution (PM2.5). Purisoft™ prevents particle adhesion on urban skin and preserves the vitality of commensal bacteria when exposed to pollution.
S. epidermidis and *S. hominis* are especially important for skin health because they are able to produce anti-microbial peptides (against *C. albicans* and *S. aureus* respectively) to protect skin from opportunistic pathogens.

Purisoft™
In vitro Results

BASF
We create chemistry

REBALANCES SKIN MICROFLORA

2 x Protects commensal bacteria against PM 2.5 (*S. epidermidis*)

1.5 x Protects commensal bacteria against PM 2.5 (*S. hominis*)

PROTECTS CELLS AGAINST TOXICITY OF HEAVY METAL AND CIGARETTE SMOKE

51% Intracellular reduction of ROS (oxidative stress induced by PM 2.5)

39% Lipid peroxidation reduction

SOOTHES THE SKIN

48% Reduction of inflammatory cytokines (IL-8) triggered by photo-pollution (PM 2.5 & UV)

Care Creations™

Purisoft™
Clinical results

BASF
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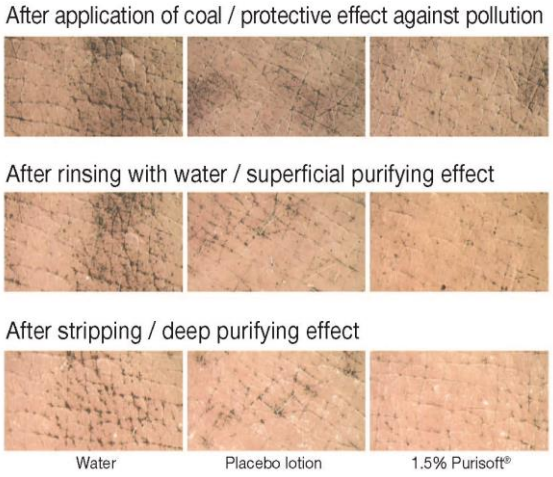
PROTECTS SKIN AGAINST POLLUTION

8 x

Pollution anti-adhesion (removal of dirt particles)



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Care Creations™

Product Characteristics

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Betapur™

A00067

INCI: Water, Butylene Glycol, Peumus Boldus Leaf Extract, Pentylene Glycol, Xanthan Gum

Dose of use: 0.5 to 5%

China IECIC listed

Page 15

Relipidium™

A00265

INCI: Hydrolyzed Yeast Protein, Butylene Glycol, Pentylene Glycol

Dose of use: 1 to 2%

China IECIC listed

Page 19

PatcH2O®

A00297

INCI: Water, Glycerin, Trehalose, Urea, Serine, Pentylene Glycol, Glyceryl Polyacrylate, Algin, Caprylyl Glycol, Sodium Hyaluronate, Pullulan, Disodium Phosphate, Potassium Phosphate

Dose of use: 3%

China IECIC listed

Page 23

Purisoft™

LS 9726

INCI: Water, Glycerin, Moringa Oleifera Seed Extract

Dose of use: 1.5%

PW PSE
LS 9836

INCI: Moringa Oleifera Seed Extract, Maltodextrin

Approved by ECOCERT RAW MATERIAL
COSMOS APPROVED

Dose of use: 0.03%

China IECIC listed

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Care Creations™

Credits

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Notes

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Notes

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