

# Depolluphane EpiPlus: Triple Action to Fight Urban Pollution

Depolluphane EpiPlus is a novel active ingredient developed by Mibelle Biochemistry to protect the skin from urban pollution. Depolluphane EpiPlus not only protects against environmental aggressors and strengthens the skin to easily face the daily stress of city life, it also protects skin cells in the long-term from the epigenetic changes caused by pollution



## Air Pollution – a Complex Toxic Mixture

Air pollution is one of the major areas of concern when it comes to skin ageing. Particulate matter (PM), particles sized between 0.1  $\mu\text{m}$  – 10  $\mu\text{m}$ , can penetrate into pores and contains toxic compounds such as heavy metals and allergens. In combination with exposure to UV light, PM causes oxidation reactions within the skin, which lead to the formation of reactive oxygen species, inflammation and the loss of collagen. The result is irritated, uneven skin that will age more rapidly.

Recent research has shown that this is not the only danger: continuous exposure to air pollution causes epigenetic changes in our cells that can persist long-term even after the harmful exposure is no longer present.

Therefore, a multi-level protection is needed to shield the skin from unwanted exposure to pollutants, to detoxify the skin by neutralising dangerous chemicals that manage to enter the skin and to prevent long-term epigenetic changes caused by pollution.

## Organic Cress Sprouts, Artichoke and a Smart Polysaccharide Complex

Depolluphane EpiPlus is made with a purified extract of garden cress sprouts which contains sulforaphane, a well-known activator of the detoxification system of the cell. It therefore enhances skin cell resistance against environmental pollutants as well as intrinsic reactive molecules. Additionally, an artichoke extract was chosen for its ability to protect skin cells from epigenetic changes caused by pollution. To produce Depolluphane EpiPlus, the organic cress sprout and the artichoke extract are sprayed on a carrier

that is based on a mixture of different polysaccharides. This smart polysaccharide complex performs various functions on the skin:

- its film forming capability shields the skin from unwanted exposure to pollutants
- its biochemical activity enhances the skin's immune function and helps to strengthen the skin barrier.

*In vitro* studies have demonstrated that cress sprout extract is indeed able to activate the expression of detox enzymes in skin cells and reduce the formation of protein carbonylation caused by

particulate matter. The artichoke extract on the other hand was shown to prevent long-term epigenetic changes caused by urban pollution. For the first time, we could show a change in histone modifications in skin cells caused by different types of pollution. These histone modification changes were highly reduced when the artichoke extract was present. Furthermore, in a placebo-controlled clinical study, the polysaccharide complex prevented the adhesion of microparticles mimicking particulate matter and promoted a significantly more efficient removal of these microparticles.

These data show that Depolluphane EpiPlus ensures a complete protection from pollution, immediately, in the short term and in the long term.

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