

# regenine

stimulating skin renewal



+33 % cell turnover  
acceleration in 3 days

83 % skin renewal  
in 6 days

Highly  
tolerable

## regenine

Skin is the soft outer covering of our body. Because it interfaces with the environment, skin plays a key role in protecting us as well as conferring a healthy look. Being such an important and complicated organ, the skin has to deal with several critical issues and can undergo many different problems. Several factors might affect skin health and appearance; aging, illness, stress, pollution, UV, physical activity, unbalanced diet, and smoking can hamper the normal metabolic activity of skin cells slowing down skin renewal.

To help skin stay healthy and maintain a young and shiny look, Phenbiox has developed REGENINE, a mix of natural extracts able to gently exfoliate and nourish the skin. REGENINE was developed using "mild" AHAs to perform the exfoliation process without being too harsh on skin. The formulation also contains a mix of natural extracts and bioliquefied products rich in protective and nutrient agents able to counteract any possible adverse effect caused by the peeling treatment as well as to sustain skin metabolism in order to further accelerate skin renewal.

*In vivo* tests show that REGENINE is highly effective in promoting skin renewal, accelerating the natural cell turnover by gently removing the corneocytes from the stratum corneum. In three days the areas treated with REGENINE showed 55 % of skin renewal and in six days the figure rose to 83 %.

*In vitro* tests show that REGENINE is far more tolerable than other AHAs such as glycolic and mandelic acid and is also safe in terms of photo-irritation.

Due to the results obtained REGENINE proved to be a very effective but also a very tolerable active ingredient to stimulate skin renewal. Thanks to its efficiency in promoting skin regeneration and to the fact that is extremely safe, REGENINE is a new active ingredient for the formulation of effective skin exfoliating treatments.

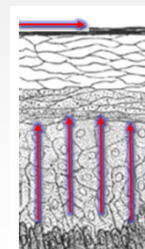
REGENINE consists of tartaric acid from grape fruit, apple extract, lemon extract, citric acid, UVIOX®, enzymatic bioliquefied red grape skin and CRUOX®, enzymatic bioliquefied wheat bran. All these ingredients aid skin revitalization thanks to the action of several different natural molecules.

REGENINE is not just a simple peeling agent but acts at different level on skin:

Performs a gentle exfoliation on skin

Protects collagen

Stimulates fibroblasts to produce new fibrils



REGENINE is a water based product that can be used in consumer and professional cosmetics as: exfoliants/soft peelings/skin renewal stimulating products.

CTFA name: TARTARIC ACID, PYRUS MALUS (APPLE) FRUIT EXTRACT, CITRUS MEDICA LIMONUM EXTRACT, CITRIC ACID, HYDROLYZED GRAPE SKIN, HYDROLYZED WHEAT BRAN, SODIUM BENZOATE, POTASSIUM SORBATE

Suggested concentration of use: 10% w/w

**phenbiox**

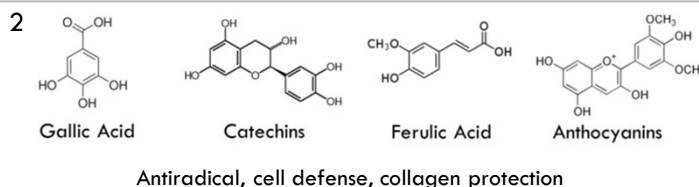
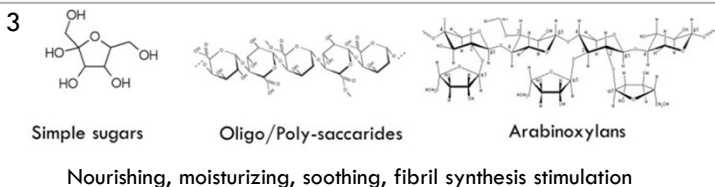
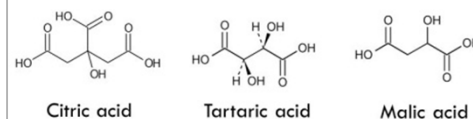
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The secret of REGENINE effectiveness is the content of three classes of chemicals:

1. Alpha-hydroxy acids,
2. Natural phenols
3. Natural sugars oligo/poly-saccharides

## 1 Soft peeling, kerato-regulation

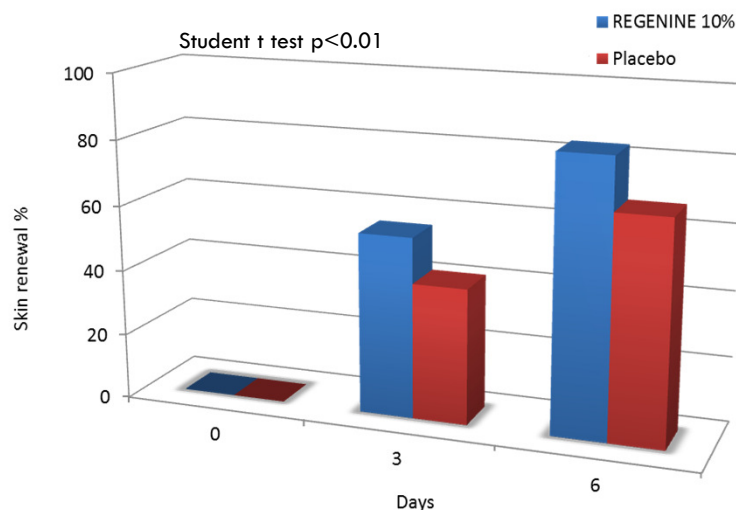


## REGENINE: in vivo testing

To evaluate the skin renewal properties of REGENINE, the exfoliation rate was measured through a colorimetric assessment of artificially pigmented skin. The study was performed on ten healthy volunteers of both sexes aged from 25 to 60.

Five testing points were present on each arm (for a total of 100 experimental points): one arm was treated with a simple cosmetic formulation containing 10% (w/w) of REGENINE, while the other arm was used as control and treated with a placebo formulation containing water instead of REGENINE. The product was applied twice per day, left on the skin for 5 minutes and then rinsed with water.

In three days of treatment the depigmentation rate was one third faster than the normal turnover and six days after treatment the stains of the test areas had almost disappeared. REGENINE is very effective in promoting skin renewal, accelerating the natural cell turnover by gently removing the corneocytes from the stratum corneum. In three days the areas treated with REGENINE showed 55% of skin renewal and in six days the figure rose to 83%.



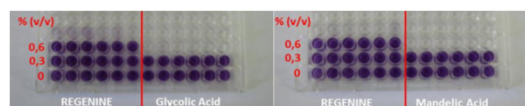
## REGENINE: in vitro testing

One of the targets during REGENINE development was to obtain an effective exfoliating agent, minimizing the side effect that are generally found in this class of products. Peeling agents, due to their actions, acidity, chemical properties, etc. are generally irritants and in most cases they can cause photosensitization.

### Skin tolerability of REGENINE

The main goal of this assay was to compare the tolerability of REGENINE with some products widely used as exfoliating agents. Glycolic acid is one of the most commonly used AHAs for cosmetic purposes and mandelic acid is considered one of the less irritant products of this kind. Both were selected in order to compare their irritant properties with those of REGENINE.

Glycolic and mandelic acids show a limit value of 0.3 % v/v, above which the keratinocytes completely lose their mitochondrial activity. REGENINE does not change the mitochondrial activity up to 0.6 % v/v being therefore much more tolerable.



picture of 96 well plates used to assess the compatibility with keratinocytes of REGENINE, glycolic acid and mandelic acid. Blue color indicates living cells.

### UV safety of REGENINE

The *in vitro* 3T3 NRU phototoxicity test is based on a comparison of the cytotoxicity of a chemical when tested in the presence and in the absence of exposure to a non-cytotoxic dose of simulated solar light. A Photo-Irritation-Factor (PIF) is calculated. Based on the OECD guideline 432, a test substance with a  $PIF < 2$  predicts: "no phototoxicity", a  $PIF > 2$  and  $< 5$  predicts: "probable phototoxicity" and a  $PIF > 5$  predicts: "phototoxicity".

The test was performed on REGENINE and chlorpromazine as a positive control. Regenine shows a PIF of 1,1 with the *in vitro* 3T3 NRU phototoxicity test, these data are predictive of the absence of phototoxic effects *in vivo*.

