



# diffuporine™

*Inner hydration to rejuvenate the skin*

## Increases AQP3 levels



### Description

Hexapeptide that enhances aquaporin 3 (AQP3) expression, improving the water flux from the basal layer of the epidermis to the stratum corneum. Skin hydration is not only preserved but raised with **diffuporine™**. Furthermore, it improves the barrier function and increases collagen I synthesis and keratinocyte proliferation, providing a complete treatment against skin aging.

### Appearance

Transparent solution containing 0.05% active ingredient.

### INCI

Butylene Glycol, Water (Aqua), Acetyl Hexapeptide-37.  
Preservative free.

### Properties

**diffuporine™** rejuvenates the skin by increasing skin moisturisation, protein synthesis and cell proliferation. Furthermore, activation of AQP3 increases SC water content and improves skin barrier function.

### Applications

**diffuporine™** can be incorporated in moisturising formulations where an additional anti-aging effect is desired.

## Improves skin moisturisation

## Maintains skin's youthful appearance

### Science

Skin not only protects us against the environment but regulates water exchange. Water is essential for the normal functioning of the skin, especially for the stratum corneum (SC) and skin barrier properties. Mechanisms that control water transport are not fully understood, but there is a continuous exchange of water between the SC, the living cells in the underlying epidermis and the atmosphere. Aquaporins are integral membrane proteins involved in water transport through the different tissue layers, acting as water selective pores. AQP3 is the most abundant aquaglyceroporin in the human epidermis, facilitating the transport of water, glycerol and other small solutes. Therefore, AQP3 improves transepidermal permeability, increasing water content in the skin surface and helping the barrier function.

**diffuporine™** enhances AQP3 expression levels in keratinocytes, which are inherently reduced due to chronologic aging and photoaging. In addition, this peptide presents further properties that contribute to maintaining skin barrier integrity and a youthful appearance.

### Dosage 2%

### Solubility

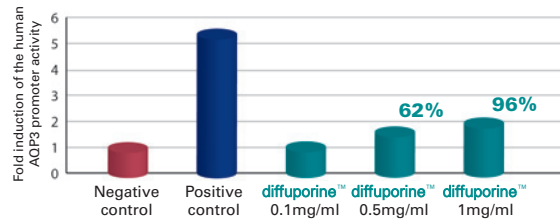
Soluble in water, ethanol and glycols.



## In vitro efficacy

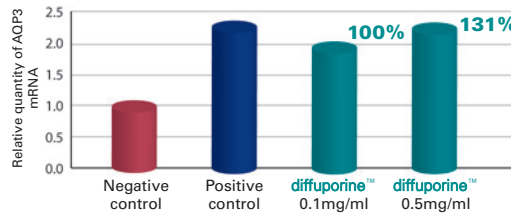
### 1. STIMULATION OF THE HUMAN AQP3 PROMOTER ACTIVITY AND EXPRESSION LEVELS

The activation of the AQP3 promoter by diffuporine™ was studied in a luciferase reporter gene assay in keratinocytes



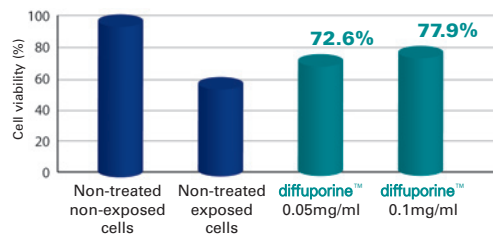
diffuporine™ induces AQP3 expression  
AQP3 promoter activity was duplicated at 1mg/ml diffuporine™.

The transcriptional activity of diffuporine™ was performed in human keratinocytes by quantitative Real Time PCR, measuring its ability to promote the expression of AQP3 mRNA.



### 2. HYDRATION ASSAY

Keratinocytes were treated with diffuporine™ and then subjected to a dehydration stress. Photographs were taken before exposing cells to desiccation ( $A_0$ ) and after the recovery period ( $A_{24}$ ) to measure cell area. Cell viability was determined by the Neutral Red Uptake method.



Cell viability is increased and mean cell area maintained when cells are treated with diffuporine™

### 3. REJUVENATING EFFECT

#### • Cell proliferation

Keratinocyte proliferation was determined by the enzymatic conversion of the non-fluorescent cell-permeant calcein-AM to the intensely fluorescent calcein, which is retained within cells.

#### • Type I collagen synthesis

Type I collagen induction by diffuporine™ was evaluated by an ELISA test on human dermal fibroblasts.



A significant stimulatory effect on keratinocyte proliferation was measured in presence of diffuporine™



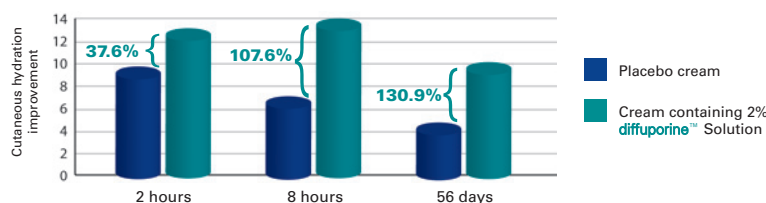
diffuporine™ increased collagen I synthesis by 61% at 1mg/ml in fibroblasts

## In vivo efficacy

### EVALUATION OF SKIN HYDRATION

A panel of 20 female volunteers with dry skin (aged from 30 to 50) applied a cream containing 2% diffuporine™ Solution on the left half-face and a placebo cream on the right half-face for 56 days twice a day.

Measurements were performed with a Corneometer CM 825 at the beginning, 2 and 8 hours after the first application and at the end of the treatment.



Hydration was enhanced with diffuporine™ by 131% respect to placebo at the end of the treatment

Significant increases in the mean basal values were detected after 2 and 8 hours and 56 days.