



# actifcol™

*advanced botanical ingredient*

## The elixir of life mushroom for a glamorous décolleté

**Increased PLOD1 for an enhanced collagen quality**

**Reduced carbamylation, a protein deterioration process**

**Improved appearance at neck and décolleté**

### DESCRIPTION

Shiitake mushroom-based extract, traditionally known as the elixir of life, selected to boost type I collagen synthesis and PLOD1 levels, which contributes to protein quality. Besides, it helps prevent the carbamylation process, responsible for the deterioration of collagen, a key protein in imparting tensile strength. **actifcol™ advanced botanical ingredient** may offer a firming effect on mature skin.

### APPEARANCE

Liquid containing 1% Lentinus Edodes Extract.

### INCI

Water (Aqua), Glycerin, Sodium Citrate, Lentinus Edodes Extract, Potassium Sorbate, Sodium Benzoate, Phytic Acid.

### USE LEVEL

2-10%

### SOLUBILITY

Water soluble.

### SCIENCE

The loss in skin firmness mostly results from a decrease in the synthesis of collagen and an increase in its deterioration. Type I collagen is one of the most abundant proteins in the skin, providing tissue structure and strength. Its proper structural and biological functions are the outcome of a post-translational modification (PTM), a critical step during biosynthesis that involves the hydroxylation of lysine residues by an enzyme encoded by the PLOD gene.

Collagen can also experience the deterioration process of carbamylation, related to a destabilization of the triple helix and an accumulation of derived products associated with a loss of elasticity and sagginess.

**actifcol™ advanced botanical ingredient** has a potential activity in increasing type I collagen and PLOD1 levels, as well as in reducing carbamylation of such protein. On mature skin, an improvement in firmness was measured and a decrease in flaccidity was observed in the face, neck and décolleté.



## In vitro efficacy

### 1. TYPE I COLLAGEN INDUCTION

Fibroblasts were treated with 1% **actifcol™ advanced botanical ingredient** and the amount of type I collagen was assessed by an ELISA.

### 2. INCREASE IN PLOD1

Fibroblasts were treated with 2% or 3% **actifcol™ advanced botanical ingredient** and an ELISA was used to measure the levels of PLOD1.

### 3. DECREASE IN CARBAMYLATION

Type I collagen was incubated with potassium cyanate, to simulate the carbamylation process, and with 2% **actifcol™ advanced botanical ingredient**. Carbamylation was evaluated with a protein carbamylation ELISA kit.

**actifcol™**  
advanced botanical ingredient



**36.6% increase in key dermal protein levels**



**PLOD1 boost, suggesting an improved collagen quality**



**Reduction in the collagen deterioration**

Carbamylation levels decreased by 75.9% versus control.

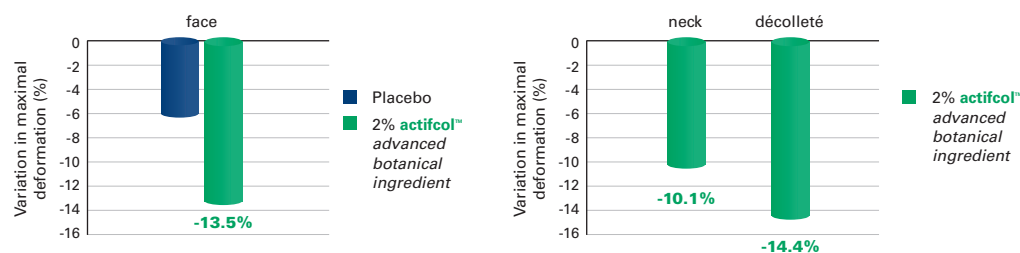
## In vivo efficacy

### ENHANCEMENT IN FIRMNESS

19 women (41-55 years old) with skin flaccidity applied a cream with 2% **actifcol™ advanced botanical ingredient** on the neck, décolleté and half face and a placebo cream on the other half, twice a day for 56 days.

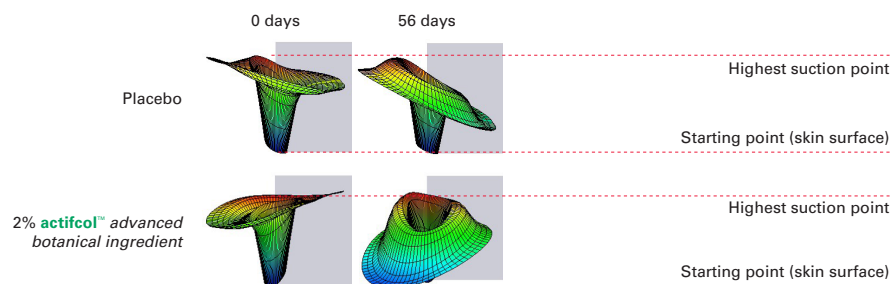
#### • Maximal deformation

The parameter was evaluated with a cutometer, which allows the quantification of firmness, being a decrease in maximal deformation (R0) associated with a firmer skin.



#### • Anisotropy

The linearity of the skin (anisotropy), which determines the displacement and returning profile, was assessed by a device that combines a mechanical force and imaging. This provides a 3D view of the suction and return of the skin to the starting point.



#### • Visible tightness

The efficacy against flaccidity was appraised through macro photographs of the volunteers.



**Statistically significant improvement in face, neck and décolleté firmness**



**More isotropic skin with an even return to the starting point**



**Demonstrated firmer and smoother complexion**

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