

## Actigen® O2 Synergistic Potentiation of Cosmetic Actives via Increased Circulation

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### Abstract

We have previously demonstrated that Actigen® O2-100 stimulates skin blood flow, without increasing irritation and reduces puffiness and dark circles in the under eye area, presumably due to this activity.

Herein we have tested the hypothesis that an increase in microcirculation by Actigen® O2-100 is likely to result in a bio-activation of other topical agents whose activity may be tied into a general stimulation of epidermal and/or dermal metabolism.

We evaluated whether the addition of Actigen® O2-100 to a variety of topical agents, previously shown to enhance the metabolic activity of the epidermis and dermis, results in a synergistic enhancement of activity.

Our results demonstrate a specific activity for Actigen® O2-100 as well as a general mechanism for increasing the bio-activity of agents capable of increasing metabolism of cells in the epidermis and dermis. Our unexpected findings suggests that agents which increase blood flow to the skin and thus may supply additional nourishment to these cells, may enhance the activity of anti-aging agents which work by enhancing skin cell metabolism.

### Introduction

Actigen® O2-100 is a proprietary blend of botanical extracts of Ginseng and Gynostemma designed to produce a beneficial provascular effect. Both Ginseng and Gynostemma have been reported as being vasodilators, anti-inflammatory and angiogenic. In clinical studies, we have previously demonstrated that Actigen® O2-100 stimulates skin blood flow, without increasing irritation and reduces puffiness and dark circles in the under eye area, presumably due to this activity.

A variety of topical agents used in our testing are listed herein. N-acetyl glucosamine (NAG), and retinyl palmitate (RP) have

been shown to stimulate epidermal metabolism and, when tested via the dansyl chloride method, increase skin cell renewal rates. Polyethylene beads have been used abundantly throughout the cosmetic industry as a mechanical scrub. Lactic acid is a well known exfoliant also used profusely in topical application. Actifirm® Ultra, a proprietary blend of botanicals clinically proven to have a firming effect on the skin, was also tested. Matrixyl®, a well known dermal stimulating bio-peptide, was also tested. Paraguay tea and theophylline are known and clinically proven agents used to reduce the appearance of cellulite. Each of these agents was tested with and without Actigen® O2-100 to determine if a synergistic effect occurred.

### Methods

#### Assessment of Skin Firmness via Ballistometry

Skin firmness is the measurement of tissue resilience, or its ability to return to normal state after deformation. The thickness and integrity of the dermis and epidermis of the skin markedly influence skin firmness measurements. Ballistometry is a well recognized technique and can be used to measure both superficial (epidermal) and integral (dermal) skin firmness. For the measurement of superficial firmness a small lightweight probe with a relatively blunt tip (4 square mm contact area) is used. The probe only penetrates slightly into the skin and results in measurements that are dependent upon the properties of the outer layers of the skin, including the stratum corneum and outer epidermis. Based upon the work of Hargens, we chose to analyze the ratio of the height of first rebound peak (H1), to the second rebound peak (H2) as a measurement of skin firmness.

To measure firmness at deeper layers in the skin (including the full epidermis and dermis) the probe tip was changed into a more pointed structure (0.05 mm<sup>2</sup> contact area). Additionally a 2-gm weight was attached to the top of the probe to encourage