Topical Effects Of A Novel Blend Of Natural Compounds, Blended In An Anti-Aging Serum, DermaStem™, On Human Skin.

Introduction

The objective for this research was to document the effects of DermaStem™, both on specific modes of action on primary human dermal fibroblasts (Adult skin Stem Cells) and inflammatory cells in vitro, in order to prepare a formula aimed at increasing skin hydration and elasticity, while achieving wrinkle reduction in healthy human facial skin.

Skin health and protection from premature aging associated with oxidative stress, inflammation and reduced stem cell repair, is a complex interplay of different biological functions. The healthy proliferation and migratory capacity of dermal fibroblasts their matrix deposition and protection from damage by free radicals, are important factors in skin aging, elasticity and hydration, leading to wrinkle formation.

The aim in the development of DermaStem™ was to identify natural compounds that would have an effect on the proliferation and differentiation of skin stem cells, and would therefore support the actual restructuration of the skin, leading to greater moisture retention, greater elasticity and consequently a reduction in fine lines and wrinkles.

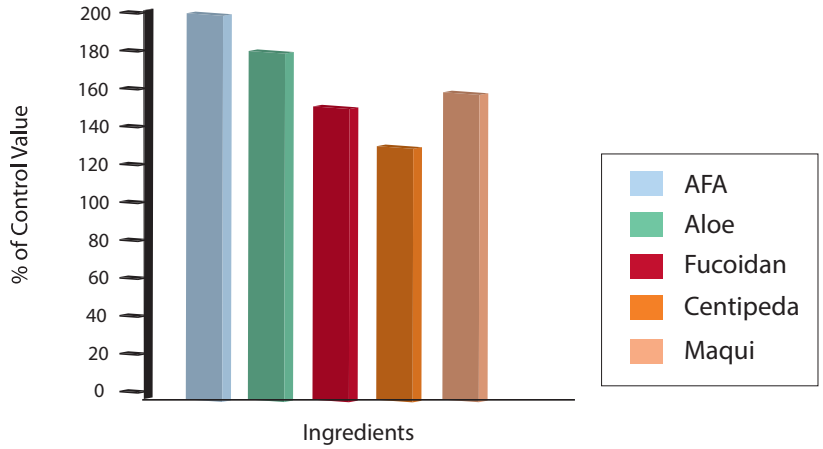
A panel of in vitro tests was performed to document effects on primary adult dermal fibroblasts (Adult skin Stem Cells). The ingredients and the blend supported the proliferation, migration and matrix deposition of primary human dermal fibroblasts. To document antioxidant and anti-inflammatory properties we used additional in vitro bioassays using primary human blood cells.

Methods & Results

A panel of in vitro tests was performed to document effects on primary adult dermal fibroblasts (Adult skin Stem Cells):

A) Support of a skin cell proliferation.

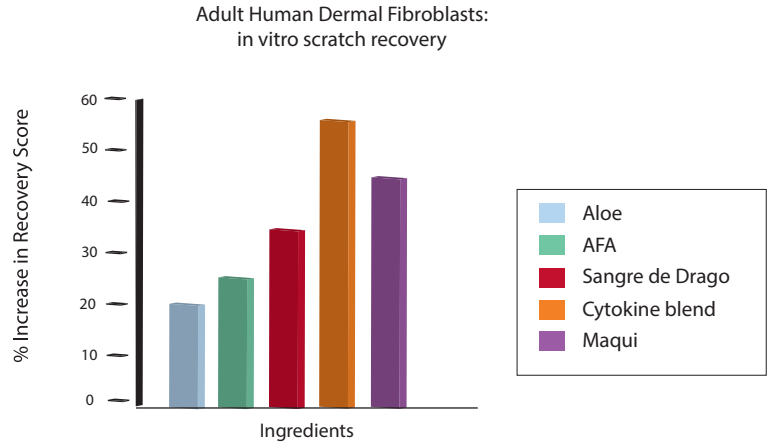
In brief, Aphanizomenon flos-aquae (AFA), Aloe vera, fucoidan from Undaria pinnatifida, Maqui berry, and Centipeda cunninghamii significantly increase dermal fibroblast proliferation by a magnitude ranging between 29% and 96% above baseline. Vanilla did not significantly increase dermal fibroblast proliferation on its own but synergistically potentiated the effect of AFA. A blend of growth factors led to a 225% increase in dermal fibroblast proliferation above baseline.



B) The ingredients in DermaStem had a substantial effect on scratch recovery and wound healing.

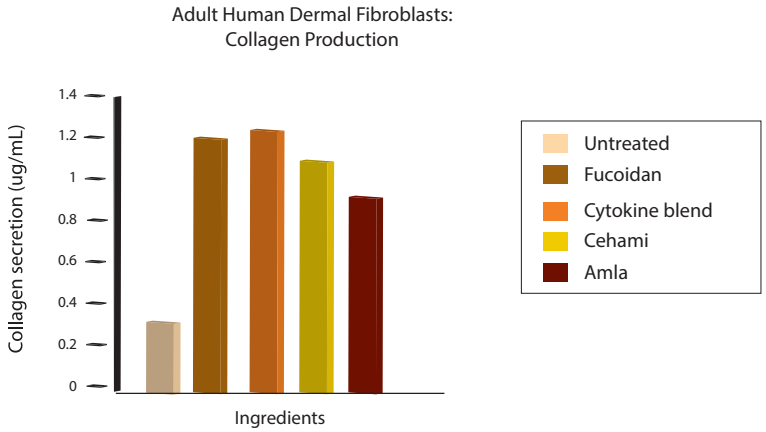
An “in vitro scratch” is a model for wound healing where adult human skin cells are cultivated until they have formed a dense film. A scratch is created through the film.

A blend of Cytokines (growth factors) led to substantial increase in dermal fibroblasts migration and accelerated recovery of the in vitro scratch. In addition, Aphanizomenon flos-aquae (AFA), Aloe vera, Sangre de Drago, and Maqui berry further supported accelerated recovery.

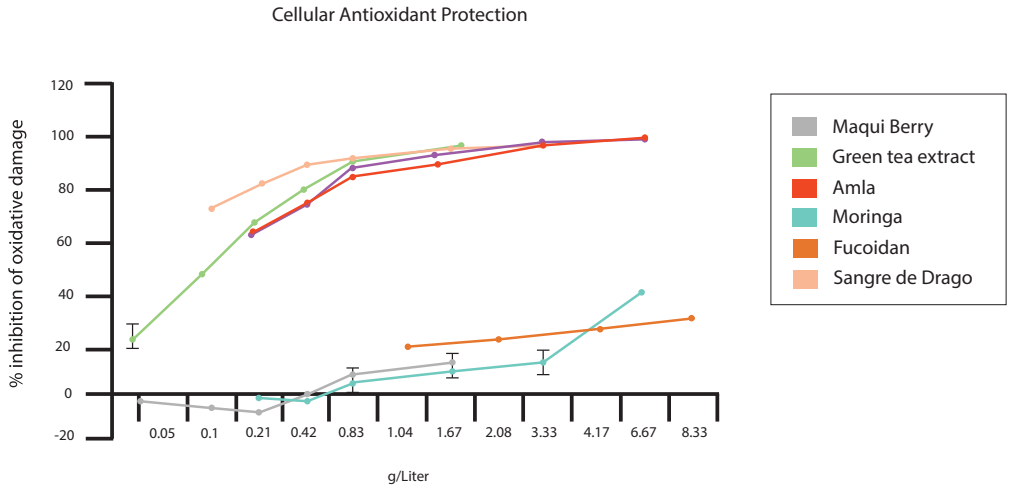


C) Matrix deposition (collagen production).

Collagen production by primary human Dermoblasts in culture was increased by fucoidan from Undaria pinnatifida, cytokines, and Vanilla.

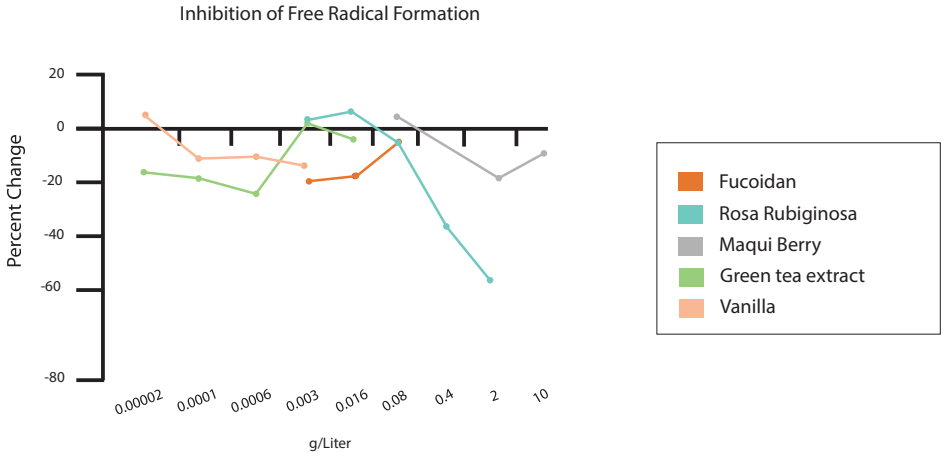


To document antioxidant and anti-inflammatory properties were used additional in vitro bioassays using primary human blood cells:



D) Cellular antioxidant protection Capacity of each ingredient in DermaStem™ was tested in the CAP-e bioassay, which tests intracellular antioxidant protection under oxidative stress. The *in vitro* data showed potent antioxidant bioavailability at the cellular level by *Indian gooseberry (AMLA), Pomegranate, Sangre de Drago and Green tea extract*

E) Inhibition of free radical formation by inflammatory cells.

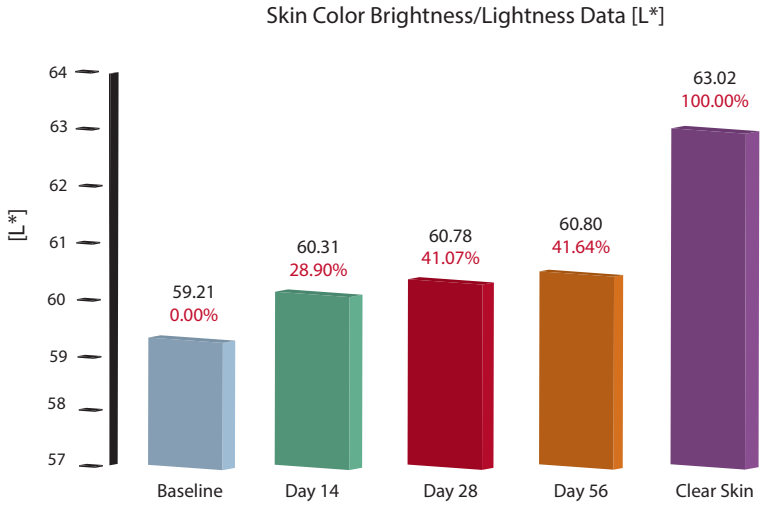


The ingredients were also evaluated for the ability to inhibit free radical formation by inflammatory cells placed under oxidative stress conditions. The data showed reduced free radical production by ingredients in DermaStem™ included fucoidan from *Undaria pinnatifida, Rosa Rubiginosa, Maqui berry, Vanilla, and Green tea extract.*

The following two effects color brightness/lightness and spot reduction were from studies done by Corum, Inc. on its branded product Genowhite (Acetyl Glycyl Beta-Alanine)

F) Color Brightness /Lightness

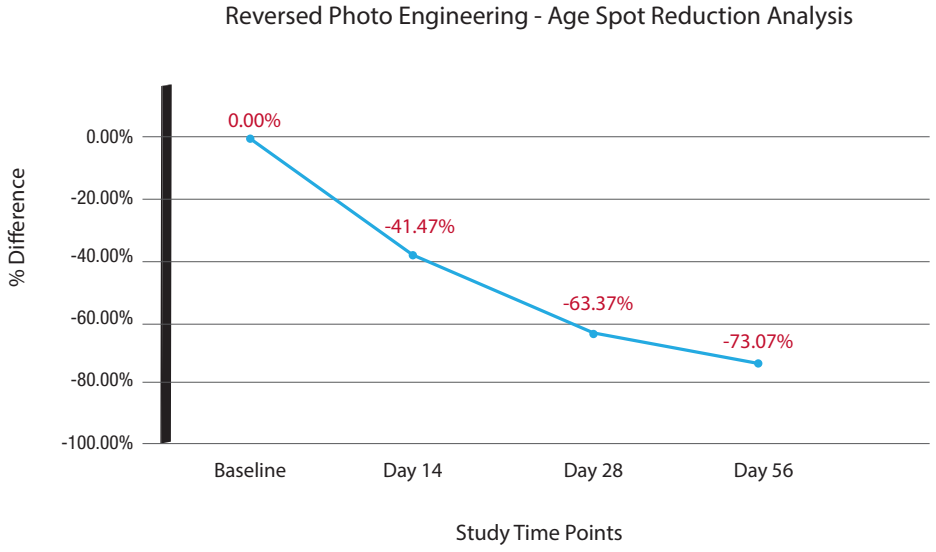
Computer detects subtle changes in color by a three dimensional profile of hue, value and chroma. These characteristics are then translated into color coordinates (a*, b* and L*) whose spacing is considered to correlate with the color changes perceived by the human eye.



G) Reversed Photo Engineering/ Age Spot Reduction

Exclusively detailed, high resolution before and after digital photography was taken, with fixed camera background, distances, angles, setting, lighting, panelist positioning, color bars, white balance, standardized and digitally certified unretouched. Each stage in the progression of the treatment regimen was photographically documented and the test area of involvement isolated. Photographs were evaluated using image analysis software which allows the age spots to be captured and quantified. The size of the area of involvement differed for each test panelist, therefore percent difference was calculated individually and then averaged.

[px^2] - Age Spot related pixels per area of involvement.



Conclusions:

With permission from Corum, Inc. Stemtech Corporation was allowed to reference two studies on GenoWhite (acetyl slucy beta-alanine) to show the effects of color brightness/lightness and age spot reduction in Dermastem Advanced.

The data from these series of in vitro tests backed up the Hypothesis that several specific mechanisms of actions including: cellular antioxidant protection, inhibition of free radical formation, stem cell proliferation and differentiation as well as Collagen production were supported by this novel blend of ingredients blended in **DermaStem Renewal Serum**

Within the limits imposed by the conduct and population size of the study described herein, the test material Whitening Spot Corrector demonstrated increases in L* value (Chromameter parameter) associated with skin lightening. The reductions are considered statistically significant at each evaluation time point.

Data was also obtained through matched scientific photography on a subset of five subjects. Image analysis software demonstrated that after 14, 28, and 56 days of usage, the test product reduced the appearance of age spots. Furthermore, the results are considered statistically significant at Day 14 and Day 56 time points.