**Fluorescent Light Energy Inducing Photobiomodulation to Treat Inflammatory Skin Conditions and Induce Healing**

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**BACKGROUND**

- The Kleresca® biophotonic platform combines a multi-LED and a chromophore containing photoconverter gel, together creating fluorescent light energy (FLE).  

- Kleresca® differs from other forms of light therapy by delivering polychromatic dynamic FLE covering the visible light spectrum, inducing a novel form of photobiomodulation.

- The biophotonic platform has proven clinical efficacy in treating inflammatory skin conditions, rejuvenating the skin as a stand-alone treatment, or pre-post other more invasive procedures.

- Here we sought to investigate some of the key mechanisms underlying its efficacy.

**METHOD**

**FLE Generation**

The picture on the left shows the 2 major layers of the skin: top to bottom: the epidermis, dermis and subcutaneous adipose tissue. A layer of chromophore containing gel (HDF) is placed on the skin and enables multi-blue light from the multi-LED lamp. The center panel highlights a topomodulator in the gel interacting with photons of light. On the right, upon absorption of the blue light by the chromophore gel at a specific wavelength, oxygen is excited (e.g. 650-660 nm).

**RESULTS**

**FLE Increases Collagen Production from Human Dermal Fibroblasts**

- A Response Blocked in the Presence of Inflammation

- Collagen production by human dermal fibroblast was enhanced following FLE and not an equivalent LED alone, but then reduced the FLE emission size to 40μm. In the presence of the inflammatory cytokine, interferon-γ (IFN-γ), blocking the release of IL-6 and TNF-α with anti-IL-6 and anti-TNF-α antibodies, respectively, reversed the baseline-induced reduction in collagen production following FLE, leading to an increased collagen production.

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**CONCLUSIONS**

- Enhanced fibroblastic collagen production, attenuation of the inflammatory signature of connective tissue cells and the promotion of angiogenesis all contribute to the de-stressing and normalizing properties of fluorescent light energy.

- FLE effectively targets inflammation in acne and rosacea and offers support in these conditions by improving the skin overall texture and the appearance of scars. Furthermore, it has been used in combination with more invasive cosmetic procedures for an enhanced effect.

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