

**“Light-based Beauty Tech – the next frontier in skin rejuvenation”**

Speaker: Lieve DECLERCQ, PhD – Manager



Haenhoutstraat 24, B-9070 Destelbergen (Belgium)  
+32 475 54 44 35 - [Lieve@skin-dlite.be](mailto:Lieve@skin-dlite.be)

**ABSTRACT:** The global Home-Use Beauty Devices market is witnessing an impressive growth, expected to reach 91.8 billion USD in 2030<sup>1</sup>. The skin rejuvenation devices utilizing technologies such as radiofrequency, microcurrent and light emitting diodes are witnessing the fastest growth within this category.

In Spas, professional salons and esthetic dermatology offices the use of LED therapy and photorejuvenation devices is well established. Propelled by the COVID-19 pandemic, the at-home use of beauty devices is booming. Consumers are looking for safe and effective solutions that are easy to use, bringing professional solutions into the comfort of their home. A review of clinical studies suggests that home beauty devices for facial rejuvenation can improve skin aging to a certain extent. Apart from transient redness and swelling, no other adverse reactions were observed<sup>2</sup>.

The therapeutic effects of visible light have been used to treat skin diseases since the early XXth century. The mechanism and applications of photobiomodulation (PBM), by which selected wavelengths of visible and infrared light trigger a biological response, have been extensively studied<sup>3,4,5</sup>. Since the introduction of LEDs, its use for stimulating healing, relief of pain and inflammation and restoration of function has seen rapid traction over the past few years<sup>6</sup>.

The use of PBM for skin rejuvenation relies on its ability to stimulate a regenerative, wound-healing type response as well as providing anti-inflammatory benefits. The mechanism by which PBM controls inflammation was shown to be Nrf2-dependent<sup>7-8</sup>.

Interestingly, the right combination of light with selected active ingredients displays improved results vs the light or active alone. The combination of red light (660 nm) with niacinamide boosts the anti-inflammatory effect in keratinocytes and promotes collagen synthesis in fibroblasts, while blue light (440 nm) boosts the effect of photolyase to repair DNA damage induced by UV exposure<sup>9</sup>.

The newest generation of beauty tech devices therefore combine PBM with a dedicated skincare regimen to amplify skin rejuvenation benefits.

<sup>1</sup> : <https://www.psmarketresearch.com/market-analysis/home-use-beauty-devices-market>

<sup>2</sup> Bu et al, Clin Cosmet Investig Dermatol 2024 Mar 8;17:553-563

<sup>3</sup> Barolet D et al, Photobiomodul Photomed Laser Surg. 2023 Apr;41(4):147-166.

<sup>4</sup> Hamblin MR. AIMS Biophys. 2017;4(3):337-361

<sup>5</sup> Hamblin MR. Photonics. 2019 Sep;6(3):77.

<sup>6</sup> Avci P et al, Semin Cutan Med Surg. 2013 Mar;32(1):41-52

<sup>7</sup> Salman S et al, Antioxidants (Basel). 2023 Mar 21;12(3):766

<sup>8</sup> Salman S et al, J Photochem Photobiol 2024 April;20:100227

<sup>9</sup> Guermonprez C et al, J Biophotonics. 2020 Dec;13(12):e202000230