

# The Importance of Interplay Between the Endo-Cannabinoid System & Cannabidiol in Skincare

by Healthcare International Research Limited

## INTRODUCTION

As part of HIR's key objective to explore the effects and benefits of Cannabidiol (CBD), HIR present this first white paper that explores the importance of interplay between the Endo-Cannabinoid System (ECS) and CBD in skincare. The CBD industry is growing at unprecedented levels. Leading independent researchers, BDSA, claim that CBD sales in the United States alone will exceed \$20 billion by 2024<sup>1</sup>. Moreover, they estimate 77% of the total revenue will be spent within mainstream retail which includes beauty and skincare sectors. However, the full benefits of the ECS within the beauty & skincare industry are not fully explored due to several complex factors. Firstly, the ECS was only recently discovered in the early 1990's with limited empirical research being completed within the past twenty years<sup>2</sup>. A major barrier for research has been the legal framework associated with research in cannabinoids. Secondly, the social stigmas attached to cannabis and the derivatives have deterred organisations and researchers from fully evaluating the effects<sup>3</sup>. Finally, companies have shied away from allocating funds in research and design for clinical research with CBD; the National Academies of Sciences, Engineering, and Medicine succinctly declares it was a risky business with no guaranteed return<sup>4</sup>.

Now that barriers to research have been surpassed, empirical research has been completed that evaluates how the ECS plays a significant role in skin function. This short white paper will assemble the prevailing theories and discuss the importance of interplay between ECS & CBD and highlight the benefits that genuine CBD products contribute to creating and sustaining healthy skin.

## THE IMPORTANCE OF INTERPLAY BETWEEN ECS & CBD

Despite the majority of ECS research focusing on the central nervous system and immune processes, there have been several important pioneering studies within the last twenty years that examine ECS and skincare<sup>5</sup>. The ECS is a complex cell-signaling system that plays a key role in regulating a range of functions and processes within the body. These include, *inter alia*, skin and nerve function, inflammation and other immune system responses that contribute to stabilising the internal health and wellbeing via a process known homeostasis<sup>6</sup>. A seminal report published in *Biochemical Pharmacology*<sup>7</sup> concludes that ECS plays an important role in the regulation of the physiology of the skin and that the dysregulation of the ECS is linked to a wide range of skin disorders including atopic dermatitis, psoriasis, scleroderma, acne, hair growth and pigmentation disorders, keratin diseases, various tumours, and skin itch. Optimal homeostasis enables the body to provide new cells to replace those that are constantly lost during tissue turnover or following injury<sup>8</sup>. Most scientists and academics collectively agree that maintaining homeostasis is the primary role of ECS<sup>9</sup>.

The health benefits of CBD have been widely researched and published with scientists, scholars and academics offering substantive evidence of its ability to treat a wide range of health-related complications and diseases<sup>10</sup>. Empirical research over twenty years unequivocally substantiates the claim that cannabinoid signalling is deeply involved in the maintenance of skin homeostasis, barri-

<sup>1</sup> BDSA, (2019) *The Global Cannabinoids Market: Will CBD overtake THC*. BDSA Analytics, available online at: <https://bdsa.com/wp-content/uploads/2019/08/BDS-Analytics-The-Global-Cannabinoids-Market-Will-CBD-Overtake-THC.pdf>

<sup>2</sup> Sledziński, P., Zeyland, J., Stomski, R. & Nowak, A. (2018) 'The current state and future perspectives of cannabinoids in cancer biology' in *Cancer medicine*, 7(3), pp.765-775.

<sup>3</sup> Arboleda, M.F. & Prosk, E. (2021) 'Barriers for the Prescription of Cannabinoid-Based Medicines' In *Cannabinoids and Pain* (pp. 145-152). Springer, Cham.

<sup>4</sup> National Academies of Sciences, Engineering, and Medicine, (2017) 'Cannabis: Prevalence of Use, Regulation, and Current Policy Landscape', in *The Health Effects of Cannabis and Cannabinoids: The Current State of Evidence and Recommendations for Research*. National Academies Press (US).

<sup>5</sup> Tóth, K.F., Ádám, D., Bíró, T. and Oláh, A. (2019) 'Cannabinoid Signaling in the Skin: Therapeutic Potential of the "C (ut)annabinoid" System' in *Molecules*, 24(5), p.918.

<sup>6</sup> Lu, H.C. & Mackie, K. (2021) 'Review of the endocannabinoid system', in *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging*, 6(6), pp.607-615.

<sup>7</sup> Del Río, C., Millán, E., García, V., Appendino, G., DeMesa, J. & Muñoz, E. (2018) 'The endocannabinoid system of the skin. A potential approach for the treatment of skin disorders' in *Biochemical pharmacology*, 157, pp.122-133.

<sup>8</sup> Blesching, U. (2020) *Your Cannabis CBD: THC Ratio: A Guide to Precision Dosing for Health and Wellness*. Ed. Rosenthal.

<sup>9</sup> Lowe, H., Toyang, N., Steele, B., Bryant, J. & Ngwa, W. (2021) 'The Endocannabinoid System: A Potential Target for the Treatment of Various Diseases', in *International Journal of Molecular Sciences*, 22(17), p.9472.

<sup>10</sup> White, C.M. (2019) 'A review of human studies assessing cannabidiol's (CBD) therapeutic actions and potential', in *The Journal of Clinical Pharmacology*, 59(7), pp.923-934.

er formation and regeneration<sup>11</sup>. Further evidence confirms that communication between ECS and CBD does exist and more importantly the interplay between the two can ameliorate skin health and associated diseases such as atopic dermatitis, psoriasis, scleroderma, acne, hair growth and pigmentation disorders, keratin diseases, various tumours, and skin itch<sup>12</sup>. A recent study concluded that modulating the activity of the ECS with CBD offers tremendous therapeutic benefits for a diverse scope of diseases because of the inflammation reduction and also antioxidant, anti-itch and antibacterial properties within CBD<sup>13</sup>.

## FUTURE RESEARCH

The majority of scientific evidence posits that CBD does make an important contribution in the treatment of many conditions such as skin rejuvenation<sup>14</sup>. However, contrasting research has demonstrated ambiguity in the ability of CBD to positively enhance the ECS<sup>15</sup> with some experts claiming that despite CBD gaining popularity for the treatment of various disorders, poor quality, unproven and unregulated cannabis-based preparations remain an extant problem<sup>16</sup>. The power to unlock the full benefits of CBD is still a work in progress<sup>17</sup>; ongoing research should aim to test CBD in a wide range of applications in many different research areas. These should include the application of CBD products in the laboratory and real-life settings over a protracted period of time so the effects can be fully understood. Moreover, the rigorous testing of CBD in a wide range of social-settings may assist in validating genuine health benefits and help demystify over-ambitious claims of CBD as a miracle cure for all ailments.

## CONCLUSION

Despite an explosive entry, CBD research is still in its infancy due to complex legal and social factors. However, recent research concludes that the ECS does communicate with CBD yielding promising results to ameliorate skin health and associated diseases such as atopic dermatitis, psoriasis and others noted. Empirical research unequivocally substantiates that cannabinoid signalling with the ECS is deeply involved in the maintenance of skin homeostasis, barrier formation and regeneration. The direct implication is that a healthy ECS will help maintain a healthy skin function. Contrasting research does make a valid argument that poor quality, unproven and unregulated cannabis-based preparations may not deliver tangible health benefits across a wide range of applications. Therefore, it is necessary to take into consideration that research may differ based upon the varying quality of CBD based preparations in the studies rather than the contribution of CBD itself. Thus, further research within the laboratory and within real life settings is urgently needed to rigorously test CBD to substantiate genuine health benefits and help separate fact from fiction.

*This white paper was completed for HIR by Harry Rule. Harry is a leading independent researcher specialising in qualitative research across a wide range of sectors. He has holds a Masters of Research and has recently completed a Doctor of Business Administration and leads HIR's research team.*

11 Tóth, K.F., Ádám, D., Bíró, T. and Oláh, A. (2019) 'Cannabinoid Signaling in the Skin: Therapeutic Potential of the "C (ut)annabinoid" System' in *Molecules*, 24(5), p.918.

12 Gupta, A.K. & Talukder, M. (2021) 'Cannabinoids for skin diseases and hair regrowth', in *Journal of cosmetic dermatology*, 20(9), pp.2703-2711.

13 Corroon, J. & Felice, J.F. (2019) 'The Endocannabinoid System and its Modulation by Cannabidiol (CBD)' in *Alternative Therapies in Health & Medicine*, 25.

14 Chelliah, M.P., Zinn, Z., Khuu, P. & Teng, J.M. (2018) 'Self-initiated use of topical cannabidiol oil for epidermolysis bullosa', in *Pediatric dermatology*, 35(4), pp.e224-e227.

15 Hazekamp, A. (2018) 'The trouble with CBD oil' in *Medical cannabis and cannabinoids*, 1(1), pp.65-72.

16 Fiani, B., Sarhadi, K.J., Soula, M., Zafar, A. & Quadri, S.A. (2020) 'Current application of cannabidiol (CBD) in the management and treatment of neurological disorders', *Neurological Sciences*, pp.1-14.

17 Close, G.L., Gillham, S.H. & Kasper, A.M. (2021) 'Cannabidiol (CBD) and the athlete: Claims, evidence, prevalence, and safety concerns', *Sports Science Exchange*, 213.