



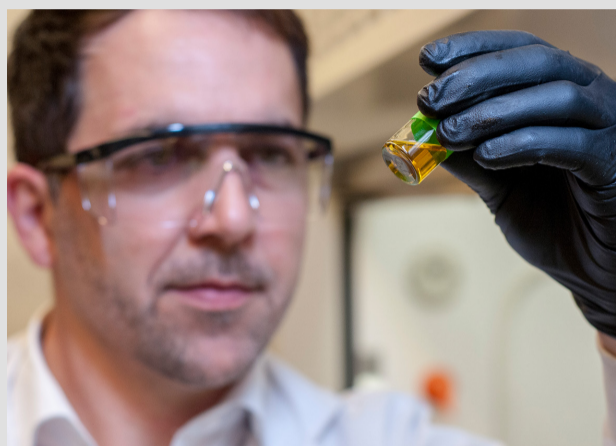
AVICANNA™

MEDICAL CANNABIS INSIGHTS

WHAT'S NEW IN THE SCIENCE OF MEDICAL CANNABIS CANNABINOID APPLICATIONS IN DERMATOLOGY

AVICANNA HIGHLIGHT

This is the first edition of our newsletter series, which will provide a range of bio-pharmaceutical topics and updates in the emerging field of cannabinoid research and clinical development. The objective of this newsletter is to create awareness of the latest and most significant cannabinoid-based research that is conducted worldwide, and available to the research



community. Furthermore, we hope this newsletter serves to engage the medical and scientific community to continue building and fostering strong academic and clinical relationships. Additionally, we will provide updates on the breakthrough research and clinical developments of Avicanna's platform in collaboration with leading academic and clinical organizations including University of Toronto, the Hospital for Sick Children, University Health Network in Canada and other world class institutions including University of Antioquia, University of West Indies and the University of Buenos Aires.

WHAT'S NEW? PUBLICATION SPOTLIGHT

The endocannabinoid system of the skin. A potential approach for the treatment of skin disorders

Carmen del Río, Estrella Millán, Víctor García, Giovanni Appendino, Jim DeMesa, Eduardo Muñoz
Biochemical Pharmacology, vol 157, 2018, 122-133

This recent review article describes the complexity of skin's structure and its roles against infection, immunity, and overall proper bodily function. More specifically, the review outlines the involvement of the endocannabinoid system (ECS) (comprised most notably of CB1 and CB2 cannabinoid receptors and AEA and 2-AG endocannabinoid metabolic enzymes), and how it modulates proper skin physiology. Components of the ECS are present in both healthy (**Figure 1**) and diseased skin, however the authors outline the differences in expression and response of endocannabinoid receptor activity when dermatological homeostasis has shifted. In particular, the review outlines in-depth recounts of the ECS as a pharmacologic target for atopic dermatitis, psoriasis, fibrotic disorders, and skin cancer.

The authors also describe how receptor activity may be manipulated toward dermatological functions aside from disease. For example, there is mention of the negative correlation between the upregulation of CB1 receptor activation and hair elongation, suggesting that CB1 antagonists may be a useful target for promoting hair growth. Conclusions from the review suggest that modulation of the ECS (possibly through topical application of exogenous cannabinoids) could be a promising approach for treatment of skin disorders as well as other cosmetic applications.

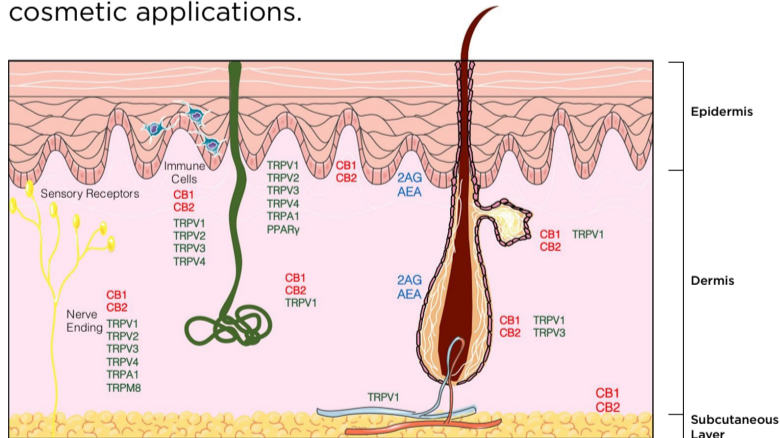


Figure 1. The endocannabinoid system of the skin. Schematic representation of the key elements (main cannabinoid receptors and their endogenous lipid ligands) of the endocannabinoid system in cellular compartments of the skin. (Reference: C.d. Rio et al., Biochemical Pharmacology, vol 157, 2018, 122-133).

EXPERT PERSPECTIVE

LITERATURE REVIEW:
Cannabinoids in Dermatology

Report prepared for Avicanna Inc.

Avicanna recently conducted a review on cannabinoid treatments in dermatology. The review highlights results from current preclinical and clinical studies involving dermatological applications of endocannabinoids, phytocannabinoids and synthetic cannabinoids. A summary of the studies performed at the molecular, cellular, animal and human levels was used to determine the efficacy, tolerability and safety of cannabinoids as treatment for a number of dermatological conditions including: atopic dermatitis, eczema, acne, psoriasis, epidermolysis bullosa, melanoma, and skin cancer.

The literature searches were conducted using The Cochrane Databases of Systematic Reviews, PubMed, Embase, and Medline.

The review identifies that, although preclinical studies of cannabinoids are becoming an increasingly active area of research, there is currently a lack of properly designed clinical trials for cannabis in dermatology.

Avicanna has reviewed the conclusions of each study and are using the authors' recommendations in the design and development of our own well-controlled clinical studies to be conducted at leading Health Research Centres such as the Hospital for Sick Kids in Toronto.

Provided by Avicanna Inc.

Avicanna aims to establish itself as a leader in the global medical cannabis industry through its product discovery and development processes, intellectual property portfolio, strategic relationships, and cultivation infrastructure. Avicanna is growing its network of strategic relationships with institutions they believe to be best-in-class and market leading, located around the world to assist with the achievement of its business objectives, including large-scale, environmentally sustainable cultivation, scientific R&D, and manufacturing and distribution.

Avicanna would like to acknowledge the following authors and editorial staff that contributed to this newsletter:
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Our next issue will focus on cannabinoids and their role in pain management.

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