

## REMOTE CDR RESEARCH SEMINAR SERIES

The Center for Dermal Research Welcomes

Dr. Deepika Arora  
Genemarkers

“Utilizing RNA-Seq to Explore the Potential of “Next-Generation” Cannabinoids for Skin Care Applications”

November 7, 2022 at 5:30pm EST



**Dr. Deepika Arora** has 10 plus years of experience in diverse areas of life science research. She is currently employed as a Scientist at Genemarkers, a leading CRO that specializes in providing quality-driven genomics services for product development. In her current role, she uses next-generation sequencing (RNA-seq) techniques to answer questions related to skin care product formulation and efficacy testing. She has played an instrumental role in launching the Company’s new Next-Generation sequencing services and leads the data and bioinformatics analysis. She has a great passion for science-based skincare and strives to understand how raw materials and product formulations work at the gene level. Dr.

Arora received her BS in Biotechnology and her MS and PhD in Plant Pathology from North Dakota State University (NDSU), USA. She has been frequently involved in reviewing the work of others in her field and has successfully disseminated her research findings through publications in peer reviewed journals and presentations at national/international scientific conferences. Additionally, she has served as a biology instructor for high school students in India and a teaching assistant for a graduate level Plant Pathology course at NDSU.

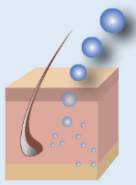
**Abstract:** The cutaneous endocannabinoid system (ECS) plays a crucial role in regulating skin biology and serves as a target for exogenous cannabinoids. The development of non-psychoactive cannabinoid-based products is prevalent in the skin care industry. Despite the identification and isolation of dozens of cannabinoids, transcriptome studies deciphering mechanism of action and dose-dependent efficacy are still limited. Most studies have been conducted using cannabidiol (CBD), with little or no work performed on the “newer” cannabinoids, like cannabigerol (CBG) and cannabichromene (CBC) in human skin at the molecular level.

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This presentation will describe work conducted using next-generation sequencing to understand the role of CBG and CBC in regulating skin biology. For the studies, CBG or CBC were applied topically for 24 hrs. to a full thickness, human 3D skin model (MatTek). Illumina mRNA-seq technology was used to determine differential gene expression profiles of three different doses of each cannabinoid compared to the vehicle control. Overall, CBG elicited a greater response than CBC, producing statistically significant changes in more genes at all doses. The differentially expressed genes (DEGs) were further analyzed using the Gene Ontology and the Kyoto Encyclopedia of Genes and Genomes (KEGG) databases. Both compounds regulated genes associated with the following processes: aging, wound healing, cell proliferation, response to oxidative stress, skin barrier, pigmentation, circadian regulation, JAK-STAT and inflammation. Additionally, the genes were enriched in KEGG functional categories that include, signaling pathways related to cytokine-cytokine receptor interaction, immune response, defense response and chemokine signaling. In addition to the aforementioned common pathways, we also observed pathways unique to each treatment. This work has identified for the first time the major pathways that are regulated by CBG and CBC on epidermal keratinocytes and dermal fibroblasts using global transcriptome analysis and demonstrates how analysis of the transcriptome can be used to identify molecular mechanisms of action for novel compounds for use in skin care product development.

**Meeting Link:**

<https://rutgers.webex.com/rutgers/j.php?MTID=ma362fac2835230d0edd66a8940618f9e>

For a direct invite, please email [cdr\\_frontdesk@dls.rutgers.edu](mailto:cdr_frontdesk@dls.rutgers.edu)

