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John Snowball

John Snowball is a Bioinformatician and Scientist working with P&G Global Bioscience in Cincinnati, Ohio, where he is utilizing his expertise in bioinformatics to further research into various skin related projects.

Mr. Snowball joined P&G's skin biology team in 2021, among other disciplines. He began his career in lung biology at Cincinnati Children's Hospital where he worked for over ten years before leaving his role as Senior Bioinformatic Analyst. He has years of experience and publications utilizing a variety of bioinformatics disciplines including transcriptomics (RNAseq, scRNA), epigenetics (ATAC seq, scATAC, Bisulfite-seq), proteomics (LC-MS-MS), lipidomic (MS/MS) along with other techniques to integrate next generation data with more conventional bench research to further the understanding of complex biological systems.

Mr. Snowball graduated from The University of Kentucky with a B.S. in Biological Sciences and obtained a M.S. in Biotechnology specialized in Bioinformatics from the University of Maryland University College.

"Characterization of the Biological Activity of a Unique Botanical Extract to Treat Atopic Dermatitis"

Abstract:

Atopic dermatitis (AD) is a chronic inflammatory skin disease that affects 15-20% of children and 1-3% of adults worldwide. First-line therapies such as corticosteroids effectively reduce disease flares but have significant side effects. The purpose of these studies was to evaluate a natural extract (BW22) and BW22 plus a colloidal oatmeal (CO) extract as potential topical therapies for AD. BW22 is a unique mixture of extracts derived from 22 plant species known to contain biologically active compounds. To simulate AD inflammation, primary normal human keratinocytes were treated for 24 hours with a combination of IL-4, IL-13, IL-22, and IFN-g, a stimulus known to evoke AD-like cascades of gene expression (AD stimulus). Co-administration of BW22 or BW22 + CO with this stimulus resulted in dose-dependent suppression of the release of CCL-5 into the growth medium. Maximal suppression of CCL-5 approached 100%, exceeding that seen with clobetasol propionate (CP; 5 mM), a potent topical

corticosteroid. To gain mechanistic insight into BW22 and BW22 + CO, we performed microarray analysis. Using two independent computational techniques (unbiased clustering and gene set enrichment) we found that both BW22 and BW22 + CO strongly prevented the induction of genes by the AD stimulus; these included genes with GO terms of cytokine mediated pathways, interferon signaling, innate immunity and defense response. In addition, BW22 and BW22 + CO prevented the repression of genes by the AD stimulus, most notably those associated with cell adhesion. Together, this prevention suggests the potential of BW22 + CO to rescue skin homeostasis. Comparisons of BW22+CO with CP indicated BW22+CO produced a more robust dampening of inflammatory response genes while also inducing genes involved in skin development and barrier function. CP either repressed these genes or had no effect. Finally, after integrating findings from two different computational tools (Ingenuity Pathway Analysis and Connectivity Mapping) we determined BW22+ CO is strongly associated with and likely functions through an interconnected mechanism involving EphrinA activation, EGFR repression and both AHR and NRF-2 induction, leading to diminished inflammation and restoration of epidermal homeostasis. Collectively, these data support that BW22+ CO is a potent non-steroidal anti-inflammatory capable of restoring keratinocyte homeostasis and repressing both innate and adaptive immune responses associated with AD.