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Selective inhibition of tyrosine kinase 2 prevents and restores interleukin-12-induced hair follicle immune privilege collapse: a novel approach to alopecia areata treatment

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Objective: To develop a novel therapy for Alopecia Areata (AA) that targets hair follicle cells and is mechanism-based.

Methods: Fractionated human hair follicles (HF) from patients with AA were used to study the effects of tyrosine kinase 2 (TK2) inhibitors. We evaluated the impact of TK2 inhibition on the expression of inflammatory cytokines and chemokines.

Results: We found that TK2 inhibition prevented the expression of inflammatory cytokines and chemokines, which are upregulated in AA. The results suggest that TK2 inhibition could be a potential therapy for AA.

Conclusion: TK2 inhibition is a promising therapeutic approach for AA that warrants further investigation.

Classification of atopic dermatitis patients based on skin properties

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Atopic dermatitis (AD) is a multifactorial inflammatory skin disorder, suggesting that individual differences in skin properties are crucial. Although significant advances have been made in understanding the pathophysiology of AD, the diversity of skin properties in AD patients is not fully understood. Herein, we evaluate and classify AD patients using multiple skin parameters, such as TEWL, hydration, pH, elasticity, frictional resistance and sebum, and to explore the relationship between skin properties and clinical multimodal data. In this study, 39 AD patients and 40 healthy subjects were enrolled and 17 parameters reflecting 6 skin properties were measured with Cutometer DTM. Simultaneously, medical examination and skin histology were performed. Dimensionality reduction was performed for the 17 skin parameters using Non-Metric Multidimensional Factorization. Then, the stratification was performed using Uniform Manifold Approximation and Projection and k-means clustering based on the reduced factors. Interestingly, the stratification based on the skin parameters revealed a group associated with the Eczema Area and Severity Index (EASI). In the first cluster including patients with mild to moderate AD, S. aureus were well correlated with EASI score, whereas in the second cluster, which included patients with moderate to severe AD, S. aureus did not show significant correlation, but inflammatory cytokines were correlated with EASI score. Both S. aureus and inflammatory cytokines were associated with EASI score in the third cluster, which included healthy subjects in addition to AD patients. These results suggest that individual differences in skin properties influence the disease severity in AD patients, thus the study is promising for the development of diagnostic and therapeutic strategies for AD.