

# Recent Advances in Skin Barrier Research: From Basic Science to Clinical Discovery

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The human skin barrier, as the first line of defense against external aggressors and the essential modulator of our body's internal homeostasis, has been studied extensively. During the past few years, with the emergence of new discoveries and scientific evidence, this field has been updating in a highly dynamic manner. The shift of biochemical compositions, especially epidermal ceramides and essential lipids, the alteration of key biomarkers under environmental damage, and the clinical manifestation of compromised skin barrier (eg, xerosis, atopic dermatitis, etc) are all at the center stage for investigation. More importantly, it has become extremely critical to provide effective prevention and treatment routines for patients of all skin types who are suffering from impaired skin barrier.

Sun exposure, as one of the most impactful environmental aggressors on human skin, poses significant risks for skin health; For example, photoaging, skin pigmentary disorders such as melasma, as well as UV-induced skin cancers (eg, basal cell carcinoma, squamous cell carcinoma, and melanoma). Its impact on viable epidermis, melanocytes, and dermal cells and extracellular matrix has long been studied. However, the direct impact of sun exposure on skin barrier disruption is yet to be fully elucidated. This will remain an important topic in skin barrier-related research programs.

This JDD supplement is aimed at providing the most recent updates in skin barrier discovery for both healthy and pathological conditions, summarizing new developments in the evolution of the understanding of barrier ultrastructure, novel scientific models for studying skin barrier, compromised skin barrier and sensitive skin in diverse population, signaling pathways, and clinical representations of barrier damage and restoration. There is a focus on demonstrating the direct impact of UV on barrier alteration and providing evidence on the efficacy of barrier restoration through ceramide-containing sunscreen formulations. Ultimately, it is essential for the personal care industry to collaborate with medical practitioners to provide effective and complementary long-term care strategy for patients seeking barrier health and overall skin quality improvement.

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