Histamine Antagonists for the Treatment of Atopic Dermatitis

A potential disease modifying treatment for inflammatory skin diseases using small molecule histamine 4 receptor inhibitors.

Problem Solved by this Technology
Currently, there are no FDA approved treatments available to repair skin barrier impairment in Atopic Dermatitis (AD), other inflammatory skin diseases (e.g. psoriasis, contact dermatitis, urticarial (hives), wound healing, UV or ionizing radiation damage), or epithelial barrier repair in other organs (e.g. gastrointestinal – IBD, coeliac disease, colitis – or respiratory – asthma, allergic rhinitis, or sinusitis). This technology provides a potential disease modifying treatment for inflammatory skin diseases using histamine receptor antagonists.

Applications of this Technology
This technology provides the first evidence that histamine-mediated skin barrier disruption is facilitated by histamine 4 receptor (H4R) and that H4R antagonists can rescue this effect and enhance the skin tight junction integrity. Small molecule H4R inhibitor, JNJ7777120, was tested in both primary human keratinocyte and ex vivo skin explants and found to be able to enhance TJ functions, assessed by trans-epithelial electrical resistance (TEER) assay. Blockade of histamine induced barrier disruption by H4R antagonists may be an effective disease modification approach for any conditions where the histamine production is increased, such as AD, psoriasis, and inflammatory bowel diseases. Conversely, H4R agonists can be explored for trans-epidermal drug delivery and transcutaneous vaccination through the temporary disruption of the skin barrier.