

BNP peptide found to be a culprit in eczema

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Researchers from North Carolina State University have pinpointed a particular peptide's role in activating atopic dermatitis, or eczema. The work could lead to more effective treatments for the condition.

Atopic dermatitis (AD) is a [skin condition](#) characterized by itching,

irritated and thickened skin at the site of the irritation. The brain [natriuretic peptide](#) (BNP) is a peptide, or short chain of amino acids, that is elevated in patients with AD.

"BNP is expressed in [sensory neurons](#), the [neurons](#) responsible for conveying sensation to the brain via the [spinal cord](#)," says Santosh Mishra, associate professor of molecular biomedical sciences at NC State and corresponding author of the work. "We know from previous work that BNP helps translate the sensation of itch from the skin to the [brain](#). In this work we wanted to see if BNP was involved in activating AD."

In a chemically induced mouse model of AD, the researchers saw that mice without BNP did not exhibit the thickened or irritated skin commonly associated with AD, and their itching was reduced compared with control mice who did have BNP.

"The results show that BNP likely plays a role in itch activation," Mishra says. "We next looked at BNP's relationship to periostin, to see if we could determine how that activation takes place."

Periostin is a protein that can interact with sensory neurons in skin to activate itch response. It is produced in skin cells called keratinocytes and fibroblasts. Keratinocytes in turn, have receptors for BNP, which are called NPR1 receptors. When the BNP receptors are activated, periostin is produced and itch can be turned on.

"But the interesting thing here is that the sensory neurons are the activator," Mishra says. The neuron releases BNP, which activates keratinocytes with the NPR1 receptor, which then release the periostin.

"This work shows that peripheral neurons, not just central neurons, are playing a role in AD—it begins in the sensory neurons, and cascades

from there," Mishra adds. "It also points to some potential therapeutic strategies, such as blocking BNP's ability to bind to NPR1 receptors in the skin."

The research appears as a letter to the editor in the *Journal of Investigative Dermatology*.

More information: Joshua J. Wheeler et al, Brain Natriuretic Peptide Exerts Inflammation and Peripheral Itch in a Mouse Model of Atopic Dermatitis, *Journal of Investigative Dermatology* (2023). [DOI: 10.1016/j.jid.2023.09.273](https://doi.org/10.1016/j.jid.2023.09.273)

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