

# Piceatannol, a resveratrol analog, attenuates Dermatophagoides farinae-induced atopic dermatitis like symptoms in NC/Nga mice

Chang Hyung Lee<sup>1</sup>, Hee Yang<sup>2</sup>, Jung Han Yoon Park<sup>2</sup>, Jong-Eun Kim<sup>3</sup>, and Ki Won Lee<sup>1</sup>

<sup>1</sup>Seoul National University College of Agriculture and Life Sciences

<sup>2</sup>Seoul National University

<sup>3</sup>Korea National University of Transportation

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## Abstract

**Background:** Piceatannol is a resveratrol metabolite commonly found in red wine, grapes, and passion fruit seeds. Several studies have investigated the immune-modulating effects of piceatannol on processes related to allergic reactions. However, the relationship between piceatannol and atopic dermatitis (AD) has not yet been reported. Therefore, this study sought to investigate the effects of piceatannol in animal and cell line models. **Methods:** AD-like symptoms and skin lesions were induced by repeated topical application of Dermatophagoides farinae extract (DFE) on the skin of NC/Nga mice. Piceatannol was topically applied five times per week for four weeks. The molecular mechanism of piceatannol was studied in the TNF $\alpha$ /IFN $\gamma$ -induced HaCaT cell line. **Results:** Topical application of piceatannol attenuated DFE-induced AD-like symptoms, as shown by skin thickness, dermatitis score, scratching time, and skin water loss. Histopathological analysis showed that piceatannol suppressed DFE-induced eosinophil and mast cell infiltration into the skin. These observations occurred concomitantly with the downregulation of inflammatory markers, including serum TARC, MDC, and IgE. In addition, piceatannol alleviated Th2 cytokines such as IL-4 and IL-13 in the skin tissue. Piceatannol decreased phosphorylation of JAK-STAT protein in the TNF $\alpha$ /IFN $\gamma$ -induced HaCaT cell line. A molecular docking study showed that piceatannol strongly interacts with JAK1, suggesting a possible piceatannol mode of action. **Conclusions:** Piceatannol, a metabolite of resveratrol, has potential therapeutic efficacy in treating AD by targeting JAK1.

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