

Microneedle approach to address peanut allergy shows promise in mice

March 4 2022



Credit: CC0 Public Domain

Treating peanut allergy with microneedles could significantly improve desensitization by directly targeting the allergen to the skin, providing greater protection from severe allergic reactions for millions of people, a new study suggests.

Investigators at Michigan Medicine, in collaboration with researchers from Moonlight Therapeutics, tested a dermal stamp containing [peanut](#)-coated microneedles on mice by applying it to the skin for five minutes once a week over five weeks. They compared that to mice receiving epicutaneous [immunotherapy](#), which involves wearing a patch on the skin for 24 hours over the same time period.

The results, published in *Immunotherapy*, reveal mice that received the five weekly [microneedle](#) treatments had significant increased rates of desensitization to [peanut allergy](#) compared with EPIT, which required two months of treatment to achieve protection. The microneedle treatment success was achieved despite applying a dose of peanut protein 10-times lower than the dose delivered by EPIT.

"While our pre-clinical results are from studies in animal models, they demonstrate the potential for peanut microneedles to improve food allergen immunotherapy through the skin," said Jessica O'Konek, Ph.D., senior author of the paper and research assistant professor at the Mary H. Weiser Food Allergy Center at Michigan Medicine. "Treatment options for food [allergy](#) are limited, so there is a lot of motivation for the development of novel therapeutics. It will be exciting to watch the clinical development of this technology," she said.

Around 6 million Americans have a peanut allergy, with symptoms that can range from mild hives to potentially fatal anaphylactic reactions. Currently, orally administered immunotherapy is the only treatment for peanut allergy approved by the United States Food and Drug Administration. However, it requires that patients follow a strict long-term protocol for ingesting each dose.

EPIT has been demonstrated to be safe in clinical trials, but the treatment showed variability in efficacy. O'Konek believes this could be due to the barrier provided by the skin surface, which may limit the

amount of allergen taken up by the body. Targeted delivery of peanut protein with microneedle patches may offer more controlled delivery of allergen.

"This is a very interesting technology that could provide a unique method to desensitize people with food allergies," said James R. Baker, Jr., M.D., co-author of the paper and director of the Mary H. Weiser Food Allergy Center. "These successful animal results argue for further development of this platform."

More information: Jeffrey J Landers et al, Targeted allergen-specific immunotherapy within the skin improves allergen delivery to induce desensitization to peanut, *Immunotherapy* (2022). [DOI: 10.2217/imt-2021-0206](https://doi.org/10.2217/imt-2021-0206)

Provided by University of Michigan

Citation: Microneedle approach to address peanut allergy shows promise in mice (2022, March 4) retrieved 28 June 2024 from <https://medicalxpress.com/news/2022-03-microneedle-approach-peanut-allergy-mice.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
