

Bacterial protein in house dust spurs asthma, according to new study

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A bacterial protein in common house dust may worsen allergic responses to indoor allergens, according to research conducted by the National Institutes of Health and Duke University. The finding is the first to document the presence of the protein flagellin in house dust, bolstering the link between allergic asthma and the environment.

Scientists from the NIH's National Institute of [Environmental Health Sciences](#) (NIEHS) and Duke University Medical Center published their findings in people and mice online Oct. 14 in the journal *Nature Medicine*.

"Most people with asthma have allergic asthma, resulting largely from allergic responses to inhaled substances," said the paper's corresponding author Donald Cook, Ph.D., an NIEHS scientist. His research team began the study to identify environmental factors that amplify the allergic responses. "Although flagellin is not an allergen, it can boost allergic responses to true allergens."

After inhaling house dust, mice that were able to respond to flagellin displayed all of the common symptoms of allergic asthma, including more mucous production, airway obstruction, and [airway inflammation](#). However, mice lacking a gene that detects the presence of flagellin had reduced levels of these symptoms.

"More work will be required to confirm our conclusions, but it's possible that cleaning can reduce the amount of house dust in general, and

flagellated bacteria in particular, to reduce the incidence of allergic asthma," Cook said.

In addition to the mouse study, the research team also determined that people with asthma have higher levels of antibodies against flagellin in their blood than do non-asthmatic subjects, which provides more evidence of a link between environmental factors and allergic asthma in humans.

"More than 20 million Americans have asthma, with 4,000 deaths from the disease occurring each year," added Darryl Zeldin, M.D., NIEHS scientific director and paper co-author. "All of these data suggest that flagellin in common house dust can promote allergic asthma by priming allergic responses to common [indoor allergens](#)."

More information: Wilson RH, Maruoka S, Whitehead GS, Foley JF, Flake GP, Sever ML, Zeldin DC, Kraft M, Garantziotis S, Nakano H, Cook DN. 2012. The Toll-like receptor 5 ligand flagellin promotes asthma by priming allergic responses to indoor allergens. *Nat Med*; [doi:10.1038/nm.2920](https://doi.org/10.1038/nm.2920) [Online 14 October 2012].

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