Bleach Found to Neutralize Mold Allergens

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DENVER — ***First-ever Human Studies Show Bleach Solution Reduces Allergenic Properties of Mold***

Researchers at National Jewish Medical and Research Center have demonstrated that dilute bleach not only kills common household mold, but may also neutralize the mold allergens that cause most mold-related health complaints. The study, published in the September issue of *The Journal of Allergy and Clinical Immunology*, is the first to test the effect on allergic individuals of mold spores treated with common household bleach.

"It has long been known that bleach can kill mold. However, dead mold may remain allergenic," said lead author John Martyny, PhD, associate professor of medicine at National Jewish. "We found that, under laboratory conditions, treating mold with bleach lowered allergic reactions to the mold in allergic patients."

The need for denaturing or neutralizing mold allergens is a critical step in mold treatment that has not been fully understood. Currently, most recommendations for mold remediation call for removal since dead mold retains its ability to trigger allergic reactions, according to Dr. Martyny.

The researchers grew the common fungus *Aspergillus fumigatus* on building materials for two weeks, and then sprayed some with a dilute household bleach solution (1:16 bleach to water), some with Tilex® Mold & Mildew Remover, a cleaning product containing both bleach and detergent, and others only with distilled water as a control. They then compared the viability and the allergenicity of the treated and untreated mold.

The researchers found that the use of the dilute bleach solution killed the *A. fumigatus* spores. When viewed using an electron microscope, the treated fungal spores appeared smaller, and lacked the surface structures present on healthy spores. In addition, surface allergens were no longer detected by ELISA antibody-binding assays, suggesting that the spores were no longer allergenic.

The National Jewish researchers then allergy-tested eight *Aspergillus* -allergic individuals with solutions from the bleach and Tilex®-treated building materials. Seven of the eight allergic individuals did not react to the bleach-treated building materials, and six did not react to the Tilex®-treated building materials. This evidence suggests that, under laboratory conditions, fungal-contaminated building materials treated with dilute bleach or Tilex® may have significantly reduced allergic health effects.

"This study was conducted under controlled laboratory conditions. In order to assure that the bleach solutions will function similarly under actual field conditions, additional experiments will need to be conducted," said Dr. Martyny. "We do believe, however, that there is good evidence that bleach does have the ability to significantly reduce the allergenic properties of common household mold under some conditions."

This study was partially funded by a grant from The Clorox Company.

National Jewish is the only medical and research center in the United Stated devoted entirely to respiratory, allergic, and immune-system diseases, including asthma, allergies, and chronic obstructive pulmonary disease. It is dedicated to enhancing prevention, treatment, and cures through research, and to developing and providing innovative clinical programs for patients regardless of age, religion, race, or ability to pay.

National Jewish Health is the leading respiratory hospital in the nation. Founded 121 years ago as a nonprofit hospital, National Jewish Health today is the only facility in the world dedicated exclusively to groundbreaking medical research and treatment of patients with respiratory, cardiac, immune and related disorders. Patients and families come to National Jewish Health from around the world to receive cutting-edge, comprehensive, coordinated care. To learn more, visit the

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