



HUMAN HEALTH RESEARCH PROGRAM

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RESEARCH SHOWS THE ROLE OF MOLD IN CAUSING OR EXACERBATING ASTHMA

Issue:

The number of Americans diagnosed with asthma, particularly children, has reached epidemic proportions. To improve understanding of the human health implications of asthma, the U.S. Environmental Protection Agency's Office of Research and Development has developed a targeted asthma research program.

One area of asthma research involves the potential role that mold plays in the development or exacerbation of asthma. Recently, there has been much media attention devoted to *Stachybotrys chartarum*, a type of black mold or fungus that has been associated with a range of health problems including asthma.

Science Objective:

Few hypotheses about mold exposure, its influence on asthma, or methods for prevention have been tested scientifically. As a result, EPA has made mold, or fungal bioaerosols, a major focus of its asthma research program.

Researchers are currently working to identify and describe the many different molds commonly present in household environments. They hope to determine which molds pose the

greatest risks and whether any has the capacity to cause asthma.

Scientists also intend to determine how much mold a person must inhale to cause an effect. Inhaling just a few particles may sensitize people's lungs, making them more likely to react to future exposure. In addition, genetic variations in humans may cause cells to respond differently which may explain why mold and other allergens cause or exacerbate asthma in some people but not in others. EPA researchers are working to determine the specific ways in which cells and organs respond to molds and other environmental pollutants.

Application and Impact:

In one study, scientists exposed mice to samples of *Stachybotrys* taken from homes and looked for immune system responses typical of allergies as well as inflammation and functional changes in the animals' lungs. The results showed that the mold can indeed cause a disease similar to asthma in mice. Meanwhile, other EPA scientists have developed sophisticated procedures for identifying *Stachybotrys* and other molds in indoor environments, making it possible to determine which molds are present in

a given household. These procedures include methods for rapidly measuring the amounts of different fungi present in dust and measuring a biomarker that, when found in a person's blood, indicates exposure to *Stachybotrys*. These studies set the stage for further research that will help determine if humans are responding to the same allergens as mice and whether these responses can be associated with asthma.

EPA investigators have also been evaluating strategies for preventing mold growth. Strategies include applying antifungal sealants for fiberglass and galvanized steel used in heating and air conditioning systems. Studies show that sealants can reduce mold growth on fiberglass and can completely prevent growth on galvanized steel.

REFERENCES:

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- CONTACT:**
Hillel Koren, Ph.D., Environmental Protection Agency's Office of Research and Development, 919-966-9791, Koren.hillel@epa.gov