# Research identifies specific bacteria linked to indoor water-damage and mold

June 19 2012

Bacterial contamination in water-damaged buildings has been identified as a potential cause of health problems, including infection and respiratory conditions like asthma. Which specific bacteria contribute to these problems, however, has been unknown—making it difficult for public health officials to develop tools to effectively address the underlying source of the problem.

In a new study, a University of Cincinnati (UC) environmental health research team found evidence linking two specific strains of bacteria—*Stenotrophomonas* and *Mycobacterium*—to indoor mold from water damage. The research is part of the U.S. Department of Housing and Urban Development's investment in research to protect the health of children from hazards in the home.

"If we are going to understand the role of indoor bacteria in human health, we must be able to identify and quantify the relevant bacterial species contributing to the health problems," says Atin Adhikari, PhD, assistant professor of environmental health at the UC College of Medicine and principal investigator of the study.

"The association between bacterial contamination and respiratory health has lagged behind mold studies because it is difficult to determine which species of bacteria are growing in homes and most of the bacterial species are non-culturable and not identified yet," adds Adhikari. "These new data will help us more accurately target and combat the bacteria and to explore synergistic health effects of bacteria and molds growing in

water damaged homes."

The UC-based team will report its findings June 18, 2012, at the American Society for Microbiology meeting in San Francisco.

For this study, Adhikari and UC postdoctoral fellow Eric Kettleson, PhD, analyzed samples collected from 42 homes from the Cincinnati Childhood Allergy and Air Pollution Study, a National Institute of Environmental Health Sciences-funded project examining the long-term effects of environmental exposures on respiratory health and allergy development in children.

Included homes fell into one of two categories—"high mold" or "low mold"—based on previously reported environmental relative moldiness index (ERMI), a DNA-based mold level analysis tool developed by the U.S. Environmental Protection Agency (EPA) that combines results of the analysis of 36 different types of mold into one index to describe a home's cumulative mold burden.

The team then compared the ERMI values and types of bacteria found in both high- and low-mold homes in an effort to better understand the environmental sources and home characteristics that influence indoor bacterial contamination.

They found strong correlations between *Mycobacterium* and visible mold and also between *Stenotrophomonas* and environmental relative moldiness index.

"Stenotrophomonas maltophilia—an emerging multidrug-resistant global opportunistic pathogen—was isolated from numerous environmental sources. Surprisingly, it was never assessed quantitatively in indoor home environments— especially in water damaged homes where this can be a real concern and may cause inhalation exposure risks to occupants.

Stenotrophomonas maltophilia is the first bacterial species associated with higher ERMI values in homes," adds Kettleson.

Provided by University of Cincinnati Academic Health Center