

Student Proving Walls (Even Sofas) Can Talk

March 4 2009



Jon McKinney (left) and Dr. Glenn Morrison, both of Missouri S&T, want to help epidemiologists identify what's triggering diseases like asthma in children. Image: B.A. Rupert

Most college students will admit to searching their couch cushions for extra coins to do laundry. But Jon McKinney's cushion hunt isn't about finding money. He wants to help epidemiologists identify what's triggering diseases like asthma in children, and he's got the backing of the Environmental Protection Agency.

Working with Dr. Glenn Morrison, associate professor of environmental engineering at Missouri University of Science and Technology, the junior is developing the science behind “building forensics,” an emerging field that lies at the outer edge of environmental engineering.

“Our goal is to identify what's happened inside a home based on the 'unique fingerprints' of the chemicals we find,” McKinney says.

The pair is using nondestructive techniques to take samples from couch cushions, drywall and even concrete to identify the concentration of chemicals that had been in the home. If successful, the technique would make it easier for scientists to reliably identify the chemical causes for many diseases.

The problem of indoor pollution has escalated in recent years as homes have been made more energy efficient, reducing the amount of natural ventilation and allowing a buildup of potentially harmful substances in the air. Many researchers believe the air found inside people's homes can be more hazardous to their health than the smog and other environmental pollutants they are exposed to during outdoor activities.

“You can choose what water you drink. You can choose what you eat. But you can't choose what air you breathe,” says McKinney, explaining his interest in the field. “This work combines nature, ecology and chemistry - all the things I like.”

The EPA estimates Americans spend roughly 90 percent of their time indoors, and indoor air pollution - caused by sources ranging from paints to cleaning solvents, personal care products to furnishings - has been linked to a wide variety of adverse health effects. Children, the elderly, and those with chronic ailments like chronic obstructive pulmonary disease are particularly vulnerable, perhaps in part due to their weaker immune systems and increased time spent indoors.

Many people don't realize the amount of chemicals they introduce into their homes every day. For example, dry-cleaned clothes can emit perchloroethylene, a chemical that has been shown to cause cancer in animals. Studies indicate that people breathe low levels of this chemical in homes where dry-cleaned goods are stored.

McKinney is currently establishing the “fingerprint” of chemicals in the type of foam materials that are commonly present in furniture cushions.

McKinney of Kansas City, Mo., and a junior in environmental engineering at Missouri S&T, is receiving more than \$45,000 to support his education and research through the EPA's Greater Research Opportunities Research Fellowship. Prior to receiving the fellowship, McKinney received funding for his research through Morrison's National Science Foundation CAREER award, which recognizes a young researcher's dual commitment to scholarship and education.

Provided by Missouri University of Science and Technology

Citation: Student Proving Walls (Even Sofas) Can Talk (2009, March 4) retrieved 26 April 2024 from <https://phys.org/news/2009-03-student-walls-sofas.html>

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.