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## Making Sense of Mold Sampling

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According to a statement released by the American College of Occupational and Environmental Medicine, "Mold spores are present in all indoor environments and cannot be eliminated from them. Normal building materials and furnishings provide ample nutrition for many species of molds, but they can grow and amplify indoors only when there is an adequate supply of moisture. Where mold grows indoors, there is an inappropriate source of water that must be corrected before remediation of the mold colonization can succeed. Mold growth in the home, school or office environment should not be tolerated because mold physically destroys the building materials on which it grows, mold growth is unsightly and may produce offensive odors, and mold is likely to sensitize and produce allergic responses in allergic individuals." <sup>1</sup>

Health effects of bio-aerosol exposure from fungal sources include allergy, infection, irritation and toxicity. The first three categories have well-established mechanisms, but dose-response data are lacking and the degree of individual susceptibility is highly variable.

Specific toxic effects due to inhaled mycotoxins are not well documented and therefore remain controversial. In the absence of specific illness and respiratory symptoms in the occupants of a home or office, responding to visible mold with knee-jerk advice is not advised. Such statements as "Move out of your home" or "Evacuate the building" have significant psychosocial and economic consequences.

Excessive moisture is the fundamental cause of mold proliferation. Before starting expensive and often low-yield environmental investigations, the first step is to eliminate excess moisture. Proper building design and construction, combined with periodic preventive maintenance to avoid water intrusion, are fundamental in preventing the adverse health effects of mold exposure.

From the *Journal of Occupational and Environmental Medicine*, we learn, "Most scientists recognize that case reports and outbreak investigations cannot provide commonly discernable knowledge, as

the population to which they may be extrapolated is controversial. The purpose of such reports generally is to make the medical and scientific community aware of discussions, theories and concerns they should be aware of, could keep their eyes open for, and perhaps recognize again if encountered elsewhere."2

The question that article hopes to answer is: When is sampling for mold needed?

Collecting air samples sometimes provides useful information in finding hidden mold when thorough inspection has not found moisture or mold, yet the symptom red flags commonly known to be associated with chronic mold exposure are present. Comparing air samples in many rooms and outdoors sometimes provides evidence that there is fungal growth or at least a reservoir of spores inside a building.

In most cases, if visible mold growth is present, pre-remediation sampling is unnecessary. The general guideline, simply put, states: If mold is present, correct the moisture source and clean up the affected areas. In specific instances, such as cases where litigation is involved, the source(s) of the mold contamination is unclear or health concerns are a problem, you may consider sampling as part of your site evaluation. Surface sampling also may be useful in order to determine if an area has been adequately cleaned or remediated. Sampling should be done only after developing a sampling plan that includes a confirmable theory regarding suspected mold sources and routes of exposure. Figure out what you think is happening and how to prove or disprove it before you sample.

If you do not have proper training and/or are in doubt about sampling, consult an experienced professional. This individual can help you decide if sampling for mold is useful and/or needed, and he or she will be able to carry out any necessary sampling. It is important to remember that the results of sampling may have limited use or application. Sampling may help locate the source of mold contamination, identify some of the mold species present and differentiate between mold and soot or dirt. Pre- and post-remediation sampling also may be useful in determining whether remediation efforts have been effective. After remediation, the types and concentrations of mold in indoor air samples should be similar to what is found in the local outdoor air. Since no EPA or other federal threshold limits have been set for mold or mold spores, sampling cannot be used to check a building's compliance with federal mold standards.

Collecting samples for mold should be conducted by professionals with specific training and/or experience in designing mold sampling protocols, sampling methods and interpreting results. Sample analysis should follow analytical methods recommended by the American Industrial Hygiene Association (AIHA), the American Conference of Governmental Industrial Hygienists (ACGIH) or other professional guidelines. Types of samples include air samples, surface samples, bulk samples (chunks of carpet, insulation, wall board, etc.) and water samples from condensate drain pans or cooling towers.

A number of pitfalls may be encountered when inexperienced personnel conduct sampling. They may take an inadequate number of samples, there may be inconsistency in sampling protocols, the samples may become contaminated, outdoor control samples may be omitted and they may incur costs for unneeded or inappropriate samples. Budget constraints often will be a consideration when sampling; professional advice may be necessary to determine if it is possible to take sufficient samples to characterize a problem on a given budget. If it is not possible to sample properly, with a sufficient number of samples to answer the question(s) posed, it would be preferable not to sample. Inadequate sample plans may generate misleading, confusing and useless results.

Keep in mind, air sampling for mold provides information only for the moment in time during which the sampling occurred, much like a snapshot. Air sampling will reveal, when properly done, what was in the air at the moment when the sample was taken.

Again quoting the American College of Occupational and Environmental Medicine: "Indoor air samples with contemporaneous outdoor air samples can assist in evaluating whether or not there is mold growth indoors; air samples also may assist in evaluating the extent of potential indoor exposure. Bulk, wipe and wall cavity samples may indicate the presence of mold, but do not contribute to characterization of exposures for building occupants." <sup>1</sup>

### **Sources Cited:**

- 1 American College of Occupational and Environmental Medicine
- 2 Journal of Occupational and Environmental Medicine

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