The Science and Art of Environmental Mold Investigations

Presented for:

Mold Medicine and Mold Science
Its Practical Applications for Patient Care, Remediation & Claims

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- Mold Facts and Myths
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Mold Facts and Myths (Source: “Mold Misinformation” by Dr. Gots)

a. Mold spore (nonviable) levels, as measured by the NAB of the American Association of Asthma, Allergy and Immunology in 100 centers nationally show remarkable variability.

b. Mold toxins at indoor environmental levels have never been shown scientifically to cause any illnesses.

Mold Facts and Myths (Source: "Mold Misinformation" by Dr. Gots)

c. The CDC paper purporting an alleged connection between newborns with bleeding lungs and the presence of *Stachybotrys* has been rescinded because the science was poor. Moreover, despite the increasing discovery of *Stachybotrys* in homes, no such "outbreaks" have been repeated.

d. The toxins made by *Stachybotrys* are not neurotoxins.

Mold Facts and Myths (Source: "Mold Misinformation" by Dr. Gots)

e. Molds may or may not make mycotoxins.

f. No one knows exactly how many homes have mold behind the walls, but the best current estimate is 70%.

g. The best known mold infections occur from outdoor mold. Histoplasmosis and Coccidiomycosis are the prime examples.

Mold Facts and Myths (Source: “Mold Misinformation” by Dr. Gots)

h. Occupational exposures to many molds (including *Stachybotrys*) can be in the millions of spores per m3–saw mill operators, landscapers, mushroom farmers, horse farmers.

i. Numbers which can be used to make rational decisions about reasonable exposures are available. The AAAAI has already developed standards.

Mold Facts and Myths (Source: “Mold Misinformation” by Dr. Gots)

j. Fungi produce allergies, primarily.

k. It is circular logic to say, “I feel sick; there is mold; the mold made me sick.”

Industrial Hygiene

"Industrial Hygiene is that science and art devoted to the anticipation, recognition, evaluation, and control of those environmental factors or stresses arising in or from the workplace that may cause sickness,…"

(Fundamentals of Industrial Hygiene, 4th Edition)

Investigations

Five primary situations prompt investigations.

- **Insurance claims**
- **Occupant complaints**
- **Building problems**
- **Asset protection**
- **Litigation support**

The “Regular Investigation”

This type of investigation is usually driven by insurance claims, known or suspected building problems, or a desire to protect assets and income (prevent occupant complaints, lease cancellations, and lawsuits). No litigation is pending or anticipated.

The “Regular Investigation”

The investigation can follow logical science, sound reason, and good industrial hygiene practice. However, if litigation happens later, you will wish you had more data, or no data at all.

The “Regular Investigation”

First, agree on your guiding principle. For example, the EPA and the New York City guidelines both recommend, in summary, that visible mold should be removed.

The “Regular Investigation”

Fundamental questions to answer are:

- Is visible mold amplification present?
- If so, is it in a place where spores can get into the air stream?
- Is surface contamination likely to be of concern?
- Is remediation warranted?

The “Regular Investigation”

Fundamental questions to answer are:

- How and where should we remediate?
- Is surface decontamination warranted, and if so, how should it be done?
- What is/are the moisture source/sources?
- How can the moisture sources be repaired or controlled?

The “Regular Investigation”

These questions follow the tried and true industrial hygiene approach of identifying the source, determining if an exposure pathway exists, and interrupting the pathway by some control method.

The “Regular Investigation”

Removal of the source is the best and most venerated control method. It usually does not take a lot of sampling, if any, to make this determination, once the source is known.

Investigation of Complaints

- Mold related, or perceived as such, health effects
- Odor
- Visible mold
- Water damage

Investigation of Complaints

If no obvious mold source is found, it may be appropriate to sample to demonstrate that indoor levels are not elevated. If indoor levels are elevated, the source must be located.

If visible mold is present, no sampling is needed to recommend removal.

Investigation of Complaints

Surface decontamination (HEPA vacuuming, wet wiping) can often be determined based on visual evidence.

Investigation of Complaints

Interviews with those who registered complaints, and those who did not, are useful. Are health effects consistent with mold related allergies? Is some other indoor air contaminant implicated? What are the temporal and geometric patterns?

Investigation of Complaints

Serious health complaints indicate the need for medical evaluations. Have any been done? Are they objective and analytical, or are the medical opinions based primarily on what the patients told the physicians?

Investigation of Complaints

Mold concerns are often expressed by tenants when lease renewal time approaches. If there is a hidden agenda related to lease negotiations, sampling is a good way to address the concerns.

Investigation for Litigation Support

The investigator must understand the issues of the case before beginning an investigation.

Investigation for Litigation Support

It is difficult to prove a negative. If the investigation is to defend an insurance company or building owner against claims of mold related health effects, no amount of sampling will be unimpeachable by the plaintiffs.

Investigation for Litigation Support

As with the other types, this investigation should also begin with a comprehensive visual inspection.

Sampling is always required. If opposing side investigations have been done, it is helpful to review these reports before beginning.

Investigation for Litigation Support

Causation is of primary importance in insurance litigation. Cost estimating is also important.

The Investigative Process

Background information and historical review

- Other reports
- Claims
- Allegations
- Legal strategy
- Understanding how the building is constructed and operates

The Investigative Process

Comprehensive visual

- Moisture problems
- Occupied spaces
- Unoccupied spaces, cavities, plenums, etc.
- Assistance from the chief engineer (commercial buildings) is vital

The Investigative Process

Comprehensive visual

- Air flow patterns
- Pressurization
- HVAC and ductwork
- Maintenance and housekeeping

The Investigative Process

Interviews

- Occupants (maybe)
  - Homeowner, tenants, etc.
- Managers
- Maintenance personnel
- Physicians

The Investigative Process

Sampling

- Air
- Surfaces
- Bulk materials
- Temperature and humidity
- Moisture content
- Other

The Investigative Process

Report

- Draft
- Final

Building Populations

Age

General health

General attitude

Life style

Perceptions

Perceptions of relatives, friends, etc.

Building Populations

Other characteristics

- Live in the building
- Work in the building
- Happy/unhappy
- Active/inactive

Building Populations

Other characteristics

- **Informed/uninformed**
- **Combative**
- **Afraid/distressed**
- **Sincere/posturing**

Community perceptions (news media)

Communications

What you communicate should be based on sound logic and good IH practice. How you communicate, whether written or verbal, is entirely an art form.

Sampling

Sampling should only be used to supplement a thorough information gathering process and a comprehensive visual inspection.

Sampling should not be used to substitute for these.

Sampling

If visible mold exists, if no health effects are being claimed, and if litigation is not pending, sampling is generally not necessary for investigations. Remove the mold.

Sampling

Know what you will do with the data, whatever they may be, before you take the first sample.

If there is a known problem, correct the problem before you sample.

Sampling

Sample if health effects are alleged and there is no known source.

Sample to support litigation.

Sample for insurance claims investigations. Causation is critical.

Sampling

Sample to address occupant complaints, maybe.

Sample for asset protection investigations, maybe.

Sample to infer what cannot be seen.

Design and Construction

Obtain assistance from architects and engineers for complex building problems.

Litigation

The plaintiffs will allege that mold has made property uninhabitable and decreased its value. They will allege life-threatening health effects.

No amount of sampling will prove the contrary to the satisfaction of the plaintiffs.