

MOLD IN THE LABORATORY: Spores Are Us!

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Safe Science: Be Protected

By Dr. Ken Roy*

I. DRIP! DRIP! DRIP!

School laboratory inspections can be very revealing at times. In one situation, a laboratory was found to have wet ceiling tiles. These tiles were wet and left unattended for a period of several weeks before being repaired. During this time, the teacher and students seemed to have respiratory problems and higher than normal absentee rates. When the school maintainer finally was able to remove the tiles, fix the leak and install new tiles, an interesting observation was made. The original wet ceiling tiles were covered with mold on their upper side!

Of course, mold is not just limited to the science laboratory. In one state, over 1,000 students spent a month at a motor speedway attending classes in the skyboxes while the mold was being removed from their high school at a cost of \$600,000! Another school was out of class for four weeks while school officials removed mold from their building at a cost of \$1 million.

With the aging of school facilities, anemic maintenance procedures, insufficient funding and just poor practice, mold is becoming a major health and education issue in our schools. Science laboratories are especially susceptible, given the presence of water. Moisture intrusion is effected through leaks, wicking of moisture in walls, sheet rock, insulation, slabs and ceilings plenum, plants, and trash containers. With over 100,000 species worldwide, it is no wonder that they are found almost everywhere.

Molds are a key component in the food chain. They are the decomposer. They usually focus on the decay of dead plant material in woodlands. However, given the right conditions, they love digesting organic materials in science laboratories and other school sites.

II. Four ingredients for growth!

Mold can be found in most places in the laboratory – under sinks, behind walls, in the ceiling, in cabinets, old books, and more. For mold

to grow, there are four main ingredients:

1. food, 2. darkness, 3. moisture and 4. warmth.

Unfortunately, newer construction tends to include sheet rock, carpeting and force air ventilation. Each of these, if not checked, contributes to mold proliferation. Science offices and storerooms which have had leaks, harbor mold on wallboard. The sheetrock serves as a wick for moisture and facilitates growth. Carpets, though not usually found in lab, are found in offices or workrooms. Again, if not properly maintained, will prove to be a breeding ground for mold. Force air ventilation requirement preventative maintenance in areas such as filters, equipments, motors, etc. When left unchecked, the system not only harbors molds, it also can spread them in the supply ducts.

Moisture levels should be maintained around 30-60% relative humidity to control mold growth. Caution is urged during the winter months in using humidifier or vaporizers. They can infuse an excessive amount of humidity in the air contributing to mold growth. The same is true of potted plants and other sources of moisture in the laboratory. Properly functioning ventilation systems will help keep moisture level down. However even ventilation systems, when malfunctioning, can raise relative humidity in the lab and contribute to mold growth.

III. So what is the big deal about mold in the lab?

Mold is becoming a major occupational problem for several reasons. Molds tend to produce allergens, irritants and toxins. Usually, most molds should not be of concern to the average healthy individual. However, molds contribute to allergic reactions and asthma episodes. The level of reactions depends on species of mold, extent of occupant's exposure and level of sensitivities or allergies. Some molds get very creative and produce toxins to defend themselves against other molds and bacteria. These are known as mycotoxins. The mycotoxins also can cause toxic effects in people. Dead mold can also cause responses in the immune system.

Symptoms resulting from mold exposure

include the following:

- A. fatigue
- B. sneezing
- C. sore throat
- D. cough
- E. nasal/sinus congestion
- F. watery eyes
- G. trouble breathing
- H. skin irritation
- I. headache

IV. What should be done about it!

First, respond as soon as possible. It takes about 24 to 48 hours for the mold to come into full "bloom." Contact the principal and science department supervisor and request that the school custodian or maintainer clean up the mold... In order to protect you and your students, make sure the following protocol is followed:

- A. Do a visual check for mold growth. This may appear as one solid patch or individual colonies.



Mold on Ceiling

- B. Look for signs of water or moisture damage from leaks, ponding water, staining, condensation, dampness, mold odors and efflorescence. Locations include carpets, pads, above ceiling tiles, within wall cavities, within cabinets, under sinks, inside appliances/equipment and behind wall coverings.
- C. Personal protective equipment such as waterproof gloves, apron, chemical splash goggles and dust mask (particulate respirator) are to be used during mold removal.
- D. Visible mold should then be captured as much as possible.

- E. On floor coverings, walls, etc., vacuum all visible mold using only a HEPA vacuum. Then, damp clean surfaces to remove remaining visible mold.
- F. Use a 5-10% hypochlorite bleach solution on floors and, rug shampoos and microbial cleaning agents/enzymes on carpeting. If active mold is evident in the carpet, it should be replaced. Non-porous surfaces can be scrubbed with a detergent solution.
- G. Allow time for complete drying of all locations. Use of dehumidifiers, fans, and other sources of ventilation **with dry air are recommended.**
- H. Do not paint over mold. It must be clean and removed.
- I. Upon completion, do a final walkthrough to make sure the source of moisture has been corrected in the lab.
- J. Formal laboratory testing for mold in the workspace might also be recommended to insure a mold free laboratory.

V. Final Word!

Communicating with Parents and faculty is critical. However, the development of an Indoor Air Quality Protection Policy and Mold Cleaning Protocol are top priority. Consult with your science department head, school principal or headmaster, school nurse and others in efforts to have a joint effort in this endeavor. An excellent source of information is the U.S. Environmental Protection Agency's Tools for Schools Program.

Resources:

Occupational Safety and Health Administration:

<http://www.osha.gov>

American National Standards Institute: <http://www.ansi.org>

U.S. Environmental Protection Agency – <http://www.epa.gov/iaq/molds/>

U.S. Environmental Protection Agency – <http://www.epa.gov/iaq/schools/index.html>

New York City Department of Health – <http://www.ci.nyc.ny.us/html/doh/html/epi/moldrpt1/html>

**LIVE LONG AND
PROSPER SAFELY!**

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