

Indoor Microbial Growth Prevention, Assessment and Remediation at UNCSA

Purpose

- Offer a basic understanding about microbial growth (sometimes called “mold”).
- Outline preventative measures to minimize indoor microbial growth in academic and administrative buildings by UNCSA Facilities Management.
- Provide information about how to minimize microbial growth in inside residential dwellings.
- Provide instructions for employees and students on how to report mold concerns.
- Outline the University steps for investigation, evaluation and remediation in response to Microbial Growth concerns.

What is microbial growth, frequently referred to as “mold”?

Mold is a species of a group of living organisms called Fungi. Some fungi produce antibiotics, some fungi are yeasts that ferment wine, beer and bread. Other types of fungi are “decomposers”, or molds that breakdown dead organic materials and return the simpler elements to the soil as nutrients that plants need to grow. Fungi and mold are essential organisms that allow the proper function of Earth’s Ecosystem and can be found most anywhere on Earth at any time, but they are considered undesirable when they grow indoors where we live and work.

How does mold get indoors?

Mold reproduces by releasing large numbers of microscopic “spores” or seeds into the air that can be transported for great distances. These spores can get indoors by attaching to clothing, pets, shoes or travel inside through open windows or doors. OSHA and the EPA do not regulate or endorse specific “safe” levels of microbial growth in indoor environments. Generally, an acceptable count of indoor microbial particle evidence is a least 30% less than the counts from outdoors.

How does mold grow indoors?

For mold spores to be able to grow indoors, they need a source of food and the right environment. Molds thrive in dark, warm, wet or humid areas with little air circulation and that provide an organic food source. When spores germinate in these ideal indoor conditions, they grow by digesting porous organic surfaces like paper-covered drywall, wood cabinets, books and insulation. Eventually they will mature and release more spores into the air and continue the life cycle. Mold growth is commonly found indoors in areas like bathrooms, cluttered storage areas, basements, kitchens or in water damaged or recently flooded areas. If indoor conditions permit frequent condensation on the windows or doors, mold will grow around windows. Some mold species will also grow on dust, wallpaper, carpet or fabric.

Health risks associated with exposure to mold

Molds are common allergens. According to the American College of Occupational and Environmental Medicine, about 10% of Americans are allergic to mold and for half of them, the allergy may result in illness. Some people are sensitive to molds and exposure can lead to symptoms such as stuffy nose, wheezing, red itchy eyes or skin. Some people have allergies to mold and may have more intense reactions that may also include fever and shortness of breath. People with asthma or immune-

mediated conditions may have more intense reactions when exposed to mold. The best treatment for mold allergies or reactions is to avoid exposure to mold. In order to facilitate a comprehensive resolution for a student or employee who feels that possible mold in their work or school environment is adversely affecting their health, they should seek medical attention in addition to contacting their RA or supervisor.

Preventing mold growth inside an apartment or dorm room

Even if a person is not bothered by mold, mold should not be allowed to grow indoors. If left unchecked, mold will smell and will weaken building material as it grows. Fortunately, there are simple and effective ways for students to minimize mold growth indoors.

In Bathrooms: If you see patches of mold growing in the bathroom, thoroughly clean with water and dish detergent, scrub if needed, bleach is not needed to remove small patches of mold. Always use the exhaust fan when running water to keep moisture levels down and avoid piling wet towels on the floor.

In Laundry and Kitchen areas: Make sure the dryer and range hood vents are venting to the outdoors. Do not leave wet clothing in the washer for long periods of time. Dry clothing thoroughly. Always use the exhaust fan while cooking on the stove. Report any leaks immediately, no matter how small.

In Bedrooms and Living areas: Make sure there is good ventilation. Keep humidity levels low by running the air conditioning during humid months. Use a de-humidifier if humidity levels feel too high. Avoid using essential oil diffusers because they increase humidity levels. Vacuum and dust regularly to reduce spore counts. People with mold sensitivity or allergy should invest in HEPA filter vacuums and air purifiers to further reduce dust and spore levels in the air. Report any leaks or excess condensation on the window or doors.

Preventative Measures in University buildings

Here are some examples of standard procedures that the Facilities Management Division takes to minimize mold growth in academic and administrative building on campus:

Air Handler Units

Monthly Maintenance for all academic building HVAC Systems: MERV 13 Filter Change, check UV Lights, clean coils, check air flow and refrigerant levels, check that condensation drip pans are draining and periodically add biocide to condensate pans to prevent mold growth.

Roof Inspections

Periodic check for roof leaks by visual inspection of roofs and top floors of buildings for leaks, standing water or stained ceiling/wall water damage.

Building Inspections

Periodic inspections of academic and administrative buildings to detect mold growth or growth indicators like musty odors, mildew and stained ceiling tiles.

Building Environmental Services

The daily cleaning protocols of the Building Environmental Services Division (BES) includes hard, non-porous surface disinfection with a chemical that inhibits the growth of *Aspergillus niger*. *Aspergillus niger* is a fungus that is found in soil and is commonly found in indoor environments, where its black colonies can be confused with those of a type of mold called *Stachybotrys* (which is sometimes called "toxic" or "black mold").

Carpets are vacuumed daily with HEPA filter Vacuums.

Emphasis is placed on removing water from reported leaks or flooding immediately and drying areas thoroughly to avoid mold growth.

Education

The entire campus community is able to assist with limiting mold growth in any campus structure. Training is available for all campus departments to learn about mold and how to prevent mold growth. Training is also available on how to report mold concerns and what the University steps will be in addressing mold concerns.

Mold Reporting

Students are encouraged to report apartment or room mold concerns promptly to their Resident Assistants (RA). The RA will visually inspect the area of concern and determine next steps.

Employees are urged to submit work requests if visual mold, water damage or leaks are observed as well as stained ceiling tiles, mildew on furniture or moldy smells.

Mold Investigation

Once a work request is initiated, A Mold Remediation Team (MRT) will be formed with 48 hours to begin a mold investigation. The MRT typically will include EHS Director, Mechanical Maintenance Director or Housing Director, BES Director and a Departmental Liaison (DL), who will be the primary contact for communications with occupants who initiated the mold complaint. During the investigation, the MRT will gather information and data that will include:

- Interview Occupant(s).

- Take pictures of the problem area and indicate the problem on a floor plan.

- Take pictures of suspected mold-damaged materials (if any).

- Take environmental measurements like temperature, humidity level, carbon dioxide level

- Work with Facilities Management or Residence Life Housing to identify a source or cause of water or moisture problem (if any).

- Document investigation findings.

- Determine level of cleaning and or remediation.

- Division Liaison communicates findings and plans with employees or occupants.

Mold Remediation

There are different approaches to mold remediation on campus. The level of cleaning and remediation is based on initial MRT findings, size* and type of area (for example: kitchen verses office) and associated health concerns (if any). In the event of a major flood event that affects over 100 sf,

professional remediation contractors will begin remediation 24 to 48 hours after the flood has been contained.

- *Minor Isolated Areas (Less than 5 sf)
- *Small Isolated Areas (5 sf up to 10 sf)
- *Mid-sized Isolated Areas (over 10 sf up to 30 sf)
- *Large Isolated Areas (30 sf up to 100 sf)

Remediation Methods

Cleaning

Non-porous surfaces like plastic, metal, glass, leather, sealed tile, stainless steel and ceramics and hard surface porous flooring like vinyl or linoleum: Damp wipe surfaces with plain water or detergent solution, scrub as needed to remove mold. For wood floors, use wood floor cleaner.

Porous surfaces like carpet, upholstered furniture, untreated wood, rubber, fabric, paper, cardboard: Wet vacuum to remove water (if applicable). Steam cleaning for carpets and upholstered furniture is highly recommended. High-efficiency particulate air (HEPA) vacuum after materials have thoroughly dried. Dispose of the contents of the HEPA vacuum in well-sealed plastic bags immediately after use.

PPE: Generally, vinyl gloves and safety glasses are recommended for minor to mid-sized cleaning jobs. Disposable surgical type or KN95 masks are recommended.

How to handle water damaged material

Throw away non-valuable books, papers, cork or cardboard that have been moisture damaged or are showing signs of mold growth. Photocopy valuable or important items, discard originals.

Throw away water damaged ceiling tiles.

Throw away wet cellulose (wood or paper based) or fiberglass insulation.

Wallboard (drywall and gypsum board) may be dried in place if there is no obvious swelling, and the seams are intact. If not, remove, discard and replace.

Window Drapes can be laundered or cleaned per manufacturer's instructions.

Drying

Use fans, dehumidifiers and heaters to dry the area within 24-48 hours after water has been extracted. Check to make sure carpet backing and underflooring are also dry.

Ventilate wall cavities whenever possible.

Air Quality

Air Scrubbers (HEPA Filter Air Cleaners) should always be used during and after cleaning and remediation efforts.

Major Flood Remediation

When there is a major water event with Extensive Areas of water intrusion (over 100 sf²), a professional restoration company will begin remediation within 48 hours of the event. Also, an independent environmental engineering firm will be contracted to provide technical recommendations and perform air quality testing to make sure that remediation efforts are successful.

Mold Sampling and Air Quality Testing

AIHA Green Book and other governing agencies do not recommend Air Quality or Mold Sampling before cleaning and remediation steps are attempted. If mold growth is observed, further characterization is not needed to remove the mold. Mold and microbial elements are always in the air all around us and Air sampling will identify types and amounts of microbial particles, even in a clean environment, which does not necessarily mean there is an air quality problem. In addition, results from mold and air sampling can take up to three weeks to process and averages about \$1000 for three samples.

When Mold and Air Quality Testing will be performed

There are instances where sampling will be performed:

- 1) To identify a suspected hidden mold source within walls or HVAC systems
- 2) When HCP documented mold sensitivity or allergy symptoms of the occupant are not relieved after initial remediation response.

Initiation of and actions after contracted Mold and Air Quality Testing

If reasonable evidence of mold activity is discovered by the initial MRT investigation, immediate remediation will always be performed, whether or not Air Quality or surface testing for microbial growth has been performed. If Air Quality or surface testing for microbial growth has been performed and results indicate an unacceptable level of microbial components in the area or the occupant is allergic to mold (per their HCP), then temporary relocation is recommended until remediation is complete and microbial growth levels are verified to be substantially reduced. Decisions for permanent relocation are be considered and approved by the occupant's administrative leaders on a case-by-case basis.