Many factors can affect a home or building’s health.

WE PUT ALL THE PIECES TOGETHER.

The problem may be exposure to mold and mycotoxins.

And we may be the answer.
It’s Not Usually the Mold Itself that Causes the Greatest Health Risk.

Analysis of a home or building for the presence of potentially harmful mold can sometimes seem like a puzzle. Spore counts can give you a piece of the picture, particularly for sensitized people with allergies. But this is not usually a problem for most occupants. Spore identification, by inspection, can fail to differentiate between a potential pathogen and a harmless species. DNA testing of spores using the ERMI test tells you if your home is moldier than 1083 randomly selected homes in a study done in 2006. And all mold testing misses the greatest health threat to the inhabitants… the production of poisonous mycotoxins by a small number of highly toxigenic indoor mold species.

What is an Acceptable or Safe Level of Mycotoxins in your Home?

Did You Know...

- Aflatoxins, produced by mold found in many homes, are the most potent natural cancer causing agent known to man. Ingestion is KNOWN to cause liver cancer in humans.
- Trichothecenes produced by Stachybotrys (“Black Mold”), found in water damaged homes, are so lethal they have been used as chemical warfare agents.
- Ochratoxins, again produced by indoor fungi, are listed in the National Toxicology Program 13th Report on Carcinogens as “Reasonably Anticipated to be Human Carcinogens”
- Animal studies with mycotoxins have shown that inhalation is the most toxic route of exposure. When certain laboratory animals are exposed to mycotoxins by inhalation… they die!

What is an Acceptable Level of Exposure for Your Family?

Mold and Mold Toxins are Out There… Fortunately, We are Here.

RealTime Labs is unique in its ability to adequately assess the threat to your health from exposure to toxic indoor mold AND the mycotoxins they produce.

- RealTime Labs can detect the presence of toxigenic and potentially infectious mold in indoor environments
  - We perform ERMI (Environmental Relative Moldiness Index) testing of environmental samples such as dust or AC filters.
- RealTime Labs can detect the presence of mycotoxins, produced by toxigenic molds in the indoor environments
  - We perform environmental mycotoxin testing on samples from homes or buildings
- RealTime Labs can test the occupants for the presence of mycotoxins using its clinical mycotoxin test.
  - We perform clinical mycotoxin testing on exposed occupants. This is particularly recommended if the home or building tests positive for mycotoxins. These tests can be ordered by a physician or by the owner/occupant if they live in one of the 26 states allowing Direct Access Testing (DAT).

“Basically, doing the mycotoxin test with the ERMI test has been incredibly helpful. Since both only show part of the picture (not all molds are tested for on the ERMI and not all mycotoxins are tested for in the mycotoxin panel) I get a better assessment of the building with both and reduce the false negatives.” ~ Ann Shippy, MD.
Potential Health Effects from Mycotoxin Exposure

Mycotoxins are well documented for their toxic effects on the human cell, causing a number of problems in normal cell function and association with a wide variety of clinical symptoms and diseases shown to the right:

### HEALTH EFFECTS

- Kidney Toxicity
- Immune Suppression
- Autism
- Neurotoxicity
- Depression
- Chronic Fatigue Syndrome
- Cancer
- Acute Pulmonary Hemorrhage
- Aplastic Anemia
- Birth Defects

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**RTL’s 15 Mycotoxin Testing Panel**

The RealTime Labs Mycotoxin test detects 15 different mycotoxins, including 9 highly toxic macrocyclic trichothecenes. Testing is done using competitive ELISA, a very sensitive detection method using antibodies prepared against Mycotoxins.

<table>
<thead>
<tr>
<th>SPECIES</th>
<th>MYCOTOXIN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspergillus flavus</td>
<td>Aflatoxin</td>
</tr>
<tr>
<td>A. ochraceus</td>
<td>Ochratoxin A</td>
</tr>
<tr>
<td>A. niger</td>
<td>Ochratoxin A</td>
</tr>
<tr>
<td>Penicillium verrucosum</td>
<td>Ochratoxin A</td>
</tr>
<tr>
<td>Stachybotrys chartarum</td>
<td>Macrocyclic Trichothecenes</td>
</tr>
<tr>
<td>A. versicolor</td>
<td>Sterigmatocytosin</td>
</tr>
<tr>
<td>A. fumigatus</td>
<td>Gliotoxin</td>
</tr>
<tr>
<td>Chaetomium globosum</td>
<td>Chaetoglobosin A, C</td>
</tr>
</tbody>
</table>

### 15 MYCOTOXINS WE TEST FOR

<table>
<thead>
<tr>
<th>Trichothecenes</th>
<th>Satratoxin G</th>
<th>Satratoxin H</th>
<th>Isosatratoxin F</th>
<th>Roridin A</th>
<th>Roridin E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aflatoxins</td>
<td>Aflatoxin B1</td>
<td>Aflatoxin G1</td>
<td>Aflatoxin B2</td>
<td>Aflatoxin G2</td>
<td></td>
</tr>
<tr>
<td>Ochratoxins</td>
<td>Ochratoxin A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gliotoxin</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**A Potentially Dangerous Miss.**

**Why Mold Testing Alone May Miss Serious Health Hazards.**

**TEST 1**

**ERMI Test From Dust in Home. Results:** **NO STACHYBOTRYS DETECTED.**

**TYPE:** Real Time-Polymerase Chain Reaction (RT-PCR)

**RESULTS:** Reported in spores/mg dust

<table>
<thead>
<tr>
<th>Organism</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspergillus fumigatus</td>
<td>826,760</td>
</tr>
<tr>
<td>Aspergillus niger</td>
<td>4,361</td>
</tr>
<tr>
<td>Aureobasidium pullulans</td>
<td>633</td>
</tr>
<tr>
<td>Alternaria alternaria</td>
<td>3,370</td>
</tr>
<tr>
<td>Chaetomium globosum</td>
<td>193</td>
</tr>
<tr>
<td>Penicillium chrysogenum</td>
<td>1,258</td>
</tr>
</tbody>
</table>

Note: most prominent organisms reported here

Results of ERMI are noted on accompanying result sheet. The important isolates are noted below. All results are reported per ml of Phosphate Buffered Saline (PBS)

**TEST 2**

**Environmental Mycotoxin Testing on Same Dust.**

**Results:** Positive for Macrocyclic Trichothecenes. Only Produced in Indoor Environments by Stachybotrys.

**Procedure:**

**TYPE:** Ochratoxin A (Procedure by ELISA).
**TYPE:** Aflatoxin Group (B1,B2,G1,G2) (Procedure by ELISA).
**TYPE:** Trichothecenes Group (Macroyclic) (Procedure by ELISA).

**Test Results:**

<table>
<thead>
<tr>
<th>Code</th>
<th>Test</th>
<th>Specimen</th>
<th>Value</th>
<th>Result</th>
<th>Negative if less than</th>
<th>Equivocal if between</th>
<th>Positive if greater or equal</th>
</tr>
</thead>
<tbody>
<tr>
<td>D8501</td>
<td>Ochratoxin</td>
<td>Env - Dust</td>
<td>0 ppb</td>
<td>Negative</td>
<td>1.8 ppb</td>
<td>1.8-2.0 ppb</td>
<td>2.0 ppb</td>
</tr>
<tr>
<td>D8502</td>
<td>Aflatoxin Group</td>
<td>Env - Dust</td>
<td>0 ppb</td>
<td>Negative</td>
<td>0.8 ppb</td>
<td>0.8-1.0 ppb</td>
<td>1.0 ppb</td>
</tr>
<tr>
<td>D8503</td>
<td>Trichothecone Group</td>
<td>Env - Dust</td>
<td>0.305 ppb</td>
<td>Positive</td>
<td>0.18 ppb</td>
<td>0.18-0.2 ppb</td>
<td>0.2 ppb</td>
</tr>
</tbody>
</table>

**TEST 3**

**Clinical Mycotoxin Testing of Resident from Home.**

**Results:** Positive for Presence of Macrocyclic Trichothecenes in Urine.

<table>
<thead>
<tr>
<th>Code</th>
<th>Test</th>
<th>Specimen</th>
<th>Value</th>
<th>Result</th>
<th>Negative if less than</th>
<th>Equivocal if between</th>
<th>Positive if greater or equal</th>
</tr>
</thead>
<tbody>
<tr>
<td>E8501</td>
<td>Ochratoxin A</td>
<td>Urine</td>
<td>0 ppb</td>
<td>Negative</td>
<td>1.6 ppb</td>
<td>1.8-2.0 ppb</td>
<td>2.0 ppb</td>
</tr>
<tr>
<td>E8502</td>
<td>Aflatoxin Group</td>
<td>Urine</td>
<td>0 ppb</td>
<td>Negative</td>
<td>0.8 ppb</td>
<td>0.8-1.0 ppb</td>
<td>1.0 ppb</td>
</tr>
<tr>
<td>E8503</td>
<td>Trichothecone Group</td>
<td>Urine</td>
<td>4.03 ppb</td>
<td>Positive</td>
<td>0.18 ppb</td>
<td>0.18-0.2 ppb</td>
<td>0.2 ppb</td>
</tr>
</tbody>
</table>
ERMI tests for the presence of mold by detecting specific DNA of the mold spores that have been released into the environment by the contaminating mold. It does not, however, confirm the presence in the environment of poisonous mycotoxins, produced by the mold. This is the bigger health concern. As an example, in our experience, we detect Stachybotrys spores (“black mold”) only 37% of the time we detect the presence of highly toxic trichothecene mycotoxins, produced by Stachybotrys. **If only an ERMI mold test was conducted, this health risk would be missed 63% or 2 out of 3 times.** Stachybotrys spores are large and heavy and generally wet, so their dissemination throughout the home is limited. The trichothecene molecules, however, are very small and easily spread throughout the home or building, where they can be inhaled or ingested by the inhabitants.

**Warnings from the Experts.**

Read what the experts have to say about environmental exposure to mold and mycotoxins.

**In 2009, the World Health Organization (WHO) stated:**

“Microbial growth may result in greater numbers of spores, cell fragments, allergens, mycotoxins, endotoxins, β-glucans and volatile organic compounds in indoor air. The causative agents of adverse health effects have not been identified conclusively, but an excess level of any of these agents in the indoor environment is a potential health hazard”.*


**In 2004, The Institute of Medicine of the National Academy of Sciences stated:**

*In-vitro and in-vivo studies have demonstrated adverse effects - including immunotoxic, neurologic, respiratory, and dermal responses - after exposure to specific toxins, bacteria, molds, or their products. Such studies have established that exposure to microbial toxins can occur via inhalation and dermal exposure and through ingestion of contaminated food.*

*Committee on Damp Indoor Spaces and Health Board on Health Promotion and Disease Prevention: 2004. Institute of Medicine of the National Academies.

**The Centers for Disease Control and Prevention (CDC) states:**

Fungal diseases pose an important threat to public health for several reasons. Opportunistic infections such as cryptococcosis and aspergillosis are becoming increasingly problematic as the number of people with weakened immune systems rises. This group includes cancer patients, transplant recipients, other people taking medications that weaken the immune system, and people with HIV/AIDS.*

*CDC Web Site. Fungal Diseases

**Importance of Testing for Macrocyclic Trichothecenes**

The most frequently detected mycotoxins in RealTime Labs Test Panel are the highly toxic, macrocyclic Trichothecenes, produced by *Stachybotrys chartarum* (“Black Mold”). This is really at the heart of the difference between RealTime Labs Test and labs who test for T-2 Trichothecenes. It is also critical to accurate clinical assessment. T-2 is a contaminant of feed and food, and produced by *Fusarium* sp., not usually associated with indoor mold contamination. So the testing of environmental samples for T-2 has no relevance either in assessing the contamination of a home or building, or clinical significance as it relates to the health of the occupants.
RealTime Labs is the Only CAP and CLIA Accredited Laboratory That Can Offer You and Your Customers the Security of Knowing Their Home is Safe From Mold AND Mycotoxins.

The Right People for the Right Answers

RealTime Laboratories Inc. is a CAP and a CLIA-accredited laboratory, specializing in testing environmental and clinical samples for mold and toxic Mycotoxins produced by mold. RealTime Labs performs thousands of Mycotoxin tests each year. Dr. Dennis Hooper, the Medical Director, is a world-renowned expert on Mycotoxins, mold exposure and mold identification.

Why RealTime Labs?

- Only CAP and CLIA lab in the US accredited to perform Mycotoxin testing on human clinical samples.
- Test validation reports have been published in peer-reviewed journals.
- Largest test panel of Mycotoxins with 15 of the most common Mycotoxins detected.
- Over 10 years of experience, performing over 100,000 Mycotoxin tests.
- Scientific committee includes world-renowned experts in mold and Mycotoxins.
- Numerous scientific publications and conference presentations on mold and Mycotoxins from medical team and scientific committee.
- Accepts Medicare and Tricare.