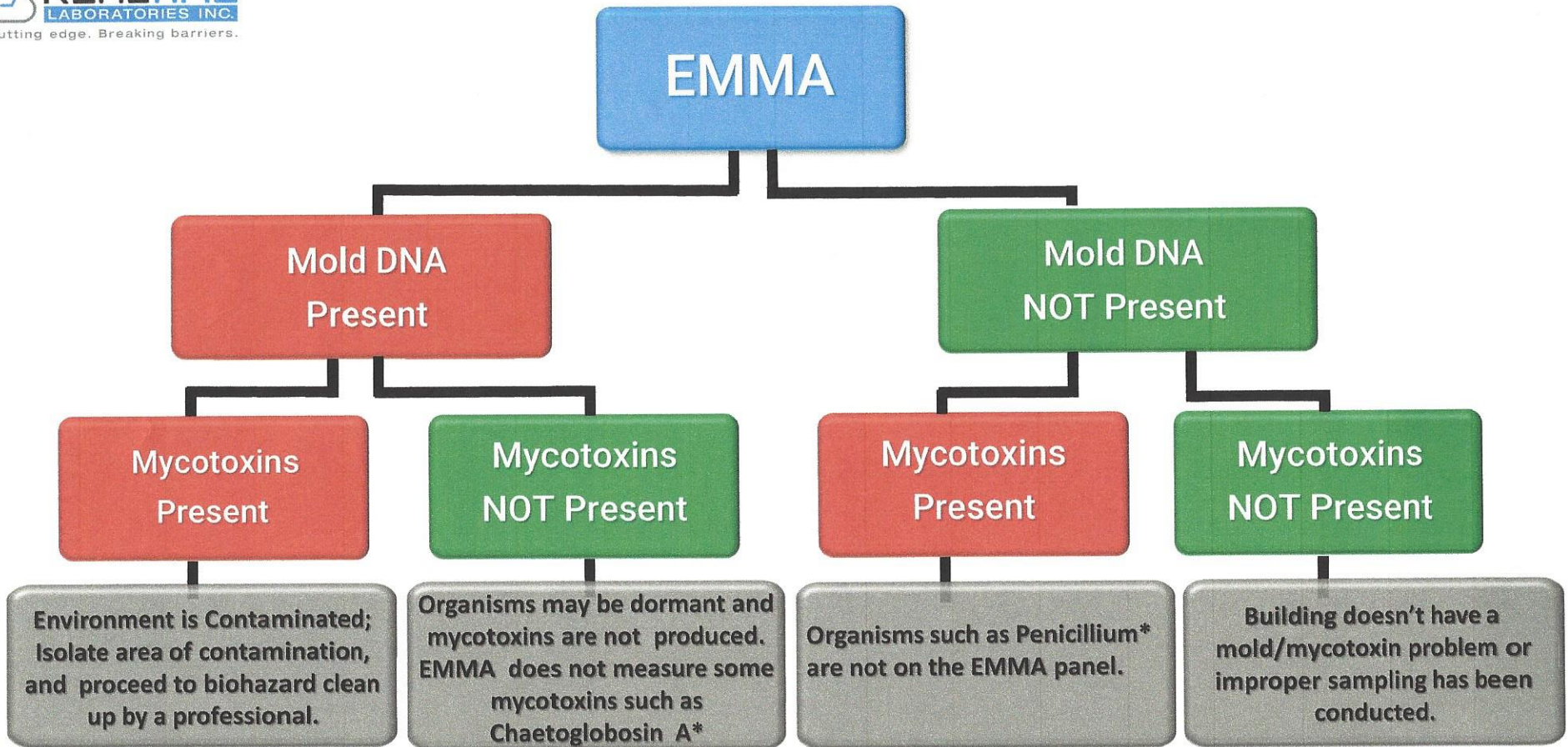


## EMMA Interpretation Guide



\*EMMA testing panel does include organisms that are proven to cause serious illness and disease



**ENVIRONMENTAL MYCOTOXIN  
PANEL REPORT FORM  
01/14/2020**

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CLIA #: 45D1051736  
CAP #: 7210193  
TaxId#: 45-0669342

**Company:** [REDACTED]  
**Project:** [REDACTED]      **Accession No:** [REDACTED]  
**Location:** [REDACTED]      **Date of Service:** 01/8/2020  
[REDACTED]      **Specimen:** Dust  
**Date of Receipt:** 01/13/2020  
**Date of Report:** 01/14/2020

Procedure Type: Semi-quantitative procedure by ELISA  
List of Mycotoxins tested in the Panel

Ochratoxin A  
Aflatoxin Group (B1,B2,G1.G2)  
Trichothecene Group (Macrocylic): Roridin A, Roridin E, Roridin H,  
Roridin L-2, Verrucarin A, Verrucarin J, Satratoxin G, Satratoxin H,  
Isosatratoxin F  
Gliotoxin Derivative

**Results:**

Code	Test	Specimen	Value	Result	Not Present if less than	Equivocal if between	Present if greater or equal
D8501	Ochratoxin A	Dust	0.18800 ppb	Not Present	1.8 ppb	1.8-2.0 ppb	2.0 ppb
D8502	Aflatoxin Group (B1,B2,G1.G2)	Dust	0.24200 ppb	Not Present	0.8 ppb	0.8-1.0 ppb	1.0 ppb
D8503	Trichothecene Group (Macrocylic): Roridin A, Roridin E, Roridin H, Roridin L-2, Verrucarin A, Verrucarin J, Satratoxin G, Satratoxin H, Isosatratoxin F	Dust	0.00900 ppb	Not Present	0.02 ppb	0.02-0.03 ppb	0.03 ppb
D8510	Gliotoxin Derivative	Dust	0.17700 ppb	Not Present	0.5 ppb	0.5-1.0 ppb	1.0 ppb

Sample #1: Furnace Filter

*Shriya*

Director Signature \_\_\_\_\_

Tests such as this should be used only in conjunction with other medically established diagnostic elements (e.g., symptoms, history, clinical impressions, results from other tests, etc). Physicians should use all the information available to them to diagnose and determine appropriate treatment for their patients.  
Disclaimer: This test was developed and its performance characteristics determined by RealTime Lab. It has not been cleared or approved by the U.S. Food and Drug Administration. The FDA has determined that such clearance or approval is not necessary. This laboratory is certified under the Clinical Laboratory Improvement Amendments of 1988 (CLIA-88) as qualified to perform high complexity clinical laboratory testing.



### BRIEF EXPLANATION ON MYCOTOXIN PANEL

For any further question on the test report please schedule a consult with our medical staff at [www.realtimelab.com](http://www.realtimelab.com)

	Mycotoxin	Cellular activity of Mycotoxin	Symptoms/Others	Association with a "Disease State"
<b>AFLATOXIN FAMILY-Organisms: <i>Aspergillus flavus</i>, <i>Aspergillus oryzae</i>, <i>Aspergillus fumigatus</i>, <i>Aspergillus parasiticus</i></b> Aflatoxins have been linked to liver cancer, hepatitis, cirrhosis, and other health issues				
1	<b>B1</b>	Binds DNA and proteins	Shortness of breath, weight loss, most potent and highly carcinogenic.	Primarily attacks the liver, other organs include kidneys and lungs.
2	<b>B2</b>	Inhibits DNA, RNA, and protein metabolism	Enters the body through the lungs, mucous membranes (nose and mouth), or the skin.	Affects the liver and kidneys. Less potent than B1. The order of toxicity is B1 greater than G1, greater than G2, greater than B2.
3	<b>G1</b>	Adversely affects the immune system	<i>A. flavus</i> second leading cause of invasive aspergillosis in immunocompromised patients.	Cancer, chronic hepatitis, and jaundice. Reye's Syndrome.
4	<b>G2</b>	Immunosuppression	Mitochondrial damage. Aflatoxicosis in Humans and Animals.	Hepatitis, malnutrition, lung cancer.
<b>OCHRATOXIN A -Organisms: <i>Aspergillus ochraceus</i>, <i>Aspergillus niger</i>, and <i>Penicillium</i> species</b>				
5	<b>Ochratoxin A</b>	Interferes with cellular physiology, inhibits mitochondrial ATP production, and stimulates lipid peroxidation	A potent teratogen and immune-suppressant. 30-day ½ life in blood; indefinite existence intra-cellular.	Kidney disease, cancer, infection of bladder, Nephrotoxic, Hepatotoxic, and Carcinogenic.
<b>TRICHOHECENE FAMILY (MACROCYCLIC) -Group D Organism: <i>Stachybotrys chartarum</i></b>				
6	<b>Satratoxin G</b>	DNA, RNA and protein synthesis, intracellular	Bleeding disorders, central nervous and peripheral nerve disorders. Most potent inhibitors of protein synthesis.	Wide range of GI problems, skin inflammation, vomiting and damage to blood producing cells. Highly toxicogenic.
7	<b>Satratoxin H</b>	Inhibits protein synthesis	Found in damp or water-damaged environment.	Vision problems, GI problems, breathing issues.
8	<b>Isosatratoxin F</b>	Immunosuppression	Causes of health problems due to poor air quality.	Contributor to "sick building syndrome"
9	<b>Roridin A</b>	Nasal inflammation, excess mucus secretion, and damage to the olfactory system	Acute and chronic respiratory tract health problems.	Acute and chronic lung and nasal problems.
10	<b>Roridin E</b>	Disrupt the synthesis of DNA, RNA, and protein	Roridin E grows in moist indoor environments.	Can impact every cell in the body.
11	<b>Roridin H</b>	Inhibits protein synthesis	Grows well on many building materials subject to damp conditions.	Lymphoid necrosis and dysregulation of IgA production.
12	<b>Roridin L-2</b>	Immunosuppression	Grows on wood-fiber, boards, ceiling tiles, water-damaged gypsum board, and HVAC ducts.	Easily airborne and inhaled by occupants of an infected building.
13	<b>Verrucarin A</b>	Immunosuppression, nausea, vomiting, weight loss	Found mostly in damp environments.	One of the most toxic trichothecenes.
14	<b>Verrucarin J</b>	Can easily cross cell membranes	Absorbed through the mouth and the skin.	Small enough to be airborne and easily inhaled.
<b>GLIOTOXIN DERIVATIVE-Organisms: <i>Aspergillus fumigatus</i>, <i>Aspergillus terreus</i>, <i>Aspergillus niger</i>, <i>Aspergillus flavus</i></b>				
15	<b>Gliotoxin</b>	Attacks intracellular function in immune system	Lung disorders, brain dysfunction, bone marrow dysfunction.	Immune dysfunction disorders. Aspergillosis, association with tumors of brain, lung.

References : <https://realtimelab.com/gliotoxin/>; <https://realtimelab.com/aflatoxins/>; <https://realtimelab.com/trichothecenes/>; <https://realtimelab.com/ochratoxins/>; <https://realtimelab.com/molds/>

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**EMMA (ENVIRONMENTAL MOLD  
MYCOTOXIN ASSESSMENT)  
REPORT FORM  
01/14/2020**

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**Company:** [REDACTED]  
**Project:** [REDACTED]  
**Location:** [REDACTED]  
**Date of Receipt:** 01/13/2020  
**Date of Report:** 01/14/2020

**Accession No:** [REDACTED]  
**Date of Service:** 01/8/2020  
**Specimen:** Dust

Procedure: EMMA  
TYPE: Quantitative PCR (Polymerase Chain Reaction)

Code	TEST	Results (ng of DNA/mL)	Spore/mL
EM001	Aspergillus flavus	0.0000	0
EM002	Aspergillus fumigatus	1.1385	13
EM003	Aspergillus niger	0.0000	0
EM004	Aspergillus ochraceus	0.0000	0
EM005	Aspergillus versicolor	0.0000	0
EM006	Chaetomium globosum	0.0262	1
EM010	Stachybotrys chartarum	0.0000	0
EM013	Aspergillus terreus	0.0000	0
EM014	Candida auris	0.0000	0
EM015	Fusarium solani	0.0000	0

**Result Comments**

Sample #1: Furnace Filter. AMENDED REPORT: corrected result formatting. 01/15/20-SA

Director Signature \_\_\_\_\_

RTL maintains liability limited to cost of analysis. Interpretation of the data contained in this report is the responsibility of the client. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by RTL. The above test report relates only to the items tested. RTL bears no responsibility for sample collection activities or analytical method limitations.  
NOTE: Results are presented as "fungal load" that measures the amount of DNA in the given sample.  
For further information use the link below.  
<https://realtimelab.com/wp-content/uploads/2019/04/Fungal-load-EMMA-final-report-DH-April-18-2019.pdf>



### BRIEF EXPLANATION GUIDE ON ENVIRONMENTAL MOLD PANEL TESTING

MOLD	MYCOTOXIN PRODUCED	POTENTIAL HEALTH ISSUES
<i>Aspergillus fumigatus</i>	Gliotoxin, Aflatoxin	<i>A. fumigatus</i> is frequently found in homes and buildings. It is considered to be an opportunistic pathogen, meaning it rarely infects healthy individuals, but is the leading cause of invasive aspergillosis (IA) in immunocompromised individuals such as cancer, HIV or transplant patients.
<i>Aspergillus flavus</i>	Gliotoxin, Aflatoxin	<i>A. flavus</i> is the second leading cause of invasive aspergillosis in immunocompromised patients. Particularly common clinical syndromes associated with <i>A. flavus</i> include: chronic granulomatous sinusitis, keratitis, cutaneous aspergillosis, wound infections and osteomyelitis following trauma and inoculation. Can cause liver cancer in humans
<i>Aspergillus terreus</i>	Gliotoxin, Citirin	Inhalation of fungal spores, which travel down along the respiratory tract, cause the typical respiratory infection.
<i>Aspergillus versicolor</i>	Sterigmatocystin	<i>A. versicolor</i> is one of the most frequently found molds in water-damaged buildings. <i>A. versicolor</i> is known to produce a mycotoxin called sterigmatocystin a potentially carcinogenic and hepatotoxic mycotoxin. It is primarily toxic to the liver and kidneys.
<i>Aspergillus ochraceus</i>	Ochratoxin	Ochratoxin has been demonstrated to be Nephrotoxic, Hepatotoxic, and Carcinogenic and is a potent teratogen and immune-suppressant. It has also been associated with urinary tract infections and bladder cancers.
<i>Aspergillus niger</i>	Ochratoxin, Gliotoxin	<i>A. niger</i> produces gliotoxin, which has been identified in the sera of humans and mice with aspergillosis. Causes immunosuppression in patients.
<i>Stachybotrys chartarum</i>	Macrocylic Trichothecenes	<i>S. chartarum</i> , commonly known as black mold, is highly toxic to humans. Nausea, vomiting, diarrhea, burning erythema, ataxia, chills, fever, hypotension, hair loss and confusion are symptoms in individuals living or working inside <i>Stachybotrys</i> infested homes and buildings.
<i>Chaetomium globosum</i>	Chaetoglobosins	<i>C. globosum</i> is a common indoor fungal contaminant of water damaged homes or buildings. Like <i>Stachybotrys</i> , <i>C. globosum</i> spores are relatively large and due to their mode of release are not as easily airborne as are some other molds.
<i>Fusarium species</i>	Fumonosins; Zearalanone	<i>Fusarium</i> can cause superficial infections such as keratitis or onychomycosis in healthy individuals and disseminated infections in immunocompromised patients.
<i>Candida auris</i>	Unknown	<i>C. auris</i> can be found in healthcare facilities and can be spread through contact with infected patients and equipment's. <i>C.auris</i> can cause blood stream infections, wound infections and ear infections.

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