REALTIME LABORATORIES INC.
Cutting edge. Breaking barriers.

Environmental Mold and Mycotoxin Assay (EMMA)

Fungal Load Explanation

"***Fungal load***" is a term that RealTime Laboratories will use when discussing fungal infestation and possible infection in the patient and his/her environment.

Without treatment in the body, the fungus can and usually does replicate (makes copies of itself) which causes the amount of fungus in the body to increase unchecked. This same thing happens in an environment like a house or a building. The fungus that is growing can and usually does make mycotoxins (mold toxins) which can prove detrimental to the body in many instances.
In the past, environmental testing laboratories have used numbers of spores/mg of dust or numbers of spores/ml of solution (reference ERMI and qPCR). The results are reported as the number of spores in the submitted specimen. The results can be misleading because of the difficulty in determining the number of spores in a colony of a filamentous (branching) fungus like *Aspergillus sp. or Penicillium sp*. Many of the more harmful fungal elements are filamentous. Thus, an actual spore count is difficult to conduct and is often misleading to the physician, building inspector, and patient. The difficulty of interpretation has led to a mistrust of laboratory results or interpretation and has left the industry in a quandary of deciding levels of fungal contamination that are dangerous to the population.

RealTime Laboratories has developed a more accurate method of reporting. Dust is homogenized in buffered saline prior to lab testing. The numbers of spores in a culture of fluid (spores)/ml of fluid are then documented and compared to the actual amount of DNA in ng/ml in the same fluid. RealTime's EMMA results will now read DNA ng/ml of fluid.

This is simply a measurement of how much fungal DNA is present in a sample. This will be more beneficial to the patient, physician, and the environmental inspector when evaluating fungal infestation in the home, etc., as well as evaluating the efficacy of the treatment of the environment.

The aim of mycotoxin and fungal treatment is an undetectable mycotoxin level in your body and the same undetectable results in your home. Your mycotoxin/fungal load should have fallen to undetectable levels within three to six months of starting treatment. If this doesn't happen, your doctor will talk to you about possible reasons for this and discuss what to do next. Once you have an undetectable fungal load in one or both areas, you should have your fungal load monitored every three to four months and your home measured once a year. If you have had an undetectable fungal load for some time and are doing well on treatment, your doctor may offer you the option to have your fungal load measured every year for two more years, both in your house and body.

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All fungal load tests have a cut-off point below which they cannot reliably detect fungi. This is called the limit of detection (LOD). If your fungal load or your house's fungal load is below LOD such readings can be considered undetectable. But just because the level of mycotoxin and/or fungus is too low to be measured doesn't mean that fungus and mycotoxins have disappeared completely from your body or your home. It might still be present but in amounts too low to be measured. Thus, the patient and environmental inspectors must be vigilant in their pursuit of ridding their body and the environment they live in of the molds and mycotoxins.

Readings of RTL are listed here with the correlation of 1 ng of DNA/ml to spores/ml. Dust is placed in 1 ml of Phosphate Buffered Saline and extracted for DNA. 200 ul of sample is used to test for DNA. Final conversions are reported in 1000 ul or 1 ml of solution.

Species	**1 ng of detected DNA per mL of sample is an average equivalent to the following number of spores per mL:**
Aspergillus flavus	1.70
Aspergillus fumigatus	11.10
Aspergillus niger	0.53
Aspergillus ochraceus	7.43
Aspergillus terreus	0.48
Aspergillus versicolor	2.26
Chaetomium globosum	2.92
Fusarium species	9.80
Stachybotrys chartarum	1.50

Species	**1 ng of detected DNA per mL of sample is approximately equivalent to the following number of colonies forming units (CFU) per mL:**
Candida auris **	0.0023[#]

** *Candida auris* is an emerging multidrug-resistant yeast causing invasive health care associated infection with high mortality (Chowdhary, et al, 2017, PLoS Pathog 13:e1006290). One colony of a *Candida auris* is removed from Sabouraud Dextrose Agar, lysed and DNA is analyzed and reported in ng/ml. Results obtained are reported in ng of DNA/ml of sample.
#. 1 CFU/ml of *Candida auris* is equivalent to 435ng/ml.

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