

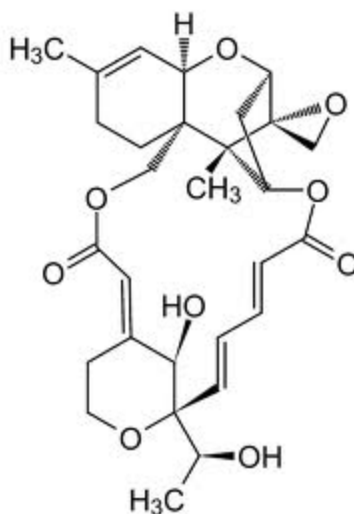


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RealTime Laboratories Technical Brief

The Importance of Testing for Macrocyclic Trichothecene Mycotoxins



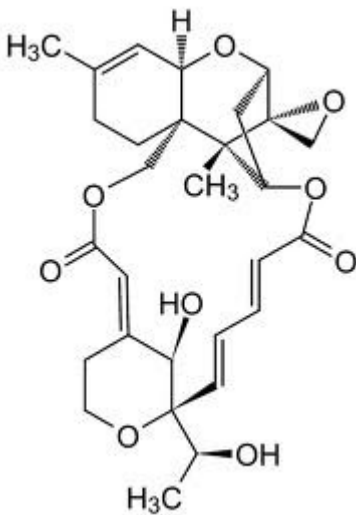
REALTIME LABORATORIES, INC.

4100 Fairway Drive • Suite 600 • Carrollton, Texas 75010
(972) 492-0419 • info@realtimelab.com • www.realtimelab.com

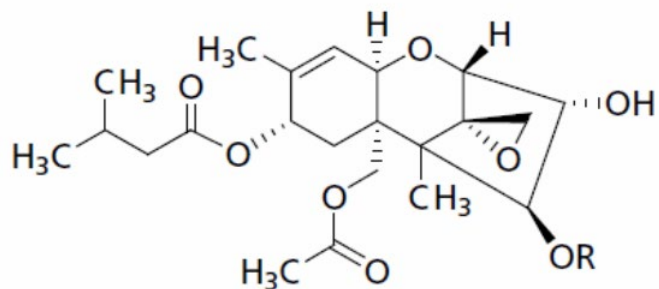
There are over 50,000 different species of mold, but only about 200 species may present serious health risks to humans or animals. These species, referred to as toxic mold, are potentially hazardous because they produce toxins, known as Mycotoxins. The impact of these Mycotoxins on our health can be life threatening.

Commonly Encountered Mycotoxin Producing Fungi

Species	Mycotoxin
<i>Aspergillus flavus</i>	Aflatoxin (AT)
<i>Aspergillus parasiticus</i>	AT
<i>Aspergillus ochraceus</i>	Ochratoxin A (OTA)
<i>Aspergillus niger</i>	OTA
<i>Penicillium verrucosum</i>	OTA
<i>Penicillium nordicum</i>	OTA
<i>Penicillium chrysogenum</i>	OTA
<i>Stachybotrys chartarum</i>	Macrocyclic Trichothecenes (e.g. Roridin, Satratoxin, Verrucarin)
<i>Aspergillus versicolor</i>	Sterigmatocystin
<i>Aspergillus fumigatus</i>	Gliotoxin
<i>Chaetomium globosum</i>	Chaetoglobosin A, C
<i>Fusarium sp.</i>	Simple Trichothecenes (e.g. T-2, Fumonison, DON)



Macrocyclic Trichothecene- Satratoxin H



T-2 Toxin: R = Ac

Simple Trichothecene- T-2

The Real Time Lab Mycotoxin Test Panel determines the presence of the following Mycotoxins

RTL's 15 Mycotoxin Testing Panel

1. Ochratoxins
 - Ochratoxin A
2. Aflatoxins
 - Aflatoxin B1
 - Aflatoxin B2
 - Aflatoxin G1
 - Aflatoxin G2
3. Macrocylic Trichothecenes
 - Satratoxin G
 - Satratoxin H
 - Isosatratoxin F
 - Roridin A
 - Roridin E
 - Roridin H
 - Roridin L-2 (Biosynthetic derivative of Roridin)
 - Verrucarin A
 - Verrucarin J
4. Gliotoxin

It is important to note: All of the Trichothecenes in the RTL panel are Macrocylic Trichothecenes.

When testing patients for Trichothecenes, it is critical that the test is for Macrocylic Trichothecenes and not simple Trichothecenes such as T-2, DON or Fumonisin. ***Why is this so important?***

1. The most commonly detected toxins in RTL's testing are the Macrocylic Trichothecenes. > 60% test positive for these Mycotoxins.
2. Macrocylic Trichothecenes are considered to be the most toxic Trichothecenes. In an article by Pestka et al on the effect of the Macrocylic Trichothecenes, roridin A and verrucarin A on human lymphocytes, they make the statement, "The toxicity of these two compounds was extraordinary relative to that reported for non-macrocylic Trichothecenes"(1). Both roridin A and verrucarin A are detected in the RTL Test Panel.
3. **The highly toxic Macrocylic Trichothecenes are produced by *Stachybotrys*, the infamous "Black Mold" found in mold infested or "sick buildings". None of the simple Trichothecenes such as T-2 are produced by *Stachybotrys*. In fact, most are produced by the mold *Fusarium*. What is the significance of this?**
 - a. In a literature search using key words such as "Trichothecenes", "Mycotoxins", "Indoor-Air" "Damp Buildings", "T-2", "*Fusarium*" and "*Stachybotrys*", the majority of citations refer to the production of Macrocylic Trichothecenes by *Stachybotrys Chartarum*. (2,3,4,5,6)
 - b. In a presentation given by Elena Page and Douglas Trout of the CDC entitled "The Role of Mycotoxins in Building Related Illness, they cite 13 relevant articles with all except one involving *Stachybotrys* (7).
 - c. We could not find compelling evidence for the presence of T-2 in mold infested buildings.
 - d. The simple Trichothecenes are generally produced by *Fusarium spp*.
 - e. We could not find compelling evidence for the presence of *Fusarium* in damp or mold infested buildings.
 - f. The majority of references for *Fusarium* and Mycotoxins relate to the contamination of feed and foodstuff by Mycotoxins from *Fusarium*, including T-2, DON, and Fumonisin. *Fusarium* primarily grows on wheat, barley, oats and other agricultural products. Examples are referenced. (8,9)
 - g. We could not find evidence that the presence of Macrocylic Trichothecenes in human urine came from ingested food.
 - h. In the EPA ERMI test for indoor mold assessment, *Fusarium* is not included in the 26 indoor molds in the test panel.
 - i. *Fusarium* is a human health problem, but generally is an opportunistic pathogen, infecting immunocompromised individuals (10).

“Why test for simple Trichothecenes, such as T-2, produced by a mold not generally identified with Mycotoxin production in moldy buildings”?

When selecting a Mycotoxin Test for your patients, consider the following:

1. **RealTime Labs** is the ONLY lab that offers testing for Macrocytic Trichothecenes.
2. **RealTime Labs** is the ONLY clinical lab accredited by CAP and CLIA to perform Mycotoxin testing on human clinical samples.

About RealTime Laboratories



- 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 (11)
- Largest test panel of Mycotoxins with 15 of the most common Mycotoxins detected.
- Patented test for Macrocytic Trichothecenes, considered to be the most toxic Trichothecenes and generally more toxic than simple Trichothecenes
- Experience. Over 12 years in business, performing over 100,000 Mycotoxin tests
- Scientific Committee includes world renowned experts in Mold and Mycotoxins
- Numerous peer reviewed scientific publications and conference presentations on mold and Mycotoxins from RTL medical team and scientific committee
- Reporting values (ppb) conform to standards used by FDA, WHO, CDC.
- Will bill insurance companies on behalf of patients
- Accepts Medicare

References:

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