

May Dooley Discusses Mycotoxin Testing with Joe Spurgeon, Ph.D.

Introduction to Dr. Spurgeon:

Dr. Spurgeon received a multidisciplinary doctorate degree in Environmental Health and Analytical Chemistry from the University of Pittsburgh in 1972. In addition, he was a Certified Industrial Hygienist until 2012. His career included working as a Senior Health Scientist for several federal agencies: Centers for Disease Control and Prevention, Agency for Toxic Substances and Disease Registry; the Environmental Protection Agency; and as a consultant for the US Public Health Service. In addition, he has been performing mold investigations as an independent consultant since 1993; and has served as an expert witness in mold cases since 2002. Dr. Spurgeon recently published “Toxic Mold in Your Home: A Guide for Consumers”; and has written several papers on mold sampling and the interpretation of laboratory reports. Dr. Spurgeon’s book, a discussion of mycotoxins, and other articles on mold may be found at www.expertonmold.com.

Introduction to May Dooley

May Dooley is a hands-on environmental home inspector and owner of EnviroHealth Consulting, Inc., out of Pennsylvania, New York, and South Carolina. With most of her work from doctor referrals, she specializes in in-depth mold investigations using an on-site microscope to find sources of mold growth, as well as conducting culture plate air testing. In addition, since mold is not the only environmental stressor, she checks for electromagnetic fields, gas leaks, vacuum cleaner efficiency, and other indoor air and water concerns. Her websites reflect a strong commitment to self-empowerment, both in do-it-yourself projects as well as providing guidelines for least-toxic but effective mold remediation.

May holds an MA, MS in Science Education, and CMC (Certified Microbial Consultant), and is a member of the Indoor Air Quality Association. She is a former middle school science teacher. In fact, many times the home inspection turns into a middle school science lab, and clients learn how to work with equipment and investigate the invisible world at their own homes. For more information, visit www.createyourhealthyhome.com and www.moldcontrolonabudget.com.

May: Joe, I read with interest your paper on Mycotoxin Opinions. Some things surprised me, and I’d like to ask you about them. For example, I was under the impression that testing could distinguish between mycotoxins from the environment compared to ingested mycotoxins.

Joe: Mycotoxins are chemicals, and routine laboratory tests do not provide information as to the source of a chemical. So, mycotoxins absorbed from a contaminated indoor environment and those ingested from eating mycotoxin-contaminated foods would be indistinguishable in routine laboratory tests.

May: So you’re saying that there is no way to know if an elevated level of trichothecenes in a urine test is from food or from the environment.

Joe: That would be my opinion-

May: Would an elevated level of trichothecenes in the urine be a sign of current exposure to

trichothecenes, to recently ingested food with trichothecenes; or to the release of trichothecenes through the process of detoxification?

Joe: Mycotoxins are typically not considered to be cumulative toxins. They tend to be rapidly metabolized into derivative chemicals which are soluble in blood and urine. Therefore, the concentration of mycotoxins in body fluids begins to decrease as soon as the exposure stops. The time it takes the body to detoxify half of the toxin is called the “half-life”; which is a measure of the rate at which a specific mycotoxin is removed from the body. Although the half-life has only been studied for a few mycotoxins, those available typically vary from hours to days. However, this does not mean that chronic exposures do not result in long-term health effects such as cancer.

May: What about measuring mycotoxin levels in urine? Doesn't their detection in urine prove that the body's ability to detoxify mycotoxins is not working?

Joe: No. The detection of mycotoxins and their metabolites in the urine indicates that the body is processing the toxins and excreting them as waste products.

May: What I'm hearing is that we really don't know how to interpret mycotoxin levels in urine testing.

Joe: There is currently no FDA-approved test for mycotoxins in human urine. Currently available tests for mycotoxins in urine are not approved by the FDA for accuracy or for clinical use. Laboratories often have a Clinical Laboratory Improvement Amendments (CLIA) certification, which addresses the quality control and procedural standards used by the laboratory but apparently does not address the clinical validity of the test results.

May: What about measuring mycotoxin levels in dust? Wouldn't that prove that the environment is the source?

Joe: Mycotoxins are “nonvolatile” chemicals, so they are not present in the air we breathe as chemical vapors. Therefore, the detection of mycotoxins in surface dust samples should not be interpreted as an indicator of occupant exposure. There has to be a pathway that allows substantial amounts of the mycotoxin-containing dust to be absorbed by the occupant.

May: I was told by a lab to send a sample from the HVAC filter, because that shows what the people in the house are breathing in. Is that a good way to sample for mycotoxins?

Joe: The air return is the central collection point for airborne particulate contaminants, such as mold spores. So testing the dust collected on an air filter is probably a good indicator of the chronic exposure to mold spores and particulates that have been circulating in the indoor air. However, to answer your question, sampling for mycotoxins, in general, is a difficult task; and the results for environmental samples frequently do not correlate with biological results. One of the primary challenges of assessing mycotoxin exposures is the collection of representative samples, with the sampling step typically contributing the largest variability in mycotoxin determinations.

May: I'm confused, Joe. Every day people are talking to me about their elevated trichothecene, aflatoxin A, ochratoxin A, and gliotoxin levels. Is this testing showing anything of significance for health?

Joe: I'm not a doctor, so I can't answer that question. What I can say is that currently available

laboratory tests for mycotoxins in urine are not approved by the FDA for accuracy or for clinical use.

May: When I questioned something in a mycotoxin test, the doctor replied that “This is the way science starts.” Another physician noted that as her patients were feeling better, their mycotoxin levels were going down. These examples may be anecdotal, but wouldn’t you think that field experience counts for something?

Joe: Certainly, but as you said, field observations are anecdotal evidence rather than representing a scientifically rigorous conclusion. This is often the first step in the scientific method, but it may be far removed from the final conclusion. That is not to say the observation is right or wrong, just not yet confirmed. The difference is between correlation and causation, that is, the difference between two parameters simply moving together and one parameter causing the change in the second parameter.

May: Are IgE and IgG responses related to the toxic effects of mycotoxins?

Joe: Toxicity differs from immune responses such the inflammation induced by IgE or IgG antibodies. Allergic or hypersensitivity reactions of sensitized individuals may be triggered by a relatively low “threshold” exposure; whereas a toxic response is typically proportional to the dose (amount of mycotoxin absorbed by the individual). In comparison to the amounts of mycotoxins present in the food chain, or in mold-contaminated indoor spaces, the chance that a toxic dose of mycotoxin will be absorbed is very low.

May: Are most of us exposed to mycotoxins in our daily lives?

Joe: Yes. Mycotoxins are naturally occurring contaminants in the food chain; and small amounts are typically absorbed when we ingest grains, meats, dairy products, nuts, fruits, wine, etc. In fact, there are regulatory limits on the amounts of mycotoxins that may be present in both animal feeds and in food items. That’s why mycotoxins and their metabolites are typically detected even in the urine of healthy persons.

May: How are toxic doses of mycotoxins usually absorbed?

Joe: Mycotoxins commonly present in the food chain include aflatoxins, ochratoxin A, fumonisins, trichothecenes, and zearalenone. Acquiring a toxic dose usually requires a substantial amount of mycotoxin to be ingested over a period of days or weeks. This can happen if contaminated foods are eaten, but this very rarely occurs in the developed world; although it is much more common in underdeveloped areas.

May: Can a toxic dose of mycotoxin be absorbed by breathing in mold spores or contaminated dust?

Joe: No, not in residential environments; although this can occur in industrial settings such as farming, enzyme production, etc.

May: Joe, what I’m hearing from you is that food is the main source of exposure and that inhalation is not likely as a source of exposure. Shouldn’t we be concerned about mycotoxins in the environment? That almost sounds like heresy to me, yet it seems the logical conclusion.

Joe: Exposures to mycotoxins are of concern in the work place, but mycotoxins as a contaminant of concern are expected to be very rare in the indoor environment.

May: Thank you for your valuable input, Joe.