

CONTINUING PERSPECTIVES ON INDOOR MOLD AND DISEASES

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An excellent article has recently been published focusing on toxigenic fungi and, in particular, *Stachybotrys* (Kuhn and Ghannoum 2003). This is a 29 page review with 465 references. It is the first major paper produced by academic clinical mycologists (Division of Infectious Diseases, Department of Medicine, and Center for Medical Mycology, Department of Dermatology, University Hospitals of Cleveland, and Case Western University, Cleveland, Ohio). Some important statements from this publication include the following:

- Although there have been many hypotheses about a relationship between exposure to damp moldy homes and workplace environments, the authors emphasize that a “causal relationship between damp housing and illness is unclear.” They note that documenting such a relationship is difficult as there are many factors that could contribute to illness, and “links between moisture damage, any of these related cofactors, and building-related illnesses are not clear.”
- Difficulties exist for the measurement of indoor air concentrations, in particular related to the huge variations that can exist among measurements. The authors state:

“Most traditional sampling methods (e.g., exposed agar plates) are incapable of adequately measuring either airborne or sedentary organisms.”

“Thus, little can be deduced from single air samples, and protocols involving multiple samples from suspect houses versus single samples from control houses will probably

disproportionately find fungus in case houses due to attrition. Furthermore, sampling needs to be done under normal room activity, since aggressive methods (e.g., vacuuming) will probably overestimate actual exposure levels.”

An additional problem noted by the authors is the fact that “species identification is not a simple process but often requires the expertise of specialized medical mycologists.”

- Despite the current media and public concerns about *Stachybotrys*, Kuhn and Ghannoum emphasize that this mold genus exists worldwide; the diversity in nutrient sources and geographic ranges “suggest that *Stachybotrys* species are essentially ubiquitous” (see also Shelton et al. 2002 for profiles of mold from various US locations).
- Kuhn and Ghannoum indicate that there are “at least 21 different mycotoxin classes with over 400 individual toxins produced by at least 350 fungi” (see also Gots and Pirages 2002 for a discussion of mold mycotoxins and problems assessing mycotoxin toxicity).
- As Kuhn and Ghannoum point out, the majority of “studies describing the health effects of indoor dampness and mold have relied on subjective and retrospective questionnaires. Remarkably few studies have included physical examination or diagnostic testing. There are obviously potential problems with such an approach.”
- Based on their review, Kuhn and Ghannoum note that:

“...there is clear evidence that exposure to indoor mold may have adverse pulmonary effects, especially by inducing allergic reactions. However, to date there is no sound evidence linking mycotoxin exposure to serious or permanent lung injury. There is no evidence to support more than mild upper airway allergic effects...”

They emphasize that “a link to pulmonary disease beyond transient irritative symptoms and in particular IPH [idiopathic pulmonary hemorrhage], has not been proven.” Similarly:

“...despite many reported subjective complaints, there is no evidence for neurological compromise caused by indoor mold exposure, in particular from *S. chartarum*.”

And about hematologic and immunologic effects, Kuhn and Ghannoum write:

“In summary, to date there is no good evidence of significant immunological compromise from inhaled fungal toxins. As in the case of neurologic complaints, at most only an association exists.”

- After reviewing many studies and several disease outcomes, Kuhn and Ghannoum conclude that certain fungal disease associations have been noted, e.g., ergotism and *Cladosporium*, alimentary toxic aleukia and *Fusarium*, and liver diseases and *Aspergillus*. (Note that these diseases are not associated with indoor air exposures, except the rare aspergillosis in immuno-compromised hospitalized patients):

“However, while many studies suggest a similar relationship between *Stachybotrys* and human disease, these studies nearly uniformly suffer from significant methodological flaws, making their findings inconclusive. As a result, we have not found supportive evidence for serious illness due to *Stachybotrys* exposure in the contemporary environment.”

References

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