EXHIBIT 1

ACMT Mold Statement as of October 26, 2015
https://web.archive.org/web/20151026030442/http://www.acmt.net/cgi/page.cgi/zine_service.html?zine=show&aid=12

Institute of Medicine Report on Damp Indoor Spaces and Health

Disclaimer

While individual practitioners may differ, this is the position of the College at the time written, after a review of the issue and pertinent literature.

INSTITUTE OF MEDICINE REPORT ON DAMP INDOOR SPACES AND HEALTH

The American College of Medical Toxicology (ACMT) is a professional society composed of physician toxicologists who focus on the diagnosis, management and prevention of acute and chronic health effects due to medications, chemicals, occupational and environmental toxicants, and biological hazards. The ACMT has reviewed the Institute of Medicine (IOM) report on Damp Indoor Spaces and Health,(1) and has prepared additional background and comments relating to this document. The ACMT considers this review to be valuable, because the IOM committee did not include input from physicians with training and board certification in the subspecialty of medical toxicology.

The ACMT commends the IOM for recognizing that damp indoor spaces present health risks to humans, in association with allergic mechanisms resulting from fungi, dust mites, bacteria, cockroach, and possibly other antigens that proliferate in moist environments. The ACMT concurs with the IOM that residences, schools, offices, and other buildings should be designed to prevent water intrusion, and that when water damage or chronic moisture is identified it should be remediated as soon as possible.

While the allergic effects of fungi are well-summarized in the IOM report, there are still a number of misperceptions relating to mycotoxins or other chemicals produced by certain species of fungi, and their role in adverse health effects from exposures in water-damaged buildings. Although several epidemiological studies of building-related illness have implicated mycotoxins as a cause of health effects in water-damaged environments, their interpretation is complicated by limitations in their study design, exposure and dose assessment methods, and confounding effects. In fact, these issues have cast doubt on the causative role of inhaled mycotoxins for any toxic health effects in the indoor residential environment. (2-5)

The ACMT believes that an improved understanding of the role of mycotoxins in damp indoor spaces should begin by acknowledging that both fungi and their mycotoxin prodcuts are ubiquitous in the outdoor environment. Human exposure to fungi can occur from contact with the soil as well as outdoor air, where fungal spores are normally present in much higher concentrations than indoor environments (with seasonal variability, e.g. cold, snow). Epidemiological studies of mold in indoor environments should include appropriate comparisons with outdoor air, and studies should be designed to consider our aggregate and cumulative exposure to fungi and mycotoxins from indoor and outdoor environments.

The ACMT would like to emphasize the importance of distinguishing exposure to mycotoxins from exposure to the fungi that are capable of producing them. Toxigenic fungi and mycotoxins are not synonymous hazards. It is well established that for many fungal species, the production of mycotoxins is significantly influenced by genetics and the environmental conditions of their growth. The isolation of a toxigenic fungal species in the environment does not necessarily indicate that mycotoxins are also present, or that they are present at doses that pose health risks from environmental exposure. For this reason, if epidemiological studies of damp indoor spaces are to include hypotheses relating to mycotoxins, then exposure assessment methods should utilize validated techniques to detect and quantify mycotoxins directly in environmental samples. The interpretation of such environmental measurements should consist of a plausible, complete exposure pathway and an assessment of the dose-response relationship.

The ACMT would also like to emphasize the importance of acknowledging that the diet is the most important source of human exposure to mycotoxins. The vast majority of scientific data on the adverse health effects of mycotoxins is derived from their presence as natural and unavoidable contaminants of foods and beverages that are consumed as part of a healthy diet. Mycotoxins of known dietary importance include aflatoxins (in corn, ground nuts, and dairy products), trichothecenes (in corn, cereals and fermented beverages) and ochratoxins (in coffee, wine, and dried fruits). Risk assessments have been conducted for several mycotoxins that are of relevance to human health,(6) and these studies should be used as a benchmark for interpreting the relative role of exposures occurring from other sources and pathways in addition to dietary ingestion.

With respect to mycotoxins in indoor air, exposure modeling studies have concluded that even in moldy environments, the maximum inhalation dose of mycotoxins is generally orders of magnitude lower than demonstrated thresholds for adverse health effects.(3,7,8) The results of human studies in agricultural environments provide additional consistency for this finding, demonstrating that in moldy environments inhalation exposure to mycotoxins results in a dose that is far less than what is normally encountered from dietary exposure.(9,10) Studies that quantify human exposure utilizing validated biomarkers as indicators of internal dose will provide additional information to assess cumulative exposure to mycotoxins. There have been significant advances in the research on biomarkers of exposure to important mycotoxins,(11-13) and the ACMT recommends that future studies utilize these methods in the assessment of the dose-response relationship.

The ACMT is aware of other types of clinical laboratory tests that have recently been utilized in epidemiological studies of damp indoor spaces, including “mycotoxin antibody testing.” Identification or measurement of antibodies to mycotoxins, rather than biomonitoring of mycotoxins directly, is not an accepted method to assess human exposure. This method has not been validated in well-designed epidemiological studies, and is not recommended for the assessment of human exposure to mycotoxins.(14) Fungal immunoassay tests (including immunoglobulin testing for IgG and IgE) can be clinically useful in the assessment of immunological conditions from exposure to fungal antigens (including common allergies and hypersensitivity pneumonitis), but they do not provide any information about exposure to mycotoxins and therefore they have no role in exposure assessment in this context.

The American Academy of Asthma, Allergy, and Immunology (AAAAI) has addressed some of these issues in their recent position statement on health effects from mold exposure (15).

In comparison to the low-level indoor exposures of general public concern, a syndrome known as Organic Dust Toxic Syndrome (ODTS) has been described in association with microbial exposures in agricultural environments, consisting of fever, malaise, myalgia, headache, dyspnea, chest tightness, dry cough, and nausea.(16) While the pathogenesis of this transient condition is not well-understood, it has been hypothesized to develop from acute inhalation exposure to high concentrations of bacterial endotoxins, fungal mycotoxins, and possibly other cellular components of microorganisms that proliferate in agricultural environments. The epidemiology of this disorder is uncertain, but the levels of microbial exposure that have been measured in association with its occurrence are generally orders of magnitude greater what has been measured in moldy home, school, or office environments. It should be noted that symptoms from ODTS are transient in nature, and generally resolve within hours to days from the time of acute exposure. There is no documented evidence that inhalation exposure to fungi or mycotoxins in indoor environments causes a chronic toxic encephalopathy.

Similarly, the role of volatile organic compounds produced by mold (mVOCs), and responsible for the musty odor, can be addressed from a toxicological perspective. In sufficient dose, mVOCs can produce transient irritive symptoms and subjective complaints such as nasal and eye discomfort, headache and dizziness. However, the concentrations of mVOCs produced by mold in indoor spaces are very low, on the order of nanograms to micrograms per cubic meter or part per billion (ppb) range (17). On the other hand, the levels that can induce sensory irritation are in the milligram per cubic meter (mg/m3) or parts per million (ppm) range in the air (18). Additionally, volatile organic compounds are volatile, thus having short environmental half-lives (minutes to hours), and their effects are transient. In cases where individuals complain of persistent neurological, cognitive, or non-specific symptoms week or months after the putative exposure, these symptoms should not be attributed to irritant effects; other causes should be sought.

In conclusion, the ACMT generally concurs with the IOM's assessment of the relationship between damp indoor spaces and human health effects. The ACMT recommends that public health responses to damp indoor spaces be based upon what is known and generally accepted with respect to their association with allergic disease. Public health responses should not be solely based upon the presence of fungi or mycotoxins, because from a toxicological perspective, the available scientific evidence does not provide any compelling data to conclude that they pose significant health risks via inhalation in these settings. The risks from inhalation exposure are minimal in comparison to other sources and pathways, including the diet, which in themselves are rarely of health consequence in the United States. Furthermore, the use of unapproved diagnostic studies and therapeutic modalities based on unproven infection or mold-related toxicity (as opposed to allergic phenomena) are medically inappropriate and costly.

Reference List

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Prepared by the ACMT Practice Committee and approved June, 2006. Primary authors: Daniel Sudakin and Tom Kurt

Disclosure forms on file at ACMT