



## Engineering Sciences Section – 2008

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### **C30 Studies of Building Related Asthma and Respiratory Symptoms in Relation to Dampness and Microbial Contamination of the Indoor Environment**

*Jean M. Cox-Ganser, PhD\*, Ju-Hyeong Park, ScD, and Kay Kreiss, MD, National Institute for Occupational Safety and Health, 1095 Willowdale Road, M/S 2800, Morgantown, WV 26505*

The goal of this presentation is to inform attendees of research done by the National Institute of Occupational Safety and Health in regard to building related asthma in offices and schools.

This presentation will impact the forensic science community by informing attendees of the use of resources to remediate damp indoor environments.

**Background:** Employee health in buildings with work-related asthma cases and a range of dampness from 2000-2005 was investigated.

**Methods:** Standardized questionnaires in 3 populations occupying 16 buildings for internal and national comparisons were used. Pulmonary function, methacholine challenge, and skin prick tests were conducted. Respiratory health outcomes in relation to semi-quantitative observational scores for moisture, water staining, visible mold, and mold odor and microbial indices in air and dust was analyzed.

**Results:** Asthma and symptom prevalences were 2-4 times expected. Observational exposure indices predicted building-related respiratory symptoms. Significant associations existed between respiratory symptoms and ergosterol, Penicillium/Aspergillus extracellular polysaccharides, and culturable fungi in floor dust and airborne total fungi and endotoxin. Symptoms were substantiated by abnormal lung function, methacholine results, or medication use in 2/3 of cases in a building in which risk of asthma onset increased 7.5-fold after occupancy; sick leave due to building-related respiratory problems accounted for 12% of sick leave in this building. Atopy was not associated with building-related respiratory complaints. Repair of the building envelope and cleaning did not interrupt incident cases of work-related respiratory disease in the 16 subsequent months.

**Conclusion:** Some water-damaged buildings have excess respiratory disease which warrants research on etiologic markers and effective remediation strategies.

**Occupational Asthma, Damp Buildings, Mold**