

## 121 Localization of Species-Specific Antibody Binding Sites to *Stachybotrys Chartarum* Using the Halogen Immunoassay

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**RATIONALE:** The potential health risks associated with exposure to *Stachybotrys chartarum* are currently the subject of intense research, however species-specific detection of the fungus using immunoassays is not available. The purpose of this study was to use the Halogen Immunoassay (HIA) to characterize the antibody binding sites of a recently developed *S. chartarum* monoclonal antibody (mAb 9B4), in pre- and post-germinated conidia.

**METHODS:** Antigen expression was detected using mAb 9B4 in the HIA. Aerosolized conidia and fungal fragments were collected onto protein binding membranes direct from sporulating *in vitro* culture plates. To germinate conidia, samples were incubated in high humidity at room temperature for 48 hours. Ungerminated and germinated samples were then laminated with an adhesive coverslip and immunostained by the HIA. The samples were examined by confocal and light microscopy and positive (haloed) particles were expressed as percentages of total spores.

**RESULTS:** The localization of specific mAb 9B4 binding sites in all pre- and post-germinated samples was primarily restricted to the conidogenous phialides and around phialoconidia. Post-germination, the proportion of phialides releasing antigen remained unchanged ( $95.3 \pm 1.5$ ) from ungerminated treatments ( $96.9 \pm 1.1$ ;  $P=0.384$ ); however there was a significant increase ( $P<0.0001$ ) in the proportion of germinated spores expressing antigen ( $53.3 \pm 2.9$ ) compared to ungerminated spores ( $6.6 \pm 1.1$ ). No immunostaining was detected in either hyphal fragments or hyphae from germinated spores in pre- and post-germinated treatments.

**CONCLUSIONS:** This study further supports that mAb 9B4 recognizes a sporulation specific antigen localized in the phialides and phialoconidia that can be used for *Stachybotrys*-specific immunoassays.

## 122 Application of Building Science Principles to Reduction of Indoor Air Pathogens

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**RATIONALE:** In hot, humid climates, if building science principles of pressurization, humidity control, and ASHRAE Ventilation Standard 62.2-2003 with HEPA filtration are implemented in high aerosol and VOC exposure residences without non-mechanical ventilation the concentration of indoor mold spores, pollen, dust mite debris and other pathogenic aerosols as well as VOCs will be significantly reduced. Products of microbiological activity within exterior wall cavities will be blocked from entry into the breathing zone by resulting air pressure differentials.

**METHODS:** In a hot, humid climate, the interiors of test dwellings without mechanical ventilation were pressurized to +0.8 to +2.0 pascals most of the time by a new, variable rate mechanical ventilation system. Humidity was controlled to less than 50% most of the time by modulating ventilation airflow rates according to indoor humidity and ASHRAE Standard 62.2-2003. All ventilation air was HEPA filtered and delivered into the breathing zone of the home at an average rate in conformity with ASHRAE Standard 62.2-2003.

**RESULTS:** Pathogenic aerosols and VOCs were significantly reduced.

**CONCLUSIONS:** In hot, humid climates, implementation of building science principles of pressurization, humidity control and controlled ventilation with HEPA filtered outdoor air in average conformity with ASHRAE Standard 62.2-2003 significantly reduced the presence of airborne pathogens and VOCs in initially high aerosol and VOC exposure residences which did not earlier have mechanical ventilation even when outdoor aerosols were very high.

## 123 A Survey Analysis of Allergist's Attitudes Toward Environmental Control

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**RATIONALE:** To determine physician attitudes toward environmental control (EC) measures in their clinical practices.

**METHODS:** A web-based (Zoomerang) questionnaire designed by the EORD Interest section and Indoor Allergen Committee was distributed to all AAAAI members. Questionnaire responses were ranked using a Leikert scale. Questions were grouped into clusters using a similarity index based on the Spearman rho-squared coefficient.

**RESULTS:** There were 460 respondents (10% response rate). Nine distinct clusters of questions were identified based on related information asked. Allergists believe EC plays an important role in managing asthma, allergic rhinitis and atopic dermatitis along with immunotherapy and medication. Allergists feel they are perceived by patients as EC experts and are comfortable educating patients about EC. They are moderately satisfied with available educational EC resources. However, allergists believe patients feel EC has a limited role in their management and non-compliance with EC among patients is often due to product affordability and/or spending priorities. Most allergists provide EC information at the patient's initial visit and reiterate its importance on follow-up visits but do not usually provide details where to obtain EC products nor do they regularly assess patient compliance. Finally, allergists generally do not feel measuring home indoor allergen levels is practical.

**CONCLUSIONS:** Allergists believe EC is important and usually provide educational materials to their patients. However, they differ in how to disseminate this information and are often remiss in assessing patient compliance over time. Strategies to improve the disconnect between physician and patient perception regarding EC importance are necessary.

**Funding:** AAAAI

## 124 Environmental Factors Found in Homes of Asthmatics

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**RATIONALE:** Asthma is often considered to be an environmentally related disease. To investigate home environmental factors that might contribute to asthma we conducted the following study.

**METHODS:** Two populations containing respectively 20 asthmatic subjects and 19 control subjects were surveyed. The test population consisted of homes occupied by a minimum of 3 individuals with at least one asthmatic child. The control population consisted of homes occupied by at least 3 individuals that did not contain an asthmatic child. The surveys were completed by a parent in consultation with their children. The subjects answered survey questions about conditions in the home including presence of moisture and pests. The subjects also completed 25 questions related to their quality of life covering both physical and emotional concerns.

**RESULTS:** Quality of life results were significantly lower for the asthmatic group with mean scores below 80% of optimum while the non-asthmatic group had mean scores above 90% of optimum ( $p<0.01$ ). Factors in asthmatic homes that were dramatically different from comparison homes included: regular use of household chemical sprays (90% vs. 70%); roof and plumbing leaks (75% vs. 55%); wet basements (40% vs. 20%); presence of roaches and insects (85% vs. 60%).

**CONCLUSIONS:** Quality of life questionnaires indicate a clear difference between homes with and without an asthmatic child. Home environmental conditions evaluated by subject completed survey can be useful in evaluating asthmatics. Further study is needed to see if remediation of these environmental factors improves the quality of life scores.