

Client: EMLab P&K MOLD REPORT
C/O: Mr. Quality Control
Re: Sample Report

Date of Sampling: 05-13-2014
Date of Receipt: 05-13-2014
Date of Report: 05-22-2014

Interpretive Guidelines

The following guidelines are compiled from the various references cited at the end of this report and are not intended to provide any medical conclusions or recommendations. An individual's susceptibility to allergic symptoms depends not only on the level of allergens present in the environment but also on the individual's response to allergens and previous exposure history.

Allergen level definitions:

Low - Levels in this range are not considered to increase risk of sensitization or symptoms.

Significant - Levels in this range may increase the risk of sensitization.

High - Levels in this range are reported to increase the risk of allergic symptoms in sensitized people.

Mite Allergens

Low : < 2 mcg/g dust

Significant : 2-10 mcg/g dust

High : > 10 mcg/g dust

Cat Allergens

Low : < 1 mcg/g dust

Significant : 1-8 mcg/g dust

High : > 8 mcg/g dust

Cockroach Allergens

Low : < 2 U/g dust

Significant : 2-8 U/g dust

High : > 8 U/g dust

Dog Allergens

Low : < 2 mcg/g dust

Significant : 2-10 mcg/g dust

High : > 10 mcg/g dust

Rodent Allergens

At the time of this report sufficient evidence is not yet available for establishing threshold risk levels for mouse and rat allergens.

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Reporting Terms

Threshold Limit Value

Threshold limits have been adopted from "Field Guide for the Determination of Biological Contaminants in Environmental Samples", Dillon, H. Kenneth, ed., et al. American Industrial Hygiene Association Biosafety Committee, Virginia. 1996. For further information refer to the sections "Interpretive Guidelines" and "Information on various Allergens".

Detection Limit

Detection limit refers to the minimum allergen level that could have been detected using the most current ELISA methodology and the available reagents.

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Information on Various Allergens

Sensitivity to indoor allergens is a worldwide problem for large segments of the population and is relevant from early childhood through adulthood. Indoor allergens have been shown to play a major role both in sensitization and as triggers of asthma in children.

Dust Mite Allergens

Dust mites are ubiquitous and are found in every household. Mites prefer warm, moist surroundings such as the inside of pillows or mattresses. The mites feed on human dander (skin scales) that accumulate in bedding and house dust.

Dust mite allergens are proteins that come from the digestive tract of mites and are found in high levels in mite feces. The allergen containing fecal balls are relatively large (~10-20 um) and remain in the air for short periods. Most exposure occurs through disturbance of dust near the breathing zone. You can minimize or reduce the exposure to dust mites by taking the following precautions:

- Wash bedding every week in hot water and use allergen free mattress and pillow covers to minimize contact with the dust mites.
- Reduce dust in the home by replacing carpet with hard flooring and minimizing the use of upholstered furniture.
- Minimize the use of curtains or drapes by using shades.
- Try to keep pets outside the house as dust mites thrive on animal and human dander.

Cat and Dog Allergens

Cats and dogs are the most common animal cohabitants, present in more than 1/3 of homes in the United States. Those who touch cats and dogs or visit households with cats and dogs easily carry these allergens from home to home, office, school, etc. These pet allergens are carried on particles ranging from 1 to 20 mm in diameter and the smaller of these particles can remain airborne for long periods of time. Consequently, pet allergens are spread easily throughout a house even when pets are kept out of certain rooms. Cat and dog allergens are also very sticky and can be found in high levels on walls and other surfaces within homes. Carpeting, bedding, and upholstered furniture can be reservoirs for deposited pet allergens. In most of the studies, a vast majority of homes have been found to contain pet allergens, even if pets are not present. This widespread distribution has been presumed to occur primarily through the passive transfer of these allergens from one environment to another.

The major cat and dog allergens are low molecular weight proteins found primarily in animal secretions. They are produced in the sebaceous, salivary, and anal glands. Touching the pet and subsequently transferring allergen from hand to nose is only one mode of contact. The most important route of exposure is by inhalation of airborne allergen. This allows deposition of large quantities of the allergen in both the upper and lower airways.

The aerodynamic characteristics and the potent nature of pet allergens make clean up efforts and minimization of allergens in a building very difficult. The best approach is to remove pets from the indoor environment, followed by extensive cleaning to remove residual allergen. Even after the most intensive cleaning, it can take up to 6 months before you begin to see the impact of allergen reduction. Those who are not willing to give up their pets can follow certain precautionary measures to minimize or reduce their exposure such as:

- Use room air cleaners that may be helpful in removing some airborne pet allergens.
- Wash the pets frequently (at least once a week).
- Try to isolate the pet to one to two rooms and never allow pets in bedrooms.
- Wash clothing after it has come in contact with a pet and wash your hands well after touching any pet.

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Information on Various Allergens (continued)

Cockroach Allergens

Cockroaches are an important source of indoor allergens worldwide. Cockroach allergens are widely distributed in homes and schools and can be found in beds, furniture, and carpets, with the highest levels typically found in the kitchen. However, cockroach allergens may be more relevant in the bedroom than the kitchen or the living room because of close contact with the pillow while in bed. About 20% of homes with no evidence of cockroach infestation have significant levels of cockroach allergen in settled dust. The level of cockroach allergen in school dust is of concern because it may constitute an occupational risk to students, teachers and other school workers.

The sources of cockroach allergens include the gastrointestinal tract, saliva, feces and body parts of the cockroach. As cockroaches die in a dwelling, their decomposing body parts become part of the environmental dust. These sources contain cockroach allergens. In order to keep your house free of cockroaches so as to minimize or reduce the exposure to cockroach allergen consider taking the following precautions:

- Store food in airtight containers.
- Seal all cracks in walls in order to prevent their entry.
- Clean any spilled food immediately and wash dishes promptly.
- Keep garbage containers sealed.
- Do not leave faucets and pipes leaking.

Rodent Allergens

Rodents (mice and rats) can occur in both home and work environments. Exposure to rodents can come either from keeping them as pets or from their presence as pests in the home. Veterinarians, laboratory technicians, etc., can become allergic to rodents due to intensive exposure to these animals in their daily work. Rodents can also be a problem in schools.

The sources of rodent allergen include the rodent urine and skin flakes. The rodent's urine has a high concentration of protein, which is the primary allergen to humans. The urine is often sprayed rather than deposited, thereby increasing human exposure. After the urine dries, the urinary proteins become airborne and are inhaled by humans, leading to allergic symptoms. To keep your living and working environment free of rodent infestation, the following precautionary measures can be followed:

- Store food in airtight containers.
- Seal all cracks in walls in order to prevent their entry.
- Keep pet rodents in filtered cages.
- Wash yourself well after touching the pet rodent.

Information provided in this section is not intended to provide medical advice, nor shall it be interpreted as an indicator of potential medical or safety problems. If you have concerns or questions relating to your health, please contact your medical doctor for advice.

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Glossary

Allergen - A substance that induces a specific immunological response that may lead to allergic disease.

Allergist - A physician specializing in treating allergies.

Allergy - Symptoms induced by exposure to an allergen to which previous sensitization has occurred.

Asthma - A respiratory disease, often caused by exposure to allergens, marked by wheezing, chest tightness, and sometimes coughing.

Cockroach - Any of various oval, flat-bodied insects common as household pests. The two most common indoor species of cockroach in North America are the German cockroach (*Blattella germanica*) and the American cockroach (*Periplaneta americana*).

Dust mites - Tiny creatures related to spiders and ticks. They are found in house dust. House dust mites, due to their very small size, are not visible to the eye, and live for approximately 3 to 4 months. The two most commonly occurring dust mites are the American house dust mite, (*Dermatophagoides farinae*) and the European house dust mite, (*Dermatophagoides pteronyssinus*).

HEPA - High Efficiency Particulate Air or High Efficiency Particulate Arrestance, refers to a filter that is manufactured, tested and certified to meet applicable construction and efficiency standards for high-efficiency filters.

HVAC - Heating, Ventilation, and Air Conditioning systems.

IAQ - Indoor Air Quality.

Industrial Hygienist - A professional with a specialized graduate degree who monitors exposure to environmental factors that can affect human health. Examples of environmental factors include chemicals, heat, lead, asbestos, noise, radiation, and biological hazards.

Protein - Any of a group of complex organic compounds that are composed of amino acids.

Sensitization - Become responsive to external conditions or stimulation. In the case of allergens, sensitization involves the production of specific antibodies (IgE).

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References and Resources

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Biological Contaminants in Indoor Environments, Morey, Feeley, Otten, Editors. 1990. ASTM, 1916 Race Street, Philadelphia, PA 19103. STP 1071.

Indoor Air and Human Health, Gammage & Kaye. 1985. Lewis Publishers.

Useful Websites:

www.aaaai.org - American Academy of Allergy, Asthma and Immunology - information regarding allergy.
www.acgih.org - American Conference of Governmental Industrial Hygienists - information on IAQ and useful links.
www.aiha.org - American Industrial Hygiene Association - general IAQ information.
www.allergies.about.com - General information and news about allergies.
www.allergyweb.com - Asthma and Allergy Association of Florida - useful allergy information and links to other resources.
www.cal-iaq.org - California Department of Health Services - useful IAQ information and links to other resources.
www.calepa.ca.gov - California Environmental Protection Agency - California IAQ resources.
www.EMLab.com - EMLab P&K
www.epa.gov - Environmental Protection Agency - information regarding prevention and remediation of mold.
www.nih.gov - National Institute of Health - information regarding environmental health issues, including IAQ.