

The National Institutes of Health Laboratory Animal Allergy Prevention Program (LAAPP)

I. Introduction

The National Institutes of Health (NIH) comprehensive Occupational Safety and Health Program has been established to provide NIH employees with places and conditions of employment in which the risk of exposure to potential hazards is minimized. The development of an allergic response to animal proteins while working with laboratory animals is an occupational health concern at the NIH. Employees work with a variety of animals and animal products in the process of conducting research. This type of work can potentially expose employees to animal products such as animal urine, dander, and saliva. The proteins, also known as allergens, found in these products can trigger an allergic reaction in some employees and may lead to the development of asthma.

Prevention of animal allergy depends on the control of animal allergens in the work environment. Controlling occupational exposure to animal allergens can involve a broad range of prevention measures. A combination of measures to eliminate or control allergen exposure, including engineering and administrative controls and personal protective equipment, has been implemented at the NIH.

II. Scope

The NIH Laboratory Animal Allergy Prevention Program (NIH-LAAPP) is an integral part of the NIH Occupational Safety and Health Program. The NIH-LAAPP uses a comprehensive approach to control exposure to animal allergens, educate supervisors and employees about animal allergens, and provide medical evaluation and management. The Occupational Safety and Health Branch (OSHB) and Occupational Medical Service (OMS) administer the NIH-LAAPP for all employees participating in the Animal Exposure Surveillance Program (AESP). All employees who may potentially work with animals must be enrolled in the AESP. The emphasis of the NIH-LAAPP is on primary prevention of laboratory animal allergy at NIH.

III. Control Measures and Standard Operating Procedures

A. Engineering Controls

Engineering controls are recognized as the most effective method for controlling occupational exposure to potential hazards. Engineering controls such as local exhaust and general dilution ventilation must be incorporated in the design phase of animal facilities. All animal rooms at the NIH have a general dilution ventilation rate of at least 10 fresh air changes per hour and most animal rooms are kept at humidity levels of 30 - 50%. These parameters help to reduce the concentration of airborne animal allergens.

1. Local Exhaust Ventilation

a. Bench Work

Surgery, necropsy, and other animal manipulations should be performed on downdraft tables, backdraft tables, within biological safety cabinets (BSCs), or under other OSHB approved local exhaust ventilation system. In areas, where local exhaust systems are not feasible, appropriate personal protective equipment (PPE) shall be worn (see Section III, C). These activities should be limited to animal procedure areas; however, they may be performed in the laboratory if the animals are properly transported (see Section III, B, 1).

b. Cage Changing (small animals)

Cage Changing should be performed in a class II BSC when protection of the animal is required. A class I BSC or chemical fume hood may be used when protection of the animal is not a prerequisite. The use of change stations that are not designed to provide employee protection is discouraged. If an appropriate local exhaust system is not available, appropriate PPE shall be worn (see Section III, C). Use of local exhaust systems is contingent upon the size of the animal. If performing transfers within a local exhaust system increases the risk of injury (e.g., bite, scratch) to personnel, the use of the device is not necessary.

c. Cage Systems

Most NIH animal facilities use individually ventilated animal racks and microisolator cages to provide protection for the animals and to minimize the potential for employee exposure to animal allergens. Animal cages that are under positive pressure should be equipped with a scavenger system to reduce allergen load within the animal room. Conventional cages (e.g., open

top) provide no protection for the employee and contribute to significantly higher airborne allergen levels than cages fitted with filter tops. Where feasible, filter top cages should be used.

d. Certification

Local exhaust systems (e.g., BSCs, chemical fume hoods, etc.) are certified annually by the OSHB to ensure compliance with all applicable guidelines. Systems that fail inspections are labeled and taken out of service until they are repaired and pass inspection.

2. Bedding

Corncob, recycled wood product (paper), and wood chip bedding are the primary bedding materials used at the NIH. Corncob bedding and recycled wood products are preferred due to their hypoallergenic properties. When using wood chip bedding, products that have been screened to remove fine particles (dust) should be chosen. As with all bedding materials, the manufacturer should be contacted to get information about potential contaminants and an analysis regarding contaminant levels.

3. Cage Dumping and Cleaning

NIH animal facilities utilize several different techniques to dump, clean, and sanitize animal cages. When dumping cages, procedures must be used that minimize exposure to animal allergens. Cages should be either wetted down before they are dumped (e.g., Somat and Garb-el systems) or a cage dumping station should be used. A cage dumping station is a simple device utilizing a fan and a High-Efficiency Particulate Air (HEPA) filter to capture airborne particulate while the employee dumps the bedding material into the disposal container. Employees working at these stations must use recommended PPE (see Section III, C).

To promote effective cleaning, animal rooms and cage wash areas are constructed to facilitate good housekeeping, including rounded floor corners and walls and smooth, washable surfaces.

B. Administrative Controls

1. Animal Transportation

Foresight during design planning and the establishment of specific areas, or

zones, for the care and use of animals within a facility, helps minimize allergen exposure. Most current and all new NIH facilities are designed to minimize animal movement and therefore enhance compliance. Employees should follow these recommended work practices:

- Movement of animals throughout the facility should be minimized.
- Avoid moving animals into the laboratory unless it is not feasible for the procedures to be performed in the animal facility.
- If transportation is necessary, the animals should be in a microisolator (filter top cage) or NIH approved filtered transport box.
- Animals should be maintained and manipulated on or in a local exhaust system in the laboratory such as a BSC, fume hood, or downdraft table. In areas, where local exhaust systems are not feasible, appropriate PPE shall be worn (see Section III, C).

2. Animal Density

Animal density can be a major factor in ambient allergen concentrations, and maintaining the number of animals in a room at an acceptable, predetermined density is an effective means to help control allergen levels. The animal facility manager and the animal program director establish an acceptable animal density for their animal housing rooms.

3. Proper Use and Maintenance of Equipment

It is the supervisor's responsibility to ensure employees are trained to properly use and maintain dumping stations, cage wash equipment, and cage ventilation systems.

4. Housekeeping

Animal facilities should be cleaned on a regular schedule using wet methods. Dry sweeping is not the preferred method for cleaning animal rooms. Appropriate PPE shall be worn if this procedure is used (see Section III, C). Employees should follow these recommended work practices:

- Work surfaces must be routinely cleaned with a detergent/disinfectant to reduce allergen loads.
- Waste materials should be promptly bagged and correctly disposed of in the appropriate receptacle(s).
- Shipment /Transfer boxes must be disposed of promptly. These boxes must not be left out in the open corridors or in laboratories.

5. Personal Hygiene

Eating or drinking is not permitted in animal rooms or laboratories. Employees are discouraged from touching their face and eyes while in animal rooms and laboratories. Before employees leave the animal facility, they must remove personal protective equipment and place in appropriate receptacles, and wash their hands.

6. Training and Education

Supervisors are provided training information that includes, but is not limited to, the OSHB pamphlet “Laboratory Animal Allergy Prevention at NIH” and the OMS primer “Allergies to Laboratory Animals, A Significant Health Risk”. Supervisors are responsible for ensuring employee comprehension of the following topics relating to animal allergy:

- importance of good personal hygiene (e.g., washing hands)
- proper use of PPE
- prescribed work practices and proper use of equipment
- importance of participating in the AESP
- awareness of allergy symptoms
- the importance of promptly seeking medical advice and assistance from OMS if symptoms develop

C. Personal Protective Equipment (PPE)

PPE that prevents skin contact and inhalation of animal allergens can help to reduce the likelihood of employee exposure. Employees working with animals and/or soiled bedding must wear gloves (e.g., nitrile) and disposable lab coats or other coverings (e.g., Tyvek® suits, scrubs). The use of dust/mist masks is recommended whenever animals and/or soiled bedding are handled by employees. All PPE should be disposed of prior to exiting the animal facility. Additional PPE such as hair bonnets, shoe covers, and scrubs are also recommended to limit the spread of animal allergens beyond the animal facility and further limit personal exposure. Employees using non-disposable PPE such as lab coats or street clothes coverings should keep one set specifically for animal work. These items should not be worn for other laboratory activities and should be laundered regularly to prevent them from becoming a collection medium for allergens.

NIH employees with known allergies to animals should wear NIOSH approved N-95 respirators. After obtaining medical clearance to wear a respirator, these employees will be provided N-95 respirators at no personal cost. Other respiratory protection may be recommended for employees based on individual need and circumstances. All NIH

employees requiring N-95 or other respirators will be fit tested by the OSHB and included in the Respiratory Protection Program.

IV. Medical Evaluation and Management

All NIH employees working with animals or animal products must be enrolled in the Animal Exposure Surveillance Program (AESP). Occupational Medical Service (OMS), Division of Safety, manages the AESP and provides individually-tailored medical evaluation and management. Employees enrolled in the AESP will be given a copy of the OMS primer “Allergies to Laboratory Animals, A Significant Health Risk” upon their initial visit to the clinic, and the healthcare provider will review the information with the employee. The healthcare provider will ascertain whether the employee has existing allergies. If the employee has existing allergy to animals, the employee will be referred to OSHB for respirator fit testing for an N-95 respirator.

Employees are required to report signs and symptoms of animal allergy to OMS promptly, so that appropriate interventions can be implemented. Employees that report possible allergic reactions to laboratory animals are interviewed by an OMS healthcare provider. Clinically indicated medical testing is performed. If the worker’s concerns are confirmed, medical treatment is provided. Workers’ Compensation forms are issued, and the relevant OSHB Safety Specialist is consulted.

V. Program Evaluation

The NIH-LAAPP is evaluated by the OSHB to ensure program effectiveness. The goal of the program is to prevent, to the extent feasible, the development of occupationally acquired allergies to laboratory animals. Illness reports of allergies to laboratory animals are evaluated routinely by the OSHB to determine areas of concern and need for program enhancement.



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