

The National Institutes of Health

Laboratory Animal Allergy Prevention Program

(LAAPP)

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I. Introduction

The National Institutes of Health (NIH) comprehensive Occupational Safety and Health Program was established to provide NIH employees with workplaces and working conditions where 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. Some proteins, also known as allergens, found in these animals can trigger an allergic reaction in some employees and may lead to the development of other conditions (e.g. asthma).

Prevention of animal allergies 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. 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 through the use of engineering controls, administrative controls and the incorporation of personal protective equipment.

Representatives from the Division of Occupational Health and Safety (DOHS) and Occupational Medical Services (OMS) provide hazard awareness through education and training of the laboratory Immediate Supervisor, and specific medical education for all employees participating in an Animal Exposure Program (AEP). All employees who will be directly handling laboratory animals at the NIH must be enrolled in an AEP as appropriate for duties and responsibilities.

II. Definitions

The following terms used in this program are clearly defined in the [NIH Policy Manual 3040-2 - Animal Care and Use in the Intramural Program](#):

Animal Exposure Program (AEP)

Animal Facility

Animal Program Management

Animal Research Advisory Committee (ARAC)

Animal User

Office of Animal Care and Use (OACU)

A. Employment Status

1. Employee

- (i) Contract Personnel – Individuals employed by a contract company to provide services at NIH.
- (ii) Federal Civilian Employee – Is either an individual or member of a group, who meets the definition of employee in [Section 2105 of Title 5, United States Code](#).
- (iii) Public Health Service Officer – A member commissioned in one of the uniformed services defined in [Section 2101\(3\) of Title 5, United States Code](#).
- (iv) [Transient Visitor](#) – Individuals not categorized as a National Institutes of Health federal or contract employees. This can include transient visitors (Animal Care and Use Committee (ACUC) non-affiliated members, maintenance contractors, etc.), special volunteers, guest workers, and postdoctoral fellows.

2. Supervisor

- (i) Immediate Supervisor (IS) – individual with direct responsibility for personnel listed as trainees. The IS can include the title of facility managers, facility veterinarians, Principal Investigator staff, contract managers, etc.
- (ii) Laboratory Director – Used in the same context as defined in the [Biosafety in Microbiological and Biomedical Laboratories \(BMBL\), 5th ed.](#) to mean the officially designated supervisor (Branch Chief or Laboratory Chief) who has responsibility for all activities within a laboratory.
- (iii) Principal Investigator (PI) – Is a scientist designated by the Laboratory/Branch Chief or the Institute and Center (IC) Director or Scientific Director who is responsible for conducting or managing an animal study protocol.

- 3. Trainee – An individual who does not have documented training and/or sufficient experience with handling or working with the designated approved animal model.

B. [Primary Barrier Equipment](#)

Equipment that provides a barrier and protection for constituents and components that may include personnel, product, and the environment. For allergy prevention, the goal is to reduce or eliminate direct contact with the allergen while minimizing the presence of the allergen in the macro environment. Equipment generally includes exhaust ventilation and/or a filtration containment system.

Types of primary barrier equipment include:

1. Biological Safety Cabinet (BSC) – containment devices that are designed for work involving biological procedures and microorganisms, and includes a high efficiency particulate air (HEPA) filtration system. BSCs provide excellent containment of animal allergens when used in accordance with the manufacturer’s instructions. For additional information on the different types and classes, see the CDC/NIH publication, “[Biosafety in Microbiological and Biomedical Laboratories \(BMBL\), 5th ed., Appendix A](#)”.
2. Local Exhaust Ventilation (LEV) System – a ventilation system that is designed to capture contaminants at their source and exhaust directly out of the work area and into the outdoor atmosphere. LEV systems may help to reduce contact with animal allergens by decreasing the level of allergens in the macro environment.
 - (i) Chemical Fume Hood (CFH) – most common LEV system primary intention is to provide personnel protection for work involving chemicals (e.g. gases, vapors, etc.).
 - (ii) Downdraft Table – table designed with ventilation slots on the table work surface with air exhausted from below the work surface.
 - (iii) Downdraft Sink – sink designed with ventilation slots around the sink surface and/or internal components.
 - (iv) Snorkel – flexible duct or hose designed to capture contaminants directly at the source.
3. Micro isolator Cage – An animal cage composed of both a cage bottom and ventilated lid. When closed, animal allergens are contained within the microenvironment of the cage. When opened in a BSC using appropriate technique, environmental allergens can be eliminated or reduced if using a ventilated cage change station.
4. Individual Ventilated Cages (IVC) – a mechanical ventilated rack and microisolator caging system that provides and maintains a stable environment for the animals while producing a safe and comfortable working environment for staff and researchers. The supply and exhaust air are commonly high-efficiency particulate absorption (HEPA) filtered and maintain a single pass air stream through the individual cages. Ventilation of the cage may be either positive or negative to the macro environment of the animal holding room. In both situations, allergens leaving the cage are prevented from entering the macroenvironment of the animal holding room by exhausting the air into the outdoor atmosphere or HEPA-filtering the air leaving the cage into the animal holding room.
5. Ventilated Cage Change Station – a stand-alone product protection workstation which commonly contains a blower and filtration system to help in the capture and containment of particulates from spreading outside of the unit. Unlike a BSC, change stations are less efficient in the containment of animal allergens and can increase the level of animal allergens in the macro environment of the animal holding room. Some stations commonly have a small opening inside the work area to permit the dumping of dirty bedding material into a waste disposal vessel.

6. Dust mist masks – are a flexible pad held over the nose and mouth by elastic or rubber straps to protect against airborne particulates and including some allergens.
 7. [Respirators](#) – are devices designed to protect the wearer from inhaling harmful dusts, allergens, fumes, vapors, or gases depending on the respirator and required protection, and meet the criteria established by National Institute for Occupational Safety and Health (NIOSH). All NIH employees required to wear a respirator must be trained and enrolled in the [NIH Respiratory Protection Program](#) (RPP): This includes both powered air-purifying respirators (PAPRs) and N-95 respirators. Personnel interested in voluntary use of a respirator must contact the DOHS Respiratory Protection Program Manager for training and evaluation of potential hazards associated with the wearing of the respirator.
- C. Institutes and Centers (IC) – Research institutes and centers, plus the National Library of Medicine, which report directly to the Director, NIH.

III. Responsibilities

A. Supervisor shall –

1. Be fully aware of their role and responsibilities as established in the NIH Policy Manual [1340 - NIH Occupational Safety and Health Management](#).
2. Ensure all visitors and support services personnel entering their work area are appropriately informed of the presence of animal allergens in their area of responsibility.
3. Ensure that the use of effective control measure(s) and other procedures are implemented to minimize human exposure to these hazards.
4. Select and employ standard operating procedures that reduce the potential for allergen exposure, injury, or illness to the lowest practical level.
5. Ensure that employees performing official duties and who become ill or are injured on the job have access to appropriate first aid and/or medical attention.
6. Ensure all employees and contact personnel under their direct responsibility are instructed and/or trained on the effective practices and procedures that safely minimize the impact of animal allergen contamination within the work environment. Supervisors:
 - (i) Shall review the contents of this policy with their employees and implement appropriate practices, procedures, and personal protective equipment (PPE) to minimize allergen exposure.
 - (ii) Shall specifically instruct their employees on the proper use of PPE for the proposed assigned tasks working with animals.
 - (iii) Shall specifically instruct their employees on the proper disposal of products and material directly related to the assigned tasks working with animals.
 - (iv) Shall ensure that all personnel requiring a respirator or voluntarily using a respirator comply with the DOHS Respiratory Protection Program.

B. Employee shall –

1. Be fully aware of their role and responsibilities as established by NIH Policy Manual [1340 - NIH Occupational Safety and Health Management](#).
2. Receive the appropriate training related to this document from their immediate supervisor and understand their role.
3. Adhere to the instructions provided by their supervisor, complete all required training prior to commencement of their duties, and report any potential unhealthful conditions, actions or infractions to the appropriate official.
4. Perform their work in a safe manner by utilizing appropriate control measures and procedures to ensure they do not place themselves, coworkers, visitors or support personnel at risk.
5. Wear the appropriate PPE described by their immediate supervisor, or when in an animal facility, follow the facility's standard operating procedures while performing any task working with animals to prevent allergen exposure.
6. Adhere to the instructions given by their immediate supervisor regarding the proper disposal of products and material directly related to the assigned tasks working with animals.

IV. Laboratory Environment

When animals are brought into the general laboratory setting, precautions are necessary to prevent sensitization of laboratory workers to laboratory animal allergens and to protect workers who may already have laboratory animal allergies or asthma.

This policy provides further guidance to investigators who must remove animals from the animal facility and work with them in a laboratory setting. This policy is designed to be adapted to each laboratory setting with the intent of containing laboratory animal allergens and preventing sensitization. The following program elements shall be implemented outside of an animal facility to ensure full compliance with this program.

A. Signage

1. All laboratories located outside of an animal facility in which animal procedures are conducted shall be posted with a sign on the door warning employees that animals may be present in the workplace.
2. When there is more than one entrance into the laboratory, all entrances must be adequately posted.
3. The appropriate signage is obtained through the DOHS. DOHS can be contacted by telephone at 301-496-2346.

B. Use of Primary Barrier Equipment

1. When animals are brought into a laboratory, primary barrier equipment shall be used wherever possible to minimize the spread of allergens throughout the laboratory.
2. Ideally, animal work should not be conducted on an open bench.
3. Additional PPE may be required based on the identified chemical, biological, and physical hazards from the comprehensive safety risk assessment conducted in consultation with the IC designated DOHS safety and health specialist.

C. Laboratory Clothing

1. To afford maximal protection, personnel working with animals in the general laboratory setting should ideally wear disposable laboratory coats or other disposable coverings to prevent contamination of clothing with animal dander and other animal associated allergens.
2. Non-disposable laboratory coats or other coverings must be laundered frequently to minimize the accumulation of particulates and allergens. Laboratory clothing should never be laundered at home.
3. Disposable garments should be removed, carefully turned inside out, rolled and placed in a [medical pathological waste](#) (MPW) container upon completion of work as stipulated in the NIH Waste Disposal Guide. Alternatively, garments can be placed in a plastic bag and sealed for disposal via routine garbage.
4. Gloves should be worn. Upon completion of work they should be removed and be disposed of properly in a MPW receptacle.

D. Decontamination of Work Areas

1. Hands and forearms should be washed with soap and water.
2. MPW containing animal carcasses, discarded personal protective equipment and wastes must be appropriately closed and removed from the laboratory as soon as practical.
3. Surfaces should be cleaned with a suitable disinfectant to remove residual dander, hair or other animal-related allergens such as urine proteins.
4. When it is impossible to use containment equipment, every effort should be made to localize the work to prevent widespread dispersal of laboratory animal allergens within the work area. When LEV or filtered exhaust systems are not available, all potentially contaminated surfaces must be washed with soap and water to remove dander and other allergens.
5. Only NIH approved rodent transport boxes, designed to contain particulates and allergens during transport, shall be used for transport at the NIH (ARAC Guidelines for NIH Rodent Transportation).
6. Used animal transport containers must be kept closed and removed from the laboratory as soon as practical. They shall not be placed in corridors or other public areas for storage or removal unless placed into a plastic bag and sealed.

V. Animal Facility Environment

This policy provides guidance to the animal facility's program management to minimize occupational exposures to animal allergens. It is designed to be adaptable to each circumstance with the intent of containing and/or minimizing animal allergens in the macroenvironment.

A. Use of Primary Barrier Equipment

1. NIH animal facilities utilize different primary barrier equipment to help minimize the level of allergens and dander within the macroenvironment of the animal facility. These devices are specific to the animal facility's husbandry and veterinary procedures with emphasis on the animal caging.
2. Animal facility standard operating procedures are created for the tasks of cage changing and animal waste management. When dumping cages, procedures are incorporated to minimize exposure to animal allergens. Ideally, cages should be either wetted down before they are dumped or a cage dumping system (e.g. Somat, Garb-el, ventilated dump station, etc.) should be used.
3. Employees shall also use the recommended PPE.
4. Work on an open bench with an animal is discouraged.

B. Disposable Laboratory Clothing.

1. To afford maximal protection, personnel working with animals should ideally wear disposable PPE to prevent contamination of clothing with animal dander and other animal associated allergens.
2. Used disposable garments should be carefully removed, and handled as outlined in each animal facility's standard operating procedures. Care must be taken to minimize the spread of attached particulates and allergens
3. Gloves should be worn and removed upon completion of work and be disposed of properly in accordance with established animal facility guidelines.

C. Decontamination of Work Area

1. Hands and forearms should be washed with soap and water.
2. Medical pathological waste receptacles containing animal carcasses, discarded personal protective equipment and wastes shall be appropriately closed and removed from the area as soon as practical.
3. Once their use is complete, approved animal transport containers must be kept closed and removed from the area as soon as practical.
4. Surfaces shall be cleaned, using a wet method, to remove residual dander, hair or other animal-related allergens such as urine proteins.

5. When it is impossible to use primary barrier containment equipment, every effort should be made to localize the work to prevent widespread dispersal of laboratory animal allergens within the work area. When LEV or filtered exhaust systems are not available, all potentially contaminated surfaces must be washed with soap and water to remove dander and other allergens.
6. HEPA equipped vacuum systems shall not be used unless they exhaust outside the building.

VI. Presence of Sensitive Workers

When workers who have allergies or asthma resulting from sensitivity to animal allergens are present in a laboratory or animal facility and they have self-identified to the laboratory supervisor or Laboratory/Branch Chief, every effort shall be made to establish an “animal free zone” within the confines of the laboratory. These areas must be posted so that animals and materials and clothing that may be contaminated with animal allergens are excluded from the “animal free zone”.

When, due to the nature of the research being performed, an adequate animal free zone cannot be established, the Laboratory/Branch Chief shall provide reasonable accommodation that, if available, may include identification of an alternative work area/assignment for the affected employee.

The DOHS Occupational Medical Service (DOHS/OMS) should be contacted to provide evaluation of medical documentation in these situations.

VII. Medical Evaluation and Management

All employees working with animals or animal tissues must be appropriately enrolled into an AEP. The DOHS/OMS manages the NIH AEP and provides individually tailored medical evaluation and management.

Employees enrolled in the NIH AEP will be given a copy of the OMS primer “*Allergies to Laboratory Animals, A Significant Health Risk*” at their initial visit to the clinic. An OMS clinician will obtain all relevant past medical history, including existing allergies, and review the educational information with each employee. If the employee has an existing allergy to animals, the employee will be referred to DOHS for enrollment into the [NIH Respiratory Protection Program \(RPP\)](#).

Employees are required to report signs and symptoms of animal allergy to OMS promptly, so that appropriate interventions can be implemented. An OMS clinician interviews employees that report possible allergic reactions to laboratory animals. If clinically indicated, the worker may be referred to a designated IC safety and health specialist for further medical management. If the worker’s concerns are confirmed, workers’ compensation forms are issued, and the relevant DOHS Occupational Safety and Health Specialist will be consulted to assist the immediate supervisor with the worksite evaluation and recommend improvements to minimize exposure to allergens.

VIII. Supporting NIH Policies

- A. NIH [Policy Manual 1340 Occupational Safety and Health Management](#)
- B. NIH [Policy Manual 3040-2 Animal Care and Use in the Intramural Program](#)
- C. NIH Facility Design Requirements
 - 1. NIH [Design Requirement Manual - 2008](#)
 - 2. NIH Design Requirement Manual - Section 2.4 Animal Research Facilities

IX. Program Evaluation

The DOHS routinely evaluates the NIH-LAAPP to ensure that the program is effectively meeting its goal of preventing, to the extent feasible, the development of occupationally acquired allergies to laboratory animals. The evaluation includes a review of all illness reports of allergies to laboratory animals to determine areas of concern or need for program enhancement. Outcomes of these reviews are communicated to the NIH Office of Animal Care and Use (OACU), the NIH Animal Research Advisory Committee (ARAC), and the Animal Program Directors (APDs) for their information, review and input to further enhance the effectiveness of the LAAPP.

X. Points of Contact

Office of Research Services, Division of Occupational Health and Safety

	Campus, Bethesda, Maryland	National Institute on Drug Abuse (NIDA), Baltimore, Maryland	Integrated Research Facility (IRF) Frederick, Maryland	Rocky Mountain Laboratories, Montana
Occupational Medical Service	Bldg 10, Room 6C-306 301-496-4411	251 Bayview Blvd, Suite 200 443-740-2309	8200 Research Plaza, Room 1B-116 301-631-7233	903 South 4 th St., Room 5202 406-375-9755
Division of Occupational Health and Safety	Bldg 13, Room 3K-04 301-496-2346	251 Bayview Blvd, Suite 200 443-740-2308	8200 Research Plaza, Room 1A- 124 301-631-7244	903 South 4 th St., Room 5204 406-363-9431

Additional Reading

- A. NIH Office of Research Services, Division of Occupational Health and Safety, Personnel Using Animals Web Site, 2013, <http://www.ors.od.nih.gov/sr/dohs/Resources/Pages/Animal-Related-Personnel.aspx>
- B. Lab Animal, January 2013, Volume 42, No 1, [[LabAnimal](#)] The characteristics, treatment and prevention of laboratory animal allergy, Corradi M, Ferdenzi E, Mutti A
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