UC RIVERSIDE
Occupational Health

Lab Animal Allergies and Occupational Asthma

What are lab animal allergies and occupational asthma?

Laboratory Animal Allergies (LAA) and Occupational Asthma (OA) can develop from exposure to animal allergens and are among the most common and serious occupational diseases affecting workers who are exposed to laboratory animals.

Laboratory animal allergens can be found in animal urine, dander, hair, saliva, serum, fur, bedding, and contaminated dust particles. Urine, particularly rodent urine, is one of the most common and significant sources of allergenic proteins.

Inhalation is the primary route of exposure to animal allergens; however, exposure may also occur through skin contact, eye contact, or ingestion.

Surveys indicate that the incidence of laboratory animal allergy may be as high as 46% among exposed workers. Allergies most frequently develop within the first three years of exposure.

The most common symptoms include rhinitis, such as sneezing, congestion, and runny nose; conjunctivitis, such as red or itchy eyes; and contact urticaria, such as skin hives. Approximately 10% of individuals with laboratory animal allergy develop asthma.

How many people develop allergies?

According to the National Institute for Occupational Safety and Health (NIOSH), approximately 33% of animal handlers have allergic symptoms and approximately 10% have symptoms of animal-induced asthma.

What are some of the symptoms?

Symptoms may occur as early as 10 minutes after exposure or within 12 months of significant contact with laboratory animals.

Common symptoms include:

- ☐ Itchy, watery eyes
- ☐ Itchy or runny nose
- ☐ Sneezing or nasal congestion
- ☐ Skin rash or hives
- ☐ Coughing
- ☐ Wheezing
- ☐ Chest tightness
- ☐ Shortness of breath

Employees experiencing wheezing, chest tightness, difficulty breathing, or severe allergic reactions should leave the exposure area and seek medical evaluation immediately.

Employees should report allergy symptoms early to Occupational Health, especially if symptoms worsen during or after animal work. Early identification and exposure reduction may reduce the risk of progression to occupational asthma.

What are some of the risk factors?

- ☐ **Exposure:** Working with animals or in animal housing areas is the most significant known risk factor.
- ☐ **Genetics:** Some individuals are predisposed to develop allergies and asthma.
- ☐ **Pre-existing allergies or asthma:** Individuals with existing allergies, asthma, or atopic conditions may be at increased risk.
- ☐ **Environment:** Working in animal-related areas without appropriate ventilation or exposure controls may increase risk.

How are allergens transmitted?

Animal allergens may enter the body through the skin, eyes, nose, mouth, or mucous membranes. However, inhalation of airborne allergens is one of the most significant routes of exposure.

Once sensitization occurs, even small amounts of allergen exposure may trigger symptoms in some individuals.

Symptoms may also continue after leaving work if allergens are carried on clothing, shoes, hair, skin, equipment, or personal items.

Will my allergies go away?

Laboratory animal allergies and occupational asthma are often long-term or permanent conditions, even when exposure stops and symptoms improve. Early identification, symptom reporting, medical evaluation, and exposure reduction are important to reduce the risk of long-term disease.

Symptoms may also continue after leaving work if allergens are carried on clothing, hair, shoes, skin, equipment, or personal items.

How can I prevent LAA and OA?

Prevention of laboratory animal allergies and occupational asthma requires collaboration among employees, supervisors, Principal Investigators (PIs), Occupational Health, Environmental Health & Safety (EH&S), veterinary staff, the Institutional Animal Care and Use Committee (IACUC), and institutional leadership.

Prevention is most effective when controls are layered using the hierarchy of controls: engineering controls, administrative controls, safe work practices, and personal protective equipment (PPE).

1. Participate in Occupational Health Surveillance

Employees who work with animals, animal tissues, or who enter animal housing or procedure areas must complete required occupational health surveillance activities.

This may include:

- ☐ Completing the Occupational Health Surveillance System (OHSS) Health Questionnaire.
- ☐ Participating in ongoing occupational health surveillance and medical evaluations as required by Occupational Health.
- ☐ Reporting allergy symptoms early, especially if symptoms worsen during or after animal work.
- ☐ Notifying Occupational Health if PPE does not appear effective or if symptoms continue despite controls.

Occupational health surveillance helps identify early allergy symptoms, evaluate exposure-related concerns, and determine whether additional controls, medical evaluation, or work modifications may be needed.

Medical information shared with Occupational Health is maintained confidentially in accordance with applicable privacy and occupational medical record requirements.

2. Use Engineering Controls

Engineering controls should be used whenever possible to minimize airborne animal allergen exposure.

Examples include:

- ☐ Biological Safety Cabinets (BSCs).
- ☐ Filter-top cages.
- ☐ Individually ventilated cages (IVCs).
- ☐ Negative-pressure cage systems.
- ☐ Ventilated cage-changing stations.
- ☐ Isolators.
- ☐ Cubicle containment systems.
- ☐ Downdraft tables, when available.
- ☐ Local exhaust ventilation.
- ☐ Appropriate room ventilation systems.
- ☐ HEPA-filtered equipment, when applicable.
- ☐ Approved fume hoods or other appropriate containment devices for cage changing or bedding-related activities in satellite or non-vivarium locations.

"The article notes that these systems can significantly reduce allergen exposure. Filter tops reduced airborne allergens by up to 94%, negative-pressure IVC systems substantially reduced room allergen levels, and ventilated cage-changing stations reduced worker exposure by approximately 55–57%" (Harrison, 2001).

3. Follow Administrative Controls and Required Training

Administrative controls help reduce exposure by ensuring personnel understand hazards, complete required training, and follow approved procedures.

Personnel should:

- ☐ Complete required training before working with animals.
- ☐ Review laboratory-specific hazard assessments.
- ☐ Follow applicable standard operating procedures.
- ☐ Minimize unnecessary time in high-exposure areas.
- ☐ Conduct animal procedures only in approved locations.
- ☐ Keep animal work areas clean and uncluttered to reduce allergen buildup on surfaces and equipment.
- ☐ Avoid touching the face while working with animals.
- ☐ Wash hands after working with animals or animal tissues.
- ☐ Avoid eating, drinking, or applying cosmetics in animal work areas.
- ☐ Prevent contaminated PPE, bedding, animal-related materials, or equipment from being used or stored in offices, breakrooms, or other non-animal areas.

4. Follow Standard Operating Procedures

All animal work should be conducted according to applicable standard operating procedures. New or revised procedures should be designed to minimize exposure to animal allergens.

Examples include:

- ☐ Conduct animal procedures in approved locations.
- ☐ Perform higher-exposure procedures inside approved containment equipment when feasible.
- ☐ Use procedures that reduce aerosolization of allergens.
- ☐ Limit unnecessary handling of animals, cages, bedding, and contaminated materials.
- ☐ Follow proper cleaning and decontamination procedures.
- ☐ Remove contaminated PPE before leaving animal rooms or procedure areas.

5. Wear Personal Protective Equipment

PPE should be selected based on the risk assessment, the species involved, the task being performed, and the potential exposure level.

PPE may include:

- ☐ Disposable gowns or lab coats.
- ☐ Gloves.
- ☐ Eye protection or face protection, when needed.
- ☐ Hair bonnet or bouffant, when required or recommended.
- ☐ Respiratory protection, when required.
- ☐ Disposable gowns and gloves should be removed before leaving animal rooms or procedure areas to prevent allergens from being carried into offices, vehicles, homes, or other non-animal areas.
- ☐ Hair bonnets or bouffants may help reduce allergen attachment to hair and decrease the likelihood of allergens being carried home to pillows, bedding, or other personal areas. Studies have demonstrated that laboratory animal allergens can accumulate on uncovered hair and may subsequently be transferred into the home environment. (Krop et al., 2007).
- ☐ Double gloving may help reduce allergen exposure from glove tears, pinholes, or contamination during glove removal. It also allows removal of the outer glove during contamination events while maintaining an inner protective barrier.
- ☐ When appropriate for the task or exposure level, personnel may wear double gloves with the inner glove placed under the lab coat or gown cuff and the outer glove placed over the cuff to help reduce skin exposure and contamination.

6. Use Respiratory Protection When Required

When respiratory protection is required by the risk assessment or Occupational Health determination, personnel must participate in the Respiratory Protection Program before using a respirator.

This includes:

- ☐ Medical clearance.
- ☐ Fit testing.
- ☐ Respirator training.
- ☐ Proper use, storage, and maintenance.

Respirators must not be used for required protection unless the individual has completed medical clearance, fit testing, and training.

When properly selected and used, N95 respirators or powered air-purifying respirators (PAPRs) can help reduce allergen exposure and may reduce sensitization, illness, and severity of symptoms.

When using an N95 respirator, appropriate eye protection such as safety glasses or goggles should also be worn when there is a potential for allergen, dust, bedding, animal fluids, splashes, or aerosol exposure to the eyes. Eye protection may also help reduce hand-to-eye transfer of allergens during animal work.

7. Supervisor and PI Responsibilities

Supervisors and Principal Investigators are responsible for ensuring that animal work is conducted safely and that required controls are implemented.

Supervisors and PIs should:

- ☐ Ensure personnel complete required occupational health enrollment and training.
- ☐ Ensure appropriate PPE, engineering controls, and work practices are available and used.
- ☐ Encourage early reporting of symptoms.
- ☐ Support exposure reduction measures when symptoms or concerns are identified.
- ☐ Ensure animal procedures are conducted in approved areas using appropriate containment and controls.
- ☐ Avoid allowing contaminated PPE or animal-related materials to be used or stored in offices, breakrooms, or other non-animal areas.

What You Can Do to Prevent Take-Home Animal Allergen Exposure

The best way to keep laboratory animal allergens out of your home is to prevent them from leaving the animal work area.

At work:

- ☐ Wear required PPE, such as lab coats, gowns, gloves, sleeves, hair coverings, eye protection, or respiratory protection, as required by the lab's hazard assessment.
- ☐ Remove PPE before leaving the animal room, procedure area, or laboratory.
- ☐ Avoid wearing contaminated lab coats, gowns, or protective clothing in offices, breakrooms, vehicles, or at home.
- ☐ Change clothes and shoes before leaving work when possible, especially after higher-exposure animal tasks.
- ☐ Keep work-exposed clothing and shoes separate from clean clothing and personal items.
- ☐ Wash hands, exposed skin, and forearms after animal work and after removing PPE.
- ☐ Shower before leaving work when available, especially after cage changing, bedding disposal, animal handling, or other higher-exposure tasks.

If you cannot change clothes or shower at work:

- ☐ Remove work shoes before entering your living space, or as soon as you enter your home.
- ☐ Change out of work-exposed clothing as soon as possible.
- ☐ Wash work-exposed clothing promptly when possible.
- ☐ Launder work-exposed clothing separately from household laundry.
- ☐ Wash your hands, face, exposed skin, or shower as soon as you get home.

These steps help reduce continued exposure after work and help prevent laboratory animal allergens from being transferred to your home, vehicle, furniture, bedding, or household members.

Tasks Associated with Higher Allergen Exposure

Tasks associated with higher allergen exposure may include, but are not limited to:

- ☐ Cage changing
- ☐ Bedding disposal
- ☐ Animal handling or restraint
- ☐ Cage washing
- ☐ Shaving or grooming animals
- ☐ Necropsy procedures
- ☐ Transporting dirty cages, bedding, or animal-related equipment
- ☐ Working in rooms where animals are housed or brought in for procedures

In the document Controlling exposure to laboratory animal allergen notes that “allergen exposure during these activities can be up to 10 times higher than ambient room concentrations” (Harrison, 2001).

Can I develop allergies if I don’t work with animals?

Yes. Individuals who do not directly handle animals may still be exposed to laboratory animal allergens, including in satellite locations where animals are housed, handled, transported, or brought in for procedures.

Secondary exposure may occur through:

- ☐ Nearby workspaces
- ☐ Shared laboratory environments
- ☐ Satellite animal procedure areas
- ☐ Contaminated surfaces
- ☐ Ventilation airflow
- ☐ Movement of cages, bedding, waste, or equipment
- ☐ Allergens carried on clothing, shoes, hair, skin, or personal items
- ☐ Shared offices, desks, chairs, phones, keyboards, carts, or other equipment
- ☐ Household exposure from contaminated work clothing or shoes

For example, administrative staff, students, facilities personnel, custodial staff, or other employees may be exposed if they work near animal areas, enter rooms where animals are used, clean contaminated spaces, or share areas where animal allergens are present.

Household members may also be exposed if allergens are carried home on work clothing, shoes, hair, or personal items.

Note: Children of laboratory animal workers have been reported to have an increased incidence of childhood asthma. Studies have also found mouse allergen in homes of laboratory workers, particularly in pillows and mattresses.

When should I contact Occupational Health?

Contact Occupational Health if:

- ☐ Symptoms worsen during or after animal work.
- ☐ You experience wheezing, chest tightness, coughing, or shortness of breath.
- ☐ You experience skin, eye, or nasal symptoms related to animal work.
- ☐ PPE does not appear to be effective.
- ☐ You need respirator medical clearance or fit testing.
- ☐ You believe workplace exposures may be affecting your health.
- ☐ You have questions about medical surveillance, work restrictions, or exposure controls.
- ☐ You experience an exposure incident or develop symptoms potentially associated with laboratory animal allergens.

Employees and researchers who experience worsening symptoms during or after animal work should notify Occupational Health promptly. Symptoms such as wheezing, chest tightness, persistent coughing, or shortness of breath may indicate progression toward occupational asthma and should not be ignored.

For severe symptoms such as difficulty breathing, swelling, dizziness, or suspected anaphylaxis, leave the exposure area and seek emergency medical attention immediately.

Additional Information

- Occupational Health: (951) 827-9902 or ehsocchealth@ucr.edu
- EHSRM Biosafety: (951) 827-5528 or ehsbiosafety@ucr.edu

Information adapted from guidance provided by NIOSH, OSHA, ACOEM, UCLA EH&S, and Occupational Health literature regarding laboratory animal allergy and occupational asthma prevention, including the 2025 ACOEM Guidance Statement: *Laboratory Animal Allergy*.

Stave GM, Swift MD, Gochnour MK, et al. *ACOEM Guidance Statement: Laboratory Animal Allergy*. Journal of Occupational and Environmental Medicine. 2025;67(5):376-384. https://journals.lww.com/joem/fulltext/2025/05000/laboratory_animal_allergy.12.aspx?utm_

Harrison, D. J. (2001). *Controlling exposure to laboratory animal allergens*. ILAR Journal, 42(1), 17–36. https://pubmed.ncbi.nlm.nih.gov/11123186/

Krop EJM, Doekes G, Stone MJ, Aalberse RC, van der Zee JS. *Spreading of occupational allergens: laboratory animal allergens on hair-covering caps and in mattress dust of laboratory animal workers.* Occupational and Environmental Medicine. 2007;64:267–272. https://pmc.ncbi.nlm.nih.gov/articles/PMC2078456/?utm_

Laboratory Animal Allergy Exposure and Safety Acknowledgement

By signing below, I acknowledge that I have reviewed and understand the requirements associated with Laboratory Animal Allergies (LAA) and Occupational Asthma (OA). I agree to comply with all applicable safety practices, training requirements, and responsibilities related to working with or around laboratory animals.

I understand that these responsibilities include, but are not limited to:

- Following all required safe laboratory practices and proper use of personal protective equipment (PPE)
- Promptly reporting any exposures, incidents, symptoms, or safety concerns to my supervisor, Biosafety Officer, and Occupational Health

Name (Print)	Identification*	Signature	Date	Supervisor / Principal Investigator

*Identification: Provide your UCR Student ID, Employee ID, UCR NetID, UCR Email, or Date of Birth.

ANIMAL OCCUPATIONAL HEALTH & SAFETY FOR INDIVIDUALS WITH RESEARCH ANIMAL EXPOSURE

UC RIVERSIDE
Environmental Health
Safety and Risk Management

INTRODUCTION



Many research programs at UC Riverside (UCR) use animals to study behavior, disease processes and treatments, and to better understand immunological and microbial interactions. The majority of animals at UCR are rodents, but other research animals may be present including birds, fish, chickens, snakes, and other vertebrates.

WHAT ARE THE RISKS?

- The most common risk is development or worsening of **allergies** to animals or **occupational asthma** as a result of exposure to animal allergens.
- Transmission of infectious diseases from an animal to a human (zoonosis).
- Individuals who are pregnant or planning to become pregnant and those with a compromised immune system may be at increased risk if they are exposed to infectious agents.

WHAT IS THE ANIMAL OCCUPATIONAL HEALTH PROGRAM (AOHP)?

UCR's AOHP is administered by EHSRM Occupational Health in coordination with the Office of Research Compliance, the Institutional Animal Care and Use Committee, and the Office of the Campus Veterinarian.

The program includes initial enrollment and general education for personnel with direct contact to research animals, health history screening, routine and special immunizations, health surveillance, and, if necessary, enrollment in the Respiratory Protection Program.

WHO MUST ENROLL AND PARTICIPATE IN THE AOHP?

All faculty, staff, students, and affiliates whose duties involve direct, casual, or reasonably anticipated exposure to animal allergens, bedding, waste, cages, contaminated equipment, aerosols, or other animal-associated hazards must complete full AOHP enrollment.

HOW TO ENROLL AND PARTICIPATE IN THE AOHP?

1. Full AOHP Enrollment

Individuals requiring full AOHP enrollment are identified by assigned duties, job responsibilities, anticipated exposures, or inclusion on an IACUC-reviewed Animal Use Protocol.

Enrollment is completed via the Occupational Health Surveillance System (OHSS), which includes:

- **Risk Assessment:** The Principal Investigator (PI) describes the individual's duties, species, procedures, hazardous agents, exposure level, and required controls.
- **Health Questionnaire:** The participant completes a confidential questionnaire for review by a UC Irvine COEH occupational medicine physician.
- **Medical Clearance:** The physician establishes clearance status, required or recommended services, functional restrictions, and the next review date.

Participants must obtain medical clearance before beginning covered animal work. Services recommended by the physician may be declined unless determined necessary for clearance or safety.

2. Reassessment Triggers

Participants must submit an early reassessment whenever a significant change occurs, including:

- **Health Changes:** Pregnancy, worsening allergies, asthma, illness, or immunodeficiency.
- **Workplace Changes:** Changes in assigned duties, animal species, procedures, hazardous agents, location, or exposure levels.

3. Non-Contact & Visitor Access

- **Non-Contact Personnel:** Individuals who enter animal-use areas solely to perform non-animal duties—and do **not** handle animals, specimens, bedding, waste, cages, contaminated equipment, or research materials—are **exempt from full AOHP enrollment**. Instead, they complete the **UCR Non-Contact Animal Exposure Acknowledgment form**. Full AOHP enrollment must be reassessed if their duties, access, or anticipated exposure changes.
- **Escorted Visitors:** Continuously supervised visitors, including vendors, are managed under applicable facility visitor procedures.

CONTACT INFORMATION

For assistance with Animal Use Protocols, amendments, training requirements, and animal use activities:
iacuc@ucr.edu
951-827-4813

For assistance with immunizations and Health Questionnaire issues:
ehsocchealth@ucr.edu
951-827-5528

For assistance with respiratory protection:
ehsih@ucr.edu
951-827-5528