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<b>Distribution</b>	RAR, ACUC, Researchers	

**Title: HM-43: Johns Hopkins University (JHU) Guidelines for Research Animal Housing in Satellite Facilities**

Purpose: This document sets forth JHU policy regarding satellite animal housing facilities, outlines the salient features of such housing that must be addressed, and summarizes the activities needed to ensure that the entire animal housing and care program meet JHU standards.

“Satellite facility” is defined as any area outside of JHU’s centrally-managed housing facilities where animals are maintained for more than 24 hours (12 hours for species covered by the Animal Welfare Act Regulations).

In brief, the elements critical to our success include a laboratory point (or points) of contact (POC) with direct or delegated responsibility for the satellite facility; physical plant and environmental considerations; appropriate choices of caging, husbandry procedures, and sanitation procedures for equipment used with animals; management of caging and supplies; arrangements for daily animal care; and veterinary care.

**I. POLICY**

JHU is committed to a uniform standard of excellence in all aspects of its animal care and use program. The entire program is based on the recommendations of the Guide for the Care and Use of Laboratory Animals (Guide). At JHU, Research Animal Resources (RAR) is responsible for the animal housing and veterinary care programs.

The operating standard at JHU is to maintain animals within its centralized animal housing facility program managed by RAR. The scientific needs of some research programs or particular phases of some projects may not be able to be accommodated within central facilities, however. In those cases, satellite housing is needed. The JHU Animal Care and Use Committee (ACUC) must review and approve the scientific rationale for short- or long-term satellite housing in the context of the applicable research protocol. The Guide indicates that convenience alone is not sufficient justification to maintain animals in satellite housing.

The policy of the JHU ACUC is to provide the RAR Director of Laboratory Animal Management copies of protocol and amendment applications involving satellite housing to enable RAR (1) to determine whether the activity can be accommodated within central facilities and (2) to provide consultation on the written plan for care in satellite housing that has been submitted to the ACUC. For first-time satellite

housing location requests, ACUC evaluation of the request also requires a consultative inspection of the location by the Director or a designee.

Regardless of the length of time an animal is housed in an ACUC-approved satellite facility, the principal investigator (PI) on the ACUC-approved protocol is responsible for seeing that its housing and care are consistent with JHU Policy. To facilitate this, RAR is responsible for maintaining contact with the satellite facility to assure appropriate support, guidance, and oversight of the care of animals housed there.

By their very nature, physical plant, housing, and procedures in satellite facilities will deviate in some manner from those in central facilities. Adherence to the general principles of the Guide and to an overarching focus on animal welfare consistent with the needs of the research procedures approved by the ACUC is a basic tenet of this policy. The Guide itself sets forth an emphasis on a “performance approach,” as preferable to an “engineering approach.” That is, “Performance standards define an outcome in detail and provide criteria for assessing that outcome, but do not limit the methods by which to achieve that outcome.” (Guide, 2011) Given the wide range of research at JHU, it is possible that this document does not adequately address potential variations on housing and procedures that will arise. We anticipate that such variations will be discussed with RAR as they arise and incorporated in the laboratory standard operating procedures as appropriate.

This document has been written to be very general, but applies primarily to satellite housing of mammals and birds. A supplementary policy applies to fish and aquatic species.

## **II. STANDARDS**

### **A. The Laboratory Point of Contact (POC)**

Accountability for the care of animals housed in satellite facilities is established formally in the satellite housing application through a laboratory POC. This person may be either the PI or another qualified person with delegated responsibility to ensure that the care given to laboratory animals in the satellite facility will be consistent with this policy. When delegated by the PI to a JHU staff member, POC responsibility should be listed as a major element on the individual’s job description and annual performance evaluation. In some laboratories, depending on the continuity of animals in satellite housing, it is desirable to appoint a secondary POC as well.

The POC may operate by directing and overseeing others in the laboratory who are performing hands-on care, may perform laboratory-based care as a primary function, or may provide RAR technical personnel with specialty guidance to enable them to care for animals with unique experimental requirements in the satellite facility. The POCs are required to be familiar with and to follow the provisions of this policy and other institutional standards (e.g., RAR policies and ACUC-approved policies and guidelines) in support of the institution’s mission to provide high quality care to all laboratory animals, regardless of housing location.

Laboratories are encouraged to create a simple task list for animal care, to have a posted list of the trained personnel who will provide back-up care in the absence of the primary care-giver(s), and to clearly establish the mechanism for arranging coverage by back-up personnel. Regardless of the approach to providing care, the POC is seen as responsible for assuring that all animals housed in the satellite receive adequate care every day.

Each satellite facility must have a copy of the Guide readily available, and the POC should be familiar with its contents. The Guide may be obtained free of charge from the ACUC office. Training and orientation sessions on satellite housing are arranged periodically by the ACUC office and/or RAR for POCs and others who are interested in this topic. In addition, RAR personnel make regular, usually weekly, visits to each satellite facility, which provides the opportunity for addressing emerging issues relevant to each location.

## B. Daily Checklist

Most of the critical elements of a basic program of laboratory-based care are included in a “Daily Animal Room Checklist” used in central facilities, which is available from RAR. This checklist provides a means for recording basic required elements of animal maintenance (i.e., temperature and humidity in the housing location as well as annotation that all animals were visually inspected seven days a week). It may also incorporate other actions performed in support of the animals in that location, as applicable. This sheet, as well as the animal census sheet, must be submitted at the end of each month by the method requested by RAR.

## C. Physical Plant and Environmental Conditions in Satellite Housing Areas

**General Principles:** According to the Guide (Chapter 4, Physical Plant), animal housing facilities should be constructed with smooth, durable, impervious surfaces to aid in maintaining a high level of sanitation and to permit effective pest and infection control efforts. The room interior should have sealed penetrations (for pest control), ceiling mounted and sealed light fixtures, and minimal cabinetry or shelf work. The room heating, ventilation and air conditioning system should provide 10 or more air changes of 100% fresh, non-recirculated air in a temperature range suited for the species involved, and between 30-70% relative humidity. Whenever possible, animal housing areas should be isolated from other areas containing personnel who do not need to have animal contact, and the differential airflow between the housing area and other personnel areas should be negative pressure to reduce personnel exposures. All JHU personnel should be afforded the opportunity to work with minimal exposure to animal allergens. In housing areas where wet sanitation of walls and floors is conducted on a routine basis, water resistant (i.e., with ground-fault interruption control) electrical outlets and switches should be installed. Animals should be provided with a regular diurnal light cycle of appropriate duration for the species and experimental requirements.

Some satellite housing facilities at JHU were constructed to be consistent with the above. Others are in laboratories, constructed for other purposes, but which may be acceptable if the basic principles of the Guide and performance standards are kept in mind. Thus those arranging satellite housing in a laboratory should direct their efforts to create an acceptable environment by implementing the following:

- 1) Place animals in a dedicated, secure area (e.g., lab bay or portion thereof) out of direct sunlight and, as much as possible, away from other areas in the laboratory that do not involve laboratory animals. The door(s) to the room should be locked when responsible personnel are not present.

- 2) The physical plant in the area should be in good repair. Surfaces should be constructed of materials that can be easily sanitized to the standards required by the research. Remove or seal unsealed wood

(e.g., shelves), unnecessary wall attachments, and replace damaged ceiling tiles. The floor, coving, and walls should be free of defects that allow vermin harborage and impede sanitation.

3) Use a light timer and/or have a laboratory process to ensure that animals have a regular daily light cycle (unless an exception has been granted by the ACUC for scientific reasons). If the room has windows that provide natural light, a timer is not required; but the room light must be turned off reliably rather than left on overnight.

4) Where temperature or humidity fall out of the Guide range for more than three consecutive days (or sooner if preferred), facilities management should be contacted to make adjustments. In some areas, humidity is difficult to maintain at greater than 30% in the winter in Baltimore, even by use of an appropriately placed room humidifier. If this is the case, consult with RAR and/or a veterinarian for appropriate methods to sample humidity at the cage level (for rodents) and/or to document whether the low humidity has an impact on the health of the animal.

#### D. General Housekeeping Provisions for Satellite Housing Areas

1) The housing area must be maintained in a clean and orderly condition.

2) The placement of standard rodent housing cages should permit easy visualization of the animals contained within unless otherwise precluded by the requirements of the experimental protocol.

3) The priority should be on arranging the housing area to facilitate sanitation and pest control. Considerations include:

a) Remove laboratory apparatus, equipment, furniture, books, papers and supplies that are not needed for ongoing experimental or husbandry. Fabric-covered chairs should be moved out of the area.

b) Where practical, movable racks or carts should be used to hold animal cages in the laboratory. The racks or carts ideally will be capable of withstanding sanitation in a mechanical cage washer. If wall mounted shelves or bench tops are used for cage placement, these surfaces should be sanitized when cages are changed.

c) Corrugated cardboard boxes should be moved away from the animal housing area, because the glue in them supports vermin propagation.

d) The floors of the housing area should be swept as needed, and mopped at least weekly.

4) Potentially harmful chemicals should not be stored near animal cages, or in biosafety cabinets or fume hoods when animals are present. All risks that a chemical spill would injure or contaminate animals should be eliminated.

5) Bench space used for animal manipulations should be wiped down with a disinfectant/soap solution after each use. Other surfaces in the housing area (e.g., walls) should be sanitized on a quarterly basis.

## E. Husbandry/Caging Requirements for Rodents: Type, Sanitation Schedule, Movement to and from Laboratory

1) Rodents housed in laboratories must be housed in microbarrier (closed top) caging with a cage lid that is appropriate to the circumstances. These cages aid in infection control, allergen and odor control, and in some cases may improve intra-cage humidity under low room humidity conditions. Whenever appropriate and practical, given the needs of the research, animals/cages in the laboratory should be handled with the infection control techniques (exterior disinfection, manipulation in a biosafety cabinet or cage change station) that are practiced in central RAR facilities.

a. Satellite areas that hold mouse populations in excess of 35 cages in rooms that were not designed for animal housing will be provided with an individually ventilated caging (IVC) rack by RAR if available and if it can be accommodated in the space available. Such a rack helps address issues related to animal health, animal allergens, and cage-changing frequency that may be problematic in satellite facilities. Other containment devices, such as semi-rigid or flexible film isolators, may also be considered for mice or rats in areas with lower cage counts if satellite housing is in a mixed function area. Cage changing in the IVC system should be adequate at the two-week interval used in central facilities.

b. Laboratories housing few rodent cages will be provided with static microbarrier cages. The tops of these cages are perforated to permit air exchange and dispersion of intra-cage moisture. Static microbarrier cages require sanitation weekly for mice, and twice weekly for rats, although longer intervals may be appropriate where rodents are singly housed.

c. If specialized caging used for experimental purposes does not provide an effective cage level barrier between the animal and the laboratory environment, a method of secondary containment is desirable if the housing is in a multiple use area. Specialized cages of this type should be designed to permit the detachment of sensitive components and constructed from materials that permit the cage to be washed in a mechanical cage washer on a weekly or bi-weekly basis. If mechanical washing cannot be done, the method of cage sanitation, including agent(s) used, is to be described in a written standard operating procedure (SOP; see below).

2) The acquisition of clean cages must be coordinated through RAR. Arrangements may be made by the POC to have RAR personnel transport cages to the laboratory.

3) Reassemble dirty cages that contain bedding in the closed position to prevent spillage and access by pests. Transport of cages in the closed-box position is preferred because the piston action of cage stacking has been associated with the airborne spread of pathogens. This may not be practical if large numbers of cages must be moved to the cage wash facilities. If dirty cages are stacked without lids to aid transportation, they must be bagged or covered to prevent the spread of waste, allergens and airborne pathogens during transit. Dirty cages must be taken to the RAR cage wash centers no later than the morning after cage changing. To aid the institutional vermin and infection control efforts, dirty cages with bedding should never sit in the laboratory un-bagged. Empty water bottles in the lab prior to transport to RAR.

4) To ensure that food remains fresh and uncontaminated and does not attract vermin, it must be stored in a container that is kept tightly closed. The container must have the type and production date (mill date),

which are found on the feed bag. Feed must be used before the expiration date, which is 180 days beyond the mill date in most cases. A common method of storing feed in a laboratory is to use a microbarrier sanitized or sterilized rodent cage. A container used for feed storage should be sanitized or replaced with a clean one each time it is emptied.

#### F. Standards for Sanitation and Specific Practices for Laboratory-Based Animal Care and Use Activities

Equipment used for research animal caging, restraint, transport, or experimentation should be designed and constructed to allow efficient cleaning or sterilization as necessary for effective infection control measures. A sound, comprehensive sanitation program for laboratory-based animal care and use activities involves the following components:

- 1) All equipment used in animal housing or to support animal care or in vivo experimental activities must be sanitized at appropriate intervals as specified below. Pertinent equipment may include, but is not limited to, specialized lab housing systems, exposure chambers, restraint chairs, transport boxes, behavioral testing equipment (e.g., mazes, swim tanks), surgery support equipment (e.g., rodent surgery boards), and bell jars used for anesthesia with recovery. Apparatus that is only used in non-survival applications should be cleaned immediately after use, but documentation of effective sanitation is not required.
- 2) Equipment that can withstand treatment in the RAR cage washers should be scheduled for routine sanitation. Equipment that cannot withstand cage washing should be sanitized by appropriate methods devised in the laboratory, which will need to be verified as efficacious by RAR, as described below.
- 3) Mechanisms (e.g., schedules, equipment identification codes) should be established so that a record can be kept of equipment that needs to be sanitized and of the dates on which it is sanitized.
- 4) Laboratories should give high priority to the replacement of equipment that may not be easily sanitized if improved versions that are easy to sanitize are available. If a wooden item is used, it should be sealed with a washable and impervious paint, polyurethane, or varnish that will allow disinfection.
- 5) In general, the minimum interval for the sanitation of equipment that has direct contact with animals used during in vivo studies is two weeks assuming the animals are all of a similar microbiological background. In some cases, more frequent sanitation may be required. The following list summarizes the usual sanitation recommendations for common items other than caging:
  - Large animal food containers on or within cage: Physically clean daily; sanitize every two weeks.
  - Large animal water containers: Sanitize every two weeks.
  - Mouse caging: Change static microbarrier cages weekly; change IVC caging every other week.
  - Rat caging: Change static microbarrier cages twice weekly.
  - Rodent water bottles: Provide fresh bottles weekly. Obtain reverse osmosis treated water from central facilities if needed for the experiments being conducted.
  - Animal transport devices: Clean between animals; sanitize every two weeks, or between animals if warranted by disease conditions.
  - Animal restraint chairs/devices – clean between animals, sanitize every two weeks or between animals if warranted by disease conditions

- Experimental animal exposure chambers: If the animals are contained in a cage within a chamber then every two weeks. If the animals have direct contact with the chamber, it should be cleaned between individuals and sanitized every other week.
  - Behavioral test apparatus: Clean between animals or cohorts as dictated by scientific requirements; sanitize every two weeks.
  - Equipment used to support animal survival surgery and post operative care: Physically clean between animals or surgical cohorts (on a given day); sanitize every two weeks during periods of active use and keep area uncluttered.
  - Additional items can be discussed during meetings with RAR.
- 6) Sanitation of items should be recorded on the “Daily Animal Room Checklist” or on a comparably maintained sanitation record that can be submitted to RAR.
- 7) Equipment that can be sanitized (or sterilized) in a cage washer is automatically afforded the benefit of existing quality assurance measures (i.e., temperature-time monitoring, microbiological monitoring). As noted in the Guide, hand sanitation is less reliable than cage washing, and the process used must be shown to be efficacious. For caging and equipment that must be sanitized by hand, laboratories should have written SOPs that describe the sanitation process, specify the chemical agents used, and indicate the contact times necessary for disinfection as applicable. RAR will provide guidance on what information should be included in the SOPs and information on the laboratory disinfectants it has available for equipment, and will assist in the selection of suitable agents. Periodic assessment of the efficacy of the sanitation process will be conducted by RAR to determine whether alteration of the procedure is needed.

### **III. VETERINARY CARE AND PARTICIPATION IN THE RAR RODENT SENTINEL SURVEILLANCE PROGRAMS FOR ANIMALS HOUSED IN SATELLITE AREAS.**

The program of veterinary care at JHU is housed in RAR, under the Director of Laboratory Animal Medicine. The responsibility for veterinary care rests exclusively with the RAR veterinary staff. The only exceptions to this policy are those specific elements of clinical care that are associated with the maintenance of an experimental animal that have been defined and explicitly stated in the ACUC-approved animal care and use protocol. Use of antibiotics that are not included in an approved protocol must be under the direction of a clinical veterinarian.

The RAR rodent disease surveillance program will be applied to animals housed in the satellite areas as deemed appropriate by the director of this program. Participation in this program will help RAR promptly identify areas of disease that pose a risk for rodent populations in central facilities. Laboratories that house only small populations of animals for relatively short periods episodically may have the requirement for participation waived. Participation will involve either the placement of sentinel animals for the detection of infections or infestations, or the submission of tissues and blood samples from experimental animals residing in the facility.

### **IV. WHAT ASSISTANCE WILL BE PROVIDED BY RAR TO SATELLITE FACILITIES?**

To assure that standards and practices for laboratory animals housed in satellite areas conform to this policy, RAR provides the following assistance:

- 1) An RAR technician will visit each satellite facility on a regular schedule (usually weekly) to review the provision of care in conformance with this and provide consultation; frequency of visits may increase or decrease as conditions warrant.
- 2) The RAR technician will review animal health and coordinate submission of samples for disease surveillance activities.
- 3) The RAR technician will supply caging and water bottles, as well as racks and carts to hold rodent caging wherever possible; and will coordinate equipment and supply exchange between the laboratory and central RAR facilities.
- 4) RAR will perform pre- and post-sanitization quality assurance testing on laboratory equipment on a regular schedule (usually twice a year).
- 5) RAR will coordinate pest control measures, and recommend physical plant repairs and improvements to be made by the laboratory. Recommendations for commonly needed physical plant improvements will be forwarded to the appropriate dean's office.
- 6) RAR technicians will be available at the laboratory's request, excluding weekends, to provide in-laboratory animal care services. Satellite facilities must assure coverage of the animals seven days per week.
- 7) RAR will continue to look for new opportunities and approaches to accommodate specialized housing and research

I acknowledge that I have read and understand the “**JHU Policy and Standards for Research Animal Housing in Satellite Facilities**” and I will follow these procedures. I agree to bring any deviations in this procedure to the attention of the Director of Lab Animal Management.

\_\_\_\_\_  
Name (Print)

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature



**Satellite Room Checklist**

**Building:** \_\_\_\_\_ **Room:** \_\_\_\_\_

**PI:** \_\_\_\_\_

**Month/Year:** \_\_\_\_\_

**Species:** \_\_\_\_\_

**Protocol:** \_\_\_\_\_

**Semi-annual room sanitization date:** \_\_\_\_\_

Day	Daily					At Least Weekly		Comments and RAR oversight (issues, service requests, ceiling filter change, hood certification out-of-date, etc.)	
	Room Temp*		Room Humidity	Feed / Water/ Health Check	Rodent Trap Check	Abnormal Health Observation/ Clinical Calls** (if any)	Room Cleaned		Number of cages changed
	Max/Min		Max/Min	Initials/Time	Initials/Time		Initials		Initials
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\*Rodents: 72 ± 5°F

\*Rabbits: 66 ± 5°F

\*Nonhuman primates: 78 ± 5°F

\*Other species (unless otherwise determined): 72 ± 5°F

**\*\*TO CALL VETERINARIANS:**

**Office hours: call (410) 955-3273**

**Outside of office hours: call 443-904-4332**

Day	Daily					At Least Weekly		Comments and RAR oversight (issues, service requests, ceiling filter change, hood certification out-of-date, etc.)
	Room Temp*	Room Humidity	Feed / Water/ Health Check	Rodent Trap Check	Abnormal Health Observation/ Clinical Calls** (if any)	Room Cleaned	Number of cages changed	
	Max/Min	Max/Min	Initials/Time	Initials/Time		Initials	Initials	
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