Name:	Rodent Husbandry	**Created:**	8/16/17
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Category:	Animal Husbandry	**Author(s):**	T. Schoenfeld

1.0 Purpose

This SOP describes the basic procedures for routine care and husbandry of rodents housed in the vivarium.

2.0 Policy

2.1 The care and husbandry of rodents housed in the FSU vivarium must be pursued according to the standards set forth in this SOP, which are to be considered routine.

2.2 Variations in this routine must be approved by the IACUC through protocol review.

2.3 Only approved personnel, whether faculty, students, or staff, may have access to the vivarium and participate in the care and husbandry of housed animals.

- 2.3.1 Such personnel must be formally identified on an approved IACUC protocol, whether proactively or retroactively listed.
- 2.3.2 Such personnel must also be formally identified on animal room cards and rodent room log sheets.
- 2.3.3 Such personnel must be fully trained in approved methods of animal care and husbandry, by:
  - 2.3.3.1 Completing assigned CITI training modules;
  - 2.3.3.2 Reviewing all pertinent FSU SOP's; and
  - 2.3.3.3 Receiving face-to-face instruction from an experienced PI.
- 2.3.4 It is the responsibility of the PI to ensure that all personnel handling animals covered by his/her protocol are approved in all of these ways before they begin such work.

3.0 Materials

3.1 Animal room card (see SOP 140)

3.2 Rodent room log sheets (see SOP 150)

3.3 Cages and cage rack

- 3.3.1 All rodents not isolated in quarantine or actively involved in an experimental procedure will be housed in holding room 101F.
- 3.3.2 Room 101F is designed to house rodents (mice or small rats) in ventilated polycarbonate shoebox cages with microisolator tops:
  - 3.3.2.1 Dimensions**:** 7in x 12in x 8in (17.8x30.5x20.3 cm);
  - 3.3.2.2 Floor Area**:** 82in^2 (529 cm^2)
  - 3.3.2.3 This space is sufficient to house no more than 5 adult mice at a weight of no more than 40g per mouse, providing no less than 15in^2 (96.8 cm^2) of floor space for each animal.
- 3.3.3 Cages are inserted into a ventilated rack system—Lab Products RAIR HD Enviro-Gard— that provides a continual exchange of HEPA filtered air

3.3.3.1 Air entering the cage is filtered through a HEPA filter at a common in-port on the rack.
3.3.3.2 Air from each cage is exhausted through a HEPA filter in the microisolator top and then through an additional HEPA filters into an HVAC room exhaust.
3.3.3.3 Thus, air from one cage cannot intermix with that of another nor flow back into ambient air outside of this system, effectively isolating animals from one another and human personnel from the animals.

3.3.4 Clean cages are prepared for cage changes by adding bedding and storing in 101E closet, with a small number kept covered in the holding room 101F for emergency cage changing.

3.4 Animal housing ID cards (cage cards)

3.4.1 All cages must be outfitted with an animal housing ID card (see SOP 120 for details), held in a card holder affixed to the microisolator top.
3.4.2 Additional colored cards may be employed to identify special circumstances, such as the presence of newborn pups or dead animals (see SOPs 120 and 150, and below).
3.4.3 Animals found housed in a cage without a cage card may be euthanized, by order of PI.
3.4.4 Further in-group differentiation of individual animals can be achieved through ear punches or temporary markings (see SOP 130).

3.5 Bedding and nesting material

3.5.1 All cages will be provided with approximately ¼ - ½ in layer of corn cob contact bedding, changed on a regular schedule.
3.5.2 Paper nesting material is added to all cages for environmental enrichment.

3.6 Food and Water

3.6.1 Laboratory rodent chow (within 6 mo of milling date) is provided *ad libitum* in the cage food hopper, unless a specific diet or regimen is required for an experiment in an approved protocol.
3.6.1.1 Bulk food is stored in a large covered container in the cage washing room for preparing cages for regular cage changing.
3.6.1.2 A small covered container holds a small amount of food in the holding room for topping off during daily checks.
3.6.2 Tap water is also provided *ad libitum* through a self-dispensing bottle held in the water hopper, unless a specific regimen is required for an experiment in an approved protocol.
3.6.2.1 Water bottles are pre-filled in the cage washing room and carried into the holding room for water changes during scheduled cage changes.
3.6.2.2 Extras are kept in the 101E closet, with a small number stored in a covered container in the holding room for water changes as needed during daily checks.

3.7 Room Environment

3.7.1 A 12h:12h light:dark (12:12 L:D) cycle, with lights on at 0700, will be the default light cycle for room 101F, unless a variation is called for in an approved protocol.
3.7.1.1 Only a PI with designated use of animals being housed in the room shall be authorized to change the set light cycle.
3.7.1.2 Caretakers and researchers may be authorized to enter the room during the dark phase, employing the red ceiling light that is controlled by the hallway switch outside the room.
3.7.1.3 Adjustments for transitions between daylight savings and standard time will be authorized and implemented only by the PI using the room.
3.7.1.3.1 PI's may opt not to change the settings over these transitions, meaning that lights on/off will shift between 0700/1900 (EST) and 0600/1800 (EDT).
3.7.1.3.2 PI's are advised to consider these seasonal time changes when scheduling experiments during the fall or spring that require entry into the holding room close to lights on or lights off.
3.7.2 Routine ambient temperature will be maintained at 21°C (70°F).
3.7.2.1 Variations in ambient temperature for this room can be requested through Capital Planning.
3.8 Procedure workstation (transfer station)
3.8.1 A modified class II type B2 ventilated biosafety cabinet (Lab Products)
3.8.2 Kept in 101F next to cage rack
3.9 Disinfectant spray bottle (in workstation)
3.9.1 Use 1% Virkon S (potassium peroxymonosulfate; Dupont)
3.9.1.1 1 tablet (0.18 oz/5 g) per 1 pint (473 ml) RO water (prep under hood)
3.9.1.2 Good for 7 days; discard as chemical waste
3.9.2 Handle with nitrile gloves
3.9.3 See section 4.1 for specific uses.
3.10 Small covered containers of fresh food pellets and pre-filled water bottles
3.11 Small number of covered clean cages with bedding

4.0 Procedure

4.1 Opening and changing cages
4.1.1 As noted below, a cage must be opened, at a minimum, in order to take the next step beyond simple observation through the clear Plexiglas front wall of the cage when inserted into the rack, such as adding food to the food hopper or changing a water bottle.
4.1.2 Wear a lab coat and nitrile gloves when preparing to open a cage with animals; use double gloves if preparing to handle an animal, e.g., to change the cage (transfer animal to another cage).
4.1.3 Turn on the ventilator and light in the room's procedure workstation (a modified class II type B2 ventilated biosafety cabinet).

4.1.4 Remove the covered cage from the rack, place it inside the workstation, spray the outside of the cage and top with disinfectant, along with your gloves and the bench surface inside the workstation, and remove the top, placing it bottom up on the workstation bench.
4.1.5 If providing food or water:
4.1.5.1 Add more food pellets to top off the level if the level was less than half capacity.
4.1.5.2 Provide a new water bottle if the level was less than half capacity.
4.1.5.3 Replace the top, respray the cage, and return cage to rack.
4.1.6 If transferring animal to new cage:
4.1.6.1 Bring a new cage with fresh bedding into the workstation, spray with disinfectant before removing top, add fresh food and fresh water, then transfer animal(s) from old cage by grasping the proximal tail by hand.
4.1.6.2 Recover the new cage and spray with disinfectant before inserting into rack.
4.1.6.3 Be sure to also transfer the animal housing ID card.
4.1.6.4 Set aside old cage for transfer to cage washing room for cleaning (be sure cages are covered with a top or empty cage, to prevent dispersal of soiled bedding volatiles and particulates).

4.2 Daily care
4.2.1 Check on all cages with animals, noting:
4.2.1.1 the health of each animal,
4.2.1.2 the supply of food and water,
4.2.1.3 whether the bedding is largely dry
4.2.1.4 whether there are dead animals
4.2.1.5 whether there are newborn pups (even if unexpected)
4.2.2 Complete the appropriate row of the rodent room log sheet (see SOP 150) by logging:
4.2.2.1 the census (# adult animals)
4.2.2.2 health status
4.2.2.3 temperature (current/min/max)
4.2.2.4 humidity (current/min/max)
4.2.3 Top off food and provide full water bottle as needed (section 4.1)
4.2.4 Remove dead animals and transfer to freezer (see section ??).
4.2.4.1 Be sure to add dead animal card (red) for follow-up by PI if living animals remain in cage.
4.2.5 Room maintenance:
4.2.5.1 Sweep floor and empty trash container as needed.
4.2.5.2 Check vermin traps.
4.2.5.3 Confirm proper operation of rack blowers.

4.3 Weekly care
4.3.1 Sweep floor and mop with low-suds detergent and hot water, followed by rinse with clear hot water only.

4.3.2 Flush floor drains with the soapy water from mop bucket and follow with a bucket-full of clean water.
4.3.3 Check filters on cage rack and procedure workstation and change/clean as needed.
4.3.4 Wipe door knobs with disinfectant-laden towel, then wipe dry.

4.4 Care every 2 weeks
4.4.1 Change all cages with clean cages having pre-filled fresh bedding.
4.4.2 Provide new water bottles and fresh food.
4.4.3 EXCEPTION: Do not change the cage or bedding of a dam with litter until after the pups are weaned and removed to a separate cage,
4.4.3.1 UNLESS the bedding has become soaked with spilled water
4.4.3.2 In which case, transfer as much of the old nest as possible to the new cage, to assist in reestablishing the nest (see also SOP 310).
4.4.4 Be sure to wipe down any carts used with disinfectant.
4.5 Care once a month
4.5.1 Change the microisolator tops
4.6 Biannual care (when holding room is not being used to house animals)
4.6.1 Wipe down all walls and surfaces with disinfectant.
4.6.2 Wipe down cage rack with disinfectant.
4.7 Special care procedures
4.7.1 Dead animals
4.7.1.1 Dead animals found in a cage during routine observations are placed in a plastic bag containing a red card attached.
4.7.1.1.1 Information from cage card should be transferred to the red card.
4.7.1.1.2 An additional red card should be added to the cage card holder to identify removal of a dead animal where other living cagemates remain.
4.7.1.1.3 The dead animal should be noted in both the log sheet and the disposition log (see SOP 160).
4.7.1.1.4 Plastic bag should be placed in the freezer designated for dead animals (either in 101B, off cage washing room, or in SCI 103 research lab, accessed through vivarium procedure room 101D).
4.7.2 Injured or distressed animals (see SOP 300)
4.7.2.1 Place a red card in the card holder of the cage, noting the date and time and specific observation warranting the card.
4.7.2.2 Contact the PI for further action, which could include:
4.7.2.2.1 Consultation with the Attending Veterinarian
4.7.2.2.2 Euthanasia
4.7.2.3 Enter comments in the room log and disposition log., noting the specific cage (and animal, if carrying an ID marking or ear punch).
4.7.3 Over-crowded cage

4.7.3.1 If the cage density exceeds guidelines (i.e., more than 5 adult mice older than postnatal day 21):
4.7.3.1.1 Mark the cage with a red card that identifies the crowding
4.7.3.1.2 Contact the PI for further action.
4.7.3.1.3 Enter comments in the room and disposition logs.

4.7.4 Escaped animals
4.7.4.1 Capture the animal and place into a cage of its own, identified as "escaped animal" with a red card.
4.7.4.2 Contact the PI responsible for the room for further action.
4.7.4.3 Enter comments in the room and disposition logs.

5.0 References

5.1 Policies and Standard Operating Procedures (Western Michigan University) https://wmich.edu/sites/default/files/attachments/u245/2015/iacuc_sops_10_2014_1.pdf

5.2 Rodent Husbandry (McGill University) http://www.mcgill.ca/research/files/research/508_-_rodent_husbandry_-_march_2016_1.pdf

5.3 Rodent Daily Care (McGill University) http://www.mcgill.ca/research/files/research/509-rodent_daily_care.pdf

SOP REVISION HISTORY

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200.01	12/20/17	Authored by T. Schoenfeld