

Purpose – “The primary aim of environmental enrichment (EE) is to enhance animal well-being by providing animals with sensory and motor stimulation, through structures and resources that facilitate the expression of species typical behaviors and promote psychological well-being through physical exercise, manipulative activities, and cognitive challenges according to species-specific characteristics.” (the Guide)

Maladaptive behaviors are an indicator of stress in social rodents, and this may be caused by pain or by lack of enrichment. Always consult with veterinary staff before recommendation of enrichment in response to clinical signs of stress. This may include but not limited to decreased activity and or appetite, cannibalization of young or cage mates, piloerection (hairs standing on end); excessive grooming, licking or scratching; rough hair coat (cessation of grooming); circling, hunched posture, abnormal gait, positioned at or near the center of the cage, lateral recumbancy or barbering.

Social needs – “An appropriate housing space or enclosure should also account for the animals’ social needs. Social animals should be housed in stable pairs or groups of compatible individuals, unless they must be housed alone for experimental reasons or because of social incompatibility.”  
(the Guide)

Species-specific enrichments may include the following:

Rats: social housing, wooden chew sticks, sheltering products

Mice: social housing, nesting materials, sheltering products

Policy: Social animals should be group housed. At least one species-specific enrichment object should be placed inside the animals’ primary environment. Any exceptions must be submitted to the IACUC for approval prior to implementation.

#### Section B – Implementation: General Objectives

The goal is provide an optimum environment for its research animals. The University (acting through the IACUC and Attending Veterinarian) will continue to periodically modify this plan in response to the evolving best practices in the field based on what has been scientifically demonstrated to benefit the animals.

If a protocol exception to limit or exclude enrichment or social housing is to be included in an IACUC submission, the PI should consult with veterinary staff during protocol development to discuss the special circumstances that might limit social housing or participation in the enrichment program. The PI will need to include the specific study requirements and scientific justification for the exemption request in the IACUC protocol, including the duration of single housing and/or the EE exemptions. If no exemptions are requested and approved within the protocol, then this guideline will be followed. Once the protocol is approved, the PI must inform animal facility personnel of the approved exceptions to this policy and coordinate the system for identifying which particular cages will be included in the exemption.

#### Enrichment Devices

- Several vendors provide an assortment of enrichment devices and treats. These may include wooden chew sticks, Nyla bones, nesting material, plastic tubes, or other devices that fit in the cages without crowding the animals and can be either discarded at cage change or sanitized. All enrichment provided by the PI in support of the aims of an IACUC research protocol must either be clearly described in an approved IACUC protocol and evaluated by VS BEFORE it is provided to the animals.
- In VS managed areas, the VS staff will be responsible for the administration of nesting material (mice), chewing devices (rats), or shelters (either species in special circumstances). In satellite areas the laboratory staff providing animal care will be responsible for providing enrichment. If novel enrichment is involved as part of particular research studies, this will be the responsibility of the research personnel.

- If a PI has received approval in a protocol that the mice and/or rats on study will receive edible treats for enrichment, this is best given by the PI or research staff as part of the study. The administration of these edible treats should be clearly documented both the approved IACUC protocol and animal's records

## Section C – Implementation: Species Specific

### C1. Mice

Certain medical or compatibility conditions may require that mice be individually housed or that other elements of the enrichment program be changed. These determinations will be made by a veterinarian and documented in the animal's record. Veterinary exemptions to this policy do not require IACUC approval.

- Compatible mice will be pair-or group-housed if space and body weight allows. Males from aggressive backgrounds (e.g., BALB/c, FVB, etc.), however, may require individual housing since they may show aggression towards other males. Housing in groups of three and providing nesting material that is handled appropriately during cage changing is a recommended option to maximize success when housing male mice.
- If scientifically justified in an approved IACUC protocol, mice may be individually housed in specific situations outlined in the IACUC protocol. When possible (depending on the caging system used) individually housed mice should be provided housing that allows visual, auditory and olfactory contact with other mice.
- If a protocol exception to limit or exclude enrichment is to be included in an IACUC submission, the PI is required to consult with veterinary staff during protocol development to discuss the special circumstances that might limit participation in the enrichment program. The Principal Investigator (PI) will need to include the requirement and scientific justification for single housing in the IACUC protocol, specify the approximate duration of single housing and/or the requested exemptions from any EE strategies included in this policy or associated SOP. If no exemptions are approved within the protocol, then the policy and associated SOP will be followed. Once the protocol is approved, the PI must inform animal facility personnel of the approved exceptions to this policy.
- Singly housed mice are presumed to need more environmental enrichment than pair- or group housed mice and may be provided with extra cage enhancements unless an exception to limit or exclude EE is justified in an IACUC approved protocol for scientific reasons. Singly housed mice will be observed daily and will have their well-being evaluated at least monthly by a veterinarian or other adequately trained staff member. The assessment and recommendations for continued single housing will be reviewed and approved by the Attending Veterinarian or designee.

### C2. Rats

Certain medical or compatibility conditions may require that rats be individually housed or that other elements of the enrichment program be changed. These determinations will be made by a veterinarian and documented in the animal's record. Veterinary exemptions to this policy do not require IACUC approval.

- Compatible rats will be pair-or group-housed if space and body weight allows. However, retired male breeders may require individual housing since they may be aggressive towards other males
- If scientifically justified in an approved IACUC protocol, rats may be individually housed if required. Unless otherwise indicated in the approved protocol, individually housed rats will be provided housing which allows visual, auditory and olfactory contact with other rats.
- If a protocol exception to limit or exclude enrichment is to be included in an IACUC submission, the PI is required to consult with veterinary staff during protocol development to discuss the special circumstances

that might limit participation in the enrichment program. The PI will need to include the requirement and scientific justification for single housing in the IACUC protocol, specify the approximate duration of single housing and/or the requested exemptions from any EE strategies included in this policy or associated SOP. If no exemptions are approved within the protocol, then the policy and associated SOP will be followed. Once the protocol is approved, the PI must inform animal facility personnel of the approved exceptions to this policy.

- Singly housed rats are presumed to need more environmental enrichment than pair- or group housed rats and may be provided with extra cage enhancements unless an exception to limit or exclude EE is justified in an IACUC approved protocol for scientific reasons. Singly housed rats will be observed daily and will have their well-being evaluated at least monthly by a veterinarian or other adequately trained staff member. The assessment and recommendations for continued single housing will be reviewed and approved by the Attending Veterinarian or designee.

## **References**

1. The Guide for the Care and Use of Laboratory Animals. 2011. NRC ILAR. P. 52-55. Environmental Enrichment