

UNITED STATES DEPARTMENT OF AGRICULTURE ANIMAL AND PLANT HEALTH INSPECTION SERVICE ANNUAL REPORT OF RESEARCH FACILITY (TYPE OR PRINT)	1. CERTIFICATE NUMBER: 14-R-0036 CUSTOMER NUMBER: 515	FORM APPROVED OMB NO. 0579-0036
University Of Massachusetts Amherst Research Administration Building 70 Butterfield Terrace Amherst, MA 01003 Telephone: (413) -545-0668		

3. REPORTING FACILITY (List all locations where animals were housed or used in actual research, testing, or experimentation, or held for these purposes. Attach additional sheets if necessary)

FACILITY LOCATIONS (Sites) - See Attached Listing

REPORT OF ANIMALS USED BY OR UNDER CONTROL OF RESEARCH FACILITY (Attach additional sheets if necessary or use APHIS Form 7023A)

A. Animals Covered By The Animal Welfare Regulations	B. Number of animal being bred, conditioned, or held for use in teaching, testing, experiments, research, or surgery but not yet used for such purposes.	C. Number of animals upon which teaching, research, experiments, or tests were conducted involving no pain, distress, or use of pain-relieving drugs.	D. Number of animals upon which experiments, teaching, research, surgery, or tests were conducted involving accompanying pain or distress to the animals an for which appropriate anesthetic, analgesic, or tranquilizing drugs were used.	E. Number of animals upon which teaching, experiments, research, surgery or tests were conducted involving accompanying pain or distress to the animals and for wh the use of appropriate anesthetic, analgesic, or tranquiliz drugs would have adversely affected the procedures, res or interpretation of the teaching, research, experiments, surgery, or tests. (An explanation of the procedures producing pain or distress in these animals and the reas such drugs were not used must be attached to this report	F. TOTAL NUMBER OF ANIMALS (COLUMNS C + D + E)
4. Dogs					
5. Cats					
6. Guinea Pigs					
7. Hamsters	220	229	101		330
8. Rabbits		5	12		17
9. Non-human Primates	26	23		4	27
10. Sheep		111			111
11. Pigs		24			24
12. Other Farm Animals					
(see continuation sheet)					
13. Other Animals					
Vole	605	756	66	604	1426
Wild birds		28			28

ASSURANCE STATEMENTS

- 1) Professionally acceptable standards governing the care, treatment, and use of animals, including appropriate use of anesthetic, analgesic, and tranquilizing drugs, prior to, during, and following actual research, testing, surgery, or experimentation were followed by this research facility.
- 2) Each principal investigator has considered alternatives to painful procedures.
- 3) This facility is adhering to the standards and regulations under the Act, and it has required that exceptions to the standards and regulations be specified and explained by the principal investigator and an Institutional Animal Care and Use Committee (IACUC). A summary of all such exceptions is attached to this annual report. In addition to identifying the IACUC-approved exceptions, this summary includes a brief explanation of the exceptions, as well as the species and number of animals affected.
- 4) The attending veterinarian for this research facility has appropriate authority to ensure the provision of adequate veterinary care and to oversee the adequacy of other aspects of animal care and use.

CERTIFICATION BY HEADQUARTERS RESEARCH FACILITY OFFICIAL
 (Chief Executive Officer or Legally Responsible Institutional Official)

SIC

(b)(6), (b)(7)c

DATE SIGNED

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Summary of Exceptions to the Regulations and Standards
Specified and Explained by the Principal Investigator and Approved by the IACUC

In a study involving Syrian hamsters, the researcher submitted a memorandum of explanation to the IACUC regarding a change in the cleaning schedule for cages in which his hamsters are housed for particular studies approved previously by the IACUC. This relates to 9 CFR, Ch. 1, Part 3, Subpart B, 3.31.a. This matter was discussed and approved by the IACUC on August 20, 2001. The measure is supported by a policy statement of the Society for the Research on Biological Rhythms which appeared in the Journal of Biological Rhythms, Vol. 8, pp. 97-106 (1993) which outlines and explains modifications of normal observance, cleanliness/sanitation, and food and water provision procedures for rodents in circadian rhythm studies. The change involved delaying cage cleaning because the stimulus of the cleaning process (new cage, fresh bedding, disrupts free running activity levels developed during the study. These activity levels must be measured over several weeks in the same (unchanged) cage environment. It was agreed that the researcher will monitor closely the cages during these particular studies to insure the environments of the hamsters and mice will be satisfactory as possible until the data collections are completed. Such observations must be conducted under very dim red illumination. It was agreed by the IACUC and the Director of Animal Care that inactive animals will be visually checked to make sure they are not ill or in distress. Healthy mice and hamsters run many revolutions on a wheel each night, and computer records indicating robust activity are considered adequate verification of each animal's well being.

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Column E Explanation

1. Registration Number: 14-R-0036
2. Species: prairie vole
3. Number: 604 pups less than 3 days of age
4. Parental Behavior: Basically, female voles at the end of pregnancy will exhibit one of two kinds of behavior when presented with pups: aggression (pups attacked), or maternal (pups licked, groomed and/or picked up). The subject is placed in a clear cage containing wood chips, food, and a small amount of hay. Two unrelated pups are placed in the corners opposite to the subject's location. Behavioral responses are recorded continuously for 10 minutes. If subjects do not make contact with either pup during the 10-minute period, testing is continued for an additional 10 minutes. In the event of an attack, pups are quickly removed from the cage and euthanized by decapitation (using sharp scissors). Decapitation is the quickest way to euthanize a pup, thereby minimizing suffering after attacks. There is no alternative behavioral test for determining maternal responsiveness in animals. The procedure described is a frequently used and established test for parental behavior. For references, see:

Wiesner & Sheard (1933). Maternal behaviour in the Rat. Edinbergh: Oliver and Boyd.

Rosenblatt (1967). Nonhormonal basis of maternal behavior in the rat. *Science* 156(781):1512-4.

Jakubowski & Terkel (1985). Transition from pup killing to parental behavior in male and virgin female albino rats. *Physiol. Behav.* 34(5):683-6.

Rees, Panesar, Steiner, Fleming (2006). The effects of adrenalectomy and corticosterone replacement on induction of maternal behavior in the virgin female rat. *Horm. Behav.* 49(3):337-45.

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Column E Explanation

1. Registration Number: 14-R-0036
2. Species: marmoset
3. Number: 4 marmosets
4. Project involves an assessment of the behavioral and chemical consequences of chronic adolescent MDMA (ecstasy) use. Behavioral consequences that will be studied are the possible cognitive consequences: learning, memory, attention, pre-frontal function; and possible psychosocial consequences: altered familial interactions, and long-term changes in reproductive and parenting behaviors. Biochemical consequences that will be studied are monitored as non-invasively as possible, thus minimizing the severity of the procedures in this study. A minimal number of animals will be sacrificed for *in vitro* analysis of neurochemical changes that cannot be determined through imaging; other animals will be monitored over the course of their MDMA exposure and later adult life using functional magnetic resonance imaging (fMRI). The use of fMRI allows us to observe the neural response to MDMA treatment and how that response changes over chronic intermittent exposure across adolescence. Primate species was needed in order to (a) eliminate significant species differences between rodents and human responses to MDMA; (b) ensure that subtle behavioral analysis is possible, and (c) allow monitoring of complex cognitive tasks that can be directly compared between primates and human subjects. Marmosets were specifically chosen as one of the smallest and most basic monkey species, allowing us (a) small body size for imaging in small bore of animal MRI scanner, (b) sufficient intelligence to carry out complex cognitive tasks, if a lot of training is carried out, (c) suitability for laboratory housing in family groups in environmentally enriched vivariums, allowing study of social behavior and reproductive function, (d) reasonably short developmental time course allowing 3 years to study adolescence into adulthood.

While fMRI allows us to examine chemical and activity responses to MDMA non-invasively and without sacrifice of animals, it does require us to restrain awake marmosets for approximately 1 hour. The restraint is inherently stressful, but we make every effort to minimize the stress involved, through the use of a validated acclimation procedure before studies begin, the use of a local anesthetic to minimize the potential pain of pressure points (where restraint system holds head steady), and the administration of acetaminophen (Tylenol) following the study. It is not possible to anesthetize, sedate or otherwise treat the marmosets during imaging, since we are seeking to examine brain activation in response to MDMA treatment in order to correlate animal brain activity with subjective reports of psychological experiences in

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ecstasy users. The response of an anesthetized subject would be of little use in these studies, and administration of any other compounds would weaken any interpretation of our data as consistent with the effects of MDMA alone.

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