

GROUP HOUSING MALE MICE

I. Purpose/Scope

The purpose of this Standard Operating Procedure (SOP) is to outline the IACUC's policy regarding group housing male mice and intervention methods if fighting occurs between male mice.

II. Sources

Bayne, K.A.L., Beaver, B.V., Mench, J.A., and Morton, D.B. 2002. Laboratory Animal Behavior. *In* Laboratory Animal Medicine, 2nd Ed. (J.G. Fox, L.C. Anderson, F.M. Loew, F.W. Quimby, Eds.). Academic Press, New York, pp. 1239-1243.

Emond, M., Faubert, S., and Perkins, M. 2003. Social Conflict Resolution Program for Male Mice *Contemporary Topics*, 42:24-26.

Van Loo, P.L.P., Van Zutphen, L.F.M., and Baumans, V. 2003. Male Management: coping with aggression problems in male laboratory mice. *Laboratory Animals*, 37:300-313.

III. Problem

Mice are social animals and, whenever possible, should be group housed. Dominant male mice of some strains (e.g., C57BL/10, FVB, DBA/2, outbred swiss, SJL, BALB/c), however, often aggressively defend territorial boundaries from subordinate males. In the confines of a laboratory cage, sustained fighting between dominant and submissive males may be common. Intersex and interfemale fighting may also occur. Aggression between mice may lead to wounding and subsequent euthanasia of the submissive male, or stress-related changes in physiology that could affect research outcomes.

IV. Consequences

Fighting activates glucocorticoid and sympathetic responses, induces opioid-like analgesia in victimized mice, produces lesions that may become infected, and, with severe injury, may be fatal.

V. Resolution

To avoid animal suffering, stress induced behaviors and their consequences, and invalid research data, steps must be taken to reduce or eliminate intermale aggression in mice. Fighting may be reduced or prevented by:

1. Allowing group housed prepubertal male mice to mature together.
2. Removing the territorial adult male (dominant mouse) from the cage and if possible from the room when fighting or when other mice show injury (bite wounds, lameness) or scarring.
3. Housing mice according to Guide floor space requirements with three mice housed per cage. Two mice housed per cage may increase

aggression, and more than three mice per cage may decrease the chance of a stable hierarchy developing.

4. Providing nesting material for each cage. Nesting material may contain aggression-reducing odor cues, so a small amount of nesting material should be transferred with each cage change. Care should be taken not to transfer bedding material that may contain urine and feces as these materials may elicit aggression.
5. Using more docile strains (e.g., CBA/Ca, C3H/He) when possible.
6. Limit disturbances in the room as much as possible as stressful situations can increase aggression.
7. Housing mice individually, although this should be avoided whenever possible.

VI. Standard for Intervention

Territorial behavior may persist for one or two days and then cease, in which case injured mice should be treated (or euthanized); non-fighting groups remain intact. If fighting and injury persist for more than two days, or if debilitating injury occurs in more than 5% of total at-risk mice in the project in periods less than two days, then dominant mice must be identified and removed or mice housed individually.