

# Social Behavior and its Influence on Stress Levels in Group-housed Laboratory Mice

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## Introduction

Social behavior plays a crucial role in the lives of group-housed laboratory mice, influencing their stress levels and overall well-being. This report explores various aspects of social behavior in mice and how these interactions can affect stress responses within the group. Laboratory mice are social animals, naturally living in colonies or groups in the wild. When housed in groups in laboratory settings, they often form complex social hierarchies and engage in a variety of social behaviors such as grooming, aggression and affiliative interactions [1]. These behaviors are not only important for their social structure but also have significant implications for their physiological and psychological health.

One of the key factors influencing social behavior in mice is the composition of the group. Groups can vary in size, sex composition and familiarity of individuals. Studies have shown that the composition of the group can affect the stability of social hierarchies and the frequency of social interactions among group members. For example, groups composed of unfamiliar individuals may initially exhibit higher levels of aggression as they establish dominance relationships, whereas groups composed of familiar individuals may exhibit more stable and affiliative social behaviors.

Social hierarchies within groups of mice are often established through aggressive interactions. Dominant individuals typically exhibit higher levels of aggression and may monopolize access to resources such as food, water and shelter. Subordinate individuals, on the other hand, may experience social stress due to their lower social status and limited access to resources. This social stress can manifest physiologically through alterations in hormone levels, such as increased levels of corticosterone, the primary glucocorticoid stress hormone in rodents. Grooming behavior is another important aspect of social behavior in mice [2]. Grooming serves not only as a means of maintaining hygiene but also as a form of social bonding. Mutual grooming interactions between individuals can promote social cohesion within the group and reduce stress levels. Grooming behavior is often reciprocal, with individuals taking turns grooming each other. This reciprocal grooming helps to strengthen social bonds and maintain a stable social hierarchy within the group.

## Description

Affiliative interactions, such as huddling and social play, also play a crucial role in regulating stress levels in group-housed mice. Huddling behavior, where mice nestle closely together for warmth and comfort, helps to promote feelings of security and reduce stress. Social play, particularly among younger mice, serves as a form of social learning and development of social skills. Play behavior is often characterized by chasing, wrestling and mock fighting, which helps to establish social relationships and reduce tension

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within the group [3,4]. The presence of a dominant male or female within a group can significantly influence social dynamics and stress levels among group-housed mice. Dominant individuals often exert control over the group's activities and resource access, which can lead to increased stress levels among subordinate group members. Subordinate individuals may experience chronic social stress due to their lower social status and limited opportunities for social interactions.

Environmental factors also play a critical role in shaping social behavior and stress responses in group-housed mice. Factors such as housing conditions (e.g., cage size, bedding material), light-dark cycles and environmental enrichment (e.g., toys, tunnels) can influence the frequency and intensity of social interactions within the group. Enriched environments that provide opportunities for social interaction and exploration can help to reduce stress levels and promote overall well-being in group-housed mice. Chronic social stress in laboratory mice can have detrimental effects on their health and research outcomes [5]. Prolonged exposure to social stressors can disrupt normal physiological processes and compromise the validity of experimental results. Researchers must carefully consider the social housing conditions of mice and monitor their social behavior and stress responses throughout the duration of experiments.

## Conclusion

In conclusion, social behavior plays a vital role in shaping stress levels and overall well-being in group-housed laboratory mice. Understanding the dynamics of social interactions, including dominance hierarchies, grooming behavior, affiliative interactions and the influence of environmental factors, is crucial for optimizing housing conditions and minimizing stress in laboratory animal research. By promoting a stable and supportive social environment, researchers can enhance the welfare of laboratory mice and improve the reliability of experimental outcomes. Further research is needed to explore the complex interplay between social behavior, stress responses and health outcomes in laboratory animals, with the ultimate goal of refining animal welfare standards and enhancing the ethical conduct of animal research.

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