Summary of: pone.0104830 1..15

Key findings and quantitative results:

Scientific Goals: - To elucidate cellular and molecular mechanisms underlying adaptation to long-term exposure to microgravity. - To follow the dynamics of re-adaptation to normal gravity or assess post-flight in vivo functions.

Experimental Design: - In vivo measurements combined with in vitro studies. - In vivo measurements included continuous arterial pressure recording during flight. - In vitro studies focused on metabolism, tissue structure, and function. - In vivo studies were conducted before and after flight, with recovery period. - In vitro studies were performed on exposed mice, with euthanasia for tissue collection.

Mouse Training/Selection: - Co-adaptation in housing groups to reduce aggressiveness. - Training program for mice designated for in vivo studies to include behavioral/functional tests. - Measures to co-adapt aggressive male mice in housing groups. - Training program for mice to reduce aggressiveness.

Outcomes: - Male C57BL/6N mice were successfully trained and selected for in vivo studies. - Mice displayed signs of disadaptation to Earth's gravity after flight. - Training program was effective in improving mouse welfare. - The program allowed for the collection of less variable data.

Quantitative Results: - Body weight data showed significant changes between flight and ground control groups. - Body weight increased in flight group, ground control, and control vivarium groups. - Distance moved, rearing frequency, and center zone entry frequency were significantly different between groups. - Latency to first entry into the center zone was increased in SF mice only.

Additional Findings: - Housing groups were formed to reduce aggressiveness. - Food consumption was monitored to assess nutritional status. - Video recordings from the Bion habitats provided valuable data for scientific purposes.

Statistical Analysis: - One-way ANOVA and Mann-Whitney U-test were used for statistical analysis. - Fisher's exact test was used for survival analysis. - Rank transformation was applied to body weight data for ANOVA.

Conclusion: - The training program was effective in improving mouse welfare. - Male mice can be successfully employed in space biomedical research. - The program allowed for the collection of less variable data. - The results presented here are useful for planning future space missions.