



Case study: Turning a challenge into a path forward

Challenge

A research team faced a critical issue during an animal protocol using marine algae: several mice died before the scheduled timepoints. It led to the immediate termination of the study by veterinary services and blocked the planned chronic project. This halt threatened the continuity of the research and risked wasting significant resources, including more than 100 3xTg-AD mice already housed in the colony. My role was to design a safe, rigorous, and compliant protocol to evaluate the compound's toxicity and unlock the project while minimizing costs and risks.

Key Objectives

- Ensure animal welfare and regulatory compliance while assessing compound toxicity.
- Develop robust acute and chronic protocols tailored to the project's needs.
- Minimize project delays and preserve resources (avoiding loss of >100 3xTg-AD mice in colony).
- Provide reliable data to support strategic decisions for the client's research.

Approach

I designed two complementary protocols, each tailored to specific needs, using 2-month-old Balb/c mice (n=6 treatment, n=6 control):

- **Chronic protocol (2 weeks):** The compound was incorporated into the diet and administered chronically. Animals were observed daily, weighed regularly, and blood samples were collected on days 2, 8, and 14. At the end, mice were euthanized and tissues analyzed for toxicity.
- **Acute protocol (single administration):** The compound was administered once, followed by daily observation, daily weighing, and blood sampling 6 hours post-administration. Mice were euthanized on day 6, and multiple organs were analyzed.

Both protocols complied with the 3Rs principles and were approved by the ethics committee. Data were compared between treatment and control groups to ensure a reliable and robust evaluation of toxicity.

Results and Impact

All animals survived until the end of the studies, and no toxicity related to the compound was detected. These outcomes enabled:

- Removal of the project blockade, allowing continuation of the chronic study without wasting valuable resources.



- Avoidance of additional animal purchases and preservation of the existing Alzheimer's mouse colony.
- Delivery of robust data to guide future decisions on compound use.
- Effective communication of results to partners, the research team, veterinary services, and their dissemination through a scientific conference and peer-reviewed publication.

This approach transformed a critical obstacle into a strategic solution by ensuring scientific rigor, optimizing resources, and providing reliable data to guide decision-making. The protocols not only safeguarded the ongoing research but also established a solid foundation for future preclinical studies, allowing the client's project to advance with confidence.