



2017 3Rs Webinar Series

July 10, 2017 • 11:00 AM Eastern

Noise and Vibration in the Animal Vivarium and Research Labs as Threats to the 3Rs Goals of Refinement and Reduction

Jeremy Turner, PhD

Co-Founder & CSO, Turner Scientific

Sources of vibration, noise, and ultrasonic noise in the animal facility include fluorescent lighting, computers, ventilated caging systems, bedding change stations, construction, etc. Noise and vibration serve as very efficient stressors for research animals, especially rodents, thereby serving as a potential stressor and a confounding variable for virtually every area of biomedical and behavioral research. A major concern with both noise and vibration in animal facilities is that neither is well controlled, managed, or even monitored/measured. Therefore, scientists and those charged with caring for lab animals are typically not aware of the impact these variables can have on their work. For example, much of the noise in our facilities is in the ultrasonic range, which we human observers cannot hear, and the noise meters we typically use cannot measure. This presentation will demonstrate how measuring and mitigating noise and vibration problems in the vivarium can Refine our animal models and Reduce the number of animals used.

August 14, 2017 • 1:00 PM Eastern

What is a 'Normal' Laboratory Rodent Like?

Joanna Makowska, PhD

Postdoctoral Research Fellow, University of British Columbia

This webinar will challenge existing preconceptions about what constitutes a 'normal' laboratory rat or mouse. Videos and data on laboratory rodents' motivation to perform natural behaviors will be presented. Focus will be placed on burrowing, climbing and upright standing in rats, as well as the importance of having separate nesting and elimination sites in mice. We will also address the cognitive and social needs of rats, and how meeting those needs can impact the welfare of both the rats and their human caretakers. Creative ideas for how to implement some changes in a conventional facility will be discussed.



September 19, 2017 • 11:00 AM Eastern

Researcher Beware: How Enrichment and Environment Can Impact Research Outcomes

Brianna Gaskill, PhD

Assistant Professor, Purdue University

The environment has been found to be a major contributor to data variability and many aspects of the laboratory environment are stressful to rodents and do not accurately reflect the human experience. Thermal stress from normal laboratory temperatures reduces immune function, breeding performance, and alters behavior; lighting may be too intense, increasing stress, and lead to immune suppression; noise from ventilators, construction, or ultrasonic noise from monitors can affect breeding performance and stress hormones; cage changing disrupts odor cues that can cause stress and increase aggression and suppress immune function. Chronic uncontrollable stress is widely acknowledged for its negative alterations to physiology, yet, there is a significant gap in the understanding of how the laboratory environment affects mouse physiology and behavior, in particular, as it relates to characteristics of the human disease being modeled. This presentation will provide attendees with information on known causes of stress in common mouse vivariums and how it can be reduced by small changes including environmental enrichment.

October 11, 2017 • 11:00 AM Eastern

Developing a Strategic Roadmap to Establish New Approaches for Evaluating the Safety of Chemicals and Medical Products in the United States

Warren Casey, PhD, DABT

Director, NTP Interagency Center for the Evaluation of Alternative Toxicological Methods (NICEATM)

In 2007 the National Research Council (NRC) published the seminal report, Toxicity Testing in the 21st Century: A Vision and a Strategy, which envisioned using information derived from human-based assays and models to provide a more efficient, predictive, and less costly system for assessing the effects of xenobiotics on human health. Over the ensuing decade, significant investments in technology development and biomedical research have resulted in many transformative scientific breakthroughs necessary for implementing the NRC vision.

However, these advances have yet to be met with a concomitant increase in our ability to more accurately predict the adverse human health effects caused by exposure to xenobiotic chemicals, whether alone or in mixtures. This limited translational impact is attributable, at least in part, to



rapid scientific advancements outpacing the change in institutional standards required for their effective utilization. Specifically, legacy test methods and classification systems developed using animal models cannot always evaluate the nuances of human pathophysiology and genetic variability important for modern risk assessment. We require a new strategic approach to ensure product safety, efficacy, and quality. Greater harmonization between global regulators and industry sectors is clearly needed in order to benefit all stakeholders. This talk will describe key strategic elements of a roadmap to establish new approaches for evaluating the safety of chemicals and medical products in the United States, along with a discussion of obstacles and roadblocks that must be addressed moving forward.

December 6, 2017 • 1:00 PM Eastern

**Leveraging Automated Data Collection Technologies to Enhance
Study Reproducibility and Animal Welfare in
Preclinical *In Vivo* Research**

Laura Schaevitz, PhD

Vice President Scientific Technologies, Vium Inc.

Animal behavior, physiology, and immune function can be profoundly impacted by environmental conditions, frequency of animal handling, study methods, and procedures conducted during the course of animal based biomedical research studies. Variability in the execution of these impacting factors can lead to increased variability in study outcome data and may reduce the reliability and repeatability of data from these experiments. While many of these confounding factors have been recognized and documented, current animal study management systems are not enabled with controls or data collection systems to fully capture the impact of environment, handling and procedures on ultimate study data quality.

Platforms that provide continuous monitoring of animals 24/7 have the unique ability to provide valuable insight into this challenge. This webinar will provide case studies illustrating how continuously capturing an animal's behavioral and physiologic response in the home cage can lead to the refinement of animal studies and reduction of number of animals necessary on study.