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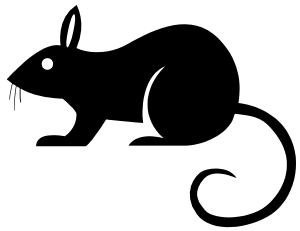
A Novel Biosecurity Auditing Process for Laboratory Rodent Facilities

William Porter, Mandy Horn, Hilton Klein
AALAS District 5 Meeting
Indianapolis, IN
May 10, 2012

Harlan Laboratories

Introduction

- What is Biosecurity?
- Why does it matter and why did we audit all our rodent production sites in North America?
- What we learned from the process
- Discussion of “Biosecurity Points To Consider” document created and utilized by Harlan Laboratories, Inc. during our biosecurity audits and soon available to others for use in their own institutions



What Is Biosecurity?

As defined in the current *Guide for the Care and Use of Laboratory Animals*, biosecurity is …

"all measures taken to identify, contain, prevent, and eradicate known or unknown infections that my cause clinical disease or alter physiologic and behavioral responses or otherwise make the animals unsuitable for research"

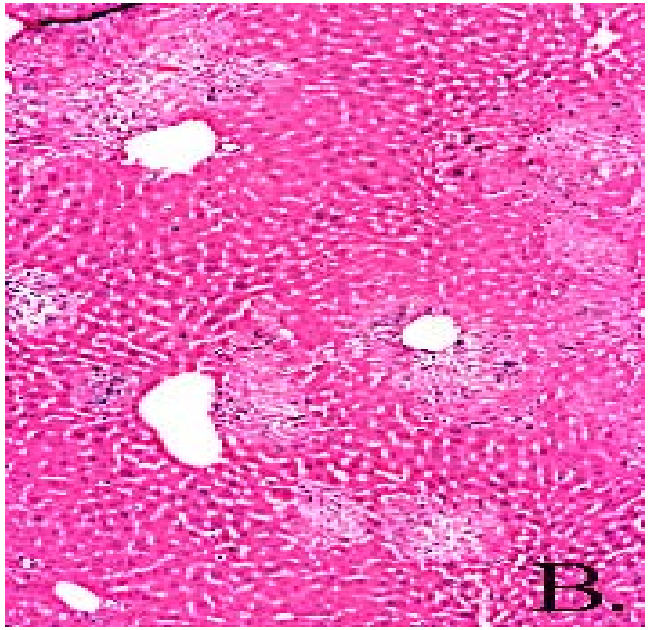
What Is Biosecurity?

Infections in laboratory rodents can…..

- Cause clinical disease in an animal
- Affect animal welfare
- Cause obvious or subtle changes in the animal's physiology or immune function that could ultimately alter study results, sometimes to the point of needing to cancel or repeat a study due to unreliable conclusions

Examples of Infectious Agents That Can Alter Toxicology Study Results

- **Mouse Hepatitis Virus** infects laboratory mice and was relatively common historically
- May be clinically silent or can cause overt hepatic disease that renders the animal clinically ill
- This virus can hinder hepatic regeneration and decrease cytochrome p450 microsomal enzyme activity in some infected animals*



*J Fox,L Anderson,F Loew, and F Quimby,eds.:*Laboratory Animal Medicine*, 2nd edition,2002

Examples of Infectious Agents That Can Alter Toxicology Study Results

- **Pinworms** are found in laboratory rodents (not the same pinworm found in humans)
- These parasites are extremely contagious in colonies and eggs can spread through the air to other animals in a room
- Pinworms can impede the development of adjuvant-induced arthritis and can induce T and B lymphocyte proliferation in the spleen*

*J Fox,L Anderson,F Loew, and F Quimby,eds.:*Laboratory Animal Medicine*, 2nd edition,2002

Our Biosecurity Auditing Project

- Assured that best biosecurity practices were in place, or would be developed, to aid in preventing a pathogen outbreak

- Assured that biosecurity rules and procedures already in place were understood and were being followed

- Site visits were carried out over a nine-month period during 2010-2011 at all Harlan Laboratories North American rodent production locations

Our Biosecurity Auditing Project

- Each visit lasted from 1 to 1.5 days

- Purpose was to identify and act upon appropriate findings that would enhance our biosecurity program to protect animals from infectious diseases

- We categorized findings as High, Medium, or Low Biosecurity Threats and acted on them appropriately, for example…

  - High Level Finding- lack of documentation of liquid chlorine dioxide concentration after mixing (this was part of a broader finding)

  - Corrective Action- appropriate sites informed of need for documentation, the SOP was altered, appropriate training carried out and compliance documented with future compliance to be monitored

Lessons Learned

- We noted differences between an audit solely focused on biosecurity compared to audits conducted by the IACUC, FDA, and AAALAC International

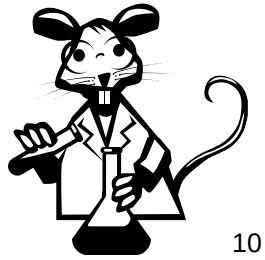
- Other audits might touch on biosecurity, but the topic is usually a small part of a much wider range of topics

- When the focus is strictly on, “Does this finding directly or even remotely affect our ability to identify, contain, prevent, and eradicate infections?”, it filters out many other distracting topics and allows visitors to probe for potential biosecurity “worst-case-scenarios”

Lessons Learned

- Feedback from production staff indicated that face-to-face visits on biosecurity by veterinary staff were welcomed and the open dialogue that developed about the challenges of biosecurity compliance was helpful

- A biosecurity auditing form was developed to standardize the topics for the site visits and to assure consistency between production sites

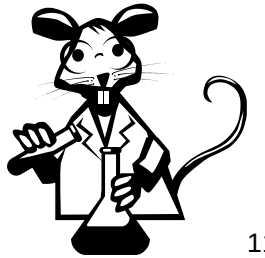


Lessons Learned

- Our auditing form contained both yes-or-no and open-ended questions to validate a participant's understanding of the biosecurity program principles

- We adapted this document for potential use by others in their own institutions and titled it "Biosecurity Auditing of Laboratory Rodent Facilities- Points to Consider"

- A hard copy of this document will be available after this presentation. An electronic version can be obtained by emailing wporter@harlan.com



General Points to Consider

- How clear are biosecurity requirements and procedures to the institution's vivarium management and staff?
- To what degree are biosecurity SOPs being followed?
- How is initial biosecurity training performed and documented for new hires and for periodic re-training?

General Points to Consider

- What are the reasons given for non-compliance by individuals?
- Who is authorized to make exceptions to a biosecurity requirement?
- Do all staff, including non-laboratory animal support staff that provide facility, engineering, and janitorial services, understand the direct and indirect impact they can have on the biosecurity of the animal colony?

Maintaining Animal Building Integrity and Perimeter Control

- What is done to decrease the likelihood of rodents and other animals (bats, raccoons, and squirrels) from entering the vivarium building and adjacent spaces such as penthouse or attic areas?

- How extensive is the program for monitoring incoming boxes, pallets, and bulk supplies that could harbor vermin or wild rodents?

- Is there a monitoring system in place for any rodents, aquatic species, and other kinds of pets that could be kept in laboratories or offices at the institution?

Controlling the Introduction and Spread of Pathogens

- To what degree is the air filtered that enters the animal space and is the air standard achieved with HEPA or other air purifying methods?

- Is physical separation of clean versus soiled animal/support equipment and traffic flow considered a factor in a potential colony pathogen break and how is this achieved and monitored for compliance?

- Are there restrictions on staff moving from one animal area to another or from animal room to animal room; on keeping pet rodents or rodents as reptile food in their homes?

Controlling the Introduction and Spread of Pathogens

- Are filtered cage lids used to prevent aerosol transmission of micro-organisms; are these cages integrated with a ventilated cage rack system for directly providing HEPA filtered air to each cage?

- What are the sanitation/disinfection/sterilization chemicals that are approved for use in the animal operation; what level of management can approve exceptions?

- How frequent and extensive is the routine or preventative maintenance program for cage washers, autoclaves, and other equipment ?

Controlling the Introduction and Spread of Pathogens

- What personal protective equipment (PPE) is required to specifically decrease the chances of a colony pathogen break in the animal facility?

- Are standards set for PPE; for example, if disposable gloves are approved for use, do they meet a minimum standard of thickness to help prevent punctures or tears?

- Are any expiration dates on containers of sanitizing liquids and hand treatment products (alcohol gels, soaps, iodine-soap impregnated hand scrub brushes) monitored to assure that suitable product is being used?

Surveillance for Pathogens and Consideration of Outbreaks

- What is the location of sentinel cages on a rack or in the room and is there any rotation of sentinel animals' cage locations within a room?

- What is the frequency of sampling for pathogens; what is the targeted sentinel sampling size/percentage of animal population; how comprehensive is the list of pathogens monitored for?

- How comprehensive is the screening and approval process to assure that biologics, including mammalian cell lines, solid rodent tumors, and solid human tumors passed through rodents, are free of rodent pathogens?

Surveillance for Pathogens and Consideration of Outbreaks

- Is there a plan of action, in case of a colony pathogen break, that includes who the decision-makers are for controlling or attempting to eliminate the spread of the pathogen in the colony?

- What is the recent and past history of the institution's pathogen control successes, failures, and times when it could never be determined where or how a pathogen break initially occurred?

- Are biosecurity audits conducted only as a result of a colony pathogen break or are they routinely conducted with re-evaluation of all biosecurity policies and procedures at predetermined intervals?

Summary

- We developed a biosecurity auditing document that greatly standardized our review process and can be modified for use by other institutions in reviewing their own programs

- We learned how a biosecurity audit differs from other reviews conducted in the animal facility

- As part of the auditing process, we opened up a dialogue about the topic of biosecurity with animal technicians, management, as well as our suppliers that will continue to lead to enhancements that will better protect our laboratory rodents and therefore research results of our clients

Acknowledgements

Joseph “Buddy” Curlee,DVM

Kim Clark

Lisa Mitchell

Terri Hare

Tony Engle

Dave Watkins

Ethan Rightley

Dale Cooper,DVM

Greg Birdsong

Don Ackley

Linda Bostrom

Enrique Gallardo

Jennie Nelson

Ciro Lomeli, DVM

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