# HANDBOOK OF MICROBIOLOGICAL INVESTIGATIONS FOR LABORATORY ANIMAL HEALTH pdf

## 1: Canadian Science Centre for Human and Animal Health - Wikipedia

*Handbook of Microbiological Investigations for Laboratory Animal Health.*

Only three attachments are required to accompany the annual report: Roster of the IACUC members, only if there has been a change to the membership Summary of any program changes Any minority view by an IACUC member If there have been no other changes to the animal program, then no other program elements are needed for the Annual Report. What You Need to Know " Flash - 53 mins. If you have any questions regarding your report, please contact OLAW at  OLAW requests that the Annual Report be faxed to or for more efficient processing. December 13, Charles River Laboratories, Inc. The Handbook of Clinical Signs in Rodents and Rabbits discusses how to make and describe observations using clinically applicable terminology and measures. It contains descriptions and images of normal and abnormal clinical findings. Versions in Spanish, French and Chinese will be available in  To obtain a complimentary copy, contact the Charles River Customer Support Center at askcharlesriver crl. Multiple copies will be provided to institutions upon request. January , Bethesda, MD Posted: This one-day workshop will help participants gain a practical understanding of the theory and application of available in vitro and in vivo alternative test methods that can be used to evaluate the eye injury hazard potential of chemicals and products while avoiding or minimizing animal use and animal pain and distress. Participants will learn the strengths and weaknesses of available alternative test methods, become familiar with the types of data they provide, and learn how to use these data in regulatory safety assessments. Workshop topics will be of particular interest to those involved in conducting safety tests for chemically induced eye injuries, those responsible for reviewing and approving study protocols prior to testing, and regulators who are expected to review data generated by the tests. This one-day workshop will help participants gain a practical understanding of the theory and application of available alternative test methods that can be used to evaluate the allergic contact dermatitis hazard potential of chemicals and products while minimizing animal use and avoiding or minimizing animal pain and distress. Workshop topics will be of particular interest to those involved in conducting safety tests for chemically induced allergic contact dermatitis, those responsible for reviewing and approving study protocols prior to testing, and regulators who are expected to review data generated by the tests. For more information, visit http: The two day conference is for IACUC members and administrators, principal investigators, attending veterinarians, regulatory personnel, and laboratory animal care staff. The program will include topics that explore advances in research animal welfare. For program, registration and accommodation information, visit http: Schmidt The articles in this issue highlight some of the exciting work being performed in birds to tackle many fundamental questions in the behavioral and neural sciences. Laboratory research in birds has already made key contributions to knowledge of brain function, and with the new avian brain nomenclature and increasing molecular evidence of similarities between avian and mammalian brains, cross talk will become easier and the impact of avian research even greater. The examples described in these articles illustrate the diversity of interesting questions and approaches in avian research as well as its potential benefits through translation to discoveries that will enhance understanding and treatment of human disease. From the perspective of laboratory animal research, the authors also emphasize the variety of experimental approaches and species being used and call for enhanced attention to husbandry and other animal care issues to help support this growing and cutting-edge area of animal research. Click to download the column: Lab Animal ; 39  For additional information, visit OLAW. November 4, One Health: Using One Health principles, scientists and health professionals of the 21st century have the opportunity to reshape and advance the future of health care for humans and animals worldwide. The articles in this issue illustrate a variety of practical and effective applications of the One Health approach, from research on the H1N1 influenza pandemic to the treatment of different types of cancer to recognition and management of zoonotic diseases that affect laboratory animals, pets, and livestock, among others. This is a meeting for IACUC staff and animal program operations personnel to present and share best

practices in the humane care and use of laboratory animals. A few openings remain for Session 1 Nov. Registration for Session 2 Nov. October 21, Chicago, IL Posted: The focus of this position is to facilitate compliance with laboratory animal welfare requirements of the Public Health Service Policy on Humane Care and Use of Laboratory Animals PHS Policy and to provide expert consultation on laboratory animal welfare in the negotiation of Animal Welfare Assurances with research institutions. This position is located in Bethesda, MD. For information concerning the duties and responsibilities of this position, salary and benefits available, required qualifications, and mandatory application procedures, interested candidates should visit the Jobs NIH website at: Questions about the announcement should be directed to Shirley Prophet prophetsh od. October 9, Atlanta, GA Posted: This one day seminar for veterinarians, IACUC members, scientists, veterinary technicians, and animal care professionals will feature experts in the field plus two interactive afternoon sessions. Program information can be found at http: Innovative Environmental Enrichment Symposium: October 10, Atlanta, GA Posted: The objective of this symposium is to provide a forum at which participants can compare notes on innovative animal enrichment and conditioning programs and how to best determine the effectiveness of those versus current practices. The event is formulated for individuals in the field of animal behavior, enrichment and welfare. Intended for those that have passions for providing quality laboratory standards that exceed regulations and meet animal welfare needs. For more information see http: The seminar recording can be found on the Education Resources page. The program focuses on topics such as advanced protocol review and provides opportunities for small discussion groups and sharing of information among participants. Call the SCAW office at  For questions, suggestions or comments, email to olaw od. September 1, Register now and save! Discounted registration extended to September  You can reserve a space now at the discounted rate with payment due by October 8. Animal Welfare and Scientific Research: Charles McCarthy who was instrumental in the development of federal regulations for the protection of human and animal research subjects. Day 2 will focus on the contributions of Scientific Research to human and animal health. State of the Science and Future Directions Posted: State of the Science and Future Directions. Natcher Conference Center in Bethesda, Maryland. For additional information, visit http: September 10, Bethesda, MD Posted: August 10, OLAW has a new online resource for information on nonhuman primate enrichment and social housing. This resource is provided to assist institutions in enhancing the care and well-being of nonhuman primates. Click here to visit the website. July 29, Animal Welfare and Scientific Research: On the second day, biomedical researchers and policy experts will discuss the contributions of animal models to human and animal health. The course provides a basic yet comprehensive overview of the laws, regulations, and policies that govern the humane care and use of research animals. This workshop is targeted for principal investigators, members of IACUCs, information providers, administrators of animal use programs, and veterinarians. All participants will receive a resource manual. Each participant must bring their own wireless enabled laptop for use during the workshop. For program, registration, and accommodation information, visit http: Discounted registration rates available through August  Call Mary Lou James at for further information. Track topics are customized to include subjects of timely interest. This report examines the value of random-source animals in biomedical research and the role of Class B dealers who acquire and resell live dogs and cats to research institutions. The prepublication copy is available at http: Lab Animal ; 39 6. June 10, Posted: Registration is limited to one connection per PHS Assured institution. This seminar will be recorded. Participants are encouraged to submit questions in advance by email to olawdpe od. Participants who registered for previous Seminars and already have web meeting accounts do not need to re-register. For more information contact OLAW at or email to olawdpe od. Disaster Planning and Management Posted: Kathryn Bayne and Jim Womack "The articles in this issue vividly illustrate that it is impossible to effectively plan for every possible disaster. Because individuals working with animals in other sectors e. We hope that the hard-won lessons learned by our contributors can be useful to colleagues both in laboratory animal science and in other fields. May , Beltsville, MD Posted: The workshop is targeted for principal investigators, members of IACUCs, information providers, administrators of animal use programs, and veterinarians. Course objectives

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are to provide: This Notice is to clarify the information that must be included in the Vertebrate Animal Section VAS of grant applications and cooperative agreements that use live vertebrate animals in research. It also explains how the VAS is evaluated as part of the NIH peer review process and is considered as part of the overall scoring. For questions, suggestions or comments, contact OLAW help. Topics include change in scope and research studies involving privately owned animals. March 11, Posted: March , in Baltimore, MD Posted: March 4, Seattle, WA Posted:

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## 2: OLAW: Office of Laboratory Animal Welfare News Archive -

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Advanced Search Abstract Proper health surveillance is vitally important to the evaluation of the microbial status of laboratory animals and the performance of standardized experiments with a minimum number of animals. But a universal testing strategy for the assessment of pathogen status in rodent populations and internationally recognized standards and definitions of their quality do not exist, even though health data can provide consistent information only when based on systematic sampling and testing. Although there have been repeated calls for the development of international health monitoring standards and reporting, there are also objections. This article presents both the advantages and limitations of guidelines. After an overview of major factors to consider I discuss previous attempts to harmonize health monitoring procedures. The health monitoring recommendations for rodents issued by the Federation of European Laboratory Science Associations FELASA could serve as a model for global recommendations and for international harmonization. Given the increased significance of accurate health information when exchanging animals, research institutions and universities would benefit from universal standards, which would also help scientists as well as reviewers and readers of publications to better assess the validity of research results. A number of reports have described the importance of microorganisms as factors that may influence animal experiments Baker , ; Bhatt et al. To assess the quality of animals used for scientific research a proper health monitoring scheme is important to define the pathogen status of both individual animals and the population as a whole, detect infection as early as possible, and validate the efficiency of measures for the prevention of agent introduction. Systematic and scheduled laboratory testing is the most effective way to determine colony status and to prevent or detect influences on experiments. Health monitoring 1 by itself does not affect the microbial quality of animals but provides an after-the-fact assessment of the adequacy of colony management practices and is thus a prerequisite for microbiological standardization of laboratory animals. Health Monitoring and Health Reports Results from health testing provide insight into the microbial status of animals tested at a particular time, whereas cumulative data from periodic testing of animals housed in a defined microbiologic unit over a longer period are more informative. Health reports that summarize the health information from regular and repeated testing comprise test results from higher animal numbers together with basic information e. Historical Development of Health Monitoring The aims of health monitoring have changed in recent decades. In the s clinical diseaseâ€”often caused by viruses, bacterial pathogens, parasites, and, most frequently, combinations of different agentsâ€”was not uncommon; testing focused on sick animals and on determining the causes of disease or death in a population. The introduction of rederivation techniques led to the elimination of numerous agents, including, importantly, indigenous murine viruses in rodent colonies even if they caused only silent infections. In addition, as commercial breeders were fairly successful in eradicating viruses and other microorganisms such as Mycoplasma pulmonis, the improved hygienic quality of their animals resulted in more purchases from commercial vendors and less breeding at many experimental facilities, which reduced the need for health monitoring at such facilities. During this period, the major aim of microbial monitoring was to ensure the hygienic quality of animals as well as the reliability of experimental data without research complications from animal infections. In the mids, soon after the introduction of transgenic techniques, various institutions started producing and using transgenic animals for research and so breeding became necessary again in research facilities. Soon transgenic animals were available from external sources, although not necessarily from carefully selected breeders. Almost every research institution now produces, breeds, or uses genetically modified rodents, so the number of source institutions for laboratory animals can be very high. However, many of these institutions do not have the expertise or the finances to establish appropriate health monitoring programs or techniques for the proper detection and identification of pathogens, so their health certificates are not always reliable. As a consequence, the increased worldwide

exchange of genetically modified animals from experimental units has resulted in the reemergence of pinworms, mites, and other agents. Importance of Health Reports and Health Monitoring For the reasons described above, international collaborations and more frequent exchanges of genetically modified animals between research institutions increase the need for measures to prevent agent introduction. It is therefore critical to accurately define microbial status through suitable and consistent health monitoring procedures. Reliable health reports are also increasingly important, especially as almost every institution now requests a health report before accepting a shipment of animals from an experimental or research colony in order to assess the quality of the animals and to avoid the introduction of agents. Comprehensive health monitoring before and during experimentation is the only way to demonstrate the presence or absence of unwanted microorganisms and thus the suitability of an animal population for a specific experiment. Knowledge of health status is an essential management aid and the basis for many decisions, such as the selection of housing conditions for animals from external sources. Health monitoring data are thus part of the experimental work and so must be considered during interpretation of experimental results both by the investigator and by those who read about the experiment. Considerations in Establishing a Health Monitoring Program The Need for Standardized Health Reporting To fulfill the aims described above a health report must contain all specifications necessary to evaluate the status of a population e. Obviously, some minimal information and standardization are necessary. In practice, however, health reports that fulfill these requirements are rare, indicating that many of those responsible for an animal facility may not be knowledgeable about procedures to effectively define the health status of a population. Test results are often submitted with insufficient and inaccurate data on the colony status and are therefore of limited value. Shipments of genetically modified mice frequently arrive with stacks of paper or long attachments to emails that are difficult and time consuming to read and assess, and do not even include the desired details. Often, only serology results are available, so it is not surprising that ecto-and endoparasites and other pathogens have been increasingly found in research animals during the last decade. Testing for bacterial infections is expensive, but it is essential to know about the presence or absence of significant bacterial agents and parasites in order to evaluate the microbial status of a population. For all these reasons standardizing the content of health reports would be very useful. Objections to and Limitations of Recommendations, Guidelines, or Regulations Despite many advantages of standardized health monitoring schemes, the usefulness of such schemes is much debated. Some scientists argue that guidelines or recommendations for health monitoring are not helpful because there are no two identical animal facilities, and different programs e. A health monitoring program is relatively easy to define for a breeding population, but it is more complex in experimental units that house different species and that bring in various strains and types of animals from multiple sources, leading to an unpredictable microbiological situation. A further argument against harmonization and general recommendations is that health monitoring programs must consider many different factors and be somewhat flexible, so guidelines could not fit all situations. For example, there are differences in the procedures for sampling animals for testing e. Thus there is general agreement that a universally applicable set of guidelines is not feasible. In addition, the number and kinds of agents to be tested vary depending on the type of research, as do the methods for detecting or excluding infectious agents. Furthermore, transmission of agents between animals and thus the prevalence rate of an infection among animals in individually ventilated cages is limited to spread during husbandry procedures and depends on the performance of such procedures. The detection rate for an infection may depend on the sentinel program and the quantity of bedding transferred into a sentinel cage, and is likely to vary from agent to agent. Animals housed in open cages and serviced in the open have the highest risk of transmitting agents, but such conditions are the best for proper and reliable health monitoring. Health monitoring should also include the testing of samples to be introduced into an animal unit, especially biological materials such as cell lines, tumors, and sera, all of which are important risk factors for the introduction of agents. It is also essential to test incoming animals for the presence of agents to avoid their introduction to an existing population. Possible limitations of standardized health monitoring include special problems that may arise with genetically

modified animals, in which unexpected changes in the immune system may occur accidentally and cause not only enhanced sensitivity to pathogens but also suppression or lack of antibody response. Sources of incoming animals and transportation conditions also affect the risk of agent introduction and must be considered when establishing a monitoring program. Not least, the extent and effectiveness of a health monitoring program depend on the funding available for it. Agents At first, the list of agents that the major rodent vendors tested for determined the agents to be monitored. Then in Parker published a list of viral infections to be tested, and 10 years later the German Society for Laboratory Animal Science GV-SOLAS published a list of pathogens to be considered Kunstyr ; the latter lists over 20 viruses, 25 bacteria, and about 30 parasites and fungi. Waggie and colleagues listed about agents that are known or suspected to be pathogenic for mice and rats or may interfere with biomedical research; the authors selected about 20 agents for regular monitoring on the basis of prevalence, importance, and availability of tests. A health report, however, should include all that are detected by the methods recommended. There are limits to the utility of lists of agents to be monitored. First, such lists are never complete, as new agents continue to emerge Karst et al. Second, they should not include agents relevant only for specific strains e. And third, a strict adherence to existing lists may risk excluding important e. Instead, the list of microorganisms should represent a moving boundary, with the removal of old agents and the addition of new agents as necessary. Guidelines or recommendations can be useful but the final decision about which agents to monitor in a population or which are unacceptable in a colony or parts of it has to be made by a veterinarian with specialization in laboratory animal medicine. Different traditions in different parts of the world have at times affected the agents for which animals are commonly tested. For example, testing for cilia-associated respiratory CAR bacillus is much more frequent in the United States than in Europe. It has since become standard practice in the United States, Europe, Japan, and elsewhere to test sera for antibodies to both MAdV-1 and  Aside from the earlier MAdV exception, testing commonly includes viruses, parasites, and various bacterial species, and there is not much variation from one country to the next. Viruses are generally considered important, and testing commonly includes those that remain prevalent in rodent populations. Parasites are regarded as indicators of poor hygiene and are thus considered unacceptable in rodent colonies. The most difficult decision is to define a list of unacceptable bacteria. Some bacteria are necessary for normal intestinal morphology and physiology; others are commensal or may have, with or without additional factors, some pathogenic potential; some are transmitted by humans. In contrast to viruses, the importance of bacteria for laboratory animals is usually estimated on the basis of their ability to induce pathologic changes or clinical disease. There have been attempts to categorize bacterial agents, but they are not practically useful. Although there is not much discussion of the significance of viruses, opinions about the importance of certain bacterial agents vary among different countries, breeders, and users. Each institution should therefore have onsite expertise to be able to tailor a program to specific needs instead of relying on strict adherence to a single set of recommendations. Test Methods It is easy to establish lists of agents, but more difficult to define test methods, although there are numerous reviews of methods that are useful for the detection or exclusion of certain agents in a population e. Several methods of serology testing differ in their sensitivity and specificity. Practical considerations are also important for a decision about which test to apply. For example, laboratories that test large numbers of sera prefer the enzyme-linked immunosorbent assay ELISA , whereas smaller laboratories may favor the indirect immunofluorescence assay IFA , which, although more laborious, offers more flexibility. During the last 5 years some of the larger laboratories have established multiplexed fluorometric immunoassay MFIA tests Khan et al. Compared to serology testing, bacteriology testing is more difficult to standardize because laboratories may use a variety of media, procedures, or culture conditions and the testing can be rather labor intensive and expensive unfortunately, the expertise and experience necessary to conduct effective bacteriology testing are often underestimated. Methods for identification of bacterial isolates vary among laboratories and may not be appropriate for certain bacterial agents from rodents. In addition, the sites or organs used for bacterial isolation may also determine the isolation rate. Variations in the isolation and identification methods for bacterial agents, among other factors, are responsible for variability in results from

different laboratories. Many customers submitting samples to diagnostic laboratories are discontented with the use of different methodologies among laboratories as they are frequently the cause of divergent results. Persons not sufficiently familiar with technical details may believe that the standardization of molecular tests is easy. However, numerous interlaboratory comparisons have shown that identical primer sets or reagents can produce different results and that molecular testing methods are very sensitive to failure. So further standardization is necessary and would be beneficial for investigators. Nonetheless, there may also be advantages to the diversity of methods for health monitoring and even in conflicting test results. In the mids, for example, researchers identified mouse colonies that gave positive reactions for minute virus of mice MVM by IFA but not by hemagglutination inhibition HI tests. Both tests detect antibodies to different viral structures and proteins. The differing results were a strong indication of the presence of an unknown virus, and the investigators subsequently learned that the colonies were infected with a novel parvovirus initially referred to as mouse orphan parvovirus and later named mouse parvovirus MPV McKisic et al. As an important contribution to further standardization of test methods, ICLAS has recently established a Performance Evaluation Program for Diagnostic Laboratories that offers subscribing laboratories the opportunity to evaluate their diagnostic methods through the analysis of well-characterized specimens for serology, bacteriology, and PCR testing ICLAS  Sample Size and Number of Animals to Be Tested The number of animals necessary to ascertain freedom from infection in a population depends on the nature of the infection and other factors such as husbandry methods e. Detection of diseases with a low tendency to spread e. Several reports describe statistical considerations for defining a sample size for a specific purpose for laboratory animals Clifford ; Kunstyr ; NRC ; Selwyn and Shek  Detailed statistical considerations intended for the detection of diseases in farm animals Cannon and Roe are also useful for laboratory animals. Costs of Health Monitoring Expenses are often a limiting factor of health monitoring. But it is important to consider that the more frequently animals are sampled and monitored, the more meaningful are the resulting health reports. Monitoring practices should include determination of the quality and health status of incoming animals upon their arrival and evaluation of the risk from experimental materials.

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## 3: - NLM Catalog Result

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Numerous benefits were identified for housing both laboratories in one building, including cost savings. Winnipeg was chosen as the site and an announcement was made in October  Construction of the facility that came to be named the Canadian Science Centre for Human and Animal Health often referred to locally as "the Virology Lab" began with an official groundbreaking in December  Construction finished toward the end of , with the first programs beginning in the spring of following an extensive commissioning process. The rest of the laboratories then became operational one by one. The official opening took place in  For a period of about 18 months, teams from NML travelled to West Africa to aid in the diagnostics during the outbreak. Their ongoing work on developing both a vaccine and treatment was fast-tracked into clinical trials during this period to help stop the outbreak. Co-location[ edit ] The primary reason for housing the two laboratories in the same complex was economic. It saves the citizens of Canada money by only having one facility to operate with a number of shared services also keeping costs down. However, the partnership between these two world leading labs also allows for collaboration and cooperation on established, emerging and re-emerging infectious diseases. Many of the viruses, bacteria and prions studied at CSCHAH are zoonotic, meaning that they can transfer from animals to humans. This model is held in high regard within the international containment laboratory community. Built to exceed national and international standards, CSCHAH maintains its high level of excellence through ongoing maintenance and regular upgrades. The complex is built as a series of program-specific blocks interconnected by an area dedicated to common elements for both departments such as the library, cafeteria, and theatre. CSCHAH houses laboratories to manage any type of infectious organism from the most common to the most exotic. Containment Level 3 involves specific engineering controls and protocols to ensure the safety of lab staff, the public and the environment;  Although the facility is thought of as a "Level 4 facility," only 3. Level 4, with its special construction and biosafety suits, is necessary to work with the most serious of pathogens including Ebola, Nipah, and Marburg. This operations centre is the hub of the National Microbiology Laboratory when there is an outbreak or a deployment of personnel off-site. It is equipped with three separate phone systems, can videoconference with 38 participants at a time, and can connect via satellite to remote locations around the world. A three-story expansion to the building was completed in  The expanded and renovated areas include specimen receiving, shipping and receiving, bio-repository, media preparation, office, and meeting space. The construction, engineering controls and sterilization systems are geared toward the highest level of safety. Safety is of paramount importance to everyone working in the facility. Extensive Standard Operating Procedures SOPs are in place and everyone is well-trained for the specific area they work in. Any material exiting the level 3 or 4 laboratories must be sterilized or decontaminated in some manner. Air is drawn into the laboratories through the use of negative air pressure before being filtered out through High Efficiency Particulate Air HEPA filters. Laboratory waste such as gloves, test tubes, and pipette tips are removed via an autoclave, a piece of equipment that sterilizes materials with steam and pressure. Any liquids leaving the high-containment space go through a biowaste system that operates like a large autoclave to sterilize it. The high-containment labs are built as a box-in-a-box; they do not border exterior walls and there are mechanical spaces above and below them. Only the lobby area is open to the public; all guests must be escorted within the secure area at all times. All staff working in the facility have Secret Level II security clearance. Further details on security at the facility cannot be disclosed. It was to create a basis for and to maintain an atmosphere of public trust and confidence between the centre and the community. The committee consists of volunteer members representing a wide range of organizations including community residents, scientists, health care professionals, and agricultural professionals. The committee meets at least four times per year, holds regular public information sessions and

issues reports on their activities. Other laboratories have modelled this approach. This ensures that the committee and others are apprised of incidents of any significance in a timely manner plus they have access to information on each and every incident no matter how minor, at their meetings.

## 4: Animal Health Program

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## 5: International Harmonization of Health Monitoring | ILAR Journal | Oxford Academic

*1. Author(s): Needham,J R Title(s): Handbook of microbiological investigations for laboratory animal health/ J. R. Needham. Country of Publication: England Publisher.*

## 6: Books on Veterinary Microbiology

*health laboratories, animal and environmental health laboratories or any other laboratories performing testing for the purpose of disease diagnosis, screening, prevention, medical treatment decisions, surveillance or public health.*

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