MARSHALL UNIVERSITY
ANIMAL RESOURCE FACILITY
ANIMAL CARE AND USE PROGRAM

Byrd Biotechnology Science Center

Director: Billy W. Howard, DVM

Hours: 7:30 a.m. to 3:00 p.m. Monday through Friday
Limited hours on Saturday, Sunday and Holidays

MARSHALL UNIVERSITY
ANIMAL CARE AND USE PROGRAM

A. Introduction

Institutional animal facilities and programs are operated in accordance with the requirements and recommendations of the Guide for the Care and Use of Laboratory Animals, the Animal Welfare Act (P.L. 89-544) and subsequent amendments, and other applicable federal, state, and local laws, regulations, and policies.

B. Institutional Policies

1. Monitoring the Care and Use of Animals

   a. Institutional Animal Care and Use Committee (IACUC)

      1) Composition

         a) Monica Valentovic, Ph.D., Professor, Pharmacology, and Chairperson of committee.

         b) Billy Howard, DVM, Director, Animal Resources Facility and University Veterinarian.

         c) Brian Antonsen, Ph.D., Assistant Professor, Biological Sciences

         d) Jung Han Kim, Ph.D., Associate Professor, Pharmacology, Physiology, Toxicology

         e) Todd Green, Ph.D., Associate Professor, Pharmacology

         f) Michael Moore, Ph.D., Volunteer, Habitat for Humanity Nonaffiliated

         g) Thomas A. Boster, Non-Scientist, Member

      2) Protocol Review Procedures

         An "Application for the Care and Use of Laboratory Animals at Marshall University" must be completed by the investigator, submitted to the Research Office for

administrative review, and placed on the agenda of the next IACUC meeting. All protocols undergo Full committee review. Only in rare cases will a protocol undergo "Designated Member-Review".

All IACUC members review every "Application for the Use of Laboratory Animals." This application includes a summary of the proposed protocol with complete details of animal use. A protocol evaluation form serves as a checklist for all items that need to be addressed in order to comply with the AWA and PHS regulations. Each IACUC member completes the evaluation form based on information supplied by the investigator and makes one of three recommendations: "Approved", "Request Modification to Secure Approval", or "Approval Withheld". These applications are considered at regular meetings of the IACUC and decisions based on majority vote. A quorum is required for votes to be taken. A single vote to table the application is all that is required to postpone further consideration of the application until additional information is obtained.

Animal work cannot begin until full approval is awarded. Request Modification to Secure Approval indicates changes must be made to the protocol prior to full approval of the protocol. Full approval is needed before animal work can begin. In addition, new investigators must complete training before beginning work with animals. During the full committee review of the protocol, changes are recommended or clarifications are requested and recorded. The Chair of the IACUC sends a list of the needed modifications to the investigator. The investigator then sends a revised application to the Chair of IACUC. Two members of the IACUC conduct a designated review of the modifications and decide on approval. The requirements for Designated Member Review (DMR) of Protocols requiring modifications after Full Committee Review (FCR) prior to being approved were discussed at a regularly scheduled meeting of the IACUC. The committee members unanimously agreed to allow DMR and signed an agreement form.

This application was adopted for use by our IACUC and provides complete information regarding the study. Other information requested on this application includes, if surgery is to be performed, who is going to do it, surgery experience of the investigator described, where it is to be performed, and who is responsible for postoperative care. If isotopes, infectious agents, carcinogens, or toxic agents are used, information is supplied and reviewed on handling exposed animals, excreta, protective clothing, and disposal of animal carcasses. These applications require approval from the Radiation Safety Officer, Chemical Safety Officer, or the Biosafety Officer. There is also a section that must be completed if prolonged physical restraint or stress is a part of the study. Any environmental requirements and how the animals will be euthanized at the conclusion are reviewed. The rationale for using the species of animal indicated is required to be supplied, as well as the rationale for using the number of animals indicated for use in the time period of the protocol. The Principal Investigator (PI) must provide a written narrative of source(s) consulted from which

the IACUC can satisfy itself that alternatives were adequately considered. A written assurance that the proposed activities do not unnecessarily duplicate previous experiments must be included. In addition, the qualifications and the experience of the personnel conducting procedures on the animal species identified must be included.

If the PI wants to start work prior to the next scheduled meeting, he or she may request a special expedited or Designated-Member Review by the IACUC. The occurrence of Designated-Member Review is rare as the IACUC has scheduled full committee meetings each month. In the case of Designated-Member Review, the same application and evaluation forms are provided to all IACUC members. All IACUC members serve as designated reviewers. Every member of IACUC must review the protocol. The IACUC members evaluate the protocol and must decide to: 1) approve, or 2) call for a full committee review. If one reviewer decides for a full committee review, the proposal will be discussed at the next scheduled full committee meeting. A reviewer requests full committee review by the "approval withheld" designation. When a full committee review is requested, approval of those research projects may be granted only after review at a convened meeting of a quorum of the IACUC members and with the approval vote of a majority of the quorum present.

All animal use, regardless of funding, undergoes the same review process. All IACUC members review applications for compliance with the AWA and that the activity is consistent with the "Guide" unless acceptable justification for a departure is presented and approved by the IACUC. Final review and approval of the full IACUC must be complete and the PI notified before the work can begin. All approved studies undergo annual review.

The IACUC will notify PI's of its decision to approve or withhold approval of those sections of applications or proposals related to the care and use of animals by returning the "Application for the Care and Use of Laboratory Animals at Marshall University" to the PI signed by the chairperson of the IACUC noting either approval or withholding approval. If modifications are required to secure approval, these will be forwarded, in writing, to the investigator and corrected in the application or proposal before approved by the IACUC.

If the IACUC withholds approval of an application or proposal, it will include in its written notification a statement of the reasons for its decision and give the investigator an opportunity to respond in person or in writing.

Amendments to protocols are reviewed in the same way. Each request is submitted in writing with a detailed description of the proposed changes along with the associated justification. Amendments are considered by all IACUC members at either the next scheduled meeting or as a special case as previously described. Committee action is

based on a majority vote of a quorum or the application may be tabled by a single vote. All actions on amendments are reviewed in the regularly scheduled meetings of the IACUC and recorded in the minutes.

If the proposed amendment is judged to be minor according to an "IACUC Policy on Temporary Administrative Approval of Proposed Changes to Approved Animal Procedures" approved by the IACUC on December 13, 1999, the Chair may grant temporary approval until the next regularly scheduled meeting of the IACUC. Amendments proposing minor changes that have been temporarily approved by the Chair will be listed on the agenda under the heading of "Temporary Administrative Approval" and will be distributed to committee members prior to the meeting at which they are considered. As in the case of "Standard Review" and "Annual Review" protocols, any member may request individual discussion and voting on any amendment listed on the Temporary Administrative Approval agenda. All other amendments listed on the Temporary Administrative Approval agenda will be voted on in a block.

The IACUC may suspend an activity that it previously approved if it determines that the activity is not being conducted in accordance with applicable provisions of the AWA, the “Guide”, or the institution’s Letter of Assurance. The IACUC may suspend an activity only after review of the matter at a convened meeting of a quorum of the IACUC and with the suspension vote of a majority of the quorum present.

Approval of all animal use protocols is limited to three years. Each PI is notified in advance of the expiration date that he or she must submit a new application of continued animal use. By doing this, continuation of any protocol is contingent on full review and approval by the IACUC every three years. All active protocols are reviewed each year by the IACUC by asking the PI’s for a brief status report.

All IACUC members are expected to attend each meeting. Unavoidable absences will occur, but each IACUC member must complete the protocol evaluation form and forward it to the IACUC chairperson. Any concerns noted on the evaluation form will be discussed at the regularly convened IACUC meeting. IACUC members are expected to vote on each research project, unless there is a conflict of interest which is noted in the minutes.

3) Review of programs for Care and Use of Animals

The IACUC meets monthly and in special sessions if necessary. Semiannually, at the June and December meetings, the program for humane care and use of animals is presented to the full IACUC for review. The IACUC uses a checklist suggested by OLAW, and approved by the IACUC, for the semiannual program and facility review.

4) Inspect at least once every six months all of the institution's animal facilities

All members are invited to attend the semi-annual review of the facilities. The inspections are conducted by at least 3 members of the IACUC including the veterinarian. We make every effort to accommodate the nonaffiliated IACUC member's schedule so that they could participate.

Semiannually, prior to the June and December meetings, at least three members of the IACUC inspect the animal facilities and the laboratories where animal research is conducted. This inspection team uses a checklist suggested by OLAW, and approved by the IACUC, for the semiannual program and facility review. This inspection report is placed in the IACUC agenda for June and December for full IACUC review.

5) Prepare reports of the IACUC evaluations and submit the reports to the Institutional Official.

After the semiannual program review and facilities inspection, the IACUC completes a form suggested by OLAW for the semiannual report to the institutional official. This report annotates deficiencies as either minor or significant, plans for correcting the deficiencies, identifies responsible parties for correcting the deficiencies, and the completion date for the deficiencies. This report is forwarded to the Institutional Official.

Departures (exemptions) from the PHS Policy, Animal Welfare Act, and the "Guide" are identified during IACUC review of proposed animal use protocols. Exemptions must be justified by the PI prior to obtaining IACUC approval to begin work on the protocol. These exemptions are reported in the minutes of the IACUC meeting and forwarded to the Institutional Official.

The semiannual report to the institutional official annotates deficiencies as either minor or significant, has plans for correcting the deficiencies, identifies responsible parties for correcting the deficiencies, and the completion date for the deficiencies. If a deficiency is deemed to be significant the Institutional Official will notify OLAW with a preliminary report on the nature of the deficiency and plans for correction, on the understanding that a full report will be submitted upon completion.

Along with the semiannual report to the institutional official, the IACUC prepares written recommendations regarding any aspect of the institution's animal program, facilities, or personnel training. These recommendations have been discussed, and agreed on, during the IACUC meeting under the agenda item of new business. Also included with the recommendations are suggested implementation options for each recommendation.

2. <u>Veterinary Care</u>

The qualifications, authority, and percent of time contributed by the veterinarian(s) who will participate in the program are as follows:

Name: Billy W. Howard is the Director of Animal Resources and serves as the University Veterinarian

Qualifications:

- Degrees: BS, DVM,.
- Training: Received DVM from Auburn University in 1983. Completed Laboratory Animal Medicine Residency at Walter Reed Army Institute of Research in 1989. He has been involved in laboratory animal medicine since that time. Attends AALAS and other continuing education seminars annually.

Authority: Dr. Billy W. Howard has direct program authority and responsibility for the Institution's animal care and use program.

Time Contributed to Program: Full time employee and dedicates 65% of his time to the animal care and use program.

Name: Jan Ball is the back-up veterinarian

Qualifications:

- Degrees: BS, DVM
- Training: Received DVM from Auburn University in 1983. Private Practice since then. Attends IACUC meetings, conference seminars. Reviews journal articles concerning laboratory animal medicine, and completed the required online training utilizing the CITI Program website as referenced in paragraph III.H.

Responsibilities: Back-up Veterinarian

Time Contributed to Program: As needed

3. Personnel Qualifications

a. Animal Resource Professional/Management/Supervisory

Billy W. Howard, DVM, who has been involved in Laboratory Animal Medicine since 1985.

b. Animal Care Personnel

There are two full-time animal care technicians. One has been on the staff since 1986. The other has been on the staff since 1992. Instruction in proper handling of the different species is provided to new technicians.

New technicians are instructed on normal animal appearance and behavior. Any deviation from the normal appearance and behavior is reported to the Director, ARF. Any abnormal condition is used as a learning tool and the abnormality is explained fully to the animal technicians.

The "Journal of the American Association for Laboratory Animal Science", the "Lab Animal" magazine, and pertinent articles in the "Journal of the American Veterinary Medical Association" are made available. Other information is obtained from articles published by various research institutes. At present, the Manual for the Assistant Laboratory Animal Technicians and the Manual for Laboratory Animal Technicians from AALAS are also available.

c. Research Staff

Research Staff has access to an online training program www.citiprogram.org that is available to all researchers seven days a week, 365 days a year. All new investigators, research staff, and graduate students are required to complete these courses prior to initiation of the use of animals in research. We require researchers to complete the course on *Working with the IACUC*. If there are any courses pertinent to the species the researcher is working with, they are also required to complete those courses, such as *Working with Mice in Research Settings, Working with Rats in Research Settings,* and *Post-Procedure Care of Mice and Rats in Research: Minimizing Pain and Distress.*

d. Use of Hazardous Agents

Once the IACUC is satisfied the investigator is qualified, hazardous agent training is taught by the PI to all staff included in the protocol

4. Personnel Hygiene.

a. Protective / Work Clothing Provided.

Scrub shirts, pants, and lab coats are provided by the division. Aprons, gloves, and boots are also provided.

b. Shower/change Facilities.

There are male and female change areas with lockers and showers located in the facility.

c. Eating, Drinking & Smoking Policies.

There is no smoking in any university building. Rooms 110, 111, and 112 in the BBSC are where eating and drinking may occur.

5. Occupational Health and Safety Program.

a. Description of Program, including Personnel Included.

The occupational health program is voluntary but highly encouraged for all members of Marshall University who work in laboratory animal facilities or have substantial animal contact. This includes animal resource personnel, research technicians, research investigators, faculty, and staff. The program consists of the following, if deemed necessary by the Occupational Health Physician:

1. Completion of Occupational Health Questionnaire
2. Review of the health questionnaire and risk assessment performed by the Occupational Health Physician who will determine which of the following procedures will be performed on the individual.
3. CBC with differential (annually)
4. Urinalysis (annually)
5. TB testing (annually), if test result is positive, employee will be given chest x-ray
6. Tetanus immunization

If deemed necessary by the Occupational Health Physician, the following vaccines shall be offered and if declined, a declination form will be signed and placed in employee personnel folder. If employee chooses at a later date to receive the vaccine, employee may do so.

Hepatitis B vaccine series

These procedures shall be offered at no cost to the employee and shall be conducted under the direction of a licensed health care professional.

Medical records shall be maintained in employee's personnel folder and shall be provided upon written request for copying to the subject employee or to anyone having written consent of the subject employee.

Department chairpersons/managers are responsible for disseminating this program to their respective department personnel. These same people are responsible for enrolling their personnel in the program and providing the above tests, procedures, and vaccines to the employee.

b. Educational Program.

An educational program prepared by the Director of Animal Resource Facility teaches all personnel having animal contact about zoonoses, personal hygiene, and precautions that need to be taken by pregnant women. Methods of preventing animal bites and treatment

procedures, should they occur, are in place. Bite wounds are recorded in the employee personnel file.

6. Experimentation Involving Hazardous Agents

   a. Hazardous agent proposals are handled through the IACUC. Additionally, we have the Regulatory Official (Radiation Safety Officer, the Infection Control Officer, Chemical Safety Officer, etc.) read the complete protocol. These individuals must approve all aspects before the IACUC acts. After IACUC approval, the principal investigator and the facility director will instruct everyone involved in the project as to the proper procedures.

   b. Monitoring is done by the Regulatory Official, Safety Specialist, Principal Investigator and the ARF Director.

7. Animal Restraint

   a. The only restraint devices used are rodent and rabbit restrainers. These are utilized during blood collections and injections. Use is limited to the time required to collect the desired volume of blood or perform the injections.

8. Multiple Major Survival Surgery

   a. Multiple survival surgery is discouraged, but may be done with the IACUC approval. They must be justified for scientific reasons in the protocol.

   b. Procedure for approving multiple survival surgeries is the same as other procedures except for these additional steps; the investigator is asked to explain to the full IACUC, in person, his protocol. He must defend why multiple surgeries are necessary. Animal cost alone is not sufficient for doing multiple survival surgeries.

C. Laboratory Animal Husbandry

1. Housing

   a. Solid bottom polycarbonate cages, stainless steel cages.

      Polycarbonate cages, 18”x9.5”x8”, 11.5”x7.5”x5”
      Stainless steel cages 30.5”x24”x18”.

   b. Social enrichment

      Appropriate social interactions among members of the same species are essential to normal development and well-being. Most animals (rodents) are housed in groups of common sex and age. Rodents housed individually are in polycarbonate cages so they can see each other.

Single housing of social species should be the exception and justified based on experimental requirements or veterinary-related concerns about animal well-being. Fighting, recovering from surgery, studies where food/water intake and/or feces/urine collection is monitored are IACUC approved exceptions to socially housing animals. Rodents housed individually are in polycarbonate cages so they can see each other. Nestlets, mouse huts, and other environmental enrichment devices, such as plastic pipes and "crawl" balls, are utilized with the rodents. Rabbits are housed individually and racks can be placed across from each other for some visual contact.

c. Macro and micro-environments

Macro environments are monitored by a centralized computer program which records humidity levels, intake air temperature, and exhaust air temperature and room.

2. Food.

a. Type

Purina pelleted food is used.

b. Vendor Quality Control.

The feed comes from a commercial vendor, Cincinnati Lab Supply who, upon receiving our order, ships the feed by commercial carrier to our facility.

c. Storage

1) At research facility

We only have one central storage area. We also have refrigerators to store bulk special diets that need refrigeration. Food is stored in room 116 in the BBSC.

2) In Animal Rooms.

In the animal rooms the feed is stored in plastic, 20 gallon containers with tight fitting lids. The milling date of the feed is taped to the lid of the container. The date the container was last sanitized is also taped to the container.

d. Type of feeders

Cage tops and hanging feeders.

e. Institutional quality control

Food quality is monitored by milling dates on bags. No food is used if the milling date is over 180 days. If there is no milling date on the feed bag, the food is discarded if it has been in our facility for 90 days. For animals requiring Vitamin C in their diet, no food is used if the milling date is over 90 days unless it has been under constant refrigeration. In that case the shelf-life is extended to 180 days after milling. Bags are rotated so the oldest milling dates are used first. We do no other quality control testing.

3. Bedding.

a. Type and how used.

We use Bed-O-Cobs® bedding which is ground corncobs manufactured by The Andersons, Inc., of Maumee, Ohio. For rodents, the animals are in direct contact with the bedding. For rabbits on wire floors the bedding is in pans beneath the cages; therefore used as indirect bedding.

b. Storage facilities.

We have one central storage facility and the clean bedding is placed in the clean cages in this area. The bedding is stored on pallets.

c. Quality control.

We rely on vendor reports for quality control.

4. Water

a. Source, Treatment

The source of water for animals in the BBSC ARF is Reverse Osmosis (RO) water which is dispensed into bottles in Room 114. This dispenser is also capable of acidifying the water prior to dispensing.

b. Quality control methods.

In the BBSC ARF water quality reports are received from the water company.

5. Sanitation

a. Cage Sanitation.

1) Cage / pen litter changing frequency.

Rodents are housed in individually ventilated cages. These cages are changed at least once a week.

2) Location where soiled bedding removed.

Soiled bedding is removed from the cages in the dirty side of the cage wash room. Hazardous material bedding is removed in the animal holding room under special procedures.

3) Frequency

a) Solid bottom cages - once a week to daily
b) Cage tops - once a week
c) Cage racks & shelves - once a month
d) Cage pans under suspended cages - two to three times a week

4) Procedures and agents

Dirty cages are transported to the cage wash room. Pharmacal® alkaline detergent is the detergent currently being used. Pharmacal® URID is used for the urine descaler.

5) Monitoring and effectiveness.

Cages and bottles are cultured once a month, after washing, to monitor the sanitation of the cages. Water temperature of the cage washer is monitored by the computer built into the machine. The machines are programed to not complete the cycle if the appropriate temperature is not attained. Washing time and temperatures are recorded on printer tapes from the washers. We also use stick-on temperature recording labels to monitor washer temperatures.

b. Sanitation of Feeding Implements.

1) Procedure and frequency for feeders.

Feeders inside of cages are cage washer sanitized once a week. Cage tops used as feeders for rodents are cage washer sanitized once a week.

c. Procedures & frequency for watering devices.

Sipper tubes and water bottles are exchanged with cage washer sanitized ones daily, except weekends. On weekends water bottles are replaced as necessary with cage washer sanitized clean ones.

d. Sanitation of Transport Cages & Vehicle.

Platform trucks for moving clean cages, feed, bedding, etc., are swept off several times daily and sanitized with a detergent/disinfectant weekly. Animal carrying cages for rabbits are cage washed after each use. Plastic tubs and tops used to transport rats and mice are cage washed after each use.

e. Room Sanitation.

1) Animal rooms.

Each animal room is swept daily with a broom assigned to that room and left in the room. Animal room floors are sponge mopped on change days. A quaternary detergent/disinfectant is used on the floors.

Once a month all movable racks with cages are removed from the animal holding rooms. The floor, walls and ceiling are sprayed with a quaternary detergent/disinfectant with house water pressure and removed with a wet-dry vacuum. Fixed equipment in the rooms, such as sinks and towel dispensers, are cleaned weekly. The cage wash room floor is mopped daily with a wet mop using the same quaternary detergent/disinfectant.

2) Corridor and support area cleaning.

Marshall University Housekeeping sweeps and wet mops the corridors and support areas each night. They are presently using a phenolic germicide for these areas.

3) Implements.

For the animal rooms we use two buckets. One bucket has the detergent/disinfectant solution and the other bucket has a bleach solution. Each room has its own mop. After the floor is mopped with the detergent/disinfectant, the mop is rinsed out in the bleach solution and placed in the rack to dry until the next use. New mops are placed into service as needed and the buckets are wiped out and polished as needed. A standard wet mop is used in the cage wash room.

4) Separation of cleaning implements by room.

Cleaning implements are not shared between animal rooms. Each room has its own broom and mop that stays in the animal room.

f. Waste Disposal Methods.

1) Soiled bedding & refuse.

All of the cages and pans that contain uncontaminated soiled bedding are transported to the cage wash room by the designated dirty corridor. Here the soiled bedding is emptied into the Garb-el® disposer. The cages are rinsed out with water and then placed in the cage washers. The rabbit pans, cages, and guinea pig cages are sprayed with a urinary descaler, after the soiled bedding is removed, to remove the urine deposits before washing in the cage washer. Both cage washers have double doors. Detergent is used and the cages are washed with 180°F water and rinsed twice in each wash cycle. The clean cages are taken out the clean side of the washer, allowed to air dry, and transported to the area designated for adding clean bedding to the cages. They are stored here until the next change. Shipping cartons, cans, paper towels, detergent boxes and other miscellaneous items are placed in a commercial repository for disposal.

2) Animal carcasses.

Animal carcasses are placed in plastic bags and stored in a 30 gallon plastic container with a tight fitting lid in the walk-in cold room. These carcasses are double-bagged and placed in a commercial repository for disposal.

3) Hazardous waste.

Hazardous waste from any source or nature are handled according to directions from the Radiation Safety Officer, Infection Control Officer, or the person designated to advise on carcinogens or toxic material. Infectious waste, such as bedding, is usually collected in the animal holding rooms under special written procedures: autoclaved before disposal, autoclaved before placing it in the sanitary sewer, or held in special drums if isotopes are used and the isotope level prevent us from incinerating the bedding. These drums are stored for commercial disposal. Infected or hazardous animal carcasses are placed in containers supplied via contract with a hazardous waste disposal company. These containers are sealed and collected by the contract company on a weekly basis.

g. Vermin Control.

1) Program.

For vermin control, the BBSC is sprayed routinely by a professional exterminator who alternately uses Ficam W® in the sprayers.

In the animal facilities, we monitor insects by the use of "sticky" traps located in various areas in the facility. We have not used insecticides in the animal facility itself. Our monitors do not indicate we have a problem. All of the animal room doors

have seals on the bottoms to keep out wild rodents. There has not been any indication of wild or escaped rodents in our facility.

2) Notification of animal users.

Before any insecticide is used in the animal facilities, each investigator would be notified and alternate arrangements made for his animals if requested, or an alternative to insecticide use would be explored.

6. Animal Identification and Records

a. Methods for Identification of Each Species.

Rodents are identified for our purposes by cage cards. These cards contain species, sex, weight or age, number of animals in cage, identification number, date received, IACUC number and investigator's name. Multiple housed animals are identified by the investigator if necessary with approved identification methods.

Rabbits are individually housed and identified by cage cards and ear tags.

b. Procedures for Maintaining Individual Records.

Each rabbit has a medical record where all the information is recorded as long as the animal is here.

7. Provisions for Emergency, Weekend and Holiday Care

a. Procedures for Weekend / Holiday Care.

On weekends our regular animal care staff alternate being on duty. Only one person comes in and checks the animals in their cages for anything abnormal. They add feed and change water bottles if necessary. They sweep the floors in the rodent and rabbit rooms. They also monitor the temperature in the rooms, check lights, ventilation fans and any other mechanical problems that may be present. They do not stay the entire day.

Holiday observations during the week are handled like a regular work day. Depending on the day of the week and the work load in the facility determines if one or two people work. Employees do not stay on the job all day.

Instructions left by the veterinarian are followed if medication is to be given to any animal.

b. Procedures for Contacting Responsible Animal Care and/or Veterinary Personnel.

Telephone numbers for Maintenance and Veterinary Staff are posted on the bulletin board outside the technician office. Mechanical problems are reported to Maintenance who responds to the problem. They are notified by pager from the computer which monitors the facility HVAC system. Animal health problems are reported to the veterinarian who responds to the problem.

c. Procedures for Monitoring Animal Facility Mechanical Systems.

Animal facility mechanical systems are monitored by computer, which is connected to the emergency power system, under contract from Johnson Controls. There are sensors that monitor electrical power, temperature, and air flow. Any deviation from normal settings are detected on site and telephoned to the Maintenance Department who respond. This is in effect 24 hours a day.

D. Veterinary Care

1. Preventive Medicine

a. Animal Procurement.

Source evaluation is from vendor periodic health reports. Selection for each species may be investigator preference or is determined by investigator's protocol or discussing with investigator the advantages and disadvantages of different vendor animals. Source evaluation may be also based upon the closeness of vendor, method of delivery, and availability of animals. All the animals in the facility are ordered by the ARF. Shipments of animals are received by ARF personnel and transferred to their appropriate cages.

b. Quarantine, Stabilization & Isolation

1) Receiving & initial evaluation procedures.

Initial procedures when animals arrive include making sure information on shipping carton corresponds to our requisition. The condition of the shipping cartons is noted and if it is a filter carton, it is sprayed with a disinfectant. The carton is opened and the sex and weight are randomly checked. All animals are visually observed for obvious health problems.

2) Quarantine facilities & procedures for purpose bred animals.

Rabbits are handled as above and are provided seven days to allow for physiological, psychological and nutritional stabilization before being released for use.

c. Separation by Species, Source, Health Status

Animals are housed separately by species and also by vendor whenever possible. They are also separated by health profiles from the same vendor.

2. Surveillance, Diagnosis, Treatment & Control of Animal Diseases

a. Program

1) Daily Observation of Animals.

The animal care technicians are responsible for observation of animals for illness or abnormal behavior. Their training has been done in house. They report problems verbally to the director.

2) Procedure for Providing Veterinary Care

Veterinary care, after a diagnosis is made and a treatment schedule established, is done by the veterinarian or the animal technician, P.I., or graduate student.

3) Medical Records Maintenance Procedures.

All AWA covered large animals have an Animal Medical Record for each individual animal. This has all the manipulations and procedures recorded. Any diagnosis and treatment set up by the veterinarian is recorded on a 3x5 card. The treatments are initialed by the responsible individual, and becomes a part of the medical record.

Rodents covered by the AWA are identified to the cage level and medical records are maintained for the animals by the cage.

4) Preventative medicine

Animals entering the animal facility must have health reports supplied by the source of procurement.

5) Animal Health Monitoring

We do not have any long term in house breeding colonies for which we would have vendor supplied health reports for comparison. We monitor, serologically, virus free animals in our facility to see if there is any seroconversion. This is done biannually.

b. Diagnostic Resources

1) In the facility there is a microscope and centrifuge. We can do skin and fecal examinations.

2) Necropsy facilities are available and used on an as-needed basis. There are no in-house histopathology capabilities.

3) Additional diagnostic services are provided by commercial enterprises. Serology, bacterial culture, bacterial sensitivities and histopathology are provided. Samples are mailed or delivered in person. Cultures and sensitivities are the most used, followed by histopathology and serology. Annual usage is approximately twelve to twenty-four requests.

4) Radiographic equipment is not available in the facility.

3. Anesthesia and Analgesia

a. Agents Used for Each Species -

Rats, mice, rabbits anesthetic is ketamine plus xylazine. Isoflurane is also used in rodents. Buprenorphine is the analgesic of choice and recommended for use in all species.

b. Guidelines Provided by the Veterinarian -

The veterinarian when reading a protocol evaluates the appropriateness of the anesthetic. If there is a problem, it is discussed with the investigator and resolved before the protocol is accepted. Approved anesthesia and analgesic drugs, routes of administration and dosages for rodents are listed in a handout prepared by the ARF and distributed to all investigators. Anesthesia and analgesics are described in the protocol as to agent, dosage, route of administration, and frequency. New methods and dosages are passed on to the investigators from the veterinarian as they are learned.

c. Monitoring the Use of Analgesics & Anesthetics -

Anesthetics and analgesics are monitored by the veterinarian by asking investigators how their work is progressing and specifically if they have any anesthetic problems. Monitoring is also done by the veterinarian both in the ARF and the research laboratories. Anesthetic and analgesic records are kept by the investigator in the laboratory record book. Investigators come to the veterinarian if they are having any problems that affect their research and data.

d. Training & Experience of Personnel Who Perform Anesthesia -

For rats, mice, gerbils and rabbits, the investigators perform the anesthesia. The IACUC evaluates the experience of the investigator using the anesthetic and the anesthetic techniques outlined in the protocol. Approval of the protocol signifies the IACUC is satisfied the training and the experience of the investigator is adequate to proceed. New investigators are instructed and monitored by the veterinarian before they proceed on their own.

e. Safety Procedures for Use of Explosive or Flammable agents -

Volatile anesthetics are not used in the animal facility.

f. Waste Anesthetic Gas Scavenging -

Anesthetic gas, when used in the laboratories, is done under exhaust hoods or the waste gas is scavenged in f-air canisters.

4. Survival Surgery and Postsurgical Care

a. Non-rodent Mammalian Species -

Survival surgery on non-rodent species is not allowed except in certain conditions approved by the IACUC. The AWA and the Guide require a three room aseptic surgery suite for non-rodent species. We do not have an aseptic surgery suite therefore only under very unusual circumstances can survival surgery be done on non-rodent species.

b. Rodent Species

1) Qualifications of individuals performing surgery.

Qualifications are reviewed by the IACUC. If it is determined that they are not qualified, they are required to obtain additional training and/or demonstrate competency before protocol is approved.

2) Facilities for rodent surgery.

Survival surgery is performed in an area set aside for surgery that is easily sanitized. The procedures are done using sterile instruments, surgical gloves, and aseptic procedures.

3) Postoperative care.

Postoperative care and records are the responsibility of the Principal Investigator and his staff. Postoperative care is outlined in the protocol.

c. Nonsurvival surgeries.

These procedures are done in the research laboratories or the ARF procedure rooms.

5. Euthanasia

a. Methods for Each Species -

Mice are euthanized by carbon dioxide, and cervical dislocation with justification. Rats by carbon dioxide, decapitation after sedation, and sodium pentobarbital. Rabbits by sodium pentobarbital, carbon dioxide, and exsanguination after ketamine/xylazine anesthesia. Hamsters by sodium pentobarbital. Guinea pigs and gerbils by carbon dioxide.

All carbon dioxide euthanasia must be followed with a physical means of euthanasia such as cervical dislocation, bilateral thoracotomy, etc.

b. Training & Experience of Personnel -

Instructions have been given to investigators by the animal care staff or the veterinarian on all of the mentioned methods. When the investigators feel comfortable and when the veterinarian feels they are qualified, they are allowed to proceed on their own. The animal care staff is experienced in carbon dioxide and cervical dislocation euthanasia in mice, and carbon dioxide euthanasia in rats.

E. Physical plant (Robert C. Byrd Biotechnology Science Center [BBSC])

1. Overview of Facility and Condition of the Facility

This facility is centralized on the ground floor of the BBSC. There is approximately 8,500 NSF.

The condition of the facility is excellent.

2. Support Areas

a. Clean cage storage - yes

b. Storage areas - yes

c. Waste disposal facilities - yes

d. Lounge areas - no

e. Administrative space - yes

f. Cage Sanitation Facilities

1) Interior surfaces are concrete blocks with epoxy paint. Floors are a monolithic, moisture proof material.

2) Sanitation equipment

a) a commercial cage washer

b) a commercial bottle washer

c) bulk pass-through steam sterilizer

d) small steam sterilizer

g. Surgery Facilities

1) Areas for:

a) Surgery - no aseptic surgery suite. Rodent surgeries are performed in ARF procedure rooms.

b) Animal preparation - no

c) Sterile supply preparation and storage – steam sterilizers

d) Dressing rooms - yes

e) Surgeon preparation - no

f) Postoperative care - no designated area.

3. Animal rooms

a. Interior surfaces

Walls are concrete block with epoxy paint. Floors are monolithic and moisture proof. Ceilings are moisture proof and sealed.

b. Lighting

Fluorescent lights on individual room timers.

c. HVAC

1) Air source is 100% fresh air.

2) Room air exchange rates are 10 - 15 changes per hour.

3) Temperature control is by individual room thermostats.

4) Humidity provided and controlled for the animal facilities by the HVAC unit.

4. Other Features

a. Emergency power - yes

b. Environmental Monitoring

1) Animal room air flows designed to provide 10 - 15 air changes per hour.

2) Relative air pressures.

Animal rooms are negative with respect to the clean corridor and positive with respect to the dirty corridor.

3) Temperature

Temperature is recorded by an environmental monitoring system provided by REES Scientific.

4) Humidity

Provided and controlled by the HVAC unit that only services the animal facilities.

c. Security - provided by Marshall University.

F. Special Considerations

1. Genetics & Nomenclature

a. Program for advisement on selection

The Director and the IACUC must be satisfied that the genetic characteristics of the animal model is suitable for what the investigator is trying to accomplish. If there is a question, various vendor information brochures, journal articles, and books are made available to the investigator. All parties are satisfied before the protocol is approved.

b. Program for advisement on nomenclature

The Director advises investigators on the standardized nomenclature for animals in a study. Most of this information is on the "Animal Request Form" for ordering the animals. The investigator gets a copy of this form for his records and for reference when writing papers.

c. Program for genetic monitoring on in-house breeding colonies

Included in the animal use application is the PI's plan for genetic monitoring of research animals.

2. Facilities and Procedures for Animal Research Involving Hazardous Agents

a. Facilities

All animals are housed in individually ventilated caging with HEPA filtered air intake and HEPA filtered air exhausted

b. Procedures

All procedures are reviewed by the IACUC after approvals from the proper individuals, i.e. the Radiation Safety Officer. Regardless of the agent, special procedures are written, instruction is provided to all those involved, and these instructions are posted in each room. When this is accomplished the protocol is allowed to start.

3. Policies for Reporting, Receiving and Handling allegations of Mistreatment or Other Noncompliance Issues

a. Definitions

Mistreatment: Any action, physical or psychological, which results in wrongful or abusive treatment of an animal (e.g., inadequate or improper care or housing of animals).

Noncompliance: Violation of University procedures or policies, which encompass those of the Public Health Service and the Animal Welfare Act. Examples include unauthorized use of animals for an activity or procedure; failure to have an active IACUC approval for an activity involving animals; continuing an activity past its authorized expiration date.

Reporting allegations: It is not always obvious at what level of alleged mistreatment or noncompliance the IACUC should become involved. Frequently the attending veterinarian, animal care personnel, and investigators can work together to prevent or resolve a problem. However, serious or repeated problems always require the involvement of the IACUC. If in doubt it is better to submit a report, as this may well protect the institution, the complainant, the alleged violator(s), and, of course, the animals.

b. Reporting Procedures

Alleged allegations may be reported in conversation with, or correspondence (letter, FAX, email) with members or staff of the IACUC, the veterinary staff, or the Institutional Official. There shall be no restrictions on who can report an alleged incident and there can be no threat of reprisals against anyone reporting the perceived mistreatment or noncompliance. Any information should be quickly relayed to the Chairperson of the IACUC for action. All complaints brought to the attention of the IACUC will be fully documented under signature. There must be sufficient substance to the complaint for the Chair to proceed further. An allegation has no substance until proven, and should remain confidential to the extent possible to protect all concerned. If the complainant has freely identified him/herself, it is appropriate that receipt of the allegation be acknowledged.

c. IACUC Procedures for the Investigation of a Complaint

The Chairperson may elect to bring the matter as a whole before the committee or may appoint a subcommittee to investigate the complaint. In either case the results of the investigation must be considered IACUC actions and all members must have the opportunity to present their views. The person(s) against whom the complaint has been raised should have an opportunity to explain their position. As much documentation as is reasonably needed will be collected. This may include animal receiving records, housing and health records, billings, memos, and other written materials. It may also be necessary to interview persons or to carry out an inspection of the facilities. The results should be made available to all parties involved, including the Institutional Official who is ultimately responsible for instituting corrective action.

d. Institutional Responses

This is influenced by legal requirements, institutional policy and the nature of the investigative findings. If the violation is verified by the IACUC, the IACUC is empowered under USDA Regulations and PHS Policy to suspend a previously approved project. If the activity is supported by PHS funds, the IACUC, through the Institutional Official, must file a full report to the National Institutes of Health, Office of Laboratory Animal Welfare (OLAW). In cases where there is sufficient evidence of serious noncompliance, it may be prudent for the IACUC to suspend an activity pending the outcome of a full investigation. In these cases, a preliminary report will be sent to OLAW and the USDA, through the Institutional Official, on the understanding that a full report will be submitted upon completion. The Association for Assessment and Accreditation of Laboratory Animal Care, International (AAALAC) will also be notified of the incident and actions taken by the institution.

The Institutional Official, in consultation with the IACUC, has the power to impose further sanctions on an investigator found to be responsible for mistreatment or noncompliance. Each case must be considered individually and all cases will result in precedents being set,

and the implications of these should be considered. The institution must also consider whether to announce its findings publicly.

4. Procurement and Quarantine Policy for Mice and Rats from Non-Approved Sources

a. Procurement

Researchers requesting animals from non-approved sources such as other institutions must submit an animal request form to the Animal Resource Facility (ARF) Administrative Secretary. The form should be complete and include a contact name, phone number and e-mail address for the other institution. The Administrative Secretary contacts the requesting researcher with updates on the order, and also keeps a log documenting the transaction. Researchers are welcome to consult with the non-approved source or Consignor, however all other matters relating to ordering the animals (including obtaining health reports) must be made by the ARF Staff to ensure compliance with institutional guidelines.

After receipt of an animal request form, the ARF Director contacts the Consignor and explains Marshall University ARF's involvement in the animal transfer. The Director, or Administrative Secretary, requests the name and phone number or e-mail address for the Consignor's Animal Care department to facilitate the transfer process.

Comprehensive necropsy reports for the originating colony from the past year are requested. The reports are reviewed by the ARF Director for compliance with Marshall University School of Medicine standards. An explanation of the disease monitoring program is requested to check the method of exposure and sampling for health testing. Husbandry specifics for the colony are also requested from the Consignor's animal care staff.

If the health reports are found to be missing some of the information desired, the Consignor is requested to test either sentinel animals or retired breeders for the disease(s). Once all of the initial health screening is reviewed and approved by the ARF Director, the animals are shipped by the Consignor and placed in quarantine upon arrival. If the Consignor's facility is unable or unwilling to perform all of the tests requested by Marshall University ARF, the Administrative Secretary or ARF Director may request that a sample group of animals be shipped to Marshall University for initial testing. The sample requested is usually two to three retired breeders from the colony, or sentinel animals that have been exposed to dirty bedding from colony animals. The sample shipment is delivered directly to the ARF for sampling of tissue and sera for comprehensive testing. Results are treated as if the animals had been tested at the Consignor's facility, quarantine is still necessary for the following group of animals.

If the animals are positive for disease at the Consignor's institution, they are not shipped until a course of action has been decided upon by the ARF Director. The requesting researcher is informed by the ARF Director of all viable options available. Historically, the options have been: isolation and treatment or burnout at the consigning institution, cesarean rederivation

or embryo transfer after arrival at the ARF, or total rejection of the shipment due to disease status.

After the disease status of the colony has been reviewed and approved, the Administrative Secretary arranges with the Consignor and their animal facility to ship the animals to the MUSOM ARF. Shipping animals to Huntington poses problems due to geographical location and daytime temperatures.

b. Quarantine

After arrival, the animals are housed in a designated quarantine facility at the ARF. The animals are quarantined for a minimum of three weeks with a pan of sentinels housed in the same room. At the end of three weeks, the sentinel animals are tested for confirmation of disease status before release to the investigator for use. Final results usually take a week for completion.

If the sentinel animals test positive in quarantine, it is the discretion of the ARF Director to plan the course of action taken. Depending on the disease, the animals can be terminated, treated, remain in quarantine for burnout, be rederived, etc. The investigator is notified of the options approved by the ARF Director, and a suitable plan is decided upon based upon the disease agent.

If the sentinel testing is negative, the investigator is notified and the animals are moved into the appropriate animal room. The animals are housed according to immune status, research type and investigator preference. The health results from tests performed on the sentinels are reviewed by both the ARF Director and investigator before being given to the investigator for their records.

A non-approved source is provisionally approved for only the particular animal room tested at the Consignor's facility. Current health reports are reviewed prior to delivery of each new shipment. If the investigator wishes to have animals shipped from any other room at a provisionally approved source, the procedure starts anew. The process also begins again if more than 12 months have passed without receiving animals and the investigator wishes to have another shipment from a previously approved source.

The requesting investigator is responsible for all charges incurred for the above process. This includes the cost, if any, of the animals and shipping. Other costs incurred are per diem during quarantine and testing, the cost of the diagnostic tests, and the cost of treatment rendered.

Enforcement of the non-approved source policy is achieved by informing researchers that any animal arriving without prior ARF approval will be terminated upon arrival per institutional policy.

c. Consignor Health Report (requested of consignor prior to shipment of animals)

Please provide to the Marshall University School of Medicine Animal Resource Facility the following information pertaining to your health monitoring program:

1. Brief explanation of your health monitoring program (method of exposure, method of sampling, etc.)

2. Serological testing results for the past year.

3. Necropsy reports for the past year.

4. Husbandry specifics for the colony are also requested from your animal care staff.

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