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Institutional Animal Care and Use Committee (IACUC) Policies

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Policy 12 - Use of Recording Devices in the Animal Facility

Version 1.0
Approval Date: 6/27/12

Background: The following policy is intended to ensure a minimally disruptive environment for resident animals, to protect the health of research animals, to protect the confidentiality and integrity of research, and to help in the accurate representation of the University’s policies and procedures. Photography or videotaping is only allowed after prior approval by the Vivarium Director or Associate Director. Photography is defined as all still pictures (digital or film) and video recording (digital or analog).

Definitions:

Devices: Cameras (digital or film), video recorders, camera phones, tablet computers, laptops, and similar devices with recording capabilities.

General considerations:
1. The recording devices must be sanitized prior to Vivarium entry according to Vivarium recommendation.
2. The photograph should show appropriate and accurate context (e.g. if an animal is anesthetized or sedated, include the vaporizer or tray holding the bottle of injectable drug).
3. All attempts should be made to have animals in clean surroundings - clean cages or clean pens with clean accessories. Water bottles and feeders should be full if visible in the photo.
4. IACUC approved policies and guidelines must be followed.
5. No references to personal information should be visible in the photograph. Pay attention to background and items such as cage cards.
6. Pictures of personnel require approval of each individual photographed.
7. All persons in the photograph must wear appropriate personal protective equipment.
8. Appropriate handling and restraint methods for the species must be used.
9. Pictures must be downloaded into a secure computer and deleted from the recording devices before leaving the University.
10. Encrypted file transfer must be used for picture dissemination (i.e. Large File Transfer Service (LiFT)).

Research staff:
1. Twenty-four-hour advance notice must be given to the Vivarium Supervisors.
2. Requests may be denied if presented on short notice.
3. All procedures shown must be described in the approved IACUC protocol for that particular animal.
4. No animals that are ill, have visible lesions, or visible research alterations (implants, tumors, etc.) are to be photographed unless approved by the Vivarium Director or Associate Director and the photography is required for scientific publication and/or data analysis by the PI.
**Vivarium veterinary staff:**
1. Photography is for educational seminars, clinical diagnoses or post-approval monitoring (PAM) only.
2. Only dedicated Vivarium cameras are to be used.
3. The camera must be kept in a secure, locked area in the Vivarium.
4. Pictures must be downloaded onto a secure computer and distributed only by encrypted email (i.e., LiFT).
5. Pictures used for training purposes must not have any reference to the PIs or the facility.

**Visitors:**
1. Visitors are not permitted to take still or video recordings in the animal facility except: (1) is a government inspector and photodocumentation is necessary for official documentation and (2) visitor is serving as a photography vendor for the faculty—all such vendor photodocumentation is subject to the policies listed above and must be approved by the Vivarium Director or Associate Director. Only IACUC-approved procedures can be photographed.
2. The faculty member should advise visitors concerning the prohibition of photography at the time of entrance into an animal facility and in conjunction with any request for a visit.

**Note:**
The Vivarium Director and or Associate Director reserve the right to review any and all pictures and video recordings, tape recordings, or camera (film or digital) images before release, and may require that these images/recordings be destroyed.
Policy 13 - Q Fever and Zoonotic Disease Prevention (Sheep)

Version 1.0
Approval Date: 6/27/12

Background: Q fever is a zoonotic disease caused by the rickettsial organism *Coxiella burnetii*. Cattle, sheep and goats are the most common reservoirs of *C. burnetii* and large numbers of organisms (up to 109 organisms per gram of tissue) may be present in placenta, birth tissues and amniotic fluids of infected animals. Human infection usually occurs through inhalation of contaminated dusts and aerosols generated by infected animals, their waste products, placental tissues and fluids, and contaminated straw or bedding. Only 10 inhaled bacteria may be sufficient to cause infection in a susceptible host. Most patients will recover to good health within several weeks without any treatment. Persons at risk (i.e. those with valvular heart disease, persons who are immunosuppressed, pregnant women) should be advised of the risk of serious illness that may result from Q fever.

Sheep requirements:
1. **General health:** Animals are healthy as determined by veterinary staff upon arrival. Sheep are purchased from a flock with no history of Q-fever or Caseous Lymphadenitis (CL). Sick animals are not permitted to enter the animal facility.
2. **Pregnancy:** Only male or non-pregnant females are used. Non-pregnancy is confirmed using serological testing, at least 4 weeks after being isolated from intact males.
3. **Vaccination:** Sheep are vaccinated against: *Clostridium perfringes* types C & D, tetanus toxoid, *Pasteurella haemolytica*, *Pasteurella multocida*, ovine ecthyma (lesions are healed before delivery), and rabies.
4. **Testing and pathogen exclusion:** Brucellosis and Q fever test results must be negative. Two negative Q fever tests at least 3 weeks apart are required. The second Q fever test must be performed no later than one week before sheep delivery.
5. **Other treatments:** Sheep are dewormed, shorn, receive foot trimming and zinc sulfate treatments.

Operational Practices:
1. **Training:** All personnel involved in sheep studies must attend the sheep zoonotic prevention seminar.
2. **Entry:** The sheep holding area is restricted to personnel who are involved in sheep studies (investigators and animal care staff).
3. **PPE:**
   1) Gloves
   2) Disposable or on site-laundered jumpsuits, coveralls, or scrubs
   3) Knee high boots (when cleaning pens)
   4) **Full face shield or goggles and surgical mask** are worn when cleaning the pens and during cage wash or certain veterinary procedures (i.e., lancing an abscess).
   5) Respiratory protection (N95) or PAPR are required during some veterinary procedures (i.e., lancing an abscess, trimming of foot rot) or for handling sheep with bloody vaginal discharge. Personnel must be enrolled in the Respiratory Protection Program in order to wear a respirator.
4. **Recommended disinfectants:**
   1) Household bleach (diluted to 10%)
   2) Hydrogen peroxide (5%)
   3) Lysol
**Policy 14 – Identification of Rodents**

**Version 1.0**

Approval date: 11/14/12

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**Purpose** – The purpose of this policy is to ensure proper identification of each individual and group of rodents in a cage.

**Background** - Proper identification of research animals is an essential component of a research and is designed and mandated by the Guide. It allows an easy method for tracking animals throughout a research project and assists animal care staff in providing care for animals. The Guide states: “identification cards should include the source of the animal, the strain or stock, names and contact information for the responsible investigator(s), pertinent dates (e.g., arrival date, birth date, etc.), and protocol number when applicable. Genotype information, when applicable, should also be included, and consistent, unambiguous abbreviations should be used when the full genotype nomenclature is too lengthy”.

**Policy** - Cage cards are used for every rodent cage; additional forms of identification are added to individually identify mice within a cage.

**Cage card information:**

Based on the Guide’s mandate, UMDNJ requires the following information on every cage card: principle investigator’s name, approved protocol number, name of contact person (can be PI), and contact’s phone number (email address is not acceptable as sole contact information). The PI listed on the cage card MUST be the PI associated with the protocol number. Date of birth must also be included on every cage card for studies using geriatric animals (rodents older than 18 months).

UMDNJ recommends (but does not require) additional information be included on cage cards: source of animals, stock or strain, sex, genotype information (if applicable), and pertinent dates (birth date for non-geriatric animals, arrival date, etc.). UMDNJ recognizes that this information is not always available for every animal.

**Individual animal identification:**

**Temporary Markings:** Temporary markings are used short-term for individual animals. Use an indelible marker of varying colors to write numbers, bars, or other distinguishable markings on the tail or the ears. If temporary marking are used for duration exceeding 3-4 days, repeat markings every 3-4 days.

**Tattooing:** Use an electric tattoo machine to write numbers on the tail using only sterile and sharp tattoo needles; tattooing is easier to perform under general anesthesia. If not using general anesthesia, apply a local anesthetic on the tail before tattooing (EMLA cream or a local anesthetic spray).
Micro-tattooing: Use a micro-tattooer or animal lancet to inject tattoo ink in the toe pads and/or the ears. Whenever possible, use a simple identification code to minimize the number of toes tattooed.

Microchip Transponders: Microchip transponders are implanted subcutaneously between the scapulae for permanent identification of individual animals. Briefly anesthetize animal; pluck or shave the skin and disinfect with surgical scrub (betadine or chlorhexadine solution). Apply digital pressure with a sterile gauze pad if bleeding is noted after implantation. If necessary, a drop of surgical glue is applied to the needle entry site.

Ear Tags: Mice are ear tagged at weaning age or older using tags no more than 5mm in length. Ear tags are rinsed in 70% alcohol before use to help prevent ear infection. Tags are positioned at the lateral base of the ear, approximately 3mm from the edge of the ear pinna. Ear tags are not placed too close to the edge of the pinna or too close to the cartilage at the base of the ear pinna.

Proper location of ear tags:

Monitor the tag implantation site 2-3 times a week for signs of local infection. Contact veterinary staff if any complications occur.

Ear Punch: Ear punches are sterilized before use; sanitize the ear punch between each cage of animals with 70% ethanol. The punch is placed approximately 3mm from the edge of the ear pinna:

Toe clipping: The Guide states: “toe-clipping should be used only when no other individual identification method is feasible. It may be the preferred method for neonatal mice up to 7 days of age as it appears to have few adverse effects on behavior and well-being at this age.” Refer to IACUC policy #9 for further information.

ANY EXCEPTIONS TO THIS POLICY MUST BE APPROVED BY THE IACUC
References -


**Policy 15 – Mouse Total Body Irradiation**  
Version 1.0  
Approval Date: 11/14/12

**Purpose** - This policy describes mice exposed to total body irradiation (TBI) emanating from a Cesium 137 source (gamma radiation).

**Background** - Ionizing radiation causes breaks in the DNA helix, primarily affecting mitotically active cells such as those of the hematopoietic and gastrointestinal tracts. The degree of cellular damage depends on the dose of radiation, age, and strain of the mice. In general, C57Bl/6 mice are more radio-resistant than BALB/c mice. B6 mice can typically tolerate radiation doses of 1000 to 1100cGy, however, the LD50 of BALB/c mice is about 880cGy (Duran-Struuck 2009). Ionizing radiation experiments are most commonly used in the fields of immunology and cancer biology.

**Definitions** –

- **Gamma irradiation** is one type of ionizing irradiation. Sources are typically Cesium 137, Cobalt 60, or high-energy X-rays; this policy refers to Cesium 137 irradiators.

- **Gray (Gy)** is the SI unit of absorbed radiation.

- **Rad** is a largely obsolete unit of absorbed radiation; 100 Rads = 1 Gray.

- **Fractionation of dose**: The total irradiation dose can be split into two or more equal parts separated by a time interval (usually 2-12hrs) in order to minimize morbidity and mortality.

**Policy** –

Requirements for animals on study exposed to irradiation -

- Irradiation must be scientifically justified in the IACUC protocol. Animals exposed to radiation must be monitored and findings documented daily on the post-procedural cards for the first 14 days. However, after protocols have been established and PI has experience with the particular strain of mice and dose, three times/week monitoring (with documentation) is acceptable. If animals experience morbidity or mortality daily checks are required.

- The planned dose of irradiation (dose range) and the frequency of the radiation must be specified in the IACUC application.

- Fractionated doses should be considered, if appropriate, to reduce morbidity and mortality.

- Unless literature references are available, a pilot study to determine the best dose is recommended if the PI is starting a new study or using a new strain of mice.

- IACUC policies 3 and 5 for humane endpoints must be followed. However, body weight loss up to 25% is acceptable during the first 2 weeks post-irradiation.

- The irradiation procedure is considered category “E” (USDA classification).
Effects of total body irradiation (TBI):

Irradiated animals experience 5 to 10 days of post-irradiation related sickness. Irradiated mice generally recover within 2-3 weeks (Duran-Struuck 2009).

**Appearance:** Mice may appear lethargic with a rough coat and assume a hunched posture due to radiation-induced tissue damage and inflammatory responses.

**Dehydration:** Early after irradiation mice can become dehydrated due to decreased water consumption and diarrhea that often develops from radiation-induced damage to the intestinal epithelium.

**Body weight loss:** Body weight loss up to 25% due to inappetance and diarrhea peaks at about 7 days post-irradiation. Depending on the dose and whether immune reconstitution had been provided, recovery will usually occur in 2 to 3 weeks. Mice may never regain their original, pre-irradiation body weight.

**Anemia:** Animals may appear pale, especially around the nose and paws.

**Intestinal bleeding:** Dark stool (melena) or blood stained perennial area may be present.

**Infection:** Severe bacteremia/septicemia may occur as a result of translocation of bacteria from the GI tract into the blood stream (Duran-Struuck 2008).

**Graft Versus Host Disease (GVHD):** Successful survival of a bone marrow graft requires suppression of the host’s immune system. If the irradiation dose is too low, Graft Versus Host Disease (GVHD) will ensue. As in humans, older mice are more prone to develop GVHD.

**Graying of hair coat:** Black mice, such as C57BL, will frequently turn gray after irradiation.

**Development of secondary neoplasia:** The development of neoplasia after irradiation has been reported in humans and many large animal species. This may occur in mice on long-term studies as well.

**Incisor damage:** One non-neoplastic illness reported in mice is incisor damage and subsequent difficulty in eating. Giving softened food during the recovery phase is required.

Care of irradiated mice:

**PIs (or designated research staff) are responsible for care of irradiated animals.** Vivarium staff will provide special care in an emergency and in such a case the PI will be charged accordingly. For the first 14 days animals must be checked daily or 3X/week, with their condition and care documented on the rodent post-procedure monitoring card (Blue cards). Care, especially during the first week, must ensure the animals are as comfortable as possible. This includes keeping them clean, hydrated, and having ready access to moistened food and Napa Nectar, if indicated. BCS or body weight
measurement should be performed and recorded in the Blue cards until mice return to normal condition, usually within 2-3 weeks.

**Use of antibiotics in the drinking water** - Administration of antibiotics in the drinking water may minimize bacterial contamination within the water source and potentially decrease the burden of gastrointestinal bacteria. Bacterial translocation from the intestinal tract after irradiation is a common source of systemic infection. PI is responsible for placing rodents on antibiotic water a few days before the scheduled irradiation in order for the animals to acclimate to the taste. Rodents are kept on antibiotic water for at least 14 days and up to 28 days post-irradiation.

**Making drinking water readily available** - Irradiated mice will suffer from radiation sickness and will not feel well for the first 7-14 days. It is important to provide easy access to water.

**Napa Nectar** must be provided on the bottom of the cage during the first 14 days if morbidity or mortality is observed. Napa Nectar is available in the animal room free of charge. Placing a new Napa Nectar in the cage daily can be done by research staff or by Vivarium staff for a fee. Napa Nectar becomes contaminated with fecal material quickly and must be replaced daily.

**Provision of softened food** - Giving softened food during the recovery phase is required. Powdered chow is available in the rodent housing rooms and should be mixed with water and served in a small Petri dish on the cage floor. Pellets moistened with water dry up easily and are not recommended. Placing a new moistened food dish in the cage must be done by the PI (or research staff) daily or can be done by Vivarium staff for a fee.

**Housing** - It is important to realize that even after bone marrow transplantation, lethally irradiated mice are severely immunosuppressed for the first two weeks and providing a completely sterile environment (cage, food, and water) is recommended (Fox 2007, Duran-Struuck 2009) and is required if post-irradiation complications occur.

**Recommended antibiotic drugs and preparation (for water bottles):**

<table>
<thead>
<tr>
<th></th>
<th>stock conc</th>
<th>dose</th>
<th>recipe</th>
<th>frequency</th>
<th>duration</th>
<th>final conc in bottle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ampicillin</td>
<td>50mg/ml</td>
<td>134mg/kg/day</td>
<td>2.6ml stock +250ml H₂O</td>
<td>Change bottle every 3 days</td>
<td>14-28 days</td>
<td>0.52mg/ml</td>
</tr>
<tr>
<td>Baytril</td>
<td>22.7mg/ml</td>
<td>40mg/kg/day</td>
<td>1.7ml stock + 250ml H₂O</td>
<td>Change bottle every 3 days</td>
<td>14-28 days</td>
<td>0.15mg/ml</td>
</tr>
<tr>
<td>Sulfamethoxazole-Trimethoprim (SMX-TMP)</td>
<td>40/8 mg/ml</td>
<td>220/42 mg/kg/day</td>
<td>5.2ml stock + 250ml H₂O</td>
<td>Change bottle every 3 days</td>
<td>14-28 days</td>
<td>0.82 / 0.16 mg/ml</td>
</tr>
</tbody>
</table>
References –


4. RWJMS IACUC policies #3 and #5
Policy 16 – Social Housing and Environmental Enrichment

Version 1.0
Approval date: 11/14/12

Purpose – “The primary aim of environmental enrichment is to enhance animal well-being by providing animals with sensory and motor stimulation, through structures and resources that facilitate the expression of species typical behaviors and promote psychological well-being through physical exercise, manipulative activities, and cognitive challenges according to species-specific characteristics.” (the Guide)

Social needs – “An appropriate housing space or enclosure should also account for the animals’ social needs. Social animals should be housed in stable pairs or groups of compatible individuals, unless they must be housed alone for experimental reasons or because of social incompatibility.” (the Guide)

Species-specific enrichments:
Rats: social housing, wooden chew sticks, sheltering products, edible rewards
Mice: social housing, nesting materials, sheltering products, edible rewards
Swine: social housing, manipulable toys, edible rewards, scratching boards
Sheep: social housing, edible rewards
Rabbits: social housing, manipulable toys, edible rewards
Hamsters: wooden chew sticks, sheltering products, edible rewards
Frogs: sheltering products
Zebrafish: social housing, edible rewards, sheltering products

Policy: Social animals should be group housed. At least one species-specific enrichment object should be placed inside the animals’ primary environment. Any exceptions must be submitted to the IACUC for approval prior to implementation.

Exemption examples:
1. Interference with experimental results (e.g., enrichment in neurological studies)
2. Animal territorial fighting
3. Paralyzed animals
4. Study requirement for individual food uptake or urine/feces collection
5. Post-op recovery

ANY EXCEPTIONS TO THIS POLICY MUST BE PREAPPROVED BY THE IACUC

References:
Policy 17- Personal Protective Equipment (PPE) Requirement for In Vivo Studies

Version 1.0
Approval date: 12/12/12

Purpose: “The use of good personal hygiene will often reduce the possibility of occupational injury and cross contamination.” (the Guide)

Abbreviations: Personnel Protective Equipment (PPE), Child Health Institute (CHI), New Research Tower Building (aka RT-2, SPH, or NRB), Research Tower Barrier (RTA), Cancer Institute of New Jersey (CINJ), Research Tower Building (aka RT-1 or RTB), Medical Education Building (MEB).

Policy:

PPE requirement:

<table>
<thead>
<tr>
<th>Facility</th>
<th>Use of biosafety cabinet (class II)</th>
<th>Required PPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHI,SPH,CINJ, RTA</td>
<td>required</td>
<td>gloves, shoe covers, dedicated lab coat</td>
</tr>
<tr>
<td>CHI suite D</td>
<td>required</td>
<td>gloves, shoe covers, dedicated lab coat, surgical mask, bouffant bonnets</td>
</tr>
<tr>
<td>MEB, RT-1</td>
<td>recommended</td>
<td>gloves, lab coats</td>
</tr>
</tbody>
</table>

Necropsy: Facility-specific PPE must be used. If the procedure is performed outside of the biosafety cabinet, use of a fit-tested respirator is recommended.

Handling dirty cages: Facility-specific PPE must be used. The microisolator top should be placed on the cage(s) before transferring outside of the biosafety hood; use of a fit tested respirator is recommended.

Use of biohazard and chemical hazards: Animals that are treated with chemical or biochemical hazards must be treated according to the EOHSS recommendations.

ANY EXCEPTIONS TO THIS POLICY MUST BE PREAPPROVED BY THE IACUC

References:
Purpose – The purpose of this policy is to provide direction and reference material regarding the production of monoclonal antibodies (MAb) in rodents. This policy does not apply to MAb production in other species such as the rabbit.

Background - The production of MAb in mice involves immunizing the animal, selecting antibody producing cells (B cells), fusing the B cells with myeloma cells, creating an ascites-producing hybridoma, and finally injecting hybridoma cells into in primed mice. The NIH concurs with the findings and recommendations in the 1999 Report of the National Research Council Monoclonal Antibody Production which indicates that during the accumulation of ascites fluid there is likely to be pain and distress, particularly when some cell lines that are tissue-invasive are used, and in situations of significant ascites development. The report concludes that there is, and will continue to be, scientific necessity for this method. However, as tissue-culture systems are further developed, tissue-culture methods for the production of monoclonal antibodies should be adopted as the routine method, unless there is a clear reason why they cannot be used. Accordingly, IACUCs are expected to critically evaluate proposed uses of the mouse ascites method by investigators. Prior to approval of such protocols, IACUCs must determine that (i) the proposed use is scientifically justified, (ii) methods that avoid or minimize discomfort, distress, and pain (including in vitro methods) have been considered, and (iii) the latter have been found unsuitable.

Policy –

**In vitro methods:** In vitro methods must be considered first. Refer to the Cornell University website for a list of commercial sources for in vitro production of monoclonal antibodies.

1. **In vivo antibody production**: Refer to IACUC Fluid Policy #19 for acceptable fluid volumes and needle sizes for injections.

   The use of *in vivo* MAb production requires scientific justification, examples of such include:
   1.1. Some hybridoma cell lines do not adapt well to *in vitro* conditions.
   1.2. Monoclonal antibodies from mouse ascites fluid might be essential for experiments in which mAb are used in mice.
   1.3. Rat hybridoma cell lines do not generate ascites efficiently in rats, usually adapt poorly to *in vitro* conditions, but usually generate ascites in immuno-compromised mice.
   1.4. Downstream purification can lead to protein denaturation and decreased antibody activity.
   1.5. Serum-free or low-serum conditions cannot provide sufficient amounts of MAb for some purposes, such as the evaluation of new vaccines against infectious organisms.
1.6. Culture methods sometimes yield populations of IgG MAb that are glycosylated at positions different from those harvested from mouse ascites fluid, thereby influencing antigen-binding capacity and important biologic functions.

1.7. When hybridoma cells producing MAb are contaminated with infectious agents (such as yeast or fungi), the cells often must be passed through mice.

2. **Immunization procedure:** Less toxic, alternative adjuvants to Complete Freund’s Adjuvant (CFA) should be used; the use of CFA requires scientific justification. Refer to IACUC policy #20 regarding proper use of CFA in rodents. CFA/antigen mixtures should be limited to primary immunization and Incomplete Freund’s Adjuvant (IFA) should be used in subsequent booster inoculations. Refer to IACUC Fluid Policy #19 for proper needle size and injection volumes.

3. **Priming agents:** Priming agents to promote ascites are generally administered IP prior to inoculation of hybridoma cells. Priming of the peritoneal cavity is often accomplished through an IP injection of pristine; ≤0.20 ml should be delivered.

4. **Induction of hybridoma cells:** Hybridomas should be tested for the presence of adventitious viral and mycoplasma agents prior to inoculation into mice in order to prevent potential transmission of murine infectious agents into animal facility experimental colonies. Refer to IACUC policy #6 for further information.

5. **Ascites:** The cranial displacement of the diaphragm due to ascites is associated with dyspnea, orthopnea, or tachypnea. It is therefore reasonable to assume that mice with large accumulations of ascites fluid experience discomfort and distress\(^1\). There is a limit of 3 abdominal taps per animal (two taps in live animals and a final tap after euthanasia); an 18-22 gauge needle should be used. General anesthesia is recommended during tapping. 1-2ml of warm (~37°C) saline should be administered subcutaneously to help prevent shock post tap. Body weight of mice should not exceed 20% of the normal weight of age- and sex-matched animals of the same strain from the onset of ascites.

6. **Clinical Signs:** Animals must be observed for signs of distress and pain. Clinical signs include: rapid or labored breathing, pallor, hunched posture, inactivity, dehydration, inappetance, low body condition score (BCS), rough hair coat, ambulation difficulty, constipation, or diarrhea. Animals that show signs of excessive distress or appear debilitated after any of the taps should be given fluids or euthanized. The veterinary staff should be contacted for immediate evaluation.

7. **Frequency of observations:** Animals must be evaluated every other day during the first post-inoculation week. However, once ascites fluid accumulation and peritoneal cavity distention is noted, daily observation (including weekends and holidays) of animals is required.
8. **Humane endpoints:** Animals must be euthanized when the following symptoms are observed: prolonged [inappetance, inactivity, diarrhea/constipation, hunched posture, rough coat], hypothermia, tachypnea, labored breathing, pallor, inability to remain upright, or any other clinical signs indicated in IACUC Policies #1,3, 5, or veterinary staff recommendation.

9. **Summary of Ascites production:**

| Fluid volume, site of injections, needle sizes | IACUC Fluid Policy #19 (recommendations) |
| Testing cell lines for murine viruses | IACUC Policy #6 (required) |
| Priming | pristane, 0.20 ml IP |
| Needle size for tap | 18-22 gauge |
| Number of taps | Maximum of three (3rd after euthanasia) |
| Fluid volume administered | IACUC Fluid Policy 19 |
| Monitoring after hybridoma inoculation | 3 times a week during the first week, then daily |
| CFA use | Need scientific justification (only one CFA injection per animal), IACUC Policy 20 |
| Fluid replacement after ascites harvesting | 1-2 ml warm saline SC |
| General anesthesia during tap | Recommended to prevent pain and distress |
| Humane endpoints | IACUC Policies 1,3, and 5 |

**References -**

1. The 1999 report of the National Research Council Monoclonal Antibody Production
3. Duke University: Guidelines for Monoclonal Antibodies
   http://vetmed.duhs.duke.edu/GuidelinesforMonoclonalAntibodies.html
Purpose – This policy was designed to provide investigators with reference values related to the administration and collection of fluids (including blood) in rodents via the most common experimentally used routes.

Background – The values included in this policy are cited directly from the literature, represent an average of multiple cited sources, or based on personal experience of the Veterinary Staff. This policy contains three sections: the first section provides recommendations regarding dosing of compounds based on common routes of administration. Included are typical injection volumes and maximum allowable volumes for each route. The second section of the policy includes common sites of blood collection, along with expected volumes for each site/method. The final section (section 3) reviews injection of tumors/pellets through a trocar (defined as any needle greater than 16ga).

Definitions:

The following abbreviations will be used in this policy:

- PO = *per os* (oral, gavage)
- IM = intramuscular
- IN = intranasal
- IV = intravenous
- SC = subcutaneous
- IT = intrathecal (into subarachnoid space of spinal column)
- ID = intradermal
- EP = epidural (outside of meninges)
- IP = intraperitoneal
- ICV = intracerebroventricular (into lateral ventricle of brain)
Section 1: Fluid Administration

Vehicle selection is an important consideration in compound administration. Ideally, the vehicle should be biologically inert and have no toxic effect on the animal. Osmolality, pH and viscosity of the vehicle should be considered when preparing compounds. If possible, compounds should be prepared so that the delivery volume is close to the typical volume (value on left side under body weight on chart). Note that compounds cannot be delivered in a volume greater than the maximum valued listed on the right column under body weight (highlighted in red) without prior IACUC approval.

**Mice** (values across top are body weights in grams)

<table>
<thead>
<tr>
<th>route</th>
<th>10</th>
<th>15</th>
<th>20</th>
<th>25</th>
<th>30</th>
<th>≥35</th>
<th>needle</th>
</tr>
</thead>
<tbody>
<tr>
<td>PO</td>
<td>100</td>
<td>500</td>
<td>150</td>
<td>750</td>
<td>200</td>
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<td>250</td>
</tr>
<tr>
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<tr>
<td>IP</td>
<td>150</td>
<td>300</td>
<td>225</td>
<td>1200</td>
<td>300</td>
<td>1600</td>
<td>375</td>
</tr>
<tr>
<td>IM*</td>
<td>0.5</td>
<td>1</td>
<td>0.75</td>
<td>1.5</td>
<td>1</td>
<td>1.25</td>
<td>1.5</td>
</tr>
<tr>
<td>EP</td>
<td>1.5</td>
<td>2</td>
<td>2.25</td>
<td>3</td>
<td>3</td>
<td>3.75</td>
<td>5</td>
</tr>
<tr>
<td>IT</td>
<td>5</td>
<td>20</td>
<td>10</td>
<td>40</td>
<td>10</td>
<td>40</td>
<td>10</td>
</tr>
<tr>
<td>IV (bolus)</td>
<td>50</td>
<td>75</td>
<td>100</td>
<td>125</td>
<td>150</td>
<td>175</td>
<td>250</td>
</tr>
<tr>
<td>IV (slow)</td>
<td>250</td>
<td>375</td>
<td>500</td>
<td>625</td>
<td>750</td>
<td>875</td>
<td>250</td>
</tr>
</tbody>
</table>

All values listed on chart are in MICRO liters (µL); value on left is typical volume, volume on right (highlight in red) is the maximum volume allowed by that route. * = requires IACUC approval

**Rats** (values across top are body weights in grams)

<table>
<thead>
<tr>
<th>route</th>
<th>100</th>
<th>150</th>
<th>200</th>
<th>250</th>
<th>300</th>
<th>350</th>
<th>400</th>
<th>450</th>
<th>500</th>
<th>needle</th>
</tr>
</thead>
<tbody>
<tr>
<td>PO</td>
<td>1</td>
<td>4</td>
<td>1.5</td>
<td>6</td>
<td>2</td>
<td>8</td>
<td>2.5</td>
<td>10</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>IN</td>
<td>35</td>
<td>50</td>
<td>35</td>
<td>50</td>
<td>35</td>
<td>50</td>
<td>35</td>
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<td>35</td>
<td>50</td>
</tr>
<tr>
<td>SC</td>
<td>0.5</td>
<td>1</td>
<td>0.75</td>
<td>1.5</td>
<td>1</td>
<td>1.25</td>
<td>1.5</td>
<td>3</td>
<td>1.75</td>
<td>3.5</td>
</tr>
<tr>
<td>ID</td>
<td>0.05</td>
<td>0.1</td>
<td>0.05</td>
<td>0.1</td>
<td>0.05</td>
<td>0.1</td>
<td>0.05</td>
<td>0.1</td>
<td>0.05</td>
<td>0.1</td>
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<td>2</td>
<td>1.5</td>
<td>3</td>
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<td>4</td>
<td>2.5</td>
<td>5</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>IM</td>
<td>0.01</td>
<td>0.02</td>
<td>0.015</td>
<td>0.03</td>
<td>0.02</td>
<td>0.04</td>
<td>0.025</td>
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<td>0.03</td>
<td>0.06</td>
</tr>
<tr>
<td>EP</td>
<td>0.015</td>
<td>0.023</td>
<td>0.03</td>
<td>0.03</td>
<td>0.04</td>
<td>0.038</td>
<td>0.05</td>
<td>0.05</td>
<td>0.06</td>
<td>0.053</td>
</tr>
<tr>
<td>IT</td>
<td>0.01</td>
<td>1</td>
<td>0.01</td>
<td>1</td>
<td>0.01</td>
<td>1</td>
<td>0.01</td>
<td>1</td>
<td>0.01</td>
<td>1</td>
</tr>
<tr>
<td>IV (bolus)</td>
<td>≤0.02</td>
<td>≤0.02</td>
<td>≤0.02</td>
<td>≤0.02</td>
<td>≤0.02</td>
<td>≤0.02</td>
<td>≤0.02</td>
<td>≤0.02</td>
<td>≤0.02</td>
<td>≤0.02</td>
</tr>
<tr>
<td>IV (bolus)</td>
<td>0.5</td>
<td>0.75</td>
<td>1</td>
<td>1.25</td>
<td>1.5</td>
<td>1.75</td>
<td>2</td>
<td>2.25</td>
<td>2.5</td>
<td>3</td>
</tr>
<tr>
<td>IV (slow)</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>≥23ga</td>
</tr>
</tbody>
</table>

All values listed on chart are in MILLI liters (mL); value on left is typical volume, volume on right (highlighted in red) is the maximum volume allowed by that route.
Notes on specific routes:

**Oral gavage (PO)** is performed using a feeding needle only (has an atraumatic, blunt ball at the end to prevent damage to the esophagus), appropriate needle length is determined by measuring from the mouth to the last rib; inject slowly. Proficient oral gavage should result in no significant animal losses (>95% survival rate).

**Subcutaneous injections** are limited to a maximum of 3 injections every 24hrs; typically SC injections are delivered on the back/dorsum or between the shoulder blades. SC fluids to account for blood/fluid loss (such as given postoperatively) are typically <0.5ml in the mouse and <3ml in the rat.

**IM injections** are limited to the quadriceps femoris or biceps femoris muscle groups. Due to the small size of mice, **IM injections are not permitted in mice without prior IACUC approval**. No more than two IM injections are permitted every 24hrs.

**IT, ICV** injections should be given over at least 1-2min per 10μl in mice and no greater than 0.25ml per minute in rats.

A **bolus IV injection** is delivered within 1 minute or less; typical IV injection sites in rodents include the lateral tail veins and the saphenous veins.

A **slow IV injection** is delivered over a 5-10 minute period.

Contact the Veterinary Staff for information regarding other routes of administration.

**Section 2: Blood Collection**

**Circulating blood volume (CBV) in rodents** is ~55-70 ml/kg (~5.5-7.0% body weight, mouse average = 7.2% BW, rat average = 6.4% BW). Investigators can safely remove 1% CBV every 24hrs, or 10% CBV every 2-4wks. No more than 20% CBV can be removed at one time and requires sufficient recover time (see below). Animals MUST have appropriate recovery time after collection, based on the total volume of blood removed.

Factors to consider when choosing the best blood collection method should include:

- type of sample (whole blood, serum, etc.)
- frequency of sampling
- quantity of blood required
- health status of the animal(s)
- quality of sample (sterility, tissue contamination, etc.)
- training/experience of collector
Blood sample volume ranges based on body weight:

<table>
<thead>
<tr>
<th>BW (g)</th>
<th>CBV (ml)</th>
<th>1% (ml)</th>
<th>10% (ml)</th>
<th>20% (ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mouse</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>1.10-1.40</td>
<td>0.011-0.014</td>
<td>0.11-0.14</td>
<td>0.22-0.28</td>
</tr>
<tr>
<td>25</td>
<td>1.37-1.75</td>
<td>0.014-0.018</td>
<td>0.14-0.18</td>
<td>0.28-0.36</td>
</tr>
<tr>
<td>30</td>
<td>1.65-2.10</td>
<td>0.017-0.021</td>
<td>0.17-0.21</td>
<td>0.34-0.42</td>
</tr>
<tr>
<td>35</td>
<td>1.93-2.45</td>
<td>0.019-0.025</td>
<td>0.19-0.25</td>
<td>0.38-0.50</td>
</tr>
<tr>
<td>40</td>
<td>2.20-2.80</td>
<td>0.022-0.028</td>
<td>0.22-0.28</td>
<td>0.44-0.56</td>
</tr>
<tr>
<td>Rat</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>125</td>
<td>6.88-8.75</td>
<td>0.069-0.088</td>
<td>0.69-0.88</td>
<td>1.38-1.76</td>
</tr>
<tr>
<td>150</td>
<td>8.25-10.50</td>
<td>0.082-0.105</td>
<td>0.82-1.0</td>
<td>1.64-2.0</td>
</tr>
<tr>
<td>200</td>
<td>11.00-14.00</td>
<td>0.11-0.14</td>
<td>1.1-1.4</td>
<td>2.2-2.8</td>
</tr>
<tr>
<td>250</td>
<td>13.75-17.50</td>
<td>0.14-0.18</td>
<td>1.4-1.8</td>
<td>2.8-3.6</td>
</tr>
<tr>
<td>300</td>
<td>16.50-21.00</td>
<td>0.17-0.21</td>
<td>1.7-2.1</td>
<td>3.4-4.2</td>
</tr>
<tr>
<td>350</td>
<td>19.25-24.50</td>
<td>0.19-0.25</td>
<td>1.9-2.5</td>
<td>3.6-5.0</td>
</tr>
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</table>

Blood collection recovery times:

<table>
<thead>
<tr>
<th>% CBV removed</th>
<th>recovery period</th>
<th>recovery period</th>
</tr>
</thead>
<tbody>
<tr>
<td>single sample</td>
<td>multiple samples</td>
<td></td>
</tr>
<tr>
<td>% CBV removed</td>
<td>in 24hrs</td>
<td>% CBV removed</td>
</tr>
<tr>
<td>0.75%</td>
<td>24hrs</td>
<td>0.75%</td>
</tr>
<tr>
<td>7.5%</td>
<td>1 week</td>
<td>7.5%</td>
</tr>
<tr>
<td>10%</td>
<td>2 weeks</td>
<td>10-15%</td>
</tr>
<tr>
<td>15-20%</td>
<td>4 weeks</td>
<td>20%</td>
</tr>
</tbody>
</table>

Blood collection sites in rodents:

<table>
<thead>
<tr>
<th>device/needle</th>
<th>general anesthesia?</th>
<th>repeat samples?</th>
<th>expected volume</th>
<th>tissue damage</th>
<th>mandibular/cheek</th>
<th>saphenus</th>
<th>lateral tail vein</th>
<th>ventral tail artery</th>
<th>cardiac</th>
</tr>
</thead>
<tbody>
<tr>
<td>mouse (25g)</td>
<td>orbital</td>
<td>yes</td>
<td>limited</td>
<td>5% CBV</td>
<td>mod/high</td>
<td>cap tube</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mandibular/cheek</td>
<td>no</td>
<td>yes</td>
<td>0.2-0.4ml</td>
<td>mod</td>
<td>lancet, 5-8mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>saphenus</td>
<td>no</td>
<td>yes</td>
<td>5% CBV</td>
<td>low</td>
<td>25-27ga</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lateral tail vein</td>
<td>no</td>
<td>yes</td>
<td>0.1-0.15ml</td>
<td>low</td>
<td>25-27ga</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ventral tail artery</td>
<td>no</td>
<td>yes</td>
<td>0.1-0.2ml</td>
<td>low</td>
<td>25-27ga</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>cardiac</td>
<td>yes/terminal</td>
<td>no</td>
<td>50% CBV</td>
<td>mod</td>
<td>23ga</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>rat (300g)</td>
<td>orbital</td>
<td>yes</td>
<td>limited</td>
<td>5% CBV</td>
<td>mod/high</td>
<td>cap tube</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mandibular/cheek</td>
<td>no</td>
<td>yes</td>
<td>0.2-0.5ml</td>
<td>mod</td>
<td>lancet, 5-8mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>sublingual</td>
<td>yes</td>
<td>yes</td>
<td>0.2-1ml</td>
<td>low</td>
<td>23-25ga</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>jugular</td>
<td>no</td>
<td>limited</td>
<td>5% CBV</td>
<td>low</td>
<td>25-27ga</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>5% CBV</td>
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<td>25-27ga</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lateral tail vein</td>
<td>no</td>
<td>yes</td>
<td>up to 2ml</td>
<td>low</td>
<td>25-27ga</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ventral tail artery</td>
<td>no</td>
<td>yes</td>
<td>0.1-0.2ml</td>
<td>low</td>
<td>25-27ga</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>cardiac</td>
<td>yes/terminal</td>
<td>no</td>
<td>50% CBV</td>
<td>mod</td>
<td>23ga</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Notes on specific techniques:

**Mandibular** samples will contain a mixture of venous and arterial blood.

Blood from the **saphenous** and **tail veins** can be achieved either by introducing an appropriate needle into the vessel, or by nicking the vessel and collecting blood into a container; note that samples collected by the latter method will not be sterile and could be contaminated with tissue(s).

**Lateral tail vein:** Prewarming the tail under a heat lamp or local warming will cause vasodilation, increasing yield.

**Orbital (retrobulbar)** samples are collected with a heparinized capillary tube from the medial/rostral canthus of the eye only; samples can be taken at a maximum of **every 2 weeks** from the same site. Personnel must be adequately trained in technique to avoid injury to the animal; technique is less commonly performed in the rat (rat has plexus while mouse has sinus).

**Cardiac blood sampling** is only permitted as a **terminal procedure** in a deeply anesthetized animal.

**Section 3: Tumor/Pellet Delivery by Trocar**

Pieces of tumor and pellets (often for slow release of drugs or hormones) are usually implanted subcutaneously in rodents through a large-bore needle called a trocar. Because of the large diameter of a trocar (≤16ga), more than momentary pain is associated with their use; therefore, **all procedures involving trocars are considered minor survival surgery** at by the IACUC. Animals MUST be under general anesthesia or have a local anesthetic agent applied at the trocar site for these procedures. Trocars will cause more damage to the skin compared to smaller gauge hypodermic needles, and skin closure (suture, staples, wound clips, surgical glue) may be needed post injection. Additionally, animals should be provided with analgesia for at least 12hrs postoperatively.

Common sites of tumor/pellet insertion include the lateral flank (just in front of the hip) and the interscapular area of the dorsum (between the shoulder blades). The IACUC recommends injection of tumors at the lateral flank to reduce irritation from the overlying wire insert of the cage (can irritate developing tumors on the dorsum). For recommendations regarding other acceptable areas, please contact the Veterinary Staff.
References -


**Purpose** – The purpose of this policy is to provide guidance and resources for investigators that require adjuvant use in live animals.

**Background** – Adjuvants include any compound that enhances the immune response to an antigen. Adjuvants are commonly used for the *in vivo* production of polyclonal antibodies either to foreign or self antigens. Many adjuvants are commercially available, and selection is based on intended use and desired effect. Examples include vaccine development/use (low immune response), monoclonal/polyclonal antibody production and collection (moderate immune response), and induction of autoimmune disease (intense immune response). No adjuvant is ideal for all situations and all adjuvants produce varying undesirable side effects, including toxicity.

Commonly used adjuvants:

- **Complete Freund’s Adjuvant (CFA)** – Water-in-oil immersion containing heat-killed *Mycobacterium tuberculosis* and/or mycobacterial cell wall components; CFA induces a very strong inflammatory response at the injection site that can be painful to the animal. Repeated use can produce sterile abscesses, skin ulceration, and skin/tissue sloughing. CFA is typically only given for the initial immunization, followed by boosters of IFA.

- **Incomplete Freund’s Adjuvant (IFA)** – Similar preparation to CFA, except IFA lacks the *Mycobacterium tuberculosis* component. Because IFA is less inflammatory, it can be used multiple times in the same animal safely.

Other commercially available adjuvants include RIBI®, TiterMax®, Specol®, montamides, SAF, aluminum compounds, MF59, liposomes, and others.

**Policy** –

All adjuvants/antigens must be prepared using sterile technique. The preferred route of administration for most adjuvants is subcutaneous (SC).

Antigen/adjuvant injection site(s) should be aseptically prepared, including shaving of site followed by disinfection with surgical scrub.

CFA should be the last resort regarding adjuvant choice; its use requires scientific justification along with demonstration of a search for alternative adjuvants (databases such as ALTWEB or ALTBIB) for IACUC approval.

- animal protocols using CFA are automatically classified at as IACUC Category 3 (equivalent of USDA Category E)
- CFA is only allowed to be administered to each animal once (usually initial immunization)
- CFA should be prepared 1:1 (volume) with aqueous antigen
- if possible, prepare concentrations of CFA <0.1mg/ml (may not be possible for auto-immune disease induction)
- inject volume at multiple sites to minimize inflammation and avoid fusion of lesions

Recommended volumes/sites for CFA-antigen emulsion administration (all volumes in microliters, mls) [1]:

<table>
<thead>
<tr>
<th></th>
<th>SC</th>
<th>ID</th>
<th>IP</th>
<th>FP</th>
<th>IM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mouse</td>
<td>&lt;0.1</td>
<td>*</td>
<td>&lt;0.2</td>
<td>&lt;0.05**</td>
<td>&lt;0.05***</td>
</tr>
<tr>
<td>Rat</td>
<td>&lt;0.1</td>
<td>&lt;0.05**</td>
<td>&lt;0.5**</td>
<td>&lt;0.1**</td>
<td>&lt;0.1***</td>
</tr>
<tr>
<td>Rabbit</td>
<td>&lt;0.25</td>
<td>&lt;0.05**</td>
<td>*</td>
<td>*</td>
<td>&lt;0.25***</td>
</tr>
</tbody>
</table>

SC = subcutaneous, ID = intradermal, IP = intraperitoneal, FP = foot pad, IM = intramuscular
* = not recommended ** = requires justification *** = only one limb, requires justification

Post injection care – Post injection monitoring and care is required for all in vivo adjuvant use. The injection site should be monitored for at least three weeks (3 times per week) or until all lesions have healed. Lesions that ulcerate, necrose, or slough must be treated under the direction of the veterinary staff. Animals that show overt signs of pain (hunched appearance, poor coat, discharge around eyes, etc.) should receive analgesics (check with veterinary staff regarding choice) [3].

References -

Policy 21 – Investigator Responsibilities Regarding Animal Care and Use

Version 1.0
Approval Date: 1/16/13

Purpose – The purpose of this policy is to summarize all responsibilities of investigators using animals at the Robert Wood Johnson Medical School (RWJMS).

Background – The most recent edition of the Guide (8th ed.) includes 29 additional “must” statements as compared to the 7th edition (1996). Many of these statements relate directly to institutional animal care and use. In order to ensure animal welfare and prevent confusion, the IACUC has created an outline of responsibilities investigators assume when working with live animals at RWJMS.

Policy –

All investigators are required to:

1. Attend Translational Resource Center (TRC) access training seminar before working with animals.
2. Have approved protocol(s) accurately describing all animal work performed; PI must have approval letter from IACUC before beginning experiments.
3. Not deviate from IACUC approved protocol(s).
4. Read and adhere to all pertinent IACUC policies and guidelines (see appendix 1).
5. Review and sign their IACUC application(s), amendments, and annual reviews.
6. Provide current contact information (email and phone number) for at least one lab member (does not have to be PI); this allows veterinary staff to communicate with lab regarding after hours/weekend emergencies.
7. Regularly communicate with TRC staff regarding animal health and humane endpoints.
8. Amend all protocol changes to the IACUC; PI must have written approval prior to initiation of changes (appendix 2 contains common examples of changes that require IACUC approval).
9. Assure all lab personnel have adequate skills to perform in vivo procedures.
10. Report all new phenotypes (trait expression) that affect the animal’s health and welfare to the IACUC and veterinary staff.
11. Assure proper record-keeping of animals (such as completing Blue cards) for procedures that produce pain and distress. This includes (but is not limited to) all major (body cavity entered) surgery. Examples are: post-op care, prolonged restraint, animal models involving paresis/paralysis, animals under veterinary treatment (such as ulcers), and animals approaching humane endpoints (tumor size 1cm (mice), BCS=2, inability to eat/drink, etc.).
12. Follow recommendation of the veterinary staff regarding treatment of sick/moribund animals.
13. Monitor all animals under protocol(s) at least 3X/week (or more) as described in the IACUC protocol or veterinary recommendations.
14. Report any observed non-compliance (within your laboratory or other laboratories) to IACUC members or the veterinary staff.
15. Provide a copy of approved protocol(s) to any lab member using live animals.
16. Assure all laboratory members follow this policy.
PIs are ultimately responsible for all animals under their protocol(s)

Additionally, University veterinarians have the authority to treat or euthanize any animal in the interest of animal welfare without prior authorization from the PI. Veterinarians will, however, make every attempt to contact the PI (or laboratory designee) before treating/euthanizing any animal(s).

“… the veterinarian must have the authority, delegated by senior administration and the IACUC, to treat the animal, remove it from the experiment, institute appropriate measures to relieve severe pain or distress, or perform euthanasia if necessary.”

-the Guide, p114

“The veterinarian must have authority to use appropriate treatment or control measures, including euthanasia if indicated, following diagnosis of an animal disease or injury. If possible, the veterinarian should discuss the situation with the principal investigator to determine a course of action consistent with experimental goals. However, if the principal investigator is not available, or if agreement cannot be reached, the veterinarian must have authority to act to protect the health and well-being of the institutional animal colony. The veterinarian’s authority should be exercised with the concurrence of the IACUC and the Institutional Official.”

-Guidelines for Adequate Veterinary Care (ACLAM 1996)

Appendix 1 – Current policies at RWJMS

<table>
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<tbody>
<tr>
<td>Tumors</td>
<td>Use of Recording Devices in Animal Facilities</td>
<td>Q Fever and Zoonotic Disease Prevention in Sheep</td>
<td>Identification of Rodents</td>
<td>Mouse Total Body Irradiation</td>
<td>Social Housing and Environmental Enrichment</td>
<td>Personal Protective Equipment</td>
<td>Monoclonal Antibody Production and Ascites</td>
<td>Fluid Administration and Collection (Rodents)</td>
<td>Use of Adjuvants</td>
<td>Investigator Responsibilities</td>
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<td>Overcrowding</td>
<td>Experimental Endpoints</td>
<td>Euthanasia</td>
<td>Weight Loss</td>
<td>Use of Cell Lines</td>
<td>Care of EAE Mice</td>
<td>Genotyping of Rodents</td>
<td>Toe Clipping</td>
<td>Survival Surgery</td>
<td>Expired / Non-Commercial Drugs</td>
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Appendix 2 – Common changes to a protocol that requires an amendment [2]:

- Change(s) in objective(s) of study
- Switch from non-survival to survival surgery
- Change(s) in degree of invasiveness of a procedure or discomfort to an animal
- Change in species or number of animals used
- Change in personnel involved in animal procedures
- Change in anesthetic agent(s) or in the use/withholding of analgesics
- Change in method(s) of euthanasia
- Change in duration, frequency, or number of procedures performed on an animal
- Incorporation/change of use of hazardous substances (chemical, biological, radioactive, carcinogens)
- Any exception(s) to federal regulations (the Guide or Animal Welfare Act) and/or IACUC policies

References -

