The University of Michigan

PHS Assurance Number – D16-00072A (A-3114-01)

Public Health Service (PHS) Policy

Animal Welfare Assurance

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The University of Michigan Assurance (D16-00072) of Compliance with the Public Health Service Policy on Humane Care and Use of Laboratory Animals

I, **Rebecca Cunningham** as named Institutional Official for animal care and use at **The University of Michigan (U-M)**, hereinafter referred to as Institution, by means of this document, provide assurance that this Institution will comply with the Public Health Service Policy on Humane Care and Use of Laboratory Animals, hereinafter referred to as PHS Policy.

I. Applicability of the Assurance

This Assurance applies whenever this Institution conducts the following activities: all research, research training, experimentation, biological testing, and related activities involving live vertebrate animals supported by the PHS, HHS, NSF, and/or NASA. This Assurance covers only those facilities and components listed below.

A. The following are branches and components over which this Institution has legal authority, included are those that operate under a different name:

    1. The U-M Ann Arbor, Dearborn and Flint campuses;

    2. The U-M George Reserve (ESGR);

    3. The U-M Sheep Research Facility (SRF); and

    4. The U-M Pellston Biological Station (UMBS).

B. The following are institution(s), or branches and components of another institution: None

II. Institutional Commitment

A. This Institution will comply with all applicable provisions of the Animal Welfare Act and other Federal statutes and regulations relating to animals.

B. This Institution is guided by the "U.S. Government Principles for the Utilization and Care of Vertebrate Animals Used in Testing, Research, and Training."

C. This Institution acknowledges and accepts responsibility for the care and use of animals involved in activities covered by this Assurance. As partial fulfillment of this responsibility, this Institution will ensure that all individuals involved in the care and use of laboratory animals understand their individual and collective responsibilities for compliance with this Assurance, as well as all other applicable laws and regulations pertaining to animal care and use.

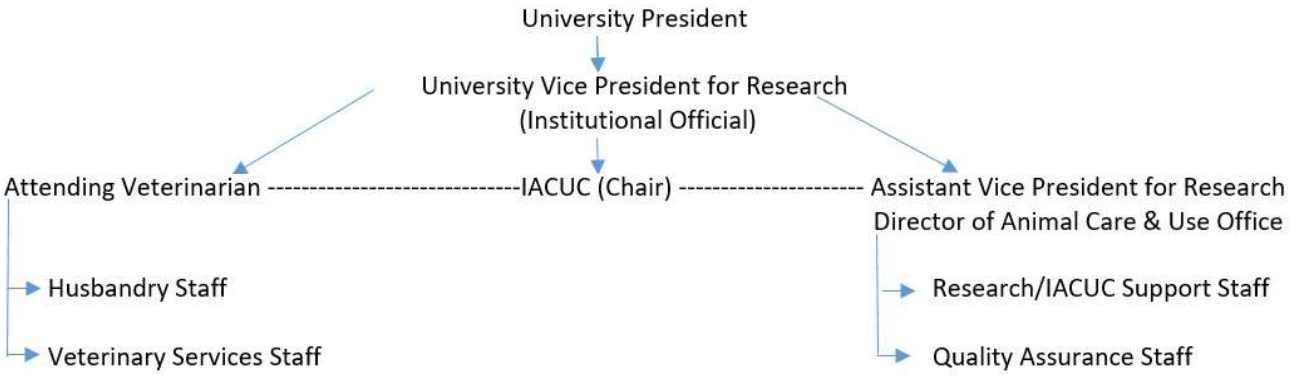
D. This Institution has established and will maintain a program for activities involving animals in accordance with the "*Guide for the Care and Use of Laboratory Animals*" (Guide).

E. This Institution agrees to ensure that all performance sites engaged in activities involving live vertebrate animals under consortium (sub-award) or subcontract agreements have an Animal

Welfare Assurance and that the activities have Institutional Animal Care and Use (IACUC) approval.

III. Institutional Program for Animal Care and Use

Please note that the IACUC Chair reports directly to the IO with each committee member having an open and direct line to the IO.



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

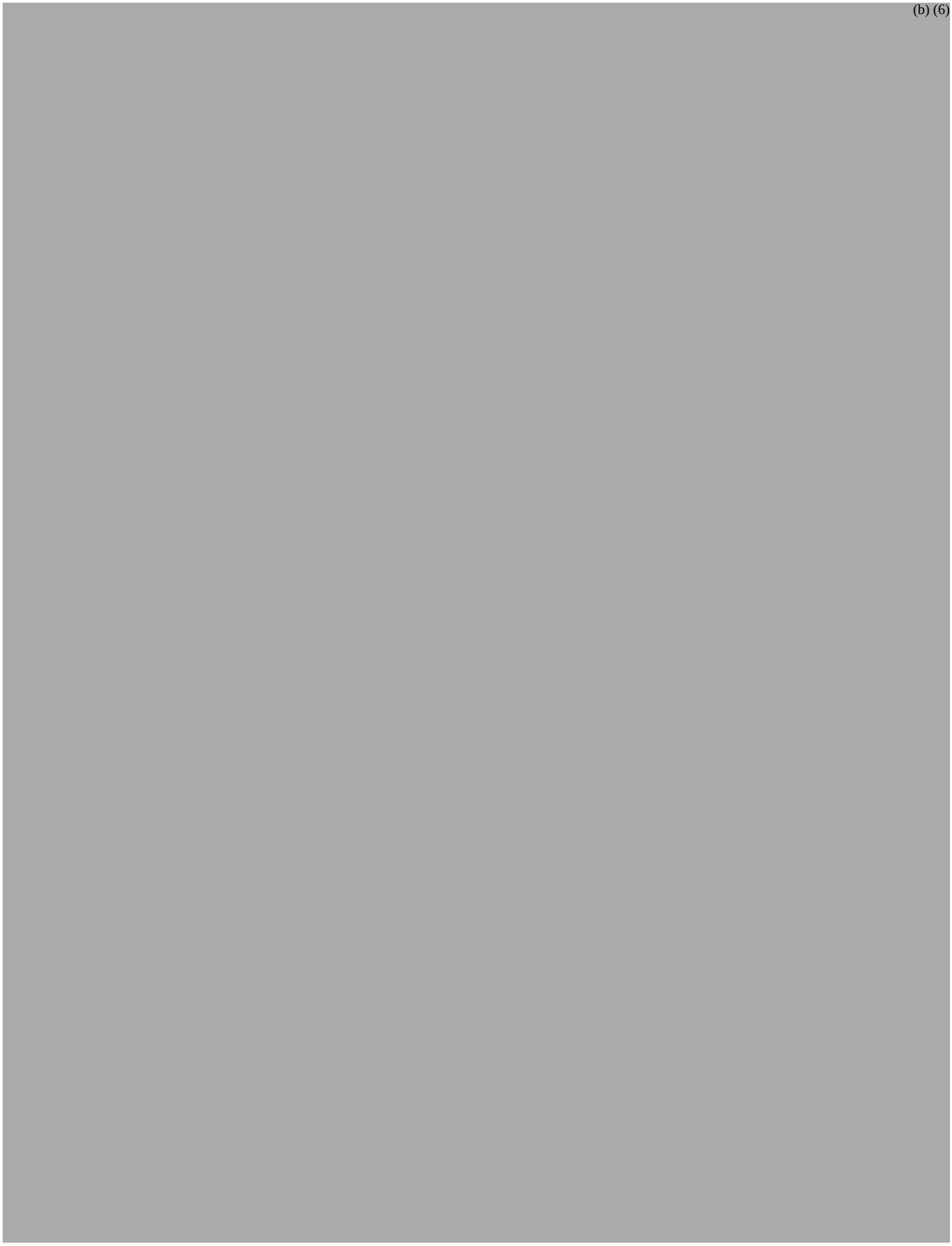
1. William W. King, AV and Executive Director of ULAM

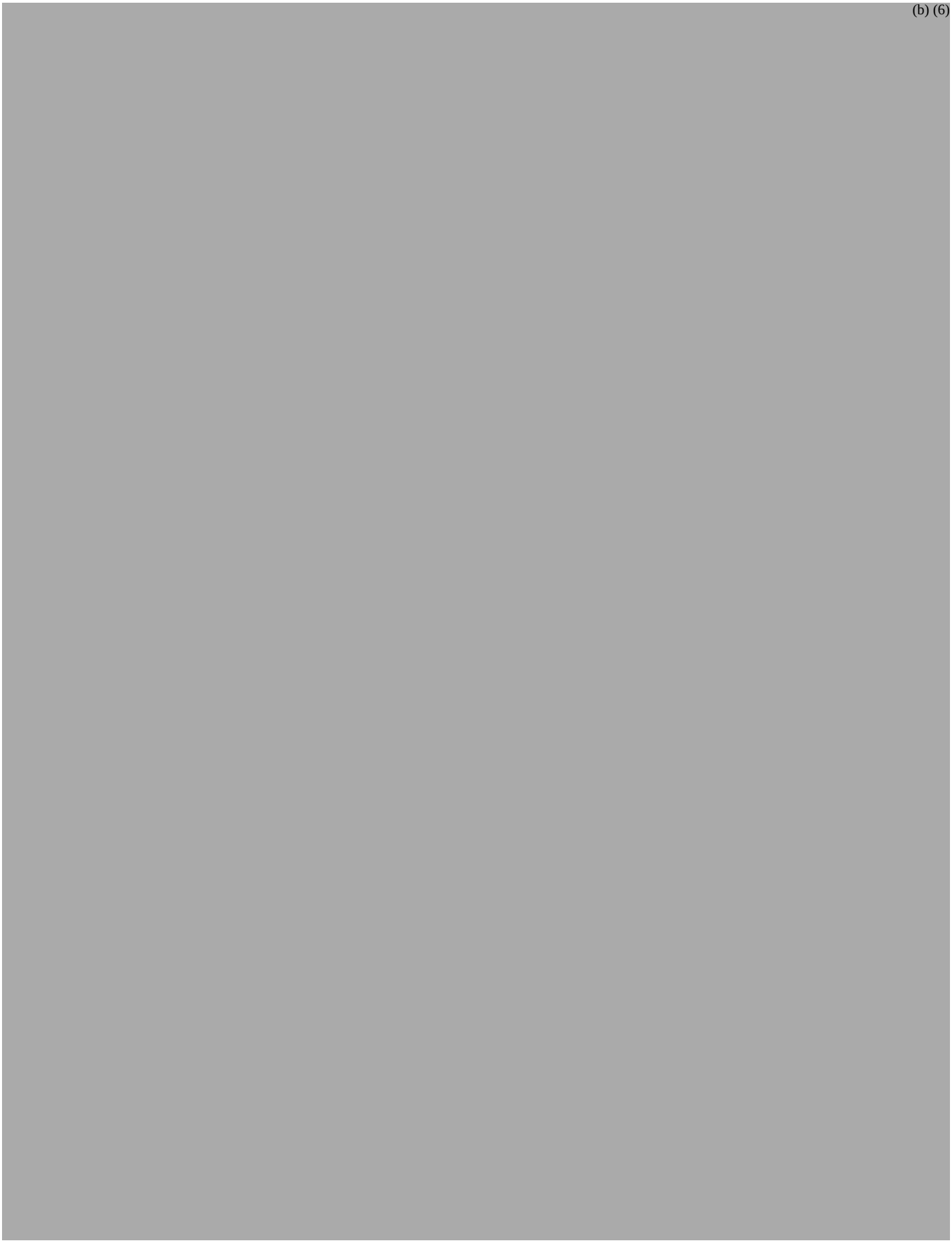
- **Qualifications:** William W. King, DVM, PhD, DACLAM; University Attending Veterinarian; Assistant Vice President, Animal Resources; Executive Director, ULAM; Clinical Professor, School of Medicine. Laboratory Animal Medicine residency (i.e., DVM) at Louisiana State University. Laboratory animal medicine post-doctoral experience since 1991. Continuing Education: National AALAS Meeting 1992-present; Association of Avian Veterinarians Annual Conference, 1993; CL Davis Foundation, Pathology of Laboratory Animals, 1996; ACLAM Forums, 1997, 1999; Charles River Laboratories Laboratory Animal Medicine Short Course, 2004; AVMA National Meeting, 2007; Public Responsibility in Medicine and Research (PRIM&R) IACUC Conference, 2012; Chinese Forum for the Care and Use of Laboratory Animals, 2014; numerous regional AALAS meetings (Chicago Branch, Kentucky Branch, District 5). AAALAC, International: Ad hoc Consultant, 1999-2004, Council on Accreditation, 2004-2016, Council Emeritus, 2016-present.

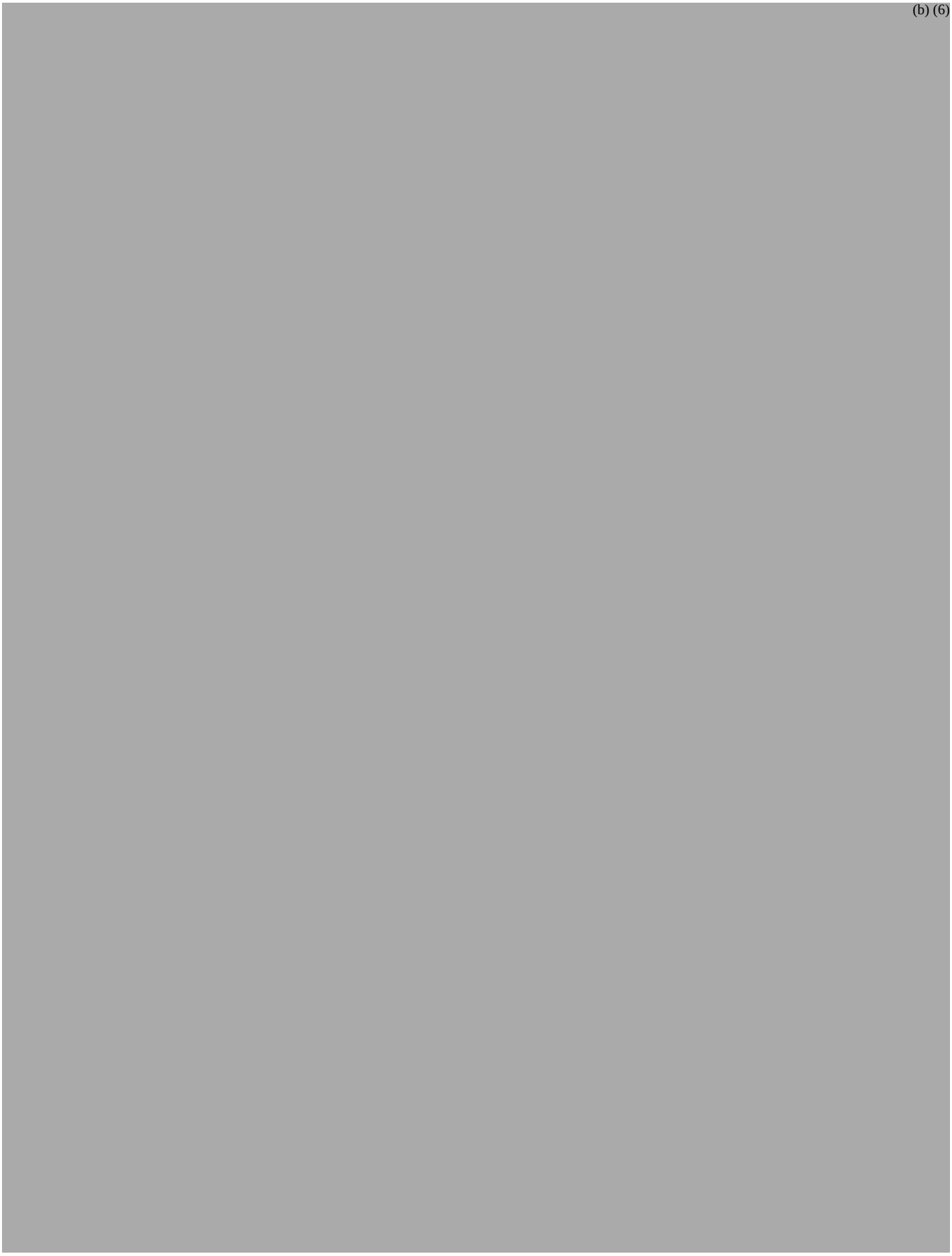
- **Authority:** Dr. King is the University Attending Veterinarian and has direct program authority and responsibility for the Institution's animal care and use program including access to all animals.

- **Time Contributed to the Program:** Dr. King is a full time employee of The University of Michigan and devotes 100% of his time to the Animal Care and Use Program, which includes laboratory animal care including access to all laboratory animals.

(b) (6)







B. The IACUC at this Institution is properly appointed according to PHS Policy IV.A.3.a. and is qualified through the experience and expertise of its members to oversee the Institution's animal care and use program and facilities. The IACUC consists of at least five members, and its membership meets the composition requirements of PHS Policy IV.A.3.b. Attached is a list of the chairperson and members of the IACUC and their names, degrees, profession, titles or specialties, and institutional affiliations. (IACUC membership Attached – Appendix A)

C. The IACUC will:

1. Review at least once every six months the Institution's program for humane care and use of animals, using the "Guide" as a basis for evaluation. The IACUC procedures for conducting semiannual program reviews are as follows:

   - IACUC members hold a formal meeting at least once every six months to review the Institution's Program for Humane Care and Use of Animals using the Guide and other pertinent resources, (e.g. the PHS Policy, the OLAW Program Review Checklist, the program description sent to AAALAC) as a basis for the review. All IACUC members are notified of the semiannual review and invited to participate. The evaluation will include, but not necessarily be limited to the following programmatic components: a) IACUC Membership and Functions; b) IACUC Records and Reporting Requirements; c) Husbandry and Veterinary Care (all aspects); d) Personnel Qualifications (Experience and Training); e) Occupational Health and Safety; and f) the program emergency disaster plan.

2. Inspect at least once every six months all of the Institution's animal facilities, including satellite facilities, using the "Guide" as a basis for evaluation. The IACUC procedures for conducting semiannual facility inspections are as follows:

   - At least once every six months IACUC members and supporting staff will inspect all of the institution's facilities where animals are housed or used (i.e., vivaria, farms, holding areas, animal care support areas, storage areas, procedure areas, and laboratories where animal manipulations are conducted) using the Guide and other pertinent resources, (e.g. the PHS Policy, OLAW Checklist) as the basis for the evaluation. Equipment (e.g. automobiles and livestock trailers) used for transporting of the animals is also inspected. Animal care and use facilities are inspected by at least two IACUC members when USDA covered species are involved in research, teaching or instruction at that location. In situations when only non-covered species are being housed or surgical procedures are being conducted, at least one IACUC member conducts the inspection. However, the IACUC remains responsible for the inspection and the report.

   In every case, all IACUC members are notified of each facility visit and invited to participate in all semi-annual inspections.

3. Prepare reports of the IACUC evaluations as set forth in the PHS Policy IV.B.3 and submit the reports to the Institutional Official. The IACUC procedures for developing reports and submitting them to the Institutional Official are as follows:

   - IACUC Administrative staff members will collate the notes taken during the committee's evaluation of the animal facilities and program review into a draft of the report to the IO,

which is provided to the IACUC during a regular meeting for discussion and approval. The report includes a description of the nature and the extent of the institution's adherence to the Guide and PHS Policy. The IACUC members are given the opportunity to comment on the report or express minority opinions. If there are no minority opinions, the report will reflect as such. The final report is signed by a majority of the IACUC members. The report is sent to the IO following the evaluations, and receipt of the document is confirmed through the IO's signature.

- Program deficiencies include activities that do not comply with the PHS Policy and/or the Guide. They are identified by IACUC members during the program and/or facilities evaluation. Significant deficiencies are defined as any deficiencies that have the potential to impact animal or human welfare or wellbeing, or directly violate a regulatory expectation. If any deficiencies are identified as significant during the evaluation process, they are immediately brought to the attention of and addressed by the responsible individual (e.g. principal investigator, veterinarian, and/or facility manager). The minor deficiencies (those not posing an immediate risk to animals) are addressed during the committee discussion of the IO report. The reportable issues are appropriately reported to the appropriate agencies (i.e., OLAW, USDA and AAALAC) by the IACUC Administrator in a timely manner. Deficiencies whether significant or minor and their IACUC developed reasonable plan and schedule for correction are specifically stated in the report to the IO. Deficiencies that are immediately corrected are also stated in the IO report.

- The noted deficiencies are corrected over a six-month period. As indicated, significant deficiencies are brought to the IACUC in a timely manner. In all cases, a suitable plan and schedule for correction is established by the IACUC and communicated to the relevant individual who ensures animal welfare concerns are addressed. Unless otherwise specified, all minor concerns are resolved by the appropriate parties and with confirmations occurring through either a telephone conversation or a written response.

- Departures from the Animal Welfare Act Regulations (AWAR), PHS Policy and/or the Guide are submitted to the IACUC for review and approval before implementation. They are reviewed by the IACUC at least annually or more often if required by the AWAR. Departures from the AWAR, PHS Policy and/or the Guide and the reason for the departures are specifically stated in the report to the IO once they are approved by the IACUC. Information regarding ongoing departures is maintained in a database by ACUO staff to which the IO has access.

4. Review concerns involving the care and use of animals at the Institution. The IACUC procedures for reviewing concerns are as follows:

   - To advise individuals how and where to report concerns involving animal care and use, the University of Michigan posts a notice in animal facilities and on the animal care and use website. The notice informs the reader that the University is committed to the humane care and treatment of animals, and that it conforms to all applicable regulations and policies. The notice also provides interested individuals at least three methods for reporting concerns (e.g., online form, email address, and phone). In addition, all notice readers are informed that all issues will be investigated, and handled confidentially with protection from discrimination and reprisals, which ensures the ability to report anonymously without the risk of reprisal.

- Reported concerns are reviewed by an IACUC member. Issues determined to be significant (i.e. creating or a risk to animals, or a violation of the regulations/policies) are referred to the IACUC for discussion and resolution.

5. Make written recommendations to the Institutional Official regarding any aspect of the Institution's animal program, facilities, or personnel training. The procedures for making recommendations to the Institutional Official are as follows:

   During IACUC monthly meetings, members have the opportunity to make recommendations to the IO regarding aspects of the institution's animal program or facilities. The committee member recommendations are documented in meeting minutes, the IO report, or in a specific notice. On behalf of the IACUC, the Assistant Vice President for Research serves as the committee's liaison to the IO. In this capacity, he provides clarifications on committee policies and reports, acquires signatures on relevant documents, and communicates IACUC concerns to the IO. In addition, the University Attending Veterinarian, the IACUC Chairman and the Assistant Vice President for Research, Animal Compliance Oversight meet semiannually, or more often if necessary, with the IO to discuss issues relevant to the animal care and use program. This process is also used by the IACUC to report concerns, related findings, and recommendations to the IO.

6. Review and approve, require modifications in (to secure approval), or withhold approval of PHS-supported activities related to the care and use of animals according to PHS Policy IV.C.1-3. The IACUC procedures for protocol review are as follows:

   The IACUC reviews all activities involving vertebrate animals utilized in research, teaching and testing regardless of the funding source.

   The IACUC uses the DMR and FCR processes. It also makes significant protocol changes in accordance with an IACUC approved VVC policy. An administrative process is used for amendments (e.g., clerical changes and personnel changes) not requiring IACUC review and approval.

   The ACUO receives and initiates the review of all proposed animal activities. PIs provide the details of the activities using a standard protocol template.

   1) Protocol receipt and prescreening

   a. PIs submit proposed animal use activities (i.e., protocol) for review to the IACUC through the ACUO Electronic Review, Approval and Management (eRAM) system.

   b. Research Compliance Associates (RCA) prescreen the protocol for completeness to ensure the required information is provided. The protocol may be returned to the PI by the RCA until it is determined to be administratively complete.

   c. To ensure protocol and grant congruency, an RCA ensures all animal activities listed in a grant are included in the corresponding protocol(s). This action confirms that all animal activities in the grant application are reviewed and approved by the IACUC.

d. Pending submissions (i.e., new, modifications and annual reviews) are collated to an "*All Applications/Amendments*" page within the eRAM system that is immediately accessible to IACUC members. This page provides committee members the protocol number and title, the species and the PI's name. Members can further access complete proposals and relevant documents through eRAM. IACUC members can request FCR at any time once the protocol is posted to the "*All Applications/Amendments*" page.

2) Protocol Review Process (Restrictions):

a. IACUC members recuse themselves from the review and approval of any activities in which he or she has a conflicting interest (e.g., is personally involved in the project) except to provide information requested by the IACUC;

b. Members having a conflicting interest do not contribute to the constitution of a quorum during the full committee review or approval of a protocol in which he or she has a conflicting interest;

c. Members having a conflicting interest are not assigned as a designated member reviewer to a protocol in which he or she has a conflicting interest;

d. The IACUC may invite consultants to provide information on complicated issues, however, these consultants do not contribute to the quorum or cast a vote after deliberations; and

e. Telecommunications are used as necessary. The use is in accordance with NIH Notice NOT-OD-06-052 of March 24, 2006, titled Guidance on Use of Telecommunications for IACUC Meetings under the PHS Policy on Humane Care and Use of Laboratory Animals.

3) Full Committee Review Process

a. Committee members have access to review project documents (e.g. protocol, grant, permits, etc.) prior to the FCR.

b. Depending on the complexity of the protocol and/or at the request of the IACUC, the ACUO may ask the PI and/or consultant(s) to participate in the review of the protocol. The PI and ad hoc consultants are excused prior to the IACUC deliberation and vote.

c. Once the deliberation is completed, the IACUC approves, withholds approval, or requires modifications before approval is granted, as determined by a majority vote of the quorum present. If modifications are required prior to approval, the review is completed using one of the following practices:

i. **FCR:** If any member requests that the revised protocol be reviewed during a full committee meeting, the needed modifications are electronically communicated to the PI. The PI amends the protocol, which is discussed during

the next regularly schedule convened meeting of a quorum of the IACUC where approval is either granted or withheld by a vote of a majority of the quorum present; or

ii. **DMR subsequent FCR:** Since an IACUC approved policy to which all members agree formalizes that the quorum of members present at a convened meeting may decide by unanimous decision to use DMR subsequent to FCR when modifications are needed to secure approval, a DMR is assigned to complete the review. Consequently at least one member of the IACUC, designated by the chairperson and qualified to conduct the review, is assigned to review the protocol. The DMR approves, requires modifications in order to secure approval, or refers the protocol to FCR.

iii. Upon IACUC approval of the submission, a member of the ACUO formally notifies the PI of the approval.

4) Designated Member Review Process:

a. IACUC members are given five business days to request that a protocol be reviewed using the FCR process. If FCR is not requested after five business days (using concurrence by silent assent), the protocol will be reviewed using the DMR process.

b. At least one member of the IACUC, designated by the chairperson and qualified to conduct the review, is assigned as the DMR. In the event more than one DMR is assigned, all will review identical copies of the protocol and the decision of the DMRs will be unanimous, or the protocol will be reviewed using FCR. The DMR(s) approves, requires modifications in order to secure approval, or refers the protocol to FCR.

c. If additional information is required prior to approval, the needed clarifications are listed directly in the submission by the DMR through eRAM. The PI amends the submission as needed, and the revised protocol is reviewed by the DMR(s).

d. This process will be followed until the project is approved, or a full committee review is requested.

e. Upon IACUC approval of the submission, a member of the ACUO formally notifies the PI of the approval.

7. Review and approve, require modifications in (to secure approval), or withhold approval of proposed significant changes regarding the use of animals in ongoing activities as set forth in the PHS Policy IV.C. The IACUC procedures for reviewing proposed significant changes in ongoing research projects are as follows:

1) FCR or DMR: Significant changes are reviewed by full committee or designated member review as described in Part lll.D.6.

2) Veterinary Verification and Consultation (VVC): Significant modifications are also made to protocols using the VVC process according to the following policy:

OLAW notice NOT-OD-14-126: "Guidance on Significant Changes to Animal Activities" defines an administrative process that can be used to make certain significant changes to IACUC approved protocols. The IACUC has approved specific changes (according to established criteria and resources defined in the VVC Policy) that can be incorporated into IACUC approved protocols by specifically designated faculty ULAM veterinarians using the VVC process. VVC changes are documented by the RCA and verified by veterinarian. The U-M IACUC applies the word "enhancement" to indicate changes (e.g., the use of a heating pad during MRI, addition of lidocaine for local block, adding options for wound closure (e.g., glue in addition to sutures), use of Dexamethasone in catheters to reduce inflammation) that improve outcomes based on veterinary professional judgment after evaluating the procedure and outcome. The following procedural changes can be made to animal activities that have already been IACUC approved if the proposed change does not result in an increase in pain, distress or degree of invasiveness:

1. Changes in pain management drugs (i.e., anesthesia and/or analgesia) to ensure the approved plan continues to meet the clinical and humane requirements as well as the needs of the research protocol, and meets the acceptable veterinary standards;

2. Enhancements to surgical procedures, including pre or post-operative procedures, that reduce the invasiveness or discomfort of the process;

3. Modifications to the process of collecting tissue samples that are used for genotyping and/or identification purposes;

4. Changes in the methods of euthanasia providing the changes are consistent with the acceptable methods described in the American Veterinary Medical Association (AVMA) panel publication on acceptable methods for euthanizing vertebrate animals;

5. Changes in the duration, frequency, type, or number of procedures performed on an animal;

6. Changes between blood collection methods (route, frequency, volume) providing the techniques are less or equally invasive and appropriate for the species as determined by the veterinarian; and

7. Enhancements to trio breeding that include trio birthing for breeding arrangements to improve breeding outcomes.

3) Administrative Amendments: Certain protocol changes have no impact on animal activities and are considered administrative amendments. Administrative changes can be made to IACUC approved protocols by any member of the Animal Care and Use Office (ACUO). The following protocol amendments may be made by administrative staff:

   1. Changes in funding sources;

   2. Changes in housing and/or procedure room locations;

   3. Changes in personnel and personnel information, other than the PI;

4. Changes due to typographical or grammatical errors; and

5. Changes in the approved number of mice or rats on a protocol providing that change does not exceed more than 10% of the originally IACUC approved number

8. Notify investigators and the Institution in writing of its decision to approve or withhold approval of those activities related to the care and use of animals, or of modifications required to secure IACUC approval as set forth in the PHS Policy IV.C.4. The IACUC procedures to notify investigators and the Institution of its decisions regarding protocol review are as follows:

   1) Principal Investigators:

   a. The IACUC informs PI's in writing (by email or formal notice) of their protocol approval and expiration date.

   b. The IACUC informs PI's in writing (by email or formal notice) when approval of an activity is withheld. The notice includes a statement of the reasons for the decision, and the investigator is given the opportunity to respond to the IACUC's decision in person or in writing.

   2) Institutional Official: The institution is notified through the IO's ability to electronically access eRAM, which includes detailed information on each submission that is reviewed and approved by the IACUC.

9. Conduct continuing review of each previously approved, ongoing activity covered by PHS Policy at appropriate intervals as determined by the IACUC, including a complete review in accordance with the PHS Policy IV.C.1-4 at least once every three years. The IACUC procedures for conducting continuing reviews are as follows:

   1) Monitoring ongoing activities:

   The IACUC utilizes the following, or a combination of the following processes for monitoring ongoing animal care and use activities.

   a. The committee periodically reviews PI written reports (i.e. annual reviews) of animal care and use activities. Annual reviews for projects involving USDA covered species are conducted using either the DMR or the FCR process as described in Part III.D.6. The report typically covers a defined period and includes information such as; a brief summary of animal use activities, information on animal use, discussions of unanticipated events that may have occurred. The committee follows-up with the PI when necessary.

   b. The IACUC has discussions with PIs, reviews laboratory records (e.g. surgery or observation records), and observes ongoing animal use activities during semi-annual facility visits.

   c. The animal care staff, veterinary technicians and veterinarians observe the animals daily, and bring concerns, as appropriate, to the IACUC.

d. Quality Assurance (QA) Program: The QA division led by the Assistant Director includes three QA Specialists (i.e., Post Approval Monitors). The QA Specialists serve as a compliance resource to PIs. They conduct routine laboratory visits, and help PIs strengthen their level of compliance confidence. When applicable, the team members also offer PIs suggestions for improving their compliance efficiency and effectiveness. Through the QA Specialists, allegations of non-compliance are identified and reported to the IACUC.

2) Continuous review of previously approved protocols:

Animal activities are approved for a maximum of three years. Prior to the three-year expiration date, scientists are required to review and update ongoing activities and resubmit them to the IACUC for a De novo review and continued approval. The three-year resubmission receives a complete review by the IACUC with additional attention directed toward the continued progress and validity of the research. The triennial review is a complete De novo review and completed using either the FCR or the DMR process as described in Part III.D.6.

10. Be authorized to suspend an activity involving animals as set forth in the PHS Policy IV.C.6.

If an animal care or use activity is not being conducted according to the provisions of the PHS Policy, the IACUC is authorized to suspend that activity. In certain situations, institutional intervention may stop an activity due to noncompliance with the PHS Policy. The IACUC procedures for suspending an ongoing activity are as follows:

a. The issue is brought to the attention of the IACUC in a timely manner, and reviewed and discussed during a convened meeting of a quorum of the committee. In most circumstances, the relevant individual(s) are asked to participate in the discussion.

b. After the discussion, the committee will suspend an activity only after a majority of the quorum present vote to suspend.

c. The IO, in consultation with the IACUC, shall review the reasons for suspension, take appropriate corrective action, and report that action with a full explanation to OLAW.

D. The occupational health and safety program (OHSP) for personnel working in laboratory animal facilities or having frequent contact with animals is as follows:

Environmental Health and Safety (EHS) at the University of Michigan, Ann Arbor Campus have the responsibility to protect employees, students, the surrounding community, and visitors from risks. EHS provides a University wide health and safety program, utilizing professional personnel with education, training and experience in biological, chemical, and radiological safety, industrial hygiene, fire protection, ergonomics, regulatory compliance and waste disposal. In addition to maintaining a University wide health and safety program, staff members from EHS, Occupational Health Services (OHS), the Unit for Laboratory Animal Medicine (ULAM), ACUO and senior administration has established, and continues to maintain an OHSP specific to animal research and support facilities. In addition, key staff members from EHS serve as Institutional Biosafety Committee (IBC) members and consultants to the IACUC. In the event

personal health information is gathered during a medical evaluation, federal, state and local HIPPA regulations are satisfied.

1) Hazard Identification:

a. Hazards Inherent to the Use of Animals

Potential hazards considered inherent to animal handling and husbandry environments are, for example, allergenic insults, zoonotic diseases, ergonomic stressors, physical hazards, and noise. EHS staff members periodically participate in IACUC semi-annual inspections of areas where animal handling occurs to conduct ongoing risk assessments to determine the need for or to modify protective equipment and/or systems. Based on the inspections, EHS staff members ensure personnel receive the proper training on identified hazards, and that the proper use of PPE and appropriate work practices are in place for mitigating the risks. The findings specific to the OHSP are communicated to the IO through the semi-annual IO report.

b. Research Related Hazards

Animal activities involving hazards are identified through the IACUC protocol and, if biological hazards, through the IBC application submission process. Animal care and use activities involving potential hazards (defined by U-M policy) must be assessed and approved by EHS before IACUC approval is granted. In addition, and where applicable, the relevant safety committee(s) must review and approve the activity prior to IACUC approval occurring. If an animal care and use project includes the use of potential hazards (such as ionizing and non-ionizing radiation, or biohazards), a dual review is required. For example, projects that include the use of radioactive materials must also be assessed and approved by the RPC. Those that include the use of biological hazards must be assessed and approved by the IBC.

In all circumstances, the relevant safety committee works in conjunction with the IACUC to ensure all safety measures necessary to protect personnel from research related hazards have been established. For example, when a biohazard is involved, an "Agent Sheet" is developed and maintained in the animal room. This form includes important safety information (e.g. PPE requirements for room entry, waste disposal requirements and disinfection procedures) that must be observed by those entering the room. In the event radioactive materials are used, only individuals trained to handle radioactive materials are permitted to maintain and conduct research with the animals.

c. Position Specific Hazards

Since the significance of work-related hazards may differ depending on an individual's job classification (e.g., outside contractor vs. veterinarians), EHS has conducted position specific risk assessments that are based on the duties associated with a particular position. As a result, and based on an individual's job classification, the degree of an individual's enrollment in the OHSP may vary. For example, a veterinarian caring for animals may be required to complete extensive training, wear task specific PPE, and receive various prophylactic vaccines to mitigate the risks associated with his/her position.

Risk Assessment: once the hazard identification process is complete EHS and, when necessary, additional relevant staff members with specific expertise (e.g. OHS, ULAM, and ACUO staff members) determine the degree of risk associated with the hazards.

2) **Participation in the OHSP:** everyone having contact with facilities associated with the animal care and use program participate in the OHSP. Each individual's level of OHSP participation is based on the risks associated with specific duties. For example, janitorial staff may attend training on animal related hazards and receive an animal safety brochure, and a researcher may complete, for example, a personal risk assessment form, web based, and classroom style trainings, as well as participate in a medical surveillance program through the OHS. Participants are enrolled in the OHSP, for example, when they complete a personal risk assessment form, attend classroom style trainings, or are listed as personnel on an animal care and use protocol.

3) **Protection from identified and assessed hazards:** Multiple methods to minimize risk exposure are employed to ensure staff members working in or around areas supporting the animal care and use program have a safe working environment. These methods include:

   a. **Personnel Training**

   EHS staff members, the OHS Clinicians, PIs, facility managers, and veterinary staff members provide different forms of safety training. Some of these trainings are formalized and in the form of either online modules or interactive didactic sessions. The training covers for example: zoonosis; hazard communication; operation of autoclaves and cage washers; and other trainings unique to animal care and use. Personnel using, for example X-Ray equipment, lasers, and radioisotopes are required to take specialized training offered through EHS. In addition, the laboratory or facility managers are ultimately responsible to assure the training of employees on the necessary safety practices associated with their animal care and use activities.

   Species-specific online training (AALAS Learning Library and UM custom trainings) is used to educate personnel on species-specific hazards (i.e., zoonotic diseases). Prior to an individual working with animals, he or she must complete the online training. IACUC protocol approvals are contingent on all protocol personnel completing the training.

   Those having only incidental contact with animals are trained on animal related hazards in various ways. For example, Facilities and Operations personnel receive a brief animal hazards training upon hire. In addition to the verbal training, they receive a one-page brochure that discusses animal related risks and specifically discusses, for example, allergies. Students working with animals as part of their classroom activities receive safety training from their instructor before animal activities are initiated. Finally, specific trainings are and have been developed for those individuals who are exposed to minimal risks (as determined by an EHS risk assessment).

Animal users are required to retake the species specific training every three years as zoonotic disease refresher training. In addition, the training brochure and posters on allergies are available for review throughout the vivarium.

a. Personal Hygiene and Protection

The University of Michigan, through the activities of the EHS, OHS, ULAM, ACUO and the IACUC, actively protect the health and well-being of personnel engaged in animal related research. IACUC administered policies regarding personal hygiene and protection have been developed to assist in minimizing exposure to animal related risks. They include:

- Personal Hygiene Requirements when Conducting Animal Activities:
- Eating, Drinking or Using Tobacco Products in Animal Facilities.
- Personal Protective Equipment while Conducting Animal Activities

b. Medical Evaluation and Preventive Medicine for Personnel

The OHS and EHS staff members collectively developed an Animal Handler Medical Surveillance Questionnaire form that is used to gather individual personal health information. The form must be completed by everyone including visiting faculty and students having direct contact with U-M animals and be submitted prior to being given access to the animal facilities. The completed form is forwarded (emailed via eRAM, faxed or hand delivered) directly to OHS. Once an individual submits the questionnaire to OHS, and he or she is cleared by a clinician, access is given to the animal facilities. Any action or treatment needed based on an individual's medical evaluation is confidential, and between the health care provider and the patient.

Each form is assessed by a medical professional (e.g., MD, Physician's Assistant, Nurse Practitioner or RN). If the clinician finds working with animals creates a higher risk to an individual due to a pre-existing health issue (e.g., immune-compromised, valvular heart disease, pregnancy), the clinicians may schedule an appointment to conduct an examination. During the examinations, the OHS clinician may review potential hazards, such as allergens and zoonosis that the individual may encounter in the workplace, the need for personal protection, and medical symptoms that would prompt more frequent health monitoring. Depending on the circumstances, pre-existing medical issues may disqualify an individual from working with research animals.

Under certain circumstances, additional diagnostic testing or prophylaxis may be required before an individual can conduct animal activities. Specifically, U-M staff working or having contact with non-human primates must be screened negative for tuberculosis annually. Staff members working with non-human primates must be current on their Rubella vaccination. In addition, other immunizations against illnesses such as rabies and tetanus are offered.

In addition to medical and diagnostic screening, staff members working with potentially hazardous species (e.g., macaques and sheep) receive specialized training on potential zoonosis and applicable personal protective equipment. For example, those working with macaques are trained to understand the hazards associated with B-Virus and methods for personal protection.

A similar training on Q-Fever and ORF is conducted for sheep users. In both cases, the training is mandatory before staff members are approved to work with these species.

During the training, individuals are educated on the symptoms associated with the specific diseases. The ultimate goal is to ensure staff members inform medical professionals of their potential exposures should they become ill. In addition, staff members are reminded of the process for informing their supervisors of any injuries or potential illness that may have resulted from a laboratory/animal exposure.

High-risk personnel (e.g., those working with sheep and macaques, husbandry staff, and those required to wear respirator) must complete the animal handler questionnaire annually. Those individuals not included in the high-risk category will receive an annual reminder email describing animal allergy symptoms, and requesting a resubmission of the Animal Handler Questionnaire if there has been a change in their medical status, a change in species or level of animal contact, or any concerns with their work environment.

c. Emergencies & Reporting Injury or Illness:

All injuries, illnesses or accidents must be immediately reported to animal users' supervisor.

Employees injured while working with animals during normal business hours must report to OMS or a panel physician. After hours, persons with job-related injuries that require immediate medical attention should report to the hospital emergency room. Position-related injuries that occur after hours, and that do not require immediate medical attention should be reported within 24 hours to the OMS. Individuals injured at any non-Ann Arbor location should seek medical care from the nearest health care provider.

As part of their overall trainings, individuals are instructed on how and where to obtain medical care in the event of an emergency or injury. In addition, specific instructions on how reporting injuries and securing care are available through the EHS website. The supervisor will investigate employee, student or visitor accidents, injuries or illnesses promptly. Appropriate corrective measures to prevent reoccurrence shall be implemented. Employees, students and visitors shall report all unsafe conditions, practices or equipment to the supervisor, instructor or Safety Officer whenever deficiencies are noted. Other incidents, e.g., spills, leaks, exposures, etc., are investigated by EHS and necessary corrective actions are taken.

d. Special Precautions for Primate Users:

High-risk species used at U-M include sheep and macaques. To reduce the potential for staff exposure, enhanced training and PPE is provided to staff members. For example, N-95 respirators are used by those handling sheep, and face shields are used by staff entering non-human primate rooms.

E. The total gross number of square feet in each animal facility (including each satellite facility), the species of animals housed therein and the average daily inventory of animals, by species included in **Appendix B**.

F. The training or instruction available to scientists, animal technicians, and other personnel involved in animal care, treatment, or use is as follows:

1) IACUC Member Training:

New members attend a special orientation meeting with an experienced ACUO staff member, the IACUC Chair and the AV (or an Associate/Assistant AV). A packet of relevant regulatory guidance (e.g., The *Guide*, PHS Policy, and AWAR) is provided to each new IACUC member to serve as a source of reference. In addition, an IACUC member's handbook is provided as a training guide for new members and as an available resource for seasoned members. The references, including guidelines and institutional policies, are discussed during the new member orientation meeting. In addition to the formal orientation, new members complete the AALAS online IACUC member training modules. In addition, committee members receive training on the 3 R's (refinement, replace and reduction – minimizing the number of animals need to achieve statistically valid results and minimization of pain and distress). They will also attend, for example, an extensive training on the protocol review process and conducting facility inspections.

As a source of continuing education, committee members are encouraged to attend IACUC specific conferences (e.g., IACUC Administrators Best Practices Meetings, IACUC 101, and PRIM&R webinars and conferences). In addition, brief education sessions are conducted during full committee meeting at least monthly. As appropriate, one-on-one training and consultation is also provided to individual members. Alternate members are encouraged to participate as non-voting members at IACUC meetings as a source of additional training.

In addition, the IACUC and the institution consider the IACUC SOPs and online policies and guidelines to be a source of continuing education for committee members. They provide committee members with information about issues such as literature searches, survival surgery, and prolonged physical restraint.

2) Research Team and other relevant staff (e.g., PIs, animal technicians): Depending on the animal activities proposed or their specific role, each individual will be asked to complete a combination of the following trainings. Training programs and brief descriptions:

i. **Orientation to Animal Care and Use at the U-M:** this course is including information on the ethical use of research animals, Federal regulations (e.g., the three R's – refine, replace and reduction – minimizing the number of animals need to achieve statistically valid results and minimization of pain and distress), institutional policies and oversight, the IACUC, how to report animal concerns, and veterinary care and security programs. This course is required for all members of the research team.

ii. **Introduction to "Species" (i.e. mouse, dog, wildlife, etc.)**: this is a series of courses with each providing details on the specifics of each species. For example, the assessment of health and basic needs, expectation for care, the detection of pain and distress, the use of anesthetics and analgesics, surgical procedures and methods of euthanasia, bio-methodologies, institutional practices, procedures and guidelines, the detection of pain and distress, and occupational health and safety

concerns (e.g., zoonotic diseases) related to the species. This course is required for all members of the research team.

iii. **Rodent Handling Workshop**: hands on technique training on common techniques (e.g., restraint, injections, euthanasia etc.) used in laboratory rodent studies (e.g., rats and mice). This course is required for all members of the research team working with rodents.

iv. **Rodent and non-rodent Survival Surgery (when applicable):** hands on technical training on conducting survival surgery in rodents. For example, the proper use of anesthesia and analgesia, maintaining accurate surgical records, and ensuring asepsis. In addition, the training includes a review of the unit's expectations and guidelines for the performance of survival surgery. This course is required for all members of the research team conducting rodent surgery.

v. **Hazard Containment:** this class provides education on the handling of BSL2 hazards in animal housing spaces. This course is required for all members of the research team that have access to animals being maintained in containment rooms (i.e., ABSL2).

vi. **Blood borne Pathogen Training and Infectious Disease:** this training covers universal precautions that should be observed when specimens derived of human or NHP origins are used in research. This course is required annually for all members of the research team working with biologics derived from human or NHP sources.

vii. **Animal Room Procedures:** this training includes details on utilizing animal housing room space, micro-isolator technique, appropriate cage labeling, and methods to communicate with animal care staff and veterinarians. This course is required for all members of the research team.

viii. **Multiple optional and specialized trainings are also available through the institution's training core.**

IV. INSTITUTIONAL STATUS

A. All of the U-M's programs and facilities (including satellite facilities) for activities involving animals have been evaluated by the IACUC within the past six months and will be reevaluated by the IACUC at least once every six months according to PHS Policy IV.B.1.-2. Reports have been and will continue to be prepared according to PHS Policy IV.B.3. All IACUC semiannual reports will include a description of the nature and extent of this Institution's adherence to the PHS Policy and the Guide. Any departures from the Guide will be identified specifically and reasons for each departure will be stated. Reports will distinguish significant deficiencies from minor deficiencies. Where program or facility deficiencies are noted, reports will contain a reasonable and specific plan and schedule for correcting each deficiency. Semiannual reports of the

IACUC's evaluations will be submitted to the IO. Semiannual reports of IACUC evaluations will be maintained by U-M and made available to the OLAW upon request.

B. The U-M is Category 1 — accredited by AAALAC International. As noted above, reports of the IACUC's semiannual evaluations (program reviews and facility inspections) will be made available upon request.

V. RECORD KEEPING REQUIREMENTS

A. This institution will maintain for at least three years:

1. A copy of this Assurance and any modifications thereto, as approved by PHS.

2. Minutes of IACUC meetings, including records of attendance, activities of the committee, and committee deliberations.

3. Records of applications, proposals, and proposed significant changes in the care and use of animals and whether IACUC approval was given or withheld.

4. Records of semiannual IACUC reports and recommendations (including minority views) as forwarded to Rebecca Cunningham, Vice President for Research and IO.

5. Records of accrediting body determinations.

B. This institution will maintain records that relate directly to applications, proposals, and proposed changes in ongoing activities reviewed and approved by the IACUC for the duration of the activity and for an additional three years after completion of the activity.

C. All records shall be accessible for inspection and copying by authorized OLAW or other PHS representatives at reasonable times and in a reasonable manner.

VI. REPORTING REQUIREMENTS

A. The Institutional reporting period is the federal fiscal year (October 1 – September 30). The IACUC, through the Institutional Official, will submit an annual report to OLAW after September 30, but on or before December 1 of each year. The annual report will include:

1. Any change in the status of the institution (e.g., if the institution becomes accredited by AAALAC or AAALAC accreditation is revoked)

2. Any change in the description of the institution's program for animal care and use as described in this Assurance

3. Any change in the IACUC membership.

4. Notification of the dates that the IACUC conducted its semiannual evaluations of the institution's program and facilities (including satellite facilities) and submitted the evaluations to the IO, Dr. Rebecca Cunningham, Vice President for Research.

5. Any minority views filed by members of the IACUC

If there are no changes to report, this institution will provide OLAW with written notification that there are no changes.

B. The IACUC, through the Institutional Official, will promptly provide OLAW with a full explanation of the circumstances and actions taken with respect to:

1. Any serious or continuing noncompliance with the PHS Policy.

2. Any serious deviations from the provisions of the Guide.

3. Any suspension of an activity by the IACUC.

C. Reports filed under VI.A. and VI.B. above shall include any minority views filed by members of the IACUC.

I. Institutional Endorsement and PHS Approval

A. Authorized Institutional Official	
Name: Rebecca Cunningham, MD	
Title: Vice President for Research, U-M Office of Research	
Name of Institution: The University of Michigan	
Address: *(street, city, state, country, postal code)* (b) (4) Fleming Building 503 Thompson Street Ann Arbor, MI 48109	
Phone: (b) (6)	Fax: (b) (6)
E-mail: (b) (6) @med.umich.edu	
Acting officially in an authorized capacity on behalf of this Institution and with an understanding of the Institution's responsibilities under this Assurance, I assure the humane care and use of animals as specified above.	
Signature: (b) (6)	Date: July 21, 2021

B. PHS Approving Official *(to be completed by OLAW)*

Jacquelyn Tubbs, DVM, DACLAM
Animal Welfare Program Specialist
Office of Laboratory Animal Welfare (OLAW)
National Institutes of Health
6700B Rockledge Drive
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Phone: +1 (301) 496-7163

Jacquelyn T. Tubbs -S

Digitally signed by Jacquelyn T. Tubbs -S
Date: 2021.07.27 08:04:52 -04'00'

Signature:	Date:
Assurance Number: D16-00072 (A3114-01)	
Effective Date: 07-27-2021	Expiration Date: 07-31-2025

II. Membership of the IACUC

Date: April 15, 2021	
Name of Institution: University of Michigan	
Assurance Number: A-3114-01	
IACUC Chairperson	
Name*: Dr. Daniel Myers	
Title*: Professor of Research, Vascular Surgery / ULAM, Director, Conrad Jobst Vascular Research Laboratories	Degree/Credentials*: DVM, MPH, DACLAM
Address*: *(street, city, state, zip code)* 2800 Plymouth Road, (b) (4) Ann Arbor, MI 48109-2800	
E-mail*: ddmyers@med.umich.edu	
Phone*: (b) (6)	Fax*: (b) (6)

IACUC Roster (Appendix A)

PHS Member #		Degrees Certificates	Title	PHS/USDA Committee Role	Department/ Unit	PHS Member Code
(b) (6)						Non-Affiliated
						Non-Scientist
						Scientist
						Veterinarian
						Scientist
						Scientific Member
						Scientist
						Non-Affiliated and Non-Scientist

(b) (6)						Non-Affiliated
						Veterinarian
148		DVM, PhD, DACLAM	Executive Director, Professor, Assistant Vice President	Attending Veterinarian	ULAM	Attending Veterinarian
(b) (6)						Scientist
						Scientist
						Scientist
						Scientist
						Scientist
114		DVM, MPH	Associate Professor	Scientist, Chair	Vascular Surgery	IACUC Chair
(b) (6)						Scientist
						Scientific Member
						Scientist
						Non-Affiliated
						Scientist
						Scientist
						Scientist
						Non-Voting Consultant

(b) (6)	Scientist
	Scientist
	Scientist
	Scientist
	Scientist

Non-Voting Members

(b) (6)	Alternate Member
	Alternate Member
	Alternate Veterinarian
	Alternate Scientist
	Alternate Veterinarian
	Alternate Veterinarian
	Alternate Member
	Alternate Veterinarian
	Alternate Veterinarian
	Alternate Veterinarian
	Alternate Veterinarian
	Alternate Veterinarian
	Alternate Veterinarian
	Alternate Veterinarian

(b) (6)	Alternate Veterinarian

III. Facility and Species Inventory (Appendix B)

Date: April 16, 2021
Name of Institution: The University of Michigan
Assurance Number: D16-00072

Laboratory, Unit, or Building*	Building Code	Gross Square Feet [*Housing*]	Gross Square Feet [*Support*]	Species Housed	Approximate Average Daily Inventory
(b) (4)		534	1,715	Rats Mice Rabbits	5 100 <1
		1,909	1,252	Zebrafish Amphibians	4300 400
		233	266	Rats Mice	5 40
		18,574	14,600	Rats Mice Rabbits Zebrafish	25 14,000 <1 16,365 +parent
		3,380	3,285	Rats Mice Rabbits	25 4000 <1
		1,629	791	Mice Guinea pigs	1600 10
		2,419	2,665	Mice	3250
		286	591	Mice Rats Zebrafish	10 10 380
		356	379	Mice	25
		490	366	Fish	<1
		4,284	2,335	Rats	600

(b) (4)

		Mice	500
500	500	Wild rodents	<1
1,847	152	Rats Mice Zebrafish Rabbits Frogs	10 10 16,160 20 <1
10,124	9,382	Mice Rats Rabbit Guinea Pigs Frogs	7000 40 10 5 <1
5,186	414+833	Mice Rats Macaques Rabbits	2200 100 2 40
5,362	3,541	Guinea Pigs Rats Mice Rabbits	5 200 4000 <1
4,080	3,041	Mice Rats Pigs Sheep	3000 10 1 1
2,045	3,584	Sheep Pigs	1 1
2,669	7,277	Mice Rats Zebrafish	2000 50 4,300
1,665	672	Rats	350
530	500	Rats Mice	<1 <1
314	327	Mice	10

(b) (4)				
	1,352	178	Mice	25
	15,251	7,295	Mice Rats Rabbits Pigs Baboons Macaques Guinea Pigs Dogs	6000 125 250 <1 5 5 100 <1
	7,170	9,374	Mice Rats Cats Pigs Rabbits	2000 200 <1 <1 75
	1,334	752	Mice	150
	817	714	Mice Rats	400 10
	2000 32 acres	acreage	Sheep	10
	3,417	1,068	Mice Goldfish Frogs	<1 <1 <1
	3,483	acreage	Fish Wild Rodents Birds	<1 <1 <1

*Institutions may identify animal areas (buildings/rooms) by a number or symbol in this submission to OLAW. However, the name and location must be provided to OLAW upon request.