HARVARD UNIVERSITY
FACULTY OF ARTS AND SCIENCES
STANDING COMMITTEE ON THE USE OF
ANIMALS IN RESEARCH AND TEACHING

Animal Welfare Assurance Renewal for Domestic Institution D16-00358/A3593-01

I, LESLIE A. KIRWAN, as named Institutional Official for animal care and use at HARVARD UNIVERSITY FACULTY OF ARTS & SCIENCES [referred to as Institution within this document], provide assurance that this Institution will comply with the Public Health Service (PHS) Policy on Humane Care and Use of Laboratory Animals (Policy).

I. Applicability of 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, DHHS, and/or NSF (if applicable). 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:
- all departments, divisions, and centers of the Harvard University Faculty of Arts & Sciences that house and use vertebrate animals in activities supported by the PHS; and
- all departments, divisions, and centers of the Harvard School of Engineering and Applied Sciences that house and use vertebrate animals in activities supported by the PHS.

B. The following are other 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 (AWA) 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 make a reasonable effort to ensure that all individuals involved in the care and use of laboratory animals understand their individual and collective responsibilities for compliance with this Assurance and 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 according to 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 (subaward) or subcontract agreements have an Animal Welfare Assurance and that the activities have Institutional Animal Care and Use Committee (IACUC) approval.

III. Institutional Program for Animal Care and Use

A. The lines of authority and responsibility for administering the program and ensuring compliance with the PHS Policy are as follows:

The Attending Veterinarian (AV), Steven M. Niemi, is responsible for assuring that adequate veterinary care is provided to all vertebrate animals maintained within Institutional research and teaching facilities. The AV also directs central laboratory animal care service (Office of Animal Resources) and has full authority for all veterinary aspects of the care and use of animals in research and teaching at the Institution. The AV reports to the Dean for Administration and Finance of the Faculty of Arts & Sciences of Harvard University, Leslie A. Kirwan, MPP, who is the Institutional Official (IO).

The IACUC reports to the IO via the IACUC Chair. IACUC Administration reports to the IO via two routes: to the IO via the IACUC Chair regarding its assigned duties and responsibilities, and to the IO via (b) (6) , regarding unit staffing and resource levels.

Please refer to Appendix A for organization charts depicting lines of authority for the IACUC, IACUC Administration, the AV, and the Office of Animal Resources.

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

1) Name: Steven M. Niemi

Qualifications

- Degrees: DVM, DACLAM
- Training or experience in laboratory animal medicine or in the use of the species at the institution: Prior to his current position, Dr. Niemi was at Massachusetts General Hospital in Boston, where for over 9 years he was Attending Veterinarian and Director of the Center for Comparative Medicine, the central animal care service that supported a daily census of 100,000 mice, 35,000 zebrafish, hundreds of rats and inbred miniature swine, and fewer numbers of primates, sheep, frogs, rabbits and occasional other species. Prior to that, Dr. Niemi held senior management positions in industry, including contract preclinical drug and device development and biotech start-ups in human gene therapy and food animal genomics. He received a DVM from Washington State University, followed by a U.S. Public Health Service National Research Service Award while a Postdoctoral Fellow in comparative medicine at the Massachusetts Institute of Technology. Dr. Niemi is licensed to practice in Massachusetts, USDA-accredited (Category II), and a Diplomate of the American College of Laboratory Animal Medicine.

Authority: Dr. Niemi has direct program authority and responsibility for the Institution's animal care and use program including access to all animals.

Time contributed to program: Full time employee – 100%

(b) (6)

(b) (6)

[redacted]

C. 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 5 members and its membership meets the composition requirements of PHS Policy IV.A.3.b. Attached, as Part VIII, Membership of the IACUC, is a list of the chairperson and members of the IACUC and their names, degrees, profession, titles or specialties, and institutional affiliations.

D. The IACUC will:

1) Review at least once every 6 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 semi-annual program reviews are as follows:

The IACUC membership is invited to perform a preliminary in-depth review of the Institution's program for humane care and use of animals using as a basis the *Guide* and the 'OLAW Semi-Annual Program and Facility Review Checklist of Institutional Policies and Responsibilities'. This pre-review meeting occurs twice a year as a precursor to a convened quorum of the IACUC at which the semi-annual program review (SAPR) is conducted. The findings and recommendations from the pre-review are presented to the convened quorum of the IACUC at the SAPR meeting for review. The SAPR meetings occur at six-month intervals, and the results are reported to the IO in writing in the Semi-Annual Report (Report) to the IO.

The SAPR addresses the following areas:

- Institutional Policies and Responsibilities
  - Animal Care and Use Program
  - Disaster Planning and Emergency Preparedness
  - IACUC – Composition and Responsibilities
  - IACUC Protocol Review – Special Considerations
  - IACUC Membership and Functions
  - IACUC Training
  - IACUC Records and Reporting Requirements
  - Veterinary Care
  - Personnel Qualifications and Training
  - Occupational Health and Safety of Personnel
  - Personnel Security
  - Investigating and Reporting Animal Welfare Concerns
- Veterinary Care
  - Clinical Care and Management
  - Animal Procurement and Transportation
  - Preventative Medicine
  - Surgery
  - Pain, Distress, Anesthesia, and Analgesia
  - Euthanasia
  - Drug Storage and Control

IACUC policies, guidelines, and standard operating procedures (SOPs) are reviewed on a rotating schedule at least once every three years and more frequently as needed by a convened quorum of the IACUC. The reviews are performed using the *Guide*, the AWA, and current pertinent literature as a basis for any changes proposed to the IACUC. The status of all policies, guidelines, and SOPs is reported to the IO twice a year as part of the Report to the IO.

2) Inspect at least once every 6 months all the Institution's animal facilities, including satellite facilities and animal surgical sites, using the *Guide* as a basis for evaluation. The IACUC procedures for conducting semi-annual facility inspections are as follows:

Facility and use-area inspections are conducted on a rotating schedule once every six months and as needed. The facility inspection assignments are arranged by IACUC Administration and are based on IACUC member availability. All animal facilities, including PI-managed satellite facilities[1] and areas outside of the animal facilities where surgeries are performed, are inspected by members of the IACUC. Areas housing/using USDA-covered species are inspected by at least two voting IACUC members. The full inspection schedule is disseminated to the IACUC members before the inspections commence so that all members can have the opportunity to participate in all inspections.

The IACUC members utilize the *Guide* (and the AWA where applicable for USDA-covered species) as a basis to inspect all animal care and use facilities. The areas of inspection are divided into five (5) categories: animal health, animal husbandry, physical plant, housekeeping, and human health and safety. The IACUC members inspect each room separately and report on the five categories for each room with a grade of A, M, S, or X (A indicating acceptable (no deficiencies); M indicating minor deficiency(ies); S indicating significant deficiency(ies); and X indicating 'not applicable' (i.e., a room in which no animals were present would have an X indicated for the inspection category of Animal Husbandry)). An SFI (suggestion for improvement) category is used for areas that are not deficient but could be improved. Noted deficiencies are described within the inspection report, are accompanied by a plan for correction, and are assigned a 'correct by date'. Reports of the noted deficiencies are sent to the facility managers, or in the case of PI-managed satellites, the responsible PI and his/her designee, for correction. It is the responsibility of the inspecting IACUC members to: (a) determine if the infraction is minor or significant, (b) assign a 'correct by date', (c) provide a reasonable plan for correction, and (d) return to that facility or obtain a report from the facility that the correction has been made.

All findings including corrections are reported to the entire IACUC at an upcoming IACUC meeting and to the IO in the Report to the IO.

3) Prepare reports of the IACUC evaluations according to 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:

At six-month intervals, summary reports of the IACUC evaluations (SAPR, inspection reports, and policy/guideline reviews as described above in sections III.D.1) and 2)) are compiled by IACUC Administration and included in the Report to the IO that is reviewed and signed by a convened quorum of the IACUC.

Also included in the Report to the IO are IACUC-approved departures from the PHS Policy and the *Guide*. The section of the Report entitled 'Departures from the *Guide*, PHS Policy, or Institutional Policy' lists all current IACUC-approved departures. Tracked departure information includes the protocol number, a description of the departure, the scientific or animal health justification, and a notation of the policy or regulation from which it is departing. Each of these departures has been reviewed and approved by the IACUC prior to implementation.

[1] Satellites are defined as an area where vertebrate animals are housed permanently or sporadically for more than 12 hours at a time if housing a USDA-covered species, or more than 24 hours at a time if housing a non-USDA-covered species.

Instances of deficiencies, if any, that were discovered during semi-annual program reviews and facilities inspections are contained in separate areas of the Report to the IO as appendices respectively entitled 'Animal Facilities Inspections' and 'Program Review'.

The compiled Report to the IO is submitted to the IACUC at the next regularly scheduled six-month convened meeting where a convened quorum reviews it, makes recommendations and signs the Report to the IO, which is then forwarded to the IO.

Minority views of the semi-annual reports, if any, are forwarded to the IO at the time the Report to the IO is submitted. Minority views filed by IACUC members are forwarded to OLAW along with the annual report to OLAW. If the minority views relate to an IACUC action that is required to be reported promptly, they are provided to OLAW at that time.

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

The IACUC reviews concerns involving the program of care and use of animals at the Institution on an ongoing basis during regularly scheduled meetings and *ad hoc* meetings of a convened quorum of the IACUC that are called as necessary.

In accordance with the IACUC's Policy on Reporting Animal Welfare Concerns (IACUC Policy), all faculty, staff, postdoctoral fellows, graduate students, and undergraduate students are encouraged to report any concerns or instances of mistreatment of animals or non-compliance with guidelines. This IACUC Policy is:

- posted in all animal housing facilities and satellites;
- printed yearly in the student and faculty handbooks which are available on line;
- posted on the IACUC website; and
- featured in the Harvard Training Portal (HTP) online module entitled "Working with the IACUC" which is assigned to all personnel working with live vertebrate animals in research and teaching; completion of the module is required at least once every three years starting when a person is initially added to an animal-use protocol.

As posted in the IACUC Policy, suspected instances of animal abuse or non-compliance with federal regulations may be reported to the IACUC Chair, the IO, the Attending Veterinarian, the Senior Director of Research Compliance, the IACUC, or the University's Compliance Hotline. The Institution will protect from retaliation members of the Harvard community who make good faith reports of suspected violations of law or University policy. The University's Compliance Hotline is a resource for members of the Harvard community who are uncomfortable reporting through the recommended contacts and prefer to anonymously report any suspected violations of law or Harvard policy.

All reports, regardless of source, are investigated in accordance with the IACUC's Standard Operating Procedure for Evaluating and Reporting Non-Compliance. After initial investigation, if the reports are found to be accurate, the IACUC is convened and corrective actions and disciplinary measures, as necessary, will follow. If not present at the meeting, the IO is informed in writing of the findings when the noncompliance is verified and there are subsequent recommendations of the IACUC. If a majority of the convened quorum of the IACUC votes to suspend or close a protocol, the IO, in consultation with the IACUC, reviews the reasons for suspension and the recommended corrective action, and reports that action with a full explanation to the applicable agencies, including OLAW and the USDA, through coordination by IACUC Administration.

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:

The IACUC makes written recommendations regarding any aspect of the Institution's animal care and use program, facilities, or personnel training to the IO as necessary. These recommendations may be included within a Report to the IO or in the form of a letter or e-mail

from the IACUC Chair or the AV. Frequent communication in the form of e-mails, phone calls and meetings also take place when attempting to secure and implement improvements suggested by the IACUC. The results of any correspondence among the IACUC Chair and/or the AV and the IO is reported back to the IACUC at the next meeting and recorded in the minutes.

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:

This Institution utilizes an electronic protocol creation, submission, review, maintenance, and reporting system: eProtocol by Key Solutions, Inc. (KSI). Protocols are created in the eProtocol system by the researchers and submitted directly to the IACUC via the system for the IACUC members to review and approve, require modifications in (to secure approval), or withhold approval. Additional protocol materials (e.g., flow charts, animal numbers justification charts, etc.) may be uploaded into the eProtocol system within the protocol itself and are appended to the protocol for viewing by IACUC members.

All new, significantly amended (as outlined below in section III.D.7), and 3rd year renewal protocols are subject to the following steps:
1) Administrative pre-review;
2) Veterinary pre-review;
3) Review type (designated member review or full committee review) determination by all IACUC members; and
4) IACUC review via designated member review or full committee review depending on the determination

Pre-Reviews

- Administrative Pre-Review
  IACUC Administration will screen the protocol and any appendices for completion of appropriate areas and sufficient detail for the IACUC to make a determination.

  As part of the administrative pre-review, IACUC Administration will notify, via the eProtocol system as necessary, Environmental Health and Safety (EH&S) including Radiation Safety Services (RSS), and Biosafety Officers (in concert with the Committee on Microbiological Safety (COMS)) for screening of any new microbiological agents or materials, chemical agents or substances, or radioactive substances for which safe handling operating procedures have not been previously established. Recommendations regarding biosafety levels, safe handling of agents and isotopes, and disposal of exposed carcasses and caging materials are returned to IACUC Administration and are entered in the "special handling" area within the eProtocol for the specific agents/materials/substances.

- Veterinary Pre-Review
  Following the administrative pre-review, the protocol and any appendices are assigned and routed via the eProtocol system to one of the veterinarians for veterinary pre-review and Office of Animal Resources housing considerations.

The eProtocol system allows each of these pre-review groups to flag areas of concern and pose questions to the investigator. Investigators respond to the questions within the system, edit the protocol as needed, and re-submit via the eProtocol system to the IACUC. Once the pre-review parties are satisfied with the investigator responses, the protocol is moved to the next step. System-generated e-mail notifications alert all parties to required actions The Veterinary Pre-Review also serves as the separate veterinarian review, per the AWA).

Review Determination
Following completion of the administrative and veterinary pre-reviews, all IACUC members are notified via the eProtocol system that the protocol and any appendices are available for review determination. All IACUC members can view the protocol and any appendices within the

eProtocol system and indicate if they choose Full Committee Review or they defer review to the member(s) as designated by the IACUC Chair.

IACUC Review – Designated Member Review (DMR) Process
If the IACUC members choose to review a protocol via DMR, the protocol is assigned to the designated reviewer(s) (DR) who has been assigned by the IACUC Chair, and the DR is/are prompted by the eProtocol system for review. The DR(s) may approve, require modifications, or request full committee review of the protocol. If modifications are required, they can be entered by the reviewer in the eProtocol system for viewing and response by the protocol Principal Investigator (PI). If there is more than one Designated Reviewer selected, they must all be unanimous in their decision, and they must all review and agree to the same protocol modifications. Our eProtocol system presents identical versions of the protocol and any modifications to all reviewers.

IACUC Review – Full Committee Review (FCR) Process
During the review determination process, if any IACUC member selects FCR of a protocol within the eProtocol system, the protocol and its appendices are placed on the meeting agenda for the next meeting during which a convened quorum of the IACUC will participate. Meeting materials packets are disseminated electronically to all IACUC members in advance of the meeting regardless of whether they are available to participate in the meeting. The IACUC is scheduled to meet every month. FCR may be conducted in a meeting room or via teleconference; in either scenario there must be a convened quorum to proceed, and a quorum must be maintained throughout the meeting for approved motions to be valid. When in face-to-face meetings, the IACUC Chair calls for a show of hands for approval of motions; when via teleconference, the IACUC Chair calls for verbal approval or abstention on proposed motions. A majority of the convened quorum may approve, require modifications, or withhold approval of the protocol. If modifications are required, they can be entered by the reviewer in the eProtocol system for response by the protocol PI. Minority views to a motion, if any, are recorded in the minutes.

IACUC Review – Designated Member Review Subsequent to Full Committee Review (DMR subsequent to FCR)
The IACUC allows DMR subsequent to FCR.

All IACUC members have agreed in advance in writing that members present at a convened quorum meeting may decide by unanimous vote to use DMR subsequent to FCR when modification is needed to secure approval. The IACUC Chair assigns one or more appropriately qualified IACUC members at the meeting to serve as the designated reviewer(s). However, any IACUC member may, at any time, request to see the revised protocol and/or request FCR of the protocol. As new IACUC members are on-boarded, they are informed of the DMR subsequent to FCR practice and must agree in writing for the practice to continue.

Conflict of Interest
IACUC members may not participate in the review or approval of a protocol in which they have a conflict of interest (e.g., is personally involved in the project), except to provide information at the request of the IACUC and may not contribute to the quorum for the vote on that project. An IACUC member having a conflict of interest recuses him/herself during deliberations but may be present if requested by the IACUC members to answer questions.

Alternate Processes

- Expedited Review
  This Institution does not have "expedited" review. For circumstances in which there is a limited time for review (e.g., an amendment is needed to bring the protocol into congruence with a research proposal), the protocol undergoes all the steps as noted above, and each party involved makes every effort to work through those steps as quickly as possible.

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 according to

PHS Policy IV.C. The IACUC procedures for reviewing proposed significant changes in ongoing research projects are as follows:

Significant changes include the following:

- An increase in animal numbers >20% from the most recently approved maximum, regardless of species
- Addition of species
- Change in procedures or activities
- Change in PI

Proposed significant changes to ongoing research projects are subject to the following steps as detailed above in Section III.D.6.:

1) Administrative pre-review;
2) Veterinary pre-review;
3) Review type (designated member review or full committee review) determination by all IACUC members; and
4) IACUC review via designated member review or full committee review depending on the determination

Alternate Processes Used to Review Changes to Ongoing Research Projects

The IACUC also utilizes the Veterinary Verification and Confirmation (VVC) Process. The following protocol modifications have been determined by the IACUC as having a potential animal welfare impact, where the expected outcome is NOT deleterious to the animal. If protocol amendments are identified as meeting the below listed criteria, they are forwarded to one of the veterinarians for VVC via the eProtocol system. Once the veterinarian verifies and confirms the amendment, it becomes part of the approved protocol. Examples of protocol amendment that may qualify for the VVC process include:

a. A change in anesthetic, analgesic, or sedation drug regimens which will have an equal or more beneficial effect on pain or distress as the original regimens and fall within IACUC-approved guidance.
b. A change from pharmaceutical grade to non-pharmaceutical grade compounds if the justification for the change meets the criteria established the IACUC's "Policy on the Use of Non-Pharmaceutical Grade Chemicals and Other Substances."
c. A change in humane endpoints which decrease the potential for pain or distress as outlined in the IACUC-approved guidance on "Body Condition Scoring and Humane Endpoints."
d. A change in animal care and/or monitoring practices which increase the frequency or methodology of non-invasive monitoring.
e. Additional method of blood sample collection in mice or rats as described in the IACUC-approved guidance "Blood Drawing in Mice and Rats ". This is acceptable only if blood sampling already exists in the IACUC-approved protocol and the additional method does not have the potential to affect the health or well-being of the animal(s).
f. Repetition of an already approved experiment (exclusive of repeating a surgery or any other invasive procedure and where no additional animals are required) to re-affirm or replace questionable data where the repetition of the experiment does not have any potential to affect the health or well-being of the animal(s).
g. Addition of noninvasive sampling/analysis (e.g., observation, collecting excreta, acoustic and motion detection devices).
h. A change or addition of euthanasia procedures that is/are recommended by the American Veterinary Medical Association (AVMA) in their AVMA Guidelines for the Euthanasia of Animals and/or the IACUC-approved guidance on "Euthanasia Methods" that does not have the potential to negatively impact the animal(s).
i. A request for delayed weaning (generally rodents) as described in the IACUC-approved "Mouse Cage Density and Weaning Policy"
j. Addition of a non-hazardous experimental substance, as categorized by EH&S. This applies only where these substances are administered via a method already approved in the protocol and whose application does not have any potential to affect the health or well-being of the animal.

k. Alterations to existing IACUC-approved behavioral testing environments that do not have any potential to affect the health or well-being of the animal and that do not alter the original goal or purpose of the environment.

We also utilize an Administrative Approval Process for modifications to ongoing research activities. However, protocol modifications qualifying for Administrative Approval have been determined by the IACUC as having NO direct animal welfare or well-being impact and would NOT be considered significant changes. If protocol amendments are identified as meeting and containing only the below listed criteria, they may be approved by IACUC Administration:

i. A transfer of animals to another protocol where animals (same stock / strain) are already approved on that other study.
ii. Deletion of personnel from an active protocol exclusive of the PI.
iii. Addition of personnel to an active protocol in accordance with IACUC-approved steps for verifying "Personnel Requirements"
iv. Adding or changing the location of animal procedures (less than 12 hours for USDA-covered species, less than 24 hours for non-USDA-covered species)
v. An increase in non-USDA species numbers < 20% from the most recently-approved maximum animal numbers of species allowable once/year, excluding any increases in Category E numbers.
vi. Addition of another strain/stock of the same animal species ONLY if the following criteria are met:
    a. The new genetically modified model does not have a clinical phenotype requiring palliative measures or if so, the phenotype and palliative measures are already covered in the approved protocol.
    b. No increase in animal numbers or an increase of less than 20% exclusive of USDA-covered species.
    c. The use of genetically modified models is already covered in the approved protocol, if applicable.
    d. No new procedures are needed.
    e. Breeding, if any, of the new genetically modified models, will be limited to that which is approved within this protocol and approved by COMS.
    f. Only use approved vendors/sources.
vii. Correction of typographical errors.
viii. Correction of grammar.
ix. Contact information updates.
x. Addition of supporting protocol information (e.g., updated flowchart).

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 according to PHS Policy IV.C.4. The IACUC procedures to notify investigators and the Institution of its decisions regarding protocol review are as follows:

Results of all decisions made by the IACUC are relayed in writing via eProtocol system-generated e-mails to the PI and all personnel on the protocol who have editor authority. The system is capable of generating action-specific e-mails including decision to approve, withhold approval, or direction to the online location of queries or conditions/modifications necessary to secure approval.

If protocol approval is withheld, the investigator receives written notification in the form of comments via our eProtocol system. The comments specifically state the reason(s) for the protocol approval being withheld and make recommendations regarding the areas that need to be re-addressed. PIs are always given the opportunity to respond in writing to IACUC queries via the eProtocol system. For protocols that are sent to FCR, the PI or his/her representative is invited to respond to the IACUC in person. In addition, any PI may request time to appear before the IACUC to discuss Committee questions or decisions regarding his/her protocol(s).

The IO is notified semi-annually via the Report to the IO of all decisions made by the IACUC during the previous six-month period. Approved protocols are available to Office of Animal Resources (OAR) personnel (animal care staff, veterinary staff, animal procurement staff) through the eProtocol system. Standard operating procedures are in place to notify OAR personnel of protocols that are closed through normal channels (e.g., project is complete, PI leaves Institution, etc.) and protocol suspensions.

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 at least once every 3 years according to PHS Policy IV.C.1.-5. The IACUC procedures for conducting continuing reviews are as follows:

Post-approval Monitoring (PAM)
PAM is achieved at this Institution through:

- a system of animal monitoring (daily observation of animals by animal care personnel, daily health checks for post-operative animals, veterinary rounds, and IACUC inspections);
- cross-referencing specified proposed animal procedures noted on new personnel addition forms against those listed on the protocol to which they are being added;
- vetting of vertebrate animal use procedures described in sponsored research proposals to assure congruence with IACUC-approved protocols/procedures; and
- regularly scheduled meetings between OAR veterinary services, OAR animal care management, and IACUC Administration to review animal welfare concerns.

Annual Protocol Reviews
Annual review is required for protocol(s) that utilize USDA-covered species or are funded by U.S. Department of Defense funds. When required, an annual review form is generated by the eProtocol system and instructs the investigator to confirm the active status of the protocol, report any adverse events for the past year, and verify the current personnel listed on the protocol. Significant amendments may not be submitted on an annual review form. If a completed annual review form is not received by the annual review due date, the protocol may be processed for expiration. Once an annual review form is received, the form undergoes an administrative pre-review for completeness. If complete, the annual review form is sent to the IACUC members for review determination. Most annual reviews will go through DMR. The designated member may approve, require modifications, or request full committee review of the annual review form. If FCR is requested, the FCR process as detailed in Section III.D.6. "IACUC Review – FCR Process" of the assurance is followed. Once an annual review has been approved, either by DMR or FCR, the PI and additional contact(s) will receive an automated e-mail notification from the eProtocol system that approval for the annual review has been granted.

3rd Year Renewal Reviews
All protocols regardless of funding source, species, or changes undergo a complete *de novo* review every three years. 3rd year renewals are reviewed in the same manner that new protocols would be reviewed. Investigators are not required to rewrite their protocols but the IACUC reviews the entire protocol as if it were new. Following the procedures outlined in Section III.D.6. above, 3rd year renewals would go through either FCR or DMR as determined by the IACUC members during the review type determination. IACUC review and approval of 3rd year renewals must be completed on or before the expiration date. Protocols that fail to meet the approval deadline are deemed expired and any animals involved are transferred to a holding protocol under the AV as PI. Under this holding protocol, those animals are not available for research or teaching, including breeding, and only are subject to veterinary treatment necessary for their health and well-being. Only if the expired protocol is renewed, may those animals be restored to that protocol or transferred to other IACUC-approved protocols if appropriate and following IACUC approval.

10) Be authorized to suspend an activity involving animals according to PHS Policy IV.C.6. The IACUC procedures for suspending an ongoing activity are as follows:

The IACUC has established and carried out policy with regards to the care and use of animals since it was established in December 1978. According to its charter, the IACUC has the responsibility and authority to prevent/stop any experimental work or laboratory exercise on animals it considers improper or unnecessary.

Protocol suspension may not occur until the IACUC has met and a majority of the convened quorum has voted to suspend the protocol. Protocol suspension is first confirmed with the IO and then notification is made to the PI via either the IACUC Chair or IACUC Administration. Animals involved in suspended experiments are remanded to the custody of the Office of Animal Resources under their IACUC-approved holding protocol (see above) until the PI complies with the IACUC requirements for reinstatement. A summary of the circumstances surrounding the suspension, the planned corrective action(s), and finally the results of those actions are reported, if applicable, to OLAW and the USDA through the IO.

E. The risk-based occupational health and safety program for personnel working in laboratory animal facilities and personnel who have frequent contact with animals is as follows:

The institutional occupational health and safety program for personnel working with animals involves the cooperative efforts of several department/units within and outside of the Institution as follows:

- Environmental Health & Safety (EH&S), includes Radiation Safety Services (RSS) reviews the use of hazardous agents in animals, makes recommendations regarding personal protective equipment and cage labeling, and works with the Office of Animal Resources when developing written standard operating procedures for the use of hazardous agents in animals.
- Committee on Microbiological Safety (COMS) reviews the use of all research involving recombinant DNA as well as work involving biohazards and makes animal biosafety level recommendations.
- Office of Animal Resources (OAR)
- IACUC and IACUC Administration
- University Health Services (UHS) is the on-campus unit that may provide some preventative care as recommended by EH&S and OEHN and post-exposure care as needed.
- Occupational & Environmental Health Network (OEHN) is the contracted occupational health provider who screens personnel for potential risks and, in consultation with EH&S and COMS, makes recommendations regarding personal protective equipment, vaccines, allergy testing, and relay recommendations for accommodations (i.e., respirator fit testing, use of non-latex gloves, etc.)

Control

Protocols involving the use of hazardous chemical, radioactive and biological agents are reviewed by EH&S, RSS, COMS, and OAR prior to approval by the IACUC to ensure the safety of the animal care staff and research personnel prior to exposure. Copies of approved protocols are available to the OAR staff and relevant researchers via the web-based eProtocol system.

Hazard Identification

Potential use of hazardous agents is identified at the protocol review stage and when new personnel are added to protocols. Protocols describing the use of hazardous agents are forwarded to the appropriate entity (i.e., EH&S, COMS, and/or the RSS) via the eProtocol system for review and comment. The specifics (species, agents, physical circumstances, and location in the case of field studies) are assessed to assure that the program currently covers training, standard operation procedures, and guidelines to accommodate the proposal and the safety of the personnel involved. New training modules and operating procedures are developed as needed.

- Hazardous Chemicals
  EH&S and OEHN developed a standard operating procedures (SOP) for the use of toxic agents in animals. The SOP is embedded in the protocol and includes information regarding identification of the agent; animal transportation and disposal; use of personal protective equipment; safe handling of animals, animal waste, bedding, cages, and carcasses; and procedures for exposure and spills.

- Radioactive Materials
  The use of ionizing or non-ionizing radiation must first be reviewed by the RSS. Procedures for handling radioactive materials, animals and equipment are developed by RSS and the OAR and are affixed to the protocol when applicable.

- Biological Agents
  The use of microbiologic agents requires registration with COMS. COMS registration numbers referenced in protocols are confirmed by IACUC Administration via the COMS database and, if necessary, in consultation with the Biosafety Officer. While the IACUC protocol may be approved, the use of the microbiological agent is prohibited until a valid COMS number and approval are provided. COMS approval contains the recommended animal biosafety level (ABSL) for housing of the animals post-exposure.

Prevention Strategies
Personnel involved in experiments in which there are potential hazards should comply with preventative requirements: enroll in the occupational health program, adhere to standard operating procedures established by EH&S and/or COMS, and wear personal protective equipment as recommended. In addition, personnel must follow post-exposure guidelines established by EH&S and OEHN.

Potential use of hazardous biologic, chemical, or physical agents, including ionizing and non-ionizing radiation, are identified at two different levels and cross-referenced to assure appropriate assessment as follows:
(1) Within each eProtocol the PI is required to identify all agents and substances that will be administered to the animals and identify who will be using each of those agents and substances. Upon receipt of the protocol, IACUC Administration reviews the agents and substances and collaborates with the appropriate groups to assure that any potentially hazardous agents and substances are appropriately classified and reviewed.
(2) At the time new personnel enter the animal use program and are associated with specific protocols, the PI/protocol owner is required to identify the protocol upon which, and the agents with which, the new personnel will be working.

Where appropriate OEHN makes recommendations regarding immunizations and vaccinations. Current tetanus vaccination is recommended for all employees. During the occupational health program enrollment process, personnel who have not received a tetanus shot within the last 10 years and wish to be vaccinated are contacted by an occupational health program representative and given instructions for receiving a tetanus vaccination at a local health care provider facility. Additionally, Hepatitis B vaccinations are available in the same manner to personnel working with human blood, primary human tissues or cell lines of human origin in conjunction with research experiments involving animals. Rabies series vaccinations may be recommended for some personnel who work with rabies virus vectors. Personnel who decline these forms of vaccinations are required to speak with the occupational health physician regarding the hazards of declining the vaccination, are given literature regarding the benefits and risks of the vaccination and are required to complete and sign a declination form that is maintained by the Institution and the occupational health provider.

Risk Assessment
Pre-existing conditions may be documented in section 3 of the medical history section of the 'Health Questionnaire' form that all employees are requested to complete prior to working with animals. Pre-existing conditions such as illness, physical limitations, allergies, or immunodeficiency would warrant a discussion between the employee and the occupational health physician and may require additional accommodations to permit that employee to handle animals or tissues. The Institution would not be informed of the details of the discussion but would be alerted to any accommodations (i.e., fit test for provision of respirators) recommended by the occupational health provider.

Research personnel enrolled in the occupational health program are rescreened at least once every three years or additionally as needed. All animal care personnel are rescreened annually.

This program does not maintain non-human primates in its animal facilities. However, there are some investigators whose research programs involve out-of-country nonhuman primates as the targets of field studies. While these field studies do not involve contact with the animals (pure observation only), the participating researchers are recommended to undergo TB testing prior to leaving for the field to guard against transmission of this disease to wild populations. Investigators who use non-human primate tissues or cells for in vitro research purposes must submit a protocol to COMS for approval before that research can begin; advisories and training on Herpes B virus precautions are provided as indicated.

Personnel Training and Personal Protection

All personnel working in laboratories are required to complete General Laboratory Safety sponsored by EH&S via the Harvard Training Portal. Additional modules may be required as job duties are defined. EH&S tracks course completion and prompts for refresher courses every 1 to 3 years depending on the type of course.

Where appropriate personnel are trained in the proper use of biological safety cabinets and personal protective equipment applicable to a given study. Any required special equipment is provided by the investigator.

Studies utilizing toxic hazardous agents specifically identify the hazard with a color coded Toxic Agent cage card (a cage-based communication form indicating what the hazard is, its route of administration (special food and or water), and the phone number and e-mail address of the contact person). Use of certain BL2 agents in animals is limited to the ABL2 suite which is clearly labeled as BL2. Access to the ABL2 suite is via ID card-swipe and is only granted following appropriate training for the area.

Procedures for Treating and Reporting Exposure

Suspected exposure to a hazard must be immediately reported to the laboratory supervisor, University Operations, and/or EH&S. University Operations has a 24-hour/7-day manned Operations Center to assist with emergencies. University Operations posts guidance throughout campus and in each lab and provides an Emergency Response Guide (booklet that affixes to the wall or bulletin board) that includes contact information for the Operations Center and instructions for accident reporting and incident follow-up, biological/blood spills, chemical spills, personnel contamination, and radiation spills.

Personnel exposed to a potential hazard must immediately report the exposure to the OEHN chief physician or his on-call designee for treatment. Instructions are given from OEHN to report to either the Mt. Auburn Hospital Occupational Health Clinic (closest OEHN-affiliated health care provider) or to University Health Services (UHS) for treatment. Instructions for reaching OEHN are available within each animal protocol using hazardous materials, are posted in the animal facilities, and are available on the IACUC website.

Personal Hygiene

Face shields and heavy-duty gloves are furnished and required for all personnel handling acids, caustics and other concentrated bulk cleaning chemicals. The use of these agents is minimal since the installation of automated chemical distribution systems in the central animal facilities. Disposable gowns or coveralls, gloves and safety eye wear, including glasses and goggles, are required in biocontainment areas. The OAR subscribes to an off-site laundry service that provides scrub suits for all OAR staff working with animals and furnishes facility-dedicated, non-skid, safety foot wear to all staff.

F. The total gross number of square feet in each animal facility (including each satellite facility), the species of animals housed there and the average daily inventory of animals, by species, in each facility is provided in Part X Facility and Species Inventory table.

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

All OAR personnel directly involved in animal care are required to have AALAS certification. Additionally, newly hired animal care staff receive instruction from the OAR management staff during employee orientation regarding zoonoses, hygiene, and other health concerns before they begin to work with animals. OAR management and veterinary staff also conduct routine informational training sessions for all its staff members. Some topics covered include (but are not limited to) rodent colony health management and disease control, biosafety and zoonoses, rodent handling, and aseptic technique. Animal care personnel are encouraged to attend regional (New England Branch) AALAS continuing education opportunities and present at QUAD and National AALAS meetings.

All personnel who plan to use animals in research or teaching at the Institution are required to be listed on a protocol, and must complete the following requirements:

- submit 'PI Authorization Form to Add Personnel to a Protocol' and 'Credentials Form';
- submit health questionnaire to the occupational health provider for assessment and facilities clearance;
- complete assigned Harvard Training Portal online modules (modules are assigned by IACUC Administration and are dependent upon what species and procedures will be performed by each researcher as well as previous level of experience the researcher may have);
- attend New Researcher Orientation (NRO) for access to OAR-managed facilities or lab orientation for PI-managed satellites; and
- be trained in protocol specific research procedures either by senior lab staff, OAR technicians, veterinary staff, or a combination thereof.

New research personnel are required to submit a Credentials Form that identifies previous training and specifies who within their current lab will be training him/her in the protocol-specific procedures. Wet labs with OAR animal care and veterinary staff are arranged on an as-needed basis and may be scheduled through the Harvard Training Portal (HTP).

Several Institutional graduate and undergraduate courses involve the use of vertebrate animals in their lab sessions. Students who will be handling animals may only do so under the tutelage of the course instructors and must also enroll in and be cleared through the occupational health program. To facilitate class schedules, the live researcher education session is part of the curriculum and is provided by IACUC Administration.

Potential use of hazardous agents is identified at the protocol review stage. Protocols describing the use of hazardous agents are forwarded to the appropriate inter-institutional agency (i.e., EH&S, COMS, and/or RSS) for review and comment (see section III.D.6). In the event that research and animal care staff are required to handle hazardous agents or animals treated with these materials, they will receive special instructions and appropriate personal protective equipment as directed by EH&S. Standard operating procedures for commonly used hazardous agents are embedded in each relevant protocol. Use of radioisotopes is controlled by the radiation protection office of EH&S, which licenses and trains investigators and inspects facilities before radioactive materials may be purchased or used. For animal care staff, in general, the task of working with hazardous or infectious agents is assigned to senior experienced animal care technicians who have demonstrated reliability, responsibility, and the ability to learn and perform specialized tasks. Instruction for handling the animals and agents within the animal housing facilities for research staff is provided by the OAR and EH&S staff. Regular review of specialized work practices is performed through in-service training and informal instruction by the animal facilities supervisor and the OAR veterinary staff.

There are several areas of training and counsel that assist those involved in animal care, treatment, and use with addressing the minimization of pain and/or distress and the number of animals required for valid results:

- All new research personnel are required to attend New Researcher Orientation before they are given ID card access to centralized vivaria. Attendees are reminded to know and understand all elements in their animal protocol(s) that pertain to anesthesia, analgesia and other components of required perioperative care.
- Species-specific HTP modules address the alleviation of pain and distress.

- All personnel working with animals are required to complete the HTP module entitled, "Working with the IACUC." This module, along with other topics, provides information regarding the replacement of animal models, the reduction of animal numbers to that which is necessary to obtain statistical significance, and the refinement of experiments or procedures to reduce the potential for pain or distress. Additionally, personnel are requested to complete the refresher course every three years.
- Veterinary consultation is available to all personnel when writing or amending protocols. The offer of veterinary consultation with veterinarian contact information is embedded in the eProtocol form in the section entitled "Vet Consult."

Training for new IACUC members includes a one-on-one training session with IACUC Administration. The materials covered include, but are not limited to: the three R's, PHS Policy, the AWA, the *Guide*, the most recent AVMA guidelines regarding euthanasia, the responsibilities and reporting requirements of the IACUC, and the protocol review process. All members are provided with standard IACUC reference materials (e.g., the *Guide*, PHS Policy, the AWA, etc.) as part of the one-on-one training with the IACUC Administration. All new members are required to complete the online module 'Working with the IACUC' via the HTP. A separate tutorial provides instructions on how to use the web-based eProtocol system for review of protocols. Instruction on how to conduct facility and use area inspections is provided during live walk-throughs of the facilities and use areas. IACUC members are provided with additional educational materials at each IACUC meeting (usually consists of recently published articles). In addition to annual attendance of the PRIM&R conference by most IACUC Administration staff, the IACUC budget allows for at least two IACUC members to attend.

IACUC policies, guidelines, and standard operating procedure are posted on the IACUC website to which all IACUC members, animal care staff, and research staff have access.

IV. Institutional Program Evaluation and Accreditation

All this Institution's programs and facilities (including PI-managed satellite facilities) for activities involving animals have been evaluated by the IACUC within the past 6 months and will be reevaluated by the IACUC at least once every 6 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 semi-annual 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. Semi-annual reports of the IACUC's evaluations will be submitted to the Institutional Official. Semi-annual reports of IACUC evaluations will be maintained by this Institution and made available to the OLAW upon request.

(1) This Institution is Category 1 — accredited by the Association for Assessment and Accreditation of Laboratory Animal Care International (AAALAC). As noted above, reports of the IACUC's semi-annual evaluations (program reviews and facility inspections) will be made available upon request.

V. Recordkeeping Requirements

A. This Institution will maintain for at least 3 years:
   1. A copy of this Assurance and any modifications made to it, as approved by the 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 granted or withheld
   4. Records of semi-annual IACUC reports and recommendations (including minority views) as forwarded to the Institutional Official, Leslie A. Kirwan, Dean of Administration and Finance for the Faculty of Arts and Sciences
   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 3 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 calendar year (January 1 – December 31). The IACUC, through the Institutional Official, will submit an annual report to OLAW by January 31 of each year following the reporting period. The annual report will include
   1. Any change in the accreditation status of the Institution (e.g., AAALAC accreditation is revoked, suspended, or withdrawn)
   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 semi-annual evaluations of the Institution's program and facilities (including satellite facilities) and submitted the evaluations to the Institutional Official, Leslie A. Kirwan.
   5. Any minority views filed by members of the IACUC

   [*Note: if there are no changes to report, we will provide written notification to OLAW 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* that have not been reviewed and approved by the IACUC
   3. Any suspension of an activity by the IACUC

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

VII. Institutional Endorsement and PHS Approval

A. Authorized Institutional Official	
Name:	Leslie A. Kirwan
Title:	Dean of Administration and Finance for the Faculty of Arts and Sciences
Name of Institution:	Harvard University Faculty of Arts and Sciences
Address: *(street, city, state, country, postal code)*	University Hall, 1st Floor South – Harvard Yard Cambridge, MA 02138
Phone: (b) (6)	Fax: (b) (6)
E-mail:	leslie_kirwan@harvard.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: 1/29/19

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

Venita B. Thornton, DVM, MPH
Senior Assurance Officer
Office of Laboratory Animal Welfare (OLAW)
National Institutes of Health
6700B Rockledge Drive
Suite 2500 - MSC 6910
Bethesda, Maryland 20892
Email: thorntov@od.nih.gov
Phone: (301) 451-4208
Fax: (301) 480-3421

Venita B. Thornton -S

Digitally signed by Venita B. Thornton -S
Date: 2019.02.06 14:42:44 -05'00'

Signature:	Date: February 6, 2019
Assurance Number:	D16-00358 (A3593-01)
Effective Date: February 6, 2019	Expiration Date: January 31, 2023

VIII. Membership of the IACUC

Date:	09/12/18
Name of Institution:	Harvard University Faculty of Arts & Sciences
Assurance Number:	D16-00358/A3593-01

IACUC Chairperson

Name*:	Craig P. Hunter
Title*:	Professor of Molecular and Cellular Biology
Degree/Credentials*:	Ph.D.
Address*: *(street, city, state, zip code)*	Biological Laboratories, 16 Divinity Avenue, (b) (4) Cambridge, MA 02138
E-mail*:	cphunter@fas.harvard.edu
Phone*:	(b) (6)
Fax*:	(b) (6)

IACUC Roster

Name of Member/ Code**	Degree/ Credentials	Position Title***	PHS Policy Membership Requirements****
(b) (6)			Scientist
			Scientist
			General member
			Nonaffiliated
			Scientist
			General member
			Alternate nonaffiliated, nonscientist
			Scientist
			Scientist
			Scientist
			Scientist
Steven Niemi	DVM, DACLAM	Director, Office of Animal Resources; Attending Veterinarian	Veterinarian
(b) (6)			Veterinarian

[2] AL earned an EdD in Secondary English Education
[3] Currently on sabbatical until January 2019.

* This information is mandatory.

** Names of members, other than the chairperson and veterinarian, may be represented by a number or symbol in this submission to OLAW. Sufficient information to determine that all appointees are appropriately qualified must be provided and the identity of each member must be readily ascertainable by the institution and available to authorized OLAW or other PHS representatives upon request.

*** List specific position titles for all members, including nonaffiliated (e.g., banker, teacher, volunteer fireman; not "community member" or "retired").

**** PHS Policy Membership Requirements:

Veterinarian	veterinarian with training or experience in laboratory animal science and medicine or in the use of the species at the institution, who has direct or delegated program authority and responsibility for activities involving animals at the institution.
Scientist	practicing scientist experienced in research involving animals.
Nonscientist	member whose primary concerns are in a nonscientific area (e.g., ethicist, lawyer, member of the clergy).
Nonaffiliated	individual who is not affiliated with the institution in any way other than as a member of the IACUC and is not a member of the immediate family of a person who is affiliated with the institution. This member is expected to represent general community interests in the proper care and use of animals and should not be a laboratory animal user. A consulting veterinarian may not be considered nonaffiliated.

[*Note: all members must be appointed by the CEO (or individual with specific written delegation to appoint members) and must be voting members. Non-voting members and alternate members must be so identified.*]

IX. Other Key Contacts (optional)

If there are other individuals within the Institution who may be contacted regarding this Assurance, please provide information below.

Contact #1			
(b) (6)			

Contact #2			
Name:	Denise Moody		
Title:	Sr. Director of Research Compliance		
Phone:	(b) (6)	E-mail:	denisemoody@fas.harvard.edu

X. Facility and Species Inventory

Date:	09/12/18
Name of Institution:	Harvard University Faculty of Arts & Sciences
Assurance Number:	D16-00358/A3593-01

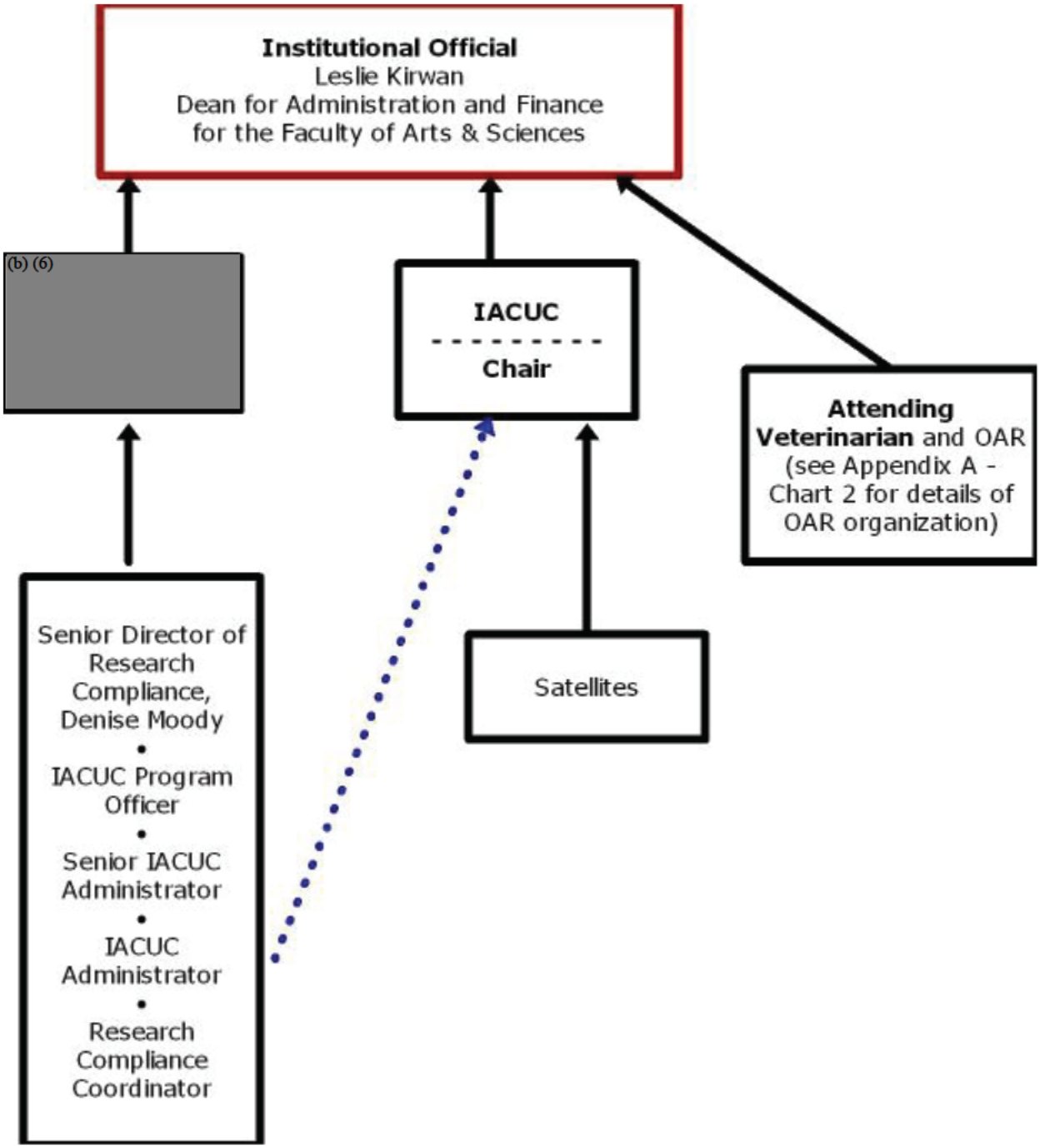
Laboratory, Unit, or Building*	**Gross Square Feet [*include service areas*]**	**Species Housed [*using common names, e.g., mouse, rat, rhesus, baboon, zebrafish, African clawed frog*]**
(b) (4)	6,953 + 8 acres	cockatiel, dove, emu, gerbil, guinea fowl, guinea pig, jerboa, love bird, mouse, pigeon, rat
	548	axolotl
	72,000	deermouse (*Peromyscus*), mouse (*Mus*), rat (*Rattus*)
	6038	African clawed frog, axolotl, mouse (*Mus*), rat (*Rattus*)
	110	zebrafish
	368	mouse (*Mus*)
	4,590	clown loach, killifish, zebrafish
	230	mouse (*Mus*)
	730	anoles
	3,328	axolotl, zebrafish
	51	American bullfrog, bearded dragon, box turtle, Mexican milk snake, White's tree frog
	600	fish
	443	axolotl, frog, salamander, toad
	80	cardinal, goldfinch
	5346	rat (*Rattus*)
	574	rat (*Rattus*)
	995	axolotl
	276	African grey parrot
Total Square Feet:	104,780 + 8 acres	

*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.

Date:	08/31/18
Name of Institution:	Harvard University / Faculty of Arts & Sciences
Assurance Number:	D16-00358/A3593-01

Species [*using common names, e.g., mouse, rat, rhesus, baboon, zebrafish, African clawed frog*]	**Approximate Average Daily Inventory**
Bird (cardinal, cockatiel, emu, goldfinch, guinea fowl, love bird, mallard, African grey parrot, pigeon)	30
Fish (bass, clown loach, darter, killifish, knifefish, perch, ray, trout, zebrafish)	91,470
Frog (African clawed frog, bullfrog, Puerto Rican tree frog, Budgett's frog, White's tree frog) and toad	544
Gerbil	5
Guinea Pig	22
Jerboa	7
Lizard (anole, bearded dragon)	797
Mouse (*Mus*)	31,369
Mouse (non-*Mus*: deermouse, white footed mouse)	2123
Rat	273
Salamander (axolotl, red-bellied)	160
Snake	1
Turtle	2

Appendix A – Organization Charts Depicting Lines of Authority (chart 1)



Appendix A – Organization Charts Depicting Lines of Authority (chart 2)