

University of California, Merced
Institutional Animal Care and Use Committee Policy

Version No. 1

Policy No. 108

Alternatives Search Guidelines

I. Purpose:

The PHS Policy and the USDA animal welfare regulations require research institutions to ensure that investigators have appropriately considered alternatives to procedures that can cause more than slight or momentary pain or distress in animals, consistent with sound research design. Federal regulations require:

1. A written narrative description of the methods and sources used to search for alternatives to procedures that may cause more than slight or momentary pain or distress (category D and E procedures).
2. A written assurance that the animal activities proposed do not unnecessarily duplicate previous experiments.

II. Definition:

Alternatives are framed within the context of the "3 R's" originally discussed by Russell and Burch in 1959 (*The Principles of Humane Experimental Technique*). These include:

- **Replacement**: Utilizing non-animal models. These may include living systems utilizing organ, tissue or cell culture techniques; non-living systems such as chemical techniques and mechanical models for training; and computer simulations. Wherever possible, use of invertebrates or vertebrate species lower on the phylogenetic scale may be considered as a replacement alternative.
- **Reduction**: Determining the number of animals used in a study by experimental design and/or statistical analysis to minimize the number of animals required to obtain meaningful data.
- **Refinement**: Reducing or eliminating pain or distress in animals by use of anesthetics and analgesics, modification of procedures or technical enhancements that increase the quality or quantity of data gathered.

III. Policy:

Alternative searches are required in the planning phase of the animal use protocol and are given equal consideration along with the overall experimental design and the appropriateness of the animal model to be used.

Additional alternative searches should be performed when a protocol is changed significantly by modification and are required when the modification involves use of a

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new or more invasive technique or procedure that would be classified as a Category D or E procedure.

The IACUC must review and assess the information provided in the protocol application to ensure that the Principal Investigator has made a good faith effort to determine the availability of alternatives and consider their applicability to the specific research project.

An animal use protocol will be returned to the Principal Investigator without approval if the application:

1. Does not include appropriate search terms for the refinement, reduction and replacement of live animal subjects.
2. Does not use at least 2 appropriate literature databases.
3. Does not provide a narrative description of the methods, sources and results of the literature search.
4. Does not include a written assurance that the use of animal subjects does not unnecessarily duplicate previous experiments.
5. Does not clearly indicate that the investigator has considered all alternatives to the use of live animals and to procedures that may produce pain, distress or discomfort.

IV. Procedures:

The USDA considers searching online scientific literature databases to be the most effective and efficient method for demonstrating compliance with the requirement to consider alternatives and avoid unintended duplication. The IACUC requires that at least two legitimate scientific databases be searched. The Principal Investigator or study designer must provide the following as part of the written protocol application:

- The date when the searches were performed (e.g., "9/25/05"). NOTE: This date may not be more than three months prior to submission of the application to the IACUC for review.
- The date range over which the search was conducted (e.g., "1950 - present").
- The phrases used to search the databases, including keywords and Boolean operators (e.g. AND, OR, NOT). Keywords used in the search must be representative of the scientific design, procedures to be used in the project, alternatives to use of live animals, appropriateness of the proposed animal model and selection of the species lowest on the phylogenetic scale that is appropriate for the study.

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- A detailed narrative description of the results and findings of the searches, including an explanation for why any alternatives found but not used are not appropriate for the study.

In some circumstances, such as highly novel or specialized fields of research, the following may be employed in lieu of a database search:

- Attendance and participation in scientific conferences and colloquia.
- Consultation with subject experts.

To provide adequate documentation in the protocol file when such methods are used in place of a database search, the Principal Investigator must provide detailed information such as the date, location and name of the conference or colloquia attended or the consultant's name and qualifications and the date and content of the consult.

The UC Merced Library staff is available to assist with searching for alternatives and the documentation of the output. Online examples can be found [at this link](#).

III. References:

1. [Institutional Animal Care and Use Committee Guidebook, 8th edition, 2011](#).
2. United States Code Title 7, Chapter 54, Section 2143(d) and (e)
3. Code of Federal Regulations 9 CFR Chapter 1, Subchapter A, Part 2, Subpart C, Section 2.31(d)(1)ii and iii.
4. National Research Council (US) Committee on Regulatory Issues in Animal Care and Use. Definition of Pain and Distress and Reporting Requirements for Laboratory Animals: Proceedings of the Workshop Held June 22, 2000. Washington (DC): National Academies Press (US); 2000. Appendix A, APHIS/USDA Policy 11 and Policy 12. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK99537/>