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# ❖ BRL BULLETIN ❖

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The purpose of this *BRL Bulletin* is to highlight some of the online resources that can supplement the information available on the BRL website. These sources have been divided into literature-based and visual learning categories in this *Bulletin*. These resources are helpful when planning a new project or procedure or in expanding one's knowledge of an existing procedure or model. Keep in mind that to initiate any change in procedure conducted on live animals, a new protocol or modification to an existing protocol must first be approved by the UIC Animal Care Committee (ACC).

## LITERATURE AND DATABASE SOURCES

Conducting a literature search is a familiar part of planning projects or researching a topic of study. The following section will cover resources and techniques to aid in these searches as they pertain to animal research.

### PubMed

The source used most often for obtaining information that is outside the expertise of a research laboratory is PubMed (<http://www.ncbi.nlm.nih.gov/pubmed/>). This is a great source to find supporting literature, but it has limitations when used to identify alternative animal models or *in vitro* alternatives. PubMed searches its database based on key words, titles, abstracts, author names, etc.; however, these criteria provide limited information on animal techniques and alternative methods. When designing a PubMed search to identify alternative methods to include in an ACC protocol, it may be useful to include the term "alternative" in the search. Otherwise, your results will only find work that is similar to what you are planning. This is worthwhile when verifying that you are not unnecessarily duplicating research, but is of little value to identify alternative animal models or *in vitro*

models. Similarly, including the term "*in vitro*" may identify cell culture or other methods that may give valuable information prior to initiating work in animals.

It is important to avoid stringing together too many search terms, such as "mouse or rat and chronic kidney disease or insufficiency and model or alternative." This strategy is not likely to return useful results (this specific search resulted in 1.7 million articles in PubMed). The simpler "animal model and chronic kidney disease and alternative models" search returns a more relevant list of articles. In this case, only 53 citations were returned, and they included a zebrafish model as well as papers describing the mechanism and utility of various animal models of chronic kidney disease. This type of search becomes especially valuable when attempting to replace a particular species for a less sentient one. Another useful search strategy in this case is the term "NOT." For instance, if you plan to use a rabbit model of kidney disease, but you would first like to perform a proof of principle study in mice, you can include the phrase, "NOT rabbit," in your search.

### Other Databases and Search Tools

It is important to be aware that there are other databases and web search tools that can be of use when planning a project. Many of these are designed precisely to identify alternative methods and models, so in many cases they are superior to using PubMed. Ideally these other search tools will complement each other, rather than just duplicating the same sources. For example, when the above search is applied to the search engine Science Direct (<http://www.sciencedirect.com>), additional citations are returned including a review paper on the translational value of animal models of kidney disease that did not appear in the PubMed

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search. Additional databases include Medline, Biosis, and CAB Abstracts, to name a few.

One of the best search tools for alternatives to animal testing is AltBib (<http://toxnet.nlm.nih.gov/altbib.html>), which is supported by the National Library of Medicine branch of the National Institutes of Health. This is a search tool that can be used specifically to conduct a search for alternatives to animal use in biomedical research. AltBib provides an "Animal Use Alternatives" function, which generates a search specifically for papers that identify ways to substitute non-animal systems, reduce the number of animals used, or replace with a phylogenetically lower animal. An additional advantage of the AltBib website is the list of links to additional resources. This list identifies many other useful search tools and databases that can be found on the internet.

The regulatory agencies of the federal government are also a great source of information on animal research topics. For example, the USDA has information on how to conduct a good literature search for alternative methods at <http://awic.nal.usda.gov/literature-searching-and-databases>.

Other universities may also provide valuable information on searching the literature. The University of California at Davis has a resource on conducting alternative searches at <https://www.lib.ucdavis.edu/dept/animalalternatives/>. Another good university resource for alternative models and alternatives to animal use is the Johns Hopkins Center for Alternatives to Animal Testing (<http://caat.jhsph.edu/>).

## **VISUAL TUTORIALS**

Visual learning, and especially videos, can be a valuable tool when planning a procedure or simply expanding your knowledge on procedures with which you are familiar. It is important to remember that photographing or filming animals at UIC is not allowed unless prior approval is obtained from the BRL Director. However, there are some excellent online

resources which can provide training and information in a visual format.

## **AALAS Learning Library**

One online resource for training is the AALAS Learning Library, which is available at <https://www.aalaslearninglibrary.org/pages/Home.aspx>. Researchers at UIC will be familiar with this site from the UIC Animal User Courses that are required before beginning work with laboratory animals. In addition to the UIC training courses, there are a large number of free courses as well as others that can be taken for a fee. UIC has an institutional subscription to the AALAS Learning Library which allows users to log in with the same username and password that were used for UIC animal training. Once logged in, you have access to all of the free training courses and instructional material. Simply find "Animal Care and Use Courses" under the "Libraries" tab. Once there, expand the "Free Courses" tab to view the selection. Topics include anesthesia, analgesia and surgery, animal health and wellbeing, biosecurity, compliance and IACUC training, occupational health and safety, management and training, and general species-specific training. The format of most of these courses is through slide presentations, similar in format to the UIC Animal User Courses.

## **NIH**

The NIH Office of Animal Care and Use (OACU) has online resources for researchers working with laboratory animals on the "Training Resources" page found at [http://oacu.od.nih.gov/training\\_resources/index.htm](http://oacu.od.nih.gov/training_resources/index.htm). This page links to information on a variety of animals, including zebrafish, rodents, rabbits, and nonhuman primates. Topics on this site include general information on colony management, as well as specifics on genotyping, identification, and breeding of transgenic mice. There is also information on regulatory compliance, health and safety issues, restraint, blood collection, compound administration, euthanasia, and disaster response. Much of the information on this

website is in the form of instructional videos which are available free to all users.

### JoVE

There are some professional and peer-reviewed resources that provide videos of many techniques that may be useful. One such resource is JoVE, or the Journal of Visualized Experiments (<http://www.jove.com/>). UIC has a subscription to this online journal that covers a diverse range of topics including *in vitro* bench work, basics of laboratory animal biology, and more advanced techniques including surgeries. The journal is easily searchable, and videos of many specific procedures and surgeries in mice have been published. JoVE is also PubMed-indexed, so you can use the video-audio filter in PubMed to identify JoVE articles without first logging in with the UIC subscription.

### University Resources

Many universities have training resources online for their students and faculty, but many are password protected and not available to the wider community. One exception is the University of Texas at San Antonio. This university provides training handouts on common techniques and procedures at <http://research.utsa.edu/research-funding/laboratory-animal-resources-center/training/>. The handouts are provided as pdf files and come in various formats from text documents to slides. The topics covered include regulations and oversight, rodent biology, aseptic technique, analgesia and anesthesia, surgery, and colony management topics such as tips on mouse breeding and procedures used to genotype mice. One unique benefit of this site is that it has a limited number of topics presented in Spanish.

Another university resource for topics on animal research alternatives and humane use is available through Johns Hopkins University. The Johns Hopkins School of Public Health has digital courses available to the public at <http://ocw.jhsph.edu/index.cfm/go/viewCourse/course/HumaneScience/.coursePage/lectureNotes/>. Topics include humane animal use, surgery,

postoperative care, identifying pain and distress, and other topics important to the proper use of animals in research. These resources are available in video, audio, or slide formats. There is also a list of texts related to the humane use of animals in biomedical research.

### NC3RS

The National Centre of the Replacement Refinement and Reduction of Animals in Research (NC3Rs) in the United Kingdom is an excellent source of information and videos (<https://www.nc3rs.org.uk/our-resources>). This is a free resource that covers a wide variety of topics across a range of species. Examples of topics include anesthesia, chemical safety testing, drug discovery, blood sampling, experimental design, housing and husbandry, use of the mouse grimace scale, and other procedures. The species covered include rodents, rabbits, ferrets, dogs, and nonhuman primates.

### FURTHER READING

Given the amount of material available on the web, this *BRL Bulletin* is meant to be a starting point for further learning. The sites mentioned above are simply a sample of some of the quality information that can be found. With any use of online sources, however, it is always important to verify the source is credible. The BRL veterinary staff is available to discuss specific information and techniques to help determine if a source is reliable. In general, websites of federal and state agencies tend to have good information, as do most university websites. Caution should be practiced when searching for information on social media sites such as YouTube. And as always, an approved ACC protocol must be in place before beginning any new technique on animals. Below is a listing of various web pages that have links to even more online resources.

**AltTox.org** - Non-animal Methods for Toxicity Testing (<http://alttox.org/>)

Information on toxicity testing including verified non-animal methods that are accepted as alternatives to animal testing for FDA, EPA, and USDA submission.

**Altweb** - Alternatives to Animal Testing on the Web (<http://altweb.jhsph.edu/resources/databases.html>)

The online resource for the Johns Hopkins Center for Alternatives to Animal Testing designed to facilitate searching for alternatives to animal use.

**USDA Animal Welfare Information Center**  
(<https://awic.nal.usda.gov/>)

Comprehensive site with information on all aspects of Animal Welfare Act-covered species, including a section on research animals. Information is provided as text and as links to other online sources, including databases, books, websites, and videos.

**EURL ECVAM** - European Reference Laboratory for Alternatives to Animal Testing  
(<https://eurl-ecvam.jrc.ec.europa.eu/>)

A European center for validating alternative methods. It maintains the DataBase on Alternative Methods (<https://ec.europa.eu/jrc/en/scientific-tool/database-alternative-methods-animal-experimentation>)

**FRAME** - Fund for the Replacement of Animals in Medical Experiments  
(<http://www.frame.org.uk/>)

Nonprofit organization focused at finding alternatives to animal testing. Publishes the journal, Alternatives to Laboratory Animals. Provides information as text, links, and bibliographies.

**NIH National Toxicology Program's Interagency Center for the Evaluation of Alternative Toxicological Methods**  
<http://ntp.niehs.nih.gov/pubhealth/evalatm/index.html>

NICEATM aims to replace, reduce, and refine animal use, especially in the area of toxicology testing.

**Society of Toxicology *In Vitro* and Alternative Methods Specialty Section**  
(<https://www.toxicology.org/groups/ss/IVSS/>)  
Professional group of toxicologists. Information is available as newsletters, symposia, and webinars.

**Environmental Protection Agency National Center for Computational Toxicology**  
(<http://www.epa.gov/aboutepa/about-national-center-computational-toxicology-ncct>)

EPA group with information on *in silico* methods to reduce safety testing on animals. Information is available as text and through links.

**American Society for Cellular and Computational Toxicology**  
(<http://www.ascctox.org/>)

Professional organization for *in vitro* and *in silico* alternatives to animal toxicology testing. Information is available as text, newsletters, links, and conferences.

## ANNOUNCEMENTS

### BRL Business Office Holiday Hours

Wednesday, 12/23, 8 to 3 PM

Thursday, 12/24, Closed

Friday, 12/25, Closed

Monday, 12/28, 8 to 3 PM

Tuesday, 12/29, 8 to 3 PM

Wednesday, 12/30, 8 to 3 PM

Thursday, 12/31, 8 to 3 PM

Friday, 1/1, Closed

Animal orders will be accepted until 2:00 PM on 12/28, 12/29 and 12/30 and until 12:00 PM (noon) on 12/23 and 12/31.



YEAR OF THE MONKEY