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14. ABSTRACT

The National Academies continue the activities of the Institute for Laboratory Animal Research (ILAR), the recognized leader in developing and disseminating guidelines for laboratory animal care, breeding, and use, (including the internationally accepted standard *Guide for the Care and Use of Laboratory Animals*); resources for identifying animal models for human diseases and physiological processes; and reports on the humane and scientific use of laboratory animals (including education and training of scientists and technicians in the care and use of laboratory animals; reduction of pain and distress in research animals; occupational safety and health of employees; and nomenclature of inbred, transgenic, and other genetically defined animals). The program goal is to improve the humane and scientifically valid use of laboratory animals as well as the availability, quality and care of laboratory animals. ILAR accomplishes this goal through a core program, carried out by staff, and a special-project program, carried out by National Academies-appointed experts. Both programs are guided by a 15-member advisory council (the Council). The Council meets three times a year to provide program direction and strategic planning; to oversee the communication and information programs (consisting of the ILAR web site and the *ILAR Journal)*; to oversee special projects; and to direct ILAR's international programs (including participation as the US national member of the International Council of Laboratory Animal Sciences).

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INTRODUCTION

For many years the Army has provided partial core support to the Institute for Laboratory Animal Research (ILAR), a component of the National Research Council (NRC). Formerly contained within the Commission on Life Sciences, ILAR is now part of a larger division of the NRC, called the Division on Earth and Life Studies. The NRC is the operating arm of the National Academy of Sciences, a private, nonprofit organization that was created in 1863 by congressional charter to serve as an official advisor to the federal government on questions of science and technology.

Founded in 1952, ILAR is both a national and international leader in developing guidelines for animal care, breeding, and use; descriptions of animal models for human diseases and physiological processes; and reports on specific issues of scientific and humane use of laboratory animals. ILAR disseminates this information to the biomedical and laboratory animal science communities by wide distribution of its reports as well as through presentations and exhibits at national meetings. These guidelines from the National Academy of Sciences serve as important indications to members of the U.S. Congress and other government officials, the press, and the public of the high quality of care provided to laboratory animals. ILAR's mission is to help improve the availability, quality, care, and humane and scientifically valid use of laboratory animals.

Recognized experts in fields appropriate to the required tasks carry out ILAR's studies, like all those of the NRC. These experts serve on a volunteer basis, without compensation. As a part of the NRC, ILAR has access to this country's most knowledgeable and distinguished laboratory animal and biomedical scientists, who provide objective counsel on laboratory animal issues. Many of the experts used by ILAR are also members of the National Academy of Sciences or the Institute of Medicine. In some cases, ILAR utilizes scientists from other countries.

Independent NRC-appointed experts in the subject area extensively review reports of NRC studies before they are released. They are prepared in sufficient quantity to ensure distribution to the sponsor, experts, and other relevant parties in accordance with Academy policy. Reports are usually made available to the public without restriction.

ILAR'S GOALS

Since its founding, ILAR has provided guidance and information on laboratory animal matters to the federal government, the biomedical and laboratory animal science communities, and the public. In keeping with its mission, ILAR continually seeks to strengthen and refine its existing programs and to initiate new programs that will assist government officials; scientists who use animals in research, testing, and education; and the institutional animal care and use committees that monitor animal use. ILAR's goals are as follows:

- to provide a forum within the National Academy of Sciences for the Department of Defense to discuss issues and develop guidance for laboratory animal-related matters;
- to continue to serve on behalf of biomedical science and education as an authoritative voice within the U.S., and on behalf of the U.S. scientists internationally;
- to promote humane and appropriate care and use of laboratory animals;

- to provide scientific guidance on laboratory animal-related issues to agencies of the federal government and others on request;
- to provide information on laboratory animal matters to government officials, laboratory animal and other biomedical scientists, institutional animal care and use committees, and the public;
- to promote the use of standardized nomenclature for accurately defining and identifying genetic stocks of animals;
- to assist developing countries in attaining quality laboratory animal science programs through dissemination of information including the translation of ILAR reports;
- to promote cost-effective ways to preserve valuable animal models;
- to sponsor workshops in areas of importance the laboratory animal community; and
- to increase access to information about appropriate biological models and methods through ILAR's home page, databases, publications, and resources of the ILAR Associates program, including the quarterly *ILAR Journal.*

Accomplishing the Goals

ILAR accomplishes its goals through its core program, which is carried out by the staff, and its special-project program. The number of studies and size of the staff are dependent on the number of special projects and available funding. Both programs are directed by a 15-member ILAR Council composed of experts in laboratory animal medicine, virology, zoology, genetics, medicine, ethics, and related biomedical sciences.

CORE PROGRAM

The Core Program of ILAR supports the activities of ILAR Council, ILAR's international activities, ILAR's information and communication programs (including the Animal Models and Genetic Stocks Information Program), the ILAR web site, and exhibits at major scientific and veterinary meetings. The production of the peer-reviewed *ILAR Journal* is also supported by core funds. Core funds support staff time devoted to these activities as well as development of new projects.

ILAR Council

The ILAR Council serves four principal functions: 1) to provide program direction and strategic planning; 2) to oversee the information and communication programs, which consist of the Animal Models and Genetic Stocks Information Program, the ILAR web site, and the quarterly *ILAR Journal;* 3) to oversee special projects; and 4) to direct ILAR's international programs and its participation as the U.S. national member in the International Council of Laboratory Animal Sciences (ICLAS). The international program is discussed in the Special Projects section below. Periodically, the Council meets with other scientists and funding agency administrators to discuss areas in which ILAR might provide guidance. The Council uses these discussions in strategic planning. The Council occasionally employs core funds to undertake specific, NRC-approved projects. The current members of ILAR Council are listed at the end of this document.

ILAR Council meets for two days, three times per year at one of the National Academies' facilities. In the past year, meetings were held on July 15-16, 2004 (Woods Hole, MA) November 19-20, 2004, and March 10-11, 2005 (Irvine, CA). During each of these meetings, ILAR Council's three subcommittees hold separate half-day meetings to discuss subcommittee projects. The three subcommittees are: 1) Animal Resources Information Subcommittee, 2) International Subcommittee, and 3) the ILAR Journal Editorial Board.

Staff

ILAR is staffed by the director, a managing editor of the *ILAR Journal*, a project assistant who maintains the web page and various databases, an administrative assistant and secretary to the director, and a project director. A part-time web master provides support for online resources. Under the special projects program, staff works closely with experts to engage in studies, develops working papers, assists in the production of cohesive reports, and conducts literature reviews. ILAR staff members are listed at the end of this document.

International Activities Subcommittee

ILAR has had a long history of interest in international laboratory animal science. Historically, this interest has sought to assist young investigators in developing countries through dissemination of reports (some translated into foreign languages to increase their usefulness) and participation in international meetings that support young investigators. In 1988, ILAR became the U.S. national member of the International Council for Laboratory Animal Science (ICLAS), with support from member agencies of the Interagency Research Animal Committee (IRAC). This membership affords a conduit for U.S. investigators to develop and conduct an active international program in laboratory animal science. One goal of the U.S. membership in ICLAS was to streamline ICLAS management and programs to better represent U.S. scientists in the international community. Following are the major international efforts of ILAR.

Report Translations

ILAR's most longstanding international effort has been to have our seminal publication the *Guide for the Care and Use of Laboratory Animals* (the *Guide*) translated into as many languages as possible. The *Guide* is used as the standard for laboratory animal care by the Public Health Service in the U.S., and by the Association for Assessment and Accreditation of Laboratory Animal Care (AAALAC) International in their certification of animal facilities throughout the world. The *Guide* has been translated into French, Spanish, Portuguese, Thai, Japanese, Korean, Arabic, Russian, and two versions of Chinese. An Indonesian version has recently been submitted for review.

Another of ILAR's reports, *Occupational Health and Safety in the Care and Use of Research Animals*, was recently published in Japanese and is now being translated into Korean. Translation of ILAR reports is carefully monitored and each translation is reviewed for its faithfulness to the English version before permission is granted for its publication.

International Council for Laboratory Animal Science (ICLAS)

ILAR supports the activities of ICLAS through its participation as the US representative. ICLAS is an international scientific organization dedicated to advancing human and animal

health by promoting the ethical care and use of laboratory animals in research worldwide. ICLAS was established in 1956 under the auspices of UNESCO, and interacts in an official capacity with the World Health Organization (WHO), the International Council of Scientific Unions (ICSU), the Council for International Organizations of Medical Sciences (CIOMS), and the World Veterinary Association (WVA). ICLAS sponsors meetings throughout the world, but focuses particularly on third world countries, where animal care conditions are in need of improvement. Through ICLAS, ILAR provides guidance in the field of laboratory animal science to scientists in developing countries. Dr. Steven Pakes, former chair of ILAR Council, was the President of ICLAS until October 2003. Dr. Harry Rozmiarek is now the US representative to ICLAS and provides reports to ILAR Council.

International Workshops

As part of ILAR core activities, ILAR has sponsored meetings first with scientists from the U.S. and Japan, and more recently on a more comprehensive international basis. In 2003, ILAR hosted another International Workshop on the Development of Science-based Guidelines for Laboratory Animal Care, which focused on issues of international harmonization and on the need for more research in order to develop scientifically sound regulations. The proceedings for this workshop were published in 2004 and a follow-up meeting is planned for August 2005 in Berlin in association with the World Congress on Animals and Alternatives in the Life Sciences.

Observer Status at the Council of Europe

In 1999, ILAR was granted observer status to the Council of Europe in the preparation of guidelines for the protection of live animals used for experimental and other scientific purposes. The goal of the Council of Europe is to harmonize guidelines throughout Europe and it is desirable to have these guidelines harmonized with regulations and guidelines in the U.S. Since the *Guide* provides the basis for many of the current U.S. guidelines, it is useful and efficient for ILAR to be an observer to this process and have the opportunity to comment.

Foreign Participation in ILAR Activities

In the last few years, ILAR has purposely increased foreign participation in its Council and ad hoc committees. Currently, two Council members are from the European Union, Dr. Michael Festing from the U.K. and Dr. Coenraad Hendriksen from The Netherlands. Both of these individuals are intimately involved with the current and developing policies in Europe that will affect the U.S. They provide valuable insights and guidance for ILAR's international activities. ILAR also plans to include international representatives on upcoming special projects.

Future Activities

In all likelihood, ILAR will become more involved in international activities in the future. The need for greater international involvement arises from a common desire to harmonize guidelines and standards for laboratory animal care across the world with the goals of improving animal welfare, conserving animal resources, and improving scientific interchange through detailed characterization of the animals used in research.

***ILAR Journal* Subcommittee**

Work Statement

ILAR Journal is produced quarterly and provides a unique repository of timely, high quality information on new developments in biomedical research that involve the use of laboratory animals. It seeks to be the premier U.S. periodical resource for investigators, institutional animal care and use committee (IACUC) members, and veterinarians involved in writing and/or reviewing protocols for laboratory animal research that must comply with national, and sometimes international, regulations and policies. Individuals and institutions who subscribe to the Journal help defray the cost of publication. In the last year, the following issues were published:

Volume 46 (3) *Immunization and Adjuvant Procedures* (2005)
Volume 46 (2) *Enrichment Strategies for Laboratory Animals* (2005)
Volume 46 (1) *Infectious Disease Research in the Age of Biodefense* (2005)
Volume 45 (4) *Animal Models and Experimental Design Considerations for Endocrine Disruptor Research and Testing* (2004)

The *ILAR Journal* is produced by a full-time Managing Editor, who is a member of ILAR staff, with oversight by the *ILAR Journal* Editorial Board. The Editorial Board is made up of 5 Council members, one of whom is the Editor-in-Chief. This group meets three times per year in conjunction with the full Council meeting to plan the structure and authorship of future issues.

ILAR Associates Program

In an effort to increase ILAR's information resources and to better leverage funding from core and project sponsors to support other activities, ILAR initiated an Associates program in 1997. Individuals and institutions that subscribe to the Associates program help defray the cost of publishing the *Journal*. ILAR Associates receive the *ILAR Journal* (number of copies varies with level of Associate membership) and a 20% discount on all ILAR and other National Academy Press publications. ILAR Associates represent the best of US biomedical and laboratory animal scientists and serve as an important audience to receive, critique, and provide guidance to ILAR's programs. ILAR's core sponsors are valuable members of the Associates program.

Future Issues of ILAR Journal

The Editorial Board must identify topics for future issues of ILAR Journal well in advance. The following issues (with anticipated publication date) are in some stage of planning or production:

Serendipity and Science in Laboratory Animal Research (9/05)

Phenotyping of Genetically Engineered Mice (12/05)

Animal Models of Diseases Related to the Fetus and Newborn (3/06)

Acclimatization of Laboratory Animals to Facilitate Research (6/06)

Type 2 Diabetes and Obesity (9/06)

Animal Resources Information Subcommittee

Work Statement and Recent Accomplishments

For more than 40 years, ILAR has provided assistance to biomedical researchers, veterinarians, and Institutional Animal Care and Use Committees (IACUCs) in interpreting guidelines for the humane care and use of animals, and fulfilling requirements of the Animal Welfare Act and PHS policy regarding reduction of pain and distress and identification of alternative methodologies. The main outlet for this information is our newly launched website, which is now more user-friendly and contains components for different constituencies. ILAR has recently been working to develop a web-based search engine that would enable investigators to search through all available sources of animal strains and models. The current search engine has the capability of searching all of the commercial and private animal breeders, lab animal repositories, and animal resource databases that are linked to ILAR's site, as well as the ILAR website. Current activities are focused on expanding this list of linked websites and partnering with these organizations to provide high level search capabilities. The ILAR website also hosts registry of codes used with standardized nomenclature of rodents and rabbits to identify institutions that maintain breeding colonies. We continually monitor traffic to the site utilizing the web statistical package Web Trends; the number of visits to the site in 2004 reached 175,000 with 62% of the visitors from the US and the remainder international.

Other aspects of ILAR's information program are focused on the ability to interact with scientists and veterinarians at national meetings. ILAR exhibits and/or lectures at these national meetings to enhance our outreach programs and increase the visibility of ILAR's programs and publications. ILAR has routinely traveled to the national meetings of the Society for Neuroscience, Experimental Biology, the American Association for Laboratory Animal Science, the Society of Toxicology, the Scientists Center for Animal Welfare, and Public Responsibility in Medicine and Research.

Core funds are used to pay staff time to develop and maintain the databases and web development, for software and other materials needed in web activities, and for travel of staff to national meetings. Core funds have also supported the development of a marketing plan for ILAR to increase its visibility throughout the scientific community. The marketing plan is also poised to help increase the visibility of the *ILAR Journal* and to increase the number of associates (subscribers). ILAR strives to provide information and scientifically-based guidelines that will benefit the research enterprise and to communicate the message that humane science is the best science.

SPECIAL PROJECTS

Projects are developed in response to specific requests from government agencies and private organizations or are initiated by ILAR staff or Council members. Although these projects are supported by contracts and grants from federal agencies, foundations, and private organizations, they are never completely separate from the core program as the ILAR Council is involved during each step of the project. The Council reviews each project extensively before it is undertaken, examines the qualifications of experts, and monitors the conduct of the project to ensure that it is accomplished in a timely manner. As such, core sponsorship (including funding provided by this grant) is recognized in each ILAR project report. In addition, some ILAR project reports are

published as special inserts of the core-supported *ILAR Journal*. The following projects are under way or will begin when funding has been received.

Projects Recently Completed

- *The Development of Science-based Guidelines for Laboratory Animal Care – Proceedings of the November 2003 International Workshop* – This report contains the presentations and discussions from the ILAR-sponsored meeting.

- Review of Smithsonian's National Zoological Park

  This project was performed in conjunction with the Board on Agriculture and Natural Resources. A committee assessed the quality and effectiveness of animal management, husbandry, and care at the National Zoological Park in Washington, DC and the Conservation and Research Center in Front Royal, VA.

- Revision of the 1991 publication for students: *Science, Medicine and Animals*

  The revision addresses animal use in scientific and medical research. The text for this report completed and provides an objective assessment of the scientific issues associated with the use of animals in research; examines historic impacts in human and animal science and medicine attributable to the use of animals in research; explores alternatives to the use of animals; defines current legal and regulatory aspects of laboratory animal use; and presents examples of appropriate, responsible, and contemporary approaches to the use of animals in research. A professional designer has provided graphics and other visuals for the report to make it attractive to students and other target audiences. ILAR is in the process of developing an electronic teachers' guide to enable educators to use *Science, Medicine, and Animals* in the classroom.

Projects in Progress

- Guidelines for Humane Transportation of Laboratory Animals

  A committee was appointed to address problems associated with transportation of laboratory animals. Among the issues to be considered are: animal welfare, availability of services, regulatory oversight and permitting problems, import/export requirements, transport of biological specimens and potential biosecurity concerns. The resulting report will provide recommendations to improve transportation practices that will benefit the research community as well as the animals.

- Toxicity Testing and Assessment for Regulatory Data Needs

  A committee is conducting a two-part study to assess and advance current approaches to toxicity testing and assessment to meet regulatory data needs. In the first part (12 months) of the study, the committee will review selected aspects of several relevant reports by EPA and others on this topic. The second part of the study (24 months), if approved, will consist of the committee preparing a report presenting a long-range vision and strategic plan for advancing the practices of toxicity testing and human health assessment for

environmental contaminants.

Upcoming Activities

Update of *Recognition and Alleviation of Pain and Distress in Laboratory Animals*

ILAR will update and supplement its 1992 report *Recognition and Alleviation of Pain and Distress in Laboratory Animals* in two separate reports, one on pain and the other on stress and distress. The first report will update those portions of the 1992 report that address distress, and in addition address the topic of stress. The report will review the current scientific literature, placing emphasis on: the scientific understanding of causes and functions of stress and distress; determining when stress becomes distress; and identifying principles for recognition and alleviation of distress.

Specific emphasis will be placed on the identification of humane endpoints in situations of distress and principles for minimizing distress in laboratory animals. While all possible scenarios cannot be included in this document, general guidelines and examples will be given to aid IACUC members, investigators and animal care staff in making decisions about protocols using laboratory animals under current federal regulations and policies. Recommendations will be based on the most current scientific data where such data are available. The committee will also identify gaps in the scientific literature where additional research data are needed.

The second report will update information based on the current scientific literature on recognizing and alleviating pain in laboratory animals. The report will discuss the physiology of pain in commonly used laboratory species. Specific emphasis will be placed on the identification of humane endpoints, pharmacologic and non-pharmacologic principles to control pain, and principles to utilize in minimizing pain associated with experimental procedures. As with the first report, general guidelines and examples will be given to aid IACUC members, investigators and animal care staff in making decisions about protocols using laboratory animals under current federal regulations and policies.

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Appendix: ILAR Council (with areas of expertise) and Staff (July 2005)

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