

INSTITUTE OF LABORATORY ANIMAL RESOURCES
ASSEMBLY OF LIFE SCIENCES
DIVISION OF BIOLOGICAL SCIENCES

ANNUAL PROGRESS REPORT

1 January 1974 -- 31 December 1974

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I. BACKGROUND

The Institute of Laboratory Animal Resources (ILAR) was founded in 1952 under the auspices of the National Academy of Sciences-National Research Council (NAS-NRC). Located within the Division of Biological Sciences, Assembly of Life Sciences, ILAR serves as a coordinating agency to disseminate information, survey existing and required resources, establish standards and guidelines, promote education, hold conferences, and, generally, upgrade laboratory animal resources within the United States.

Since its inception ILAR has been recognized by various governmental agencies, private biomedical research institutions, pharmaceutical companies, and educational institutions as the focal point for the distribution of information on laboratory animals and as a key advisory group in the laboratory animal field. The standards and guidelines developed by the ILAR committees have provided the framework for governmental and institutional animal welfare policies.

ILAR represents the United States on the International Committee on Laboratory Animals (ICLA). The Chairman of ILAR or his designated representative is the U.S. national member.

The Institute of Laboratory Animal Resources is located in the Joseph Henry Building, 2100 Pennsylvania Avenue, N.W., Washington, D.C. ILAR maintains a library of several thousand publications.

II. CURRENT ACTIVITIES

The Institute's committee structure was reviewed July 1, 1974, in accordance with NRC policy. For FY 1975, 89 specialists in biosciences were invited to serve on the 13 ILAR committees and Advisory Council. (For a complete listing of committees see V.)

Committee Activities

The Executive Committee met three times during 1974: January 23-25, April 18-19, and September 12-13. The Advisory Council met on October 31 - November 1. These bodies received and discussed budgetary requirements and ILAR committees' activities. Review of other matters of major importance included the status of ILAR publications; sponsorship of symposia and workshops; current and pending legislation that affect laboratory animal resources; nominations to ILAR committees for FY 75; the nonhuman primate availability for biomedical research; development and/or revision of standards and guidelines; the role of humane societies in ILAR symposia; and reviews of the ILAR information services and Animal Models and Genetic Stocks Program.

o The Committee on Laboratory Animal Diseases under the chairmanship of Dr. Chester A. Gleiser, Texas A & M University, completed the Guide to Infectious Diseases of Guinea Pigs, Gerbils, Hamsters, and Rabbits. Their report was published in the July 1974 issue of the ILAR News. The committee appointments were terminated June 30, 1974.

o The Committee on Animal Models and Genetic Stocks guides an ILAR information exchange program that was initiated in July 1969 as a

result of resolutions adopted by the Genetics Society of America and the National Institutes of Health. These resolutions cited the urgent need to establish a central agency to collect, maintain, and disseminate information on animal models and genetic stocks useful in biomedical research.

The objectives of the program are to locate sources of animal models or genetic stocks, to describe these models accurately, and to maintain a locator file so that this information is available to scientists seeking a particular strain of animal or model. This is accomplished through the collection, storage and dissemination of data such as (1) key references and major characteristics pertaining to an animal model or genetic stock, (2) names and addresses of sources of supply and location of animal colonies, and (3) names and addresses of scientific consultants knowledgeable on animal model topics. The accumulated data are made available to interested scientists through the ILAR News and through responses to specific inquiries from investigators.

The committee is chaired by Dr. Dante G. Scarpelli, University of Kansas Medical Center.

During calendar year 1974 the Animal Models and Genetic Stocks Information Program responded to 294 inquiries. Over 1,500 inquiries have been answered since the program's inception and over 5,200 references have been cited in the ILAR News. Approximately 550 colonies are listed in the Genetic Stock Registry.

The ILAR exhibit "Mutants, Models, and Man," was shown at the AAAS and ACP meetings in San Francisco, California. This exhibit has been replaced by a new exhibit entitled "Animal Models--Contributions to Understanding of Human Diseases", sponsored jointly by the Registry of Comparative Pathology (AFIP) and the Institute of Laboratory Animal Resources (NRC). This exhibit was displayed at the annual meeting of the AALAS at Cincinnati, Ohio in October 1974.

o The Committee on Animal Models for Thrombosis and Hemorrhagic Diseases was established July 1, 1974, at the request of the National Institutes of Health to organize and conduct an in-depth two day workshop on Animal Models of Thrombosis and Hemorrhagic Diseases.

The committee, under the chairmanship of Dr. W. Jean Dodds, Division of Laboratories and Research, New York State Department of Health, met on September 18th to develop the workshop program. This workshop will serve as an avenue for exchange of information and as a means to establish guidelines for maintaining different types of stocks and strains and to assure their availability to qualified investigators.

o The Committee on the Care and Use of the "Nude" Mouse was established July 1, 1974 in response to a request of NIH. The committee met on November 15th to develop an outline of their report and receive working assignments. This mouse mutant is immunologically incompetent due to recessive thymic aplasia and will accept allografts and heterografts of both normal and neoplastic tissue. This mouse is very sensitive to the microbiological milieu and it has been frequently reported that breeding and rearing is difficult.

o The Committee on Care and Use of Spontaneously Hypertensive Rats was established July 1, 1974, upon ILAR Executive Committee recommendations. The spontaneously hypertensive rat (SHR) was developed about 10 years ago through selection for elevated blood pressure and inbreeding from an original male that was characterized by higher-than-average blood pressure. This rat is currently one of the most widely studied animal models for hypertension. In carrying out their study the committee will: assess the appropriateness of the spontaneously hypertensive rat (i.e., mating, monitoring for hypertension, methods for measuring blood pressure, etc.); develop guidelines for the breeding, care, and use of an appropriate normotensive control animal; and prepare a report incorporating the above material.

The committee, under the chairmanship of Dr. Sidney Udenfriend, Roche Institute of Molecular Biology, met on November 5th to discuss their charge, develop an outline for the report and receive working assignments.

o The Committee on Conservation of Nonhuman Primates chaired by Dr. Charles H. Southwick, Johns Hopkins University, met on May 3rd and September 20th to review and discuss the committee efforts. The committee was organized in March 1970 to examine the distribution and abundance of the eight most commonly used species of nonhuman primates and assess the effect of harvesting on indigenous population levels. The committee is conducting field studies of selected South American primates in Colombia and Peru through a subcontract with the Pan American Health Organization.

With support from the Division of Research Resources, National Institutes of Health, ILAR has employed a full time staff officer (primatologist) familiar with techniques employed in literature reviews and field surveys. The staff officer, working under the guidance of the Committee on Conservation of Nonhuman Primates, conducted a survey of biomedical research institutions in the United States to determine the number of nonhuman primates either purchased or bred that were utilized by them during the period October 1972 to October 1973. Existing scientific literature relative to population dynamics is being reviewed and those data extracted and assembled that provide a realistic picture of nonhuman primate populations in the wild.

The assembled data are being collated and a judgment of those species in short supply that are of value to biomedical research is being made. Based on assembled information, the committee will select an appropriate area of the world for field surveys of those species considered to be the most critical for research purposes.

The final report, when assembled, should provide a current assessment of natural populations of primates on a worldwide basis by:

1. Identifying those species or subspecies of nonhuman primates critical for biomedical research that are rapidly being depleted.
2. Identifying possible alternative sources of supply of nonhuman primates critical for biomedical research that are rapidly being depleted.

3. Identifying environmental parameters (e.g., food, habitat, behavioral characteristics) essential for maintenance of adequate primate populations, either in the wild or in breeding centers.

o The Committee on the Care and Use of Laboratory Animals (formerly the Committee on the Revision of the Guide for Laboratory Animal Facilities and Care) was established in 1965 at the request of the National Institutes of Health (NIH) to develop Guidelines to assist scientific institutions in providing professionally appropriate care for laboratory animals. The guidelines are based on scientific principles, expert opinion and experience with methods and practices that have proved to be consistent with high quality animal care.

The "Guide" was revised by the committee in 1968 and 1972. More than 180,000 copies have been distributed since it was published, and it has become a primary reference on standards of animal care in scientific institutions. The committee receives and reviews changes to the guide as recommended by users of laboratory animals. A second printing of the 1972 guide was accomplished in 1974.

The committee augmented by an Ad Hoc Task Force met on July 12th to comment on an advanced copy of the proposed rules entitled "Proposed Rules--Dogs and Cats; Proposed Veterinary Care, Space, and Exercise, and Audio-Visual Requirements" as published in the Federal Register September 25, 1974. The committee report was forwarded to the United States Department of Agriculture and the text of the report was published in the fall issue of the ILAR News. The committee is currently chaired by Dr. Alvin F. Moreland, University of Florida College of Medicine.

o The Committee on Long-Term Holding of Laboratory Rodents was appointed July 1, 1973. The committee charge is to develop a standard for the long-term care and maintenance of laboratory rodents (mice, rats, and hamsters). The committee is chaired by Dr. Albert Jonas, Yale University School of Medicine. The committee met on January 10 and October 20 to review the draft manuscript. It is anticipated that a final report will be available by June 1975.

o The Committee on Maintenance of Genetic Stocks was established July 1, 1974, at the request of the National Institutes of Health to conduct a definitive study of the genetic repository of rodents maintained by the Veterinary Resources Branch, Division of Research Service, NIH. The committee will evaluate the potential importance of these stocks for biomedical research, provide guidelines for determining which strains should be added, maintained or eliminated from the repository and approximate the costs for maintaining the repository, over and above those costs necessary for the support of NIH intramural research.

The committee, under the chairmanship of Dr. Herman B. Chase, Director, Institute of Life Sciences, Brown University, met on December 12-13. It is anticipated they will complete their report during FY 1975.

o The Committee on Nomenclature for Inbred Rats, Hamsters, Gerbils, and Rabbits was formed July 1, 1972. The committee, chaired by Dr. Carl T. Hansen, National Institutes of Health, is charged with

the formulation of standards of strain nomenclature, and definition of in-bred strain, and designation of sub-strains of the commonly used small laboratory animals other than mice. Formulation of these standards should eliminate the duplicative designations of strains currently in existence.

o The Committee on Standards for Birds, chaired by Dr. James R. King, Washington State University, was appointed July 1, 1972. An organizational meeting was held in Washington, D.C., on September 28-29, 1972, to develop a preliminary outline of the committee report and to make working assignments. The committee members are preparing their assigned sections and it is anticipated that the committee will complete their report during FY 1975.

o The Committee on Standards for Cats was appointed July 1, 1972. The committee originally chaired by Dr. James E. Corbin, University of Illinois, held its organizational meeting in St. Louis, Missouri, on October 16, 1972, at which time working assignments were made. Due to an excessive academic workload, Dr. Corbin resigned as chairman. The chairmanship was assumed on July 1, 1974, by Dr. Richard A. Griesemer, Oak Ridge National Laboratory. The committee met at Cincinnati, Ohio, on October 20, 1974 to collate the draft manuscript. The committee plans to complete their report during FY 1975.

o The Organizing Committee for the Symposium on the Future of Laboratory Animals, Cells, Models, and Systems was established July 1, 1974, upon ILAR Executive Committee recommendations, to organize, and conduct an in-depth two day Symposium on the Future of Animals, Cells, Models, and Systems in Research, Development, Education, and Testing.

The committee, chaired by Dr. George T. Harrell, Vice President Emeritus, Pennsylvania State University, met on December 3rd to develop a preliminary outline of the symposium. By this symposium ILAR will seek to explore the implications of new pressures to substitute tissue culture and computer techniques for work with common species of laboratory animals and to assess the future so far as utilization of laboratory animals is concerned.

It is planned to hold the symposium at the National Academy of Sciences in the fall of 1975.

Staff Activities

The staff assisted in the activities of each committee. In addition, the ILAR offices served as an information center on various aspects of the laboratory animal and answered approximately 5,800 inquiries on laboratory animal topics. ILAR News, the Institute's newsletter, was distributed without charge quarterly to 4,400 investigators and institutions in the United States and 57 foreign countries. During 1974 approximately 10,000 copies of laboratory animal standards and other ILAR publications were distributed.

The staff members of the institute provided assistance to foreign visitors, made occasional site visits upon request, addressed groups interested in the laboratory animal field, and cooperated with other

organizations to improve laboratory animal facilities and care. The chairman of ILAR, as the U.S. representative to ICLA, attended the meeting of the governing board held in Koupio, Finland, June 27-28, 1974.

Conferences, Symposia, and Workshops

The Institute provides, through conferences, symposia, and workshops a forum for the discussion of important laboratory animal problems. Conferences and workshops have dealt with animal standardization and accreditation, primate resources, procurement of wild animals, inbred mouse production and cell culture, research animal housing, gnotobiotic technology, infections of laboratory animals potentially hazardous to man, animal technician training, and graduate education in laboratory animal medicine. ILAR-sponsored symposia, conferences and workshops held during 1974 were:

- o Symposium on Animal Models of Human Diseases. Under the co-chairmanship of Dr. J. Russell Lindsey, University of Alabama Medical Center, and Dr. Charles Capen, Ohio State University, the symposium co-sponsored with the American College of Laboratory Animal Medicine was presented at the July 1974 meeting of the American Veterinary Medical Association in Denver, Colorado.
- o Workshop on Basic Aspects of Freeze Preservation of Mouse Strains. The Institute of Laboratory Animal Resources co-sponsored a Workshop on Basic Aspects of Freeze Preservation of Mouse Strains with the UNESCO-International Cell Research Organization (ICRO) and the International Committee for Laboratory Animals (ICLA) on September 16-18, 1974, at the Jackson Laboratory, Bar Harbor, Maine. The workshop represented the first organized effort to bring together experts in the recently developed technique of freeze preservation of mouse strains and, hopefully, served to propagate the idea and possibilities of this technique.

Planned Symposia, Workshops, or Conferences

- o Symposium on Environmental Factors Influencing Biomedical Research. This symposium is being developed by an ad hoc ILAR group under the co-chairmanship of Dr. C. Max Lang, Pennsylvania State University, Hershey, Pennsylvania, and Dr. Elliot Vessell, Pennsylvania State University, Hershey, Pennsylvania, for presentation at the 1975 meeting of the Federation of American Societies for Experimental Biology in cooperation with the American Society for Pharmacology and Experimental Therapeutics. It will deal with the effects and implications of the routine use of certain chemical compounds in laboratory animal resource facilities--for disease and pest control, and for control of odors.

- o Symposium on the Future of Animals, Cells, Models, and Systems in Research, Development, Education, and Testing. By means of this symposium ILAR hopes to examine the contributions of animals to human health and welfare; the use and limitations of cell, tissue, and organ cultures; and the application of statistical and computer technology to biomedical research. Specialists from the United States and abroad will be invited to participate. Representatives of humane groups will also

be afforded the opportunity to present their views. Government scientists will be asked to examine the validity of their existing regulations requiring the use of living animals to evaluate the safety of drugs, vaccines, and food additives.

o Workshop on Animal Models of Thrombosis and Hemorrhagic Diseases. This workshop will serve as an avenue for the exchange of information and as a means to establish guidelines for the selection and maintenance of stocks and strains of animals suitable for models of blood diseases. After evaluating the animal models and assessing needs and projected needs, the participants will develop a series of recommendations that will assist funding agencies to establish sounder positions concerning support of animal colonies. The workshop will be held on March 12-13, 1975, in the Lecture Room of the National Academy of Sciences, 2101 Constitution Avenue, N.W., Washington, D.C.

The following topics are being considered by the ILAR Executive Committee for future workshops or symposia.

- o Care and Use of Marine Invertebrates in Biomedical Research
- o Laboratory Animal Facilities Architectural Design
- o Invertebrate Nomenclature
- o Inherited Diseases of Nerve and Muscle
- o Germplasm as an Essential Natural Resource
- o Conference on Bio-Safety

III. COMMITTEE MEETINGS AND CONFERENCES

During 1974 the following committee meetings were held under the auspices of ILAR.

<u>Date</u>	<u>Committee</u>	<u>Location</u>
January 10	Long-Term Holding of Laboratory Rodents	Washington, D.C.
January 23-25	Executive Committee	Cedar Key, FL
April 4	Intergovernmental <u>Ad Hoc</u> Committee	Washington, D.C.
April 11	Subcommittee--Animal Models and Genetic Stocks	Atlantic City, NJ
April 17	Task Force--Symposium on Future Use of Laboratory Animals	Washington, D.C.
April 18-19	Executive Committee	Washington, D.C.

May 3	Committee on Conservation of Nonhuman Primates	Washington, D.C.
July 12	Committee on the Guide for the Care and Use of Laboratory Animals	Washington, D.C.
September 12-13	Executive Committee	Puerto Rico
September 18	Organizing Committee for the Workshop on Thrombosis and Hemorrhagic Diseases	Washington, D.C.
September 20	Committee on Conservation of Nonhuman Primates	Washington, D.C.
October 20	Committee on Long-Term Holding of Laboratory Rodents	Cincinnati, OH
October 20	Committee on Standards for Cats	Cincinnati, OH
October 31- November 1	Advisory Council	Washington, D.C.
November 5	Committee on Care and Use of Spontaneously Hypertensive Rats	Washington, D.C.
November 15	Committee on Care and Use of the "Nude" Mouse	Washington, D.C.
December 3	Organizing Committee for the Symposium on the Future of Laboratory Animals, Cells, Models, and Systems	Washington, D.C.
December 12-13	Committee on Maintenance of Genetic Stocks	Bethesda, MD

IV. REPORTS AND PUBLICATIONS

The following publications resulted from ILAR staff or committee activities since January 1, 1974.

- o ILAR News. Quarterly newsletter. Volume XVII, No. 2 through No. 4, Volume XVIII, No. 1, 1974.
- o Annual Progress Report. Calendar Year 1973.
- o Selected Abstracts on Animal Models for Biomedical Research, III. 1974.
- o Institute of Laboratory Animal Resources: Objectives, Committees, Activities. FY 1974 Brochure.
- o Animal Models and Genetic Stocks Information Exchange Program. FY 1974 Brochure.

- o Guidelines for the Breeding, Care, and Management of Laboratory Animals: Amphibians. ILAR Subcommittee on Amphibian Standards. 1974.
- o Guidelines for the Breeding, Care, and Management of Laboratory Animals: Fishes. ILAR Subcommittee on Fish Standards. 1974.
- o Guidelines for the Breeding, Care, and Management of Laboratory Animals: Ruminants: Cattle, Sheep, and Goats. ILAR Subcommittee on Standards for Large (Domestic) Laboratory Animals. 1974.
- o Guide for the Care and Use of Laboratory Animals, revised 1972 second printing 1974. Committee on the Guide for Care and Use of Laboratory Animals. 1974.
- o Guide to Infectious Diseases of Guinea Pigs, Gerbils, Hamsters, and Rabbits. ILAR Committee on Laboratory Animal Diseases. Published in Vol. XVII No. 4, ILAR News. 1974.
- o 1974-1975 Directory. Institute of Laboratory Animal Resources Advisory Council and Committee Personnel. 1974.

V. ILAR COMMITTEE MEMBERSHIP AND STAFF FY 1975

ASSEMBLY OF LIFE SCIENCES

Dr. James D. Ebert, Chairman; Dr. Thomas D. Kennedy, Executive Director

DIVISION OF BIOLOGICAL SCIENCES

Dr. Donald Kennedy, Chairman; Dr. Russell B. Stevens, Executive Secretary.

INSTITUTE OF LABORATORY ANIMAL RESOURCES

Dr. Cluff E. Hopla, Chairman; Dr. Robert H. Yager, Executive Secretary; Dr. Charles B. Frank, Staff Officer; Dr. Nancy A. Muckenhirn, Staff Officer; Dr. John Tobie, Consultant; Ms. Lydia E. Koutze, Administrative Assistant; Ms. Delores Clonce, Secretary; Ms. Carmela F. Jackson, Secretary; Mrs. Ellen Jackson, Secretary; Ms. Andrea Lynn, Secretary.

ADVISORY COUNCIL

(* ILAR Executive Committee)

*Dr. Cluff E. Hopla, Chairman; Professor, Department of Zoology, University of Oklahoma, Norman, Oklahoma

Dr. Francis C. Cadigan, Jr., U.S. Army Medical Research and Development Command, Forrestal Building, Washington, D.C.

*Dr. Herman B. Chase, Division of Biological and Medical Sciences, Director, Institute of Life Sciences, Brown University, Providence, Rhode Island

Dr. Lester E. Fisher, Director, Lincoln Park Zoo, Chicago, Illinois

Dr. Charles E. Graham, Yerkes Regional Primate Research Center, Emory University, Atlanta, Georgia

*Dr. Joe R. Held, Director, Division of Research Services, National Institutes of Health, Bethesda, Maryland

Dr. Joseph J. Knapka, Veterinary Resources Branch, National Institutes of Health, Bethesda, Maryland

Dr. C. Max Lang; Professor and Chairman, Department of Comparative Medicine, Pennsylvania State University, Hershey, Pennsylvania

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Dr. Nancy S. Milburn, Dean of Instruction, Ballou Hall, Tufts University, Medford, Massachusetts

*Dr. Alvin F. Moreland, Professor, Division of Comparative Medicine, University of Florida College of Medicine, Gainesville, Florida

Dr. Elizabeth S. Russell, The Jackson Laboratory, Bar Harbor, Maine

*Dr. Dante G. Scarpelli, Chairman and Professor, Department of Pathology & Oncology, University of Kansas Medical Center, Kansas City, Kansas

Dr. John G. Vandenbergh, North Carolina Department of Mental Health, Raleigh, North Carolina

Dr. John E. Willson, Assistant Director, Johnson & Johnson Research Foundation, New Brunswick, New Jersey;

COMMITTEE ON ANIMAL MODELS AND GENETIC STOCKS

Dr. Dante G. Scarpelli, Chairman and Professor, Department of Pathology & Oncology, University of Kansas Medical Center, Kansas City, Kansas

Dr. W. Jean Dodds, Associate Research Scientist, Division of Laboratories and Research, New York State Department of Health, Albany, New York

Dr. August Epple, Associate Professor of Anatomy, Jefferson Medical College of Thomas Jefferson University, Philadelphia, Pennsylvania

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Dr. John C. Harshbarger, Registry of Tumors in Lower Animals, National Museum of Natural History, Smithsonian Institution, Washington, D.C.

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Dr. T. C. Jones, New England Regional Primate Research Center, Harvard Medical School, Southboro, Massachusetts

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Dr. Norman D. Reed, Immunobiology Unit, Department of Micro-
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Dr. Richard W. Thorington, Jr., Smithsonian Institution, Museum of Natural History, Washington, D.C.

Dr. John G. Vandenbergh, North Carolina Department of Mental Health, Raleigh, North Carolina

COMMITTEE ON GUIDE FOR THE CARE AND USE OF LABORATORY ANIMALS

Dr. Alvin F. Moreland, Professor, Division of Comparative Medicine, University of Florida College of Medicine, Gainesville, Florida

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Dr. Hulda Magalhaes, Professor, Department of Biology, Bucknell University, Lewisburg, Pennsylvania

Miss Joan Staats, Staff Scientist and Librarian, The Jackson Laboratory, Bar Harbor, Maine

Dr. George Yerganian, Research Associate, Children's Cancer Research Foundation, Children's Hospital Medical Center, Boston, Massachusetts

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Dr. Marion Roger Fedde, Department of Physiological Sciences, Kansas State University, Manhattan, Kansas

Dr. Jack P. Hailman, Department of Zoology, University of Wisconsin, Madison, Wisconsin

Dr. Wilbor O. Wilson, Chairman, Department of Avian Sciences, University of California, Davis, California

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Dr. James E. Corbin, University of Illinois, Urbana, Illinois

Dr. Neal S. Nelson, Environmental Protection Agency, Criteria Standards Division, Washington, D. C.

Dr. John Post, Associate Professor, Department of Pathology, New York State Veterinary College, Cornell University, Ithaca, New York

Dr. Nickolas J. Sojka, Director, Vivarium, University of Virginia School of Medicine, Charlottesville, Virginia

Dr. Neil B. Todd, Carnivore Genetics Research Center, Newtonville, Massachusetts

ORGANIZING COMMITTEE FOR THE SYMPOSIUM ON THE FUTURE OF LABORATORY ANIMALS, CELLS, MODELS, AND SYSTEMS

Dr. George T. Harrell, 2010 Eastridge Road, Timonium, Maryland

Dr. Charles Edward Cornelius, Dean, College Veterinary Medicine, Kansas State University, Manhattan, Kansas

Dr. Victor A. Drill, G. D. Searle & Company, Chicago, Illinois

Dr. William I. Gay, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Bethesda, Maryland

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Dr. Bernard F. Trum, Director, New England Regional Primate
Research Center, Harvard Medical School, Boston, Massachusetts

VI. FINANCIAL SUPPORT, 1 July 1974 - 30 June 1975

<u>Contractors</u>	<u>Contract</u>
American Cancer Society, Inc.	RC-1Q
Atomic Energy Commission	AT(11-1)-3369
U. S. Army Medical Research and Development Command	DADA17-71-C-1117
National Institutes of Health	PH43-64-44
National Institutes of Health National Heart and Lung Institute	74-C-799
National Institutes of Health National Heart and Lung Institute	N01-HV-42974
National Institutes of Health National Cancer Institute	N01-CP-45617
National Institutes of Health National Cancer Institute	N01-CP-3338
National Science Foundation	C310(T.O. 173)
U. S. Air Force	N00014-67-0244-0016, NR202-010
U. S. Army Medical Research and Development Command	"
Office of Naval Research	"
U. S. Department of Agriculture Agriculture Research Service	12-16-140-155-91

Private Contributions

Abbott Laboratories
Bio-Science Laboratories
Burroughs Wellcome Company
The Charles River Breeding Laboratories, Inc.
Flow Research Animals, Inc.
Hoffmann-LaRoche, Inc.
The Lilly Research Laboratories

Merck Sharp & Dohme Research Laboratories
Microbiological Associates, Inc.
Ortho Research Foundation Pfizer, Inc.
Primate Imports Corporation
Schering Corporation
Smith Kline and French
The Upjohn Company
Wyeth Laboratories, Inc.