

THE PHYSIOLOGIST



A Publication of the American Physiological Society

Volume 30, Number 3

June 1987

EDITORIAL

A Monkey Off Our Back

After six years, the Supreme Court finally has taken a monkey off the back of the research community. The rejection of the animal rights groups' challenge confirmed a lower court ruling that animal advocates lack legal standing to challenge federally financed medical experiments using animals. Finally, the threat of standing has been removed from the armamentarium of the animal activist groups.

Despite this decision, the battle for the Silver Spring monkeys is not yet over. As long as National Institutes of Health is paying the bills for the monkeys, the animal rights groups will be trumpeting the use of federal funds to support these animals. The next step for the scientific community is to get the monkeys off the public dole. With the cooperation and assistance of several other societies/associations, APS is working to transfer support to private sources, thereby getting that monkey off NIH's back.

Unfortunately, the Silver Spring monkeys are only one of several issues used by animal activists in their attempt to convince the public that medical researchers are insensitive to animal pain and suffering. There have been numerous cases of laboratory break-ins and confiscation of videotapes that have enabled the news media to focus on the negative rather than the positive side of medical research. As a result, the People for Ethical Treatment of Animals has seen a phenomenal increase in membership and financial support, creating an extremely potent political force.

The power of the animal rights groups is now being redirected away from labo-

Sixtieth President of APS

Harvey V. Sparks, Jr.



Harvey V. Sparks, Jr., M.D., is the 60th President of the American Physiological Society. Dr. Sparks, who has been active in Society affairs since 1970, succeeds Dr. Franklyn G. Knox as the APS's chief elected officer.

Born in Flint, Michigan, Dr. Sparks received his M.D. degree cum laude from The University of Michigan in 1963. While a medical student, he worked with Dr. David F. Bohr. He then did postdoctoral work with Dr. A. Clifford Barger at Harvard Medical School and Dr. Bjorn Folkow at the University of Goteborg in Sweden. In 1966 he returned to The University of Michigan as an Instructor in the Department of Physiology, where he established a research laboratory for the study of the local regulation of blood flow. He also became involved in medical education, serving as Assistant Dean for Admissions and as Chairman of the Steering Commit-

tee of The University of Michigan's Integrated Premedical-Medical Program. He became a Professor of Physiology in 1974. In 1979, Dr. Sparks became Professor and Chairman of the Department of Physiology at Michigan State University. During the 1986-1987 academic year, he is Visiting Professor of Physiology at the University of Zimbabwe.

Although his research has touched on many aspects of vascular physiology, Dr. Sparks' main interest has been the mechanisms of active hyperemia in heart and skeletal muscle. His recent work has focused on the role of adenosine, but he has also done studies on potassium ion, prostaglandins, O_2 , CO_2 , and the myogenic mechanism. His interest in the regulation of the interstitial concentration of these metabolites has led to the use of mathematical models describing their capillary transport. He has authored over 90 publications on these and related topics.

Within the American Physiological Society, Dr. Sparks has served as a member of the Porter Development Committee, Governmental Affairs Network, Liason Committee with Industry, Program Executive Committee, Centennial Committee, and as Chairman of the Committee on Committees. He has been a member of Council since 1984. He served on the editorial board of *Federation Proceedings*, representing APS. He was Chairman of the Cardiovascular Section in 1983-1984 and served on the editorial board of the *American Journal of Physiology* from 1974 to 1986. He co-edited the *Handbook of Physiology* on vascular smooth muscle.

Dr. Sparks has served on the editorial boards of *Annual Review of Physiology*,

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EDITORIAL

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ratory break-ins to the political arena. Legislators at the local, state, and federal levels respond to their individual constituents. Because most members of the public never write their representatives, those that do express their opinion, the vocal minority, can exert undue influence on legislative decisions. Although over 72% of the American public endorses the use of animals in medical research, most of the letters received by the Congress are opposed to their use. Having been involved in the Viet Nam protests, I am continually shocked to hear that in 1982, Congress received more letters opposed to animal use than were received by Congress opposing the war during the Viet Nam war.

APS members *must not* be complacent because of the Supreme Court decision. We *must not* think that animal rights activists will slink back in their holes and leave researchers alone. Instead, it is time for scientists to take the offensive. Armed with the Supreme Court decision and victories in Jackson, MS, Sierra Vista, AZ, and Tampa, FL, to name a few, we must begin a dialogue with our elected representatives. As Harold Modell learned from Rep. Mike Lowry, his representative from Seattle, "there is a very determined minority working on this issue and it is rare to hear from the other side, so your letter is especially welcome." For those of you who failed to communicate with your elected representatives during the Centennial Meeting, remember that there is still time to write. With the assistance of Bill Samuels in the APS office, we can help you identify bills that might impede the alleviation of disease.

The time has come for all medical re-

searchers to stand up and be counted. From coast to coast, elected representatives are pleading for input from their constituency. Without our voice explaining why animals are important, the animal activists will succeed in closing down research facilities nationwide through restrictive legislation.

Just as President Reagan wants his inspector generals to be meaner than a junkyard dog, it is time for biomedical researchers to behave the same way. While one monkey is off our back, there are others waiting to jump on. We must remember that the animal rights activists are at the gate. It is time to fight back.

Martin Frank

SPARKS

(Continued from p. 33)

Blood Vessels, and *Pflügers Archiv* and as a member of review committees of the National Institutes of Health. He has participated in the activities of the American Heart Association as a member of the Executive Committee of the Council on Circulation and a Research Study Committee. His interest in medical education has continued as indicated by his membership on accreditation survey teams of the Liaison Committee on Medical Education, the National Board of Medical Examiners, and on one of the Working Groups that produced the GPEP Report. He has also written two texts for medical students. His commitment to the promotion of use of animals in research is evidenced by his membership on the Board of Directors of the Michigan Society for Medical Research. Dr. Sparks is the recipient of a Fulbright Lectureship for the purpose of promoting graduate research training at the University of Zimbabwe. ¶

The Physiologist
Published bimonthly and
distributed by

The American Physiological Society
9650 Rockville Pike
Bethesda, Maryland 20814

ISSN 0031-9376

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Subscriptions: Distributed to members as part of their membership; nonmembers and institutions, \$25.00 per year in the United States; elsewhere \$35.00. Single copies and back issues when available, \$5.00 each; single copies and back issues of Fall Abstracts issue when available, \$20.00. In 1987 subscribers to *The Physiologist* will receive it and the abstracts of the Fall Meeting of the American Physiological Society. The American Physiological Society assumes no responsibility for the statements and opinions advanced by contributors to *The Physiologist*.

Deadline for submission of material for publication: Dec. 5, February issue; Feb. 5, April issue; April 5, June issue; June 5, August issue; Aug. 5, October issue; Oct. 5, December issue. If you change your address or telephone number, please notify the central office as soon as possible.

APS Election Results

Aubrey E. Taylor, Professor and Chairman of the Department of Physiology, University of South Alabama School of Medicine, Mobile, will become President-Elect July 1, 1987. The new Councillor elected for a four-year term is Vernon Bishop, Professor of Cardiovascular Pharmacology, University of Texas Health Science Center, San Antonio.



An Assessment of NHLBI Requests for Applications

Carl A. Roth

*Chief, Program Analysis and Evaluation Branch
National Heart, Lung, and Blood Institute*

A Request for Applications (RFA) is currently defined by the National Institutes of Health (NIH) Manual as "a formal statement which

- invites grants or cooperative agreement applications in a well-defined scientific area to accomplish specific program purposes;
- indicates the amount of funds set aside for the competition and/or the estimated number of awards to be made;
- identifies generally only one application receipt date."

This paper presents a series of retrospective analyses of data relating to RFAs sponsored by the National Heart, Lung, and Blood Institute (NHLBI). The first section focuses on the development of RFA concepts. The origins of RFA ideas, the rationales advanced to support the issuance of RFAs, and the kinds of research expected to be supported by RFAs are briefly discussed. The next section is concerned with the response of the research community to issued RFAs. Specifically, data are presented that reflect the quantity and quality of RFA applications as well as the kinds of research actually funded under RFAs. Summarized in the concluding section are analyses of data relevant to the outcomes of RFAs. Although the analyses do not directly address the issue of the degree to which RFAs are successful in attaining their stated objectives, obtainable quantitative measures, such as renewal rates for RFA grants and publications derived from RFA grants, do offer some insight into the impact of NHLBI RFAs.

Development of RFAs

Although a number of NIH solicitations for grant applications before 1975 would qualify as RFAs under the current definition, the first NIH solicitation actually designated as a "Request for Applications" was issued by the NHLBI in October 1975. Since that first issuance, the NHLBI has regularly included proposals for RFAs in the implementation plans it presents to the National Heart, Lung, and Blood Advisory Council for review and concurrence. (A comprehensive list of NHLBI RFAs is available from the author on request.)

Source of RFA Concept

The NHLBI has had in place for some time a formal process that is followed by each of its extramural program divisions in planning, developing, and implementing all program initiatives, including proposals for RFAs. As noted in the current NHLBI policy statement regarding the evolution of Institute initiatives, suggestions for potential initiatives arise from a range of sources. That assertion was confirmed by an examination of the "Project Origin" section of RFA program initiatives developed by the NHLBI. Among the most frequently appearing sources were 1) Institute advisory committees, 2) recommendations from workshops and conferences, 3) ad hoc advisory groups to the Institute and Institute-assembled task forces, and 4) Institute staff.

Justification for RFA Issuance

All RFA concepts, whatever their source, are proposed because of some perceived research need or opportunity. The particular reason for advancing a given RFA concept for consideration by the Institute initiative review process is summarized in the "Need and Justification" section of the initiative documentation. Not surprisingly, the need and justification section in most of the previous RFA initiatives prepared by the Institute focused in some manner on the inadequacy of the present knowledge base and/or the inadequacy of the current research activity.

Among recent program initiatives for RFAs, it has begun to be common practice to identify the number of regular research project grants presently addressing the subject area. The data are certainly limited, so no summaries are possible, but where such data have been included, the numbers have invariably supported an assertion of inadequate current research activity. An assertion that current knowledge is inadequate may not be so easily verified quantitatively. However, all such assertions are either advanced by or endorsed by an Institute advisory committee composed of acknowledged experts in relevant research areas.

Research Orientation of RFAs

When classified as either applied research (including clinical research), basic research, or both, the distribution of RFA

initiatives varied considerably among the program areas of the Institute. Data for the Institute and for the individual program areas of the Institute are presented in Figure 1. For the Institute, over half of the RFA initiatives described a solicitation for basic research, one-quarter of them sought applied research, and the remaining 20% sought both applied and basic research. The distribution of lung program RFAs differed markedly from the overall distribution for the Institute and the distributions for both the heart and blood programs: over 90% reflected a basic orientation. In contrast, neither the heart nor the blood program issued more than one-half of their RFAs with a primarily basic science orientation.

Response to RFAs

Applications Responding to RFAs

Applications responsive to the Institute's RFAs have received approval and award rates comparable to those for new (type 1) applications for regular research project grants (R01s). Figures 2A-C compare the rates of approval (approved/applied), award (awarded/approved), and success (awarded/applied) for RFA applications and type-1 R01 applications from FY 1976 through FY 1986. The approval rate for R01 applications was higher than for RFA applications in all but two of the years, and in those years the difference was minimal. Aggregated over the entire period, the approval rates for the type-1 R01 applications and the RFA applications were 76.6 and 66.9, respectively.

Except for FY 1977, the award and success rates for RFA applications remained below those for type-1 R01 applications until FY 1984. As a result of the higher award and success rates for RFAs between FY 1984 and FY 1986, the overall award rates for RFA applications (33.0%) and type-1 R01 applications (33.2%) were essentially equal for the period between FY 1976 and FY 1986, as were the success rates (22.1% and 25.4%, respectively).

Priority Scores for RFA Applications

Figure 3 compares the last paid priority scores for all type-1 applications for research support (regular research grants, new investigator awards, small business innovation research grants, program proj-

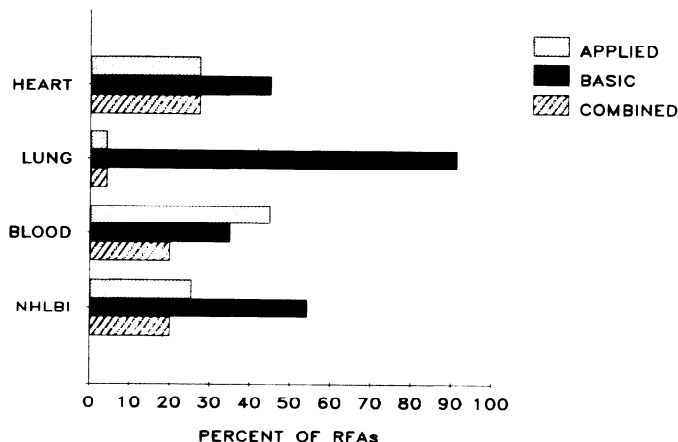


Fig. 1

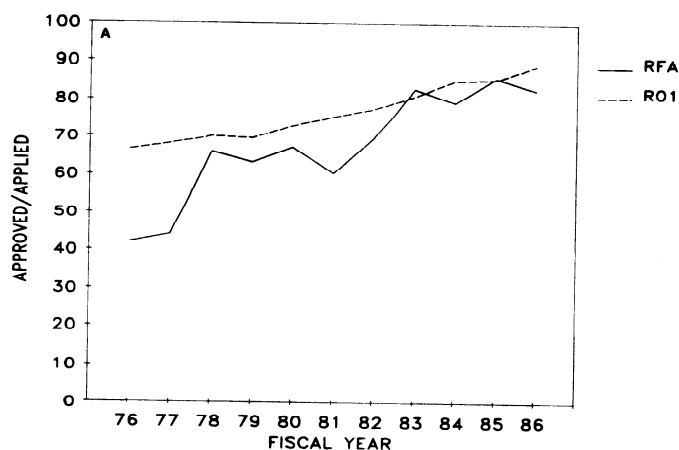


Fig. 2A

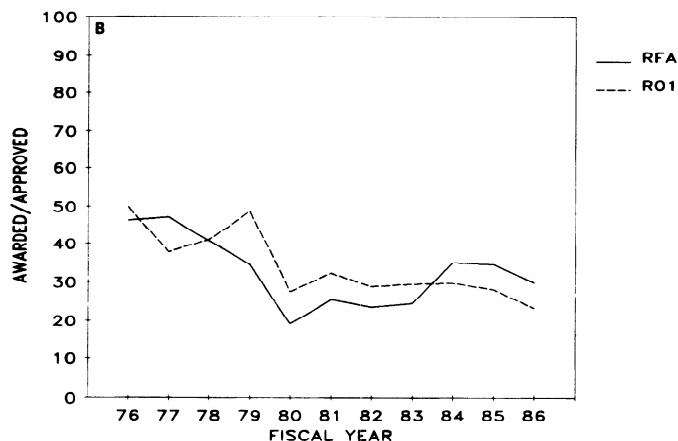


Fig. 2B

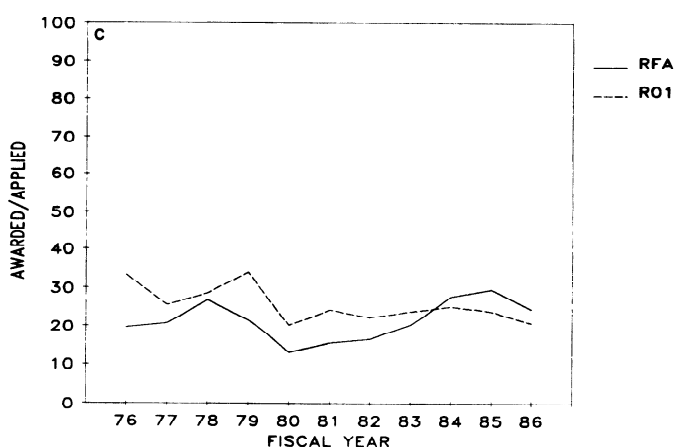


Fig. 2C

ect grants, and cooperative agreements) and all type-1 regular R01s with those of grants paid under RFAs for the period beginning in FY 1976 and ending in FY 1986. Although the last paid score is an admittedly crude measure of comparative quality, it does indicate that RFAs are paid within the same general range as are other NHLBI-supported research activities.

Research Orientation of RFA Grants

The apparent basic science emphasis of RFA initiatives is reflected in the nature of the grants funded as a result of the solicitations. NIH regularly reports to the National Science Foundation on the distribution of its support among the following categories of scientific research: science base, applied, and technology transfer. NHLBI grants and contracts are coded by Institute staff according to their relative emphasis on each of the three areas. Figure 4 summarizes the distribution of codes for NHLBI RFAs among the science base, applied, and technology transfer categories. The emphasis on basic science is pronounced: nearly 84% of the coded Institute RFA grants were science base, and even the program with the highest relative commitment to applied research still had almost three-quarters of its RFA grants coded as science base. Moreover, the rel-

ative order in the proportion of RFA initiatives allocated by the Institute's program areas to basic science was maintained in the resultant grants. As might be expected from the relative priorities of the three program areas of the Institute, the proportion of basic science RFAs was highest in the lung program while the proportion of applied RFAs was highest in the blood program.

Outcome of RFAs

The following discussion of RFA outcomes is limited to a survey of accessible quantitative measures of program performance. The measures are indirect; they do not directly address the issue of the degree to which RFAs have been successful in attaining the objectives specified for them at the time of their inception. Despite this major limitation, the data do provide an important perspective on the NHLBI's use of the RFA mechanism.

RFA-Related Research

The impact of an RFA is not limited to the grants it directly supports. As with regular R01 applications, applications responsive to an RFA that receive priority scores beyond the pay line are frequently amended and resubmitted. However, be-

cause RFAs provide for only one receipt date, amended RFA applications must be submitted and reviewed as regular R01 applications. It follows that the NHLBI-supported research activity derived from an RFA is at least equal to the sum of the directly funded RFA grants and the amended RFA applications that successfully compete for regular R01s.

Figure 5 shows the rate at which unsuccessful applicants for RFA support reapply for and receive regular R01 awards. Between FY 1976 and FY 1985, nearly 10% of unsuccessful RFA applications were resubmitted as amended applications. Approximately 20% of those applications were eventually funded, resulting in a total of 39 additional awards addressing RFA-related topics. Over the same period, a total of 548 awards were directly supported by RFAs, so that the additional awards extended the total number of RFA-related awards by over 7%.

Continuation of RFA-Supported Research

Competitive renewals of research projects initiated in response to an RFA are significant primarily because they assure an extension in time of the influence of an RFA. In addition, applications for competitive renewals indicate an interest among

researchers in an extended commitment to the RFA subject area. Success in obtaining competitive renewals indicates that research projects initiated in response to an RFA are favorably reviewed when in open competition with other investigator-initiated research project applications.

Figure 6 compares the population of new RFA grantees in a given year with the population of grantees who received type-1 R01s in the same year in terms of the frequency with which they apply for and receive competitive renewals. On both measures, the RFA grantees are comparable to the recipients of regular R01s. As an aggregate over the period between FY 1976 and FY 1983, 63.8% of RFA grantees applied for competitive renewals as compared with 70.3% of the type-1 R01 recipients. Those application rates resulted in renewal rates (number renewed/number originally funded) of 32.0% for RFA grantees and 36.2% for the type-1 R01 awardees.

Publications Derived from RFA-Supported Research

Publications citing RFA grant numbers were retrieved from Medline for RFAs awarded by the NHLBI between FY 1979 and FY 1982. The retrieval was limited to

those years for two reasons: 1) Medline only began capturing Public Health Service grant and contract numbers in January 1981 so it is quite likely that a significant number of publications arising from RFAs issued earlier than FY 1979 would not be retrievable, and 2) the grant periods for awards made after FY 1982 would have just expired so that many of the publications derived from the RFA grants would not yet be in print. Accepting that RFA-derived publications without grant support acknowledgements are not retrievable and that there is no simple way of distinguishing between publications arising from an initial RFA grant and publications arising from a competitive renewal of an RFA grant, it is still possible to conclude that RFA grants have resulted in a substantial contribution to the scientific literature.

A total of 152 grants were supported as a result of the 23 selected RFAs. Despite the fact that no publications were found for 16 of the grants, 717 publications were identified in Medline that cited support from RFA grants. Even if the most negative possible assumption is made about the grants for which no publications were identified, i.e., that no publications arose from those grants, the RFA grants would still have produced approximately 4.7 pub-

lications per grant. The publication output per RFA grant would be somewhat lower if publications arising from competitive renewals could be excluded. However, only 27.6% of the grants obtained competitive renewals, so that a substantial proportion of the publications can be attributed solely to the initial RFA grants.

An approximation of the publication rate arising solely from the initial RFA grant can be obtained by considering only those grants without competitive renewals. Of course, grants that qualify for competitive renewals have been adjudged by peer review to be productive research efforts and are therefore likely to have produced more publications during the award term than unrenewed grants. Still, even if it is again assumed that no publications arose from grants without citations in Medline, the average number of publications per grant was only reduced by one to 3.7.

For the overwhelming majority of RFA-supported publications, the RFA grant was not the only acknowledged source of support. Nearly three-quarters (73.5%) of the papers acknowledging RFA grant support also acknowledged support from at least one other NIH grant or contract. Overall, publications acknowledging RFA support averaged 2.2 support acknowledgements.

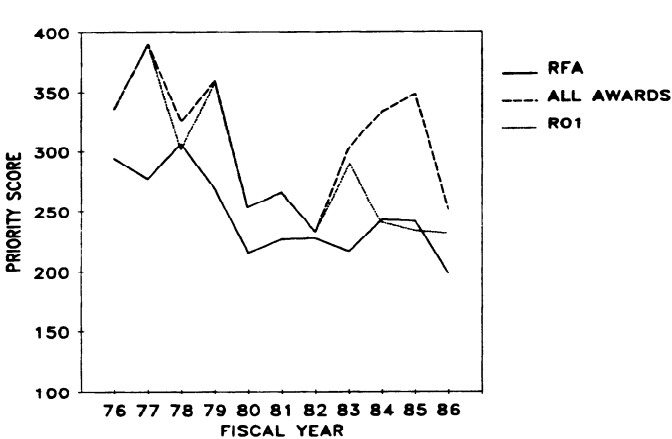


Fig. 3

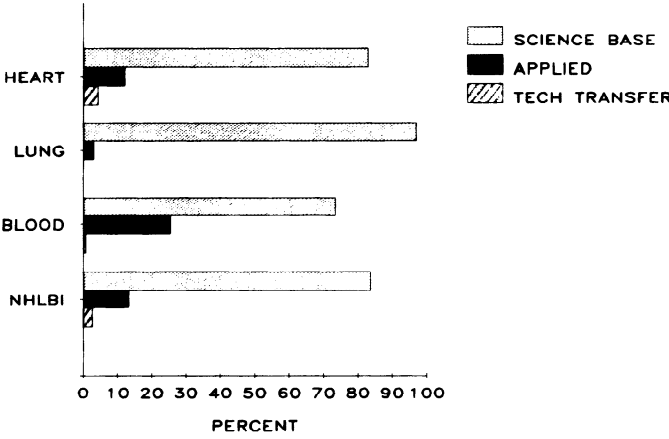


Fig. 4

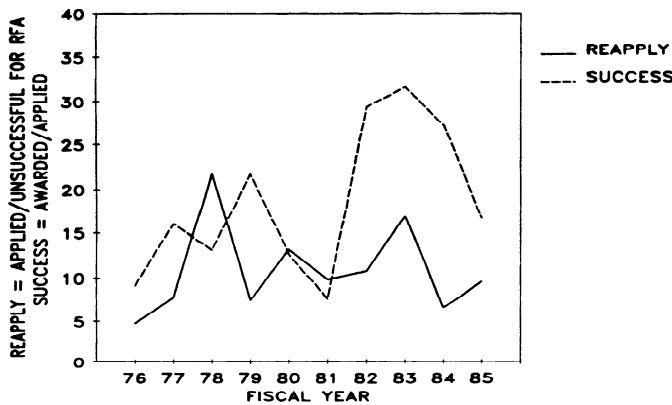


Fig. 5

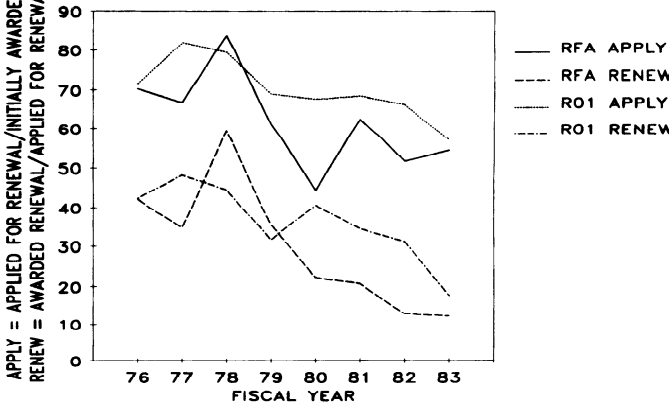


Fig. 6

Whereas ~57.7% of the RFA-supported publications acknowledged other NHLBI support, acknowledgements of support from other components of NIH appeared in 26.4% of them. One possible interpretation of the apparent availability of additional sources of support is that RFA research areas may have received some attention without the issuance of the RFA. However, if sufficient numbers of other NIH grants were directly addressing a given RFA subject area, it is unlikely that the Institute would have issued the RFA. Another possible interpretation of the multiple sources of support is that aspects of the research conducted by RFA grantees are meritorious enough to attract additional peer-reviewed research support.

Research Orientation of Publications Arising from RFAs

The publications resulting from RFA grant support provide a further perspective on the type of research sponsored by RFAs. One approach to bibliometric analysis attempts to characterize the research described in publications by the journals in which the publications appear. Computer Horizons, Inc., a leading practitioner of bibliometric analysis, has assigned re-

search "levels" to most of the leading clinical and biomedical journals to reflect their relative position in the spectrum between clinical and basic science. The level scale ranges from 1 to 4. Verbal descriptions of the four levels and representative journals for each level are listed in Table 1.

Figure 7 shows the distribution of RFA publications over the four research levels for the years in which the publications appeared. Throughout the period, the RFA publications tended to be heavily concentrated in the journals more oriented toward fundamental investigation. This pattern is consistent with the emphasis on basic science noted among RFA initiatives and with the preponderance of science base among RFA grants.

The distribution of research journal levels is also fairly consistent with our earlier analyses when RFA publications are compared according to the originating program of the RFA. As may also be seen in Figure 7, the publications citing lung RFA grants have the highest concentration in the level 4 journals, whereas the publications citing blood RFA grants show the highest concentration in the level 3 journals. Overall, however, there was little difference among the research programs of the Institute in

terms of the percentage of papers that appeared in level 3 and 4 journals.

In an independent effort, Computer Horizons, Inc., conducted a bibliometric survey of research publications appearing between 1973 and 1980 that indicated NHLBI support. Figure 8 compares the distribution over research levels of the RFA publications with NHLBI-supported papers that appeared in the periods between 1973 and 1976 and between 1977 and 1980. Even if the publications that appeared in unclassified journals are assumed to be in level 1 or 2 journals, the RFA publications are notably more concentrated in journals with a basic science orientation.

Citations to Publications Arising from RFA Grants

One measure of the attention received by a research publication is the frequency with which it is cited in other later research publications. Figure 9 shows the average number of citations (excluding self-citations) received by RFA publications. The data are displayed according to the year in which the publications appeared. Obviously, the number of citations a paper receives depends on the number of years that have elapsed since its publication.

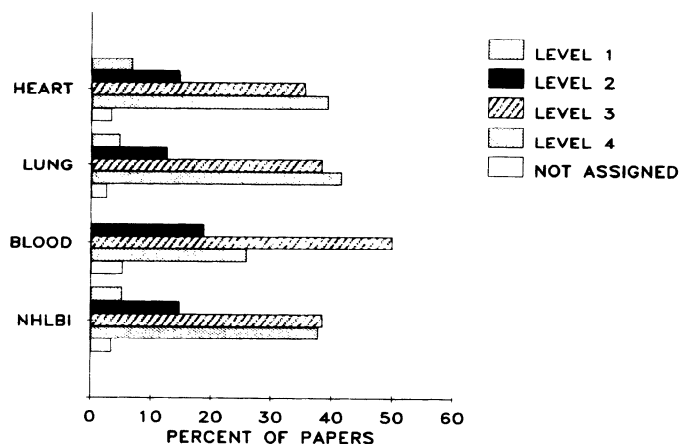


Fig. 7

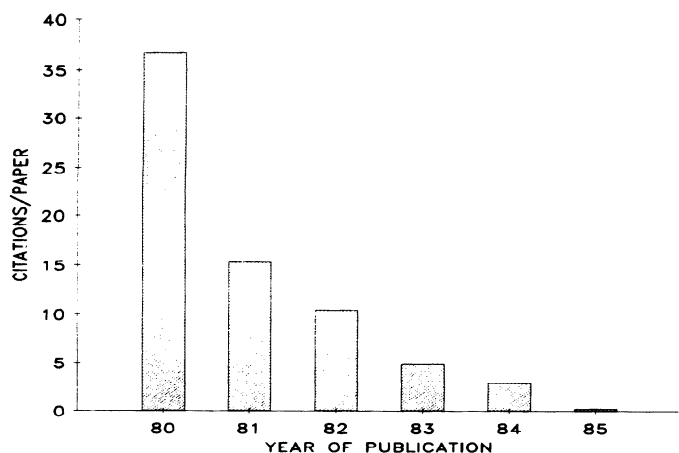


Fig. 9

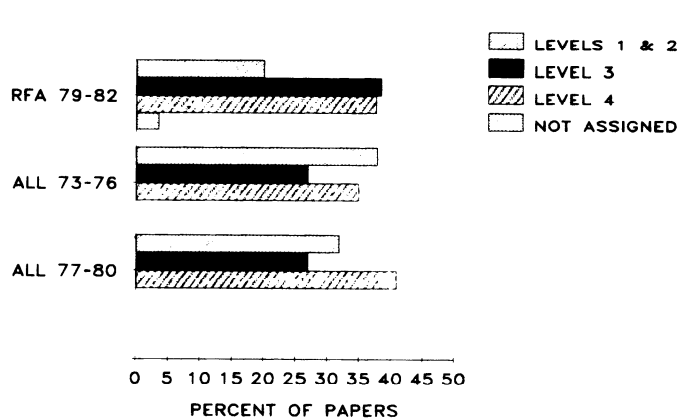


Fig. 8

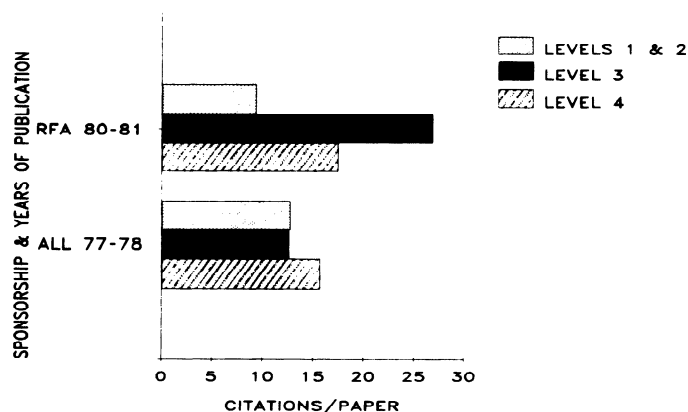


Fig. 10

TABLE 1. Biomedical Research Journals: Level Descriptions and Prototypes

Level	Description	Prototype Journal
1	Clinical observation	<i>Journal of the American Medical Association</i>
2	Clinical mix	<i>New England Journal of Medicine</i>
3	Clinical investigation	<i>Journal of Clinical Investigation</i>
4	Basic research	<i>American Journal of Physiology</i>

Even without resorting to a comparison, the 1980 and 1981 RFA publications appear to have received a relatively high number of citations. This view is reinforced when the combined figures for 1980 and 1981 are compared with citation data from the Computer Horizons, Inc., study of NHLBI-supported research papers. The study estimated that, within the seven years following their publication, NHLBI-supported papers in clinical medicine and biomedical research would average 13.8 citations. In a shorter time period, the 1980 and 1981 RFA publications received an average of 20.0 citations. As may be seen in Figure 10, the higher citation rate for all RFA publications is due to the higher citation rates for the RFA publications that appeared in the level 3 and level 4 journals

Summary

Requests for Applications have frequently been initiated by the NHLBI in response to suggestions from members of its advisory committees and from other representatives of the research community. They have generally been issued because of either a need for additional knowledge or a need for expanded research activity in a given scientific area. Overall, NHLBI RFAs have manifested an intent to support basic science and they have been success-

ful in doing so. The basic science emphasis is apparent in both the grants issued under the RFAs and the publications that resulted from the grants. The community response to NHLBI RFAs has resulted in approval and award rates for RFAs comparable to those for type-1 applications for regular R01s. Priority scores for RFA applications have been within the range of scores for other type-1 research activities supported by the Institute.

The impact on the research community of NHLBI RFAs extends beyond the initial funding of grants. Significant numbers of unsuccessful RFA applications subsequently received funding when they were revised and submitted as regular research project grants. In addition, RFA grantees applied for and received competitive renewals at rates generally comparable to those for R01s.

Substantial numbers of research publications have appeared in the scientific literature with acknowledgements of support by NHLBI RFA grants. Nearly three-quarters of the papers acknowledging RFA grant support also acknowledged support from at least one other source of NIH support. The numbers of citations received by RFA publications compares very favorably with available data relating to all NHLBI-supported research. Φ

APS NEWS

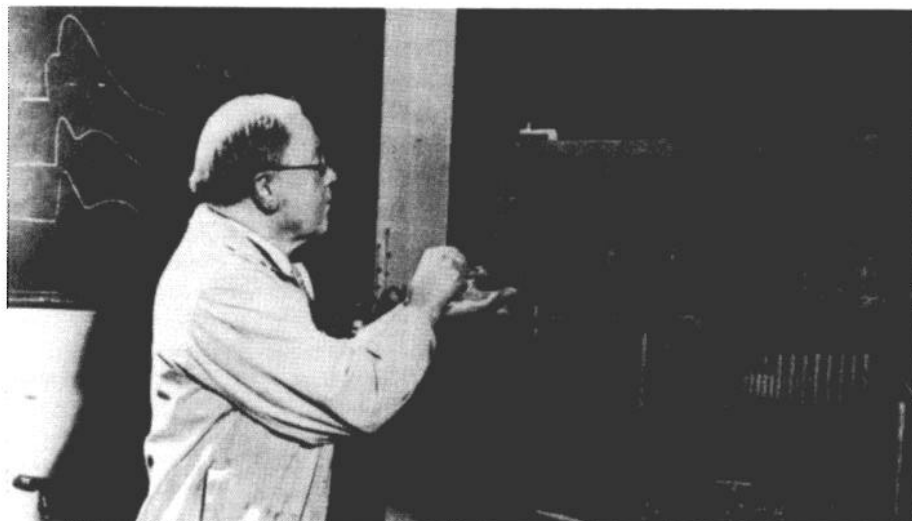
The Need for Basic Research

The need for basic research is perhaps illustrated in an amusing way by a story which I am told has been going the rounds of the Navy recently. A man called up a veterinarian about his sick cat, and described its symptoms. The veterinarian understood calf for cat and prescribed a pint of castor oil which was duly administered (more or less). Some days later the veterinarian met his client and inquired about the welfare of the patient. The man threw up his hands in despair and said that the cat had had a hard time and had enlisted the assistance of three other cats. One was digging holes for him, the second was covering them up and the third was way out in front opening up new territory. We probably need and should have two applied researchers for every one in research but we cannot do without the latter, the fellows who are out in front opening up new fields, developing new interpretations, new products, new ideas, and new methods. How few of the papers in our scientific journals are really original and new, in the sense that the theory of relativity, for example, is new? Yet one such good new idea is worth a thousand others because it stimulates a flood of new work.

Excerpt from Past President's address given by Wallace O. Fenn at the first APS Fall Meeting, September 16, 1948. Reprinted from *Am. J. Physiol.* 159: 553, 1949.

History of Physiology Exhibit Booklet

The National Library of Medicine has published an illustrated booklet, "A Century of American Physiology," in conjunction with an exhibit of books, articles, and photographs displayed in the lobby of the National Library of Medicine from February to April 1987. The exhibit and booklet were prepared by the Library's History of Medicine Division with the cooperation of the American Physiological Society in commemoration of the Society's Centennial. The booklet highlights those important contributions of Americans to physiology that were featured in the exhibit, covering the period from the beginnings of the sciences in this country to about the middle of the twentieth century. Single copies of the publication may be obtained without charge by writing to the Chief, History of Medicine Division, National Library of Medicine, 8600 Rockville Pike, Bethesda, MD 20894.



Walter B. Cannon in his laboratory at Harvard Medical School, 1940 (APS Photo Collection, donated by J. H. Wills).

1987 Fall Symposia Preview

San Diego, CA

Theme I—Hypoxia & Hypometabolism

Session I: Physiological and Biochemical Correlates of Hypometabolism

J. Fields, K. B. Storey, S. Hand, J. Duman, F. N. White, and P. Hochachka.

Research on hibernation in mammals, estivation in reptiles, amphibians, teleosts, insects, and mollusks, overwintering in insects, facultative anaerobiosis, and diving mammals has shown that a reduction in metabolic rate is a common adaptation to these profound physiological stresses. This common denominator may be mediated by common physiological and biochemical mechanisms. These might include similar properties of enzymes involved in controlling metabolism, similar responses to intracellular pH, similar responses to carbon dioxide, and some mechanism for maintaining the integrity of cell membranes. The objective of this symposium is to explore some of the physiological and biochemical correlates of hypometabolism on a comparative basis.

Session II: Adaptations to Hypoxia: Fish, Amphibians, and Reptiles

D. J. Randall, R. Boutilier, M. Glass, W. K. Milsom, and S. Wood.

Variations in oxygen levels in the body are frequent in fish, amphibia, and reptiles due either to periodic breathing or to environmental hypoxia, common in aquatic ecosystems. These animals have a myriad of responses to short- and long-term hypoxia; these will be discussed in this symposium. Oxygen transport will be the focus of attention. Behavioral responses to hypoxia are of significance in these animals and so this aspect is also included in our program.

Session III: Oxygen Transport in Birds at Altitude: Atmosphere to Tissue

F. L. Powell, R. B. Banzett, L. A. Maginniss, O. Mathieu-Costello, and P. Scheid.

It is generally held that birds tolerate altitude better than mammals. Bar-headed geese have been seen in migratory flights over the peaks of Mt. Everest and K2. This is amazing not only because of the low O₂ availability at such altitudes but also because flight requires very high levels of O₂

consumption. This symposium focuses on physiological mechanisms of O₂ delivery in birds, especially as they are relevant to avian abilities at altitude.

Session IV: Adaptations to Hypoxia in Mammals and Man

J. B. West, G. Schmid-Schonbein, J. S. Ingwall, G. Gutierrez, P. D. Wagner, and D. C. Wilford.

The symposium will discuss adaptations to hypoxia in mammals and man from a broad interdisciplinary standpoint.

Session V: Limits of Gas Exchange and Transport in the Invertebrates

L. E. Burnett, C. R. Bridges, and P. L. deFur.

The purpose of this workshop is to review the current status of the response of gas exchange and transport systems in the invertebrates when they are confronted with factors that push the systems to their limits. This format is preferable to a symposium, because it will enable the speakers to present a more concise treatment of the subject to an audience consisting of physiologists who work largely with non-invertebrate species. In addition, this workshop will complement nicely other symposia on limitations to gas exchange and transport that have been proposed for this meeting.

Theme II—Neural Principles of Pattern Generation

Session I: J. Feldman, P. Getting, K. Pearson, and A. I. Selverston.

Session II: J. Feldman, W. J. Schwartz, A. C. Bekoff, J. B. Waverley, and E. Knobil.

Session III: R. Lydic, J. Feldman, E. Marder, F. Morales, and W. Kristan.

These sessions will focus on recent work concerning the cellular and molecular mechanisms implicated to be causally involved in the generation of rhythmic physiological events. The neurobiological basis for physiological rhythms is commonly attributed to pattern generating neurons. The central pattern generator concept offers an explanatory model for investigating the cellular mechanisms underlying pro-

cesses as diverse as locomotion, respiration, feeding, and reproduction. One goal of these sessions is to identify common ionic, membrane, synaptic, or metabolic properties that may be shared by central pattern generating neurons. Toward that end, these sessions will bring together investigators working with invertebrate and vertebrate models of pattern generation. The influence of sensory feedback on central pattern generating neurons will also be addressed and a workshop using biologically viable material will demonstrate state-of-the-art techniques for studying pattern generating cells.

Session IV: Neural Network Models and Mechanisms of Parallel Distributed Processing

E. Fetz, J. A. Anderson, J. J. Hopfield, D. W. Tank, and T. J. Sejnowski.

This symposium will focus on neural mechanisms of parallel distributed processing in the nervous system, as elucidated by computer network models. A fundamental unresolved issue in systems neurophysiology concerns the principles of distributed information processing in large populations of neurons. Cell recordings in animals provide valuable but very limited insights into the ensemble behavior of neural networks. In contrast, model networks can be completely specified and their capacities systematically investigated as a function of network properties. Recent years have witnessed an explosive increase in experimental and theoretical work on neural network modeling. The members of this panel are among the pioneers in the field whose work has contributed to major advances in understanding mechanisms of distributed processing.

THEME III—Molecular Kinetics in the Cardiovascular System

Session I: Selected Ionic Currents of the Heart

N. Sperelakis, D. Clapham, D. Di Francesco, W. Giles, J. Lederer, B. Bean, and J. Hume.

This symposium will focus on some of the more recently discovered ionic currents in different types of heart cells, in-

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cluding pacemaker cells and ventricular myocardial cells. The currents to be discussed include the acetylcholine-activated K^+ current, the hyperpolarization-activated pacemaker current, I_f (I_H), the transient outward current, I_{to} , the transient inward current, I_{ti} , the fast (transient) and slow (sustained) calcium currents, and the sodium-calcium exchange ("creep") current. These currents are, in aggregate, important in automaticity, autonomic regulation of automaticity and duration of the atrial action potential, electrogenesis of the cardiac action potential, regulation of calcium influx and excitation-contraction coupling, and contribution of sodium-calcium exchange to the action potential.

Session II: Patch Clamp and Single-Cell Voltage Clamp Techniques

N. Sperelakis, H. Sada, N. Rusch, G. Bakaly, I. Josephson, G. Wahler, S. Vogel, and M. McLean.

This workshop will focus on the newest state-of-the-art techniques for studying the ionic currents and ion channels in the heart and vascular smooth muscle. These techniques will include patch clamp and single-cell voltage clamp of isolated single cells using the patch pipette method. The workshop will emphasize the methods used to isolate single cells, to make the patch pipettes, to measure the macroscopic currents in whole-cell voltage clamp, and to measure the microscopic currents in cell-attached patch and isolated inside-out and outside-out patch experiments. The composition of the solutions used in the patch pipettes to record the various currents will be explained. Results will be presented to illustrate the methods, including the macroscopic fast sodium current in isolated myocardial cells, the macroscopic fast (transient) and slow (sustained) calcium currents in whole-cell voltage clamp of single vascular smooth muscle cells, the macroscopic calcium and potassium currents in single ventricular cells and vascular muscle cells, the macroscopic and microscopic inward rectifying K^+ currents in heart cells, the regulation of microscopic K^+ currents of myocardial cells by cyclic nucleotides, the ACh-activated microscopic K^+ currents in atrial cells and cultured skeletal myotubes, and the macroscopic measurement of inward currents in neurons.

Session III: Propagation Mechanisms in Cardiac Muscle: Computer Simulations and Modeling

N. Sperelakis, Y. Rudy, R. Plonsey, R. Joyner, M. Spach, F. Roberge, and B. Steinhaus.

This symposium will focus on propagation mechanisms in cardiac muscle, with

emphasis on computer simulations and modeling. The topics to be discussed include the effects on propagation of: discrete cellular structure, interstitial resistance, nonuniformities of cell geometry and membrane properties, anisotropy and action potential rate of rise (\dot{V}_{max}), active Na-K transport, and cell-to-cell electrical interactions during repolarization.

Session IV: Charge-Related Selectivity of Continuous Capillaries

J. C. Parker, W. M. Deen, M. Silverman, F.-R. E. Curry, B. Haraldsson, and N. F. Voelkel.

Physiologists tend to agree that continuous capillaries sieve macromolecules based on their effective hydrodynamic radii and that glomerular capillaries exhibit a significant degree of negative charge selectivity. However, the charge barrier function of continuous capillaries is more controversial because lymph clearances studies suggest a net positive capillary barrier, whereas most tissue uptake studies suggest a negative barrier. This symposium will present some of the most current work in charge-related selectivity of continuous pulmonary, renal, and peripheral capillaries. The physical forces that determine charge interaction at the capillary pores will be described, as well as thermodynamic equations governing transport of charged solutes. Studies will be described in which selectivity and transport of charged molecules were assessed using single capillary methods, single pass extraction, tissue uptake, and plasma-lymph transport of charged macromolecules. Discussions will focus on evaluating the net charge barrier function of intercellular clefts between endothelial cells, and the fixed negative charges on basement membranes, cell surfaces, and the interstitial matrix. Evidence for the role of polycations in reducing membrane charge selectivity and inducing microvascular damage and vasoconstriction will also be presented. The current status and future directions of this field of investigation will be outlined.

Session V: Transport of Fluid and Electrolytes Across the Distal Pulmonary Epithelium

R. M. Effros, A. Taylor, M. Matthay, E. Crandall, R. Bland, F. Chinard, and G. R. Mason.

The pulmonary epithelium covering the distal airspaces of the lung manifests a remarkable selectivity between lipophilic and hydrophilic solutes. Whereas gases readily cross this barrier, sugars and electrolytes diffuse very slowly between the alveolar and interstitial compartments of the lung. The ability of the epithelium to resist electrolyte movement presumably

plays an important role in restraining the movement of edema fluid into the airspaces, an event that would seriously compromise gas exchange. Injury to the epithelium is characteristic of most forms of noncardiogenic edema and is probably responsible, at least in part, for the flow of exudative fluid into the alveoli. Aside from its function as a barrier, recent evidence suggests that the epithelium may be capable of reabsorbing any water and solutes that enter the airspaces. Two mechanisms may be responsible for this process: active sodium transport and the generation of an osmotic gradient by consumption of glucose in the airspace compartment. This symposium will review our current understanding of solute and water transport across the epithelial membrane of the lungs.

Session VI: Dynamics of Endogenous Molecules in the Coronary Microcirculation

J. B. Bassingthwaite, C. A. Goresky, E. O. Feigl, T. R. Harris, and G. van der Vusse.

Dynamics of substrate exchange is an exciting, controversial, and rapidly developing aspect of the field of regulation and control of metabolism and regional function in the heart. The studies range from quite basic physical chemistry of membrane transport processes through to clinical applications by positron emission tomography and NMR. The multiplicity and complexity of the phenomena involved require bringing together experts from diverse areas of research to provide a comprehensive overview in the field. A workshop to be held in the afternoon on the same topic would emphasize the practical analytical approaches to describing in quantitative terms the kinetics of transport transformation and metabolism.

Session VII: Water Exchange in the Conducting Airways

A. Wanner, D. McDonald, R. J. Phipps, I. Gilbert, and E. H. Bergofsky.

Session VIII: Humoral Factors on the Cardiovascular Control

R. Rosas, R. Albertini, N. Basso, E. Krieger, and E. Schiffrin.

Short Course—Molecular Biology and Physiology

Session I: Introduction of Molecular Biology to Physiologists

S. Chien, E. Benz, S. Taylor, M. G. Rosenfeld, and S. Heinemann.

The aim of this session is to introduce the modern developments in molecular biology to physiologists working at cellular and organ-system levels, so that these new

methodologies and concepts can be applied to investigations in physiological systems, leading to a widening of the horizon of physiological research.

Session II: Hormonal Regulation of Gene Expression

E. C. Ridgway, W. W. Chin, W. H.

Dillman, M. Montminy, and D. G. Gardner.

Recent advances in molecular biology and recombinant DNA technology have provided molecular physiologists the opportunity to study the effects of hormones on gene expression at the molecular level. This symposium brings together investigators who focus on a number of mammalian genes that are important in endocrine, cardiovascular, and neuroendocrine systems. In particular, each presentation will examine the roles of hormones on specific gene expression and activity. Overall, the speakers will provide an overview of the impact of these new investigative approaches to our understanding of these various physiological events at the gene level.

Practicum of Molecular Biology Techniques

(A series of five hands-on workshops presented in cooperation with a number of biotech companies)

Workshop A: DNA Isolation and Quantitation

Workshop B: Restriction Enzyme Digestion and Electrophoresis

Workshop C: Southern, Northern, and Plaque Transfers: Probe Molecules and Mapping

Workshop D: Sequencing DNA

Workshop E: Vectors

APS Bowditch Lecture

D. Neil Granger, Louisiana State University, will present the Bowditch Lecture entitled "Role of Xanthine Oxidase and Neutrophils in Ischemia-Induced Microvascular Injury" at the APS Fall Meeting, San Diego, CA, on Wednesday, October 14, 1987, at 4:15 P.M., followed by the Society Business Meeting at 5:15.



PUBLIC AFFAIRS

Animal Rights Advocates Look to Congress to Offset Reversals by Courts, Electorates

Animal rights advocates are looking to the Congress once again to gain through federal legislation what the Supreme Court, state general assemblies, and the electorate denied them during the first six months of 1987.

The animal rights movement suffered major setbacks in efforts to achieve recognition by the courts and the enactment of state or local law prohibiting the release of unclaimed pound animals to research and educational institutions.

Rebuffed by the judiciary and turned down by both the voters and their elected state officials, animal rights advocates are pressuring the Congress to 1) amend the Animal Welfare Act so that anyone can file a civil suit against the federal government on behalf of any animal and 2) enact the "Pet Protection Act of 1987," a proposal that would prohibit the use of any unclaimed pound animal by researchers who have grant funds from the National Institutes of Health (NIH).

The proposed amendment to the Animal Welfare Act is a backdoor attempt to circumvent the U.S. Supreme Court decision in April that neither animal rights organizations nor individual activists have standing with the courts. Standing is the recognition granted by the courts to organizations and/or individuals who can show that they have a stake in litigation as plaintiffs and, therefore, the right to file civil suits. The proposed amendment, if enacted, would grant individuals the right to file civil suits against the U.S. Department of Agriculture for alleged failures in the enforcement of compliance with the Act by research and educational institutions.

The upholding of a lower court decision by the Supreme Court ended a six-year effort by animal rights advocates to gain legal custody of 14 monkeys confiscated by police from a research laboratory in Silver Spring, MD. The monkeys are now in the custody of the Delta Regional Primate Center in Louisiana.

The custody battle was initiated by the International Primate Protection League, People for the Ethical Treatment of Animals, Animal Law Enforcement Association, and seven individuals who filed suit in federal district court. The suit was thrown out by the court after a magistrate ruled that the plaintiffs did not have standing. The district court's decision was up-

held last fall by the court of appeals, and the Supreme Court has upheld that ruling.

While the courts were rejecting the appeal for standing, general assemblies in seven states, the electorate in two municipalities, and a board of commissioners were rejecting appeals to close animal pounds to research and educational institutions.

Bills that would have restricted the use of unclaimed pound animals were rejected by legislatures in Montana, New Mexico, West Virginia, Arkansas, Oklahoma, Wyoming, and Utah; voters in Tampa, FL, and Sierra Vista, AZ, defeated by better than 2-to-1 margins referenda that would have ended the releasing of pound animals to area universities; and, Spokane, WA, commissioners voted unanimously to continue making unclaimed cats and dogs available to Washington State University for teaching and research.

As a result of these setbacks, efforts have increased to push for the enactment of the "Pet Protection Act of 1987." The bill (HR 778), introduced by Rep. Robert J. Mrazek (D-NY), focuses on unclaimed pound animals by outlawing their use for any project wherein NIH funds are directly or indirectly involved. Violation would mean immediate termination of the funding.

The bill is similar to the bill introduced by Mrazek in the 99th Congress but is more restrictive than his earlier version. The earlier bill only prohibited the use of NIH funds for the purchase of unclaimed animals. The current proposal states that anyone who purchases or uses unclaimed pound animals for any research purpose (regardless of the source of funds used to purchase the animals) shall be ineligible for NIH funds.

Because animal rights proponents now are shifting their efforts from the state and local scenes to Capitol Hill, their chances of gaining their goals through legislative means may be enhanced. History reveals that the animal rights movement scored its biggest gains in Congressional actions, an arena where educators and scientists, by and large, fear to tread, unlike the state and local arenas, where the educators and scientists have blunted legislative efforts to add further restrictions to the use of laboratory animals.

William M. Samuels

THE PHYSIOLOGIST

Edward Francis Adolph (1895–1986)

Ninety-one years ago Edward Francis Adolph was born in Philadelphia on July 5, 1895. He spent his early life there and was schooled in the classical curricula of his day: Latin, Greek, philology, and mathematics. His excellence in scholarship won him a place at Harvard College, where he was graduated magna cum laude in 1916. From there he went to Yale College to pursue graduate work but was interrupted by World War I and a year's service in the U.S. Army Medical Department.

After discharge from military service, he continued his graduate education at Harvard College, where he received his Ph.D. in 1920 under the guidance of L. J. Henderson. A Sheldon Traveling Fellowship then allowed him to do research at Oxford University with J. S. Haldane and to attend the International Congress of Physiology in Paris as well as to visit cities and laboratories in Western Europe.

During 1921 he joined the faculty of the University of Pittsburgh, where he remained for the next three years. Summers during those years were spent at Woods Hole Marine Biological Laboratory, where he taught invertebrate physiology. In 1924 he received a fellowship from the National Research Council to study zoology at Johns Hopkins University. In 1921 he married Mary Grace Bagge; three children were born between 1923 and 1931.

From 1925, and for more than 60 years following, Dr. Edward Adolph was associated with the School of Medicine and Dentistry at the University of Rochester. In 1924 Dr. Wallace O. Fenn formed a new Department of Physiology, and a year later Dr. Adolph joined him. During these 60 years Dr. Adolph's students included medical, graduate, and undergraduate; 16 graduate students received Ph.D.s with his sponsorship. His students remember him best in the laboratory, where his challenging and insightful questions stimulated many to find answers by performing their own experiments. In his honor, one of his former students established the Edward F. Adolph Award in 1975 to be presented annually to the medical student at the University of Rochester whose accomplishment was judged to be superior.

Dr. Adolph won several fellowships of his own and was the recipient of a number of awards: a Guggenheim Fellowship to study at the Kaiser Wilhelm Institute in



Berlin in 1927; a consultantship to the Climatology Unit of the U.S. Army Quartermaster Department from 1943 to 1953 and to the Aeromedical Laboratory of the U.S. Air Force in 1944. He also served on the Subcommittee on Environmental Protection of the National Research Council and the panel on Physiology of the Research and Development Board. In 1948, he received a U.S. Presidential Certificate of Merit and in 1964 was awarded the Alumni Gold Medal of the University of Rochester School of Medicine and Dentistry. In 1975 he was honored as the University of Rochester's twenty-first John R. Murlin Lecturer. He served as President of the American Physiological Society during 1953–1954 and was honored again by the Society in 1984. At this time he was chosen for the Ray G. Daggs Award for his contributions to the Society and the science of physiology. His strong devotion to the American Physiological Society began early in his career and never waned.

In his research career Dr. Adolph recognized early the significance of regulatory controls, concepts that have been adopted by many of today's bioengineers. His book on *Physiological Regulations* of 1943 has become a classic in the field of regulatory physiology as have his publications on the role of water in living organisms and physiological regulation of body fluids, size, and body temperature. He also published studies on development of regulations and adaptations in animals, self-regulation of heart beats, and other characteristics. These are discussed in his monograph on *Origins of Physiological Regulations*. He published four books and nearly 200 articles in numerous biological

and physiological journals. He was actively publishing until 1984. He served as referee editor of several journals and continued to serve as a member of the editorial boards of the American Physiological Society until 1986.

Dr. Adolph never fully retired. He remained an active member of the Department of Physiology, although in his final few years, he came to the department only several days a week. Perhaps his life, which ended on December 15, 1986, and his research contributions, which spanned over half a century, can be described best by a passage from Claude Bernard who wrote in his *Introduction to the Study of Experimental Medicine*:

"In the experimental sciences, great men are never the promoters of absolute and immutable truths. Each great man belongs to his time and can come only at his proper moment, in the sense that there is a necessary and ordered sequence in the appearance of scientific discoveries. Great men may be compared to torches shining at long intervals, to guide the advance of science. They light up their time, either by discovering unexpected and fertile phenomena which open up new paths and reveal unknown horizons, or by generalizing acquired scientific facts and disclosing truths which their predecessors had not perceived. If each great man makes the sciences which he vitalizes take a long step forward, he never presumes to fix its final boundaries, and he is necessarily destined to be outdistanced and left behind by the progress of successive generations. Great men have been compared to giants upon whose shoulders pygmies have climbed, who nevertheless see further than they. This simply means that science makes progress subsequently to the appearance of great men, and precisely because of their influence. The result is that their successors know many more scientific facts than the great men themselves had in their day. But a great man is, nonetheless, still a great man, that is to say—a giant."

Melvin J. Fregly
Marilyn S. Fregly

Physiology and FASEB 1987

"A Century of Progress" was the central theme for FASEB '87, providing a focus for the celebration of the APS Centennial. From the start, this was to be a special meeting for the Society, for it provided an opportunity to reflect on its past and prepare for the future. Numerous activities were planned for the meeting, requiring extra effort from the members of the Program Committee, Centennial Celebration Committee, Council, and Society staff. As a result of their efforts, each element of the meeting from the opening lecture to the closing reception was designed to focus on physiology and its importance to biomedical understanding.

Five FASEB member societies and several guest societies met in Washington, DC, to celebrate APS's 100th and FASEB's 75th anniversaries. Overall, the participants in this meeting submitted 7,007 abstracts of volunteered papers, representing a 22% increase over FASEB '86. Of this total, 2,265 papers were submitted by the APS membership and three guest societies: the Society for Experimental Biology and Medicine (SEBM), the Biomedical Engineering Society (BMES), and the Society for Mathematical Biology (SMB). The physiology component of FASEB '87 represented 32.8% of the short communications presented.

Of the APS-sponsored papers, 359 or 15.8% were first authored by women and

114 or 5.0% were received from research laboratories outside of the Americas. Scientists from U.S. government laboratories contributed 170 abstracts or 7.5% of the total. Abstracts derived from industrial laboratories accounted for 63 or 2.8%. In acknowledging support for the work presented in the volunteered papers, 34.5% acknowledged support from a federal agency.

Table 1 shows the program designation of the volunteered papers processed by APS. Of the 2,124 APS member-sponsored abstracts, 80.5% were designated for inclusion in topics programmed by APS. For all the abstracts processed by APS, only 21.2% were designated for sessions programmed by other FASEB member societies.

Table 2 shows the distribution of volunteered papers programmed by APS and its guest societies and their correspondence to Society sections. Of the 2,283 papers programmed by the Program Advisory Committee (PAC), 1,619 or 70.9% were

scheduled for poster sessions. The percentage of posters at FASEB '87 was greater than the percentage at FASEB '86 and FASEB '85 (66.6% and 62.1%, respectively). The PAC programmed the volunteered papers into 64 slide sessions and 93 poster sessions. Overall, there were a total of 199 physiology sessions scheduled during the Centennial Meeting. Table 2 also reveals the number of papers and symposia contributed by each of the sections of the Society. Consistent with the increase in abstracts received for FASEB '87, nearly every section programmed more volunteered papers than in 1986.

Of the 1,028 abstracts programmed by APS and designating departmental affiliation, 354 or 34.5% were from departments of physiology. In addition, 94 or 9.1% were from departments of physiology and biophysics. Table 3 provides additional information on the question, "where do APS-submitted abstracts come from?"

Unfortunately, two abstracts were re-

TABLE 1. Volunteered Papers Sponsored by APS, SEBM, BMES, and SMB for FASEB '87

Society	Total		FASEB Program Designation					Total
	Received	Withdrawn	APS	ASPET	AAP	AIN	AAI	
APS	2,129 (94.0%)	5	1,710 (80.5%)	193 (9.1%)	130 (6.1%)	65 (3.1%)	26 (1.2%)	2,124
SEBM	77		17	20	14	22	4	77
BMES	55		50	0	4	0	1	55
SMB	4		3	0	1	0	0	4
Total	2,265	5	1,780 (78.8%)	213 (9.4%)	149 (6.6%)	87 (3.8%)	31 (1.4%)	2,260

TABLE 2. APS Scientific Sessions at FASEB '87

	Volunteered Papers			Sessions				
	Slide	Poster	Total	Slide	Poster	Symposia	Special	Total
Cardiovascular	181	370	551 (444)*	17	22	3		42
Cell & general	29	106	135 (166)	3	10	2		15
Comparative	10	30	40 (23)	1	1	0		2
Endocrinology & metabolism	48	166	214 (197)	4	12	2		18
Environmental, thermal, & exercise	54	74	128 (116)	5	5	2		12
Epithelial transport	32	46	78 (83)	3	1	0		4
Gastrointestinal	23	65	88 (68)	2	4	2		8
History	0	10	10 (0)	0	1	1		2
Muscle	35	91	126 (86)	3	7	4		14
Nervous system	19	35	54 (42)	2	2	4		8
Neural control & autonomic regulation	45	62	107 (86)	4	2	0		6
Renal	45	83	128 (87)	4	7	2		13
Respiration	93	387	480 (357)	9	17	4		30
Teaching	0	8	8 (9)	0	1	1		2
Water & electrolyte	23	31	54 (50)	2	2	2		6
Biomedical engineering	16	41	57 (39)	2	2	3		7
Clinical	0	0	0	0	0	2		2
Theme	10	14	25 (48)	2	1	0		3
Centennial committee	0	0	0	0	0	3	2	5
Total	663	1,619	2,283 (1,840)	64	93	37	2	199

* 1986 totals.

TABLE 3. Author Affiliations of Programmed, Volunteered Papers

Department	No. of Papers	% Total
Physiology	354	34.5
Physiology/biophysics	94	9.1
Medicine	105	10.2
Pharmacology	125	12.2
Biology	38	3.7
Surgery	29	2.8
Anesthesiology	41	4.0
Pediatrics	41	4.0
Pathology	21	2.0
Biochemistry	25	2.4
Engineering	41	4.0
Kinesiology	13	1.3
Sub-total	927	90.2
Other (25)	101	9.8
Total	1,028	100.0

ceived too late to be programmed during FASEB '87. No doubt, the papers represented the frenzied efforts of physiologists to bring their work to the attention of the membership. Because of the works' importance the titles and authors are included for information purposes. 1) Stress induced in others by graduate students (GS) and post-doctoral fellows (PF) during FASEB abstract preparation. *I. M. Craze and U. R. Nuts*. Dept. of Looniology, Univ. of Trancendation, Anyplace, U.B. 2) Stress induced by graduate students and postdoctoral fellows during FASEB abstract preparation. *I. M. Tired and U. R. A. Pain*. Apathetic Univ., Everywhere, U.S.A. While the scientific content of these abstracts was questionable, their levity factor during abstract processing time was outstanding.

Overall, the Centennial Meeting and our contribution to FASEB '87 was a success. It provided an opportunity for the Society to review its past and prepare for its second century of progress.

Martin Frank

News From Senior Physiologists

Letters to Roy Greep:

William W. Scott, who has recently celebrated his 74th birthday, is continuing to see patients at his office at Johns Hopkins University one day a week and enjoying living on a farm with his wife Jessie raising polled Herefords and restoring old automobiles. He writes of his just-completed chronicle, *Urology at Hopkins, 1889-1987*: "That was fun! It is interesting to note that many of our residents were or are heads of urology here and abroad. Having spent my early days at the University of Chicago with that wonderful group in Physiology, Carlson, Luckhardt, Gerard, Kleitman, and Ralph S. Lillie, and later five years in urology with Charles Huggins, I have developed the strong prejudice that research should be part of a resident's training. Hence I was instrumental in making one year in research of the total of four obligatory. I think it has made a difference."

William Sweet writes that since his administrative duties as Chief of the Neurological Service at the Massachusetts General Hospital have ended nine years ago, he has been fortunate at being able to continue a full-time professional, clinical, and investigative life. He is having "a magnificent time carrying out such clinical responsibilities as has appealed to me, principally in the field of neurosurgical management of pain." The third edition of his *Operative Neurosurgical Techniques*, co-edited with Henry Schmidek, is about to appear.

John R. Morison thanks the Committee for its note of remembrance on his father's 80th birthday and regrets that his father cannot answer for himself. For the last year Robert S. Morison has been suffering from metastatic disease and has not long to live. A birthday party was held for him in his bedroom (in Peterborough, NH) with his brothers, their wives, and three of the four grandchildren. He enjoyed it and was glad to reach 80. Dr. Robert Morison is a fifty-year member of APS.

Roy Greep sends news of Elwood Henneman, professor of physiology at Harvard Medical School, who has recently received one of two 1986 Wakeman Awards for Research in the Neurosciences. The purpose of the award is "to acknowledge and bring to international attention outstanding neuroscientific research contributing to the goal of curing paraplegia." Henneman was honored as "a leader in the study of the normal and pathologic physiology of the spinal cord."

Irv Rothchild writes: "my poetic muse came back this year for a short but delightful visit, aided to a considerable extent, I think, by my encounters (as a patient naturally) with no less than 8 physicians, between mid-July and last week." He forwarded the results—a 10-stanza Christmas-time poem, illustrated by his wife Ellen, wishing his family and friends good health for the coming year.

Letters to Ewald E. Selkurt:

Larry Wesson of Jefferson Medical College sends in the following reflections on aging: "Time's passage seems increasingly traumatic for me. The first real blow of recent decades was when the new pope was younger than I. Most recently, someone wants my photo for an essay on the early history of studies of renal tubular transport he is writing [the *APS People and Ideas* series]. . . . I ceased applying for research support about six years ago when I noticed that all pink sheets were opening pointedly with "The applicant collaborated with Homer Smith and others . . ." In addition to reviews of only those subjects he takes a fancy to, he is engaged in the unfunded study of an early interest, ants. ("Ed Wilson stayed with ants and invented sociobiology. I switched to medicine.") He believes that many of the physiological concepts applicable to a dog or rat can be applied to a colony of social insects.

Wilfried Mommaerts, soon to retire as professor and chairman of the Department of Physiology at the UCLA School of Medicine, has just received the Alexander von Humboldt Award, which will enable him to spend a year in research at the Max Planck Institutes in Heidelberg. He plans to investigate the controlled expression of isogenes for the heavy chain of the myosin molecule, using the year as an opportunity to reenter daily laboratory work. At the urging of many friends and the University of California Press, he has begun writing his autobiography.

Contributors to 1987 APS Spring Meeting Program

The American Physiological Society gratefully acknowledges the support provided for the Centennial Meeting by the following organizations: Grass Foundation; Royal Society of Medicine Foundation; Office of Naval Research; Sterling-Winthrop Research Institute; Pharmacia-Chiron Partnership; Bayer AG/Miles Laboratories; Glaxo, Inc.; Roche Laboratories; Janssen Pharmaceutica; Mead-Johnson Nutritional Division; Sandoz Pharmaceuticals; Abbott Laboratories; Marion Laboratories, Inc.; Stuart Pharmaceuticals; Ayerst Laboratories Research Inc.; Jandel Scientific; Beckman Instruments Inc.; and Smith Kline & French Labs.

PEOPLE AND PLACES



Leon E. Farhi, M.D., chairman of the Department of Medicine at the State University of New York at Buffalo, has been named Special Faculty Associate to the Provost. Dr. Farhi, a member of APS since 1960 and

former Councillor, will continue as chairman of the department.

APS member David J. Dzelak, Ph.D., associate professor, Department of Physiology and Biophysics, University of Mississippi Medical Center, has moved to Adria Laboratories in Columbus, OH.

Rico E. Viray, M.S., formerly with Trav-enol Laboratories, Inc., has moved to Dupont Critical Care in Waukegan, IL.

Edward E. Soltis, Ph.D., has accepted a position in the Department of Pharmaceutical Sciences, School of Pharmacy, Campbell University, Buies Creek, NC. An APS member since 1984, Dr. Soltis was formerly in the Department of Pharmacology at the University of Iowa.

New Chair Established to Honor Julius Comroe

John A. Clements, MD, a lung researcher whose discoveries led to treatments that have saved the lives of countless children born with respiratory distress syndrome, has been appointed to the new Julius H. Comroe, Jr. Chair in Pulmonary Biology, created to honor a lung biologist whose research also led to life-saving treatments.



Clements has been a member of APS since 1958. A professor of pediatrics at UC-San Francisco and a senior member of the Cardiovascular Research Institute, he discovered early in his career that the lungs are lined with a detergent-like substance that keeps them from collapsing between breaths. This substance is often lacking in

newborns, particularly premature infants, making it impossible for them to inflate their lungs properly for breathing. This problem, known as respiratory distress syndrome or hyaline membrane disease, is the commonest cause of death in the newborn.

Physicians trained by Comroe and Clements at UCSF soon came up with a technique called continuous positive airway pressure to help these infants breathe until their lungs matured enough to produce the substance, called a surfactant, for themselves. The system and various modifications of it were adopted throughout the world, and the death rate for all but the most premature infants decreased dramatically—from 40% in the 1950s to nearly zero today.

This research brought Clements worldwide renown and many honors, among them the Bowditch lectureship of the American Physiological Society in 1961, appointment as a Career Investigator of the American Heart Association, the Gairdner Foundation International Award, the Trudeau Medal of the American Lung Association, membership in the National Academy of Sciences and fellowship in the Royal College of Physicians in England.

The new professorship was created in memory of Julius H. Comroe, Jr., MD, a world-famous researcher and teacher in heart and lung physiology who came to UCSF in 1957 to head the newly formed Cardiovascular Research Institute. In 16 years as director he built the Institute into a model center for multidisciplinary research on diseases of the cardiovascular and pulmonary systems and made it a unique training ground for a generation of doctors and medical scientists. Comroe was president of APS in 1960.

John F. Perkins, Jr., Memorial Award

The American Physiological Society invites applications for the John F. Perkins, Jr., Memorial Fellowships. The fund is designed to provide supplementary support to the families of foreign physiologists who have arranged for fellowships or sabbatical leave to carry out scientific work in the United States. Applications by U.S. physiologists who require supplementary assistance to work abroad will also be considered.

It is the interest of the Perkins Fund to develop the full potentialities for cultural benefit associated with scientific exchange. Preference will be given to physiologists working in the fields of respiratory physiology, neurophysiology, and temperature regulation.

Each application should be made by both the visiting scientist and his host. Ordinarily, the joint applicants will have made financial arrangements for the visiting scientist before applying to the Perkins Fund for family support. The application should contain an account of these arrangements with a description of the proposed scientific work and a brief account of how the visitor and his family intend to make use of the cultural benefits.

The amount available for each award will be in the range of \$3,000–7,500, depending on the estimated needs of the family over and above the amount already available to the visiting scientist. Ordinarily, two to four awards will be available in any one year.

Application forms for host and visiting scientist may be obtained from Dr. Martin Frank, Executive Secretary, American Physiological Society, 9650 Rockville Pike, Bethesda, MD 20814.

Proposed Amendment to the Society Bylaws to Change the Title of Executive Secretary-Treasurer to Executive Director

The APS Council adopted a resolution to change the title of Executive Secretary-Treasurer to Executive Director and that the Society Bylaws be amended to reflect the change in title. The change was recommended because the title "Executive Director" more nearly reflects the responsibilities of the office. The title corresponds to that in current usage by similar organizations and facilitates the conduct of the office with extramural individuals and associations. The proposed amendment will be presented to the membership for vote at the Fall Business Meeting, Wednesday, October 14, 1987.

Positions Available

There is a \$25 charge per issue for each position listed. A check or money order payable to the American Physiological Society must accompany the copy. Purchase orders will not be accepted unless accompanied by payment. Ads not prepaid will not be printed. Copy must be typed double-spaced and limited to 150 words. All copy is subject to the editorial policy of *The Physiologist*. EOAAE indicates Equal Opportunity/Affirmative Action Employer and appears only where given on original copy. Copy deadline: copy must reach the APS office before the 15th of the month, 2 months preceding the month of issue (e.g., before December 15 for the February 1986 issue). Mail copy to APS, 9650 Rockville Pike, Bethesda, MD 20814.

POSITION AVAILABLE

Radiological Sciences Research Director.

Applications are invited for a tenure-track full-time faculty position as Radiological Sciences Research Director in the Department of Radiology at the University of Nebraska Medical Center. Candidates must be a Ph.D. and/or M.D. with postdoctoral research experience, including thorough knowledge of biostatistical analysis and knowledge in physiology and anatomy. The Director will be expected to prepare grants and obtain external funding from local, state, and federal agencies, to coordinate developmental research projects, and to be responsible for basic science and clinical experimental design. The Director will be encouraged to pursue independent research projects in areas complementing those of the current faculty. Applications should be received no later than October 1, 1987, by Thomas J. Imray, M.D., Professor and Chairman, Department of Radiology, University of Nebraska Medical Center, Omaha, Nebraska 68105. Phone 402-559-6396 for further details. [EOAAE]

"3M Life Sciences Award"

Nominations are being accepted for the thirteenth annual "3M Life Sciences Award," administered by the Federation of American Societies for Experimental Biology. The award, sponsored and supported by 3M, is \$10,000. The deadline for receipt of nominations and supporting letters is October 15, 1987. Send nominations to Mrs. Marge Averi, 3M Life Sciences Award Committee, Executive Office, FASEB, 9650 Rockville Pike, Bethesda, MD 20814. Phone: (301)530-7092.

ANNOUNCEMENTS

NIAAA Research Grants Available

The National Institute on Alcohol Abuse and Alcoholism (NIAAA) announces the availability of increased resources for its extramural research grant program in FY 1987. The dollar amount available for awards for approximately 100 new and renewal regular research grants in FY 1987 is \$13.0 million, an increase of \$1.8 million over the last fiscal year. Similarly, in the Research Scientist Development and Research Scientists programs, the projection for FY 1987 is 18 new and renewal awards totaling \$972,000. Thus, the opportunity for funding under these two support programs has increased immeasurably. Applications are especially encouraged for projects focused on alcohol and immunology, including AIDS (\$0.7 million), studies on the effects of alcohol on endocrine and psychosocial development in adolescents (\$0.5 million), development and validation of objective markers for alcohol intake (\$0.5 million), and development of improved technology for measuring prevention outcome (\$0.5 million). In the area of research training, an additional \$1.3 million is available to support new institutional training grants and individual fellowship awards in FY 1987. Information: Dr. Helen Chao, Chief, Biomedical Research Branch, or Dr. Ernestine Vanderveen, Chief, Clinical and Psychosocial Research Branch, Division of Extramural Research, NIAAA, Parklawn Building, 5600 Fishers Lane, Room 14C-17, Rockville, MD 20857. Phone: (301)443-4223.

Health Benefits of Animal Research

Health Benefits of Animal Research, in its second printing, is now available from the Foundation for Biomedical Research. The six chapters of this book, each on a single species, describe medical advances attributable to studies of mice, rats, rabbits, cats, dogs, and nonhuman primates—the six species that account for over 95% of all animal research. To order copies of

the book, please send a check or purchase order in the amount of \$10.00 per book (\$7.50 plus \$2.50 postage and handling) to FBR, 818 Connecticut Avenue, NW, Suite 303, Washington, DC 20006. Phone: (202)457-0654.

Dautrebande Prize for Physiopathology

The "Fondation de Physiopathologie Pr L. Dautrebande" will award his next prize in 1988 for work on human or animal clinical physiopathology, such work preferably having therapeutic implications. Deadline for receipt of candidacy is December 31, 1987. Information: Dr. Stalport, Maison Batta, Avenue Batta n 3 a 5200 HUY Belgium.

Pharmacology of Thermoregulation

The Pharmacology of Thermoregulation, the seventh in a series of international symposia, will be held on August 22-26, 1988, at The University of Odense, Odense, Denmark. This will be a joint meeting with the Nordic Council for Arctic Medical Research. For further details concerning the presentation and publication of papers, registration and reservation forms contact Dr. Peter Lomax, Department of Pharmacology, UCLA School of Medicine, Los Angeles, CA 90024.

Molecular Basis of the Immune Response

The New York Academy of Sciences will sponsor a conference on "Molecular Basis of the Immune Response," January 11-13, 1988 to be held in New York City. The conference will focus on the organization of genes, major histocompatibility antigens and lymphokines, as well as on molecular mechanisms of the immune responses. Deadline for submission of abstracts is September 15, 1987, to be sent to Constantin A. Bona, M.D., Ph.D., Professor of Microbiology, Mount Sinai School of Medicine, One Gustave Levy Place, New York, NY 10029.

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Future Meetings

1987	
APS Fall Meeting	October 11-16, San Diego
1988	
FASEB Annual Meeting	May 1-6, Las Vegas
Joint APS/ASPET Fall Meeting	October 9-14, Montreal
1989	
FASEB Annual Meeting	March 19-24, New Orleans, LA
APS Fall Meeting	October 15-19, Rochester, MN
1990	
FASEB Annual Meeting	April 1-6, Washington, DC
APS Fall Meeting	October 7-11, Orlando, FL