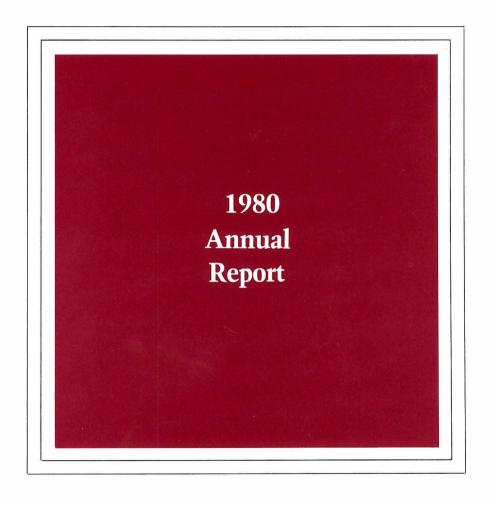
# Pharmaceutical Manufacturers Association Foundation, Inc.



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# THE NEXT FIVE YEARS

How relevant—over the next five years—are the PMA Foundation's programs to the needs in those fields of special interest to the Foundation? This question served to launch a year-long program review. The answer was largely positive: virtually all of the Foundation's programs appear to be in concert with the needs of these disciples, namely, clinical pharmacology, drug toxicology, pharmacology and pharmaceutics.

In a recent survey by the Association of Medical School Pharmacologists to ascertain why medical schools have not developed clinical pharmacology programs, two of the major reasons given were lack of funding to support such a unit and inability to recruit trained clinical pharmacologists. The Foundation's faculty awards program, which provides funds for beginning faculty, and support for clinical pharmacology units are aimed at precisely these needs. The Foundation's own review, on the other hand, revealed that its program of fellowships for post-residency study and the medical student program, which provides support for a year-long involvement in a research effort, may have outlived their usefulness. These two programs will be offered in an

amended fashion for one year to determine if the changes make these programs more useful.

Basic pharmacology is facing problems common to the other basic sciences. The continuing deemphasis on the basic sciences in schools and the demise of pharmacology laboratory experience for students will impact negatively on the field. Funds to ensure that those individuals who are approaching doctorates are able to finish them is an important need. Of special concern is the expansion of opportunities for those who have finished their postdoctoral training. A corollary need now and for the foreseeable future is that of research funds for beginning faculty members. The Foundation programs in basic pharmacology are aimed squarely at each of these areas. No program changes were considered necessary except to increase the funds involved in each award as well as the number of awards as funds become available.

The pharmacology-morphology fellowship program which seeks to promote interdisciplinary research in the study of drug action continues to be of value. It is targeted in the directions from which advances in the understanding of mechanisms of drug action will surely come.

Drug toxicology support has been accomplished principally through workshops and the research starter grant program. However, one of the needs of the field is to attract academic scientists who are interested in analyzing, reviewing and questioning, where appropriate, the present state of the art. To accomplish this, a faculty award program has been authorized this year on a three-year pilot basis. The goal of the program is to attract veterinary and comparative pathologists who are beginning faculty members to spend two years engaged in drug toxicology research. The program will undoubtedly take a number of years for a critical mass of these individuals to accumulate, not unlike the Foundation's experience with its clinical pharmacology awards. But, a beginning must be made.

The review produced a clear consensus that the best way to proceed over the next years is to continue to focus on the training and initial periods of independent career development of individuals interested in the fields identified by the Foundation for funding. Through its variety of programs, the Foundation is supporting a diversity of research by carefully chosen individuals who show considerable promise for productive careers. This "people approach", augmented by the direct research support provided by the starter grant program, continues to be the most productive and cost efficient approach for the Foundation to take. This conclusion, however, will continue to be subject to review each year as the Foundation constantly seeks to evaluate its efforts.









### **HIGH RATINGS**

he December meetings, the eleventh this year, of advisory committee members and awardees continue to receive high ratings. Continuing the tradition of excellent keynote addresses, Dr. Stanley N. Cohen, Professor, Department of Genetics. Stanford University spoke on "Gene Transplantation: Current Status and Future Prospects". Donald van Roden, Chairman of the PMA Foundation Board of Directors. informed the audience of changes in some of the current award programs and used the occasion to announce the offering of a faculty program in toxicology. Following Dr. Cohen, six awardees presented papers during the time remaining in the morning session

The audience divided into three subgroups for the afternoon. The clinical pharmacologists met and discussed the topic "The Challenges of Directing a Clinical Pharmacology Unit in the 1980's". The basic pharmacology group heard some further reports from the awardees as well as a discussion by Dr. Gilbert Mannering, Professor, Department of Pharmacology, University of Minnesota on the pharmacology of interferon. The Pharmacology-Morphology group also scheduled some additional reports from former fellows, concluding with a talk by Dr. James A. Ferrendelli, Professor, Department of Neurology and Neurological Surgery, Washington University on "Anatomy, Physiology and Biochemical Pharmacology of the Hippocampus in Vitro".

In August, 1980 a meeting was held with the research starter



grantees and the advanced predoctoral fellows in pharmacology/ toxicology during the fall meeting of the American Society for Pharmacology and Experimental Therapeutics. The speaker was Dr. Earl H. Wood, Senior Consultant, Biodynamics Research Unit, Mayo Foundation who described the background on the unique capability of the dynamic spatial reconstructor (DSR) and discussed its potential for research and patient care. The DSR uses the principles of the "CAT scan" but has greater capability to represent soft body tissues and blood flow. A video tape of the DSR's ability to "dissect" by computer the three-dimensional representation of the heart was a highlight of the presentation.

These meetings continue to be of value both to the awardees and to the advisory committee members. By this yearly update on the awardees' professional activities, the advisory committee members are in a better position to gauge how well the various programs are achieving their goals.

### **ACTIVITIES**

Since its formation in 1965, more than \$11 million has been authorized by the PMA Foundation for a variety of workshops, conferences, research projects and educational programs. Of this amount, approximately \$3.3 million has been used to support research and about \$7.3 million has gone into educational awards. The remaining \$478,000 has provided financial assistance for scientific meetings, along with a small portion for publications.

Virtually all of the 1980 grants and awards were made within programs sponsored by the Foundation. These include two faculty level programs of salary and fringe benefit support, four fellowship programs—two postdoctoral, one at the advanced predoctoral level and one at the medical student level—plus a program of research starter grants for beginning investigators wishing to move into areas of independent research. A special award to assist in expediting the research efforts of new clinical pharmacology units or those with new directors is also available.

Through these programs in 1980 the Foundation assisted an additional 56 individuals. All of these were helped at a crucial time in their career development. The Foundation has, in its slightly more than fifteen years of existence, helped about 640 individuals through its research and educational support programs.

# EDUCATION AND TRAINING PROGRAMS

To further its objectives in the field of education, the PMA Foundation sponsors four programs in clinical pharmacology, one in the combined field of pharmacology-morphology, one in pharmacology or toxicology and one in basic pharmacology. A new program was authorized in 1980 which will make its first award in 1982. This is a faculty award in toxicologic pathology, a program aimed at interesting veterinary pathologists and comparative pathologists in research directed towards problems in drug toxicology. This will be offered on a three-year pilot basis at one award a year.

# **CLINICAL PHARMACOLOGY Faculty Awards on Clinical Pharmacology**

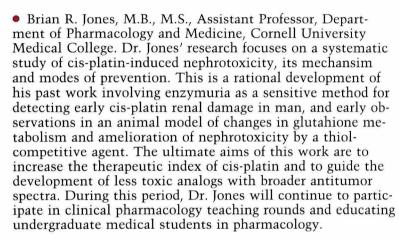
The four clinical pharmacology programs provide opportunities at the student, fellow and faculty levels. Through the Faculty Development Awards in Clinical Pharmacology pro-

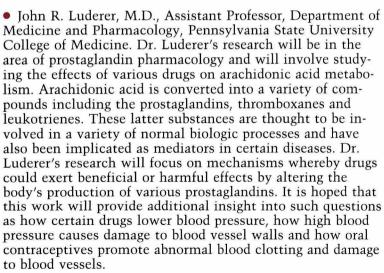
gram, the Foundation makes two-year awards to medical schools for salary and fringe benefits support of full-time junior faculty members. The level of support varies, in keeping with the salary structure of the applicant university. However, the Foundation has set a ceiling of \$30,000 on the amount of its participation in the total yearly salary and fringe benefit for any candidate.

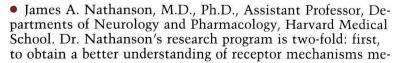
With the awards scheduled to begin July 1, 1981 a total of 56 individuals has been supported under this program since

1967.

#### Recipients of the five awards to begin July 1, 1981 are:









Brian R. Jones, M.B., M.S.



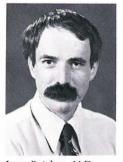
John R. Luderer, M.D.



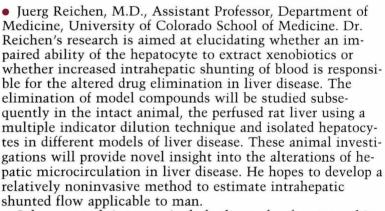
James A. Nathanson, M.D., Ph.D.

diating the hormonal and neurogenic control of cerebral blood flow, vascular permeability and cerebrospinal fluid secretaion; and, second, to use this information in order to develop drugs which may be useful in the treatment of disorders related to these physiological processes (i.e., stroke, subarachnoid hemorrhage, hydrocephalus and migraine headache).

The first objective will be accomplished through the biochemical and pharmacological characterization of plasma membrane hormone receptors located on the large extraparenchymal cerebral arteries, on the small intraparenchymal microvessels of the brain and on the cellular elements of the choroid plexus. The second objective will be accomplished through the testing, *in vitro* and *in vivo*, of defined receptor agonists and antagonists on physiological measures of cerebral blood flow, vascular permeability and CSF secretion.



Juerg Reichen, M.D.



Other research interests include the study of water and ion transport in cholestasis and the mechanisms of hepatic organic anion transport.



Branimir I. Sikic, M.D.

• Branimir I. Sikic, M.D., Assistant Professor, Divisions of Oncology and Clinical Pharmacology, Stanford University School of Medicine. Dr. Sikic is studying the mechanisms of resistance by human tumor cells to anti-cancer drugs, in particular, bleomycin, doxorubicin, and vinblastine. A better understanding of how cancers become resistant to drugs may lead to improved strategies for overcoming such resistance. He is also developing methods for predicting the drug sensitivity of tumors from individual patients. These include measurements of drug uptake and inactivation by cancer cells, as well as effects on the growth and metabolic activity of these cells.

#### Those individuals who awards began July 1, 1980 are:

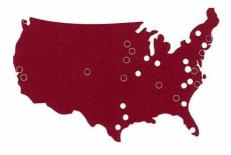
- Ka Kit Hui, M.D., Assistant Professor, Department of Medicine, University of California, Los Angeles, School of Medicine
- Richard D. Mamelok, M.D., Assistant Professor, Department of Medicine, Stanford University, School of Medicine
- Christopher S. Wilcox, M.D., Ph.D., Assistant Professor, Department of Medicine, Harvard Medical School
- Alastair J. J. Wood, M.B., Ch.B., M.R.C.P., Assistant Professor, Departments of Medicine and Pharmacology, Vanderbilt University School of Medicine

### Those individuals who entered their second year of awards in July, 1980 are:

- Thorir D. Bjornsson, M.D., Assistant Professor, Department of Pharmacology, Duke University Medical Center
- Bernhard H. Lauterburg, M.D., Assistant Professor, Department of Internal Medicine, Baylor College of Medicine
- Stephen P. Spielberg, M.D., Ph.D., Assistant Professor, Departments of Pediatrics and Pharmacology and Experimental Therapeutics, The Johns Hopkins University, School of Medicine

#### The individuals who concluded their awards in 1980 are:

- Robert M. Graham, M.B., B.S., Assistant Professor, Departments of Pharmacology and Internal Medicine, University of Texas, Southwestern Medical School
- Fred E. Karch, M.D., Assistant Professor, Department of Pharmacology and Toxicology, University of Rochester, School of Medicine and Dentistry
- Juan J. L. Lertora, M.D., Ph.D., Assistant Professor, Departments of Medicine and Pharmacology, Northwestern University, Medical School during the time of the award. Currently he is Head, Section of Clinical Pharmacology, Department of Pharmacology at Tulane University
- Aubrey R. Morrison, M.B., B.S., Assistant Professor, Departments of Medicine and Pharmacology, Washington University School of Medicine
- Raymond L. Woosley, Jr., M.D., Ph.D., Associate Professor, Departments of Medicine and Pharmacology, Vanderbilt University, School of Medicine



Geographical distribution of Foundation awards under its "Faculty Development Awards in Clinical Pharmacology" program, 1967-1981

- One
- O More than One

# Fellowships for Careers in Clinical Pharmacology

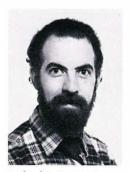
The second program provides Fellowships for Careers in Clinical Pharmacology. This award offers clinicians an opportunity for intensive study in any of the basic sciences that fall within the general field of pharmacology. The program is open to physicians, dentists and veterinarians who are well into their clinical training and wish to pursue careers in clinical pharmacology. With the year or two or support offered by this fellowship program, depending on the particulars of the undertaking, the individual can pursue full-time the basic pharmacologic sciences needed to complement his clinical skills.

The program was amended in 1980 to allow an individual to apply for a fellowship two years in advance of the activation date of the award. For example, those applying for a fellowship in the fall of 1981 may elect to ask that the fellowship be for July 1982 or July 1983.

The first awards under this program were made in 1973. Since that time, twenty-two fellowships have been awarded.

#### Recipients of the two fellowships beginning July 1, 1981 are:

• Richard P. Day, M.D., Fellow, Department of Medicine, University of Washington, School of Medicine. Dr. Day plans to investigate the role that endogenous PGE synthesis plays in diabetic ketoacidosis. He will measure circulating prostaglandins and prostaglandin metabolities in human beings with diabetic ketoacidosis. These studies will involve the use of prostaglandin synthesis inhibitors, nicotinic acid and beta adrenergic antagonists in order to ascertain whether



Richard P. Day. M.D.

generation of prostaglandins are related to lipolysis and, if so, whether they are part of the host defense mechanisms to counter-regulate lipolysis in ketoacidosis. These studies will also involve collection of human adipose tissue to characterize PGE receptors in normals and in patients with diabetes and to examine the changes in receptor characteristics before, during, and after episodes of ketoacidosis.



Linday A. Linday, M.D.

• Linda A. Linday, M.D., Fellow, Departments of Pharmacology and Pediatrics, Cornell University Medical College. Dr. Linday's research concerns the comparative effects of vasoactive drugs on the pulmonary versus the systemic vascular beds in the developing organism when these circuits are connected by a cardiac malformation such as a ventricular septal defect or patent ductus arteriosus. Dr. Linday has completed a clinical study of vasodilator drugs in infants and children with cardiac left-to-right shunts. In contrast to the expected beneficial effect of decreased shunt flow by systemic vasodilation with hydralazine or phentolamine, she observed an increase in the left-to-right shunt. Recent studies with prazosin in a neonatal lamb model of ventricular septal defect suggest that it decreased shunt flow by preferential dilation of the systemic vascular bed. Further studies with neonatal animals followed by additional clinical trials based on the results of the animal work will be carried out during the tenure of the fellowship. These studies will assess whether age affects the response of the pulmonary and systemic vasculature to vasoactive agents and, if so, to eludidate the mechanism of the age-related change in response.

#### Those individuals whose fellowships began July, 1980 are:

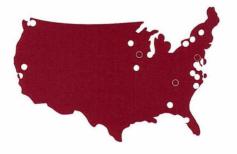
- Mark J. Goldberg, M.D., Fellow, Department of Internal Medicine, The University of Iowa, College of Medicine
- Cheryl Mahony, M.D., Fellow, Division of Clinical Pharmacology, Duke University Medical Center
- Theodore Wang, M.D., Research Fellow, Division of Clinical Pharmacology, Vanderbilt University, School of Medicine
- Jeffrey R. Wilcke, D.V.M., Fellow, Department of Veterinary Clinical Medicine and Veterinary Biosciences (Pharmacology), University of Illinois, College of Veterinary Medicine

# The individual whose fellowship entered the second of award on July, 1980 is:

• Claes M. Nilsson, M.D., Postdoctoral Fellow in Hematology-Oncology, Cancer Research Institute University of California, School of Medicine, San Francisco

#### Those individuals who ended their awards in June, 1980 are:

- Richard C. Ahrens, M.D., Assistant Professor, Departments of Pediatrics and Pharmacology, University of Iowa, College of Medicine
- Robert L. Blum, M.D., Postdoctoral Fellow, Division of Clinical Pharmacology and the Department of Computer Science, Stanford University, School of Medicine
- James R. Matson, M.D., Assistant Professor, Departments of Pediatrics and Pharmacology, University of Iowa, College of Medicine during the time of the fellowship. Currently he is an Assistant Professor, Department of Pediatrics at the University of Oklahoma
- Douglas K. Reilly, M.D., Fellow in Clinical Pharmacology, Department of Pharmacology and Toxicology, University of Rochester, School of Medicine and Dentistry during the time of the fellowship, Currently he is a Resident, Department of Psychiatry, University of Kansas Medical Center



Geographical distribution of Foundation "Fellowships for Careers in Clinical Pharmacology" program. 1973-81

One

O More than One

### Medical Student Research Fellowships in Pharmacology-Clinical Pharmacology

The third program is the Medical Student Research Fellowships in Pharmacology-Clinical Pharmacology. This program, which began in 1974, provides students an opportunity to spend one year full-time in an investigative project in pharmacology-clinical pharmacology. To meet the full-time requirement, the student must interrupt his formal medical training, but he must also intend to continue his schooling at the conclusion of the fellowship. It is hoped that by having students become involved extensively in investigative projects at a point when career choices are still relatively flexible, that they will opt for research careers in clinical pharmacology. Thirty-eight awards have been made since 1974.

Changes in medical school curricula since 1974 have made it more difficult for individuals to apply for this grant. To accommodate these curriculum changes, the program has been modified for the 1982 awards to allow a student to apply for as short as a three-month full-time fellowship, as long as the current year-long program or any length of time in between.

#### The four students offered fellowships for July 1, 1980 were:

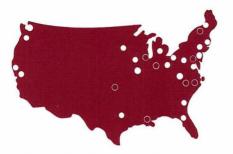
- Thomas L. Eggerman, University of Washington (Seattle)
- Richard A. Frank, University of Missouri (Columbia)
- Jon E. Grossman, University of Louisville
- Marco A. E. Zarbin, Johns Hopkins University

Various situations developed as the fellowships for three of these individuals were about to begin or were into the early months which made it necessary for them to terminate the fellowships. The one individual completing the year-long fellowship is Mr. Richard Frank, who is spending the final six months of the fellowship at the University of Tennessee.

Mr. Frank's principal advisor is Dr. Henry G. Wilcox, Associate Professor, Department of Pharmacology.

Mr. Frank in involved with research aimed at describing mechanisms by which the drugs triiodothyronine  $\{T_3\}$  and propylthiouracil (PTU) alter lipid and lipoprotein metabolism. Principally, hepatic synthesis and secretion of lipid and apoprotein constituents of lipoproteins will be examined using the isolated perfused rat liver. Additionally, changes induced by these drugs in plasma lipoproteins in the whole an-

imal will be examined. Definition of the effects of thyroid hormones on lipoprotein metabolism will provide a rational approach to the development of thyroactive drugs with hypolipidemic potential.



Geographical distribution of Foundation "Medical Student Research Fellowships in Pharmacology-Clinical Pharmacology" program, 1974-1980

OneMore than One

### Clinical Pharmacology Unit Support

This program is designed to assist directors of clinical pharmacology units established within the prior two years of the award year and for units with a change in directorship during that period. The grant provides a total of \$50,000 which may be used at any time during a three-year period. The program is aimed at providing some initial funds to enable the unit's research efforts to be maintained until other research grants are obtained. The first grants were made in 1978. The total number of awards made to date is five.

#### The awards beginning July 1, 1980 were made to:

- Division of Clinical Pharmacology, University of Massachusetts, School of Medicine. The unit was established in September, 1978 in the Departments of Medicine and Pharmacology. The director is Brian F. Johnson, M.D., Professor of Medicine and Pharmacology. The ongoing research includes studies such as the comparison of minoxidil with hydralazine; studies of labetalol; the interaction of pindolol and hydrochlorothiazide in hypertension; a phase I study of BAY e 5009, a vasodilator drug; and a study of the clinical pharmacology of analgesics in the terminally ill patient.
- Division of Clinical Pharmacology, Tufts University, School of Medicine. The division was formed within the Departments of Psychiatry and Medicine in December, 1979. The Chief of the unit is David J. Greenblatt, M.D., Professor of Psychiatry and Associate Professor of Medicine. The current focus of Dr. Greenblatt's research program involves the study of pharmacological and pharmacokinetic changes associated with the aging process. He has a long-time interest in the metabolism of sedative-hypnotic and cardiovascular drugs.



Geographical distribution of Foundation Clinical Pharmacology Unit Grants, 1978-1980

One

#### BASIC PHARMACOLOGY

# Faculty Development Awards in Basic Pharmacology

The purpose of these Faculty Development Awards is to strengthen basic pharmacology by helping maintain existing academic capability and, ultimately, to expand it by enlarging the faculty base. To accomplish these goals, support is provided to full-time junior faculty members committed to careers in pharmacology who give promise of outstanding accomplishments.

The first awards, which are for a two-year period, were made in 1973. The program provides salary and fringe benefits. The Foundation has set a ceiling of \$25,000 on the amount of its participation in the total yearly and fringe benefits for any candidate beginning with the 1980 awards. The total number of awards made to date is twenty-five.

#### Those who received awards beginning July 1, 1981 are:

- Allyn C. Howlett, Ph.D., Assistant Professor, Department of Pharmacology, St. Louis University, School of Medicine. Dr. Howlett's research is directed toward a better understanding of the regulation of cyclic nucleotide metabolism in nervous tissue. Her approach is to use neuroblastoma cells in culture to examine the stimulation of cyclic AMP synthesis by prostaglandins that have been found in brain. Particular attention will be directed to investigating the means by which other neuromodulators such as opiates and muscarinic agents can alter this response and to determine how the neuronal cell adapts to chronic stimulation by these neuromodulators.
- Edwin K. Jackson, Ph.D., Assistant Professor, Department of Pharmacology, Vanderbilt University, School of Medicine. His research will examine the role of prostaglandins in the control of renin release. He will attempt to answer these questions: 1) Which prostaglandins are involved with the *in vivo* regulation of renin release? 2) Where do prostaglandins fit in the overall scheme of renin release control? 3) Are prostaglandins involved in the renin release of disease states? His studies will proceed from the thesis that PGI<sub>2</sub> is the major prostaglandin involved in renin release. This hypothesis will be tested by investigating the relationships between



Allyn C. Howlett, Ph.D.



Edwin K. Jackson, Ph.D.



Kenneth P. Minneman, Ph.D.

PGI<sub>2</sub> biosynthesis and renin release in both animals and man following physiological and pharmacological stimuli.

• Kennth P. Minneman, Ph.D., Assistant Professor, Department of Pharmacology, Emory University, School of Medicine. Dr. Minneman's primary research effort will be a quantitative characterization of opiate receptor subtypes in the central nervous system. Methods will be developed to determine the number and properties of opiate receptor subtypes by means of radioligand binding assays. Once the number and properties of these receptor subtypes are known, methods will be developed to quantitatively measure each subtype in tissue homogenates to obtain information on the regional distribution of these receptors. Further experiments will focus on determining the cellular localization, regulatory properties and functional role of each opiate receptor subtype.

#### Those who began their awards in July, 1980 are:

- Ted H. Chiu, Ph.D., Assistant Professor, Department of Pharmacology, Medical College of Ohio
- Paul H. Fischer, Ph.D., Assistant Professor, Department of Pharmacology, University of Missouri, School of Medicine
- Lindsay B. Hough, Ph.D., Assistant Professor, Department of Pharmacology, Mount Sinai School of Medicine
- Guy Le Breton, Ph.D., Assistant Professor, Department of Pharmacology, University of Illinois, College of Medicine

### Those who entered the second year of their awards in July, 1980 are:

- Joan Heller Brown, Ph.D., Assistant Professor, Department of Medicine, University of California, School of Medicine, La Jolla
- Karen N. Gale, Ph.D., Assistant Professor, Department of Pharmacology, Georgetown University, School of Medicine
- Hazel H. Szeto, Ph.D., M.D., Assistant Professor, Department of Pharmacology, Cornell University Medical College

#### Those who ended their awards in June 1980 are:

- Yvonne C. Clement-Cormier, Ph.D., Assistant Professor, Departments of Pharmacology and Neurobiology, University of Texas Medical School, Houston
- Linda F. Quenzer, Ph.D., Assistant Professor, Department of Pharmacology, University of Connecticut, School of Medicine



Geographical distribution of Foundation "Faculty Development Awards in Pharmacology." 1973-81

One

O More than One

#### Fellowships for Advanced Predoctoral Training in Pharmacology or Toxicology

The program, offered initially in 1977, is designed to assist those candidates who have one or two years remaining in their predoctoral training, the time during which they are engaged in their thesis research.

The fellowship program provides a stipend of \$5,040 a year, payment of tuition and \$500 a year for incidentals directly associated with the thesis research preparation. The program has been funded to provide eight fellowships each year. However, two extra fellowships were authorized for 1981. A total of forty fellowships has been made.

# Those who received fellowships which begin between January-August, 1981 are:

- David Aharony, Department of Pharmacology, Thomas Jefferson University, School of Medicine. His dissertation advisor is Dr. J. Bryan Smith, Professor of Pharmacology. The research deals with the role of arachidonate-lipoxygenase pathway in platelet function and in inflammation.
- Ronald W. Barrett, Department of Pharmacology, Rutgers University, College of Pharmacy. His dissertation advisor is Dr. Jeffrey L. Vaught, Assistant Professor of Pharmacology. His research is concerned with the isolation and characterization of endogenous factors which modulate opiate binding.
- Donald C. Bode, Department of Pharmacology, University of Colorado, School of Medicine. His dissertation advisor is Dr. Perry B. Molinoff, Associate Professor of Pharmacology. His research is concerned with the effects of membrane fluidity on the beta adrenergic receptor-adenylate cyclase system.

- Vincent A. Florio, Department of Pharmacology, University of Virginia, School of Medicine. His dissertation advisor is Dr. Elliott M. Ross, Assistant Professor of Pharmacology and Biochemistry. His research is concerned with the mechanism of alpha adrenergic inhibition of adenylate cyclase.
- Roberta L. Friedman, Department of Pharmacology, Vanderbilt University, School of Medicine. Her dissertation advisor is Dr. Elaine Saunders-Bush, Professor of Pharmacology. Her research is concerned with the functional role of of serotonin binding sites in the rat brain.
- J. Russell Grove, Department of Pharmacology, Stanford University, School of Medicine. His dissertation advisor is Dr. Gordon M. Ringold, Assistant Professor of Pharmacology. His research is concerned with the isolation and characterization of rat hepatoma cell variants with altered responses to glucocorticoids.
- Katherine S. Hilliker, Department of Pharmacology and Toxicology, Michigan State University, College of Human Medicine. Her dissertation advisor is Dr. Robert A. Roth, Jr., Assistant Professor of Pharmacology and Toxicology. Her dissertation is concerned with the role of platelets in monocrotaline-induced pulmonary hypertension.
- Stephen M. Lanier, Department of Pharmacology, University of Tennessee, College of Medicine. His dissertation advisor is Dr. K. U. Malik, Professor of Pharmacology. His research is concerned with the interactions between prostaglandins and angiotensins at the adrenergic neuroeffector junction.
- Daniel C. Medynski, Department of Pharmacology, Harvard Medical School. His dissertation advisor is Dr. Jonathan B. Cohen, Associate Professor of Pharmacology. His research is concerned with the effects of local anesthetics and perhydrohistrionicotoxin on acetylcholine receptor function.
- Jacqueline Sagen, Department of Pharmacology, University of Illinois Medical Center. Her dissertation advisor is Dr. Herbert K. Proudfit, Assistant Professor of Pharmacology. Her research is concerned with brain stem and bulbospinal noradrenergic neurons and their participation in the modulation of nociceptive threshold.

#### Those awardees whose fellowships continued into 1980 are:

MELVIN F. BILLINGSLEY George Washington University School of Medicine

RONALD M. BURCH Medical University of South Carolina ARLEEN CHASE Boston University School of Medicine

GALE L. CRAVISO New York University School of Medicine ELAINE M. FAUSTMAN Michigan State University College of Human Medicine

ROBERT N. FONTAINE University of Missouri School of Medicine

KELVIN W. GEE
University of California (Davis)
School of Medicine

VIVIAN Y. HO HOOK University of California (San Francisco) School of Medicine

STANLEY R. JOLLY Medical College of Wisconsin

RICHARD H. KENNEDY University of Nebraska College of Medicine

JANET L. MARIAN Duke University School of Medicine

MICHAEL R. PALMER University of Colorado School of Medicine

LINDA M. PARSONS Stanford University School of Medicine

STEVEN L. PETERSON University of California (Davis) School of Medicine JAMES B. REESE University of California (San Diego) School of Medicine

JOSEPH L. ROMSON University of Michigan Medical School

JUDITH A. ROY
University of Kentucky
College of Medicine

PETER J. RICE Ohio State University College of Pharmacy

ADELAIDE M. SIEGL Thomas Jefferson University Jefferson Medical College

SUSAN TRIESER Georgetown University School of Medicine

DAVID A. WIERSMA Michigan State University College of Human Medicine

JERWIN WU University of California (San Francisco) School of Medicine

DIANE M. YAHN
University of Connecticut
School of Medicine



Geographical distribution of Foundation awards under the "Fellowships for Advanced Predoctoral Training in Pharmacology/Toxicology," 1978-81

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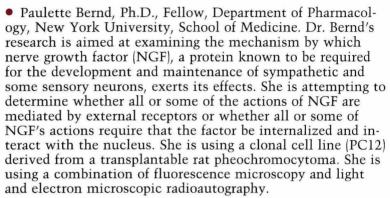
# Fellowship Awards in Pharmacology-Morphology

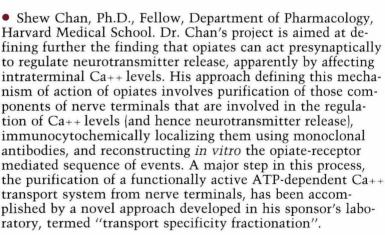
The aim of this program is to advance understanding of drug action through the discovery of specifically related cellular and tissue changes; and, concurrently, to uncover associations between normal and abnormal function in particular tissues and cellular structure.

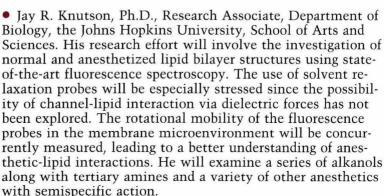
The awards are for two years each. The level of support varies and is aimed at keeping within the existing stipends for similarly trained individuals within the applicant university. Since 1968 when the first fellowships were offered, 46 awards have been made.

The program requires that a candidate be qualified primarily either in a morphologic specialty or in pharmacology. However, training to be achieved under the fellowship in the complementary discipline need not be formal. The candidate's program should result in a familiarity with a new discipline approach by using his primary discipline as a medium for acquiring the second.

#### The recipients of fellowships which began in July, 1980 are:









Paulette Bernd, Ph.D.



Shew Chan, Ph.D.



Jay R. Knutson, Ph.D.

# Those individuals who entered the second year of their fellowships in 1980 are:

- Suzanne N. Haber, Ph.D., Postdoctoral Fellow, Department of Anatomy, University of Minnesota, Medical School during the time of the fellowship. Dr. Haber terminated the fellowship seven months early to accept an NIH fellowship. She is currently in the Department of Psychology, Massachusetts Institute of Technology.
- Gary E. Pickard, Ph.D., Postdoctoral Fellow, Department of Anatomy, Columbia University, College of Physicians and Surgeons.
- Janet K. Stephens, Ph.D., Postdoctoral Fellow, Departments of Pharmacology and Pathology, University of Colorado Medical Center at the time of the fellowship. After three months of the second year of the fellowship, Dr. Stephens resigned the award to enter medical school. She is currently a student at the University of Toronto.



Geographical distribution of Foundation "Fellowship Awards in Pharmacology-Morphology" 1968-80

One

O More than One

### Those individuals whose fellowships concluded in June, 1980 are:

- Virginia S. Seybold, Ph.D., Assistant Professor, Department of Anatomy University of Minnesota, Medical School
- Peter G. Smith, Ph.D., Research Associate, Department of Pharmacology, Duke University, School of Medicine

#### RESEARCH GRANTS

An important aspect of PMA Foundation effort has been the support of fundamental research in drug toxicology. Between 1966 and the end of 1971, 26 research grants of relatively large amounts for two to five years were awarded, principally to established investigators to either extend existing research or to provide "seed" monies to follow a promising lead. In 1971 a change in emphasis within the Foundation's programs shifted the bulk of the funds into educational support programs, and, therefore, less into research. The Foundation does, however, continue to accept requests for support and suggestions for pertinent research projects, since it is important that the potential within the Foundation for helping that particularly promising effort be maintained.



Geographical distribution of Foundation general research grants, 1966-81

- One
- O More than One
- Outside U.S.

#### **Research Starter Grants**

As part of the change of emphasis in 1971 which sought to direct monies more toward the development of the individual, a program of Research Starter Grants was initiated. These grants are intended to provide financial support for beginning investigators. The program offers \$6,500 a year for two years, with the second year contingent upon a continuing need for the funds. The research areas of interest within this program are in pharmacology, clinical pharmacology and drug toxicology. Research into the general principles of pharmaceutics is also included in the program. The program allows for approximately 20 research starter grants each year. The first awards were made in 1972. A total of 244 research starter grants have been made, including the 27 awards beginning January 1, 1981.

#### The recipients of the grants beginning January 1, 1981 are:

ROBERT S. ARONSTAM, Ph.D. Medical College of Georgia School of Medicine

WALTER F. BORON, M.D., Ph.D. Yale University School of Medicine

PATRICK J. BYRNE, M.D. Georgetown University School of Medicine

VINCENT A. CHIAPPINELLI, Ph.D. St. Louis University School of Medicine

CRAIG W. DAVIS, Ph.D. University of South Carolina School of Medicine

MARY ANN ELCHISAK, Ph.D. Purdue University School of Veterinary Medicine

THOMAS A. GASIEWICZ, Ph.D. University of Rochester Medical School

GEETHA GHIA, Ph.D. University of South Alabama College of Medicine

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STEVEN GRANT, M.D. Columbia University College of Physicians and Surgeons

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ROBERT M. WARD, M.D. Pennsylvania State University College of Medicine

JOHN C. WHITE, Ph.D. Wake Forest University Bowman Gray School

FRANK P. ZEMLAN, Ph.D. University of Cincinnati College of Medicine

Review of the need of the 25 research starter grantees whose awards began January 1, 1980 for a second year of the awards resulted in 10 of them having their awards continued. These are:

RUTH ELLEN BILLINGS, Ph.D. University of Texas (Houston) Medical School

NIGEL A. BROWN, Ph.D. George Washington University School of Medicine

STEVEN R. CHILDERS, Ph.D. University of Florida College of Medicine DAVID L. EATON, Ph.D. University of Washington School of Public Health

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ROBERT F. O'DEA, Ph.D., M.D. University of Minnesota Medical School JAMES W. SIEG, Ph.D. University of Kentucky College of Pharmacy

DOUGLAS R. YINGST, Ph.D. Wayne State University School of Medicine



Geographical distribution of Foundation awards under the "Research Starter Grants" program, 1972-81

OneMore than One

### OTHER SUPPORT

#### **Toxicology Workshops**

The PMA Foundation sponsored an invitational Workshop on Cellular and Molecular Toxicology October 8-11, 1978. This unique workshop was the first of a series of three planned in the broad field of toxicology.

The proceedings of the workshop were published as a regular issue of *Pharmacological Reviews*. Copies of the proceedings can be purchased from the publisher, Williams & Wilkins, Baltimore, Maryland. The toll free number to order is #1-800-638-0672.

A second toxicology workshop has been planned for May 17-20, 1981. The subject area will deal with the immunological aspects of toxicology.

#### **PURPOSE**

The PMA Foundation was established to promote the betterment of public health through scientific and medical research, with particular reference to the study and development of the science of therapeutics. In achieving this goal, the Foundation plans and initiates scientific and medical research activities, collects and disseminates the results of these activities, and provides financial support and aid to individuals or institutions whose purposes are scientific, educational or charitable.

Certain guidelines have been developed to promote the wise and proper use of the limited resources available. The areas of interest which govern the distribution of funds are support of fundamental research on drugs and programs for training personnel in basic and clinical pharmacology and toxicology.

Throughout the year, programs have been supported and developed which provide the means of achieving the goals of the Foundation. Many worthwhile proposals have been submitted. It has been necessary to limit support to those who hold the highest promise of advancing the purposes of the Foundation.

Those areas not supported within the existing guidelines are:

- (1) Research on specific drugs. This exclusion is not meant to preclude support of projects which, of necessity, use a number of drugs to establish a methodology or screening program of potential general applicability. It does exclude those efforts primarily aimed at learning more about specific drugs or classes of drugs.
- (2) Funds for construction. The Foundation is not unmindful of the needs and the tremendous pressures for private funds for construction projects. However, it is believed that the scientific community can be better served by channeling the Foundation's available resources into other areas.
  - (3) Funds for travel.
  - (4) Funds to cover entertainment costs.

In 1971, the Board of Directors authorized a major shift in program emphasis. While Foundation support of research continues, such support is to be primarily available in a redirected fashion such as the Research Starter Grants program discussed on page 20.

In line with this change of emphasis, the Foundation is expanding support within its current educational programs as outlined in the Education and Training Programs Section on page 4. While meetings have never received a large portion of the support dollar, only in very exceptional circumstances will meetings receive support in the future.

#### FOUNDATION FINANCES

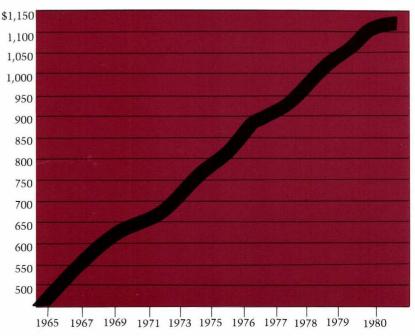
The total income of the Foundation in 1980 was \$1,284,177. Of this amount, \$1,104,996 came from contributions. The balance of \$179,181 came from investments and refunds of unexpended balances from grants.

Contributions were received from approximately four out of every five PMA Member Firms. Contributions were also received during 1980 from individuals and other groups in the health field.

Grants, Foundation-sponsored programs and other expenses for 1980 amounted to \$1,205,850. Of this total \$972,666 represented expenditures for grants. There was a fund balance of \$1,661,201 as of December 31, 1980. This figure, however, does not reflect the tentatively authorized, undisbursed funds for some of the grants and programs described earlier. The Foundation reports these amounts as expenditures when the funds are distributed. As of December 31, 1980, the contingency liability for 1981 was approximately \$1,880,533.

The Foundation's financial position as of December 31, 1980 has been audited by the Washington, D.C. accounting firm of Buchanan & Company.

PMA Foundation Contribution Income 1965-1980 (Thousands)



### Statement of Income and Expenditures For the Year Ended December 31, 1980

#### Income

Contributions—Note a	\$1,104,996
Income from Investments	171,548
Gain on Sale of Stock	12,103
Miscellaneous Income	7,633
TOTAL INCOME	\$1,296,280

#### **Expenditures**

Grants—Note b
Clinical Pharmacology Faculty Awards . \$238,785
Clinical Pharmacology Fellowships 94,297
Clinical Pharmacology Unit Support50,200
Basic Pharmacology Faculty Awards 169,350
Medical Student Research Fellowships 4,000
Pharmacology-Morphology Fellowships 69,644
Research Starter Grants 228,000
Advanced Predoctoral Fellowships 112,390
Special Fellowship—Brussels 6,000
\$972,666

Administrative, December Awardee Meeting and Toxicology Workshop Expenses . . \$233,184

TOTAL EXPENDITURES	\$1,205,850
Excess of income over expenditures	\$90,430
General fund balance at	
January 1, 1980	\$1,570,771
General fund balance at	
December 31 1980	\$1,661,201

**Note a**—The Foundation received contributions of \$118,800 prior to December 31, 1980 which the Foundation considered applicable to 1981, and, therefore, are not recorded as income in 1980.

**Note b**—In addition to the amounts shown, the Foundation has committed itself, subject to annual review, to make certain grants. At December 31, 1980 the amounts still to be disbursed with respect to these grants during 1981 amounted to approximately \$1,029,923.

# ORGANIZATION AND ADMINISTRATION

The PMA Foundation operates through its officers and four advisory committees. In July, 1980 Donald van Roden, Vice Chairman of the Board, SmithKline Corporation, was reelected Chairman of the Board. Herman Sokol, Ph.D., President, Bristol-Myers Company, was elected Vice Chairman and Albert Bowers, Ph.D., President and Vice Chairman of the Board, Syntex Corporation was elected Secretary, Treasurer. Thomas E. Hanrahan is President and Irwin C. Winter, M.D., Ph.D. serves as staff consultant.

In reaching decisions on the most worthwhile activities for support, the Board of Directors has had the advice of extremely knowledgeable individuals serving on four advisory committees.



Donald van Roden

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<sup>&</sup>lt;sup>1</sup> Terms Expired April, 1980

<sup>&</sup>lt;sup>2</sup> Named to the Board of Directors April, 1980

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<sup>&</sup>lt;sup>3</sup> Terms expired December, 1980

<sup>&</sup>lt;sup>4</sup> Term expired April, 1980

<sup>&</sup>lt;sup>5</sup> New Members December, 1980

<sup>&</sup>lt;sup>6</sup> New Members April, 1980 <sup>7</sup> Became Chairman December, 1980

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<sup>11</sup> New Members April, 1980 12 Resigned April, 1980

<sup>13</sup> Resigned September, 1980

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<sup>14</sup> Terms Expired December, 1980 15 New Member December, 1980

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The Foundation accepts requests for support and suggestions for pertinent research projects from qualified institutions and individuals. However, in 1971 the Foundation underwent a major shift in program direction, now emphasizing education and training support.

To expedite the handling of requests for research support, it is suggested that a brief one or two page letter be directed to the Foundation, outlining the intended project and an estimate of the funds involved. After review of this more informal request by members of the Scientific Advisory Committee to determine the degree of likelihood of the project falling within Foundation guidelines, a decision can be made as to whether a formal proposal is warranted.

Letters should be addressed to:

Thomas E. Hanrahan President Pharmaceutical Manufacturers Association Foundation, Inc. 1155 15th Street, N.W. Washington, D.C. 20005