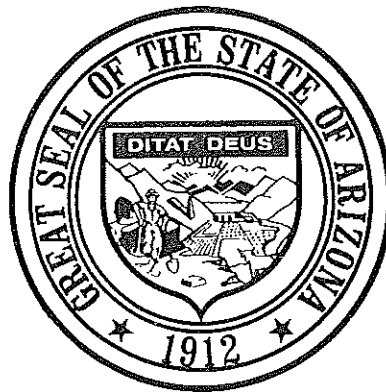


ARIZONA DISEASE CONTROL RESEARCH COMMISSION

ANNUAL REPORT



YEAR 1988

ARIZONA DISEASE CONTROL RESEARCH COMMISSION

ANNUAL REPORT

YEAR 1988

Rose Mofford
Governor
State of Arizona

Arizona Disease Control Research Commission
1740 West Adams Street
Room 408
Phoenix, Arizona 85007

(602) 542-1028

Arizona Disease Control Research Commission

MESSAGE FROM THE CHAIRMAN OF THE COMMISSION

January 15, 1989

The Arizona Disease Control Research Commission (ADCRC) was established by the Arizona Legislature in 1984. The ADCRC provides funds for research on the causes, epidemiology, diagnosis, treatment, and prevention of diseases affecting Arizonans. The Commission is unique in the United States in its expenditure of public funds for basic research on a wide range of medical concerns. Funds are appropriated annually from penalties or interest on delinquent taxes. By statute, the Commission must prepare and submit a report on or before January 15 of each year to the Governor, the President of the Senate and the Speaker of the House of Representatives.

During 1988, the Commission awarded thirty-eight new contracts for medical research in Arizona. Twenty contracts were continued from the previous year. Summaries of the nineteen projects that ended in 1988 are presented in the first issue of ABSTRACTS, a copy of which is enclosed with this report. Five projects involving cancer research were concluded. One researcher from the College of Pharmacy at the University of Arizona discovered a new antitumor agent from the plant world in the fight against breast and colon cancer. Another University of Arizona investigator identified a previously unknown peptide with the potential of regulating the immune response to malignant growths. A Dermatologist from the University of Arizona developed a new and effective treatment in the fight against skin cancer. An immunologist at Northern Arizona University tried to devise a method for obtaining immune cells with an improved ability to destroy tumor cells. A radiologist from the University of Arizona investigated a new method for determining if malignancy has spread from its original site to the spine via the bloodstream.

Four projects concerned with heart disease also concluded in 1988. A researcher in the biological sciences at Northern Arizona University increased our understanding of arterial wall inflammation and atherosclerosis. A biochemist from the University of Arizona investigated the function of an enzyme and cardiac contraction. A scientist in the University of Arizona College of Medicine (physiology) looked at differential morbidity and mortality rates among newborns and adults following open heart surgery. A pharmacologist at the University of Arizona investigated the way in which drugs used to treat hypertension affect blood vessels and their nerves.

In the area of health promotion and disease prevention, three research projects were concluded in 1988. A microbiologist from Arizona State University studied the development of a

bacteria that would kill mosquito larvae when eaten, contributing to the control of mosquito-transmitted diseases in Arizona. A researcher from the University of Arizona investigated cost effective and sensitive techniques for the detection of viruses in wastewater, sewage effluents reused for irrigation, recreation and other uses. A study was concluded by a University of Arizona researcher to improve the quality and quantity of information on farmworkers' health by developing a statewide patient data collection system.

Two studies were completed in the area of metabolic and endocrine disorders. A researcher from Arizona State University developed a new glucose sensor for the treatment of diabetes patients. An investigator affiliated with the Samaritan Medical Foundation analyzed the influence of diet fats and carbohydrates on the levels of blood fats and cholesterol in order to develop a proper diet for the treatment of individuals with diabetes.

In the area of respiratory diseases, two projects were concluded in 1988. An investigator from Arizona State University's Department of Botany and Microbiology produced a new culture medium for the diagnosis of Valley Fever. A physiologist at the University of Arizona explored molecular defects in Cystic Fibrosis (CF) pulmonary cells. CF is the leading chronic respiratory disease in Arizona.

The treatment of spinal cord injuries was the subject of a project at Barrows Neurological Institute at St. Joseph's Hospital. Giardia, a common infectious agent in diarrheal illness among day care center children in Arizona was studied by the Maricopa County Department of Health Services. The object was to design effective strategies to control infections by the intestinal parasite in Arizona's day care centers. Finally, a project at the University of Arizona expanded a program for decreasing the incidence of developmental disabilities in children born in Arizona by targeting the avoidance of known human teratogens during pregnancy.

Arizonans can be proud of the leading role their state has taken in the funding of basic medical research by Arizona researchers. As Chairman of the Arizona Disease Control Research Commission, I am pleased to report on the progress of the program. The Commissioners deserve our thanks for their selfless dedication to the task of reviewing and awarding contracts that are leading to the improvement of the health of our citizens.



Ted Williams
Chairman

COMMISSION MEMBERS:

The Governor appoints nine members to serve on the Commission. Three members represent the medical community, three represent the scientific research community and three represent the general public. Members are appointed for three year terms. The Director of the Department of Health of Services serves as ex-officio member and chairs the Commission.

Members at the end of 1988:

Ex-Officio Member and Chairman

Ted Williams, J.D.

Director
Arizona Department of Health Services
1740 West Adams, Room 407
Phoenix, Arizona 85007



Ted Williams was appointed Director of the Arizona Department of Health Services (DHS) in January, 1987. Mr. Williams has extensive experience in state government. He has served as Deputy Director of DHS, Deputy Director of the Arizona Department of Transportation, and consultant to the Arizona Legislature. Prior to his appointment as DHS Director, Mr. Williams was Executive Vice President of Baptist Hospitals and Health Systems.

General Public Representatives

Jane Aiken, J.D.

College of Law
Arizona State University
Tempe, AZ 85821



Ms. Jane Aiken is Associate Professor of Law at Arizona State University. She was admitted to the Arizona Bar in 1986. Before joining the law faculty at ASU in 1985, Ms. Aiken was an Advocacy Fellow at the Center for Applied Legal studies at Georgetown. She is a member of the Arizona Civil Liberties Union, a board member of Mobilization Against AIDS (Phoenix), and she serves on the Medical Ethics Board of Phoenix Indian Hospital. Ms. Aiken chairs the

Governor's Task Force on AIDS. She was appointed to the Commission in June, 1988; her term expires in January, 1991.

Maxine Marshall
The Marshall Fund
4000 North Scottsdale Road
Suite 203
Scottsdale, AZ 85251



Ms. Marshall has been a resident of Arizona for 25 years. She has a long time interest in the promotion of quality health care. She served as a member of the Phoenix Advisory Board of the University of Arizona Cancer Center and participated on the Pritzlaff Commission on Long Term Care in Arizona. Ms. Marshall was formerly Associate Publisher of the Scottsdale Daily Progress newspaper. Currently, she devotes herself full time to the Marshall Fund, a non-profit private foundation. She was appointed to the Commission in March, 1985; her term expires in January, 1989. She was one of the first Commissioners.

Jay Robertson
1002 E. Myrtle
Phoenix, Arizona 85020



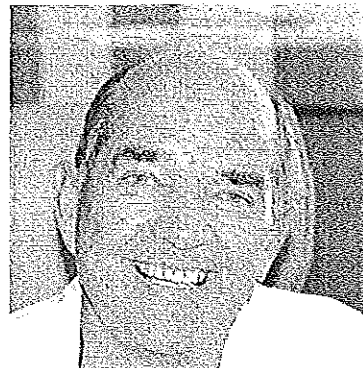
Mr. Robertson has lived in Arizona since 1961. He is a retired Project Manager of Honeywell Information Systems. Prior to his position at Honeywell, Mr. Robertson was an engineer with the General Electric Company

for 25 years. He brings to the Commission a strong interest in medical issues and a wealth of experience in reviewing grant applications. Mr. Robertson was appointed to the Commission in March, 1987; his term expires in January, 1990.

Medical Community Representatives

William Crisp, M.D.

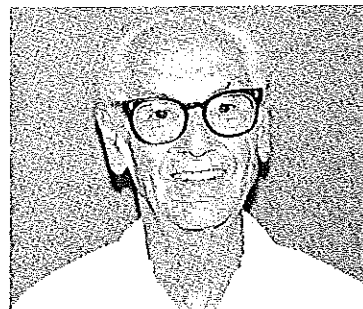
1144 E. McDowell Road
Suite 300
Phoenix, AZ 85006



Dr. Crisp currently holds a number of positions. He is Clinical Associate Professor at the University of Arizona College of Medicine. At the Maricopa County Hospital, Dr. Crisp is Chairman of the Department of Obstetrics and Gynecology, Director of Oncology, Director of the Research Committee, and Director of the Cryobiology Laboratory. He is Chairman of the Department of Obstetrics and Gynecology at Good Samaritan Hospital. Dr. Crisp has served as President of both the Arizona Medical Association and the Maricopa Medical Society. He was appointed to the Commission in June, 1988; his term expires in January, 1991.

Herbert Abrams, M.D.

College of Medicine
Department of Family and Community Medicine
The University of Arizona
Tucson, Arizona 85724



Dr. Abrams was the founder and Head (1968-1978) of the Department of Family and Community Medicine at the University of Arizona College of

Medicine. From 1978 to 1983, he was Director of the Arizona Center for Occupational Safety and Health, which he also founded. Dr. Abrams, currently, is Professor of Family and Community Medicine at the University of Arizona. He has been an Arizona resident for 20 years. Dr. Abrams was reappointed to the Commission in 1987. His term of office ends in January, 1990.

Louis Newton, M.D.
 Edwards Medical Plaza
 1300 N. 12th Street, Suite #612
 Phoenix, Arizona 85006



Dr. Newton is a physician in private practice in the field of medical oncology, and is a long time resident of Arizona. He has served as Director of the Division of Oncology and as Chief of Staff at Good Samaritan Medical Center. Dr. Newton has served as President and Chairman of the Arizona Division of the American Cancer Society. He was appointed to the Commission in 1985. His term of office ends in January, 1989.

Scientific Research Community Representatives

Robert B. Gilsdorf, M.D.
 1300 N. 12th Street
 Suite 407
 Phoenix, Arizona 85006



Dr. Gilsdorf is Director of Integrated Medical Specialties, a private multi-specialty clinic, specializing in the treatment of catastrophic illnesses. He is

also a Clinical Professor of Surgery at the University of Arizona College of Medicine. Dr. Gilsdorf has been a resident of Arizona for 14 years. He was appointed to the Commission in March, 1987; his term of office expires in January, 1990.

Mary J. C. Hendrix, Ph.D.

Department of Anatomy
University of Arizona
Tucson, Arizona 85724



Dr. Hendrix received her Ph.D. in Anatomy from George Washington University in Washington, D. C. She is currently Associate Professor of Anatomy at the University of Arizona College of Medicine. Dr. Hendrix also serves as Adjunct Researcher in the Department of Pathology at the University of California School of Medicine in San Francisco. She has been a resident of Arizona for seven years. Dr. Hendrix was first appointed to the Commission in March, 1985. She was reappointed in 1988. Her term of office expires in January, 1991.

John P. Schaefer, Ph.D.

Research Corporation
6840 E. Broadway Blvd.
Tucson, Arizona 85710



Dr. Schaefer is President of Research Corporation and Research Corporation Technologies, a private foundation located in Tucson, Arizona. Dr. Schaefer was President of the University of Arizona from 1971 to 1982. He has

been a resident of Arizona for 28 years. Dr. Schaefer was appointed to the Commission in January, 1986. His term of office expires in January, 1989.

Activities of the Commission - 1988

January - March

The Commission gained two new members and one member was reappointed to a second term. Dr. William Crisp replaced Dr. Robert Brooks, representing the Medical Community. Jane Aiken, J.D., replaced Isabel Fathauer, representing the General Public. Finally, Dr. Mary Hendrix was reappointed to a second term, representing the Scientific Research Community. Because of the changes in the Governor's Office, the three new Commissioners were appointed, pending confirmation by the Senate.

Research proposals were received for the the eight priority areas solicited:

Cardiovascular and Other Circulatory Diseases/Disorders
Health Effects of Environmental Pollutants
Health Promotion and Disease Prevention
Infectious and Immunologic Diseases/Disorders
Malignant Neoplasms
Metabolic and Endocrine Disorders
Neurologic, Mental, and Behavioral Diseases/Disorders
Respiratory Disease

The Commission received 94 applications (listed in Attachment 6) in response to the Request for Proposals issued in the fall, 1987. Subsequently, the applications were sent out for peer review. Every effort was made to get three reviews on each application, although in the case of specialized proposals, only two reviews were possible. The peer reviewers were asked to review and score the proposals based on the following criteria:

1. Scientific merit, including study design , methodology, feasibility, uniqueness, and evaluative content.
2. Productivity and ability of the investigator(s) in the project to perform the research, as indicated by their knowledge and experience.
3. Adequacy of facilities and staff, including personnel and equipment capable of supporting the proposed research.
4. Appropriateness of budget request.

In addition, the peer reviewers were asked to score the applications on a subjective evaluation of one to five, one being excellent and five being poor.

April - May

The Commission made 38 new contract awards for 1988-89, totaling \$1,222,500. The largest number of new awards was in the priority area: Infectious and Immunologic Diseases or Disorders. The priority area receiving the smallest number of new awards was for Respiratory Diseases which also had the smallest number of applications. The new proposals funded are listed in Attachment 3.

As expected, the majority of the applications were submitted by researchers from the state's universities. Researchers at the University of Arizona submitted the largest number of proposals (54), and received the largest number of awards (25). Continuing contracts are listed in Attachment 4.

The balance of the quarter was occupied with the notification of investigators as to the award or denial status of their applications and the subsequent preparation of contracts for each individual project to commence July 1, 1988.

July - September

Peggy Broussard, Executive Assistant to the Commission, resigned her position and recruitment of a replacement took place during the third quarter. Robert S. Byars, Ph.D., was recommended by the interview panel which was chaired by Ted Williams, Chairman of the Commission and Director of the AZ Department of Health Services. The Commissioners approved the recommendation and Dr. Byars commenced work in mid-July.

Contracts were mailed to those researchers receiving new awards for 1988-89, and to those receiving continuing contracts. The Commission met in August and acted to simplify reporting requirements for contractors.

The Request for Proposals (RFP) for 1989-90 awards was mailed out on August 24, one month earlier than last year. An estimated \$550,000 was available for new contract awards in 1989.

A new Administrative Assistant, Toshie Isogai, was recruited to fill the position vacated by Sonya Santor.

October - December

After serving from the earliest start-up days of the agency, Commissioner Maxine Marshall resigned from the Commission in order that a

new person could be named to replace her in plenty of time to begin work on the next year's award process.

The Commission received 82 proposals by November 4, in response to the Request for Proposals that was issued on August 24. One of these was not appropriately responsive to the RFP and was not eligible for review and evaluation. Attachment 5 presents a summary of the research applications received, and Attachment 6 contains a listing of the proposals received, by Category and Priority Area. After review by Commission staff, all fully developed proposals were sent to panels of scientific and medical experts recruited along lines of scientific disciplines or disease areas. Peer review evaluations must be returned to the Commission by early January, 1989, after which the Commissioners will review the proposals and make the awards for Fiscal Year 1989-90.

A new Commission publication, ABSTRACTS, was developed prepared for release in January, 1989. The newsletter presents summaries of research projects supported by the ADCRC that were completed during the calendar year. The purpose of the publication is to inform the scientific and medical research communities, legislators, and the general public about basic research being conducted in Arizona with public funds. Ideally, the circulation of this newsletter will help to advance the frontiers of knowledge as a cross-fertilization of ideas and findings begin to take place among the States' medical researchers. Attachment 7 contains the first issue of ABSTRACTS.

ATTACHMENTS

- 1 1988-89 Research Application/Award Summary
- 2 1988-89 Awards, by Disease Category
- 3 1988-89 New Awards
- 4 1988-89 Continuing Awards
- 5 Research Proposals for 1989-90 Awards:
Summary
- 6 Research Proposals for 1989-90 Awards, by
Priority Area
- 7 ABSTRACTS..... , January, 1989 Issue

ATTACHMENT 1

ARIZONA DISEASE CONTROL RESEARCH COMMISSION
1988-89 Awards

Total Number of New Awards: 38

<u>DISEASE CATEGORIES</u>	<u>NO. OF AWARDS</u>	<u>% OF TOTAL AWARDS</u>
Cardiovascular and other Circulatory Diseases	4	11%
Health Effects of Environmental Pollutants	4	11%
Health Promotion/Disease Prevention	5	13%
Infectious and Immunologic Diseases/Disorders	7	18%
Malignant Neoplasms	5	13%
Metabolic and Endocrine Disorders	6	16%
Neurologic, Mental and Behavioral Disorders	4	11%
Respiratory Diseases	3	8%
TOTAL	38	101%*

*Totals more than 100% because of rounding.

<u>INSTITUTION</u>	<u>NO. OF AWARDS</u>	<u>% OF TOTAL AWARDS</u>
University of Arizona	25	66%
Arizona State University	5	13%
Northern Arizona University	1(declined)	3%
St. Joseph's Hospital	2	5%
Barrow Neurological Institute	1	3%
Institute for Gerontology Research	1	3%
Johns Hopkins	1	3%
National Institutes of Health	1	3%
Department of Health Services	1	3%
TOTAL	38	102%*

*Totals more than 100% because of rounding.

ATTACHMENT 2

ARIZONA DISEASE CONTROL RESEARCH COMMISSION
1988-89 Applications Funded--Summary

Total Number of Proposals Submitted: 94

Total Number of Proposals Funded: 38

Total Amount Awarded for New Contracts: \$1,222,500

Total Number Funded, by Category:

Category I (\$25,000 or Under; One Year): 4 (10.5%)
 Category II (Over \$25,000; Multi-Year): 34 (89.5%)

Total Number Submitted and Funded by Priority Area and Category:

Priority Area	Category	Submitted	Funded
Cardiovascular and other Circulatory Diseases/ Disorders	I	3	1
	II	8	3
Health Effects of Environmental Pollutants	I	1	0
	II	10	4
Health Promotion and Disease Prevention	I	10	0
	II	9	5
Infectious and Immunologic Diseases/Disorders	I	1	1
	II	11	6
Malignant Neoplasms	I	4	1
	II	13	4
Metabolic and Endocrine Disorders	I	4	1
	II	5	5
Neurologic, Mental and Behavioral Disorders	I	2	0
	II	8	4
Respiratory Diseases	I	2	0
	II	3	3

ATTACHMENT 3

Arizona Disease Control Research Commission

New Awards for FY 1988-89

<u>Principal Investigator</u>	<u>Institution</u>	<u>Project Title</u>	<u>Award Amount</u>
Akporiaye	Northern Arizona University	Cloning of Cytotoxic T-lymphocytes and Elucidation of Cell Recruitment during Tumor Rejection	25,000
Blanchard	University of Arizona	Procedures for Monitoring Free Theophylline Blood Levels: Evaluation of Binding Variability in Patients on Regular Theophylline Therapy	29,000
Bloom	University of Arizona	Cholinergic Mechanisms in Bronchoconstriction	24,500
Bogardus	National Institutes of Health	A New Method to Measure Physical Activity in Man: Relationship with Age and Diabetes Mellitus	22,500
Brannon	University of Arizona	Aging and Digestive Function of the Pancreas	25,000
Burke	Arizona State University	Genetic Manipulation of Mosquitocidal Bacteria	23,500
Cluff	Arizona State University	Effects of Hearing Protection on Communication	22,000
Dillenberg	Department of Health Services	A Project to Assess the Actual Fluoride Levels in Arizona Water Supplies and to Determine the Knowledge About and Appropriate Utilization of Dietary Fluoride Supplements by Health Care Providers of Children	60,000
Dorson	Arizona State University	Augmented Hemoperfusion for the Treatment of Hyperbilirubinemia	60,000
Duffy	University of Arizona	Hyperthermia Induced Polyamine Acetylation	24,500
Egen	University of Arizona	A Technique for Identifying and Quantifying Specific Rattlesnake Venom in Envenomated Patients	24,500
Feinberg	University of Arizona	Molecular Markers of Hemostasis in Cerebrovascular Disease	24,500
Friedman	University of Arizona	Further Development of Rapid Diagnostic Tools for Identification of Bordetella Pertussis	45,000
Gmitro	University of Arizona	In-Vivo Diagnosis and Localization of Disease via NMR and Optical Spectroscopy	25,000

Goldberg	University of Arizona	Cardiac Teratogenicity of Halogenated Aliphatic Hydrocarbons and Chromium in Avian and Mammalian Models	90,000
Gruener	University of Arizona	Ion Channel Behavior of Cystic Fibrosis Epithelial Cells	65,000
Guilbeau	Arizona State University	Evaluation of Pericardial Substitutes	25,000
Harrison	University of Arizona	Validation of Objective Measures of Adherence to Low-Fat Diets	23,500
Hill	University of Arizona	Enhanced Isolation of Cis-Platinum-Resistant Mutants from Human Tumor Lines Following DNA Synthesis Inhibition	25,000
Jeevanandam	St. Joseph's Hospital and Medical Center	Metabolic Responses to Trauma in Obese Subjects and the Nutritional Implications	24,500
Kruelen	University of Arizona	Antihypertensive Diuretic Drugs: Neurovascular Sites and Mechanisms of Action	70,000
McCuskey	University of Arizona	Role of Kupffer Cells in Liver Pathophysiology	24,500
Meltzer	University of Arizona	Molecular Analysis of B-Cell Neoplasia	25,000
Montgomery	University of Arizona	Regulation of Lymphocyte Proliferation by Prolactin-Like Proteins	24,500
Nagle	University of Arizona	Quantitative Immunohistochemical Determination of Estrogen Receptor Content, DNA Quantitative Analysis, and Proliferative Index in Breast Carcinoma and Their Relationship to Clinical Staging and Survival	24,500
Perednia	University of Arizona	Computerized Skin Scanning for Early Detection, Evaluation, and Treatment of Skin Disease	25,000
Petersen	University of Arizona	Comprehensive Data Collection and Statistical Analysis of HIV Infected Patients in Arizona	24,500
Rogers	Institute for Biogerontology Research	Brain-Immune Interactions in Alzheimer's Disease	24,500
Santosham	Johns Hopkins University	BPIG Prophylaxis of Pneumococcal and Other Infections	85,000

Schiller	St. Joseph's Hospital and Medical Center	Evaluation of Biochemical Markers of Catabolism in Trauma	24,500
Schumacker	University of Arizona	Africanized Bees: Antivenom Therapy	24,500
Sommerfeld	Arizona State University	Urban Lakes: Potential Sinks for Biohazardous Substances	24,500
Spetzler	Barrow Neurological Institute	Familial Cavernous Malformations: Study of the Natural History	40,000
St. John	University of Arizona	ALS and Factors That Block Death of Motoneurons	24,500
Udall	University of Arizona	Development of a New Method to Assess Lactose Malabsorption	20,000
Witte, C.	University of Arizona	Boosting Extrasplenic Splenomimetic Function to Avert Fatal Post-Splenectomy Sepsis	24,500
Witte, M.	University of Arizona	Effect of Alcohol on the Hepatic Microvasculature in Vivo and in Vitro	24,500
Yamamura	University of Arizona	Evaluation of Novel Opioid Drugs Using Cultured Neuroblastoma Cells	24,500

ATTACHMENT 4

Arizona Disease Control Research Commission

Continuation Awards for FY 1988-89

<u>Principal Investigator</u>	<u>Institution</u>	<u>Project Title</u>	<u>Award Amount</u>
Barber	University of Arizona	Neurochemical Substances Which Generate or Block Brainstem Unitary Responses Concerned with Food Intake	24,500
Bernstein	University of Arizona	The DNA Damaging Activity of Bile Acids in Colon Tissue: Relationship to Colon Cancer (Statewide)	29,000
Braun	University of Arizona	Kidney Stones: A Basic Model to Elucidate the Development of Kidney Stones in Humans	24,500
Buseck	Arizona State University	Health Effects and Characterization of Particulate Air Pollutants in Arid, Urban Environments: Phoenix and Tucson	100,000
Davis	University of Arizona	Human Papillomavirus Genotypes in Cervical Dysplasia	20,000
Dillenberg	Department of Health Services	Arizona State Pathfinder Survey	20,000
Galgiani	University of Arizona	Purification and Application of Antigens of <i>Coccidioides Immitis</i>	80,000
Hadley	University of Arizona	Melanotropic Peptides for Melanoma Studies	24,500
Jacobs	Arizona State University	Mechanism of Induction of Virus-associated Diabetes Mellitus	24,500
Katz	National Institutes of Health	Glucose 1, 6-bisphosphate Content and Glycogen Synthase Activity in Human Skeletal Muscle and Their Relationship to Carbohydrate Metabolism in Normal and Non-Insulin Dependent Diabetic Subjects	25,000
Korc	University of Arizona	Control of Neoplastic Growth by Modulation of Growth Factor Receptor Expression and Activation	24,500
Laird	University of Arizona	Mechanism of Benzodiazepine Modulation of Normal and Malignant Cell Growth	24,500
Morkin	University of Arizona	Action of Thyroid Hormone on the Heart: A New Basis for Treatment of Congestive Failure	100,000
Mufson	Institute for Biogerontology Research	Somatostatinergic Systems in Aged and Alzheimer's Disease Brain	24,500

Pettit	Arizona State University	Discovery and Development of New Anticancer Drugs	175,000
Ryan	University of Arizona	Molecular Methods for Detection and Characterization of Shigella Species	24,000
Salmon	University of Arizona	Arizona Cancer Center Research Program	750,000
Schiller	St. Joseph's Hospital and Medical Center	Metabolic Responses to Multiple Trauma in Elderly and the Nutritional Implication	26,500
Smith	Arizona State University	Cell Growth Regulation by a (2'-5') Oligoadenylate-Dependent Endonuclease (RNase L)	24,000
Smothers	University of Arizona	The Effect of Aluminum Contaminated Water Supply in Man: An Experimental Approach	24,500
Spetzler	Barrow Neurological Institute	Induced Cardiac Arrest and Brain Ischemia	40,000

ATTACHMENT 5

ARIZONA DISEASE CONTROL RESEARCH COMMISSION

FY 1989-90 Contract Proposals

Proposals Submitted

Total = 81

<u>Priority Area</u>	<u>Number Submitted</u>	<u>% of Total Submitted</u>
A. Cardiovascular and Other Circulatory Diseases/ Disorders	11	14%
B. Health Effects of Environmental Pollutants	9	11%
C. Health Promotion and Disease Prevention	12	15%
D. Infectious and Immunologic Diseases/Disorders	13	16%
E. Malignant Neoplasms	18	22%
F. Metabolic and Endocrine Disorders	9	11%
G. Neurologic, Mental and Behavioral Diseases and Disorders	7	9%
H. Respiratory Diseases	<u>2</u>	<u>2%</u>
TOTALS	81	100%

<u>Institution</u>	<u>Number Submitted</u>	<u>% of Total Submitted</u>
University of Arizona*	46	57%
Arizona State University	10	12%
Northern Arizona University	6	7%
Harrington Arthritis Research Center	6	7%
Barrow Neurological Institute	4	4%
St. Joseph's Hospital and Medical Center	3	3%
Institute for Biogerontology Research	1	1%
Mesa General Hospital Medical Center	1	1%
National Institutes of Health	1	1%
Phoenix Integrated Surgical Residency Foundation	1	1%
Southwest Biomedical Research Institute	1	1%
No Affiliation	<u>1</u>	<u>1%</u>
TOTALS	81	100%

*Includes Veterans Administration Medical Center

ATTACHMENT 6

FY 1989-90 Contract Proposals

Cardiovascular and Other Circulatory Diseases/Disorders

<u>ID No.</u>	<u>Principal Investigator</u>	<u>Institution</u>	<u>Project Title</u>	<u>Yrs</u>	<u>Budget Amount</u>
026	Burt	University of Arizona	Role of Gap Junctions in Vascular Responses	3	83,089 86,412 89,859
066	Carter	University of Arizona	Evaluation of Heparin and Tissue Plasmiogen Activator Therapy for the Treatment of Embolic Stroke	1	61,733
059	Graham	University of Arizona	Characterization of Accelerated Coronary Atherosclerosis in Cardiac Transplant Patients	1	24,334
053	Guilbeau	Arizona State University	Evaluation of Pericardial Substitutes	1	25,000
013	Keller	Barrow Neurological Institute	Screening for Normalcy of Arterial Vasculature in Human Necks by Magnetic Resonance Angiography	2	21,744 23,412
032	Litwin	University of Arizona	Diabetic Cardiomyopathy: Time Course of Changes in Mechanical Function and Response to Therapy	1	24,963
063	MacDonald	Southwest Biomedical Research Institute	Role of Arachidonoyl-Diacylglycerol Kinase in Fatty Acid Homeostasis: Effects on Inhibitors on Cellular Functions Related to Cardiovascular Disease	3	25,000 25,000 25,000
006	Marcus	University of Arizona	An Evaluation of the Safety, Efficacy, and Pharmacokinetics of Regional Antiarrhythmic Drug Delivery	2	25,000 25,000
028	Markle	Northern Arizona University	Studies of Aortic Wall Substance P and Permeability	3	25,000 25,000 25,000
033	Morkin	University of Arizona	Actions of Thyroid Hormone on the Heart: A New Basis for Treatment of Congestive Heart Failure	3	115,608 121,364 128,646
015	Nolan	University of Arizona	Clinical Pharmacokinetics of Amiodarone in the Elderly, Obese and in Individuals with Hepatic Disease	3	23,802 24,785 24,983

FY 1989-90 Contract Proposals

Health Effects of Environmental Pollutants

<u>ID No.</u>	<u>Principal Investigator</u>	<u>Institution</u>	<u>Project Title</u>	<u>Yrs</u>	<u>Budget Amount</u>
039	Brower	University of Arizona	Development Toxicity of Heavy Metals: An Insect Model System	3	24,677 22,309 23,670
067	General	Mesa General Hospital Medical Center	Correlation of Organophosphate Pesticide Exposure and Neuropsychological Deficits	1	24,416
052	Kearfott	Arizona State University	Radon Gas in Arizona Homes	3	39,450 54,803 55,891
055	Lantz	University of Arizona	Synergistic Effects of Oxidant Air Pollutants and Coal Fly Ash on Pulmonary Alveolar Macrophages	3	24,233 24,998 23,073
027	Lindstedt	Northern Arizona University	Scaling of DNA Replication Rates in Mammals	1	25,000
001	Park	University of Arizona	Food Safety: Reduction in Health Risks Posed by Aflatoxin Contamination	2	24,936
009	Pepper	University of Arizona	Health Risks Associated with Land Disposal of Municipal Sludge in Arizona	3	24,993 81,982 80,828 85,333
014	Rose	University of Arizona	Gene Probe Technology for Rapid Monitoring of Giardia in Reused Wasted Water	2	37,848 35,797
004	Schwartz	Barrow Neurological Institute	Dietary Induction of Neurofibrillary Tangles in Rabbits	1	29,524

FY 1989-90 Contract Proposals

Health Promotion and Disease Prevention

<u>ID No.</u>	<u>Principal Investigator</u>	<u>Institution</u>	<u>Project Title</u>	<u>Yrs</u>	<u>Budget Amount</u>
023	Eblen	Harrington Arthritis Research Center	Assessment of Two Experimental Walkers on Independence in Daily Living	1	24,686
022	Eblen	Harrington Arthritis Research Center	The Longitudinal Influence of Stressful Life Events Upon Symptomatology in Juvenile Rheumatoid Arthritis (JRA)	1	24,952
003	Finley	University of Arizona	The Use of Recombinant DNA Technology and Restriction Fragment Length Polymorphism in the Study of Hemophilia A (Factor VIII Deficiency) and Carrier States in Arizona	1	24,937
007	Girsh	Harrington Arthritis Research Center	Milk Antigen Induced Arthritis	2	24,402 22,294
029	Hughes	Northern Arizona University	An Assessment of the Relationship Between the Level of Volunteer Activity, and Health Related Factors in Elderly Anglo and Native American Populations	3	22,716 22,716 22,716
050	Kearfott	Arizona State University	Radon Mitigation Demonstration: Southwest Tucson	2	50,509 59,476
080	Keller	Arizona State University	Development and Testing of an Illness Behavior Model	2	18,566 15,351
074	Keller	Arizona State University	Perceived Seriousness and Vulnerability and Their Relationships to Cardiovascular Disease Risk Behaviors Among Black Women	2	22,904 22,608
082	Rappaport	University of Arizona	The Hemodynamic Effect of Alcohol on Experimentally Produced Liver and Spleen Injuries in the Pig Model	1	25,125
043	Stini	University of Arizona	Bone Mineral Density Longitudinal Study, Sun City, Tucson and Pinal County	1	28,867
041	Valenzuela	University of Arizona	Prehospital Triage of Children with Non-Traumatic Illness--A Comparison of Three Groups	1	24,021
049	Weiss	University of Arizona	Relationship Between Illiteracy and Health Care Costs among Patients in the AHCCCS Program: Implications for Preventive Health Education	1	63,375

FY 1989-90 Contract Proposals

Infectious and Immunologic Diseases/Disorders

<u>ID No.</u>	<u>Principal Investigator</u>	<u>Institution</u>	<u>Project Title</u>	<u>Yrs</u>	<u>Budget Amount</u>
034	Galgiani	University of Arizona	Purification and Application of Antigens from <u>Coccidioides immitis</u> , Phase II	3	87,436 91,230 97,436
056	Hoffman	University of Arizona	Isolation of Anti-Infective Agents from Plants	3	24,795 25,000 25,000
008	Howard	Harrington Arthritis Research Center	The Presence of Mycoplasma Antibodies in Rheumatoid Arthritis; Its Prevalence and Scope as a Diagnostic Marker	2	22,944 24,977
020	Husemann	Northern Arizona University	Stochastic Models of Plasmid Copy Number	3	25,000 23,122 23,881
012	Joens	University of Arizona	Investigations into the Invasive Properties of <u>Campylobacter jejuni</u>	3	22,157 23,044 23,969
047	Schifman	VA Medical Center and University of Arizona	Rapid Antibiotic Susceptibility Testing in Urinary Tract Infection by Bioluminescence Assay of Bacterial Adenosine Triphosphate	1	25,000
038	Schleiger	None	Drugs of Acquired Immune Deficiency Syndrome in Arizona	3	23,000 26,300 28,930
061	Schram	University of Arizona	A New Approach to Diagnosis of HIV Infection and Staging of AIDS Based on Analysis of Urinary Nucleosides by GC-MS	2	60,688 52,387
011	Scuderi	University of Arizona	The Effect of Ethanol on Macrophage Cytokine Production and Activity	3	25,000 25,000 25,000
021	Wheeler	Northern Arizona University	Electrochemical Dissolution of Metals in Physiological Fluids	1	25,000
018	Witte	University of Arizona	AIDS and HIV Infection in the United States in 1968	3	24,750 24,750 15,000
072	Yocum	University of Arizona	Characterization of Epidermal Growth Factor Regulation in Rheumatoid Arthritis	2	25,000 25,000
071	Yocum	University of Arizona	Characterization of Natural Killer Cells in Patients with Rheumatoid Arthritis	1	25,000

FY 1989-90 Contract Proposals

Malignant Neoplasms

<u>ID No.</u>	<u>Principal Investigator</u>	<u>Institution</u>	<u>Project Title</u>	<u>Yrs</u>	<u>Budget Amount</u>
077	Fajardo	University of Arizona	Prospective Comparison of Mammography Guided Fine Needle Aspiration Cytology of Suspicious Breast Lesions with Surgical Biopsy Pathology	1	12,100
054	Frink	University of Arizona	Prospective Comparison of Intrapleural Bupivacaine and Intravenous Narcotics for Hepatobiliary Interventional Radiologic Procedures	1	2,200
076	Gillies	University of Arizona	The Role of Na ⁺ /H ⁺ Exchange in the Proliferation of Human Fibroblasts	3	27,946 27,981 29,437
081	Grimes	University of Arizona	Biochemical Studies of the LAK Phenomenon	3	69,134 67,264 66,714
017	Johnson	Barrow Neurological Institute	Improved Classification of Astrocytomas	1	25,188
057	Lam	University of Arizona	Antigen-directed Immunotherapy in B-cell Lymphoma	3	25,000 25,000 25,000
005	Lukas	Barrow Neurological Institute	Studies on Induced Differentiation of A Human Brain Tumor Cell Line	3	48,235 53,059 58,365
065	Mufti	University of Arizona	Mechanisms of Tobacco-Alcohol Carcinogenesis in Human Exfoliated Oral Mucosal Cells	2	34,068 30,072
060	Payne	University of Arizona	Quantitative X-Ray Microanalysis and Morphometry in Cancer Diagnosis	3	24,739 24,739 24,739
073	Pettit	Arizona State University	Discovery of Naturally Occurring Antiviral and Anticancer Drugs	3	173,294 187,209 196,569
079	Schmidt	Arizona State University	Detection of New Anticancer Drugs with Human Tumor Cell Growth Inhibition Assays	3	25,000 25,000 25,000
040	Seftor	University of Arizona	Modulation of Cell Surface Dramatically Effects Tumor Cell Invasions: Analysis of Specific Composition and Structural Changes	2	24,844 24,602

036	Shimizu	University of Arizona	Mechanisms Involved in the Lack of EGF Receptor Gene Expression in Small Cell Lung Carcinoma	3	21,000 22,010 25,010
078	Smith	Arizona State University	Anti-Tumor Effects of Interferons and Other Cytokines	3	25,000 25,000 25,000
068	Spier	University of Arizona	Modulation of Antigen Expression in Malignant Lymphoma: A Model System for Study of Its Therapeutic Potential	1	22,676
045	Unger	University of Arizona	Liposomal BCNU for the Treatment of Glioblastoma	2	27,870 29,217
048	Unger	University of Arizona	Liposomal MR Contrast Agents	1	25,000
037	Yochem	University of Arizona	Mechanisms Governing the Expression of Class I and II Histocompatibility Antigens during Tumor Cell Invasion: Modulation with Retinoic Acid and Interferon-Gamma	2	24,921 24,921

FY 1989-90 Contract Proposals

Metabolic and Endocrine Disorders

<u>ID No.</u>	<u>Principal Investigator</u>	<u>Institution</u>	<u>Project Title</u>	<u>Yrs</u>	<u>Budget Amount</u>
016	Beggs	St. Joseph's Hospital and Medical Center	Diabetic Complications: Fate of Diabetic-Induced Tissue Changes Following Pancreas Transplant	1	24,316
075	Dorson	Arizona State University	Continuous Ambulatory Peritoneal Treatment of Diabetes: Research, Simulation and Design Feasibility of the Hybrid Artificial Pancreas	2	24,995 24,963
010	Gilles	Phoenix Integrated Surgical Residency Foundation	A Comparison of a Fixed Formula to Computer Managed Linear Logic in Prescribing the Nutrients in Total Parenteral Nutrition	1	24,137
002	Jeevanandam	St. Joseph's Hospital and Medical Center	Altered Protein Synthesis Efficiency in Acute Major Injury	3	26,950 32,967 35,219
051	Kirkwood	National Institutes of Health	Glucose Transporters and Skeletal Muscle Morphology and Ultrastructure in Diabetic and Non-Diabetic Caucasians and Pima Indians	3	25,000 25,000 25,000
064	Koeneman	Harrington Arthritis Research Center	Internal Calibration for CT Bone Mineral Density	2	41,325 50,907
024	Longo	Harrington Arthritis Research Center	The Effect of Diphenylhydantoin on Bone Healing Response	3	25,000 25,000 25,000
058	Mooradian	University of Arizona	Age-related Changes in Tissue Specific Gene Expression	3	25,000 25,000 25,000
025	Wright	University of Arizona	Pathways of Drug Excretion	3	77,329 80,422 83,639

FY 1989-90 Contract Proposals

Neurologic, Mental and Behavioral Diseases and Disorders

<u>ID No.</u>	<u>Principal Investigator</u>	<u>Institution</u>	<u>Project Title</u>	<u>Yrs</u>	<u>Budget Amount</u>
046	Brady	Institute for Biogerontology Research	Neuropathology of Memory Associated Regions in Alzheimer's Diseased Brain	3	25,000 25,000 25,000
044	French	University of Arizona	Cellular Neurobiology of Psychosis Producing Drugs of Abuse: A Model for Schizophrenia	3	25,000 25,000 25,000
062	Glisky	University of Arizona	Training Patients with Organic Memory Disorders for a Computer Data-Entry Job	1	24,979
030	Griffin	Arizona State University	Marital Support as a Mediating Factor in the Effectiveness of the Treatment of Parkinson's Disease	1	24,806
042	Gruener	University of Arizona	Volatile Anesthetic Action on Ion Channels from Brain and Heart	1	25,000
035	Johnsen	St. Joseph's Hospital	Identification of Risk Factors and Pathogenesis of Navajo Neuropathy	3	55,000 55,000 55,000
019	Prior	Northern Arizona University	Neural Modulation of Central and Peripheral Targets	3	23,910 22,236 23,353

FY 1989-90 Contract Proposals

Respiratory Diseases

<u>ID No.</u>	<u>Principal Investigator</u>	<u>Institution</u>	<u>Project Title</u>	<u>Yrs</u>	<u>Budget Amount</u>
070	Martinez	University of Arizona	The Role of Orally and Parenterally Administered Growth Factors in Lung Development	3	24,960 24,952 24,965
031	Seeley	University of Arizona	Pilot Study to Evaluate the Efficacy of Developing Computer Programs to Aid Radiologists as Consults during Diagnosis and in Training Medical Students and Radiology Residents	3	24,996 24,549 24,961

ATTACHMENT 7

ABSTRACTS....

RESEARCH PROJECTS SPONSORED BY THE

ARIZONA DISEASE CONTROL RESEARCH COMMISSION

1740 West Adams Street, Room 408, Phoenix, AZ

Tel. (602) 542-1028

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The *Arizona Disease Control Research Commission (ADCRC)* was established by the Arizona Legislature and signed into law in 1984. The intent of the legislation is to support medical research on diseases of particular relevance to the State. The *Commission* is unique in the United States in its commitment of public funds (penalties and interest on delinquent taxes) to a wide area of medical concerns in the State.

Beginning with this issue, ABSTRACTS.... will be published annually, in the month of January. It is devoted to the presentation of summaries of research projects supported by the *Commission* that were *completed* during the previous calendar year.

The purpose of the publication is to inform the scientific and medical research communities, legislators, and the general public about basic research being conducted in Arizona with public funds. Ideally, the circulation of this publication will help to advance the frontiers of knowledge as a cross-fertilization of ideas and findings begins to take place among the State's medical researchers.

The abstracts that follow are grouped in terms of the eight priority areas of research activity that have been established by the *Commission*.

TED WILLIAMS, Chairman

January

1989

MALIGNANT NEOPLASMS (CANCER)

Principal Investigator: Emmanuel T. Akporiaye, Ph.D.

Title of Research Project: *Generation of T-lymphocytes with High Antitumor Activity*

Institution: Northern Arizona University (Department of Biological Sciences)

Award Period: July 1, 1987 - June 30, 1988 [Multi-Year Award]

Award Amount: \$42,000

The objective of this multi-year study was to develop a method for obtaining immune cells (T-lymphocytes) with improved ability to destroy tumor cells. A gelatin sponge was to be implanted in a tumor-bearing animal to capture these cells. The number of such immune cells was to be increased *in vitro* by exposing them to a growth factor. The cells were then injected into tumor-bearing animals to cause tumor regression--a process known as adoptive immunotherapy. These methods were expected to require the injection of fewer immune cells than would be the case with current methods employed in adoptive immunotherapy. Technical problems encountered in the course of the research delayed the accomplishment of most of the research objectives.

Principal Investigator: Norman Levine, M.D.

Title of Research Project: *Radiofrequency Hyperthermia in the Treatment of Skin Cancer*

Institution: University of Arizona (Health Sciences Center/Dermatology)

Award Period: July 1, 1987 - June 30, 1988

Award Amount: \$31,000

This study sought to develop a new and effective treatment method (localized radiofrequency hyperthermia) in the fight against skin cancer. It is known that tumor cells are more sensitive to the effects of heat than are normal cells, and are selectively destroyed when heated. The researchers developed several animal models of skin cancer whereby transplanted tumors can be treated with radiofrequency hyperthermia, as delivered by a newly designed device developed in Arizona. The new device is capable of heating the tumor while sparing normal surrounding tissue. The researchers successfully demonstrated that small intracutaneous murine melanomas can be eradicated by radiofrequency hyperthermia.

Principal Investigator: Raymond Carmody, M.D.

Title of Research Project: *MRI vs Myelography for Diagnosis of Spinal Cord Compression due to Metastasis*

Institution: University of Arizona (Health Sciences Center/Radiology)

Award Period: July 1, 1987 - June 30, 1988 [Multi-Year Award]

Award Amount: \$19,000

Many types of cancer spread tend to spread (metastasize) from the original site of the tumor to the spine, via the bloodstream. If the tumor is allowed to grow unchecked in the spinal column, compression of the spinal cord will result, leading eventually to paraplegia or quadriplegia. A number of methods have been used to determine if malignancy has involved the spine (i.e., nuclear bone scans using radioisotopes, computed tomography, and myelography), but only myelography which is painful and invasive has been successful in demonstrating spinal cord compression due to metastatic cancer. Myelography is currently the procedure of choice. Magnetic Resonance Imaging (MRI), is a new modality, similar to CT scanning, which is painless and harmless to the patient. MRI

is well suited for producing exquisite images of the spinal cord. The goal of this multi-year study was to examine 100 patients with suspected spinal cord compression by MRI and myelography to determine the relative accuracy of each technique and to determine if MRI should become the screening procedure of choice.

Principal Investigator: Jack Cole, Ph.D.

Title of Research Project: *Novel Antitumor Agents from Plants*

Institution: University of Arizona (College of Pharmacy)

Award Period: July 1, 1987 - June 30, 1988 [Multi-Year Award]

Award Amount: \$45,000

With the aid of folklore and oriental herbal medicines, 156 plants were collected during the first year of this multi-year project and analyzed as possible sources of new drugs for the treatment of cancer. Crude extracts were submitted for shrimp bioassay and a general anti-infective screen. The bioassay was used to select the best compounds for expanded anti-tumor testing. These tests were conducted by the National Cancer Institute. The screen was useful in isolating and identifying a new and unusual diterpene, chrysothame, which has demonstrated good levels of activity against some solid tumors found primarily in the breast and colon. Chrysothame may turn out to be an antitumor agent or prototype for a new class of antitumor agents.

Principal Investigator: Diane Russell, Ph.D.

Title of Research Project: *Mechanism of Prolactin Regulation of Normal and Malignant Growth*

Institution: University of Arizona (Department of Pharmacology)

Award Period: July 1, 1987 - June 30, 1988 [Multi-Year Award]

Award Amount: \$43,000

An elevated blood level of prolactin has been implicated as a contributory agent in the development of testicular tumors, prostate tumors, breast cancers, and is known to occur in conjunction with alcoholic liver cirrhosis. This multi-year study sought to answer the question: what are the cellular events elicited by Prolactin (PRL) in cell models of normal and malignant growth. An understanding of how prolactin is coupled with normal and malignant growth would enable us to target drugs that inhibit the pathological consequences of prolactin action. The discovery of a heretofore unknown PRL-like peptide and its potential role in regulating the immune response represents one of the major accomplishments of this study.

HEALTH EFFECTS OF ENVIRONMENTAL POLLUTANTS

Principal Investigator: H. Eugene Hoyme, M.D.

Title of Research Project: *Arizona Teratogen Information Program*

Institution: University of Arizona (College of Medicine/Pediatrics)

Award Period: July 1, 1987 - June 30, 1988 [Multi-Year Award]

Award Amount: \$40,000

One goal of the Arizona Teratogen Information Program (ATIP) was to decrease the overall incidence of developmental disabilities in children born in Arizona through a program targeted at the avoidance of known human teratogens (drugs, chemicals, infectious, or physical agents that cause birth defects) during pregnancy. Another goal was the establishment of a mechanism for the investigation of potential human teratogenic exposures in the state. Toward these ends, a toll-free statewide telephone-based teratogen counseling program and a statewide educational program in reproductive toxicology

ology have been established. Also, ATIP has established working relationships with the Arizona Birth Defects Registry and the Department of Health Services in the identification of epidemiologic trends in the state.

HEALTH PROMOTION AND DISEASE PREVENTION

Principal Investigator: William F. Burke, Jr., Ph.D.

Title of Research Project: *Genetic Engineering of Mosquitocidal Bacteria*

Institution: Arizona State University (Department of Microbiology)

Award Period: June 1, 1987 - June 30, 1988

Amount: \$20,548

The major goal of this study was the development of protosynthetic bacteria indigenous to mosquito larval feeding zones in Arizona. The bacteria, genetically engineered to produce potent protein toxins, would kill the mosquito larvae when eaten. Successful production of such bacteria could decrease the need for the frequent applications to mosquito breeding habitats, thereby contributing to more effective control of mosquito-transmitted diseases in the State. Because of unexpected contamination problems in newly acquired growth chambers, the research goals had to be revised. The Investigator concentrated on the development of a transformation technique for *Bacillus thuringiensis* (var. *israelensis*) which did not require protoplating, and on improving the currently available technique for *Bacillus sphaericus* transformation.

Principal Investigator: Aaron B. Margolin, Ph.D.

Title of Research Project: *Rapid Detection of Enteric Viruses in Water Using Gene Probes*

Institution : University of Arizona (Department of Microbiology and Immunology)

Award Period: July 1, 1987 - June 30, 1988

Award Amount: \$24,000

In 1981, Arizona became the first state to require routine virus monitoring of reclaimed wastewater, sewage effluents to be reused for irrigation, recreational or other uses. Current methods for testing water for the presence of viruses entails the use of live animal cells. This method is expensive, labor intensive, slow and relatively insensitive. Rapid techniques (fluorescent antibody, enzyme-linked-immunosorbent and radioimmunoassay) lack the needed sensitivity for the detection of low numbers of viruses. This project sought to produce nucleic acid probes that could rapidly indicate the presence of viruses while maintaining a high degree of sensitivity at cost effective levels.

Principal Investigator: Joel S. Meister, Ph.D.

Title of Research Project: *The Health of Arizona's Farmworkers: Creating a Database for Service, Research and Policy*

Institution: University of Arizona (Health Sci. Ctr./Family and Community Medicine)

Award Period: July 1, 1987 - June 30, 1988

Award Amount: \$24,500

The purpose of this study was to improve the quality and quantity of information on farmworkers' health by expanding a model patient data collection system developed in Yuma County for use on a statewide basis. Users of the data include health care providers, researchers and policymakers. The data base would be added to the Farmworkers' Health

Database to be housed at the Rural Health Office of the University of Arizona. A third goal of the project was to provide training in farmworker health to providers.

CARDIOVASCULAR AND OTHER CIRCULATORY DISEASES

Principal Investigator: Ronald A. Markle, Ph.D.

Title of Research Project: *Pilot Studies of Substance P and Arterial Permeability*

Institution: Northern Arizona University (Department of Biological Sciences)

Award Period: July 1, 1987 - June 30, 1988

Award Amount: \$23,500

The principal aim of this pilot study was to test the hypothesis that substance P (SP), a neuropeptide of the tachykinin family, would enhance aortic permeability to circulating macromolecules. Based upon research conducted with laboratory animals, there is evidence that SP does enhance aortic albumin permeability. There are preliminary indications that SP and its related peptide, SK, may be capable of attracting circulating monocytes. The study increases our understanding of arterial wall inflammation and atherosclerosis.

Principal Investigator: Janis M. Burt, Ph.D.

Title of Research Project: *Intercellular Communication in Neonate vs Adult*

Myocardium: Influence of Surgical Conditions and Ischemia

Institution: University of Arizona (College of Medicine/Physiology)

Award Period: July 1, 1987 - June 30, 1988 [Multi-Year Award]

Award Amount: \$41,000

The hypothesis to be tested in this multi-year project was: the newborn experiences greater morbidity and mortality rates than adults do following open heart surgery as a result of 1) differences in the factors which regulate the intercellular communication pathway, and 2) differences in the influence of surgical conditions (anesthesia) and ischemia (alteration of membrane composition) on the communication pathway. Research demonstrated that the cardiac gap junction is an extremely dynamic pathway for intercellular communication whose function is labile under conditions of general anesthesia and ischemia. The research also demonstrated that successful intercellular communication via this pathway is susceptible to several of the changes previously demonstrated to occur during myocardial ischemia. Finally, the study showed that anesthesia can also compromise communication via this pathway. Many of the tested interventions may have synergistic or additive effects.

Principal Investigator: Michael A. Cusnovich, Ph.D.

Title of Research Project: *Cardiac Myosin: Normal and Diseased*

Institution: University of Arizona (Department of Biochemistry)

Award Period: July 1, 1987 - June 30, 1988 [Multi-Year Award]

Award Amount: \$39,000

The objective of this project was to understand the function of cardiac myosin ATPase (an enzyme) in terms of the breakdown of the high energy chemical compound, adenosine triphosphate (ATP), and the coupled mechanical processes leading to cardiac contraction. The information was used to elucidate the alterations in myosin ATPase in calf hearts in which cardiac performance was altered as a result of *in vivo* treatment with the hormone thyroxine as a model of heart disease.

ABSTRACTS...

6

Principal Investigator: David L. Kreulen, Ph.D.

Title of Research Project: *Neural Control of Blood Vessels and the Action of Antihypertensive Drugs*

Institution: University of Arizona (College of Medicine/Pharmacology)

Award Period: July 1, 1987 - June 30, 1988 [Multi-Year Award]

Award Amount: \$45,000

The purpose of this multi-year study was to determine the manner in which nerves control arteries and veins, and to determine how drugs used to treat hypertension affect blood vessels and their nerves. Data suggests that amiloride may produce its antihypertensive effects in part by inhibiting contraction in peripheral blood vessels. Its effects are concentration dependent and require relatively high concentrations. The depressant effects on contraction are independent of the stimulus used and, therefore, are directly on the vascular smooth muscle. The contractions of veins removed from hypertensive animals are depressed the most by amiloride. The actions of amiloride are shared only by high concentrations of furosemide and are limited to veins from hypertensive animals. Hydrochlorothiazide did not depress the contractions of isolated blood vessels.

INFECTIOUS AND IMMUNOLOGIC DISEASES OR DISORDERS

Principal Investigator: Charles Juels, M.D.

Title of Research Project: *Development of Effective Interventions for Control of Giardiasis*

Institution: Maricopa County Department of Health Services

Award Period: July 1, 1987 - June 30, 1988 [Multi-Year Award]

Award Amount: \$30,000

Giardia is the most common infectious agent identified in diarrheal illness among day care center children in Arizona. The aim of this multi-year research project was to develop effective strategies to control infections by the intestinal parasite *Giardia lamblia* among children in Arizona day care centers. Three strategies were studied for the control of *Giardia* in day care centers with identified cases. It was expected that one of the three strategies would result in at least a 20 per cent reduction in the rate of secondary transmission or *Giardia*-associated diarrhea during a six month follow-up period. Data were gathered from 31 child care centers. Data analysis still underway at the end of the contract year.

METABOLIC AND ENDOCRINE DISORDERS

Principal Investigator: Eric J. Gulibeau, Ph.D.

Title of Research Project: *Glucose Sensor for Diabetes*

Institution: Arizona State University (Dept. Chemical, Bio and Materials Engineering)

Award Period: July 1, 1987 - June 30, 1988 [Multi-Year Award]

Award Amount: \$24,000

The goal of this three-year study was to develop a reliable implantable glucose sensor to continuously administer insulin in response to changing blood glucose levels. The objectives this year were: 1) to continue to develop an optimized design for the sensor to maximize its utility and make it suitable for implantation in the body; 2) to improve the

long term stability of the enzyme immobilized on the sensor surface; 3) to devise a method of supplying oxygen to the enzyme reaction and thereby eliminate variations in sensor output resulting from changes in solution oxygen tension; and 4) to test the sensor *in vivo* in an animal model to confirm its performance when planted in the body. The glucose sensor developed as a result of ADCRC funding has been submitted to the U.S. Patent Office and the Boehringer Mannheim Corporation has licensed the technology from Arizona State University to further develop the technology for use in its products to aid patients in their treatment of diabetes.

Principal Investigator: Barbara Howard, Ph.D.

Title of Research Project: *The Effect of a High Carbohydrate Low Saturated Fat Diet on Lipoprotein Metabolism in Non-Insulin Dependent Diabetes Mellitus*

Institution: Samaritan Medical Foundation

Award Period: July 1, 1987 - June 30, 1988 [Multi-Year Award]

Award Amount: \$46,700

The objective of this multi-year study was to understand the mechanisms by which dietary fats and carbohydrates influence the levels of blood fats and cholesterol with the goal of developing a proper diet for the treatment of individuals with diabetes. A sample of diabetics and non-diabetics were admitted to the metabolic ward for six weeks. During the first period, they consumed a diet containing about 45 percent fat; during the second period, they consumed a diet high in carbohydrate and low in saturated fat. At the end of each diet period the subjects were given extensive tests to measure levels of fat and cholesterol in the blood, the rate of production and breakdown of the lipoproteins, and measurements of fatty acids, energy balance, and lipoprotein binding. The results of the research indicate that the substitution of saturated fat with complex carbohydrate generally has a beneficial effect of lowering LDL cholesterol without having a significant adverse metabolic effects. The response, however, was not homogeneous among all subjects. Careful individual monitoring of each patient is necessary to determine both the efficacy of the diet and lack of adverse effects.

NEUROLOGIC, MENTAL AND BEHAVIORAL DISORDERS OR DISEASES

Principal Investigator: Volker K. H. Sonntag, M.D.

Title of Research Project: *Identification of the Mechanisms of Traumatic Spinal Cord Injury*

Institution: St. Joseph's Hospital (Barrow Neurological Institute)

Award Period: July 1, 1987 - June 30, 1988

Award Amount: \$13,500

The purpose of this project was to study what occurs to the spinal cord when it is injured in order to find a beneficial medical treatment for spinal cord injuries. The study attempted to define the actual injury process when the spinal cord is stretched or rotated, the two most common forms of injury. Sophisticated techniques were used to measure spinal cord blood flow and electrical activity in order to determine how much rotation or distraction can be tolerated before irreversible injury occurs. The study shows that the rate of change of the distraction is key to stimulating cervical injuries occurring in motor vehicle accidents.

RESPIRATORY DISEASES

Principal Investigator: Raphael Gruener, Ph.D.

Title of Research Project: *Single Chloride Channel Behavior of Cultured Cystic Fibrosis Epithelial Cells*

Institution: University of Arizona (College of Medicine/Physiology)

Award Period: July 1, 1987 - June 30, 1988 [Multi-Year Award]

Award Amount: \$40,000

Research involved the exploration of molecular defects in Cystic Fibrosis (CF) pulmonary epithelial cells grown in culture. The goal of this multi-year project was to use the patch clamp (SCA) technique to monitor single ion channel activity from CF epithelial cells. Researchers were able to describe in detail the fundamental properties of the Chloride channel in CF epithelial cells. The research raises hopes that it might be possible to reduce the severity of the defect by finding an agent that would improve the operation of the channel. Search for such an agent will take place over the next two years, partially supported by ADCRC funds. CF is the leading chronic respiratory disease in Arizona.

Principal Investigator: Chester Leathers, Ph.D.

Title of Project: *Coccidioidomycosis: Improved Diagnostic Techniques*

Institution: Arizona State University (Department of Botany/Microbiology)

Award Period: July 1, 1987 - June 30, 1988) [Multi-Year Award]

Award Amount: \$40,000

Coccidioidomycosis, also known as Valley Fever, is common in Arizona and is caused by a soil-inhabiting fungus or mold (*Coccidioides immitis*) whose spores become airborne as a result of soil-disturbing activities. A new culture medium (Leathers-Awasthi Medium, or LAM) was developed for identifying *c. immitis* isolates under prior contract awards. This multi-year study sought to further compare LAM with conventional media to determine the extent to which the new medium may be relied upon in the clinical laboratory and to compare costs. The principal investigator states that the LAM has proved to be a valuable addition in the isolation and identification of *Coccidioides immitis* from clinical specimens. He anticipates that the use of this medium will greatly shorten the time required to obtain a more accurate diagnosis of this disease and will hasten the use of therapy for patients in which therapy is indicated.

Arizona Disease Control Research Commission
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