

PA-ABK-204  
ISA 75160

**OUTPUTS/BENEFITS OF THE  
HBCU RESEARCH GRANTS  
PROGRAM**

**Agency for International Development  
Office of Research and University Relations  
May 1990**

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Outputs/Benefits of  
HBCU Research Grants Program

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Summary of All Questionnaire Responses

GENERAL INFORMATION

Grants Summarized in This Report	85
Grants Completed	58
Final Reports Submitted	52

DIRECT BENEFITS

Personnel Supported	
Faculty	608.4 person-months
Research Assistants	793.9 person-months
TOTAL	<u>1402.3 person-months</u>
Graduate Students Trained	88
Items of Equipment Purchased	169
Countries Involved	30
Outputs of Research	
Refereed Papers	102
Unrefereed Papers	14
Abstracts	100
Theses	12
TOTAL	<u>228</u>

INDIRECT BENEFITS

Additional Grants Acquired	
NSF	3
NIH	11
USAID	6
Other Private	6
Other Government	11
TOTAL	<u>37</u>
Linkages Established	
With LDC Institutions	75
Other Universities	71
Int. or Scientific Orgs.	48
TOTAL	<u>194</u>

**I. AGRICULTURE AND NATURAL RESOURCES RELATED PROJECTS**

**A. Livestock Science**

Outputs/Benefits of HBCU Research Grant

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Proposal #006

GENERAL INFORMATION

TITLE: STUDY LOCAL FEED TO IMPROVE PRODUCTIVITY OF GOATS  
PI: Claude H. McGowan  
SCHOOL: Florida A & M Univ  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
Haiti

PERSONNEL SUPPORTED:  
Faculty: 3.6 person-months  
Research Assistants: 1.2 person-months

GRADUATE STUDENTS TRAINED: 2

EQUIPMENT PURCHASED:  
typewriter  
IBM PC computer  
steam distillation unit  
FAT extraction apparatus  
vacuum pump

OUTPUTS OF RESEARCH:

Unrefereed Papers:

McGowan, C.H. "Nutritional Analysis of Certain Grasses, Forbs, Crop Residues and Crop By-Products in Selected Areas of Haiti." FAMU Agric. Res. Bull. pp. 28-31, 1987.

McGowan, C.H. "Utilization of Crops Residues and Crop By-Products in Goat Rations." Proc. of 6th Biennial Res. Symp. of 1890 Land Grant Univ., 1985.

Abstracts:

"Nutritional Analysis of Certain Grasses, Forbs, Crop Residues, and Crop By-Products in Selected Areas of Haiti." 6th Biennial Res. Symp. of 1890 Land Grant Univ., Atlanta, Ga., 1985.

Outputs/Benefits of HBCU Research Grant

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Proposal #006

INDIRECT BENEFITS

GRANTS/CONTRACTS RESULTING FROM HBCU RESEARCH GRANT:

Government - USDA-OICD to co-sponsor "International Goat Symposium"

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

Investigate possibility of improving goat production in Haiti by using agricultural crop residues, crop by-products, shrubs and forbs found in selected areas to determine their nutrient composition and make recommendations on their utilization as feeds in goat production.

BRIEF STATEMENT OF RESEARCH FINDINGS:

Feeds analyzed were generally high in protein, above 10%. TDN appeared to be very good, averaging around 70%. Crude fibers were generally higher in grasses and crop residues. Nitrogen-free extract was very low in sugar cane tops-need for supplementation.

**Outputs/Benefits of HBCU Research Grant**

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Proposal #014

**GENERAL INFORMATION**

**TITLE:** STUDY IMPROVE QUALITY BARBADOS BLACK-BELLY SHEEP  
**PI:** Helen A. Swartz, Ph.D.  
**SCHOOL:** Lincoln Univ (Missouri)  
**STATUS:** This project has been completed.  
A final report has been submitted to RUR.

**DIRECT BENEFITS**

**COUNTRIES WHERE RESEARCH WAS CARRIED OUT:**  
Barbados

**PERSONNEL SUPPORTED:**  
Faculty: 1.6 person-months  
Research Assistants: 1.6 person-months

**GRADUATE STUDENTS TRAINED:** 0

**EQUIPMENT PURCHASED:**  
None

**OUTPUTS OF RESEARCH:**

Unrefereed Papers:

Swartz, Helen A. and M. Alexander. "Growth Rate Lambing Per Cent and Rate of Gain in Barbados Black-Belly Sheep." MO Acad. Sci. pp. 10-11, 1987.

Abstracts:

Swartz, Helen A., M. Alexander and M. Hunte. "Comparison of Barbados Black-Belly Lambs Raised in Confinement with Imported New Zealand Lambs." J. Anim. Sci., 66:307, 1988.

Swartz, Helen A. "Correlation Coefficient for Warner, Bratzler Shear-Force and Sensory Panel Evaluation on Tenderness of Black-Belly and New Zealand Lambs." 8th Biennial Research Symposium of 1890 Land Grant Universities, Washington, D.C., October, 1989.

Swartz, Helen A., and M. Alexander. "Carcass Characteristics of Black-Belly Lambs Raised in Confinement in Barbados." J. Anim. Sci., 65: (supp. I), 1987.

Outputs/Benefits of HBCU Research Grant

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Proposal #014

INDIRECT BENEFITS

GRANTS/CONTRACTS RESULTING FROM HBCU RESEARCH GRANT:

\$100,000 USAID - another HBCU research grant (1989)

LINKAGES ESTABLISHED:

With LDC Institutions:

Ministry of Agriculture, Barbados

With Other Universities:

University of Missouri

University of Minnesota

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

To select genetic parameters on which to base breeding of the Barbados black belly hair sheep. Selection of animals was based largely on growth rate and carcass quality evaluations.

BRIEF STATEMENT OF RESEARCH FINDINGS:

Due to variation in weaning weight, height, length and carcass quality and quantity of the Black-Belly sheep, continuation in selections for prolificacy, weaning weight and carcass quality will be necessary to achieve the goals originally determined. Carcass quality was excellent overall and the 140 lb. carcasses were not excessively fat (0.2 in. back fat), according to USDA standards. Dressing percentages ranged from 45.7 to 59.3, with an average of 52 percent. The adjusted loin-eye ranged from 1.3 sq. in. to 2.9 sq. in. Leg conformation scores ranged from average prime (14) to average good (8), with an overall average of choice (11). Quality grade ranged from average good (8) to prime minus (13). Yield grade ranged from 1.8 to 3.4.

**Outputs/Benefits of HBCU Research Grant**

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**Proposal #014**

**ADDITIONAL COMMENTS**

**Production of video**

Outputs/Benefits of HBCU Research Grant

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Proposal #019

GENERAL INFORMATION

TITLE: CONFINEMENT REARING OF GUINEA FOWL IN LDCS  
PI: Kieu Van Vo, Ph.D.  
SCHOOL: Tennessee State Univ  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
USA

PERSONNEL SUPPORTED:

Faculty: 1.2 person-months  
Research Assistants: 3.6 person-months

GRADUATE STUDENTS TRAINED: 2

EQUIPMENT PURCHASED:

typewriter  
battery brooders  
growing cages  
Sartorius balance

OUTPUTS OF RESEARCH:

Abstracts:

Vo, K.V., C.L. Fenderson and R. Norman. "Energy requirement during the first four weeks and its effect on performance and carcass composition of guinea keets." Proc. Seventh Biennial Research Symposium of 1890 Land Grant Universities, p. 6, October, 1987.

Vo, K.V., S.L. Osbourne and C.L. Fenderson. "Effect of dietary protein on performance and carcass composition of guinea fowl." Poultry Sci., 64(1):45, 1986.

Vo, K.V., S.L. Osbourne and C.L. Fenderson. "Effects of space allowance and management systems on performance and carcass characteristics of guinea keet broilers." Poultry Sci., 65(1):139, 1987.

Outputs/Benefits of HBCU Research Grant

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Proposal #019

Theses:

Amadi, A.C. "Dietary protein requirement and its effect on performance, carcass composition and selected physiological characteristics of guinea keet broilers." Tennessee State University, 1987.

Osbourne, S.L. "Space requirement and its effect on performance, carcass composition and selected physiological characteristics of guinea keets." Tennessee State University, 1987.

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With Other Universities:

Clemson University

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

Study effect of rearing density and method of rearing on performance and carcass composition of guinea keet broilers. Determine optimal level of protein and energy in rations for guinea keet broilers reared in developing countries.

BRIEF STATEMENT OF RESEARCH FINDINGS:

Optimal diet of 23%, 19%, 17% protein, with floor space of 360, 540, 800 sq.cm./bird during starting, growing, and finishing periods, respectively. An energy level of 3000 kcal/kg is recommended for starter diet.

Outputs/Benefits of HBCU Research Grant

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Proposal #114

GENERAL INFORMATION

TITLE: ADAPTING THE DOMESTIC RABBIT TO PROD BY LTD  
PI: Richard J. Coppings, Ph.D.  
SCHOOL: Tennessee State Univ  
STATUS: This project has been completed.  
A final report has not been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:

USA  
Liberia

PERSONNEL SUPPORTED:

Faculty: 2.0 person-months  
Research Assistants: 6.0 person-months

GRADUATE STUDENTS TRAINED: 1

EQUIPMENT PURCHASED:

microscope  
rabbit cager  
incubator

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

- (1) To assess the role of several environmental and nutritional variables in the regulation of the growth and reproductive processes of the domestic rabbit.
- (2) To make possible the production of high quality rabbit meat for limited income families in developing countries.

BRIEF STATEMENT OF RESEARCH FINDINGS:

(No final report received as of 4/90.)

Outputs/Benefits of HBCU Research Grant

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Proposal #116

GENERAL INFORMATION

TITLE: DEV OF AN EMBRYO TRANS PROGRAM-CATTLE IN JAMAICA  
PI: Steven Meredith, Ph.D.  
SCHOOL: Lincoln Univ (Missouri)  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
Jamaica

PERSONNEL SUPPORTED:  
Faculty: 6.0 person-months  
Research Assistants: 5.0 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:  
embryo freezer  
liquid nitrogen tank

INDIRECT BENEFITS

LINKAGES ESTABLISHED:  
  
With LDC Institutions:  
Ministry of Agriculture, Jamaica  
  
With Other Universities:  
University of Missouri

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

Determine the effect of various doses of follicle stimulating hormone on the number of ova released from donor cows for embryo transfer. Determine the effectiveness of Estrumate vs. Synchronate B for estrus synchronization, pregnancy rates in recipients and embryo transfer technology to Jamaica.

**Outputs/Benefits of HBCU Research Grant**

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**Proposal #116**

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

Embryos were successfully transferred in Jamaica which resulted in live calves. There was no effect of type of FSH treatment on response. There was no difference in response of cows between Estrumate or Synchronate B. The project was carried out on different farms with widely varying success rates.

Outputs/Benefits of HBCU Research Grant

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Proposal #124

GENERAL INFORMATION

TITLE: INCIDENCE & FIELD MGMT OF INFERTILITY IN CATTLE  
PI: Kashmiri L. Arora, DVM, Ph.D.  
SCHOOL: Fort Valley State College  
STATUS: This project has been completed.  
A final report has not been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
India

PERSONNEL SUPPORTED:  
Faculty: 18.0 person-months  
Research Assistants: 14.0 person-months

GRADUATE STUDENTS TRAINED: 6

EQUIPMENT PURCHASED:  
blood chemistry analyzer  
stereo microscope  
electronic blanket  
vehicle (van)  
lab air-conditioner  
deep freezer  
2nd deep freezer  
oven-incubator  
digital pH meter  
micropipetter  
office and lab fixtures  
microelectrodes  
centrifuge

OUTPUTS OF RESEARCH:

Refereed Papers:

Arora, K.L. "Use of rapid milk progesterone assay kits for diagnosing early pregnancy in Murrah buffaloes." Journal of Theriogenology, paper submitted for publication, 1989.

Outputs/Benefits of HBCU Research Grant

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Proposal #124

**Abstracts:**

Arora, K.L. "Studies on the incidence and reproductive management of infertility in breedable dairy animals in rural Haryana, India." Proc. 10th. Int. Congress on Reprod. Al, vol. 4, pp. 544-546. Dublin, Ireland, 1988.

**Theses:**

Yadava, Navander K. "A Study on the factors causing non-clinical reproductive disorders in breedable buffaloes/heifers and their ameliorative measures in some villages falling in dry zone of Haryana State." Haryana Agricultural University, 1988.

INDIRECT BENEFITS

**LINKAGES ESTABLISHED:**

**With LDC Institutions:**

Haryana Agricultural University, Hisar, India

**With Other Universities:**

Tuskegee University, College of Veterinary Medicine

University of Georgia, College of Veterinary Medicine,  
USDA/OICD, Heifer Project International

Ohio State University

**With International or Scientific Organizations:**

USDA - OICD

USDA - Low Input Sustainable Agricultural Program

Farming System Research/Extension

Heifer Project International

Outputs/Benefits of HBCU Research Grant

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Proposal #124

OBJECTIVES AND FINDINGS

**BRIEF STATEMENT OF RESEARCH OBJECTIVES:**

Identify factors attributing to low productivity and reproductive disorders in cattle and buffaloes in rural Haryana, India and develop suitable ameliorative measures to enhance cattle productivity.

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

Productivity and reproductive efficiency in cattle and buffaloes was hampered by the delayed sexual maturity, anestrus conditions, faulty management practice, malnutrition and lack of organized cattle breeding operations.

ADDITIONAL COMMENTS

Improved capabilities of the faculty to develop and execute research projects at this institution and internationally. Encouraged other faculty to participate in international development programs. Developed a one-year Livestock Production and Veterinary Health Care training program for LDCs jointly with Ohio State University. A model will be developed regarding the formulation and operation of livestock improvement programs at the farmer's level for application in LDCs.

Outputs/Benefits of HBCU Research Grant

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Proposal #226

GENERAL INFORMATION

TITLE: METABOLIC ASPECTS OF THE LEUCAENA TOXIC MIMOSINE  
PI: Juan M. Fernandez, Ph.D.  
SCHOOL: Langston Univ  
STATUS: This project has not been completed.  
A final report has not been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
USA

PERSONNEL SUPPORTED:  
Faculty: 5.0 person-months  
Research Assistants: 18.0 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:  
set of 10 portable mini-infusion pumps

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With LDC Institutions:

National Center for Goat Research, (CNPC), EMBRAPA,  
Brazil

West Visayas State University, Philippines

With Other Universities:

Prairie View A&M University

University of Georgia, Dept. of Animal Science

Midwest Animal Disease Center, Ames, IA

With International or Scientific Organizations:

OICD

Outputs/Benefits of HBCU Research Grant

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Proposal #226

OBJECTIVES AND FINDINGS

**BRIEF STATEMENT OF RESEARCH OBJECTIVES:**

To determine the effects of acute and sub-acute mimosine toxicity on key metabolic intermediates and hormones, changes in mohair yield and quality, as well as milk production and subsequent performance of offspring.

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

Infusion of mimosine in Angora goats resulted in complete defleecing and acute renal-related uremia. There were profound changes in nitrogen metabolism as evidenced by elevated plasma urea N and lowered total protein N levels; however, glucose levels in the plasma were unaffected. Elevated bilirubin levels suggest liver dysfunction.

Outputs/Benefits of HBCU Research Grant

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Proposal #245

GENERAL INFORMATION

TITLE: OPTIMIZING THE UTILIZATION CROP RESIDUES  
PI: Suchet L. Louis, Ph.D.  
SCHOOL: Tuskegee Univ  
STATUS: This project has not been completed.  
A final report has not been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
Burkina Faso  
USA

PERSONNEL SUPPORTED:  
Faculty: 12.0 person-months  
Research Assistants: 12.0 person-months

GRADUATE STUDENTS TRAINED: 1

EQUIPMENT PURCHASED:  
Apple computer  
balance, scale

OUTPUTS OF RESEARCH:

Theses:

Tuskegee University. "In vitro Improvement of Sorghum  
Stover Nutritional Value for Sheep and Goats." M.Sc  
Thesis. Tuskegee University, 1990.

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With LDC Institutions:

University of Ouagadougou, Burkina Faso -- other HBCU  
research proposals are being developed in Crop and  
Animal Science areas as a result of this project at  
the University of Ouagadougou.

With Other Universities:

Alabama A&M University

Outputs/Benefits of HBCU Research Grant

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Proposal #245

With International or Scientific Organizations:  
International Livestock Center for Africa

OBJECTIVES AND FINDINGS

**BRIEF STATEMENT OF RESEARCH OBJECTIVES:**

Determine the right combinations of post-harvest time, moisture content and urea concentration for improving Sorghum Stover's nutritive value for small ruminants.

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

(Project not completed as of 8/89).

Outputs/Benefits of HBCU Research Grant

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Proposal #250

GENERAL INFORMATION

TITLE: DEVEL A SYNTHETIC TROPICAL RABBIT BREED IN GHANA  
PI: Steven D. Lukefahr, Ph.D.  
SCHOOL: Alabama A & M Univ  
STATUS: This project has not been completed.  
A final report has not been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
Ghana

PERSONNEL SUPPORTED:  
Faculty: 2.4 person-months  
Research Assistants: 0.0 person-months

GRADUATE STUDENTS TRAINED: 1

EQUIPMENT PURCHASED:  
IBM computer  
2nd IBM computer  
regenerative power supply

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With LDC Institutions:

Various linkages with institutions in Ghana  
Various linkages with institutions in Niger  
Various linkages with institutions in Liberia  
Various linkages with institutions in Burkina Faso  
Various linkages with institutions in Nigeria

With Other Universities:

Florida A&M University  
University of Maryland (Eastern Shore)

**Outputs/Benefits of HBCU Research Grant**

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**Proposal #250**

**Other Universities (continued)**

**Kansas State University**

**Purdue University**

**Southeast Consortia for International Development**

**With International or Scientific Organizations:**

**International Institute of Tropical Agriculture**

**Heifer Project International**

**OBJECTIVES AND FINDINGS**

**BRIEF STATEMENT OF RESEARCH OBJECTIVES:**

**Establish a breeding program towards the development of a tropical breed of rabbit in Ghana at the National Rabbit Project, Terna.**

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

**(Project not completed as of 9/89)**

**B. Soil Science**

Outputs/Benefits of HBCU Research Grant

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Proposal #112

GENERAL INFORMATION

TITLE: DYNAMICS OF SOIL ORGANIC MATTER FORMULATION  
PI: Yuch-Ping Hsieh, Ph.D.  
SCHOOL: Florida A & M Univ  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:

Peru  
USA

PERSONNEL SUPPORTED:

Faculty: 5.6 person-months  
Research Assistants: 21.0 person-months

GRADUATE STUDENTS TRAINED: 1

EQUIPMENT PURCHASED:

standing dropping mercury electrode

OUTPUTS OF RESEARCH:

Refereed Papers:

"Dynamics of Soil Organic Matter Formation in  
Croplands -- Conceptual Analysis." The Science of  
the Total Environment 81/82:381-390, 1989.

"Measurement of Topsoil Erosion by a Litter-bag  
Method." Journal of Soil Conservation, in press,  
1989.

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With LDC Institutions:

Minister of Agriculture, Belize

With Other Universities:

North Carolina State University

Outputs/Benefits of HBCU Research Grant

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Proposal #112

With International or Scientific Organizations:

Christian Reformed World Relief Committee

OBJECTIVES AND FINDINGS

**BRIEF STATEMENT OF RESEARCH OBJECTIVES:**

Investigate trends and status of soil organic matter formation under tillage and no-tillage management in tropics.

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

Rate of soil organic matter formation under high-input (tillage) and low-input (non-tillage) systems are approximately the same in the tropical Peruvian croplands. High-input system had layered magnitude nutrient cycling which resulted in a more stable cropping system.

Outputs/Benefits of HBCU Research Grant

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Proposal #142

GENERAL INFORMATION

**TITLE:** TOXIC TRACE METALS IN ACID SOILS  
**PI:** Eugene A. Brams, Ph.D.  
**SCHOOL:** Prairie View A & M Univ  
**STATUS:** This project has not been completed.  
A final report has not been submitted to RUR.

DIRECT BENEFITS

**COUNTRIES WHERE RESEARCH WAS CARRIED OUT:**  
USA

**PERSONNEL SUPPORTED:**  
Faculty: 12.0 person-months  
Research Assistants: 12.0 person-months

**GRADUATE STUDENTS TRAINED:** 2

**EQUIPMENT PURCHASED:**  
atomic absorption-element lamps and software  
laboratory ware

**OUTPUTS OF RESEARCH:**

Refereed Papers:

"Bioavailability of toxic trace metals in vegetables from acid and limed soils." Journal of Environmental Quality, in press, 1990.

"Toxic Metals in Rice, Corn and Vegetables on Acid Soils of Puerto Rico." Plant and Soil, in press, 1990.

Abstracts:

"Toxic metals in rice, corn and vegetables on acid soils of Puerto Rico." 8th Biennial Research Symp. of 1890 Land Grant Universities, October 1989, Washington, D.C., 1989.

Outputs/Benefits of HBCU Research Grant

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Proposal #142

INDIRECT BENEFITS

**GRANTS/CONTRACTS RESULTING FROM HBCU RESEARCH GRANT:**

Government - TVA - collaborative research on  
fertilizers designed for acid soils of the Tropics

**LINKAGES ESTABLISHED:**

**With Other Universities:**

University of Miami, School of Medicine --  
epidemiological studies of diet and toxic trace metals  
in food and soil

University of Puerto Rico, School of Agriculture

Texas A & M University

University of Houston

**With International or Scientific Organizations:**

TVA Fertilizer Center

USAID mission, Dominican Republic

Environmental Protection Agency

OBJECTIVES AND FINDINGS

**BRIEF STATEMENT OF RESEARCH OBJECTIVES:**

Measure accumulation of toxic trace metals in tissues  
of food plants grown in acid soils under lime  
treatments. Measure retention of trace metals in  
tissue of animals fed the food plants.

Outputs/Benefits of HBCU Research Grant

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Proposal #142

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

No detectable levels of aluminum, cadmium and lead were found in rice seed and ear leaf under the lime and no-lime treatments at Corozal. No detectable levels of aluminum, cadmium and lead were found in the corn seed and ear leaf from experimental planting at Mayaguez. Relatively low to moderate levels of aluminum were found in pulses (seed) under the experimental site at Mayaguez. However, markedly high levels of aluminum were found in vegetable leaves of endive and lettuce from unlimed soils at Mayaguez. In addition, Zn deficiencies became evident when lime rates were elevated and/or manure was applied. Thus, a complex problem exists regarding the balance of plant (and human) nutrients and toxic trace metals in acid soils under liming and manuring regimes.

**ADDITIONAL COMMENTS**

The research resulting from this grant, in concert with on-going soil and plant studies, gave us the ability to plan an epidemiological research program to be sited in a LDC, where indigenous people, in large part, consume their own produce. We have already established a functional linkage with Texas A&M, the University of Houston and the Agricultural Research Service, Southern Plains Area, to conduct collaborative research on the effects of adulterated feed on the immune system and clinical/hematological parameters and residues in tissues of test animals consuming these products.

Outputs/Benefits of HBCU Research Grant

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Proposal #229

GENERAL INFORMATION

TITLE: FATE OF FERTILIZER NITROGEN IN MAIZE-GROUNDNUT  
PI: G. Bhaskar Reddy, Ph.D.  
SCHOOL: North Carolina A & T State Univ  
STATUS: This project has not been completed.  
A final report has not been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
Zambia  
USA

PERSONNEL SUPPORTED:  
Faculty: 2.4 person-months  
Research Assistants: 7.0 person-months

GRADUATE STUDENTS TRAINED: 1

EQUIPMENT PURCHASED:  
None

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With LDC Institutions:

Ministry of Agriculture, Zambia

With Other Universities:

North Carolina State University

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

To quantify the extent of fertilizer N and soil N removal through several mechanisms that function simultaneously in the soil-plant ecosystem.

**Outputs/Benefits of HBCU Research Grant**

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**Proposal #229**

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

**(Project not completed as of 01/90.)**

**C. Plant Science**

Outputs/Benefits of HBCU Research Grant

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Proposal #012

GENERAL INFORMATION

TITLE: EFFICIENCY OF NITROGEN FIXING BACTERIA/JAMAICA/MO  
PI: D. Marsh, Ph.D.  
SCHOOL: Lincoln Univ (Missouri)  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:

Jamaica  
USA

PERSONNEL SUPPORTED:

Faculty: 6.0 person-months  
Research Assistants: 6.0 person-months

GRADUATE STUDENTS TRAINED: 1

EQUIPMENT PURCHASED:

chain saw  
light meter  
35mm. camera

OUTPUTS OF RESEARCH:

Refereed Papers:

Marsh, D.B. "Survival of Introduced Cowpea Rhizobia in Jamaican Soils." Jour. of CARIB. Foods Crops Society. Accepted for Publication, 1989.

Marsh, D.B. "Production of Specialty Crops for Ethnic Markets in the U.S.A." Hort. Sci., 23:628-629, 1987.

Marsh, D.B. "The Survival and Efficiency of Selected Nitrogen Fixing Bacteria When Introduced into Various Tillage Systems." Letters in Applied Microbiology Submitted for Publication, 1989.

Marsh, D.B. "Survival of Bradyrhizobium sp. when Introduced into Several Jamaican Soils." Letters in Applied Microbiology. Submitted for Publication, 1989.

Outputs/Benefits of HBCU Research Grant

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Proposal #012

Abstracts:

Marsh, D.B. "The Effect of Introduced Wild Rhizobium Strains on the Efficiency of Known Effective Rhizobium." Association of Research Directors Meeting, Atlanta, Georgia, 1986.

Marsh, D.B. "The Survival and Efficiency of Selected Nitrogen Fixing Bacteria." Caribbean Food Crop Society Annual Meeting, Ocho Rios, Jamaica, 1988.

Marsh, D.B. "Ethnic Crop Production in Missouri." ASHS National Meetings, Tulsa, OK, 1989.

Swartz, H. and D.B. Marsh. "Forage Potential of Vita 3 Cowpea in Mid-Missouri." Missouri Sheep Report, UMC, 1988.

Swartz, H. and D.B. Marsh. "The Effect of Feeding Lambs Cowpea vs. Oat-hay Concentrate Diet." Mid-Western American Society for Animal Science, Ames, Iowa, 1988.

INDIRECT BENEFITS

GRANTS/CONTRACTS RESULTING FROM HBCU RESEARCH GRANT:

\$203,565 Private - Jamaica Agriculture Development Foundation (USAID-funded group) - to conduct research on breeding red pea Phaseolus vulgaris for disease resistance and enhanced biological nitrogen fixation

Government - USDA-CSRS-proposed four year funding for crop potential of specialty (tropical) vegetables in Missouri

LINKAGES ESTABLISHED:

With LDC Institutions:

University of the West Indies

Scientific Research Council

Ministry of Agriculture in Rwanda

Ministry of Agriculture, Barbados

Outputs/Benefits of HBCU Research Grant

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Proposal #012

LDC Institutions (continued)

Ministry of Agriculture, Antigua

With Other Universities:

Tuskegee University -- investigating N<sub>2</sub> fixation of exotic legumes.

Michigan State University, Dr. Russell Freed

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

Determine the survival and subsequent efficiency of Rhizobium strains when introduced into farming systems utilizing both conventional and minimum tillage.

BRIEF STATEMENT OF RESEARCH FINDINGS:

Of the four Rhizobium strains tested, JRC29 isolated from cowpea plants in Jamaica had the best survival at all sites at the end of the three-year study. Inoculation increased the N<sub>2</sub> fixation and grain yield of both cowpea cultivars. However, Mississippi silver grain yield was higher at all locations.

ADDITIONAL COMMENTS

The research results -- which indicated that the indigenous Rhizobium strain JRC29 is an effective nitrogen fixer -- have prompted the Jamaican Research Council to investigate producing Rhizobium inoculum in Jamaica. The introduction of the cowpea cultivar Mississippi Silver to Jamaica has resulted in increased cowpea acreage. The research results are being used by Lincoln University scientists to plan and conduct N<sub>2</sub> fixation related studies in Morocco, Rwanda, Antigua and Barbados.

Outputs/Benefits of HBCU Research Grant

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Proposal #018

GENERAL INFORMATION

TITLE: NITROGEN-FIXING EFFICIENCY IN BAMBARA GROUNDNUT  
PI: Joseph G. Wutoh, Ph.D.  
SCHOOL: Maryland, Univ of (Eastern Shore)  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:

Togo  
Senegal

PERSONNEL SUPPORTED:

Faculty: 4.8 person-months  
Research Assistants: 0.0 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:

moisture meter  
Everback shaker

OUTPUTS OF RESEARCH:

Refereed Papers:

Dadson, R. and C. Brooks. "Response of bambara groundnut (Voandzeia subterranea) to applied nitrogen in southern Togo." Tropical Agriculture (Trinidad), 66:169-175, 1989.

Dadson, R., C. Brooks and J. Wutoh. "Evaluation of selected rhizobial strains grown in association with bambara groundnut." Tropical Agriculture (Trinidad), 65:254-256, 1988.

Brooks, C., R. Dadson and B. Green. "Evaluation of symbiotic effectiveness of elite and wild strains of Bradyrhizobium in cultivars of Voandzeia subterranea." Tropical Agriculture (Trinidad), 65:61-63, 1988.

Outputs/Benefits of HBCU Research Grant

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Proposal #018

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With LDC Institutions:

Institut National Des Sols and Direction Recherche  
Agronome, Togo

Insitut Scientifique Recherche Agricole and Centre  
National Recherche Agriculture, Senegal

With International or Scientific Organizations:

IITA, Nigeria

NIFEAL, Hawaii

USDA - Agricultural Research Service

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

Collect and evaluate bambara groundnut for agronomic characteristics. Collect, isolate, evaluate rhizobia strains from West Africa. Establish effective rhizobial strains for specific bambara groundnut cultivars. Determine nitrogen utilization efficiency of bambara groundnut germplasm.

BRIEF STATEMENT OF RESEARCH FINDINGS:

The most effective strains were native rhizobial strains from West Africa; hence the beneficial effect of inoculating bambara groundnut with these strains. Germplasm collected from Togo had a higher relative efficiency for nitrogen utilization than was the case for Senegal.

Outputs/Benefits of HBCU Research Grant

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Proposal #023

GENERAL INFORMATION

TITLE: SYMBIOTIC NITROGEN & YIELD OF COWPEAS-ALA/JAMAICA  
PI: Urias D. George, Ph.D.  
SCHOOL: Tuskegee Univ  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:

Jamaica  
USA

PERSONNEL SUPPORTED:

Faculty: 0.0 person-months  
Research Assistants: 0.0 person-months

GRADUATE STUDENTS TRAINED: 1

EQUIPMENT PURCHASED:

None

OUTPUTS OF RESEARCH:

Abstracts:

"Effect of P<sub>x</sub>Mn and P<sub>x</sub>Zn interactions on the growth of Southern Peas." Annual Meetings of American Society of Agronomy - S. Branch, 1985.

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With LDC Institutions:

University of the West Indies

Caribbean Agricultural Research and Development  
Institute

Outputs/Benefits of HBCU Research Grant

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Proposal #023

OBJECTIVES AND FINDINGS

**BRIEF STATEMENT OF RESEARCH OBJECTIVES:**

Research conducted to determine the effects of manganese, zinc and phosphorous on the growth of cowpeas at different soil pH levels.

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

Greenhouse experiments using cowpea cultivars showed that application of phosphorus fertilizers considerably increases shoot height and dry weight, as well as the number of nodules per plant root. In field experiments, there was no significant effects of zinc, manganese or phosphorus applications on cowpea yields. Increasing soil pH has also decreased the intake of zinc and manganese by the plants.

Outputs/Benefits of HBCU Research Grant

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Proposal #113

GENERAL INFORMATION

TITLE: SCREENING GRAIN LEGUME GERMPLASM  
PI: Ajmer S. Bhagsari, Ph.D.  
SCHOOL: Fort Valley State College  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
Dominican Republic

PERSONNEL SUPPORTED:  
Faculty: 2.0 person-months  
Research Assistants: 12.0 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:  
None

OUTPUTS OF RESEARCH:

Abstracts:

Bhagsari, A.S., D. Rengifro and Luis Tejeda.  
"Evaluations of peanut germplasm under Dominican  
Republic conditions." International Congress of Plant  
Physiology, New Delhi, India, 1988.

Bhagsari, A.S., D. Rengifro and Luis Tejeda.  
"Tolerance of selected soybean germplasm to acid and  
alkali soils." Annual meetings of American Society of  
Agronomy, Southern Region, 1988.

Shoushtari, N.H., A.S. Bhagsari and M. Latimore.  
"Response of soybean genotypes and Rhizobium strains  
to different soil pH." Agronomy Abstracts, p. 188,  
1986.

Outputs/Benefits of HBCU Research Grant

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Proposal #113

OBJECTIVES AND FINDINGS

**BRIEF STATEMENT OF RESEARCH OBJECTIVES:**

To screen and introduce grain legume germplasm and to improve modulation and nitrogen fixation under the variable soil conditions in the Dominican Republic.

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

Of the number of grain legumes studied, only soybean had genotypes which were tolerant to both acid and alkaline conditions. None of the peanut, pigeon peas or dry bean strains showed tolerance of pH stress. Inoculation of soybean and peanut seeds significantly increased nodule numbers and dry weights. The effects of inoculation in pigeon peas and dry beans were variable.

Outputs/Benefits of HBCU Research Grant

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Proposal #145

GENERAL INFORMATION

TITLE: CHEMICAL STUDIES OF GRAIN AMARANTH & CELOSIA SPEC  
PI: Robert L. Shepard, Ph.D.  
SCHOOL: Howard Univ  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:

Nigeria  
USA

PERSONNEL SUPPORTED:

Faculty: 6.0 person-months  
Research Assistants: 18.0 person-months

GRADUATE STUDENTS TRAINED: 4

EQUIPMENT PURCHASED:

None

OUTPUTS OF RESEARCH:

Refereed Papers:

Aknyemiju, Y., G. Adegroye, F. Ayorinde, et al.  
"Correlation between day length, days to flower, days to mature and plant height at maturity on yield in nineteen amaranth cultivars grown under West African agronomical conditions." Field Crops Res., paper submitted for publication, 1990.

Ologunde, M., B. Headley-Ayotund, B. Harland and R. Shepard. "Amaranth grain as an alternative protein source: phytate, total dietary fiber and protein content." J. Food Comp. Anal., paper submitted for publication, 1990.

Shepard, R. and M. Ologunde. "Variation of Mineral and Amino Acid Contents of Defatted Vernonia galamensis Meal During Oil Extraction." J. Am. Oil Chem. Soc., paper submitted for publication, 1990.

Outputs/Benefits of HBCU Research Grant

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Proposal #145

Refereed Papers (continued)

Shepard, R., M. Ologunde, O. Afolabi, et al. "Novel Cleaning Method for Amaranth Seeds." J. Food Tech., paper submitted for publication, 1990.

Ologunde, M., F. Ayorinde and R. Shepard. "Chemical Evaluation of Defatted Meal of Vernonia galamensis." J. Am. Oil Chem. Soc., 67:92-93, 1990.

Ologunde, M., O. Afolabi, O. Oke and R. Shepard. "Sterol and Fatty Acid Composition of Seed Oil from Exotic Varieties of Grain Amaranth Grown in West Africa." J. of Food Chem., in press, 1990.

Shepard, R., M. Ologunde, B. Taylor, O. Afolabi, et al. "Chemical Evaluation of Grain Amaranth Growing in Nigeria." J. Food Agric. 2:2 46-51, Nigeria, 1988.

Ayorinde, F., J. Clifton, O. Afolabi and R. Shepard. "Rapid Tranesterification and Mass Spectrometric Approach to Seed Oil Analysis." J. Am. Oil Chem. Soc. 65:6 942-947, 1988.

Ayorinde, F., G. Osman, R. Shepard and F. Powers. "Synthesis of Azelaic Acid and Suberic Acid from Vernonia galamensis." J. Am. Oil Chem. Soc. 65:11 1774-1777, 1988.

Shepard, R.L. "Amaranth Grain As A Food Source." New Directions Magazine 16:1, 22-27, 1989.

Ologunde, M. O. and R. L. Shepard. "Investigating the Chemistry of Seeds From V. Galamensis." Proc. of 16th NOBCCHE Meeting, 1989.

Afolabi, O.A., R.L. Shepard, R. Oke, et al. "Amino Acid Composition of Grain Amaranthus cruentus (West African Genus): A Potential Substitute in Cereal-Based Foods." Chemical Society of Nigeria, Lagos, Nigeria, 1986.

Ayorinde, F.O., M.O. Ologunde, E.Y. Nana, et al. "Determination of Fatty Acid Composition of Amaranthus Species." Journal American Oil Chem. Soc., 66:(12), 1812-1814, 1989.

**Outputs/Benefits of HBCU Research Grant**

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**Proposal #145****Unrefereed Papers:**

Shepard, R.L., F.O. Ayorinde, et al. "Agronomical and Chemical Studies of High Yielding Lines of Grain Amaranth: A Potential Food Source for West Africa." Contractor Report AID/CR-8801, 1988.

Shepard, R.L., F.O. Ayorinde, et al. "Agronomical and Chemical Studies of High Yielding Lines of Grain Amaranth: A Potential Food Source for West Africa." Interim Report HUDC87-01, USAID, 1987.

**Abstracts:**

"Grain Amaranth: A Potential Weaning Food Source." Kraft, Inc., Glenville, Illinois, 1989.

"Mineral, Amino Acid and Phytate Composition of Grain Amaranth Growing in Nigeria." National Organization of Black Chemists and Chem. Engineers, Chicago, Illinois, 1989.

"The Potential of Grain Amaranth as a Food Crop in West Africa." USAID, Washington, DC, 20523, 1988.

"Using Food Chemistry to Investigate the Food/Feed Potential of Lesser Known Plants Growing in West Africa." Awolowo University Seminar Series, Ile-Ife, Nigeria, 1987.

"Correlating the Chemistry and Agronomy of Grain Amaranth." National Research Council Review Committee, Washington, D.C., 1987.

"Some Recent Investigations of Grain Amaranth." United States Department of Agriculture/ARS, N. Region Research Center, Peoria, 1987.

**Theses:**

"Some Aspects of the Chemistry and Potentials of Grain Amaranth as Food." Ologunde, M.B. Ph.D. Thesis. Obefemi Awolowo University, 1989.

Outputs/Benefits of HBCU Research Grant

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Proposal #145

INDIRECT BENEFITS

GRANTS/CONTRACTS RESULTING FROM HBCU RESEARCH GRANT:

\$653,000 NSF - Pre-College Students Pilot Project:  
From Seeds to Nylon

\$108,963 USAID - Development of grain amaranth as a  
crop in West Africa

\$50,000 Private - Kraft, Inc., Food Science and  
Technology Lecture Series

\$1,035,000 Private - Kraft Foundation, Howard  
University Food Technology Laboratory

\$50,000 Government - USDA-OICD Potential Source of  
Raw Materials for Plastics

LINKAGES ESTABLISHED:

With LDC Institutions:

Obafemi Awolowo University, Nigeria

With Other Universities:

Eastern Michigan University

With International or Scientific Organizations:

Rodale Research Center, PA

USDA Agricultural Research Service, MD

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

Document agronomical conditions favorable for optimum  
cultivation of light-seeded amaranth in West Africa  
and to perform chemical analyses on African-cultivated  
grain to identify the amaranth species showing  
greatest potential as a food supplement.

Outputs/Benefits of HBCU Research Grant

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Proposal #145

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

Light colored amaranth seed can be grown successfully in West Africa. Without use of fertilizers, yields are comparable to conventional cereals, with substantial yields even under adverse weather conditions and without irrigation. Cleaning and drying of the seeds is within the reach of low-income farmers.

Outputs/Benefits of HBCU Research Grant

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Proposal #150

GENERAL INFORMATION

TITLE: NITROGEN USE EFFICIENCY/ASSOCIATE N<sub>2</sub>-FIXATION  
PI: Walter A. Hill, Ph.D.  
SCHOOL: Tuskegee Univ  
STATUS: This project has been completed.  
A final report has not been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
Nigeria

PERSONNEL SUPPORTED:  
Faculty: 8.0 person-months  
Research Assistants: 18.0 person-months

GRADUATE STUDENTS TRAINED: 1

EQUIPMENT PURCHASED:  
None

OUTPUTS OF RESEARCH:

Refereed Papers:

"Inoculation of Sweet Potatoes with Azospirillum."  
Hort. Sci. 22(3): 420-422, 1987.

Unrefereed Papers:

"N-use efficiency and Associated N<sub>2</sub> - fixation of  
sweet potato cultivar." 8th International Symp. on  
Trop. Root Crops, Thailand, 1988.

"Populations of N<sub>2</sub> fixing bacteria in sweet potato  
fibrous roots." 3rd Conf. of African Assoc. of  
Biological N-fixation, 1988.

Outputs/Benefits of HBCU Research Grant

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Proposal #150

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With LDC Institutions:

International Institute of Tropical Agriculture,  
Nigeria

University of West Indies, Trinidad

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

To evaluate sweet potato genotypes for root N<sub>2</sub>-fixing bacterial associations that may help explain the ability of sweet potato to produce high yields without fertilizer input.

BRIEF STATEMENT OF RESEARCH FINDINGS:

(Final report not submitted as of 01/90.)

**D. Agricultural Economics**

Outputs/Benefits of HBCU Research Grant

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Proposal #017

GENERAL INFORMATION

TITLE: ASSESSMENT OF SMALL BUSINESSES, LIMON, COSTA RICA  
PI: A. G. Mariam, Ph.D.  
SCHOOL: Morgan State Univ  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
Costa Rica

PERSONNEL SUPPORTED:  
Faculty: 3.0 person-months  
Research Assistants: 3.0 person-months

GRADUATE STUDENTS TRAINED: 1

EQUIPMENT PURCHASED:  
None

INDIRECT BENEFITS

GRANTS/CONTRACTS RESULTING FROM HBCU RESEARCH GRANT:

USAID - A training project sponsored by AID for Costa Rica public administrators and technicians.

LINKAGES ESTABLISHED:

With International or Scientific Organizations:

Consultant: 80 days

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

Identify existing problems and issues related to black small businesses in Limon, Costa Rica, and anticipated training needs for these businesses. Provide policy recommendations to enhance business skills and capabilities of these enterprises.

Outputs/Benefits of HBCU Research Grant

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Proposal #017

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

(1) Business training needs include basic skills in bookkeeping, budgeting, record keeping and inventory management. (2) Credit and capital requirements are especially severe, but amounts needed, per business, are in the area of only a few hundred dollars.

Outputs/Benefits of HBCU Research Grant

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Proposal #024

GENERAL INFORMATION

TITLE: SMALL FARM MGMT AGRICULTURAL PRODUCTIVITY IN KENYA  
PI: Michael S. Joshua, Ph.D.  
SCHOOL: Virginia State Univ  
STATUS: This project has not been completed.  
A final report has not been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
Kenya

PERSONNEL SUPPORTED:  
Faculty: 30.0 person-months  
Research Assistants: 0.0 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:  
IBM personal computer  
computer printer

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With LDC Institutions:

Egerton University, Kenya

With Other Universities:

University of Wisconsin, Madison

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

Document the socioeconomic implications of the land subdivision process in Njaro Division, Kenya, and document the management aspects of subdivided Njoro agriculture. Identify and explain patterns in the management of Njoro farms.

Outputs/Benefits of HBCU Research Grant

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Proposal #024

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

(research still in progress as of 8/89)

**ADDITIONAL COMMENTS**

The analysis of small holder land management regime indicates that research of this nature can provide vital inputs to agricultural development policy in LDCs. In addition, the output of this kind of work enhances the capacity of our institution in delivering technical assistance to developing countries, including developing training programs.

Outputs/Benefits of HBCU Research Grant

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Proposal #194

GENERAL INFORMATION

TITLE: QUANTITATIVE ANALYSIS OF THE AKUAFO CHEQUE SYSTEM  
PI: Bruce H. Dunson, Ph.D.  
SCHOOL: Prairie View A & M Univ  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
Ghana

PERSONNEL SUPPORTED:  
Faculty: 2.6 person-months  
Research Assistants: 1.6 person-months

GRADUATE STUDENTS TRAINED: 2

EQUIPMENT PURCHASED:  
None

OUTPUTS OF RESEARCH:

Refereed Papers:

"Formal Financial Institutions as Savings Mobilizing  
Conduits in Rural LDCs." Savings and Development,  
(Quarterly Review), 1987.

Unrefereed Papers:

Dadzie, Kofi and B. H. Dunson. "A Baseline study of  
farmers response to the introduction of a bank-based  
system of cocoa purchasing." A research report  
submitted to the Ghana Cocoa Board, 1985.

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With Other Universities:

North Carolina Central University

Outputs/Benefits of HBCU Research Grant

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Proposal #194

OBJECTIVES AND FINDINGS

**BRIEF STATEMENT OF RESEARCH OBJECTIVES:**

(1) To determine which variables had any effect on savings propensity, and (2) whether forced association with a bank had any residual effect on individual savings for cocoa farmers in Ghana participating in the Akafo Cheque Program.

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

(1) Farmers have a positive savings propensity; the age of the farmer influences the decision to save and the amount saved. (2) Farm size was negatively related to the probability of having a savings account and the amount saved. (3) Previous savings account experience had a positive effect on the amount saved.

Outputs/Benefits of HBCU Research Grant

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Proposal #222

GENERAL INFORMATION

TITLE: ECONOMIC VIABILITY OF THE SLOPING AGRIC LAND  
PI: Suresh R. Londhe, Ph.D.  
SCHOOL: South Carolina State College  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
Philippines

PERSONNEL SUPPORTED:  
Faculty: 8.0 person-months  
Research Assistants: 7.0 person-months

GRADUATE STUDENTS TRAINED: 1

EQUIPMENT PURCHASED:  
IBM PS/2 Model 80 computer  
computer printer

INDIRECT BENEFITS

GRANTS/CONTRACTS RESULTING FROM HBCU RESEARCH GRANT:  
\$100,000 USAID - Another HBCU Research Grant

LINKAGES ESTABLISHED:

With LDC Institutions:

Visayas State College of Agriculture, Philippines

With Other Universities:

Clemson University

With International or Scientific Organizations:

Philippine Council for Agriculture and Resources  
Research Development

Winrock International

Outputs/Benefits of HBCU Research Grant

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Proposal #222

OBJECTIVES AND FINDINGS

**BRIEF STATEMENT OF RESEARCH OBJECTIVES:**

Assess the pattern of adoption of the Sloping Agricultural Land Technology (SALT) among the upland farms. Conduct an economic evaluation of SALT and determine long-term viability of SALT.

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

Demographic and farm resource characteristics for the adopters and non-adopters of SALT were very similar. Assistance in the form of seeds and technical guidance were primary motivating factors for accepting SALT. Non-adopters indicated willingness to adopt SALT with similar assistance.

Outputs/Benefits of HBCU Research Grant

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Proposal #232

GENERAL INFORMATION

**TITLE:** PROPOSAL/STUDY THE DETERMINANTS OF LOAN DEFAULTS  
**PI:** Bruce H. Dunson, Ph.D.  
**SCHOOL:** Prairie View A & M Univ  
**STATUS:** This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

**COUNTRIES WHERE RESEARCH WAS CARRIED OUT:**

Ghana  
USA

**PERSONNEL SUPPORTED:**

Faculty: 6.0 person-months  
Research Assistants: 12.0 person-months

**GRADUATE STUDENTS TRAINED:** 0

**EQUIPMENT PURCHASED:**

None

**OUTPUTS OF RESEARCH:**

**Refereed Papers:**

"Promoting the Bank Savings Habit in Ghana." Journal of Macro Marketing vol.9: 16-23, 1989.

INDIRECT BENEFITS

**LINKAGES ESTABLISHED:**

**With LDC Institutions:**

Central Bank of Ghana  
Rural Banks of Ghana  
Ghana Cocoa Marketing Board

**With Other Universities:**

Georgia State University

Outputs/Benefits of HBCU Research Grant

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Proposal #232

OBJECTIVES AND FINDINGS

**BRIEF STATEMENT OF RESEARCH OBJECTIVES:**

An examination of the determinants of individual loan default rates based upon the characteristics of the borrowers and indicators of the efficiency of the particular branch where the loan is serviced. Data for this study were collected by sampling both files and customers of the rural banks of Ghana.

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

Analysis of loan default data showed that 30.9% of all loans were defaulted; 50% of all borrowers who defaulted were farmers and 40% of all defaulted loans were for the purpose of farming. Loans secured by security other than liens made up 80% of all defaulted loans. In addition, variables such as sex, marital status, number of children, education level, age, amount of loan and personal loans all had significant effects on loan delinquency.

**E. Rural Sociology/Development**

Outputs/Benefits of HBCU Research Grant

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Proposal #122

GENERAL INFORMATION

**TITLE:** DEVELOPMENT IMPACT OF PUBLIC SECTOR MGMT TRAINING  
**PI:** Hashim T. Gibrill, Ph.D.  
**SCHOOL:** Atlanta Univ  
**STATUS:** This project has not been completed.  
A final report has not been submitted to RUR.

DIRECT BENEFITS

**COUNTRIES WHERE RESEARCH WAS CARRIED OUT:**  
Nigeria

**PERSONNEL SUPPORTED:**  
Faculty: 7.0 person-months  
Research Assistants: 13.0 person-months

**GRADUATE STUDENTS TRAINED:** 4

**EQUIPMENT PURCHASED:**  
Mitsubishi MP286 personal computer  
Panasonic computer printer  
Canon SureShot camera  
set of four personal cassette recorders

**OUTPUTS OF RESEARCH:**

Theses:

Waziri, I. "Integrated Rural Development in Bauchi State, Nigeria." Clark Atlanta University, in preparation.

INDIRECT BENEFITS

**LINKAGES ESTABLISHED:**

With LDC Institutions:

University of Maiduguri, Nigeria

With Other Universities:

The Johns Hopkins University, Institute for International Programs

Outputs/Benefits of HBCU Research Grant

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Proposal #122

With International or Scientific Organizations:

Nigeria Family Health Services Project

OBJECTIVES AND FINDINGS

**BRIEF STATEMENT OF RESEARCH OBJECTIVES:**

Evaluate, in terms of needs and impact, a public sector management training program for state and local government officials being conducted in northeast Nigeria at the University of Maiduguri. Provide a firm basis for strengthening the training program and, consequently, the administration of development in the research region and beyond.

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

(research still in progress as of 11/89)

Outputs/Benefits of HBCU Research Grant

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Proposal #221

GENERAL INFORMATION

TITLE: MANENGA: AN INVESTIGATION OF WOMEN'S PRACTICES  
PI: Collette M. Hopkins, Ph.D.  
SCHOOL: Atlanta Univ  
STATUS: This project has been completed.  
A final report has not been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
Cameroon

PERSONNEL SUPPORTED:  
Faculty: 9.0 person-months  
Research Assistants: 1.0 person-months

GRADUATE STUDENTS TRAINED: 1

EQUIPMENT PURCHASED:  
None

OUTPUTS OF RESEARCH:

Refereed Papers:

(in preparation as of 10/89).

Unrefereed Papers:

(in preparation as of 10/89). NETWORK.

Abstracts:

"Conducting Research in Developing Countries -- The Realities of Village Life." Comparative and International Education Society, Harvard Graduate School of Educ., Spring, 1989.

INDIRECT BENEFITS

GRANTS/CONTRACTS RESULTING FROM HBCU RESEARCH GRANT:

Government - Small contract regarding rural sanitation

**Outputs/Benefits of HBCU Research Grant**

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**Proposal #221**

**LINKAGES ESTABLISHED:**

**With LDC Institutions:**

**Ministry of Health, Cameroon**

**Ministry of Women's Affairs, Cameroon**

**With International or Scientific Organizations:**

**UNICEF**

**Peace Corps**

**NETWORK (The International Resource Network of Women of African Descent)**

**WASH (Water and Sanitation for Health Project)**

**Comparative and International Education Society**

**OBJECTIVES AND FINDINGS**

**BRIEF STATEMENT OF RESEARCH OBJECTIVES:**

**Investigate the sociocultural implications of traditional beliefs and behaviors of rural villagers on the introduction of an improved sanitation technology.**

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

**The consideration of sociocultural factors must be fundamental to the development of sanitation projects at the village level.**

Outputs/Benefits of HBCU Research Grant

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Proposal #227

GENERAL INFORMATION

TITLE: ESTIMATING THE WILLINGNESS TO PAY FOR WATER  
PI: Fred O. Boadu, Ph.D.  
SCHOOL: Atlanta Univ  
STATUS: This project has not been completed.  
A final report has not been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
Ghana

PERSONNEL SUPPORTED:  
Faculty: 0.0 person-months  
Research Assistants: 0.0 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:  
None

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

To apply some recently developed techniques for valuing public goods and referendum procedures to the problem of determining water value in a selected developing country.

BRIEF STATEMENT OF RESEARCH FINDINGS:

(project not completed as of 12/89)

**F. Food Storage/Preservation**

Outputs/Benefits of HBCU Research Grant

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Proposal #022

GENERAL INFORMATION

TITLE: EVAL OF INDIGENOUS FOOD PRESERVATION TECHNIQUES  
PI: Ralphenia D. Pace, Ph.D.  
SCHOOL: Tuskegee Univ  
STATUS: This project has been completed.  
A final report has not been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
Ghana

PERSONNEL SUPPORTED:  
Faculty: 4.0 person-months  
Research Assistants: 12.0 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:  
None

OUTPUTS OF RESEARCH:

Refereed Papers:

"Survey of microbial quality of dry fish, cassava, and okra in Ghana." Journal of Food Protection, vol. 51(8): 660-662, 1988.

"Nutritive composition of smoke dried herrings in Ghana." Nutrition Reports International, 38(2): 299-306, 1988.

Unrefereed Papers:

"Status of food preservation methods for selected Ghanian foods." Food Reviews International, 5(1): 1-12, 1989.

Abstracts:

"The nutritional composition of smoked and stored herrings in Ghana." 85th SAAS Meeting, 1988.

Outputs/Benefits of HBCU Research Grant

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Proposal #022

INDIRECT BENEFITS

GRANTS/CONTRACTS RESULTING FROM HBCU RESEARCH GRANT:

USAID - "Evaluation of selected storage conditions in post-processing losses and quality preservation of smoked herrings."

LINKAGES ESTABLISHED:

With LDC Institutions:

Food Research Institute, Ghana

With Other Universities:

Oregon State University -- The present research will be enhanced by assistance from Oregon in nitrosamine determinations of fresh, processed and six-month stored fish samples.

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

Identify the major food preservation technique being used in Ghana and evaluate the adequacy of techniques as related to nutrient quality of preserved food and public health problems.

BRIEF STATEMENT OF RESEARCH FINDINGS:

The major food preservation technique is dehydration, especially by sun drying. This is used on root crops, vegetables and fish. The most important preserved food is smoke-dried herring. Spoilage during storage is a big problem.

Outputs/Benefits of HBCU Research Grant

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Proposal #153

GENERAL INFORMATION

TITLE: THE SOLAR BOX COOKER AND FOOD QUALITY  
PI: George J. Hammons, Ph.D.  
SCHOOL: Philander Smith College  
STATUS: This project has not been completed.  
A final report has not been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
Zambia

PERSONNEL SUPPORTED:  
Faculty: 18.0 person-months  
Research Assistants: 18.0 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:  
HPLC system  
nitrogen determining system  
drying oven

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With LDC Institutions:

Collaborative effort with the National Food and  
Nutrition Commission of Zambia, providing the PI with  
international development work experience.

With International or Scientific Organizations:

Solar Box Cooker International

Outputs/Benefits of HBCU Research Grant

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Proposal #153

OBJECTIVES AND FINDINGS

**BRIEF STATEMENT OF RESEARCH OBJECTIVES:**

Provide quantitative data on nutrient retention in foods cooked in the solar box cooker and to assess the overall utility and acceptability of the cooker in a local environment of potential use.

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

(project still in process as of 12/89)

Outputs/Benefits of HBCU Research Grant

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Proposal #165

GENERAL INFORMATION

TITLE: ANALYSIS OF HEALTH ASPECTS OF SOLAR BOX COOKER  
PI: Barbara W. Carpenter, Ph.D.  
SCHOOL: Southern Univ (Baton Rouge)  
STATUS: This project has not been completed.  
A final report has not been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
Sierra Leone

PERSONNEL SUPPORTED:  
Faculty: 16.0 person-months  
Research Assistants: 18.0 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:  
set of 19 box cookers

INDIRECT BENEFITS

GRANTS/CONTRACTS RESULTING FROM HBCU RESEARCH GRANT:

\$11,000 Government - USDA

\$7,500 Government - USDA

LINKAGES ESTABLISHED:

With LDC Institutions:

Institute of Agriculture, Njala University College,  
Sierra Leone

Ministry of Agriculture, Natural Resources and  
Forestry, Sierra Leone

With Other Universities:

California State University

Alabama State University

Outputs/Benefits of HBCU Research Grant

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Proposal #165

OBJECTIVES AND FINDINGS

**BRIEF STATEMENT OF RESEARCH OBJECTIVES:**

To test the extent of reduction of pathogenic microorganisms in foods cooked and water pasteurized via the solar box cooker in a village environment and to determine acceptability of food cooked via the solar box, and to estimate fuel and labor savings.

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

Pathogenic microorganisms can be reduced significantly by cooking and pasteurizing in a solar box cooker compared with food cooked in a traditional manner, fuel savings are very significant.

Outputs/Benefits of HBCU Research Grant

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Proposal #178

GENERAL INFORMATION

TITLE: POTENTIAL NUTRITIONAL BENEFITS/DRIED MANGOES  
PI: Jenice Rankins, Ed.D.  
SCHOOL: Tuskegee Univ  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:

Senegal  
USA

PERSONNEL SUPPORTED:

Faculty: 2.0 person-months  
Research Assistants: 5.0 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:

None

OUTPUTS OF RESEARCH:

Refereed Papers:

"Palatability and Nutritional Significance of  
Solar-dried Mangoes for Senegal." Ecology of Food  
and Nutrition, vol. 23, pp. 131-140, 1989.

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With LDC Institutions:

Institute for Food Technology  
Institute of Agriculture and Research Sciences  
Horticulture Development Center  
Center for Research of Renewable Energy

Outputs/Benefits of HBCU Research Grant

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Proposal #178

OBJECTIVES AND FINDINGS

**BRIEF STATEMENT OF RESEARCH OBJECTIVES:**

To develop procedures and standards for producing a high quality dried mango and demonstrate its potentiality for improving diets of malnourished weaning age children in Senegal.

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

(1) Mangoes are good sources of both carotene and Vitamin C. (2) These nutrients were not affected by dry storage of the fruit for as long as six months. (3) There was no problem with the flavor of the dried fruit or with excessive bacteria growth. (4) The small fibrous mangoes grown locally proved unsuitable for the treatment. (5) Only the direct type dryers worked well on a consistent basis.

ADDITIONAL COMMENTS

Various follow-on research activities have been prepared by the PI and her associates in the U.S. and Senegal.

Outputs/Benefits of HBCU Research Grant

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Proposal #189

GENERAL INFORMATION

TITLE: LOW COST & PRACTICAL SOLAR FRUIT DRYING SYSTEMS  
PI: D. Y. Goswami, Ph.D., P.E.  
SCHOOL: North Carolina A & T State Univ  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
USA

PERSONNEL SUPPORTED:  
Faculty: 0.0 person-months  
Research Assistants: 0.0 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:  
None

OUTPUTS OF RESEARCH:  
Unrefereed Papers:

"Performance of a Geodesic Solar Dome Used for Fruit Drying." ISES Solar World Congress, Japan, 1989.

OBJECTIVES AND FINDINGS

**BRIEF STATEMENT OF RESEARCH OBJECTIVES:**

(1) Review/evaluate economic feasibility and manufacturability of solar drying systems. (2) Fabricate and test performance of two systems. (3) Recommend most appropriate systems for LDCS.

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

(1) Geodesic type structure requires 7-8 sunny days to dry grapes, and collects more solar energy than conventional greenhouses. (2) Natural air configuration with a ventilator is superior to forced air designs. (3) Geodesic solar dryer is economical and convenient for developing countries.

Outputs/Benefits of HBCU Research Grant

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Proposal #249

GENERAL INFORMATION

TITLE: EVAL OF SELECTED STORAGE CONDITIONS/PREVENTION  
PI: John Y. Lu, Ph.D.  
SCHOOL: Tuskegee Univ  
STATUS: This project has not been completed.  
A final report has not been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
Ghana

PERSONNEL SUPPORTED:  
Faculty: 6.0 person-months  
Research Assistants: 12.0 person-months

GRADUATE STUDENTS TRAINED: 1

EQUIPMENT PURCHASED:  
None

OUTPUTS OF RESEARCH:

Refereed Papers:

Plahar, W.A., R.D. Pace and J.Y. Lu. "Effect of storage on the quality of smoked-dry herrings." Jour. of Food Sci., submitted for publication, 1990.

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With LDC Institutions:

Food Research Institute of CSIR in Ghana

Outputs/Benefits of HBCU Research Grant

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Proposal #249

OBJECTIVES AND FINDINGS

**BRIEF STATEMENT OF RESEARCH OBJECTIVES:**

(1) Study conditions prevailing in traditional smoked food storage. (2) Assess losses. (3) Evaluate efficiency of proposed improvements in storage and processing.

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

(project not completed as of 12/89)

**G. Aquaculture**

Outputs/Benefits of HBCU Research Grant

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Proposal #026

GENERAL INFORMATION

TITLE: FEASIBILITY OF AQUACULTURE IN DOMINICAN REPUBLIC  
PI: Judith A. Bender, Ph.D.  
SCHOOL: Morehouse College  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
Dominican Republic

PERSONNEL SUPPORTED:  
Faculty: 24.0 person-months  
Research Assistants: 18.0 person-months

GRADUATE STUDENTS TRAINED: 2

EQUIPMENT PURCHASED:  
environmental control chamber  
2nd environmental control chamber  
Kjeldahl analysis unit

OUTPUTS OF RESEARCH:

Refereed Papers:

Ekpo, I. and J. Bender. "Digestibility of a commercial fish feed, wet algae, and dried algae by Tilapia Nilotica and silver carp." Progressive Fish-Culturalist 51:83-86, 1989.

Bender, J., Y. Vatcharapijarn and A. Russell. "Fish Feed from Grass Clippings." Aquacultural Engineering, in press, 1989.

Archibold, E., V. Ibeanusi, J. Bender, and J. Gould. "The Use of a Mixed Microbial System in Removal of Lead from Contaminated Waters." Biodeterioration Research II pp.161-174, 1989.

Bender, J., E. R. Archibold, V. Ibeanusi and J. P. Gould. "Lead Removal From Contaminated Water By a Mixed Microbial System." Water Science and Tech., 21(12): 1661-1665, 1989.

Outputs/Benefits of HBCU Research Grant

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Proposal #026

Abstracts:

Bender, J., I. Ekpo, Y. Vatcharapijarn and I. Archibald. "Microbial Production of Nutritional Protein for Aquacultural Systems." American Society of Microbiologists Conference. New Orleans, LA, May, 1989.

Bender, J. "AID Supported Research at Morehouse College." National Research Council, Washington, D.C., 1988.

Bender, J. and I. Ekpo. "Microbial Production of Nutritional Protein for Aquacultural Systems." World Aquacultural Society Conference. Honolulu, Hawaii, January, 1988.

Bender, J., E. Archibald, V. Ibeanusi and J. Gould. "Lead Removal from Water by a Mixed Microbial System." Proceedings of the IAWPRC 14th Biennial Conference, 1988.

Bender, J.E. "Morehouse Aquaculture Project in Dominican Republic." NAFEO/AID Update, 1987.

Bender, J.E. "HBCU Researcher Develops Natural Fish Feed." Front Lines, (A.I.D.), p. 7, November, 1988.

INDIRECT BENEFITS

GRANTS/CONTRACTS RESULTING FROM HBCU RESEARCH GRANT:

USAID - Water purification potential of silage-microbe ecosystem in Nigeria

LINKAGES ESTABLISHED:

With LDC Institutions:

Universidad Catolica Madre y Maestra, Dominican Republic

With Other Universities:

Xavier College

Auburn University, Dept. of Fisheries and Agriculture

Outputs/Benefits of HBCU Research Grant

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Proposal #026

OBJECTIVES AND FINDINGS

**BRIEF STATEMENT OF RESEARCH OBJECTIVES:**

Assess the natural resources, biomass, agricultural wastes for potential use in the development of a natural fish feed for Tilapia nilotica.

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

Indigenous leaves and grass clippings with no competitive uses produced a high-quality protein when pre-treated by silaging and fed to microbes in shallow ponds. The final biomass was easily harvested.

Outputs/Benefits of HBCU Research Grant

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Proposal #126

GENERAL INFORMATION

TITLE: EVAL OF A NEW ANDROGEN & PROCEDURE FOR MASS PROD  
PI: Frank Meriwether, II, M.S.  
SCHOOL: Arkansas, Univ of (Pine Bluff)  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
USA

PERSONNEL SUPPORTED:  
Faculty: 0.0 person-months  
Research Assistants: 0.0 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:  
None

OUTPUTS OF RESEARCH:

Refereed Papers:

Merriweather, F. H. and E. L. Torrans. "Evaluation of a New Androgen and Procedure to Induce Functional Sex Reversal in Tilapia." The First Asian Fisheries Forum. Asian Fisheries Society, Philippines. pp.675-78, 1986.

Unrefereed Papers:

Torrans, E. L. and F. Merriweather. "Sex Reversal of Tilapia with Mibolerone." World Agricultural Society Annual Meeting, Honolulu, January 4-9, 1988.

Abstracts:

"Sex Reversal of Tilapia Using Mibolerone." Proc. of World Aquaculture Society, 1989.

Outputs/Benefits of HBCU Research Grant

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Proposal #126

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With Other Universities:

Arkansas State University

University of South Carolina

Tennessee Tech. University

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

Research designed to test the hypothesis that the sex of Tilapia fish can be altered from female to male by the introduction of an Androgen, "Mibolerone," into the fish pond.

BRIEF STATEMENT OF RESEARCH FINDINGS:

Exposing Tilapia fish to Mibolerone immersion flow-through solution, at 0.6 ppm concentration, appears to be a feasible method of eliminating the production of functional females and thereby increasing the size of the resultant crop.

Outputs/Benefits of HBCU Research Grant

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Proposal #202

GENERAL INFORMATION

TITLE: DEVELOPMENT OF FISH FEEDS FOR DOMINICAN REPUBLIC  
PI: Judith A. Bender, Ph.D.  
SCHOOL: Morehouse College  
STATUS: This project has been completed.  
A final report has not been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
Dominican Republic

PERSONNEL SUPPORTED:  
Faculty: 24.0 person-months  
Research Assistants: 0.0 person-months

GRADUATE STUDENTS TRAINED: 2

EQUIPMENT PURCHASED:  
None

OUTPUTS OF RESEARCH:

Unrefereed Papers:

Bender, J. "Sustainable Agriculture." Seeds, vol. 12(10), p. 16, November, 1989.

Abstracts:

Bender, J., I. Ekpo, E. Archibold and Y. Vatcharapijarn. "Microbial Production of Nutritional Protein for Aquaculture Systems." World Aquaculture Society Meeting, Hawaii, 1988.

Bender, J., E. Archibold, Y. Vatcharapijarn, V. Ibeanusi and J. Gould. "Development of a mixed microbial ecosystem for biotechnology." American Association for the Advancement of Science, 1988.

Bender, J., Y. Vatacharapijarn and E. Archibold. "Microbial Production of Nutritional Protein." Amer. Soc. of Microb. Conf., New Orleans, LA, May, 1989.

Outputs/Benefits of HBCU Research Grant

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Proposal #202

Abstracts (continued)

Ibeanusi, V., E. Archibold, J. Bender and J. Gould.  
"Adaptation of mixed microbial strains for increased uptake and recovery of heavy metals in a simulated pond system." Third Pan-American Biodeterioration Society Meeting, 1989.

Archibold, E., J. Bender, V. Ibeanusi and J. Gould.  
"Use of Mixed Microbial Ecosystems in the Recovery of Heavy Metals from Mineral Processing Water and Wastewater." American Society of Microbiologists, May, 1988.

Ibeanusi, V., E. Archibold, J. Bender and J. Gould.  
"Recovery of Lead in Mixed Microbial Ecosystems." Southeast Branch, American Society of Microbiology, 1987.

Theses:

Ekpo, I. "Production and digestibility of a mixed microbial plankton raised on silaged grass." Ph.D. Thesis, Atlanta University, 1988.

INDIRECT BENEFITS

GRANTS/CONTRACTS RESULTING FROM HBCU RESEARCH GRANT:

Private - UCNF- to develop study situations for environmental education in Kenya and the Dominican Republic.

Government - EPA-funded removal of heavy metals from contaminated water.

Government - Bureau of Mines-funded removal of heavy metals from contaminated water

LINKAGES ESTABLISHED:

With LDC Institutions:

CIMPA, Agricultural Research Station, Government of the Dominican Republic

Outputs/Benefits of HBCU Research Grant

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Proposal #202

LDC Institutions (continued)

CREAR, Sustainable Agriculture Experiment, Government  
of the Dominican Republic

OBJECTIVES AND FINDINGS

**BRIEF STATEMENT OF RESEARCH OBJECTIVES:**

Assess native grasses for potential feed stock for nitrogen-fixing microbes and cellular protein production. Test resulting feed for fish growth in lab. Test feed production processes in field ponds.

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

Field pond production was similar in ecology and productivity. A nutritious digestible product was produced during the dry season. Production decreased one-half during the rainy season.

**H. Human Nutrition**

Outputs/Benefits of HBCU Research Grant

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Proposal #002

GENERAL INFORMATION

TITLE: ADOPTION OF NUTRITION EDUC PROGRAMS  
PI: Richard A. Frempong, Ph.D.  
SCHOOL: Atlanta Univ  
STATUS: This project has not been completed.  
A final report has not been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
Ghana

PERSONNEL SUPPORTED:  
Faculty: 0.0 person-months  
Research Assistants: 0.0 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:  
None

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With LDC Institutions:

Government of Ghana -- MOH officials, Cecera and  
appropriate regional officials

With International or Scientific Organizations:

Catholic Relief Society

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

To undertake an empirical investigation of the extent  
to which nutrition education can be effectively used  
to resolve malnutrition problems arising from food  
beliefs and habits, especially in juvenile  
malnutrition.

Outputs/Benefits of HBCU Research Grant

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Proposal #002

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

Research apparently never completed -- or at least written up. There is one short progress report dated 9/2/85, but it is purely descriptive and provides no data relevant to project objectives.

Outputs/Benefits of HBCU Research Grant

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Proposal #013

GENERAL INFORMATION

TITLE: NUTRIENT ANALYSIS OF UPPER VOLTAIC VEGETATION  
PI: W. Ardine Kirchhofer, Ph.D.  
SCHOOL: Lincoln Univ (Missouri)  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
Burkina Faso

PERSONNEL SUPPORTED:  
Faculty: 9.0 person-months  
Research Assistants: 0.0 person-months

GRADUATE STUDENTS TRAINED: 1

EQUIPMENT PURCHASED:  
None

OUTPUTS OF RESEARCH:

Abstracts:

Kirchhofer, W.A.L. "Nutrient Analysis of Uncultivated  
Vegetation in Burkina Faso." 6th Annual Meeting of  
1890's Research Directors, Wash., D.C., 1985.

Theses:

"Nutrient Analysis of Uncultivated Vegetation in  
Burkina Faso." Ph.D. Thesis. University of  
Missouri-Columbia, 1986.

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With LDC Institutions:

University of Ouagadougou

Outputs/Benefits of HBCU Research Grant

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Proposal #013

With Other Universities:

University of Missouri

OBJECTIVES AND FINDINGS

**BRIEF STATEMENT OF RESEARCH OBJECTIVES:**

To determine the nutrient composition of commonly consumed uncultivated vegetation in Burkina Faso for protein, fat, crude fiber, etc.

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

(1) Uncultivated vegetation of Burkina Faso has a proximate composition characteristic of cultivated green vegetation. (2) The content of most of the essential amino acids in the uncultivated vegetation were equal to or greater than the levels recommended by FAO/WHO.

Outputs/Benefits of HBCU Research Grant

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Proposal #021

GENERAL INFORMATION

TITLE: IMPACT OF NUTRITION INTERVENTION ON FAMILY INCOME  
PI: Jenice Rankins, Ed.D.  
SCHOOL: Tuskegee Univ  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:

Jamaica  
USA

PERSONNEL SUPPORTED:

Faculty: 20.0 person-months  
Research Assistants: 14.0 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:

stove  
refrigerator  
sewing machine  
mini-computer  
printer

OUTPUTS OF RESEARCH:

Refereed Papers:

"A Comparative Report on rehabilitation interventions and undernutrition outcomes in 12-35 month olds in Jamaica." Society for Nutr. Educ., vol. 22(1) pp. 39-45, 1990.

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With LDC Institutions:

Jamaica MOH Div. of Nutrition and Dietetics

Outputs/Benefits of HBCU Research Grant

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Proposal #021

OBJECTIVES AND FINDINGS

**BRIEF STATEMENT OF RESEARCH OBJECTIVES:**

To compare the effectiveness of three different nutritional interventions in combatting protein malnutrition in children including: (a) Supplementary family income; (b) nutrition education; and (c) container gardening.

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

Of 2,900+ children (ages 0-59 mo.) from three villeges, approximately 1,000 showed evidence of malnutrition and about 300 of these were severely malnourished. Mean weight gain in the nutrition rehab group was significantly higher than those without rehab intervention.

Outputs/Benefits of HBCU Research Grant

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Proposal #103

GENERAL INFORMATION

TITLE: CYANIDE-MALNUTRITION EFFECT ON THYROID FUNCTION  
Pi: Olusegun L. Oke, Ph.D.  
SCHOOL: Howard Univ  
STATUS: This project has not been completed.  
A final report has not been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:

Nigeria

USA

PERSONNEL SUPPORTED:

Faculty: 8.0 person-months

Research Assistants: 11.0 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:

IEC PRL Centrifuge

Labconco model 3 freeze-drier

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With LDC Institutions:

Obafemi Awolowo University

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

To examine the mechanism of interaction between cassava cyanide and protein calorie malnutrition in the etiology of hypothyroidism and concomitant endemic goiter in an area of Western Nigeria.

BRIEF STATEMENT OF RESEARCH FINDINGS:

(Project not completed as of 12/89.)

Outputs/Benefits of HBCU Research Grant

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Proposal #115

GENERAL INFORMATION

TITLE: TOXIC METAL ACCUMULATION IN PLANTAIN  
PI: James T. Kinard, Ph.D.  
SCHOOL: Benedict College  
STATUS: This project has not been completed.  
A final report has not been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
USA

PERSONNEL SUPPORTED:  
Faculty: 6.0 person-months  
Research Assistants: 3.0 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:  
None

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

- (1) Determine baseline data on accumulation of toxic elements by plaintains eaten in Barbados and Puerto Rico.
- (2) Determine extent to which this happens in areas with moderate to heavy traffic, industry, etc.
- (3) Determine any correlations between toxic metal profiles in ratios of one metal to another in plaintain.

BRIEF STATEMENT OF RESEARCH FINDINGS:

Interim: Bananas and plaintains grown in industrialized areas contain higher lead and cadmium levels than those in a "non-industrialized area".

Outputs/Benefits of HBCU Research Grant

Proposal #197

GENERAL INFORMATION

TITLE: NUTRITIVE VALUE OF LEAFY GREEN VEGETABLES-BELIZE  
PI: James W. Nordstrom, Ph.D.  
SCHOOL: Lincoln Univ (Missouri)  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
Belize

PERSONNEL SUPPORTED:  
Faculty: 4.7 person-months  
Research Assistants: 4.8 person-months

GRADUATE STUDENTS TRAINED: 1

EQUIPMENT PURCHASED:  
isothermic lab oven  
sonic dismembrator  
industrial hot plate  
electric balance

OUTPUTS OF RESEARCH:

Abstracts:

"Nutritional status of children in Belize." 7th  
Biennial Research Symposium of 1890 Land Grant  
Universities, October, 1987. Washington, D.C., 1987.

"Nutritional deficiencies among children in Belize."  
8th Biennial Research Symposium of 1890 Land Grant  
Universities, October 1989, Washington, D.C., 1989.

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With LDC Institutions:

University of the West Indies

Outputs/Benefits of HBCU Research Grant

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Proposal #197

OBJECTIVES AND FINDINGS

**BRIEF STATEMENT OF RESEARCH OBJECTIVES:**

Provide data to serve as a basis for educational programs to improve diet of Belizeans. Assess the utilization and nutritional value of leafy green food plants. Contribute to the educational and research capability of Belize personnel in foods and nutrition.

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

Malnutrition contributes to retarded growth for Belize children. Evidence was found for deficiencies of energy, Vitamin A and C, riboflavin, calcium, zinc, and iodine in children. Several leafy green plants were found to compare favorably with spinach in nutrient content.

Outputs/Benefits of HBCU Research Grant

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Proposal #219

GENERAL INFORMATION

TITLE: ASSESSMENT OF VITAMIN A STATUS OF CHILDREN/BELIZE  
PI: Dhiren D. Makdani, Ph.D.  
SCHOOL: Lincoln Univ (Missouri)  
STATUS: This project has not been completed.  
A final report has not been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
Belize

PERSONNEL SUPPORTED:  
Faculty: 6.0 person-months  
Research Assistants: 9.0 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:  
None

OUTPUTS OF RESEARCH:

Abstracts:

Makdani, D. "Vitamin A deficiency assessment of children in Belize." Eighth Biennial Research Symposium of 1890 Land Grant Universities, Washington, D.C., 1989.

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With Other Universities:

University of Minnesota

Johns Hopkins University

Outputs/Benefits of HBCU Research Grant

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Proposal #219

OBJECTIVES AND FINDINGS

**BRIEF STATEMENT OF RESEARCH OBJECTIVES:**

Assess the Vitamin A status of pre-school and school children of Belize, thus helping the government of Belize to formulate a nutritional policy for the country.

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

Preliminary findings suggest 40% of the children exhibit the biochemical signs of severe to marginal Vitamin A deficiency.

**I. Pest Management**

Outputs/Benefits of HBCU Research Grant

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Proposal #239

GENERAL INFORMATION

TITLE: SYSTEMATICS/AQUATIC WEEVILS TO ENHANCE BIOLOGICAL  
PI: Charles W. O'Brien, Ph.D.  
SCHOOL: Florida A & M Univ  
STATUS: This project has not been completed.  
A final report has not been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:

Argentina  
Venezuela

PERSONNEL SUPPORTED:

Faculty: 24.0 person-months  
Research Assistants: 24.0 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:

None

OUTPUTS OF RESEARCH:

Refereed Papers:

Wibmer, G. and C. O'Brien. "Additions and corrections to annotated checklists of the weevils of North America, Central America, West Indies and South America." Southwest Entomol. (Suppl.) 13:1-49, 1989.

O'Brien, C. and G. Wibmer. "Revision of the Neotropical weevil genus Argentinorhynchus Brethes." Ann. Entomol. Soc. Amer. 82:267-278, 1989.

O'Brien, C. and G. Wibmer. "Two new South American species of the weevil genus Argentinorhynchus Brethes." Southwest Entomol., 14:213-223, 1989.

O'Brien, C. and G. Wibmer. "Revision of the Neotropical genus Neohydronomus Hustache." Coleoptera Bulletin, 13(3): 291-304, 1989.

Wibmer, G. and C. O'Brien. "Two new Neotropical genera in the weevil tribe Stenopelmini." Southwest Entomol., 14(4):395-407, 1989.

Outputs/Benefits of HBCU Research Grant

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Proposal #239

Abstracts:

"Weevils, Premiere Biocontrol Agents." XVIIIth  
International Congress of Entomology, 1988.

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

Develop a cladistic analysis and a key to the genera of the New World Stenopelmini (aquatic weevils), Eirrhinae, and to revise the species of the genera Neohydronomus, Argentinorynchus and Onychylis to enable the use of selected weevils as potential biological control agents of exotic weeds.

BRIEF STATEMENT OF RESEARCH FINDINGS:

Number of known genera is being doubled from 20 to 40, and approximately 25 new species are being described in published papers. More than 25 new host plant associations were verified in the field in South America, data vital to successful biological control programs.

ADDITIONAL COMMENTS

Directed research for two years, of Post-doctoral Fellow, Dra. Analia A. Lanteri, at FAMU. Funded by the Argentine government through CONICET.

Outputs/Benefits of HBCU Research Grant

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Proposal #251

GENERAL INFORMATION

TITLE: INSECT RESISTANCE AND ALTERNATIVES TO INSECTICIDES  
PI: Shobha Sriharan, Ph.D.  
SCHOOL: Selma Univ  
STATUS: This project has not been completed.  
A final report has not been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
Rwanda

PERSONNEL SUPPORTED:  
Faculty: 20.0 person-months  
Research Assistants: 0.0 person-months

GRADUATE STUDENTS TRAINED: 2

EQUIPMENT PURCHASED:  
computer  
environment controlled room  
incubator  
heater  
humidifier

OUTPUTS OF RESEARCH:

Refereed Papers:

"Evaluation of Insect Resistance to Actellic in Rwandan Storage." Journal of Stored Product Insects. Paper submitted for publication, 1990.

"Efficacy of 'Neem-Extract' for Postharvest Protection of Dry Edible Beans, Soft Red Wheat and Sorghum." Journal of Tropical Agriculture. Paper submitted for publication, 1990.

Abstracts:

"The Effectiveness of Actellic on Stored Product Insects, Rhizopertha Dominica and Sitophilus Oryzae." American Chemical Society, Agrochemical Session, 1990.

Outputs/Benefits of HBCU Research Grant

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Proposal #251

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With LDC Institutions:

OPROVIA, Rwanda

With Other Universities:

Montana State University, Entomology Department

University of Minnesota, International Program

With International or Scientific Organizations:

Max-Planck Institute for Biochemistry, Insect  
Biochemistry Dept., Munich, West Germany

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

The major objective of the study was to survey the resistance among three species of stored grain insects to two insecticides commonly used in Rwanda - Actellic and Phostoxin. Other objectives included testing for possible cross resistance to other insecticides and use of non-toxic plant extracts (NEEM extracts) as possible alternatives to insecticides for the control of stored product pests in Rwanda.

BRIEF STATEMENT OF RESEARCH FINDINGS:

Resistance to Actellic was found in insect populations at warehouses in Nianza and Kupakazo, whereas at certain locations, Actellic is still effective. This pesticide needs to be evaluated for its continued use in Rwanda. "Neem-extract" is effective against certain insects, thereby suggesting that the commodities like edible dry beans, softened wheat and sorghum could be protected with this plant extract.

Outputs/Benefits of HBCU Research Grant

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Proposal #251

ADDITIONAL COMMENTS

Entomologists from India working on stored product insects, biological control of insects, use of plant extracts as alternatives to pesticides and Integrated Pest Management have been invited to Selma University. Efforts are also being made to initiate a research program on the control mosquitoes in countries where malaria is on the increase.

**II. HEALTH RELATED PROJECTS**

**A. Schistosomiasis/Malaria**

Outputs/Benefits of HBCU Research Grant

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Proposal #008

GENERAL INFORMATION

TITLE: PLASMODIAL INDUCTION OF EPSTEIN-BARR VIRUS  
PI: Sally Gravely, Ph.D.  
SCHOOL: Howard Univ  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
USA

PERSONNEL SUPPORTED:  
Faculty: 8.0 person-months  
Research Assistants: 0.0 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:  
CO2 incubator  
refrigerator-freezer  
MASH II automated sample harvester  
HB-4 rotor

OUTPUTS OF RESEARCH:

Abstracts:

"Plasmodial Induction of Epstein-Barr Virus." IXth  
Int. Congress of Infectious and Parasitic Diseases,  
1986.

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

Determine whether P. falciparum induces Epstein-Barr  
Virus (EBV) activation and increased viral capsid  
antigen (VCA) in Berkitt's Lymphoma (BL) cell lines  
and whether the parasite thus enhances proliferation  
of rapidly dividing BL cells.

Outputs/Benefits of HBCU Research Grant

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Proposal #008

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

(1) P. falciparum increased expression of VCA in one of the BL cell lines but not in others. (2) P. falciparum-infected red blood cells (RBC) significantly increase DNA synthesis. However, the effect of this on the latent EBV genome in Raji-3 cells remains to be determined.

Outputs/Benefits of HBCU Research Grant

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Proposal #009

GENERAL INFORMATION

TITLE: IMMUNO...TO BACTERIAL VACCINES IN SCHISTOSOMIASIS  
PI: Kunle Kassim, Ph.D.  
SCHOOL: Howard Univ  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
USA

PERSONNEL SUPPORTED:  
Faculty: 6.0 person-months  
Research Assistants: 9.0 person-months

GRADUATE STUDENTS TRAINED: 1

EQUIPMENT PURCHASED:  
ELISA microplate reader  
incubator  
refrigerator

OUTPUTS OF RESEARCH:

Refereed Papers:

"Induction of Humeral Immune Response to Bacterial Vaccine in Schistosomiasis." Transactions of Royal Society of Tropical Medicine and Hygiene. Accepted for publication.

"Immunosuppression in Schistosomiasis." Journal of Tropical Medicine and Hygiene. Accepted for publication.

Abstracts:

"Contended Issues in Schistosomiasis." Schisto Symposium, Fogarty Center, 1986.

Outputs/Benefits of HBCU Research Grant

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Proposal #009

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With International or Scientific Organizations:

WHO -- subsequent related research

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

Determine the specificity of humoral and cellular immunosuppression resulting from experimental Schistosoma mansoni infection in mice.

BRIEF STATEMENT OF RESEARCH FINDINGS:

The total non-responsiveness of S. mansoni infected mice to pertussis and tetanus antigens indicates development of a complex pattern of selective and specific immunosuppression to various bacterial antigens in S. mansoni infected subjects. This demonstrates that immunosuppression induced by a parasitic disease may have a profound effect on the success of immunization programs against certain diseases caused by bacteria.

Outputs/Benefits of HBCU Research Grant

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Proposal #010

GENERAL INFORMATION

TITLE: LATEX SLIDE AGGLUTINATION TEST/MALARIA ANTIGEN  
PI: Margaret E. Grigsby, M.D.  
SCHOOL: Howard Univ  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
USA

PERSONNEL SUPPORTED:  
Faculty: 0.0 person-months  
Research Assistants: 9.0 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:  
high-tech equipment (total: \$19,542)

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

Develop simple latex slide agglutination test for detection of malaria antigen in the blood of mice and determine if similar tests can be adapted to use in humans.

BRIEF STATEMENT OF RESEARCH FINDINGS:

Work was not completed. All that could be demonstrated was ability to generate desired monoclonal antibody which attached to latex molecules. No agglutination was observed.

ADDITIONAL COMMENTS

Work not completed. Minimal results available.

Outputs/Benefits of HBCU Research Grant

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Proposal #020

GENERAL INFORMATION

TITLE: DEV OF ANTISCHISTOSOMAL COMPOUNDS  
PI: Arun L. Jadhav, Ph.D.  
SCHOOL: Texas Southern Univ  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
USA

PERSONNEL SUPPORTED:

Faculty: 0.0 person-months  
Research Assistants: 0.0 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:

Beckman DD spectrophotometer

OUTPUTS OF RESEARCH:

Abstracts:

"Kinetic Differences Between the Purine Salvage Pathways in Human Red Blood Cells and S. mansoni." VIth International Congress of Parasitology, 1986.

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

Further identify structural characteristics of potential inhibitors of the purine salvage enzymes, based on previous work.

BRIEF STATEMENT OF RESEARCH FINDINGS:

C-2 and C-6 substituted purines provided the structural requirements for inhibition of Hypoxanthine-guanine phospho-ribosyl transferase (HGPRT). Non-purine compounds were found to be inactive. An intact purine ring was found to be necessary for inhibition of HGPRT.

Outputs/Benefits of HBCU Research Grant

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Proposal #020

ADDITIONAL COMMENTS

Prior to this grant, the PI did not have any funding or laboratory facilities to pursue research activity, therefore considerable time was consumed acquiring lab supplies and establishing experimental techniques. The grant allowed the PI to establish the first "research laboratory" in the College of Pharmacy with potential for developing future research at TSU.

Outputs/Benefits of HBCU Research Grant

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Proposal #160

GENERAL INFORMATION

TITLE: KINETIC CHARACTERISTICS-ENZYME PATHWAYS-S. MANSONI  
PI: Arun L. Jadhav, Ph.D.  
SCHOOL: Texas Southern Univ  
STATUS: This project has not been completed.  
A final report has not been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
USA

PERSONNEL SUPPORTED:  
Faculty: 3.0 person-months  
Research Assistants: 12.0 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:  
fast pressure liquid chromatograph (FPLC)  
Pharmacia Fine Chemicals

OUTPUTS OF RESEARCH:

Refereed Papers:

Jadhav, A.L. and S. Sirosian. "Structural Requirements for Inhibition of Salvage Pathways." Schistosoma mansoni, Drug Devpt. Research, under review.

Abstracts:

"Kinetic Differences Between the Purine Salvage Pathways in Human Red Blood Cells and Schistosoma mansoni." VIIth International Congress on Parasitology, Brisbane, 1988.

Outputs/Benefits of HBCU Research Grant

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Proposal #160

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

To study kinetics of the enzyme hypoxanthine-guanine phosphoribosyl transferase (HGP-RTase) isolated from Schistosoma mansoni in order to identify structural characteristics of potential inhibitors of salvage enzymes essential for S. mansoni reproduction in the human.

BRIEF STATEMENT OF RESEARCH FINDINGS:

The substrate specificity of the parasite enzyme differs significantly from HGP-RTase obtained from human red blood cells.

Outputs/Benefits of HBCU Research Grant

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Proposal #192

GENERAL INFORMATION

TITLE: DEVEL OF THE NATURAL PRODUCT PHYTOLACCA DODECANDRA  
PI: William O. Jones, Ph.D.  
SCHOOL: Tuskegee Univ  
STATUS: This project has not been completed.  
A final report has not been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
Ethiopia  
Zambia

PERSONNEL SUPPORTED:  
Faculty: 12.0 person-months  
Research Assistants: 12.0 person-months

GRADUATE STUDENTS TRAINED: 1

EQUIPMENT PURCHASED:  
HPLC columns  
fraction collector  
gamma counter

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

Carry out a demonstration project to test and establish efficacy and feasibility of using endod, an African soapberry plant, as a molluscicide against the snail hosts of human schistosome infection.

BRIEF STATEMENT OF RESEARCH FINDINGS:

Project in progress as of 12/89 -- but some objectives have been completed; e.g., measurement of differential toxicants of endod for fish and snails.

Outputs/Benefits of HBCU Research Grant

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Proposal #203

GENERAL INFORMATION

TITLE: PRODUCTION OF MONOCLONAL ANTIBODIES/MONKEY-HUMAN  
PI: L. P. Washington, Ph.D.  
SCHOOL: Tuskegee Univ  
STATUS: This project has not been completed.  
A final report has not been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
Nigeria  
USA

PERSONNEL SUPPORTED:  
Faculty: 12.0 person-months  
Research Assistants: 0.0 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:  
None

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With LDC Institutions:

University of Ibadan Medical School, Ibadan, Nigeria

With Other Universities:

Scripps Institute, La Jolla, California

Outputs/Benefits of HBCU Research Grant

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Proposal #203

OBJECTIVES AND FINDINGS

**BRIEF STATEMENT OF RESEARCH OBJECTIVES:**

To develop a rapid enzyme-linked immunodiagnostic test for detection of merozoite and gametocyte-specific antigens in the West African, Nigerian population of Ibadan. Also, to generate bioepidemiological data which can be used to generate computer models and thus provide quantitative information regarding distribution and density of surface-end-stage specific epitopes in the West African population.

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

(1) ELISA for falciparum malaria developed. (2) Refinements required before it can be used in diagnostic tests.

Outputs/Benefits of HBCU Research Grant

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Proposal #233

GENERAL INFORMATION

TITLE: DEVELOPMENT/ANTISCHISTOSOMAL AGENTS  
PI: Arun L. Jadhav, Ph.D.  
SCHOOL: Texas Southern Univ  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
USA

PERSONNEL SUPPORTED:  
Faculty: 0.0 person-months  
Research Assistants: 12.0 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:  
high-speed refrigerated centrifuge  
protein purification chromatograph

OUTPUTS OF RESEARCH:

Refereed Papers:

Jadhav, A.L. and S. Sirossian. "Inhibition of salvage pathways of Schistosoma mansoni." Drug Development Research, submitted for publication, 1990.

Abstracts:

"The Purine Salvage Pathways of S. mansoni." The Pharmacologist 29(3):208, 1987.

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With Other Universities:

Rice University, Department of Chemistry -- to synthesize new, potential inhibitors of purine salvage

Outputs/Benefits of HBCU Research Grant

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Proposal #233

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

Develop methods to isolate and purify as well as study the kinetics of purine metabolizing enzymes (HPRT, APRT and ARP) of S. mansoni.

BRIEF STATEMENT OF RESEARCH FINDINGS:

The methods to isolate and purify these enzymes were developed and their preliminary kinetics were studied.

ADDITIONAL COMMENTS

This finding has significantly strengthened research capabilities of the PI and Texas Southern University.

Outputs/Benefits of HBCU Research Grant

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Proposal #240

GENERAL INFORMATION

TITLE: SCHISTOSOMIASIS: BIOLOGY AND HOST-PARASITE  
PI: Betty R. Jones, Ph.D.  
SCHOOL: Morehouse College  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
USA

PERSONNEL SUPPORTED:  
Faculty: 1.0 person-month  
Research Assistants: 2.0 person-month

GRADUATE STUDENTS TRAINED: 4

EQUIPMENT PURCHASED:  
DV-7 Beckman spectrophotometer

OUTPUTS OF RESEARCH:

Refereed Papers:

Jones, B.R. "The Role of Biodeteriogens Relevant to Ultrastructure and Infectious Diseases." Biodeterioration Res., vol. 2, pp. 599-600, Plenum Press, NY, 1989.

Jones, B.R., S.C., Pan, and M.M. Amarin. "Structure of Sensory Nerves and Serotonin-Like Immunofluorescent Activity in Schistosoma mansoni miracidia and Cercariae." Biodeterioration Res., vol. 2, pp. 601-626, Plenum Press, NY, 1989.

Siddiqui, A.A., M.M. Amarin and B.R. Jones. "Biomphalaria Glabrata, A Continuing Environmental Biodeteriogen: Alterations in the Levels of Some Hydrolases Following Schistosoma Mansoni Infection." Biodeterioration Res., vol. 2, pp. 627-37, Plenum Press, NY, 1989.

Outputs/Benefits of HBCU Research Grant

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Proposal #240

Refereed Papers (continued)

Jones, B.R., P. Darion, J. Hicks and C. Nelson. "Cilia Polymorphism Among Schistosome Snail Hosts as Revealed by Scanning Electron Microscopy." Biodeterioration Res., vol. V, pp. 639-659, 1989.

Jones, B.R. "Ultrastructural Freeze Fracture Etch Technology on the vesicular system of S. Mansoni, miracidia." Proceedings, Second Beijing Conference on Instrumentation analysis, Beijing, P.R. of China, vol 3, pp. 192-194, 1989.

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With LDC Institutions:

Office of Research and Development, Nigeria  
University of Ife

With Other Universities:

Atlanta University Center Consortium  
George Washington University

With International or Scientific Organizations:

Scientific Societies

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

Obtain a better understanding of the nervous system of Schistosoma mansoni miracidia and snail hosts.

Outputs/Benefits of HBCU Research Grant

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Proposal #240

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

Four papers were produced which provide basic scientific data on the overall neurobiology of Schistosoma mansoni miracidia and cercariae, enzyme kinetics and morphology of snail hosts and the ultrastructural effects of the anthelmintic drug, oltiprax, on the tegument of the larval tapeworm, Cysticercus fasciolaris. The potential approaches of these studies fall particularly into the general realm of biological control, especially if they can be integrated with other biological and environmental methods designed to foster disruption of transmission of the biodeteriogen.

**ADDITIONAL COMMENTS**

The PI incorporated the four papers into one chapter of a book. PI won a White House award for this research.

Outputs/Benefits of HBCU Research Grant

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Proposal #263

GENERAL INFORMATION

TITLE: SEROEPIDEM. DETERMINATION OF SCHISTOSOME CERCARIAE  
PI: Adeleh Esfandiari, Ph.D.  
SCHOOL: Drew (Charles R) Postgraduate Medical School  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
Kenya

PERSONNEL SUPPORTED:  
Faculty: 4.0 person-months  
Research Assistants: 4.0 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:  
None

OUTPUTS OF RESEARCH:

Refereed Papers:

(Submitted as of 10/89, second submission 1990).  
"Field Application of Cercarial Elastase Antigen as a  
Seroepidemiological Tool to Assess Exposure to  
Schistosomiasis." American Journal of Tropical  
Medicine and Hygiene, likely publication, vol. 42,  
(approx. 5 pages), 1989.

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With LDC Institutions:

University of Nairobi, Kenya

With Other Universities:

Johns Hopkins University

University of California at San Francisco

Outputs/Benefits of HBCU Research Grant

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Proposal #263

OBJECTIVES AND FINDINGS

**BRIEF STATEMENT OF RESEARCH OBJECTIVES:**

To investigate the epidemiological significance of anti-elastase antibodies in communities living in endemic areas in central Kenya. This can indicate where transmission is occurring and would be useful for determining the protection value of a schistosome vaccine.

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

Optical densities to elastase antigen measured in the high prevalence, high transmission area, were higher than those detected in the low transmission area. Measurement of elastase antibodies has potential as a seriological tool.

ADDITIONAL COMMENTS

The advantage of this project was not only to complete the research but develop a relationship and foster the spirit of cooperation among U.S. universities and colleagues overseas.

**B. Trypanosomiasis/Leishmania**

Outputs/Benefits of HBCU Research Grant

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Proposal #155

GENERAL INFORMATION

TITLE: REPLICATION OF TRYPANOSOME KINETOPLAST DNA  
PI: Manuel S. Valenzuela, Ph.D.  
SCHOOL: Meharry Medical College  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
USA

PERSONNEL SUPPORTED:  
Faculty: 12.0 person-months  
Research Assistants: 12.0 person-months

GRADUATE STUDENTS TRAINED: 1

EQUIPMENT PURCHASED:  
Beckman SW 50.1 rotor package  
sorvall GSA rotor  
Fisher microcentrifuge

OUTPUTS OF RESEARCH:

Refereed Papers:

Ikpeazu, E. and M. Valenzuela. "A specific deletion caused by insertion of Poly (dA).poly(dT) in pBR322 DNA." Plasmid 21:247, 1989.

Abstracts:

Ikpeazu, E. and M. Valenzuela. "Construction of recombinant plasmids containing berenil-target sequences." MBRs-MARC Symposium, 1987.

Ikpeazu, E. and M. Valenzuela. "Specific deletions caused by insertion of poly(dA).poly(dT) in pBR322 DNA." FASEB Symposium, 1988.

Outputs/Benefits of HBCU Research Grant

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Proposal #155

**Theses:**

Ikpeazu, E. "Recombinant plasmids containing poly(dA).poly(dT) sequences: effect of poly(dA).poly(dT) on plasmid integrity and sensitivity to berenil." Meharry Medical College, 1988.

INDIRECT BENEFITS

**GRANTS/CONTRACTS RESULTING FROM HBCU RESEARCH GRANT:**

\$200,000 NSF - Targeted inhibition of DNA replication in yeast recombinant plasmids.

**LINKAGES ESTABLISHED:**

**With LDC Institutions:**

Universidad Peruana Cayetano Heredia, Peru

OBJECTIVES AND FINDINGS

**BRIEF STATEMENT OF RESEARCH OBJECTIVES:**

Increase understanding of mechanism by which certain trypanocidal drugs interfere with the replication of kinetoplast DNA. This information may lead to new concepts of chemotherapy against parasites containing these unusual DNA structures.

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

Recombinant plasmids containing poly(dA).poly(dT) sequences were used as model systems to study effect of berenil on replication of these plasmids. Found that the presence of the homopolymer renders the plasmids susceptible to the drug, indicating the preference of the drug for poly(dA).poly(dT) sequences.

Outputs/Benefits of HBCU Research Grant

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Proposal #176

GENERAL INFORMATION

TITLE: T. CRUZI MEMBRANE COMPONENTS/PARASITE-HOST CELL  
PI: Fernando Villalta, Ph.D.  
SCHOOL: Meharry Medical College  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
USA

PERSONNEL SUPPORTED:  
Faculty: 15.0 person-months  
Research Assistants: 15.0 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:  
Geiger counter  
refrigerator  
electrophoresis Protean Cell II  
electrophoresis Mini Protean 2D-Cell  
Mini trans blot  
computerized power supply for electrophoresis  
gradient former  
Beckman microcentrifuge

OUTPUTS OF RESEARCH:

Refereed Papers:

Lima, M. and F. Villalta. "T. cruzi trypomastigotes cloned differentially express a parasite cell adhesion molecule." Molecular and Biochemical Parasitology 33:159-170, 1989.

Lima, M. and F. Villalta. "Host cell attachment by T. cruzi: Identification of an adhesion molecule." Biochemical and Biophysical Res. Communic. 155:256-262, 1988.

Outputs/Benefits of HBCU Research Grant

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Proposal #176

Abstracts:

Lima, M. and F. Villalta. "Identification of T. cruzi trypanomastigote binding molecule to host cells." FASEB Journal 2:A1256, 1988.

Noisin, E. and F. Villalta. "T. cruzi amastigote-macrophage recognition process: Role of fibronectin." Proc. of American Society of Tropical Medicine and Hygiene, 1987.

INDIRECT BENEFITS

GRANTS/CONTRACTS RESULTING FROM HBCU RESEARCH GRANT:

NIH - Training Grant in Molecular and Biochemical Parasitology

LINKAGES ESTABLISHED:

With LDC Institutions:

Institute of Microbiology, Federal University of Rio de Janeiro, Brazil

With Other Universities:

Tennessee State University

With International or Scientific Organizations:

International WHO Center for Health Sciences at Meharry Medical College

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

Identify what membrane components present on the cell surface of T. cruzi mediate the interaction between T. cruzi trypanomastigotes and its host cells.

Outputs/Benefits of HBCU Research Grant

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Proposal #176

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

Identified an 83kDA glycoprotein, found to be universally present on T. cruzi trypomastigotes, as the adhesion molecule which attaches the parasite to rat heart muscle cells. The assumption is that it is the same with respect to a human host. This reasoning is supported by the fact that only infected humans have an antibody which recognizes this molecule.

Outputs/Benefits of HBCU Research Grant

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Proposal #180

GENERAL INFORMATION

TITLE: TRYPANOSOME RNA TRANSCRIPTION  
PI: Frank Hatcher, Ph.D.  
SCHOOL: Meharry Medical College  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
USA

PERSONNEL SUPPORTED:  
Faculty: 18.0 person-months  
Research Assistants: 12.0 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:  
liquid scintillation counter  
computer

OUTPUTS OF RESEARCH:

Refereed Papers:

Hodo, H.G. and F.M. Hatcher. "Multiple DNA dependency  
of RNA Polymerases." Molecular Biochem.  
Parasitology, vol. 19, pp. 77-82, 1986.

INDIRECT BENEFITS

GRANTS/CONTRACTS RESULTING FROM HBCU RESEARCH GRANT:

NSF - Hybridoma Research Grant

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

Further isolate and characterize the RNA polymerases  
of Trypanosome cruzi. Initiate a similar study using  
T. brucei.

Outputs/Benefits of HBCU Research Grant

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Proposal #180

BRIEF STATEMENT OF RESEARCH FINDINGS:

A third chromatographic species of RNA polymerase with a preference for poly dA:dT templates as well as ss DNA. Preliminary evidence indicates the presence of a single chromatographic species of RNA polymerase from T. brucei procyclic forms.

Outputs/Benefits of HBCU Research Grant

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Proposal #241

GENERAL INFORMATION

TITLE: CHARACTERIZATION OF TRYPANOSOMA CRUZI KINETOPLAST  
PI: Manuel S. Valenzuela, Ph.D.  
SCHOOL: Meharry Medical College  
STATUS: This project has been completed.  
A final report has not been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
USA

PERSONNEL SUPPORTED:  
Faculty: 12.0 person-months  
Research Assistants: 12.0 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:  
refrigerated incubator  
refractometer  
vacuum pump

OUTPUTS OF RESEARCH:

Refereed Papers:

Valenzuela, M. "Catenated dimers: Putative intermediates in the replication of T. cruzi minicircle DNA." (being submitted as of 8/89).

Bardhan, S. and M. Valenzuela. "Free kinetoplast minicircles from T. cruzi contain knotted DNA." (being submitted as of 8/89).

Outputs/Benefits of HBCU Research Grant

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Proposal #241

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With LDC Institutions:

Universidad Peruana Cayetan Heredia -- Dr. Abraham Vaisberg, Dean, School of Sciences and Humanities at Universidad Peruana Cayetano Heredia, Lima, Peru, spent four weeks in the PI's laboratory learning some basic techniques in recombinant DNA.

With Other Universities:

Tennessee State University

Fisk University

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

Develop a methodology to isolate intact kinetoplast networks from T.cruzi and characterize both protein and DNA components.

BRIEF STATEMENT OF RESEARCH FINDINGS:

A procedure previously used to obtain HeLa nucleoids was adapted to isolate kinetoplast DNA networks from T. cruzi cells. Protein analysis by PAGE-SDS electrophoresis showed a unique pattern of protein bands. Analysis of the free minicircle DNA uncovered two novel putative replicative intermediates.

Outputs/Benefits of HBCU Research Grant

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Proposal #242

GENERAL INFORMATION

TITLE: ROLE OF A HOST IRON-BINDING PROTEIN TRYPANOSOMA  
PI: Fernando Villalta, Ph.D.  
SCHOOL: Meharry Medical College  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
USA

PERSONNEL SUPPORTED:

Faculty: 17.0 person-months  
Research Assistants: 17.0 person-months

GRADUATE STUDENTS TRAINED: 1

EQUIPMENT PURCHASED:

cell harvester  
preparative isoelectrofocusing chamber  
Vacugene blotting system  
Transphor membrane slicer  
IBM personal computer and printer

OUTPUTS OF RESEARCH:

Refereed Papers:

Lima, M. and F. Villalta. "Trypanosome cruzi  
receptors for human transferrin and their role."  
Molecular and Biochemical Parasitology, vol 38, pp.  
245-252, 1989.

Noisin, E. and F. Villalta. "Fibronectin increases T. cruzi  
binding to and uptake by murine-macrophages and  
human monocytes." Infection and Immunity  
57:1030-1034, 1989.

Abstracts:

Lima, M. and F. Villalta. "Developmentally regulated  
T. cruzi trypomastigote 83kDa glycoprotein binds to  
mammalian host cells in a liquid receptor interaction  
manner." 37th Annual Meeting Am. Soc. of Trop. Med.  
and Hyg., 1988.

Outputs/Benefits of HBCU Research Grant

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Proposal #242

Abstracts (continued)

Lima, M. and F. Villalta. "Membrane receptors for human transferrin in intracellular forms of T. cruzi." J. of Cell Biology 107:788a, 1989.

Villalta, F. and M. Lima. "Specific surface membrane interaction between T. cruzi and heart cells." J. of Cell Biology Joint Meeting ASCB-ASBM, 1989.

Theses:

Noisin, E. "Role of fibronectin in the interacting of T. cruzi amastigotes with murine macrophages and human blood monocytes." Meharry Medical College, 1989.

INDIRECT BENEFITS

GRANTS/CONTRACTS RESULTING FROM HBCU RESEARCH GRANT:

\$350,000 NIH - Host cell invasion by T. cruzi (5 years: 1988-1993)

LINKAGES ESTABLISHED:

With LDC Institutions:

Federal University of Brazil, Institute of Microbiology

With Other Universities:

Tennessee State University

With International or Scientific Organizations:

International Center for Health at Meharry Medical College

Outputs/Benefits of HBCU Research Grant

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Proposal #242

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

Define the role of a host iron-binding protein on Trypanosoma cruzi multiplication and development by: (a) determining the specificity and number of receptors for human transferrin, and iron-binding protein, on amastigote and trypomastigote forms of T. cruzi; (b) studying the involvement of human transferrin on the transport of iron to T. cruzi; (c) studying the effect of iron on T. cruzi amastigote multiplication; and (d) identifying the parasite receptor for transferrin and comparing its properties with the host cell receptor for transferrin.

BRIEF STATEMENT OF RESEARCH FINDINGS:

Showed that T. cruzi amastigotes present receptors for human fibronectin. In the presence of physiologic concentrations of this protein, these receptors increase the binding to and uptake of amastigotes by both murine macrophages and human monocytes. Demonstrated macrophage-monocyte interactions with T. cruzi amastigotes play an important role in the immunomodulation of the host response to T. cruzi. Furthermore, unlike mammalian cells which present only one type of transferrin, T. cruzi amastigotes present two. These differences suggest that this human parasite may present a peculiar mechanism by which iron is taken by the host. This phenomenon if proven by further research, could offer a novel approach to blocking T. cruzi infection.

Outputs/Benefits of HBCU Research Grant

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Proposal #252

GENERAL INFORMATION

**TITLE:** CHARACTERIZATION OF TRYPANOSOME NON-HISTONE  
**PI:** Jaswant S. Bhorjee, Ph.D.  
**SCHOOL:** Meharry Medical College  
**STATUS:** This project has not been completed.  
A final report has not been submitted to RUR.

DIRECT BENEFITS

**COUNTRIES WHERE RESEARCH WAS CARRIED OUT:**  
USA

**PERSONNEL SUPPORTED:**  
Faculty: 12.0 person-months  
Research Assistants: 12.0 person-months

**GRADUATE STUDENTS TRAINED:** 0

**EQUIPMENT PURCHASED:**  
NuAire laminar flow biological cabinet  
Beckman SW50.1 rotor and buckets  
Olympus microscope camera  
H-P, UV/Vis diode array spectrophotometer  
Rotator shaker

**OUTPUTS OF RESEARCH:**

Refereed Papers:

Bhorjee, J.S. "Trypanosome Brucei: Isolation of Nuclei  
Charaterization of Chromatin Submit Structure and  
Evidence for the Presence of Histone Ho-like Protein."  
Experimental Parasitology, (paper submitted Oct. 30,  
1989. Awaiting approval).

Outputs/Benefits of HBCU Research Grant

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Proposal #252

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

(1) Develop reliable and reproducible methodology for isolation of nuclei and chromatin from trypanosomes. (2) Analyze the physical and chemical properties of chromatin from different life cycle stages of T. brucei. (3) Examine the presence of acid soluble proteins including the High Mobility Group (HMG) nuclear proteins in trypanosomes and investigate their role in chromatin structure.

BRIEF STATEMENT OF RESEARCH FINDINGS:

We have developed a reliable procedure for isolating clean nuclei from two strains of T. brucei. And, although the nuclear membranes are partly damaged, the nuclear integrity is retained. T. brucei chromatin exhibits a nucleosomic structure; however, the trypanosome chromatin is more nuclease sensitive than mammalian chromatin. A low mol. wt. histone H1-like protein is present. HMG-like proteins seem to be absent.

ADDITIONAL COMMENTS

The funding of the proposal from A.I.D. has allowed me to initiate the studies on the molecular biology and biochemistry of the trypanosome nuclear genome, i.e., chromatin, at Meharry Medical College. In the future this area of investigation should allow my laboratory to develop collaborative research projects with laboratories in the developing countries interested in studying chromatin organization in trypanosomatids. Understanding the differences between the host and the parasite chromatin structures should allow for specific design and targeting of DNA-binding trypanocidal drugs.

Outputs/Benefits of HBCU Research Grant

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Proposal #285

GENERAL INFORMATION

TITLE: TRYPANOSOMA CRUZI BINDING TO MAMMALIAN CELLS  
PI: Fernando Villalta, Ph.D.  
SCHOOL: Meharry Medical College  
STATUS: This project has not been completed.  
A final report has not been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
USA

PERSONNEL SUPPORTED:  
Faculty: 12.0 person-months  
Research Assistants: 13.8 person-months

GRADUATE STUDENTS TRAINED: 1

EQUIPMENT PURCHASED:  
None

OUTPUTS OF RESEARCH:

Abstracts:

Villalta, F. and M.F. Lima. "Trypanosoma cruzi Membrane Proteins Involved in Its Adhesion to Mammalian Cells." Journal of Cellular Biochemistry, 1989.

Villalta, F. and M.F. Lima. "Developmentally Regulated Trypanosoma Cruzi Trypomastigote 83kd Glycoprotein Binds to Mammalian Cells in a Ligand Receptor Interaction Manner." XVth Annual Meeting in Basic Research in Chaga's Disease, 1988.

Lima, M.F. and F. Villalta. "Interaction of Host Growth Factors with Trypanasoma cruzi Amastigotes." AAAS Annual Meeting, New Orleans, La., 1990.

Outputs/Benefits of HBCU Research Grant

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Proposal #285

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

Isolate the 83 Kda glycoprotein molecule found on cell surface of T. cruzi amastigotes and study its ability to inhibit attachment of invasive trypomastigotes to rat heart muscle myeloblasts.

BRIEF STATEMENT OF RESEARCH FINDINGS:

Objectives achieved and the glycoprotein (GP) has been purified. In the process it was discovered that this glycoprotein is composed of three separate GPs with different isoelectric points.

**C. Diarrhea**

Outputs/Benefits of HBCU Research Grant

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Proposal #003

GENERAL INFORMATION

TITLE: TABLET ALTERNATIVE FOR HOME ORT IN THE TROPICS  
PI: Rosalyn C. King, Pharm.D.  
SCHOOL: Drew (Charles R) Postgraduate Medical School  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
USA

PERSONNEL SUPPORTED:  
Faculty: 1.2 person-months  
Research Assistants: 4.8 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:  
balances  
bath  
desiccator  
humidity/temperature chamber  
polarimeter  
Roche friabilator  
tablet harness testers  
vacuum pumps  
bulk density apparatus  
drive unit  
mixer/blender  
ovens  
shaker unit sieves

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With Other Universities:

Xavier University, School of Pharmacy -- jointly  
planning a pharmaceuticals management training program  
for developing countries.

Outputs/Benefits of HBCU Research Grant

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Proposal #003

OBJECTIVES AND FINDINGS

**BRIEF STATEMENT OF RESEARCH OBJECTIVES:**

Prepare and evaluate standard and alternative ORS formulations as a preliminary step to developing a suitable ORS tablet alternative for enhanced shelf life, increased accuracy and economy for routine home use in oral rehydration therapy in developing countries.

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

Results indicate no single group emerges as an outstanding candidate for a tablet formulation; however, none could be ruled unsuitable. Formulation of a tablet alternative for home oral rehydration therapy is promising because all existing problems are solvable. More experiments need to be performed for conclusive results and before a suitable tablet can be developed.

Outputs/Benefits of HBCU Research Grant

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Proposal #015

GENERAL INFORMATION

TITLE: MAMMALIAN TARGET CELL/ENTAMOEBIA HISTOLYTICA  
PI: Gordon B. Bailey, Ph.D.  
SCHOOL: Morehouse College of Medicine  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
USA

PERSONNEL SUPPORTED:  
Faculty: 1.2 person-months  
Research Assistants: 12.0 person-months

GRADUATE STUDENTS TRAINED: 1

EQUIPMENT PURCHASED:  
electrophoresis unit  
transblotting unit - refrigerated centrifuge  
vacuum evaporator

OUTPUTS OF RESEARCH:

Refereed Papers:

Bailey, G. B., E. Nudelman, D. Day, C. Harper and J. Gilmour. "The specificity of glycosphingolipic recognition by Entamoebas histolytica." Infection and Immunity, vol. 58, pp. 43-47, 1989.

Bailey, G. B., E. Nudelman, D. Day and J. Gilmour. "Use of non-cellular models to study the interaction of E. histolytica with mammalian cells." Archives of Investigative Medicine (Mexico), in press submitted for pres. XIth International Seminar on Amoebiasis, 1989.

Bailey, G. B., J. Gilmour, N.E. McCoomer. "Roles of Target Cell Membrane Carbohydrate and Lipids in E. Histolytica Interaction with Mammalian Cells." Infection and Immunity, in press.

Outputs/Benefits of HBCU Research Grant

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Proposal #015

Abstracts:

Bailey, G., C. Nokkaew and D. Day. "Molecules involved in stimulation of attack by Entamoeba histolytica." American Society for Microbiology, Annual Meeting, 1987.

Day, D., C. Nokkaew and G. Bailey. "Specific target membrane lipids stimulate attack by Entamoeba histolytica." Fourth Annual Naibrit Symposium, 1987.

Bailey, G., C. Nokkaew and D. Day. "Lipids in the contact-mediated attack response of Entamoeba histolytica." Journal of Cell Biology 103:394a, 1986.

Bailey, G., D. Day and C. Nokkaew. "Introduction of E. histolytica cytoskeleton activation and selective endocytosis by target cell membrane liposomes." Archives of Investigative Medicine, 1986.

Bailey, G., D. Day and C. Nokkaew. "Cell membrane liposomes stimulate actin polymerization and phagocytic attack by Entamoeba histolytica." Fed. Proc. 45:1912, 1986.

INDIRECT BENEFITS

GRANTS/CONTRACTS RESULTING FROM HBCU RESEARCH GRANT:

\$215,304 NIH - Entamoeba histolytica -- Target Cell Interaction

\$183,602 Government - USAMRDC - Use of liposomes for directed drug delivery against Entamoeba histolytica

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

Identify the chemical nature of molecules in the membrane of human red blood cells that stimulated attachment and attack responses by the tissue destructive human pathogen E. histolytica.

Outputs/Benefits of HBCU Research Grant

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Proposal #015

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

Found that glycosphingolipids and negatively charged phospholipids of the cell membrane were the molecules that stimulated attachment and attack responses by E. histolytica. In subsequent studies, it has been determined that specifically, only glycosphingolipids with terminal galactose or N-acetyl galactosamine carbohydrates are effective.

Outputs/Benefits of HBCU Research Grant

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Proposal #016

GENERAL INFORMATION

TITLE: INTESTINAL MUCUS BLANKET/DIARRHEA/AMEBIASIS  
PI: Gordon J. Leitch, Ph.D.  
SCHOOL: Morehouse College of Medicine  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
USA

PERSONNEL SUPPORTED:  
Faculty: 1.8 person-months  
Research Assistants: 12.0 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:  
slit lamp and pachymeter  
pH meter  
micromanipulator  
tissue homogenizer

OUTPUTS OF RESEARCH:

Refereed Papers:

Leitch, G.J. "Intestinal lumen and mucosal microclimate H<sup>+</sup> and NH<sub>3</sub> concentrations as factors in the etiology of experimental amebiasis." American Journal of Tropical Medicine and Hygiene, vol. 38, pp. 480-86, 1988.

Leitch, G.J., S.A. Harris-Hooker, and I.A. Udezulu. "Movement of Entamoeba histolytica trophozoites in rat cecum and colon intact mucus blankets and harvested mucus gel." American Journal of Tropical Medicine and Hygiene, vol. 39, pp. 282-87, 1988.

Leitch, G.J. "Cholera enterotoxin-induced mucus secretion and increase in the mucus blanket of the rabbit ileum in vivo." Infection and Immunity, vol. 56, pp. 2871-2875, 1988.

Outputs/Benefits of HBCU Research Grant

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Proposal #016

Refereed Papers (continued)

Leitch, G.J. "Possible roles of large bowel lumen and mucous blanket solutes on Entamoeba histolytica trophozoite invasion." Archives of Investigative Medicine, (Mexico), vol. 17, pp. 379-390, 1986.

Leitch, G. J., G. S. Visvesvara, S. P. Waldquist, C. T. Harmon. "Dietary Fiber and Giardiasis: Dietary Fiber Reduces Rate of Intestinal Infection by G. Lamblia in the Gerbil." American Journal of Tropical Medicine and Hygiene, vol. 41, pp. 512-520, 1989.

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With International or Scientific Organizations:

Centers for Disease Control

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

Clarify the role of the mucous blanket in providing protection to the intestinal mucosa. Two infectious disease models were studied, experimental cholera in the rabbit and experimental amebiasis in the rat, hamster and gerbil. The rabbit model was used to determine whether the mucus blanket was affected by secretory diarrhea and by oral replacement therapy (ORT) during secretory diarrhea. The experimental amebiasis significantly restricted the mobility of Entamoeba histolytica trophozoites and established mucosal microenvironments that influenced amoeba viability.

Outputs/Benefits of HBCU Research Grant

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Proposal #016

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

The mucous blanket and associated epithelial layers form a mucosal microclimate which may have a Ph and ammonia concentration significantly different from the luminal fluid of the intestine. Thus, the pathogenicity of E. histolytica trophozoites is directly related to the concentrating of ammonia and Ph of both the luminal fluid and the mucous blanket.

**ADDITIONAL COMMENTS**

This grant increased the capabilities and recognition of Morehouse School of Medicine as an institution where work was being conducted in the area of diarrheal diseases that are of importance to third world countries. Two laboratories at Morehouse are continuing to work in this area.

Outputs/Benefits of HBCU Research Grant

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Proposal #168

GENERAL INFORMATION

TITLE: ROLE HOST NUTR/PATHOGENESIS-INTESTINAL AMEBIASIS  
PI: Gordon J. Leitch, Ph.D.  
SCHOOL: Morehouse College of Medicine  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
USA

PERSONNEL SUPPORTED:

Faculty: 1.8 person-months  
Research Assistants: 12.0 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:

IBM personal computer  
computer printer  
phase contrast microscope  
automatic camera

OUTPUTS OF RESEARCH:

Refereed Papers:

Leitch, G.J., G.S. Visvesvara, S.P. Wahlquist and C.T. Harmon. "Dietary Fiber and Giardiasis: Dietary fiber reduces rate of intestinal infection by Giardia lamblia in gerbil." American Journal of Tropical Medicine and Hygiene, vol. 41, pp. 512-520, 1989.

Abstracts:

Leitch, G.J. and D.B. Day. "Effect of osmotic stress on Entamoeba invadens and Entamoeba histolytica." American Society for Microbiology Meeting, 1988.

Leitch, G.J., G.S. Visvesvara, S.P. Wahlquist and C.T. Harmon. "Dietary fiber reduces intestinal infection by Giardia lamblia." American Society of Tropical Medicine and Hygiene Meeting, 1988.

Outputs/Benefits of HBCU Research Grant

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Proposal #168

Abstracts (continued)

Leitch, G.J. "Osmoregulation in Entamoeba histolytica." International Seminar on Amebiasis, 1989.

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With International or Scientific Organizations:

Centers for Disease Control

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

Study relationship between host diet and the course of experimental amebiasis to determine how diet affects large bowel solutes which in turn affect Entamoeba histolytica trophozoite viability and virulence.

BRIEF STATEMENT OF RESEARCH FINDINGS:

PI studied giardiasis instead of amoebiasis because the strain of amoebae used proved non-infective for the animal model, Mongolian Gerbils. But Giardia were infective, and results showed that attachment to intestinal lumen by Giardia was much inhibited by a high fiber diet.

Outputs/Benefits of HBCU Research Grant

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Proposal #170

GENERAL INFORMATION

TITLE: PREPARATION OF MONOCLONAL ANTIBODIES TO DETECT  
PI: Gordon B. Bailey, Ph.D.  
SCHOOL: Morehouse College of Medicine  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
USA

PERSONNEL SUPPORTED:  
Faculty: 0.6 person-months  
Research Assistants: 12.0 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:  
microcomputer  
refrigerated water bath

OUTPUTS OF RESEARCH:

Refereed Papers:

(in preparation as of 10/89).

Abstracts:

Nokkaew, C., C. H. Aloisio and G. B. Bailey. "An  
Entamoeba histolytica Monoclonal Antibody that Blocks  
Target Stimulated Amoeba Actin Polymerization." Amer.  
Soc. Parasit. Abstr. #84, 1988.

Theses:

Nokkaew, C. "Use of monoclonal antibodies to identify  
surface antigens involved in Entamoeba histolytica  
attack on mammalian cells." Atlanta University, 1989.

Outputs/Benefits of HBCU Research Grant

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Proposal #170

INDIRECT BENEFITS

GRANTS/CONTRACTS RESULTING FROM HBCU RESEARCH GRANT:

\$245,232 NIH - Subproject: Interaction of Entamoeba histolytica with Mammalian Cells

~~\$215,304 NIH - Entamoeba histolytica - Target Cell Interaction~~

LINKAGES ESTABLISHED:

With LDC Institutions:

Ramkhamheng University, Bangkok, Thailand -- visiting graduate student

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

The goal of this project was to prepare monoclonal antibodies against E. histolytica surface membrane antigens that inhibited attachment and parasite attack upon mammalian target cells. This strategy was designed to identify antigens that were involved in the parasite attack mechanism that might be useful for the development of a vaccine against amebiasis.

BRIEF STATEMENT OF RESEARCH FINDINGS:

Five monoclonal antibodies with the desired properties were isolated. These antibodies all recognized previously unreported E. histolytica membrane glycoproteins with Mr = 48,000 and 40,000. The antigen is under further study to determine its role in the molecular pathology of amebiasis.

**D. Pharmaceuticals**

Outputs/Benefits of HBCU Research Grant

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Proposal #004

GENERAL INFORMATION

TITLE: PUB HEALTH IMPLICATIONS/SERUM RIFAMPIN-INDONESIA  
PI: Rosalyn C. King, Pharm.D.  
SCHOOL: Drew (Charles R) Postgraduate Medical School  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
Indonesia

PERSONNEL SUPPORTED:  
Faculty: 1.8 person-months  
Research Assistants: 0.5 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:  
microcomputer  
2nd. microcomputer  
refrigerator/freezer  
high pressure liquid chromatograph

OUTPUTS OF RESEARCH:

Abstracts:

"The Pharmacokinetics of Rifampin in a Selected Population in Indonesia: Implications for the Cost-Effectiveness of Therapy." World Conference on Lung Health, 1990.

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With LDC Institutions:

Gadjah Marda University, Yogyakarta, Indonesia -- possible future projects and clerkships for Drew medical students.

Outputs/Benefits of HBCU Research Grant

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Proposal #004

OBJECTIVES AND FINDINGS

**BRIEF STATEMENT OF RESEARCH OBJECTIVES:**

Estimate the pharmacokinetic parameters of Rifampin in healthy and tuberculous Indonesian subjects following the administration of 300- and 600-mg. and to derive public health implications from the results.

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

The results indicated that a 300-mg. dose of Rifampin may be sufficient to reach the therapeutic serum concentrations necessary for the effective treatment of tuberculosis in Indonesians.

Outputs/Benefits of HBCU Research Grant

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Proposal #005

GENERAL INFORMATION

TITLE: TRADITIONAL VS WESTERN MEDICINE SAME ILLNESS ZAIRE  
PI: Rosalyn C. King, Pharm.D.  
SCHOOL: Drew (Charles R) Postgraduate Medical School  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
Zaire

PERSONNEL SUPPORTED:  
Faculty: 2.4 person-months  
Research Assistants: 24.0 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:  
spectrophotometer  
chromatograph

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With LDC Institutions:

University of Kinshasa, Zaire

With Other Universities:

Florida A & M University, College of Pharmacy and  
Pharmaceutical Sciences

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

Study the conjunctive use of traditional and modern  
medicines for the same illnesses (diarrhea, malaria,  
fever) in selected populations in Zaire.

Outputs/Benefits of HBCU Research Grant

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Proposal #005

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

Results indicate that 58% of the 2063 respondents were using both systems for the treatment of diarrhea and 56.2% used both systems for the treatment of malaria or fever.

Outputs/Benefits of HBCU Research Grant

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Proposal #007

GENERAL INFORMATION

TITLE: PHYTOCHEMICAL SCREENING/SOLANUM SPECIES/JAMAICA  
PI: Surendar S. Lamba, Ph.D.  
SCHOOL: Florida A & M Univ  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:

Jamaica  
USA

PERSONNEL SUPPORTED:

Faculty: 4.8 person-months  
Research Assistants: 12.0 person-months

GRADUATE STUDENTS TRAINED: 1

EQUIPMENT PURCHASED:

spectrophotometer  
microcomputer

OUTPUTS OF RESEARCH:

Refereed Papers:

Lamba, S.S. and K.Y. Buch. "Estimation of glycoalkaloids as solasodine in Solanum torvum indigenous to Jamaica." Iyton 49(1/2):35-39, 1988.

Abstracts:

Lamba, S.S., K.Y. Buch and Charles Osuji. "Estimation of glycoalkaloids as solasodine in S. varbascifolium indigenous to Jamaica." Journal of Pharmaceutical Sciences, Vol. 76, No. 11, 211, 1987.

Lamba, S.S., H.N. Luman and B. Erukora. "Estimation of glycoalkaloids as solasodine in S. torvum indigenous to Jamaica." 14th Annual Minority Biomedical Research Support Symposium, 60, 1986.

Outputs/Benefits of HBCU Research Grant

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Proposal #007

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With LDC Institutions:

University of the West Indies, Mona, Jamaica

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

Identify species of *Solanum* with high glycoalkaloid (solasodine) contents. Solasodine being a nitrogen analog of diosgenin appears to be a promising substitute for the production of useful steroidal drugs.

BRIEF STATEMENT OF RESEARCH FINDINGS:

*Solanum torvum* and *Solanum crianthum* were identified to contain over 2% solasodine. The solasodine content in fruits, leaves and flowering tops was found to be 2.45, 2.18 and 1.35 percent in *S. torvum* and 2.2, 1.75 and 1.2 percent in *S. erianthum*, respectively.

Outputs/Benefits of HBCU Research Grant

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Proposal #025

GENERAL INFORMATION

TITLE: ETHNOPHARMACOLOGIC RESEARCH-NEW PROTOTYPE DRUGS  
PI: Richard F. Ochillo, Ph.D.  
SCHOOL: Xavier Univ  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:

USA  
Kenya

PERSONNEL SUPPORTED:

Faculty: 2.0 person-months  
Research Assistants: 6.0 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:

None

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With LDC Institutions:

Beginning linkage: Makerere University Medical  
College, Uganda

Outputs/Benefits of HBCU Research Grant

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Proposal #025

OBJECTIVES AND FINDINGS

**BRIEF STATEMENT OF RESEARCH OBJECTIVES:**

(1) To carry out a series of ethnopharmacologic investigations of some traditional medications, either through isolation of active substances or through "pharmacological" findings. (2) Obtaining information leading to substantial improvements in traditional therapy, as well as development of such agents "for the benefit of the whole of humanity." (3) For isolation and characterization of active components of a specific African traditional medicine, the African arrow poison of plant origin (curare).

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

Various analyses of the arrow poison curare were carried out on mice, including fractionation of the curare by means of high pressure liquid chromatography (HPLC). The PI claimed that findings made it possible now to standardize crude toxin and investigate further the isolated components. No scientific publications were prepared or accepted for publication in a refereed journal.

Outputs/Benefits of HBCU Research Grant

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Proposal #166

GENERAL INFORMATION

TITLE: INFLUENCE OF STORAGE UNDER TROP COND-DRUG TABLETS  
PI: Ahmed F. Asker, Ph.D.  
SCHOOL: Florida A & M Univ  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
USA

PERSONNEL SUPPORTED:  
Faculty: 2.0 person-months  
Research Assistants: 9.0 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:  
Bench top temperature/humidity chamber  
spectrophotometer -- Hitachi model

OUTPUTS OF RESEARCH:

Abstracts:

Asker, A. and C. Harris. "Influence of Storage Under Tropical Conditions on the Stability and Dissolution of Neomycin Sulfate Tablets."

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

Study the effects of tropical climate storage on the stability and drug-release characteristics of neomycin sulfate.

Outputs/Benefits of HBCU Research Grant

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Proposal #166

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

Changes in drug content, appearance and disintegration time and release patterns were observed at 40 degrees C. and 90% RH and at 40 degrees C. and 35% RH. Higher humidity proved an important factor in promoting physical and chemical instability of the drug.

ADDITIONAL COMMENTS

The original proposal, on which it is presumed the grant was based, indicated that some of the work was to be carried out in Egypt. However, it appears that this never happened. In addition, major components of the proposal submitted to RUR (3/25/84) were never carried out. In particular, the original proposal called for testing a number of drugs, none of which were studied. Neomycin must have been something of an afterthought.

**E. Other Health**

Outputs/Benefits of HBCU Research Grant

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Proposal #011

GENERAL INFORMATION

TITLE: NATIONAL SURVEY/PREVALENCE/GLAUCOMA/WEST INDIES  
PI: Roger P. Mason, Ph.D.  
SCHOOL: Howard Univ  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
St. Lucia

PERSONNEL SUPPORTED:  
Faculty: 12.0 person-months  
Research Assistants: 48.0 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:  
ophthalmoscope  
2nd ophthalmoscope  
set of 4 visual acuity charts  
sphygmomanometer  
stethoscope  
Schiotz tonometer  
2nd Schoitz tonometer

OUTPUTS OF RESEARCH:

Refereed Papers:

Mason, R.P., O. Kosoko, M. Wilson, J. Martone, et al.  
"National Survey of the Prevalence and Risk Factors of  
Glaucoma in St. Lucia, West Indies, Part 1:  
Prevalence Findings." Ophthalmology, vol. 96, #9, pp  
1363-68, 1989.

Mason, R. P., O. Kosoko, J.C. Gear and D. Ross-Degnan.  
"St. Lucia Glaucoma Survey: Risk Factor Analysis."  
Investigative Ophthalmology and Visual Science,  
supplement to vol. 30, 1989.

Cowen, C.L., D.M. Worthen, R.P. Mason and A.L. Anduze.  
"Glaucoma in Blacks." Archives of Ophthalmology,  
1988.

Outputs/Benefits of HBCU Research Grant

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Proposal #011

Refereed Papers (continued)

Mason, R. P., O. Kosoko, J. Martone, C. Cowan, et al.  
"Glaucoma Prevalence Survey: Risk Factor Analysis."  
Supplement to Investigative Ophthalmology and  
Visual Sciences, vol. 29, 1988.

Abstracts:

Mason, R. P., O. Kosoko, J. Gear and D. Ross-Degnan.  
"St. Lucia Glaucoma Survey: Risk Factor Analysis.  
Orlando, Fla." 94th Annual Assembly of the National  
Medical Association, 1989.

"Racial Influences in the Primary Glaucomas." 24th  
Annual Meeting of Am. Soc. for Contemporary  
Ophthalmology, The Internal Glaucoma Congress,  
Hollywood, Fla., Mar., 1989.

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With International or Scientific Organizations:

The International Eye Foundation

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

Determine prevalence of glaucoma in a black population  
in individuals 30 and over. Train nurses to become  
glaucoma diagnosticians. Investigate role of risk  
factors in development of glaucoma.

BRIEF STATEMENT OF RESEARCH FINDINGS:

Prevalence of glaucoma in 30 year and older population  
is 8.8%. Prevalence is markedly higher than found in  
other prevalence studies.

Outputs/Benefits of HBCU Research Grant

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Proposal #101

GENERAL INFORMATION

TITLE: COMPANIGANJ HEALTH DELIVERY-BANGLADESH  
PI: Ruhul Amin, Ph.D.  
SCHOOL: Morgan State Univ  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
Bangladesh

PERSONNEL SUPPORTED:  
Faculty: 6.0 person-months  
Research Assistants: 16.0 person-months

GRADUATE STUDENTS TRAINED: 5

EQUIPMENT PURCHASED:  
None

OUTPUTS OF RESEARCH:

Refereed Papers:

Amin, R., S.A. Chowdury, G.M. Kamal, and J. Chowdury.  
"Community Health Services and Health Care Utilization  
in Rural Bangladesh." Social Science and Medicine,  
in press.

Unrefereed Papers:

Amin, R. and A.G. Mariam. "Infant Mortality in Rural  
Bangladesh." Demography India, (1959-1976), vol.  
15,1, pp. 34-45, 1986.

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With LDC Institutions:

Associate for Community and Population Research  
(ACPR), Bangladesh

Outputs/Benefits of HBCU Research Grant

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Proposal #101

LDC Institutions (continued)

Department of Primary Health Care, Government of  
Bangladesh

Department of Family Planning, Government of  
Bangladesh

With Other Universities:

Dept. of Population Dynamics, Johns Hopkins University

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

To explore the level of utilization and distribution of traditional and modern health services and the relative impact of a decentralized community-based intervention program in rural Bangladesh.

BRIEF STATEMENT OF RESEARCH FINDINGS:

High quality rural outreach health services lead to increased utilization of modern health services. Physical access of rural health services and home visits by health workers are important elements of increased utilization of modern health services.

ADDITIONAL COMMENTS

The government of Yemen adopted the household survey questionnaire developed for this study to conduct their national health and family planning survey financed by the World Bank. They are contemplating awarding a grant to Morgan State University to analyze the results of the proposed household survey.

Outputs/Benefits of HBCU Research Grant

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Proposal #157

GENERAL INFORMATION

**TITLE:** STUDY OF DIFFUSION/INNOVATION-HEALTH CARE-BOTSWANA  
**PI:** Regina L. Monnig, Ph.D.  
**SCHOOL:** Tennessee State Univ  
**STATUS:** This project has not been completed.  
A final report has not been submitted to RUR.

DIRECT BENEFITS

**COUNTRIES WHERE RESEARCH WAS CARRIED OUT:**  
Botswana

**PERSONNEL SUPPORTED:**  
Faculty: 12.0 person-months  
Research Assistants: 0.0 person-months

**GRADUATE STUDENTS TRAINED:** 5

**EQUIPMENT PURCHASED:**  
None

**OUTPUTS OF RESEARCH:**

Refereed Papers:

Linn, J.G., R.L. Monnig, T.T. Fako and P. Gilpin.  
"Promoting Safe Motherhood in Southern Africa:  
Postnatal Care in Botswana." J. of Health and  
Social Policy, submitted and under revision.

Monnig, R.L., J.G. Linn, T.T. Fako and P. Gilpin.  
"Diffusion of Innovation in a Health Care System in  
Botswana." J. of Holistic Nursing, submitted and  
under revision.

Abstracts:

Linn, J.G., R.L. Monnig, T.T. Fako and P. Gilpin.  
"Promoting Safe Motherhood in Southern Africa:  
Prenatal Nursing Practices in Botswana." American  
Public Health Association Meeting, 1989.

"Postnatal Care and Women's Health in Botswana."  
American Public Health Association Meeting, 1989.

Outputs/Benefits of HBCU Research Grant

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Proposal #157

INDIRECT BENEFITS

**LINKAGES ESTABLISHED:**

**With LDC Institutions:**

University of Botswana, Department of Education and  
Department of Sociology

Ministry of Health, Government of Botswana

**With Other Universities:**

Meharry Medical College, International Health  
Sciences, WHO center

**With International or Scientific Organizations:**

USAID/Botswana

OBJECTIVES AND FINDINGS

**BRIEF STATEMENT OF RESEARCH OBJECTIVES:**

Determine state of the art in Botswana with respect to nursing practice in the areas of public health, maternal and child health and family planning. Determine if previous AID-funded Meharry nurse training program has had an impact on nursing practice in Botswana. Also, identify factors and conditions which facilitated or impeded the implementation of the MCH/FP nursing practices.

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

Preliminary results indicate widescale implementation of the Meharry-taught post-natal practices and more recent Botswana innovations (such as providing information on breast and perinatal problems and on involution of the uterus) which are supportive of improved women's health.

Outputs/Benefits of HBCU Research Grant

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Proposal #157

ADDITIONAL COMMENTS

Proposal, and Maternal and Child Health Care survey instrument, provided to Evaluation Department, AID/PPC/CDIE, Washington, D.C. Survey instrument provided to School of Nursing, University of Manaus, Brazil.

Outputs/Benefits of HBCU Research Grant

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Proposal #159

GENERAL INFORMATION

TITLE: T-LYMPHOCYTE CHANGES IN EXPOSURE TO BENZO(A)PYRENE  
PI: Paul Urso, Ph.D.  
SCHOOL: Morehouse College of Medicine  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
USA

PERSONNEL SUPPORTED:  
Faculty: 3.0 person-months  
Research Assistants: 12.0 person-months

GRADUATE STUDENTS TRAINED: 2

EQUIPMENT PURCHASED:  
Forma-80 degree freezer  
microdissection apparatus (microscope)

OUTPUTS OF RESEARCH:

Refereed Papers:

Urso, P. and R.A. Johnson. "Early changes in T lymphocytes and subsets of mouse progeny defective as adults in controlling growth of a syngeneic tumor after in utero insult with benzo(a)pyrene." Immunopharmacology, vol. 14, pp. 1-10, 1987.

Urso, P., M.C. Ryan and J.S. Bennett. "Changes in Peripheral Blood Cells in Mice After Injection with Benzo(a)pyrene During Pregnancy." Immunopharmacology and Immunotoxicology, vol. 10, #2, pp. 179-193, 1988.

Johnson, R.A. and P. Urso. "Changes in T Subsets in Primiparous Mice Injected with Benzo(a)pyrene During Pregnancy." Proc. Soc. Exp. Biol. Med., 1986.

Urso, P. and R.A. Johnson. "Quantitative and Functional Changes in T Cells of Primiparous Mice Following Injection of Benzo(a)pyrene at the Second Trimester of Pregnancy." Immunopharmacology and Immunotoxicology, vol 10, #2, pp. 195-217, 1988.

Outputs/Benefits of HBCU Research Grant

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Proposal #159

**Abstracts:**

Urso, P. and R.A. Johnson. "Further Studies on Progeny T Lymphocytes After in utero Insult by Benzo(a)pyrene." Fed. Proc., 1986.

Urso, P., R.A. Johnson and S.L. Jones. "Changes in T and B Cells After Exposure to Benzo(a)pyrene at Midgestation." 6th International Congress of Immunology, 1986.

Urso, P. and R.A. Johnson. "Suppression by Lyt 1+ and Lyt 2+ Fetal Liver Cells Emerging After in utero Insult with Carcinogenic Benzo(a)pyrene May be Mediated by Lyt 1+ Cells." Fed. Proc. 46:451, 1987.

Urso, P., R.A. Johnson, J.R. Cobb and M.K. Kramer. "Suppressor Activity of Lymphocyte Subsets from the Fetal Liver of Benzo(a)pyrene Exposed Mice." Symposium on Mechanisms of Immunotoxicity, 1987.

INDIRECT BENEFITS

GRANTS/CONTRACTS RESULTING FROM HBCU RESEARCH GRANT:

NIH - NIH/NCI/MBRS grant

NIH - In-house NIH/BRSB grant

NIH - In-house NIH/BRSB grant

Private - In-house RCMI grant

LINKAGES ESTABLISHED:

With LDC Institutions:

University of Ife, Nigeria

With Other Universities:

Communication with scientists from Howard University

Communication with scientists from Lawrence Livermore National Laboratory

Outputs/Benefits of HBCU Research Grant

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Proposal #159

Other Universities (continued)

Collaboration with Dr. N. Ponzio, New Jersey Medical College

Invitation to give seminars at the University of Puerto Rico Medical Center

Invitation to give seminars at the Inter-American University of Puerto Rico

With International or Scientific Organizations:

6th International Congress of Immunology, Toronto, 1986

NAFEO Conference in Washington, D.C., 1988

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

Characterize quantitative consequences on the T lymphocyte population in progeny and mothers and some functional characteristics of T cell-mediated responses after the mother was exposed to benzo(a)pyrene at mid-pregnancy.

BRIEF STATEMENT OF RESEARCH FINDINGS:

A dramatic change in the numbers of cells expressing thy 1, Lyt 1, and Lyt 2 antigens were observed, punctuated by increases in Lyt 2 cells in progeny fetal spleen and fetal liver and maternal spleen. Also, a preferential depletion of maternal circulating lymphocytes occurred and maternal splenic allogeneic and syngeneic mixed lymphocyte responses were subnormal.

Outputs/Benefits of HBCU Research Grant

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Proposal #175

GENERAL INFORMATION

TITLE: INFANT MORTALITY IN SE CAMEROON/PREV & FAM PLNG  
PI: Gwendolyn S. Prater, Ph.D.  
SCHOOL: Jackson State Univ  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
Cameroon

PERSONNEL SUPPORTED:  
Faculty: 7.0 person-months  
Research Assistants: 21.0 person-months

GRADUATE STUDENTS TRAINED: 18

EQUIPMENT PURCHASED:  
personal computer

OUTPUTS OF RESEARCH:

Abstracts:

Prater, G. and M. Azevado, (preliminary findings).  
International Association of Social Workers Meeting,  
1989.

Prater, G. and M. Azevado. (preliminary findings).  
Assoc. for Advancement of Policy Research Dev. in the  
Third World, 1989.

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With LDC Institutions:

University of Yaounde, Cameroon -- faculty exchange  
program

With Other Universities:

University of North Carolina at Charlotte

Outputs/Benefits of HBCU Research Grant

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Proposal #175

Other Universities (continued)

Iowa State University, includes consulting services for Iowa State faculty

Association for the Advancement of Policy, Research and Development in the Third World

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

Determine beliefs, attitudes and practices that impact on infant mortality and the extent to which Cameroonians in the East Province utilize modern health care facilities. Questions related to death, disease, fertility, breast-feeding, nutrition etc., were part of administered questionnaires.

BRIEF STATEMENT OF RESEARCH FINDINGS:

A significant finding was that in the geographic areas in which this research was carried out, almost all major diseases are attributed to supernatural causes. Thus, in that environment traditional healers are still very powerful and health centers are rarely used for prevention of disease.

Outputs/Benefits of HBCU Research Grant

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Proposal #177

GENERAL INFORMATION

TITLE: PROBLEMS & SOLUTIONS IN DEVEL MEDICAL DATABASE  
PI: Samy M. Sidky, Ph.D.  
SCHOOL: Atlanta Univ  
STATUS: This project has not been completed.  
A final report has not been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:

Egypt  
USA

PERSONNEL SUPPORTED:

Faculty: 3.0 person-months  
Research Assistants: 6.0 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:

computer hardware/software, \$6,000  
coulter counter, \$15,000

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With LDC Institutions:

Mansoura University Hospital and Medical School

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

To develop application of computer technology to aid physicians and paramedical personnel in the diagnosis of anemia in five communities in the Egyptian Nile Delta area, centered around the Mansoura Hospital and Medical School.

BRIEF STATEMENT OF RESEARCH FINDINGS:

(Project not completed as of 12/89.)

Outputs/Benefits of HBCU Research Grant

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Proposal #182

GENERAL INFORMATION

TITLE: USE OF MATERNAL ARM CIRCUMFERENCE/PREDICTING MORT  
PI: Teresa OseiBoama, Ph.D.  
SCHOOL: Drew (Charles R) Postgraduate Medical School  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
Bangladesh  
USA

PERSONNEL SUPPORTED:  
Faculty: 12.0 person-months  
Research Assistants: 10.0 person-months

GRADUATE STUDENTS TRAINED: 1

EQUIPMENT PURCHASED:  
desktop computer  
typewriter

OUTPUTS OF RESEARCH:

Abstracts:

(being submitted as of 9/89). AHEA Convention, 1990.

Theses:

Krasovec, K. "The Use of Maternal Arm Circumference  
for Nutritional Monitoring on Pregnant Women." Johns  
Hopkins Univ. Sch. of Public Health.

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With Other Universities:

Johns Hopkins University, Department of Nutrition

Outputs/Benefits of HBCU Research Grant

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Proposal #182

With International or Scientific Organizations:

Holy Family Hospital, Ghana

OBJECTIVES AND FINDINGS

**BRIEF STATEMENT OF RESEARCH OBJECTIVES:**

Determine the relationship between arm circumference and other conventional methods of measuring nutritional status of women vis-a-vis the risk rating of pregnancy results (infants) for mortality and growth.

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

Maternal arm circumference was found to be more similar to weight at certain stages of pregnancy than to height and provided consistently higher sensitivities across all levels of specificity compared to other anthropometric measures.

Outputs/Benefits of HBCU Research Grant

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Proposal #190

GENERAL INFORMATION

TITLE: FUNCTIONAL PROPERTIES OF IMMUNE CELLS  
PI: Paul Urso, Ph.D.  
SCHOOL: Morehouse College of Medicine  
STATUS: This project has not been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
USA

PERSONNEL SUPPORTED:  
Faculty: 2.4 person-months  
Research Assistants: 24.0 person-months

GRADUATE STUDENTS TRAINED: 2

EQUIPMENT PURCHASED:  
None

OUTPUTS OF RESEARCH:

Refereed Papers:

Urso, P. "Augmentor and Suppressor Activity by Murine Fetal Liver Cells: Modulation by Benzo(a)pyrene." Immunol. Invest., 1989.

Urso, P., R.A. Johnson, M.K. Kramer and J.R. Cobb. "Modulation of the Allogeneic Mixed Lymphocyte Response by Fetal Liver Cells from Benzo(a)pyrene Exposed Mice Expressing Lyt Antigens After Passage Through Nylon Wool." Immunol. Invest., 1989.

Urso, P., J.R. Cobb and J.R. Gilmour. "Serologic and Immunofluorescence Detection of Lyt and L3T4 Surface Antigens on Thymic and Fetal Liver Cells of Benzo(a)pyrene-Exposed Mice." Immunopharmacology, 1989.

Urso, P., M.K. Kramer and J.R. Cobb. "Modification of the Syngeneic and Allogeneic Thymic Mixed Lymphocyte Response in Benzo(a)pyrene-Exposed Mice." Immunopharmacology and Immunotoxicology, 1989.

Outputs/Benefits of HBCU Research Grant

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Proposal #190

Abstracts:

Urso, P., R.A. Johnson, J.R. Cobb and M.K. Kramer.  
"Benzo(a)pyrene Evokes Suppressor Action by Fetal  
Liver Cells." FASEB Journal 2:A699, 1988.

Urso, P., J.R. Cobb, M.K. Kramer, et al. "T Cell  
Profiles in Murine Fetal Liver." Int. Journal Dev.  
Comp. Immunol., 1989.

Urso, P., J.R. Cobb, M.K. Kramer, et al. "Murine Fetal  
Liver Lyt and L3T4 Cell Profiles." FASEB Journal  
3:A278, 1989.

Urso, P., M.K. Kramer and J.R. Cobb. "Diversity of  
Murine Fetal Liver." 7th International Congress of  
Immunology, 1989.

INDIRECT BENEFITS

GRANTS/CONTRACTS RESULTING FROM HBCU RESEARCH GRANT:

NIH - NCI/MBRS grant

NIH - BRSG in-house grant

NIH - NIAID RCMI Acquired Immunodeficiency Syndrome  
grant

Government - Environmental Protection Agency

LINKAGES ESTABLISHED:

With LDC Institutions:

Obafemi-Awolowo University, Ife, Nigeria

With Other Universities:

New Jersey College of Medicine

With International or Scientific Organizations:

National Institute of Environmental Health Sciences

Outputs/Benefits of HBCU Research Grant

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Proposal #190

OBJECTIVES AND FINDINGS

**BRIEF STATEMENT OF RESEARCH OBJECTIVES:**

The objectives were to identify specific cells in the fetal liver expressing T antigens and their functional activity, and to identify specific cellular pathways that may be evoked by treatment with benzo(a)pyrene (BP) and their modifications in interactions. Insight on these may eventually lead to better methods for health control in individuals exposed to this (or other) carcinogens in the environment.

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

Unusual cell types were found in the murine fetal liver and fetal thymus expressing T antigens including: L3T4+Lyt 2+; L3T4+Lyt 1-; and L3T4-Lyt 1+. BP-fetal liver cells induce suppression of an allogeneic mixed lymphocyte response (T cell mediated proliferation), while corn oil-controls (CO) augmented the response. Macrophages may be interacting with T cells for augmentation (CO) or suppression (BP) (perhaps direct cellular interaction and/or soluble mediators such as interleukin-1 and/or interleukin-2). These data show that BP can induce functional reversal of fetal liver cells. Thymic mixed lymphocyte responses (allogeneic and syngeneic) are drastically modified. Finally, NK cell activity appears depressed up to eight weeks after birth, but additional definitive data are needed, while for cytolytic T cell activity, the data are inconclusive for progeny and mothers (including maternal NK activity).

Outputs/Benefits of HBCU Research Grant

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Proposal #196

GENERAL INFORMATION

TITLE: CULTURING HUMAN EPIDERMIS FOR WOUND HEALING  
PI: Carl A. Reindorf, M.D.  
SCHOOL: Howard Univ  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:

USA  
Nigeria

PERSONNEL SUPPORTED:

Faculty: 0.0 person-months  
Research Assistants: 12.0 person-months

GRADUATE STUDENTS TRAINED: 1

EQUIPMENT PURCHASED:

Apple 2e computer  
inverted microscope

OUTPUTS OF RESEARCH:

Refereed Papers:

Walker-Jones, D., et al. "Generation of differentiating human epidermal cells on basement membrane matrigel: Potential for use as autografts in recurrent ulcerative lesions." Materials Res. Soc. Symposium. Proc. 110:393-397, 1989.

"Rapid healing of leg ulcers with collagen." Journal of the National Medical Association, vol. 81, #8, pp. 866-868, 1989.

"Model for Phase III studies with epidermal cells grown on collagen matrices." Journal of the National Medical Association, vol 81, #10, pp. 1071-1076, 1989.

Outputs/Benefits of HBCU Research Grant

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Proposal #196

Abstracts:

Walker-Jones, D., et al. "Generation of differentiating human epidermal cells on basement membrane matrigel: Potential for use as autografts in recurrent ulcerative lesions." Materials Res. Soc. Symposium Proc., fall 1987. Also cited in Science, Nov. 11, 1988 p. 886.

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With LDC Institutions:

University of Ife, Nigeria -- Howard University faculty member spent summer as a visiting scientist working on clinical applications of this research.

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

Develop a culture procedure for the rapid growth of differentiated human epidermal cells on collagen matrices. Evaluate collagen matrix in promoting healing of leg ulcers at University of Ife, Nigeria.

BRIEF STATEMENT OF RESEARCH FINDINGS:

Electron microscopic and immunocytochemical evaluation verified the presence of multilayered aggregates with desmosomal junctions, keratin intermediate filaments and polarity which are characteristic of differentiating epidermal cells. In the clinical studies carried out in Nigeria, collistat was found to promote healing of leg ulcers.

Outputs/Benefits of HBCU Research Grant

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Proposal #275

GENERAL INFORMATION

TITLE: SOCIO-ECONOMETRIC ANALYSIS OF CHILD HEALTH PRACTIC  
PI: Eddie Ayivor, Ph.D.  
SCHOOL: Atlanta Univ  
STATUS: This project has not been completed.  
A final report has not been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
Ghana

PERSONNEL SUPPORTED:  
Faculty: 0.0 person-months  
Research Assistants: 0.0 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:  
None

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

Identify information regarding rural households or families in selected areas of rural Ghana with respect to childhood diseases, policy decisions and types of childhood investment needed.

BRIEF STATEMENT OF RESEARCH FINDINGS:

(project not completed as of 12/89)

**F. Population**

Outputs/Benefits of HBCU Research Grant

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Proposal #001

GENERAL INFORMATION

TITLE: FAMILY NUCLEATION & FERTILITY IN TROPICAL AFRICA  
PI: E. B. Attah, Ph.D.  
SCHOOL: Atlanta Univ  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
Nigeria

PERSONNEL SUPPORTED:  
Faculty: 5.0 person-months  
Research Assistants: 12.0 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:  
None

OUTPUTS OF RESEARCH:

Refereed Papers:

(Being submitted as of 3/88.). "Family Nucleation and Fertility Decline in Tropical Africa: Adaptations in the Structure of Risk Devolution." Population and Development Review.

(Being submitted as of 3/88.). "Family Life in Transition?." Research for Development.

(Being submitted as of 3/88.). "Focus Group Research in Africa." Qualitative Sociology.

Abstracts:

Annual Meetings of the Population Association of America, 1985.

Annual Meeting of the Georgia Sociological Association, 1986.

W.E.B. DuBois Conference, Atlanta, Georgia, 1987.

Outputs/Benefits of HBCU Research Grant

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Proposal #001

Abstracts (continued)

World Bank Seminar, 1985.

Reproductive Health Group Seminar, CDC, 1986.

Emory University, Atlanta, Georgia, 1986.

Seminar, Department of Political Science, Atlanta University, 1984.

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With LDC Institutions:

University of Calabar, Nigeria

With Other Universities:

Atlanta University

Emory University

With International or Scientific Organizations:

IBRD, World Bank -- seminars

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

Establish a theoretical approach for a model on the background to fertility transition in tropical Africa and the western impact on family structure and reproductive behavior.

BRIEF STATEMENT OF RESEARCH FINDINGS:

(1) A model was constructed. (2) A number of significant sociocultural claims were identified, e.g., nucleation of families, women's status and proletarianization, which had a significant impact on desired family size.

Outputs/Benefits of HBCU Research Grant

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Proposal #001

ADDITIONAL COMMENTS

The project was highly significant in its own light, a true landmark in the area of sociocultural and economic determinants of fertility in an African country.

Outputs/Benefits of HBCU Research Grant

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Proposal #027

GENERAL INFORMATION

TITLE: GONADOTROPIN-RELEASING HORMONE/MALE CONTRACEPTIVE  
PI: David R. Mann, Ph.D.  
SCHOOL: Morehouse College of Medicine  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
USA

PERSONNEL SUPPORTED:  
Faculty: 12.0 person-months  
Research Assistants: 12.0 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:  
water jacketed incubator

OUTPUTS OF RESEARCH:

Refereed Papers:

Mann D.R., D. Collins, M. Smith and K. Gould. "Effect of continuous infusion of a low dose of GnRH antagonist on serum LH and testosterone concentrations, spermatogenesis and semen quality in the rhesus monkey." Journal of Reproduction and Fertility, vol. 81, pp. 485-493, 1987.

Gould K., and D.R. Mann. "Comparison of electrostimulation methods for semen recovery in the rhesus monkey (Macaca mulatta)."  
Journal of Medicine and Primatology, vol. 17, pp. 95-103, 1988.

Mann D.R., S. R. Adams, K. G. Gould, T. E. Orr and D. C. Collins. "Evaluation of The Possible Direct Effects of Gonadotropin-Releasing Hormone Analogues On The Monkey (Macaca mulatta) Testis." Journal of Reproductive Fertility, vol. 85, pp. 89-95, 1989.

Outputs/Benefits of HBCU Research Grant

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Proposal #027

**Abstracts:**

D.R. Mann, K. Gould, M. Smith, T. Duffey and D. Collins. "Influence of simultaneous gonadotropin releasing hormone agonist and testosterone treatment of spermatogenesis and potential fertilizing capacity in male monkeys." Journal of Clinical Endocrinology and Metabolism, vol. 65, pp. 1215-1224, 1987.

D.R. Mann, D. Collins, T. Duffey, T. Buckner and K. Gould. "Combined GnRH agonist and testosterone treatment induces azoospermia in male monkeys." XXXth Congress International Union of Physiological Sciences, July 13-19, 1986.

**INDIRECT BENEFITS**

**GRANTS/CONTRACTS RESULTING FROM HBCU RESEARCH GRANT:**

\$185,263 Private - Genentech: Influence of estradiol and growth hormone on the preservation of bone mass in the gonadotropin releasing hormone agonist treated female.

**LINKAGES ESTABLISHED:**

**With Other Universities:**

Emory/V.A. Medical Center

**With International or Scientific Organizations:**

Yerkes Primate Research Center

Centers for Disease Control

Contraceptive Development Branch of NIH

Outputs/Benefits of HBCU Research Grant

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Proposal #027

OBJECTIVES AND FINDINGS

**BRIEF STATEMENT OF RESEARCH OBJECTIVES:**

Re-evaluate the effect of gonadotropin-releasing hormone (GnRH) agonist (Ag) alone, and in combination with androgen therapy, on spermatogenesis on monkeys. Determine potential fertilizing capacity of sperm from Ag-treated oligospermic male monkeys.

**BRIEF STATEMENT OF RESEARCH FINDINGS:**

Treatment of monkeys with physiologic levels of testosterone(T) does not interfere with the production of azoospermia by an Ag, and in fact, appears to enhance the inhibitory effect of the Ag on spermatogenesis. During the early oligospermic phase of Ag treatment, there is a substantial reduction of the potential fertilizing capacity of recovered sperm. Thus, combined GnRH analog and T therapy may be a viable option for male contraception.

Outputs/Benefits of HBCU Research Grant

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Proposal #169

GENERAL INFORMATION

TITLE: DIRECT GONADAL EFFECTS OF GONADOTROPIN RELEASING  
PI: David R. Mann, Ph.D.  
SCHOOL: Morehouse College of Medicine  
STATUS: This project has been completed.  
A final report has been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
USA

PERSONNEL SUPPORTED:  
Faculty: 12.0 person-months  
Research Assistants: 12.0 person-months

GRADUATE STUDENTS TRAINED: 0

EQUIPMENT PURCHASED:  
water jacketed incubator

OUTPUTS OF RESEARCH:

Refereed Papers:

Mann, D., K. Gould, D. Collins and K. Wallen.  
"Blockade of neonatal activation of the  
pituitary-testicular axis: effect on peripubertal  
luteinizing hormone and testosterone secretion and on  
testicular development in male monkeys." Journal of  
Clinical Endocrinology and Metabolism, 1989.

Mann, D., S. Adams, K. Gould, T. Orr and D. Collins.  
"Evaluation of the possible direct effects of  
gonadotrophin-releasing hormone analogues on the  
monkey (Macaca mulatta) Testis." Journal of  
Reproductive Fertility, vol. 85, pp. 89-95, 1989.

Abstracts:

Mann, D., K. Gould, S. Adams and D. Collins. "Failure  
of in vivo and in vitro gonadotropin-releasing  
hormone agonist treatment to directly alter  
steroidogenesis by the primate testis." 69th Annual  
Meeting of the Endocrine Society, 1987.

Outputs/Benefits of HBCU Research Grant

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Proposal #169

Abstracts (continued)

Collins, D., K. Gould and D. Mann. "Bioactive and immunoactive LH and the common alpha subunit during GnRH agonist treatment in female rhesus monkeys." The Society for the Study of Reproduction Meeting, 1988.

INDIRECT BENEFITS

LINKAGES ESTABLISHED:

With Other Universities:

Emory/V.A. Medical Center

With International or Scientific Organizations:

Yerkes Primate Research Center

Centers for Disease Control

Contraceptive Development Branch of NIH

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

To understand the mechanisms of GnRH analogue-induced male infertility in primates. Determine whether these analogues can directly alter gonadal function in primates.

BRIEF STATEMENT OF RESEARCH FINDINGS:

Neither the in vivo nor the in vitro evidence from this research supports the hypothesis that GnRH analogues directly alter testicular steroidogenesis in primates. It is possible that more chronic treatment with one of the analogues would have altered either basal testosterone secretion or the response of the cells to human chorionic gonadotropins.

Outputs/Benefits of HBCU Research Grant

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Proposal #204

GENERAL INFORMATION

TITLE: DIRECT ACTIONS OF GNRH ANALOGUES ON OVARIAN CELLS  
PI: Rajagopala Sridaran, Ph.D.  
SCHOOL: Morehouse College of Medicine  
STATUS: This project has not been completed.  
A final report has not been submitted to RUR.

DIRECT BENEFITS

COUNTRIES WHERE RESEARCH WAS CARRIED OUT:  
USA

PERSONNEL SUPPORTED:  
Faculty: 2.5 person-months  
Research Assistants: 9.0 person-months

GRADUATE STUDENTS TRAINED: 1

EQUIPMENT PURCHASED:  
None

OBJECTIVES AND FINDINGS

BRIEF STATEMENT OF RESEARCH OBJECTIVES:

To examine in detail the short-and long-term effects of GnRh-Ag (Agonists) on the synthesis of gonadotropins and their receptors and also the consequences of these changes on ovarian follicular development and steroidogenesis. A second objective is to investigate the effect of GnRh on oocyte maturation.

BRIEF STATEMENT OF RESEARCH FINDINGS:

Though not yet completed (as of 12/89), the research has shown that high doses of GnRh agonists have an inhibiting effect on estrol cyclicity and on steroidogenesis and that this inhibition seems to hold both in the long and short term.