

Research Notes

TCOM

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North Side students and teachers develop scientific interests and skills working with TCOM researchers

Eight students and two teachers from the High School of Medical Professions at North Side High School spent eight weeks this summer learning how research is done working side-by-side with Texas College of Osteopathic Medicine faculty members and graduate and medical students. TCOM's High School Student Research Apprentice Program pairs them with TCOM faculty investigators involved in health-related research in an effort to renew or spark a new interest in the biomedical sciences and medicine. Both minority and economically disadvantaged students participate, using TCOM's laboratories, computers and other state-of-the-art instrumentation and facilities to learn modern research techniques.

Seven of the eight students participating in the 1991 apprentice program won awards at this year's North Side Science Fair and five went on to win awards at the Regional Science Fair held at Texas Christian University. Trent Watkins, a 1991 and 1992 participant, co-authored a scientific paper with his mentor, Rafael Alvarez-Gonzalez, Ph.D., assistant professor of microbiology and immunology. Watkins helped present that paper at an American Society for Biochemistry and Molecular Biology meeting in Houston in February of 1992.

Kim Fagan, a 1991 student apprentice, and Nam Ly, a 1989 and 1990 apprentice program participant, returned to TCOM this summer to work with faculty researchers. Ly is currently a premed major receiving honors at Harvard University, and Fagan attends Florida A&M University and made the dean's list her first two semesters as a premed major. Both Fagan and Ly say that



Apprentice Pam Bhogal helps Rafael Alvarez-Gonzalez, Ph.D., Microbiology and Immunology, with cancer research.

their experiences at TCOM gave them an edge over their college classmates.

"I was already exposed to some of the scientific theory and research techniques, and had more experience in the chemistry lab than many others," Ly says. "A lot of the people were starting from scratch as far as experiments were concerned."

Cres Salazar, who began his senior year at North Side this fall, says working with Wayne Nicholson, Ph.D., assistant professor of microbiology and immunology, over the last two summers has helped him become better organized for school. "He not only taught me about the lab, but about the things that I should focus on in college — like chemistry and microbiology, even astronomy and geography."

The TCOM/North Side apprentice program was among 10 Fort Worth ISD Adopt-a-School partnership programs receiving cash awards at an April 20 recognition and awards ceremony at the Worthington Hotel. The college won a \$250 project award for "offering unique

learning opportunities to North Side students and teachers" through the apprentice program. The money will be put back into the program.

Apprentices just part of North Side/TCOM bond

The apprentice program is just one part of TCOM's Adopt-a-School relationship with the High School of Medical Professions at North Side. About 170 TCOM volunteers spend 6,700 hours per year working with North Side students, who are required to rotate through a series of six-week preceptorships at the college during their junior year. TCOM medical students, faculty and staff members also assist and judge science projects at fairs; serve as mentors to students; and provide lectures to students.

For Connie Smith, magnet program coordinator at North Side, the proof of the apprentice and magnet programs' success is demonstrated in the increasing numbers of magnet school applicants. "We depend on TCOM to provide hands-on experiences for the kids. There would be no North Side medical magnet program without our partnership with TCOM."

For Alvarez-Gonzalez, the main goal is to ensure that apprentices still like science when they leave the program. "Here we've accomplished more than that because we have so many talented kids with the potential for being good scientists," he says. "If they're around the right environment, they will develop. That's encouraged me to continue with this type of program."

Continued on last page

RECENT TCOM AWARDS

Rafael Alvarez-Gonzalez, Ph.D., (Department of Microbiology and Immunology), "ACS PROJECT SEED - Summer Educational Experience for the Disadvantaged," American Chemical Society, 06/15/92 - 08/07/92, \$3,000.

Barbara A. Barron, Ph.D., (Department of Physiology), "Opioids in Cardiac Myocytes," American Heart Association, Texas Affiliate, Inc., 07/01/92 - 06/30/93, \$33,000.

James L. Caffrey, Ph.D., and **Barbara A. Barron, Ph.D.**, (Department of Physiology), "Enkephalins and the Aging Heart," Texas Institute for Research and Education on Aging, 06/15/92 - 08/31/92, \$3,624.

Patrick R. Cammarata, Ph.D., (Department of Anatomy and Cell Biology), "Mechanism of Sugar Cataract Formation in Lens Cells," National Institutes of Health - National Eye Institute, 07/01/92 - 06/30/93, \$142,899.

Michael H. Chaitin, Ph.D., (Department of Anatomy and Cell Biology), "Cytoskeletal Proteins in Retinal Photoreceptors," National Institutes of Health - National Eye Institute, 08/01/92 - 07/31/93, \$111,692.

Michael B. Clearfield, D.O., (Department of Medicine), "Coronary Atherosclerosis Prevention Study, TexCAPS," Facilitators of Applied Clinical Trials, 07/01/92 - 06/30/93, \$50,000.

S. Dan Dimitrijevic, Ph.D., (Department of Biochemistry and Molecular Biology), **Judy Wilson, Ph.D.**, and **John G. Mills, D.O.**, (Department of Public Health and Preventive Medicine), "Effect of Hyperbaric Oxygen on Epidermalization in Young and Old Skin Equivalents," Texas Institute for Research and Education on Aging, 06/15/92 - 08/31/92, \$5,000.

H. Fred Downey, Ph.D., (Department of Physiology), "Effects of Smokeless Tobacco on Blood Flow to Tissues of the Mouth," Smokeless Tobacco Research Council, Inc., 07/01/92 - 06/30/93, \$49,610.

H. Fred Downey, Ph.D., (Department of Physiology), "High School Science Teachers Research in Physiology Program," American Physiological Society, 06/01/92 - 08/15/92, \$5,750.

H. Fred Downey, Ph.D., (Department of Physiology), "Regional Non-Ischemic Myocardial Hypoxia," National Institutes of Health - National Heart, Lung, and Blood Institute, 07/01/92 - 06/30/93, \$171,062.

Richard A. Easom, Ph.D., (Department of Biochemistry and Molecular Biology), "Role of Myosin Light Chain Kinase in Insulin Secretion," American Heart Association, Texas Affiliate, Inc., 07/01/92 - 06/30/93, \$33,000.

Michael W. Emmett-Oglesby, Ph.D., (Department of Pharmacology), "Tolerance to the Stimulus Properties of Cocaine," Alcohol, Drug Abuse and Mental Health Administration - National Institute on Drug Abuse, 06/01/92 - 05/31/93, \$164,825.

Michael J. Forster, Ph.D., and **Harbans Lal, Ph.D.**, (Department of Pharmacology), "Discovery of Drugs Against Age-Related Dementia," Texas Institute for Research and Education on Aging, 06/15/92 - 08/31/92, \$9,472.

Russell G. Gamber, Ph.D., (Department of Manipulative Medicine), "Maintenance of Functional Ability in Nursing Home Patients," Texas Institute for Research and Education on Aging, 06/15/92 - 08/31/92, \$1,573.

Patricia A. Gwartz, Ph.D., (Department of Physiology), "Adrenergic Limitation of Coronary Flow During Exercise," National Institutes of Health - National Heart, Lung, and Blood Institute, 07/01/92 - 06/30/93, \$142,120.

Carl E. Jones, Ph.D., (Department of Physiology), "Anti-Infarction Effects in the Denervated Heart," National Institutes of Health - National Heart, Lung and Blood Institute, 07/01/92 - 06/30/93, \$188,250.

Robert L. Kaman, Ph.D., (Department of Physiology), "Outcome Evaluation of the PSE&G Health Promotion Program," American Corporate Health Programs, Inc., 06/01/92 - 05/31/93, \$60,000.

Bhalchandra J. Kudchodkar, Ph.D., (Department of Biochemistry and Molecular Biology) and **Stephen Weis, D.O.**, (Department of Medicine), "Plasma Low and High Density Lipoprotein Subspecies in Aging," Texas Institute for Research and Education on Aging, 06/15/92 - 08/31/92, \$4,500.

Andras G. Lacko, Ph.D., (Department of Biochemistry and Molecular Biology), "Carbohydrate Component of LCAT," American Heart Association, National Center, 07/01/92 - 06/30/93, \$37,840.

Harbans Lal, Ph.D., (Department of Pharmacology), "Drugs for Reversal of Dementia," Neuromedica Inc., 08/01/92 - 07/31/93, \$3,000.

Harbans Lal, Ph.D., and **Michael J. Forster, Ph.D.**, (Department of Pharmacology), "Drug Discovery for Age-Related Dementia," Glaxo Group Research Limited, 07/01/92 - 06/30/93, \$62,724.

Robert R. Luedtke, Ph.D., and **Harbans Lal, Ph.D.**, (Department of Pharmacology), "Neuroimmunologic Implications of Age-Related Autoimmunity," Texas Institute for Research and Education on Aging, 06/15/92 - 08/31/92, \$3,000.

Robert T. Mallet, Ph.D., (Department of Physiology), "Subcellular Mechanisms for Pyruvate Protection in In Situ Myocardium," American Heart Association, Texas Affiliate, Inc., 07/01/92 - 06/30/93, \$35,200.

Wayne L. Nicholson, Ph.D., (Department of Microbiology and Immunology), "Repair System for Novel UV Light - Induced DNA Damage," American Cancer Society, Inc. - Junior Faculty Research Award, 07/01/92 - 06/30/93, \$32,000.

Raymond M. Pertusi, D.O., (Department of Medicine), "The Effect of Manipulation on Measures of Immune Function and Quality of Life in SLE," American Osteopathic Association - Clinical Investigator Development Award, 07/01/92 - 06/30/93, \$22,432.

Peter B. Raven, Ph.D., (Department of Physiology), "Alterations in Human Baroreceptor Reflex Function Following Active Detraining," National Aeronautics and Space Administration, 05/01/92 - 04/30/93, \$58,999.

Peter B. Raven, Ph.D., (Department of Physiology), "Education of Scientists in Cardiovascular Regulation," National Institutes of Health - National Heart, Lung, and Blood Institute, 07/01/92 - 06/30/93, \$51,708.

Peter B. Raven, Ph.D., (Department of Physiology), "Baroreflexes and Orthostatism: A Fitness Effect," National Institutes of Health - National Heart, Lung, and Blood Institute, 08/01/92 - 07/31/93, \$120,428.

Peter B. Raven, Ph.D. and **Xiangrong Shi, Ph.D.**, (Department of Physiology), "Arterial and Cardiopulmonary Baroreflexes of the Elderly," Texas Institute for Research and Education on Aging, 06/15/92 - 08/31/92, \$3,500.

Xiangrong Shi, Ph.D., (Department of Physiology), "Interactions of the Cardiopulmonary and Carotid Baroreflexes: Effect of Fitness," American Heart Association, Texas Affiliate, Inc., 07/01/92 - 06/30/93, \$33,000.

James E. Turner Sr., Ph.D., (Department of Anatomy and Cell Biology), "Retina Wound Repair: Grant and Trophic Phenomena," National Institutes of Health - National Eye Institute, 08/01/92 - 12/31/92, \$139,517.

Thomas Yorio, Ph.D., (Department of Pharmacology), "Augmentation Award for Science and Engineering Research Train-

ing," Department of Defense/United States Army Medical Research Acquisition Activity, 06/01/92 - 07/31/93, \$25,068.

Thomas Yorio, Ph.D., (Department of Pharmacology), "Vasopressin Receptor Signaling and Cycling of Water Channels in Renal Epithelia - Student Training in Cellular and Endocrine Pharmacology," Department of Defense/United States Army Medical Research Acquisition Activity, 06/01/92 - 05/31/1993, \$69,199.

Thomas Yorio, Ph.D., (Department of Pharmacology), "Establishment and Characterization of a Corneal Endothelium Reduction Model: Implications for Drug Development and Testing," Alcon Laboratories, Inc. 05/01/92 - 04/30/93, \$10,932.

Thomas Yorio, Ph.D., (Department of Pharmacology), "Graduate Student Fellowship," Alcon Laboratories, Inc., 05/01/92 - 04/30/93, \$5,000.

Total Funding Awarded: \$1,892,924

GRANT PROPOSALS SUBMITTED

Rafael Alvarez-Gonzalez, Ph.D., (Department of Microbiology and Immunology), "Characterization of the Poly(ADP-ribose) Polymerase Automodification Reaction with 3'-dNAD," Texas Research Enhancement Program, \$6,000.

John E. Aschenbrenner, Ph.D., and **Fred Jackson, Ph.D.**, (Department of Anatomy and Cell Biology), "Immunolocalization of Basic Fibroblast Growth Factor in the Lewis Rat During Experimental Autoimmune Encephalomyelitis (EAE)," Texas Research Enhancement Program, \$2,509.

William W. Barrow, Ph.D., (Department of Microbiology and Immunology), "Examination of an Opportunistic Pathogen in AIDS Patients," Texas Research Enhancement Program, \$5,500.

William W. Barrow, Ph.D., (Department of Microbiology and Immunology), "Processing of AIDS-Related Mycobacterial Antigens," National Institutes of Health - National Institute of Allergy and Infectious Diseases, \$1,118,661.

James L. Caffrey, Ph.D., (Department of Physiology), "Intrinsic Cardiac Enkephalins and Autonomic Control," American Heart Association, National Center, \$132,000.

James L. Caffrey, Ph.D., (Department of Physiology), "Adrenergic Control of Myocardial Enkephalin," Texas Research Enhancement Program, \$9,500.

James L. Caffrey, Ph.D., (Department of Physiology), "Opioid/Autonomic Interactions in the Circulatory System," National Institutes of Health - National Heart, Lung, and Blood Institute, \$1,207,983.

Patrick R. Cammarata, Ph.D., (Department of Anatomy and Cell Biology), "Mechanism of Sugar Cataract Formation in Lens Cells," National Institutes of Health - National Eye Institute, \$142,899.

Michael H. Chaitin, Ph.D., (Department of Anatomy and Cell Biology), "Cytoskeletal Proteins in Retinal Photoreceptors," National Institutes of Health - National Eye Institute, \$111,692.

Michael B. Clearfield, D.O., **John McKenzie, D.O.**, (Department of Medicine) and **Andras G. Lacko, Ph.D.**, (Department of Biochemistry and Molecular Biology), "Oral Magnesium Therapy for Hypertriglyceridemic Patients," Texas Research Enhancement Program, \$8,000.

Paul F. Cook, Ph.D., (Department of Microbiology and Immunology), "Study of Kinetic and Chemical Mechanisms of Enzymes," National Institutes of Health - National Institute of General Medical Sciences, \$139,117.

Michael W. Emmett-Oglesby, Ph.D., (Department of Pharmacology), "Neurobiology Associated with Reinforcement and Drugs of Abuse," Texas Research Enhancement Program, \$14,738.

Michael W. Emmett-Oglesby, Ph.D., (Department of Pharmacology), "ADAMHA Small Instrumentation Program," Alcohol, Drug Abuse, Mental Health Administration, \$23,309.

Brian H. Foresman, D.O. (Department of Medicine), and **Eugene E. Quist, Ph.D.**, (Department of Physiology), "Altered Autonomic Receptor Signal Conduction with Training," Texas Research Enhancement Program, \$7,935.

Michael J. Forster, Ph.D., (Department of Pharmacology), "Ethanol and Age-Associated Cognitive Decline," National Institute on Alcohol Abuse and Alcoholism, \$493,979.

Michael J. Forster, Ph.D. and **Michael W. Emmett-Oglesby, Ph.D.**, (Department of Pharmacology), "Assessment of Potential Cocaine Treatment Medications in Rodents," Tichenor & Associates, \$1,908,264.

Stephen R. Grant, Ph.D., (Department of Biochemistry and Molecular Biology), "Hyperphosphorylation and the Control of

Human B Cell Proliferation," Texas Research Enhancement Program, \$4,800.

Robert W. Gracy, Ph.D., (Department of Biochemistry and Molecular Biology), "Molecular Basis for Abnormal Proteins in Aging Cells," Research Supplement for Underrepresented Minorities, National Institutes of Health - National Institute on Aging, \$139,726.

Ben G. Harris, Ph.D. (Research Office), "Biomedical Research Support Grant," National Center for Research Resources - National Institutes of Health, \$50,000.

Robert L. Kaman, Ph.D., (Department of Physiology), "Outcome Evaluation of the PSE&G Health Promotion Program, American Corporate Health Programs, Inc. \$60,000.

Andras G. Lacko, Ph.D., (Department of Biochemistry and Molecular Biology), "Structure/Function of Recombinant ICAT," American Heart Association, National Center, \$129,973

Andras G. Lacko, Ph.D., (Department of Biochemistry and Molecular Biology), "Structure/Function of Recombinant ICAT," National Science Foundation, \$349,941.

Andras G. Lacko, Ph.D., (Department of Biochemistry and Molecular Biology), "New Strategies for Reducing Cardiovascular Risk in Elderly Women," AARP Andrus Foundation, \$44,928.

Harbans Lal, Ph.D., (Department of Pharmacology), "Drugs for Reversal of Dementia," Neuromedica Inc., \$3,000.

John C. Licciardone, D.O., (Department of Public Health and Preventive Medicine), "Academic Award in Environmental/Occupational Medicine, National Institute of Environmental Health Sciences," \$527,256.

Robert R. Luedtke, Ph.D., (Department of Pharmacology), "Monoclonal Antibody Facility for TCOM," Robert J. Kleberg Jr., and Helen C. Kleberg Foundation, \$183,000.

Robert R. Luedtke, Ph.D., (Department of Pharmacology), "Characterization of Renal D2-Like Receptors," Texas Research Enhancement Program, \$7,000.

Robert R. Luedtke, Ph.D., (Department of Pharmacology), "Role of Autoimmunity in Age-Related Cognitive Decline," National Institutes of Health - National Institute on Aging, \$471,075.

Continued on next page

Continued from previous page

Sue G. Lurie, Ph.D., (Department of Medical Humanities), "Mental Health, Family and Social Roles in a Multi-Ethnic Community," National Center for Health Statistics - United States Census Bureau, \$17,880.

Michael W. Martin, Ph.D., (Department of Pharmacology), "Effects of Chronic Ethanol on Adenosine Receptor Systems," National Institute on Alcohol Abuse and Alcoholism, \$380,222.

Walter J. McConathy, Ph.D., (Department of Medicine), "Interactions of Lp(a) with Subendothelial Cell Matrix," National Institutes of Health - National Heart, Lung, and Blood Institute, \$293,319.

Wayne L. Nicholson, Ph.D., (Department of Microbiology and Immunology), "Characterizing the *Bacillus subtilis* spl DNA Repair Gene," Texas Research Enhancement Program, \$5,600.

Edward L. Orr, Ph.D., (Department of Anatomy and Cell Biology), "Arachnoid Barrier Cells and Cerebrospinal Fluid Outflow," Texas Research Enhancement Program, \$4,935.

Eugene E. Quist, Ph.D., (Department of Pharmacology), "Regulation of Beta Adrenergic Receptor-Gs Coupling by NAD in Cardiac Sarcolemma," Texas Research Enhancement Program, \$7,100.

Carolyn W. Quist, D.O., (Department of Obstetrics and Gynecology), "Regulation of Human Chorionic Vascular Tension by Arachidonic Acid and Cyclic Nucleotides," Texas Research Enhancement Program, \$7,600.

Nalini Ramasesh, Ph.D., (Department of Biochemistry and Molecular Biology), "How Do Enzymes Age?," National Institutes of Health - National Institute on Aging, \$70,600.

Peter B. Raven, Ph.D., (Department of Physiology), "Baroreflexes and Orthostatism: A Fitness Effect," National Institutes of Health - National Heart, Lung, and Blood Institute, \$120,428.

Peter B. Raven, Ph.D., (Department of Physiology), "Preliminary Investigations into Dry Immersion as a Land-Based Model of Microgravity: Cardiovascular and Neuromuscular Effects," National Aeronautics and Space Administration, \$363,244.

Tony Romeo, Ph.D., (Department of Microbiology and Immunology), "Charac-

terization of a Gene that Encodes a Novel Global Regulator of Bacterial Transcription," Texas Research Enhancement Program, \$6,000.

Tony Romeo, Ph.D., (Department of Microbiology and Immunology), "Bacterial Glycogen Synthesis: Regulation and Biological Function," National Science Foundation, \$242,800.

Victoria L. Rudick, Ph.D., (Department of Anatomy and Cell Biology), "Secretory Pathway Mutants of Polarized Epithelial Cells," Texas Research Enhancement Program, \$3,800.

Victoria L. Rudick, Ph.D., (Department of Anatomy and Cell Biology), "Secretory Pathway Mutants of Polarized Epithelial Cells," Subcontract with Texas Woman's University, National Institutes of Health - National Institute of General Medical Sciences, \$22,066.

Ronald L. Singer, M.S., (Department of Pathology), "The Identification and Classification of Foams and Foam Products," National Institute of Justice, \$37,000.

Paula Sundstrom, Ph.D., (Department of Microbiology and Immunology), "Proteins of *Candida albicans*, an AIDS-Related Pathogen," National Institutes of Health - National Institute of Dental Research, \$106,756.

James E. Turner Sr., Ph.D., (Department of Anatomy and Cell Biology), "Retina Wound Repair: Grant and Trophic Phenomena," National Institutes of Health - National Eye Institute, \$139,517.

Robert J. Wordinger, Ph.D., (Department of Anatomy and Cell Biology), **Steve P. Buchanan, D.O.**, (Department of Obstetrics and Gynecology), and **Stephen L. Putthoff, D.O.**, (Department of Pathology), "Immunolocalization of bFGF in Human Placenta," Texas Research Enhancement Program, \$3,300.

Ming-chi Wu, Ph.D., (Department of Biochemistry and Molecular Biology), "Mechanism of Leukemia Cell Differentiation Induced by a New Differentiation Factor," Texas Research Enhancement Program, \$3,000.

Thomas Yorio, Ph.D., (Department of Pharmacology), "Short-term Research Training for Minority Students," National Institutes of Health - National Heart, Lung, and Blood Institute, \$371,693.

Total Funding Requested: \$9,509,645

Continued from front page

Program expanded to include teachers, disadvantaged students

The apprentice program was entirely funded by the National Institutes of Health until 1991, when five prestigious foundations provided additional funding to expand the program to include economically disadvantaged high school students. Contributing foundations include the Max and Victoria Dreyfus Foundation Inc. of New York, RGK Foundation of Austin, and the Alcon, Pate and Gil & Dody Weaver foundations, all of Fort Worth. The American Chemical Society Project SEED also funds two students' participation.

Additional NIH funding also enabled the participation of teachers for the first time in 1991. The experience is designed to update teachers' skills in modern research instrumentation and techniques and broaden their knowledge of scientific concepts.

North Side teacher Kimberly Smith worked part time with pharmacology professors John Lane, Ph.D., and Michael Emmett-Oglesby, Ph.D., this summer, and with Robert Wordinger, Ph.D., associate professor of anatomy, during the summer of 1991. Smith said she was grateful for the opportunity to work in a modern research facility.

Besides gaining an excellent lab worker for the summer, Wordinger says he also felt a sense of accomplishment in passing along information that he knew would eventually reach high school students. "There's a great need to attract young people into science and medical professions," he says. "I feel like we've made some positive contacts. Perhaps we'll see some of them come back as TCOM students."

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