National Institute of Environmental Health Sciences'
Core Centers Program

Community Outreach and Education Administrative Supplements:

Report

October 2001

and

Presentation Slides

59th Annual Center Directors Meeting
Austin, Texas, October 30, 2001

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Part I
Administrative Supplement Report

National Institute of Environmental Health Sciences'
Core Centers Program

Administrative Supplement Report: Community Outreach and Education

October 2001

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Introduction

Purpose

This document highlights the accomplishments of the twelve Community Outreach and Education Programs (COEPs) that received administrative supplement awards to develop new or build upon existing outreach efforts.

In 2000, the National Institute of Environmental Health Sciences (NIEHS) announced to its Core Centers a one-year administrative supplement award to enhance the efforts of their COEP. This announcement was in response to recommendations of Center directors who expressed the need for increased support of COEP. Seeking to foster greater interactions between and among COEPs, NIEHS offered two levels of support:

1. Single COEP application for a total cost of up to $60,000.
2. Inter-COEP application for a total cost of up to $150,000.

Diversity of Awards

Of the twelve awards, seven are single COEP projects and five are inter-COEP projects. These projects represent a diversity of mechanisms and audiences, which can be categorized into:

1. K-12 Education (students and teachers)
2. Professional Development (teachers, professors, promatoras, and community health representatives)
3. Community Forums (general public)

Partnerships were not limited to other COEPs. Several COEPs collaborated with community-based organizations to ensure the success of their work. Some COEPs partnered with other NIEHS grantees from programs such as K-12 Environmental Health Science Education and Environmental Justice.

Impact of Awards

The following progress reports highlight many great accomplishments with funding received through these supplemental awards. A majority of the COEPs conducted some form of an evaluation to measure the overall impact of their outreach and education efforts. Several of these evaluations are not yet complete. In the projects with final evaluations, the results have been very positive.

From a programmatic perspective, the two most telling signs of the impact resulting from these projects are the number of people affected by the outreach, and the COEP's ability to apply for and receive additional support to sustain the efforts begun with the supplemental award.

Focusing solely on the educational projects, there is a clear indication of the positive outcomes from the supplemental award projects. As Table 1 shows, over 225 teachers received some form of education or professional support through these projects. In addition, an estimated 4,000 students have been affected by the work of the Center COEPs.

Table 1: Number of Teachers and Students Reached by Projects

Center	Teachers	Students
MDI	20	380
Arizona	6	40
UMDNJ	64	1,300
USC	15	~300
UTMB	101	
Univ. Wash.	19	~950
Vanderbilt		~1,000
	225	**3,970**

Many COEPs have applied for grants to sustain what they have begun with the supplemental award. Table 2 highlights the agencies or foundations to which Centers applied, and lists the amount of the anticipated award. As indicated in the following reports, several COEPs are still in the process of applying for grants to continue their work.

Table 2: Agencies to which requests for continuing support have been requested

Center	Agency	Amount
MDI	NSF	$600K
MDI	EPA	
TAMU	HRSA-EPA	$150K
Arizona	SEPA	$900K
Arizona	NSF	$2.75M
Arizona	Tucson Electric Co.	$10K
UNM	AOEC	
UNM	ATSDR	
UNM	CDC	
USC	Liberty Hill	$10K

Next Steps

As this booklet goes to press, several COEPs are still in the process of conducting outreach efforts and/or evaluating the impact of their work. Therefore, this booklet represents a draft of the final report that will include complete analyses of these supplemental awards. The final report will be posted to the Centers website and will be sent to the COEP Resource Center.

Mount Desert Island Biological Laboratory, Center for Membrane Toxicity Studies

Lead COEP Name: Center for Membrane Toxicity Studies
Mount Desert Island Biological Laboratory
Salisbury Cove, ME

Partner COEP: n/a

Project title: A Community Environmental Toxicology Laboratory

Project Specific Aims:

a) Establish the Community Environmental Toxicology Laboratory (CETL) at the Mount Desert Island Biological Laboratory as a component of our Marine and Freshwater Biomedical Science Center's Community Outreach and Educational Programs (COEP)

b) Establish the CETL as a center for academic-year water quality projects involving local students from kindergarten to twelfth grade.

c) Establish the CETL as a center for training teachers as leaders who will mentor other teachers to utilize water quality projects in their classrooms.

d) Offer six, six-week summer fellowships for Hancock county high school students to work in a mentored-research water quality program at the CETL.

e) Educate the community on the direct correlation of good human health and healthy water.

f) Export the CETL to a nationwide audience via a weekend conference for other NIEHS Centers, a newsletter, and website.

Outcomes/Results of outreach/education project:

a) Organization of program (winter 2000/2001): The Community Environmental Toxicology Laboratory, a collaborative project of the Center for Membrane Toxicity Studies and the Mount Desert Island Water Quality Coalition, was established in the winter of 2000/2001. Michael McKernan, Director of Education at the Mount Desert Island Biological Laboratory was selected to direct the Community Laboratory. Janet Redman, Program Coordinator for the MDI Water Quality Coalition was selected to manage the public outreach and educational programs at the Community Laboratory.

b) Equipping the laboratory: Initially, funds were used to equip the laboratory with the necessary equipment required to conduct water quality studies in fresh and salt water environments. Glassware, test kits, disposables, filters, reagents, and pipets were purchased in addition to large items including microscopes, water baths, refractometers, and a laboratory computer. Supplement funds provided the laboratory with a critical mass of equipment for several seasons of research.

c) Tremont Consolidated School: Students programs began in April with visits by a group of eighth graders from the Tremont Consolidated School in Bass Harbor, ME. Eighteen eighth grade students collected water samples from the marsh behind their school suspected of having a non-point source of pollution for analysis at the community lab. Tremont School does not have the laboratory space or equipment to perform the necessary analysis and data collection, so the community lab provided the space, equipment and research supervision for quality control. The students, with teacher Jim Sawyer, analyzed the samples for dissolved oxygen and fecal coliform bacteria leading to the discovery of low level bacteria contamination in the

Bass Harbor Marsh. The same group of students made three return trips to the community laboratory for further water quality studies during the spring of 2001.

d) MDI High School Water Keepers: A second primary group of students to use the community lab was a group of students from the MDI High School—the MDI Water Keepers. The MDI Water Keepers is an after school organization for students interested in continuing curricular water quality projects and initiating novel experiments. The MDI Water Keepers primarily studied the watershed of Eddie Brook, a suburban stream that empties onto a commercial clam flat where soft shell clams and mussels were historically are harvested for human consumption. Recently, the clam flat was closed by the Maine Department of Marine Resources due to bacteria contamination. The source of this bacteria contamination is currently being pursued by the MDI Water Keepers.

e) Outreach in the schools: As an outreach of the Community Lab activities, Janet Redman also traveled to area schools to help teachers plan and perform water quality research projects to supplement their existing science curriculum. Students and teachers participated in watershed studies and phytoplankton monitoring. An umbrella goal of the school visits was to build awareness and stewardship, describe and discuss research principles, and engage students in finding solutions to local water quality problems.

f) Teacher training: The community lab hosted a teacher workshop on March 10 of this year. The workshop, facilitated by the staff of the MDI Water Quality Coalition, provided training for local elementary school teachers in water quality monitoring techniques, as well as project design and implementation. The goal was to enhance science curriculum at five elementary schools island-wide by introducing, or enhancing, an on-going monitoring project on a local watershed, marsh, or beach area.

g) Summer internships for high school students: Also in March, students were selected by application to receive summer fellowships to work at the Community Lab for the summer season. These internships were the highlight of this COEP effort—proving dedicated students the resources to carry out original and independent research projects in the health of local waters. This summer, four fellowships were awarded to MDI High School students Melissa Brown, Meghan Burgess, Amber Howard, and Jennifer Reynolds. Janet Redman mentored the students for eight weeks in projects including the detection and monitoring the of fecal coliform bacteria at local swim beaches, detection of toxic phytoplankton in marine water sources, and bacteria and nutrient monitoring in twin island watersheds—one in the town of Bar Harbor, one in Acadia National Park. A fifth fellowship was awarded to Joshua Bridges who worked in the laboratory of MDIBL summer scientists Drs. Elizabeth Crockett and Patrick Hassett on their project "Sterol Limitaion of Zooplankton Growth: Roles in Nutrition and Membrane Biology."

h) Public policy: The students' primary objective was the research itself; however, students were equally interested in the public outreach portion of their activities at the Community Lab. On July 25th, 2001, the summer interns, with support from Janet Redman, held a public meeting in the Bar Harbor city council chambers. The purpose of the meeting was to describe their findings with regard to detection and monitoring of fecal coliform bacteria at island swim beaches. The meeting was attended by representatives from Acadia National Park, Bar Harbor town council, University of Maine, concerned parents, representatives from the Maine Sea Grant Program, regional press, and interested community members. The outcome of the meeting was a list of strategies to build public awareness about swimming-related illness and responsible beach user practices.

As of September 2001, the Community Lab continues to operate and prepare for school groups in the new school year.

Impact of outreach/education project:

In ongoing school-year water quality research projects, 30 students from 3 island schools utilized resources and mentoring at the Community Lab. Parent volunteers were an integral part of the success of field projects. Two students from the College of the Atlantic and one student from the University of Maine served as volunteers working on macroinvertebrate, swim beach, and phytoplankton monitoring. One homeschooled student utilized the community lab to study toxic phytoplankton.

In the most recent school year, Janet Redman was able to visit 11 classrooms and approximately 170 students and 12 teachers.

Five students participated in in-depth summer studies for eight weeks for six to eight hours five days a week, with some weekend activity. The public meeting planned and held by the summer interns drew an audience of 20 community members and local policy makers. This public meeting opened a discussion between community members and town officials about public notification of swim beach water quality.

The teacher workshop drew 7 teachers from 4 island schools, plus a teacher-in-training from the College of the Atlantic, a teacher from Ellsworth, ME, and a homeschool teacher.. Potentially, the workshop impacted science curriculum in each of their classrooms, affecting 175 elementary and middle and high school students on Mount Desert Island.

Benefit to COEP and Center involved Assessment of Accomplishments:

The Community Environmental Toxicology Laboratory accomplished five of six specific aims and was successful in its first year of operation. Through a collaborative effort, the Center for Membrane Toxicity Studies and the MDI Water Quality Coalition began to bridge the gap between environmental health and public health. Research projects began to determine potential risks to public health at swim beaches with high concentrations of fecal coliform bacteria. Work in identifying toxic phytoplankton (e.g.-red tide) helped initiate the closure of commercial clam and mussel harvesting in certain tidal areas around Mount Desert Island during July 2001. Further work was undertaken with town policy makers to restrict overboard discharges and sources of non-point water contamination.

This effort accomplished more than anticipated. The success of Community Lab programs can be directly attributed to the Coalition's mission of classroom and public outreach, and a skilled teaching staff. They work directly with teachers and students, in hands-on water quality projects, stimulating a high degree of interest and participation from students at all levels.

One shortcoming was not integrating the Community Lab with the projects of center investigators. Because the Center operates at full strength only in the summer, it was difficult to encourage participation by Center investigators who had only a few weeks to pursue their studies at the Laboratory. More advanced studies at the Community Lab will be undertaken coincident with the hiring of a *year-round* Center investigator in toxicology/toxicogenomics. With the new investigator, work will be done in 2002 to integrate marine water quality studies with the science of toxicology and the Center's research cores.

Additional grant support ($593,737) has been requested from the National Science Foundation under the ASCEND (After School Centers for New Discovery) program. Funds will provide three years of full salary support for a year round teacher, summer interns, travel expenses, expanded school year activities, and major pieces of analytic equipment. An Environmental Education grant will be submitted to the EPA in mid November.

Future Directions:

The Center and the MDI Water Quality Coalition plan to continue this effort into 2002. As mentioned above, more focus will be given in 2002 to integrate the research of the Community Lab to the research of a year-round toxicologist.

Texas A&M University, Center for Environmental and Rural Health

Lead COEP

Community Outreach and Education Program
NIEHS Center for Environmental and Rural Health
Texas A&M University

Partner COEPs

UT Medical Branch
UT MD Anderson Cancer Center-Science Park

Project Title

"Environmental Health Training of Promotoras along the Texas-Mexico Border"

Funding Period: 10-01-00 to 9-30-01

Project Specific Aims

> **Aim 1:** To implement a bilingual curriculum on environmental health for community outreach workers (Promotoras) in Cameron Park and Progresso, two Hispanic communities (colonias) along the Texas-Mexico border.
>
> **Aim 2:** To formalize a partnership to establish an inter-center COEP collaboration with NIEHS COEP programs at UT Medical Branch and UT MD Anderson Cancer Center by adoption of curricula contents on skin cancer and asthma for development of sustainable Promotora training programs in Texas.

Outcomes/Results of Outreach/Education Project

- Collaboration with NIEHS COEPs at UT Medical Branch and UT MD Anderson Cancer Center-Research Park
- Training of eight Promotoras in Cameron Park
- Enhanced Environmental Health Science Curriculum for promotora education
- Public scientific presentations in the community
- Participation in the UT Medical Branch Summer Institute for training of high school teachers
- Participation in the UT MD Anderson Cancer Center Bench Tutorial Program
- Computer training of Promotoras
- Adoption of Toxic Island, a PEER environmental health educational activity, into the existing curriculum.

In collaboration with our partners, a bilingual curriculum suitable for Promotora and colonia resident education was completed. Collaborations with the COEPs at UT Medical Branch and UT MD Anderson Cancer Center allowed us to add units on asthma and cancer, respectively, to our curriculum and to have experts in these areas present their respective modules. Specifically, Dr. Edward Brooks, pediatrician and director of the asthma program at UT Medical Branch provided asthma education to Cameron Park

promotoras. Dr. Robin Fuchs-Young, center scientist and COEP director at UT MD Anderson Cancer Center, provided cancer education to Cameron Park Promotoras

Lap tap computers were purchased for each of the eight Promotoras. Computer training was provided to the Promotoras by the office of Instructional Design of the College of Veterinary Medicine at Texas A& M University. Acquisition of computer skills allowed them to use the Toxic Island CD-ROM to review environmental health concepts learned during the environmental health educational program.

Collaborations with other Texas COEPs have also provided the opportunity to work together in other grant proposals.

Impact of Outreach/Education Project (number of teachers trained, number of students/community residents reached, policy change, etc.)

Eight Promotoras were successfully trained on environmental health in the colonia Cameron Park, Texas.

Pre intervention assessment was performed in five hundred households and education of colonia residents as of September 2001 included four hundred households, with projections to complete the entire colonia by December 2001.

The "Train-the-Trainer" Program is helping us reach residents in Cameron Park to address the concerns expressed by residents of this community in a pre-intervention assessment completed by CERH scientists. Education of colonia residents will empower the community with the knowledge needed to make educated decisions about real and perceived risks to human health. At the same time, environmental health education will enhance the capacity of the communities to engage in the process of health prevention.

Benefits to COEPs and Centers Involved

The COEP supplement provided our COEP the opportunity to formalize inter-Center collaborations focusing on expansion of our bilingual environmental health science curriculum for Promotoras along the Texas-Mexico border.

Supplemental funding was used to support community outreach activities in the Lower Rio Grande Valley. This funding supported collaborative efforts with the NIEHS COEPs at UT Medical Branch and UT MD Anderson Cancer Center to incorporate asthma and cancer education into the existing curriculum, and to interact with these centers in training high school science teachers and students on environmental health.

The successes of our "Train-the-Trainer" Program have received attention from other federal agencies such as EPA and HRSA, and interest has developed in partnering with us to address safe drinking water issues in Hidalgo County. A contract to support these activities is currently being negotiated.

Specific benefits include:

1. **Curriculum Enhancement:** Two additional units, one in asthma and one in cancer were added to the Texas A&M COEP Environmental Health Science curriculum.

2. **Train-the-Trainer Program:** This program helped to expand the network of community outreach efforts of the CERH in this critical region of the State of Texas; and to promote a self-sustaining message of environmental disease prevention, behavior modification, and health promotion.

3. **PEER:** CD-ROM Toxic Island, one of the activities of the K-12 program (PEER), was translated into Spanish to enhance environmental health science knowledge of Promotoras. Two PEER co-investigators participated this summer in the training of teachers at the summer teacher-training institute offered by UT Medical Branch in Galveston.

4. **Bilingual Summer Teacher Training Institute K-12:** This year the program included scientists from the three NIEHS COEPs in Texas.

5. **Cancer CD-Rom Curriculum**

6. **Bench Tutorial Program:** This program provided the opportunity for two high schools to interact with center scientists in their laboratories, and to develop a project, to be presented at the upcoming fair in 2002.

7. **Participation of other Center scientists in Promotora education**

Assessment of Accomplishments

The effectiveness of the program was measured based on the results obtained from:

1. A detailed community pre intervention assessment
2. Pre and post tests for each of the lectures provided to the Promotoras
3. Final comprehensive test
4. Overall program evaluation
5. Written comments from community residents

Statistical analysis of the results obtained in the pre-intervention assessment will be completed by December 2001. These data will be compared to the results of a post-intervention assessment in the target community and is expected to provide important data on socio-economic factors influencing environmental literacy in the community of Cameron Park. The results of pre- and post-tests for each of the lectures provided to Promotoras, along with results from the final comprehensive test and the overall program evaluation indicated that we successfully fulfilled the specific goals of the program. Our collaboration with two University of Texas programs worked out as was expected, and deliverables were made to each program other as promised. It should also be noted that arrangements are being made to expand our "Train-the-Trainer" Program with funding from HRSA-EPA (approximately $150,000) to address safe drinking water issues in Hidalgo County.

Future Directions

- Among the most important plans is a post-intervention assessment of the target community to evaluate the effectiveness of outreach and education efforts in the Cameron Park colonia.

- We have also identified new outreach opportunities and already have initiated efforts to train church leaders and their communities in the Lower Rio Grande Valley on issues related to environmental health.

- Finally, we are committed to securing financial resources to continue expansion of our "Train-the-Trainer" Program to other colonias along the Texas Mexico border.

University of Arizona, Southwest Environmental Health Sciences Center

Lead COEP Name: Southwest Environmental Health Sciences Center, The University of Arizona
Partner COEP(s): None

Project Title: Integrating Multiple Perspectives Across the Curriculum for Today & Tomorrow (IMPACTT)

Project Specific Aims: 1. Develop and refine eight 9th grade level environmental health/environmental science integrated units. The units address Biodiversity, Endangered Species, Air Quality, Land and its Use, Water, Energy, Industry and the Environment, and Distribution of Goods and Services.

2. Implement the eight units during the 2000-2001 school year.

Outcomes/Results: The Southwest Environmental Health Sciences Center (SWEHSC) Community Outreach and Education Program (COEP) received supplementary funds to support the first year of a program called Integrating Multiple Perspectives Across the Curriculum for Today and Tomorrow (IMPACTT). IMPACTT is being developed in partnership with the Sunnyside Unified School District (SUSD) in Tucson, AZ and is a unique, fully integrated environmental health/environmental science academy or "school within a school."

The IMPACTT staff used the National and Arizona State Standards to create a completely integrated curriculum centered around the environment and environmental health. Participating students received all of their 9th grade academic credits including math, science, English, Outdoor Education (physical education), technology, careers, and health.

IMPACTT emphasizes environmental health through the context of traditional academic subjects, broad year-long umbrella themes, and focused thematic Units. The completely integrated design breaks the compartmentalized, often sterile and uninteresting paradigm of "worksheet-based" teaching. Instead it utilizes scientific inquiry and real-life experiences to teach. Students complete interesting and meaningful Major Projects within each Unit which allow them to achieve a comprehensive understanding of the complex web of multiple academic subjects and human motivation that constitute real world events and applications.

Table 1 shows the overall structure of IMPACTT and how it applies to the 9th grade level.

Table 1: IMPACTT Structure.

General Structure		9th Grade Level
Year-long Theme	→	9th grade – The Environment
4-6 Units Per Year	→	5 Units - Biodiversity, Endangered Species, Air Quality, Land Uses, Water
1-3 Major Projects Per Unit	→	10 Major Projects
Activities to Support Major Project	→	Specific Activities

The original Specific Aims of the pilot program were to "develop and refine eight 9th grade level environmental health/environmental science integrated units" and to "implement the eight units during the 2000-2001 school year." Instead we developed and implemented five integrated 9th grade units including Biodiversity, Endangered Species, Air Quality, Land and its Uses, and Water. The other two units were dropped because these five units had higher content priority and we wanted to spend enough time on each unit to ensure student mastery.

On the last page of the report is a table (Table 2) outlining the 9th grade Year-at-a-Glance which includes Major Projects and general content addressed in the 9th grade. Please note that content and concepts are continually reinforced throughout the year, but they are not repeated in the table to save space. For example, students continuously use the internet, word processing, and writing skills but they are only listed when they are introduced to the students in great detail.

Impact of Outreach Project: Development of the 9th grade component of IMPACTT began in October 1999 and was implemented during the 2000-1 school year. Forty students and six teachers, representing math, science, English, health, physical education, and technology/careers, participated in the pilot IMPACTT program. Due to limited financial and staffing resources during the pilot project, formal qualitative and quantitative assessments were narrow in scope. However, preliminary data shows that IMPACTT students received 20% fewer disciplinary referrals than the entire 9th grade Sunnyside class and 83% of IMPACTT students received A's in all 6 subjects compared with 66% of their non-IMPACTT peers. Also, according to the IMPACTT teachers, attendance is significantly higher in IMPACTT. Doug Cardell, the math teacher, noted that on the days skirting spring break he had only one absence (of 40 students) compared with greater than 25% absence in his other non-IMPACTT classes. Another success indicator is that the 10th grade IMPACTT class is filled to capacity with 30 students, 100% of which participated in IMPACTT last year.

Benefit to COEP: The greatest benefits to the COEP are the opportunity to develop new, unique environmental health curricula, and to demonstrate to teachers, students, and educational administrators the power of integrated education. Overall, we did accomplish our goals by developing and implementing a monumental, year-long, 6-subject environmental health curriculum. We will continue to refine the curriculum and eventually place it on the internet. We certainly encountered challenges over the past year, including developing the curriculum format, organizing classroom implementation between subjects and teachers, maximizing planning sessions, and trying to get six teachers to philosophically agree. The lessons learned last year are being implemented this year.

We have submitted a total of three grant applications. Two are multi-year grant applications to support the expansion of IMPACTT into a four year high school academy, and the third is an application to

partially support the 9th grade level for one year. The multi-year grant proposals are to NIH-SEPA for three years of support for $931,904 and to NSF for five years of support for $2,751,769. The third application is to Tucson Electric Power Company for $10,000.

Future Directions: Because of the pilot program's success, IMPACTT is continuing into its second year. We have eighteen 9th grade students enrolled (full capacity due to limited classroom size) and thirty 10th grade students (also full capacity). We are developing a completely new curriculum to support the 10th grade which is centered around the theme "World Explorations." Through "World Explorations" students are investigating the history of the world through science and environmental health.

TABLE 2: 9th Grade Year At-A-Glance Broad Content (Theme: The Environment)

Unit	*Major Projects*	*Science & Health Content*	*English Content*	*Technology Content*	*Math Content*	*Careers, Outdoor Ed. (P.E.), Cultural Content*
SEMESTER ONE						
Biodiversity	• Mapping your local ecosystem • Biodiversity Power Point presentation	• Ecosystems • Population density • Biomes • Human/Environment interactions • Co-evolution	• Vocabulary • Reading for information • Writing factual material • Observational skills	• Global Positioning Systems • Basic computer use • Word processing • Internet	• Cause & effect • Logic • Measurement • Functions • Modeling • Statistics graphs	• The Sonoran Desert • Habitat inventory • Career pathways • Cultural views of biodiversity • Medicinal & poisonous plants
Endangered Species	• Endangered species presentation • Your local conservation plan	• Causes of Extinction • Endangered Species Act	• Oral presentation • Writing notes	• Powerpoint • Internet	• Ratio & proportion • Percent • Axiomatic systems	• Sonoran Desert Conservation Plan • Protected species in Pima County
Land & Its Uses	• Build school gardens • Create a game about limited resources • Your Modest Proposal	• Food production • Logging • Ranching • Mining • Human population	• Organizational schemes • Reading period pieces • Writing response essays	• Paint/Draw programs • Graphing functions with a calculator	• Exponential versus linear growth • 2 variable statistics • Regression rates • Function graphs	• Gardening methods • Types of gardens • Composting • Outdoor activities
SEMESTER TWO						
Unit	***Major Project***	***Science & Health***	***English***	***Technology***	***Math***	***Outdoor Ed***
Water	• Take a personal water inventory • Lobbying for a water related cause	• Properties of water • Need for/uses of water • Water pollution	• Creative writing – symbolism, visual descriptions • Persuasive writing • Fact versus opinion	• How to set up a spreadsheet to record data • Water purification devices	• Budgeting • Calculating area	• Irrigation • Water saving plants • Cultural views of water
Air Quality	• Organize & implement a tobacco & health conference • Create a video documentary on cancer • Inform the community about local air quality issues	• Health effects of tobacco • Cancer • Indoor air quality • Outdoor air quality	• Planning & Organization • Promotional materials • Communicating with the public • Summarizing information • Telling a story using video	• Video recording & editing • Entering data into Excel • Graphing using Excel • Air quality monitoring equipment	• Data analysis • Significant figures • Standard deviation • Modeling cancer cell growth • Cancer and population statistics	• Air quality & plants • Healthy lifestyles • Ceremonial uses of tobacco

University of Medicine and Dentistry of New Jersey, Environmental and Occupational Health Sciences Center

Training Teachers, Reaching Students: The Spanish Bilingual *ToxRAP*™ Initiative
PROGRESS REPORT γ GRANT NO: P30 ES05022-13S1

Program Summary

The Community Outreach and Education Program (COEP) at the National Institute of Environmental Health Sciences (NIEHS) Center of Excellence in New Jersey is pleased to report the successful implementation of *Training Teachers, Reaching Students: The Spanish Bilingual ToxRAP™ Initiative.* This initiative is supported by NIEHS. The NIEHS Center of Excellence, Center for Environmental Health Sciences, is located at the Environmental and Occupational Health Sciences Institute (EOHSI) and is jointly sponsored by the University of Medicine and Dentistry of New Jersey-Robert Wood Johnson Medical School and Rutgers, The State University of New Jersey.

Sixty-four (64) K-8 Spanish bilingual teachers from four diverse New Jersey school districts participated in hands-on workshops that focused on environmental health issues and in the use of EOHSI's Spanish bilingual curricular materials. Following curriculum implementation, these teachers will reach approximately 1,300 students through this initiative. The *ToxRAP*™ workshops were rated very highly by Spanish bilingual teachers. On a scale from 1-4 (with 1=poor; 4=excellent), the average score for the overall value of the workshops was 3.99; the average score for the curricular materials was 3.95.

Program Achievements

The aims of this initiative are to improve the quality of environmental health sciences (EHS) education in K-6 Spanish bilingual classrooms and increase Spanish-speaking students' scientific literacy by disseminating award-winning and innovative EHS curricula through professional development programs for bilingual teachers The objectives of this initiative include the following.

Upon the completion of this one-year initiative,

A. A *ToxRAP*™ Team, comprising educational specialists, bilingual teachers and environmental health experts, will be established;
B Approximately 80 K-6 bilingual teachers will be trained in the use of the Spanish bilingual versions of the *ToxRAP*™ K-3 and 3-6 modules through workshops conducted by the *ToxRAP*™ Team;
C. At least 85% of participating teachers will rate the overall value of the workshops conducted by the *ToxRAP*™ Team at least 3.5 on a scale of 1 to 4 (1=poor; 4=excellent);
D. At least 75% of participating teachers will report learning about EHS concepts and being better prepared to teach EHS education in their bilingual classrooms;
E. At least 75% of participants will report implementing a majority of the *ToxRAP*™ lessons in their classrooms;
F. Approximately 1,500 K-6 Spanish-speaking students will gain a better understanding of EHS through using *ToxRAP*™; and
G. At least 75% of participating teachers will report enhanced critical thinking, problem solving and decision making skills among LEP students.

ToxRAP™ Bilingual Teacher Trainer Team

A *ToxRAP*™ Team comprising COEP educators, bilingual teachers and a scientist was established. Laura Hemminger, COEP Co-Director, and Suzanne Hooper, Environmental Health Educator, served as the COEP educators. Theresa Santiago and Marissa Ammerman, both bilingual teachers from the Perth Amboy School District in New Jersey, represented the Spanish bilingual teachers on the team and Sonia Mesia Vela, PhD, a research associate at EOHSI from South America served as the environmental health scientist. The bilingual teachers were very knowledgeable about the *ToxRAP*™ Framework as each had implemented the English version in their classrooms. The *ToxRAP*™ Team participated in a training, held in Piscataway, New Jersey, to develop a bilingual teacher workshop format to train Spanish bilingual teachers to implement the *ToxRAP*™ K-3 and 3-6 modules-Spanish versions. The Spanish bilingual workshop format was very similar to the workshop format followed for the English version of *ToxRAP*™. The warm-up activity and select lessons and activities were conducted in Spanish, the Spanish terms for the vocabulary were featured, additional information regarding how the materials address the New Jersey Core Curriculum Content Standards was provided and discussions regarding the use of the science terms was highlighted by the environmental health scientist, when necessary.

Bilingual Teacher Workshops

A total of sixty-four (64) teachers were trained as a result of participating in the workshops offered through this initiative. Workshops were conducted by the *ToxRAP*™ Bilingual Teacher Trainer Team and either focused on the Spanish version of the *ToxRAP*™ Early Elementary Module, "The Case of the Green Feathers," or the Intermediate Elementary Module, "What is Wrong with the Johnson Family?" See Table 1 for a breakdown of the workshops. (An additional 16 teachers will be trained on the curricular materials prior to end of the grant year.)

TABLE 1
***ToxRAP*™ Bilingual Teacher Workshops**

District	Curriculum	Teachers	Grades
Jersey City	CGF	22	K-3
Paterson	WJF	28	1-8
Perth Amboy	CGF & WJF	11	2nd & 5th
Plainfield	WJF	3	K-3

Key:CGF = *ToxRAP*™: The Case of the Green Feathers
WJF = *ToxRAP*™: What is Wrong with the Johnson Family?

The hands-on workshop format allowed teachers to fully experience the curricular activities in much the same way their Spanish-speaking students would in the classroom. Teachers learned how to educate Spanish-speaking students to evaluate environmental health problems using a risk assessment framework, and to convey the principles of toxicology, exposure assessment and industrial hygiene. By working with the materials and discovering how the activities build upon one another, teachers were prepared to teach the module in the classroom.

ToxRAP™*: The Case of the Green Feathers • Early Elementary Grade Teachers (K-3)*

"The Case of the Green Feathers" explores natural air contaminants, such as pollen, that can cause allergic or asthmatic reactions. Teachers participated in many of the hands-on activities, from properties of air activities to exposure activities to building a cubic meter box-demonstrating the measurement of pollen counts. To introduce teachers to the case study, participants read the oversized children's book, "The Case of the Green Feathers." (Teachers received a curriculum module, the storybook, a curriculum kit and resource information.)

ToxRAP™*: What is Wrong with the Johnson Family? • Intermediate Elementary Grade Teachers (3-6)*

"What is Wrong with the Johnson Family?" examines indoor air quality through an investigation of the Johnson family's unexplained health problems. Activities are conducted and games are played to help solve the mystery--carbon monoxide is leaking from a furnace that has a blocked chimney. Teachers

participated in many of the hands-on activities, from investigating parts per million to ranking each family member's risk level to learning about different control methods. To become familiar with the situation, participants first read the case study and played "What's in the Air?," a game about potential sources and health effects of indoor air hazards. (Teachers received a curriculum module, enough sets of the game to accommodate 30 students, a curriculum kit and resource information.)

Curriculum Implementation

After curriculum implementation (expected to be completed by December 2001), this initiative will enable more than 1,300 students to apply the risk assessment framework to many environmental health issues and which may reduce their exposure to potential pollutants. Students will role-play environmental health scientists and be introduced to careers in environmental health. Students will learn to recognize, evaluate and, when necessary, control contaminants. Students will also be able to describe the impact that environmental hazards have on human health, after experiencing first-hand the processes and tools scientists use to solve environmental problems.

Program Results (Evaluation)

A combination of techniques, including process evaluation, pre-/post-training assessment, interviewing and surveying, are being used to assess all phases of the project. Teachers complete an evaluation form (scantron) at the end of each workshop and will complete a program evaluation after curriculum implementation (December 2001). Evaluation data and written comments demonstrated that teachers were very enthusiastic about the workshops, reflected the quality of the instruction and showed the high applicability of the curricular materials for their classrooms.

Workshop Evaluation

The teachers' ratings of the workshops are of particular interest. Respondents applied a 4-point rating scale (1=poor; 4=excellent) to the variables listed in Table 2. The data represent the averages by workshop and the program as a whole, with all ratings above 3.85. The teachers' written comments reinforce the high ratings: "The workshop was interactive. It provided useful information and activities useful in the bilingual classroom" and "It's all real life 'stuff' and that's what the children/students are interested in."

Participants were also asked to report whether their comfort level in teaching the topics related to the curriculum, their interest in the topic and their ability to integrate the topic or materials into their regular curriculum changed (more, less or same) as a result of the *ToxRAP*™ workshops. As can be seen from the "All" category of Table 3, nearly all of teachers reported "more" for each of these categories. On written evaluation forms, one teacher wrote, "I was truly afraid of anything to do with science--not anymore. I now feel ready to talk about the subject!"

Finally, participants were asked whether they planned to use the curricular materials as a result of the workshop, whether they felt the workshop objectives had been met and whether they would recommend the workshop to colleagues. Of those reporting, 100% believed that the objectives of the workshops were completely met and 100% said that they would recommend the program to their colleagues.

Program Evaluation

In December 2001, participants will complete a program evaluation form. Teachers will indicate the perceived value of the workshop and curricular materials during the workshop sessions conducted by the *ToxRAP*™ Team. Program evaluation will determine the value and implementation of the curricular materials in the classroom. Teachers will be asked to report on length of time teaching from the unit, nature and extent of lesson and exercise adaptations, adequacy of materials, etc. Surveys will include teachers' perspectives of student learning as assessed with anecdotal data, aggregate outcomes from classroom exercises or assessments that are used with the curriculum.

Key for Tables 2-4: CGF = *ToxRAP*™: The Case of the Green Feathers • Early Elementary Module (Grades K-3)
WJF = *ToxRAP*™: What is Wrong with the Johnson Family?• Intermediate Elementary Module (Grades 3-6)

TABLE 2
Participants' Ratings of Initial Workshops on Select Variables
(1=poor, 2=fair, 3=good, 4=excellent)

ITEM	Jersey City CGF	Paterson WJF	Perth Amboy CGF &WJF	Plainfield CGF	**ALL**
Preparation & organization of instructor(s)	3.95	3.94	4.00	4.00	3.97
Responsiveness of instructor(s) to questions & concerns	3.86	4.00	4.00	4.00	3.97
Instruction in scientific content of the curriculum topics	3.86	3.89	4.00	4.00	3.94
Instruction in the application/adaptation of curriculum	3.95	4.00	4.00	4.00	3.99
Usefulness of workshop exercises/activities	3.90	4.00	4.00	4.00	3.98
Impression of curriculum & support materials	3.90	3.89	4.00	4.00	3.95
OVERALL VALUE OF WORKSHOP	3.95	4.00	4.00	4.00	3.99

TABLE 3
Self-Reported Effect of Workshop on Participants

As a result of attending the workshop, the percentage of participants who are:	Jersey City CGF	Paterson WJF	Perth Amboy CGF &WJF	Plainfield CGF	**ALL**
More comfortable in teaching about this topic	100%	100%	100%	100%	100%
More interested in teaching about this topic	100%	100%	100%	100%	100%
More able to integrate this topic/materials into their curriculum	100%	94.1%	100%	100%	98.5%

TABLE 4
Participants' Intent to Use Curricular Materials and Opinions Regarding Workshops

The percentage of participants who:	Jersey City CGF	Paterson WJF	Perth Amboy CGF &WJF	Plainfield CGF	**ALL**
Believe workshop objectives were completely met	100%	100%	100%	100%	100%
Would recommend workshop to colleagues	100%	100%	100%	100%	100%

University of New Mexico, Environmental Health Sciences Developmental Center

Lead COEP Name: University of New Mexico Health Sciences Center, Community Environmental Health Program (CEHP)

Project Title: Developing a Native American Risk Assessment Resource Network

Project Specific Aims: The specific aims of the COEP Supplement were:

1. To use the Cerro Grande Fire scenario as a model to develop a Case-Based Risk Assessment Training Module for Native American Communities.
2. To use presentation of this module to Pueblo Community Health Representatives (CHRs) and Environmental staff members to begin to establish a resource network within the tribes with a basic understanding of environmental health and emergency responses.
3. Begin to provide a network throughout the tribes that can continue trainings on other environmental topics of concern and meet the long-term objectives of developing an environmental health CHR position in each tribe.

Outcomes/Results of outreach/education project

A series of trainings has occurred which have included both CHRs and tribal Environment Department staff members. Miranda Cajero, an environmental scientist from Jemez Pueblo, was hired to assist in the development of the training module and coordinate with the pueblos to schedule trainings. Her participation has helped to ensure that teaching methods and content are culturally appropriate. Often when tribes encounter state and federal agencies regarding environmental health concerns tribal and cultural practices are not taken into consideration. Miranda and our multidisciplinary staff have incorporated into the module and teaching methods concepts that are culturally sensitive. In this way the tribal staffs are learning ways to evaluate land and water use and possible exposures without divulging sensitive practices that need to be kept private. During each presentation special attention has been taken to include discussion on specific concerns of the pueblo and their members.

It has become evident that the CHRs are overworked and understaffed and cannot take on the additional responsibility of becoming trainers themselves. Frequently there are only one or two CHRs for a community of 500 to 1000 people. Following participation in the fire risk module, there has been significant interest to learn about other environmental health concerns and subsequent trainings have included other topics, such as pesticide use and environmental lead exposures. Issues such as increased exposures resulting from unique resource use in cultural practices, interactions of environmental and occupational exposures, and bioaccumulation of contaminants have also been discussed. The director of Environmental Programs for Eight Northern Pueblos, Maxine Ewanko, has been an active participant in the program and continues to involve additional tribal members in the outreach effort. The outreach effort has also expanded beyond the Pueblos and been taken up in the Hispanic communities of Northern New Mexico, also affected by the Cerro Grande Fire.

Below is a list of places and dates with a brief synopsis of Risk Assessment trainings held to date. Evaluations from the trainings have been extremely positive. Summaries of the evaluations are available upon request.

- Indian Health Service 13th Annual Research Conference, April 24, 2001 in Albuquerque; 10 participants.
  This research conference's sessions are usually a time for hearing about current research being conducted in Native American communities. We were the only concurrent session that provided an opportunity for training that morning. It was the first time the material was presented; yet the overall evaluations and comments were good.

- Santa Clara, June 25, 2001 at the invitation of Santa Clara Pueblo; 14 participants.
  The participants were a mix of tribal environment department staff, summer interns, CHRs and community college environmental science students. The participant's level knowledge was very diverse and the small group sessions really benefited from this.

- San Ildefonso, July 26, 2001 at the invitation of San Ildefonso Pueblo; 7 participants.
  At this presentation the participants were all from the tribal environment department. The CHRs that were scheduled to attend were called away at the last moment. Many participants had already attended risk assessment trainings yet still found the module informative.

- Community Health Representatives Quarterly Meeting, August 17th, 2001, in Albuquerque, 17 participants, 15 evaluations received.
  The CHR quarterly meeting provided an opportunity to reach CHRs from many tribes in the area. The Pueblos represented were: Zia, Picuris, Cochiti, Jemez, Santa Clara, Taos, Zuni, and Isleta. The Jicarilla Apache tribe was also represented. Some of the Pueblos indicated that the CHRs and their environment department staff work closely together and others not at all. Those that collaborate shared their experiences and reinforced the concept of using the environmental staff as a resource.

- Zia Pueblo, August 29, 2001, invited by Zia Pueblo; 9 participants.
  A Zia CHR who had attended a presentation at the CHR Quarterly Meeting requested that CEHP provide a similar training on lead exposure for Zia Pueblo. A special presentation was developed on lead using the same basic concepts taught in the risk assessment module. The presentation was well received and included actual assessment of lead in some locally used ceramic ware.

- 5 Sandoval Indian Pueblos Incorporated, September 7th, by invitation. 8 participants.
  The Risk Assessment Module was presented by request following the CHR quarterly meeting, and a second presentation to the 5 Sandoval tribes on Pesticides has been requested for September 21st.

Benefit to COEP and Center, Assessment of Accomplishments

To date, trainings in environmental health have been provided to at least 12 of the New Mexico Tribal Communities. Many of these tribes have requested presentations based on either participation of a tribal member in a scheduled training, or through word-of-mouth reference to the program. In addition, tribes have requested additional trainings on other topics which we have been able to accommodate. More than 60 individual participants have received training to date, and a network is developing that is increasing the awareness of environmental health issues in these communities. In addition, the CEHP is becoming known as a resource which can be counted on to provide information and assist when problems arise.

Although the formal network of trainers originally anticipated has not yet been developed, a slower and steadier approach which involves the CEHP staff for a longer term has continued to gain momentum and helped to build trust with the tribal communities. As we move forward, we see this network continuing to develop and as we see some of the same faces attending multiple trainings, and contacting our office with questions, we are finding individuals that we are starting to incorporate in the trainings. Having a tribal member on staff to address some of the cultural concerns and to translate difficult concepts into Native languages has also helped to build the relationships and increase our understanding of some of the issues faced.

The program is increasing the awareness of potential environmental risks to health that can be observed during home visits and thereby helping to identify the major problems in the communities, allowing us to develop effective resources to provide information to both the CHRs and community members. We feel a level of confidence is developing that the CEHP can be a reliable source of information during community emergencies such as the Cerro Grande Fire, should such events occur in the future. This supplement, therefore, has filled a huge gap that existed at the time where many of the tribes were fearful and felt there was nowhere they could turn to for information they could trust. In addition, it provides a resource for the tribes to help them negotiate the governmental system as it impacts their health concerns around environmental issues.

The accomplishments resulting from the supplement have enabled us to obtain additional funding from the Association of Occupational and Environmental Clinics and the Agency for Toxic Substances Disease Registry to develop additional training modules and to formalize this and the additional modules for distribution to other communities. We also hope to make these trainings available via a website.

Future Directions.

We continue to provide trainings in environmental health to Pueblo lay health workers (CHRs) as well as environmental staffs. We are also working to use environmental health as a model that provides a framework for doing their home assessments, thereby continuing to identify environmental issues of concern to community health.

We have also begun to work with promotoras, or lay health workers in Hispanic communities to provide training and to address issues related to certification of lay health workers in a manner parallel to that used in the Native American communities. These trainings also use an environmental health approach as a core model for assessing health status.

We hope to seek additional funding to expand these trainings and to promote efforts to integrate lay health workers from both Hispanic and Native American communities into primary care practices in rural communities in the Southwest. This has been a long-term goal of our efforts with lay health workers as they are the major link to providing effective health care in these rural communities where language, culture, economics, and a lack of primary care providers combine to reduce access to health care.

A proposal has been submitted to CDC to incorporate lay health workers into asthma treatment programs in the state, and a parallel research proposal has been submitted to NIH and will be resubmitted in the coming year. Asthma remains a primary environmental health concern among both tribal and Hispanic communities throughout New Mexico.

University of Rochester, Environmental Health Sciences Center

Lead COEP:
University of Rochester Environmental Health Sciences Center

Partner COEP:
New York University School of Medicine (Dept. of Environmental Health Sciences)

Project Title:
Women's and Children's Environmental Health – New York State Regional Town Meetings

Project Specific Aims:

1. To inform the public about topics in environmental health that are of particular concern to women and children. Education on these topics was not limited to the actual or theoretical human health effects but how the community can take action to make change (i.e. contacting local politicians, changing existing habits or living conditions etc.).
2. To inform the public about the Environmental Health Sciences Centers sponsored by NIEHS and the Children's Environmental Health Research Centers, as well as local/regional agencies and community-based organizations that are concerned with environmental health.

Outcomes/Results of Outreach/Education Project
Three community forums have been held, so far (see Table 1 for a list of speakers) in Rochester, NY, East Greenbush, NY (a suburb of Albany) and in the Bronx, NY. In addition, a community lecture by noted environmental health author, Dr. Theo Colborn was held at the University of Rochester on April 23, 2001. The goal of these forums has been to inform and educate community members about environmental health concerns in their communities that are of particular interest to women and children. About 140-150 people attended each of the two Rochester events. The Albany event drew less people (about 50), as did the Bronx event (about 35).

The Rochester forum took place at the Rochester Museum and Science Center. The Albany forum took place at the State University of New York (SUNY) Albany School of Public Health. The Bronx forum was hosted at a local community college (Eugenio Maria de Hostos Community College). In an effort to reach the Spanish speaking population in the South Bronx, all materials including flyers, Bronx programs and posters were developed in English and Spanish.

Impact of outreach/education project
One objective of these forums was to inform the community about the NIEHS Environmental Health Sciences Centers (at NYU and Univ. of Rochester) and the community based organizations that are available as environmental health resources for their particular concerns. A community advisory committee was convened for the Bronx, NY forum, and consisted of four groups: Sports Foundation Inc., The Point, Youth Ministries for Peace & Justice and We/Stay Nos Quedamos. The Bronx forum also became a vehicle to make the public aware of a new air pollution study that NYU Center investigators have begun in the South Bronx.

In addition to educating the public about the pertinent environmental health topics and the various resources, collaboration with the community groups generated additional outreach activities. Sports Foundation Inc., in conjunction with NYU, subsequently conducted peer workshops with a group of high school students from the South Bronx. It is a six-week program that has includes education on various

environmental health issues and leadership workshops. The students recently visited NYU's Nelson Institute of Environmental Medicine. They were given a tour of the NYU-EPA van and were given a lecture on air pollution.

A partnership was formed with the Albany-based organization Environmental Advocates, in order to develop and promote the Albany forum. This community-based organization assisted us in locating local speakers, provided mailing lists, and helped to promote the forum throughout the greater Albany area.

The Rochester forum prompted interest in environmental health topics and issues from Rochester City government. The Rochester EHSC has become involved in the development of the Rochester City Environmental Stewardship Campaign, and will join with Rochester City Hall on October 1, 2001 to present a community environmental symposium.

The Rochester and Albany forums (as well as the Theo Colborn community lecture) included a photodocumentary display by local Rochester author Margaret Lee Braun entitled "DES Stories" Ms. Braun is past director and co-founder of the national DES Cancer network.. The Bronx forum included the exhibit of a 30-foot NYU-EPA mobile air pollution monitoring van to be used in an NYU study of South Bronx air pollution Technicians and instrumentation specialists were present in the van to answer questions and educate the community.

The Rochester and Bronx forums, and the Theo Colborn lecture generated a variety of media coverage. Dr. Markowitz and Dr. Weiss were interviewed by several Rochester television news stations prior to and during the Rochester forum. Prior to the Bronx forum, one of the most listened to radio stations in America, 1010 WINS, interviewed Dr. George Thurston on the town meeting and the South Bronx Air Pollution Project, and ran the story the evening before, and day of, the forum. The Bronx forum also generated TV coverage from WOR Channel 9 News, Bronx 12 (a local Bronx cable station) and several local Hispanic cable stations. Local newspapers also covered both of these events.

Benefit to COEP(s) and Center(s) involved: Assessment of Accomplishments
A questionnaire was developed as the assessment tool for the Bronx community forum (see Appendix 1 and Table 2. Questionnaires were distributed to all attendees although not all attendees filled them out. The mean effectiveness score was 1.59, which is midway between *Agree and Strongly Agree* that the topic was effectively covered. A general satisfaction survey was distributed at the Rochester and Albany events (see Appendix 2).

At the end of each of the community events, time was set aside for questions and comments by the community. Numerous community members expressed interest by asking questions of the speakers.

Although the Rochester events were well attended, several problems limited attendance at the Bronx and Albany events. We were unsuccessful in obtaining residential mailing lists from the community organizations to allow us to do direct mailings in the Bronx, as originally planned. The lack of media coverage for the Albany event may have significantly contributed to the low attendance. Another problem that impacted our Albany program was that the distance of the Rochester EHSC to this area. It is difficult to coordinate an event (and handle mailings, media coverage, etc.) that is not located in close proximity to our Centers. The Rochester events, located minutes from our University of Rochester EHS Center, were the most successful, with respect to community attendance.

Outreach materials developed for this project consisted of flyers, programs, posters and GIS maps that illustrated locations in the Bronx affected by air pollution. As previously mentioned all materials for the Bronx event were developed in English and Spanish.

Additional grant support was not needed for this project.

Future Directions.

The University of Rochester Environmental Health Sciences Center has formed a collaboration with the City of Rochester, as part of the Rochester 2010 Environmental Stewardship Campaign. We will be co-sponsoring a community environmental symposium on October 1. This event will focus on community environmental concerns of local Rochester citizens, particularly on what local government agencies are doing to address the concerns and how citizens can go about resolving environmental concerns.

New York University and the N.A.A.C.P (Newburgh Chapter) are in the process of planning a town meeting to be held in the fall in the city of Newburgh. Newburgh is located 40 miles north of New York City in Orange County. Preliminary meetings have taken place to discuss their town's environmental health concerns. The format of this meeting will be similar to the one held in the South Bronx. Community leaders from the town of Newburgh expressed the desire for adult education workshops on environmental health issues in addition to the town meeting.

TABLE 1
Community Forums: Speakers

Rochester, NY October 10, 2000

TOPIC	SPEAKER	AFFILIATION
NIEHS Environmental Health Sciences Centers	Deborah Cory-Slechta Ph.D.	Univ. of Rochester
Monroe County Environmental Health Report Card	Andrew Doniger, M.D., M.P.H.	Monroe County Health Department
Endocrine Disruptors	Tom Gasiewica, Ph.D.	Univ. of Rochester
Female Reproductive Hazards of the Workplace	Linda Karbonit, D.O., M.P.H.	Univ. of Rochester
Lead and Osteoporosis	Edward Puzas, Ph.D.	Univ. of Rochester
Breast Cancer and the Environment	Mary Wolff, Ph.D.	Mount Sinai School of Medicine
Interactive Q & A Session	Audience & Panel	

Albany, NY May 2, 2001

TOPIC	SPEAKER	AFFILIATION
Program Overview	Audrey Their, M.P.H.	Environmental Advocates
Toxic Exposures and Neurobehavioral Development	Bernard Weiss, Ph.D.	Univ. of Rochester
Breast Cancer and the Environment	Patricia Brown, Ph.D.	Siena College
Hazardous Waste Sites	David Carpenter, Ph.D..	University at Albany, SUNY
Endocrine Disruption	Tom Gasiewicz, Ph.D.	Univ. of Rochester
Mapping Environmental Hazards	Steven Romalewski	NY Public Interest Research Group
Interactive Q & A Session	Audience & Panel	

Bronx, NY June 16, 2001

TOPIC	SPEAKER	AFFILIATION
South Bronx Air Pollution Project	Lung Chi Chen Ph.D.	NYU
Asthma in the South Bronx	Ms. Yolanda Garcia	We Stay/Nos Quedamos
Air Pollution & Health	George D. Thurston Sc.D	NYU
Metals in the Urban Environment/Lead	Max Costa Ph.D.	NYU
Gas Generators in Your Neighborhood	Mathy Stanislaus Esq.	Enviro-Sciences Inc.
Community Involvement	Alexie Torres-Fleming	Youth Ministries for Peace & Justice
Interactive Q & A Session	Audience & Panel	

Table 2. Participant Evaluations of South Bronx Town Meeting Effectiveness

TOPIC	Strongly Agree 1	Agree 2	No Opinion 3	Disagree 4	Strongly Disagree 5	TOTAL	Weighted Value	Mean
Asthma Environmental Triggers	10	9	1	0	0	20	31	1.55
Asthma Prevalence Awareness	8	10	1	0	0	19	31	1.63
Air Pollution & Asthma	8	11	1	0	0	20	33	1.65
Air Pollution & Health Effects	6	13	1	0	0	20	35	1.75
Diesel & Air Pollution	8	11	1	0	0	20	33	1.65
Gas Generators	8	9	3	0	0	20	35	1.75
Lead & Health Effects	11	7	2	0	0	20	31	1.55
Lead Source Identification	9	9	2	0	0	20	33	1.65
S. Bronx Study Purpose	14	6	2	0	0	22	32	1.45
S. Bronx Study Van	13	5	3	0	0	21	32	1.52
Community Involvement	13	6	1	0	0	20	28	1.40
TOTAL	108	96	18	0	0	222	354	1.59

University of Southern California, Southern California Environmental Health Sciences Center

Lead COEP:
Southern California Environmental Health Sciences Center (SCEHSC),
University of Southern California/University of California, Los Angeles

Partner COEP:
Center for Environmental Health in Northern Manhattan (CEHNM),
Columbia University

Subcontractor:
West Harlem Environmental Action (WEACT) (in its capacity as Columbia University COEP community partner and COEP coordinator)

Community partners:
Environmental Health Coalition (EHC), Boyle Heights Mejoramiento, and Communities for a Better Environment (CBE)

Project title: Traffic and Public Health Program (TPHP)

Project specific aims:

a. Increase public understanding of vehicular traffic and human health effects in urban neighborhoods of Los Angeles (LA) and New York City (NYC), where environmental health problems resulting from heavy traffic are key scientific and community concerns.
b. Empower students and community residents to conduct their own measurements to quantify real-time exposures using a TPHP Toolbox;
c. Enhance science and math education in high school classrooms and further develop environmental leadership capabilities in students and in community group members; and
d. Increase public awareness of the connections between environmental justice and traffic.

Outcomes/Results:
The COEP partnership involved two NIEHS Centers, their COEPs, high school teachers and students, both undergraduate and graduate students and their professors, and several community-based organizations. Outcomes include:

a. Developed a Toolbox of sophisticated hands-on real-time traffic-related monitoring equipment that can be utilized effectively by both students as part of school field trips and by trained representatives of community groups. *SCEHSC has bought both particulate and noise monitoring equipment; Columbia is buying just air pollution devices.*
b. Reviewed existing air pollution curricula and developed a pilot week-long classroom curriculum unit directed at urban high school science students, focusing on urban air pollution issues and including a role-play exercise. The pilot unit focuses on biology, chemistry, and social sciences, including environmental justice. The air pollution curriculum covers: major components of air

pollution and their pathway into the body. How the environment influences air pollution levels. The role of traffic and combustion products. The respiratory system. The health effects of particulate matter, especially fine particles and diesel emissions. Acute versus chronic effects. Data collection and the weather. How to conduct a traffic count survey. What particulate matter is and how particles affect health. How to measure fine particles with a particle counter before, during, and after traffic passes. Calibration. Time activity patterns and exposure assessment. Measures that can be taken to lessen exposure. *In collaboration with the EHC in San Diego (under an NIEHS EJ grant) and using equipment bought under this NIEHS administrative supplement.*

c. Developed a framework for a 5-hour field trip for high school science students, during which students visit an air pollution monitoring station, conduct asset and hazard mapping of their neighborhoods, conduct traffic counts on a busy street (e.g., total number of vehicles and percent heavy duty trucks), and take real-time particle measurements of the traffic. *In collaboration with EHC/NIEHS EJ grant.*

d. Developing for Nov. 2001 an additional 2-hour pilot unit on Noise and Public Health. *SCEHSC in collaboration with CBE/NIEHS EJ grant.*

e. Developed a one-hour stand-alone unit on particulate matter health effects, introducing to students the concept of monitoring. *CEHNM/WEACT.*

f. Developing a month-long after school program on air pollution issues aimed at NYC high school students (Oct. 2001). WEACT will pilot test the effectiveness of the new joint curriculum as an after-school program.

g. Used parts of the new curriculum in a summer project for 10 high school students ("The Earth Crew)" from various NYC neighborhoods (Harlem, the Bronx, etc.) that focused on traffic and air pollution, with an emphasis on outdoor ozone monitoring. *WEACT in collaboration with Environmental Defense.*

Impact of project:

* Number of teachers trained to date: 15
* Number of students reached to date: 160, including 90 monolingual Spanish-speaking biology and chemistry students who were taught completely in Spanish
* Number of additional students to be reached in 2001: 75
* Number of additional students to be reached in early 2002: 60
* Number of community group leaders/directors educated on traffic and public health issues: 17
  -- 12 at Liberty Hill Foundation Environmental Justice Institute
* Number of college and graduate students conducting special projects on traffic and public health topics in conjunction with the NIEHS Centers: 8

Benefit to COEP(s) and Center(s) involved:

The two Centers' COEPs have developed a very positive working relationship and collaboration as a result of this administrative supplement. Both COEPs are concerned about disproportionate impacts from traffic-related air pollution and their joint efforts have enhanced their abilities in this area, especially with the additional of real-time monitoring capabilities for particles. CEHN/WEACT has been praised for its technical expertise in working with community residents on air pollution issues by the EPA. In addition, the SCEHSC COEP has been praised by the California Air Resources Board (CARB) for selecting to teach the new air pollution curriculum in 3 communities where CARB recently installed air pollution monitors under a new Children and Air Pollution law, allowing student field trips.

Assessment of Accomplishments:
In some areas, we have accomplished more than we set out to do. For example, the SCEHSC COEP managed to combine its resources (e.g., the newly purchased monitoring equipment) under this Administrative Supplement with those of its NIEHS EJ grant partners (EHC and CBE). As a result, the SCEHSC and CBE trained science teachers (whom we had not anticipated training) in using the equipment. Many more students were educated than we had anticipated – including monolingual Spanish speakers – because the SCEHSC was able to partner with the EHC in San Diego. The SCEHSC taught classes in English; EHC staff taught in Spanish.

We have accomplished many of our goals; we are still actively working on this joint project. Andrea Hricko was to do a Toxic Tour of West Harlem with Swati Prakash of WEACT in September 2001, but this was postponed until December due to the September 11th tragedy. Swati Prakash, Environmental Health Director at WEACT and COEP Coordinator of the Columbia University Center will visit L.A. in November 2001 and teach part of the air pollution curriculum at Banning High School in Wilmington, which is near the Port of L.A. We have not yet begun to develop the unique website that is planned for this project. We hope to begin work on the website following the L.A.Town Hall Meeting in Dec. 2001 (for which we will be hiring a website designer).

The SCEHSC COEP has obtained a small grant ($5,000) from the Liberty Hill Foundation to assist two fledgling community groups in L.A. with their work on reducing public health threats from traffic issues – a direct result of this administrative supplement.

A community group (Boyle Heights Mejoramiento) received a small grant ($5,000) from Liberty Hill to work with the SCEHSC COEP in training students on using the new particle and noise meters. WEACT, supported by its close outreach collaboration with Columbia University, has obtained an EPA EMPACT grant ($200,000) that will allow it to purchase real-time *stationary* monitoring equipment and report results to community residents. Although the EPA grant was not a direct result of this administrative supplement, WEACT staff will purchase additional portable equipment under the supplement to enhance its capabilities of doing *portable* readings of particulate matter.

A new curriculum has been developed and pilot-tested as a result of this supplement; it is being revised and pilot tested again and will be ready for distribution in May 2001.

Future Directions:
We do not consider the project over and are continuing our joint efforts. This project has greatly enhanced the air pollution monitoring capabilities and the ability of both COEPs to provide education and training on air pollution. Each COEP is now in a position to provide technical assistance and work more closely with both community residents and students on these issues. For example, CEHNM/WEACT has been asked to assist a group of residents that is newly concerned about diesel exposures from a garbage truck depot in its neighborhood, and the SCEHSC's COEP has just been asked to evaluate particulate and noise levels in a neighborhood of L.A. that is surrounded by three freeways. In addition, college students have been trained in using the monitoring equipment and have developed student projects involving real-time measurements.

University of Texas M.D. Anderson Cancer Center, Science Park Research Division, Center for Research on Environmental Disease

LEAD COEP:

Center for Research on Environmental Disease at the MD Anderson Cancer Center, Science Park Research Division, Smithville, TX

PARTNER COEPS:

NIEHS Center in Environmental Toxicology, The University of Texas Medical Branch at Galveston (UTMB)
Center on Environmental & Rural Health (CERH), Texas A&M University (TAMU)

Other contributors:

- CRED faculty, including Drs. Gerry Adair, David Mitchell, and David Johnson.
- The Molecular Biology Facility Core, including Dr. J.J. Shen and Mr. Sean Hensley, and the Cell Analysis Facility Core, including Mr. Kent Claypool.
- Ms. Chris Yone – graphics artist

1. COEP and CRED staff, Don Cook, Sydni McGahan, Terry Krueger and Joe Rodriguez

PROJECT TITLE

"CD ROM based Curriculum Enhancement for High School Students"
Production and distribution of a new environmental health and science curriculum: SCREAM (Student Cancer Research Education and Assessment Module) Against Cancer.

SPECIFIC AIMS

1. **To produce and distribute an environmental science and health curriculum enhancement on CD-ROM for high school students, grades 9-12.**
   The primary responsibility of the CRED COEP is to design a new environmental curriculum enhancement, featuring Center research on disease susceptibility and environmental risk factors. The goals are to enhance secondary school education in Texas, to improve students' comprehension of environmental science and research, and to provide information to help students make healthy lifestyle choices.
2. **To implement a collaborative bench tutorial program for high school students at the three participating centers, at TAMU, UTMB and UT MD Anderson, Smithville.**
   The CRED COEP will expand and modify their existing high school internship program to adopt the UTMB model and implement the Bench Tutorial Program on all three campuses. In addition, the CRED COEP will sponsor the year-end symposium for participating students on the UTMB campus.
3. **To support the Summer Teacher Training Institute, being developed by the COEP at UTMB, in order to promote utilization of new curriculum enhancement, bench tutorials and other NIEHS-sponsored educational materials in Texas schools.**
   The CRED COEP will attend the teacher institute, supply and present the CD ROM-based enhancement, and participate in training workshops and ancillary seminars.

   In addition, as part of the interactive supplement submitted by the CERH COEP at Texas A&M University, the CRED COEP will participate in the *Promotoras* training program. The CRED COEP will: 1) provide the "Environment and Cancer" slide module that includes educational

materials on environmental carcinogenesis, and 2) travel to Cameron Park to provide the training session for the *Promotoras*.

OUTCOMES AND RESULTS

- Development of new CD ROM based curriculum enhancement for high school students

Content

During the course of the previous 10 months the CD ROM development team, including the CRED COEP, Ms. Christie Snodgrass, a high school science teacher from Brady TX, and Griffon Animations, have collaborated to design, storyboard, script, and animate the curriculum. Initial decisions concerning overall appearance, organization, site mapping and navigation, color schemes, and developmental processes were made at the first 3 meetings of the group. Monthly meetings of the development team are continuing as the last module is finalized and alterations and upgrades are completed.

The CD-Rom content is based on the original "Environment and Cancer" slide module developed by CRED faculty to teach basic principals of toxicology, cellular biology, risk assessment, genetics and environmental risk factors. The scientific content was expanded and translated into appropriate language for high school students, and adapted for classroom use by addition of interactive activities, illustrative animations, virtual experiments, demonstrations and self-assessment quizzes. The purpose of the original slide module and the high school curriculum enhancement is to foster an improved understanding of how environmental factors and individual genetics interact to impact the risk of disease, especially cancer. The long-term goals include improving environmental science and health education in our state, and assisting students and adults in making better informed, healthier lifestyle choices to reduce their cancer risk.

The curriculum enhancement consists of 5 modules, including the Introduction, DNA and the Genetic Code, Cancer and the Cell Cycle, Genes and Gene Mutation and Environmental Risk Factors. Each module is further subdivided into lessons, relevant activities and demonstrations that reinforce the concepts, and a self-assessment quiz. The CD-ROM is, at this time, about 80% complete. At present we have finished the first four modules and have proceeded with initial rounds of evaluation and debugging. The final module covering environmental risk factors, including: a.) Sun and DNA Damage, b.) Tobacco, c.) Pesticides and Xenobiotics, and, d.) Diet and Nutrition, is currently in development, with completion anticipated by the end of 2001. The project also includes the development of a teacher workbook with supplementary materials, lesson plans, evaluation forms and a full discussion of the state-mandated curricular requirements (Texas Essential Knowledge and Skills, TEKS) addressed by the sections of the enhancement.

Distribution and Testing

Teachers were first able to see and evaluate the curriculum enhancement at the Summer Institute, on August 3, 2001. The response was extremely favorable and comments and suggestions have proven useful as the development of the enhancement continues. The participating teachers voiced approval and enthusiasm and were anxious to utilize the CD ROM in their classrooms.

As proposed, the Curriculum Enhancement will also be presented at two workshops at this years' CAST, Conference to Advance Science Teaching, to be held in Austin on November 1-3, 2001. This is the largest professional conference of science educators in the state, and will provide us with an opportunity to present and discuss the enhancement in two, 90-minute workshops. Evaluations of the content and usefulness will be solicited from all workshop participants. In addition, all teachers attending the CAST and the Summer Institute will receive copies of the curriculum enhancement and accompanying teacher workbook when they are completed.

- Development of collaborative high school internship using the Bench Tutorial Model developed by the COEP at UTMB.

  This year two high school students from the CRED intern program joined 22 students from UTMB in the Bench Tutorial program. Ms. Kristen Adams and Mr. Jonathan Snyder also traveled to Galveston to take part in the year-end symposium held on May 19, 2001. Both of the CRED students made oral presentations of their work at the symposium and both received awards for the their presentations. Ms Adams, who worked in the laboratory of Dr. Robin Fuchs-Young, gave a presentation of her research, entitled: Expression in Uterine Myometrium from Wild Type and Progesterone Receptor Knockout Mice. Mr. Snyder, who worked in the laboratory of Dr. Ellen Richie, presented a talk entitled: IGF-1 Promotes Thymic Epithelial Development.

  The daylong symposium included an oral presentation session in the morning, followed by a catered lunch, afternoon poster session and awards ceremony. Both CRED students reported being nervous, but "really enjoying" the day and the "chance to meet other students doing research".

- Collaborate with the COEP at TAMU in training of Promotoras, using translated educational materials on environmental carcinogens.

  On February 20, 2001,the CRED COEP Director accompanied Dr. Irma Ramos and other CERH members to the Cameron Park Colonia, and presented the Environment and Cancer slide module to the Promotoras. Dr. Ramos reported that the Promotoras enjoyed the presentation and specifically requested that this module be included in the instructional materials used to inform and educate residents of the Colonia about environmental carcinogens. In response, the translated module was loaded onto computers for the Promotoras to use during their visits to homes in the Colonia.

Benefit to COEPs and IMPACT OF EDUCATIONAL PROJECT

The interactive supplements succeeded in enhancing collaboration among the three Texas COEPs, allowing each Outreach program to benefit from shared expertise and resources. In addition, the COEPs were able to leverage particular strengths of each of the centers to produce better, more extensive programs. A significant increase in communication among COEP personnel was achieved. The supplements also provided a framework for continuing collaboration, and plans for extending and continuing the Teacher Training Institute and Bench Tutorials at all three Centers are ongoing.

The summer Teacher Training Institute provided the CRED COEP with an opportunity to present and solicit evaluations of the curriculum enhancement during development. Participating teachers evaluated the curriculum enhancement in 4 areas; realization of objectives, appropriateness of content and activities, effective use of technology and value of quizzes for evaluating student learning. Of responding teachers, 70% gave the enhancement the highest rating in each of the categories and 14% gave it the next to highest (4 of 5) rating. The responses were overwhelmingly positive, and teachers expressed willingness to utilize the curriculum enhancement and the anticipation that the materials would be a useful addition to their lesson plans. Comments from workshop participants included:

"useful for most of my classes"
the module met my expectations, "and more",
"I expect a great product"
"I really liked this and it is (sic) very useful in my class".

In addition, several participants made helpful suggestions, most notably, to increase the emphasis on environmental aspects.

FUTURE DIRECTIONS

We anticipate completing the development of the content of the curriculum enhancement by the end of 2001 and will begin extensive evaluation and beta testing in Bastrop County, Brady, and Galveston schools. We will utilize pre- and post-testing to evaluate the level of student learning resulting from use of the curriculum enhancement in these test classrooms. In addition, evaluations and suggestions from the CAST workshops and future Teacher Training Institutes will be incorporated.

As proposed, distribution of the final version of the CD-ROM will be accomplished via the Teacher Training Institute, in-service professional development workshops, CAST and the Science Coordinators at the TEA Regional Service Centers throughout Texas. Our goal is to have the CD-Rom in use in at least one school in each of the TEA regions within one year of completion, and to double this within two years. We will maintain a database of teachers/schools using the curriculum, and contact teachers periodically to solicit their evaluations. The materials will be provided free of charge to any teacher or school requesting it, but evaluations of its impact and utility will be expected from recipients.

The CRED Outreach Program will continue to collaborate with the other Texas COEPs on expanding the Bench Tutorial Program, an annual Teacher Training Institute, and ongoing training of Promotoras. It is our intention to investigate opportunities for additional collaborative funding to support integrated programs to enhance professional development for teachers, and environmental science and health education for students and community health workers in our state.

Content of the CD-ROM based Curriculum Enhancement for High School Students is shown on the following page.

Content of the CD-ROM based Curriculum Enhancement for High School Students

SCREAM against Cancer

Student Cancer Research Education and Assessment Module

Section I *Introduction – What is your environment?*
Environmental Assessment Activity

Section II. *DNA and the Genetic code*
- *DNA Tutorial*
- *PCR Tutorial*
- *DNA Sequencing Activity*
- *Gel Electrophoresis Activity with movie*
- *Quiz*

Section III. *Cancer and the Cell Cycle*
- *Cell Cycle Tutorial*
- *Flow Cytometry and Fluorescence Tutorial*
- *Flow Cytometry and the Cell Cycle Activity*
- *Quiz*

Section IV. *Genes and Gene Mutation*
- *Gene Tutorial*
- *Direct Detection of Mutations – Activity*
- *Quiz*

Section V. *Environmental Risk Factors*
- *Sunlight and Skin Cancer Tutorial*
- *Tobacco and Cancer Tutorial*
- *Pesticides and Xenobiotics Tutorial*
- *Diet and Nutrition Tutorial*
- *Assessing Risk Activity*

University of Texas Medical Branch at Galveston, Center in Environmental Toxicology

LEAD COEP:

NIEHS Center in Environmental Toxicology, The University of Texas Medical Branch at Galveston (UTMB)

PARTNER COEPS:

- Center for Research on Environmental Disease (CRED), University of Texas, MD Anderson Cancer Center, Sciences Research Park, Smithville
- Center on Environmental & Rural Health (CERH), Texas A&M University (TAMU)
- Environmental & Occupational Health Sciences Institute (EOHSI), University of Medicine & Dentistry of New Jersey/Rutgers University (UMDNJ)

OTHER COLLABORATORS:

- Center for Community Education, Baylor College of Medicine
- College of Education, Southwest Texas State University (SWTSU)

PROJECT TITLE

Environmental Health Sciences Summer Institute for K-12 Educators

SPECIFIC AIMS:

As a result of supplementary funding awarded by the National Institute of Environmental Health Sciences, the Community Outreach & Education Program at the University of Texas Medical Branch sought to offer professional development opportunities in environmental health sciences to K-12 educators throughout Texas by creating a teacher-training institute. This unique educational opportunity for teachers included a series of one-day workshops to train teachers on priority environmental health issues and in the implementation of several of the nation's NIEHS Centers' curricular materials and NIEHS sponsored curricular materials, thus making it the first comprehensive and multi-centered collaboration of its kind. The goal of the Environmental Health Sciences Summer Institute for K-12 Educators (here after referred to as the Summer Institute) was to explore the critical interrelationships between human health and the environment. The Summer Institute took place on the campus of Southwest Texas State University in San Marcos, Texas, from July 31st to August 3rd, 2001. Workshops, pursuing the connection between health and the environment, focused on cancer, genetics, cell biology, indoor and outdoor air pollution, lead poisoning, water quality and toxicology. Additionally, trainers taught ways to identify an individual's role and responsibility in preventing environmental problems before they occur. It was also the goal of the Summer Institute to not only increase teachers' understanding and awareness of environmental and health-related issues, but to increase the availability and quality of the necessary tools and knowledge to engage students' minds in hands-on learning about the environmental health sciences. The curricular materials employed throughout the Summer Institute sought to educate teachers about not only the issues that directly impact their lives, but also gained knowledge about the mechanisms (biological, toxicological) by which they affect their lives through the use of scientific inquiry.

The Environmental Health Sciences Summer Institute served to:

- Raise awareness of environmental health issues and to provide much needed resources and opportunities for teachers with English as a second language and border populations.
- Increase availability and improve quality of environmental health science curricular materials used in the schools.

- Address interdisciplinary learner-centered education through integration of curricular materials in the language arts, science and math.
- Enable students to make informed decisions about their environment and their health while improving critical thinking and problem solving skills.
- Create a set of student-friendly materials that will allow students to develop an informed appreciation for the scientific method and rational analysis of issues affecting them, as they become educated citizens.

OUTCOMES & RESULTS

The three Texas NIEHS Center COEPs embarked on an exciting collaboration that offered a unique exchange of ideas, resources and programs amongst one another. The supplemental award initiated and made possible the first in-depth partnership in the development and implementation of a 'pipeline' into Texas schools to deliver environmental health science education. The plan envisioned bringing extant environmental health materials (EOHSI, Baylor and CERH) into the schools in addition to creating new models like the CRED's cancer education CD-ROM for high school students.

Participating teachers received training, curricular materials and supplementary materials for their chosen workshop(s) focusing on environmental and health issues. Teachers attended the workshops free of charge (food and housing included) and could have also received travel awards for reimbursement of transportation costs. The travel grants were initiated to increase attendance from all over the state of Texas - exactly 50% of all attendants were awarded a travel grant. Participants hailed from half of all the regions in the state of Texas (NOTE: The state of Texas is divided into 20 regions administered by Region Education Service Centers - each region is then made up of school districts). The location for the Summer Institute, central Texas, was chosen because of its proximal reach to the diverse and distant regions of the state. In addition, Southwest Texas State University has the largest number of newly certified teachers in the state of Texas that graduate annually from the College of Education.

Each workshop demonstrated how curricular materials are aligned with the state's education standards, Texas Essential Knowledge and Skills (TEKS). Through participation in the Summer Institute, teachers were given numerous ways in which to address subject integration, especially with respect to the language arts (reading, writing, speaking and listening). Several concerns that were addressed in the implementation of the curricular materials offered during the Summer Institute were:

- Scientific "process and content" are both important and can be taught through integrated teaching
- Curricular materials are visual in scope, thus aiding a linguistically and culturally diverse student population in Texas
- Prior knowledge is important for comprehension, and curricular materials will aid in building knowledge, allowing for easier comprehension of textbooks
- Curricular materials stress higher order thinking skills rather than literal memory of facts/content

IMPACT OF EDUCATION PROJECT

Proposed measurable objectives of the Summer Institute are as follows:

- Introduce and promote environmental health science curricular materials to both bilingual and English speaking teachers
- 300 teachers, grades K-12, will participate in the Summer Institute
- 90% (or more) of participating teachers will rate the Summer Institute highly
- 20% (or more) of participating teachers use English as a second language
- 40% (or more) of all participating independent school districts will be low income, low population density or of predominant minority status
- 75% (or more) of participating teachers will report learning new knowledge and feeling more prepared to teach environmental health sciences issues

- 75% (or more) of participating teachers will report integrating workshop materials into classroom learning during the 2001/2002 school year

Reported measurable objectives of the Summer Institute are as follows:

- The Summer Institute offered a variety of workshops focusing on cancer, genetics, cell biology, indoor and outdoor air pollution, lead poisoning, water quality and toxicology. All Spanish workshops were combined with their English counterpart *(SEE BELOW)*.
- Although it was anticipated to enroll almost 300 teachers, the Summer Institute had 101 participating teachers. Of the workshops offered, teachers often attended more than one, thus filling half of the workshops almost to capacity (capacity being 30 persons). Without a prior presence in the state of Texas, we were gratified by what should still be considered an extremely strong response from Texas educators. We anticipate word of mouth will increase this number substantially next year.
- 97% of all participating teachers rated the Summer Institute as highly valuable and useful. All teachers gave the Summer Institute an overall grade of an A or an A+ (out of a possible grading range of A, B, C, D, & F)

INDIVIDUAL COMMENTARY FROM TEACHERS:

- *Great Job: Please continue for 2002!*
- *I really appreciate the free lodging and food provided!!*
- *Thank you for providing this free of charge - it made it easier to be able to come!*
- *Thanks for giving me the opportunity to attend and for putting together this huge project.*

NOTE: The only negative commentary received from teachers about the Summer Institute regarded the temperature of the workshop rooms and breakfast, being that it was too high in sugar content.

- The bilingual workshops were combined with their English workshop counterpart with the intent of offering either Spanish or English curricular materials to teachers. -- 10% of all workshop participants use English as a second language.
- 40% of all participating independent school districts are low income, low population density or of predominant minority status. To this end, recruitment efforts to reach these regions directly addresses the concerns of the NIEHS for increased environmental education among minorities and specifically to approach growing efforts to address border health issues.
- 97% of all participating teachers chose to attend the Summer Institute to improve their knowledge of science. In rating individual workshop content on a scale of 1-5 (1 being the highest grade and 5 being the lowest) all workshops were ranked within a range of 1-2.2.
- All participants stated that they would implement the curriculum, yet many commented that they would do so with slight modifications. At this juncture, information has not been obtained to determine whether participating teachers have indeed implemented the curricular materials. Phone interviews will be conducted in the spring to ascertain how teachers have integrated the curricula into classroom learning.

BENEFIT TO COEP INVOLVEMENT & FUTURE DIRECTIONS - BUILDING A PRESENCE

By collaborating with other NIEHS Center COEPs to provide professional development opportunities to teachers in Texas, we have begun to build a presence and a reputation as an authority on important environmental health science issues. The Summer Institute will serve as an annual forum to train and disseminate NIEHS sponsored materials as well as NIEHS Center developed materials.

With additional funding, the three Texas NIEHS Centers hope to hold a Second Annual Environmental Health Sciences Summer Institute on the campus of Southwest Texas State University projected to take

place during a similar time period. All previous collaborators have agreed to participate in offering the same workshops as well as implementing newly developed curriculum. New strategies will be developed in order to build a larger presence in the state of Texas as the authority for environmental health sciences curricula. Grant support from a variety of institutions including the Environmental Protection Agency will be sought during the next year to ensure the success of a Summer Institute in the year 2002. The Centers' hope is to gradually build a presence in the state of Texas by offering professional development opportunities and environmental health information to K-12 educators in a variety of ways.

- COEP Newsletter sponsored by the three Texas NIEHS Centers
- Annual Summer Institutes
- Forming Region Education Service Center networks
- Participation in Texas professional development conferences

Generating support and enthusiasm for the Summer Institute has proven not to be difficult in the state of Texas as evidenced by the overwhelming positive feedback from the participating teachers and trainers. However, ensuring statewide coverage and publicity in the year to follow will require many mailings and much effort towards networking with individual independent school districts. Teachers were asked to suggest ways to market to teachers, keeping in mind that our strategy was to sample teachers randomly through direct mailings, principal bulletin boards and listing professional development opportunities with the Region Education Service Centers. Throughout the next year, we will incorporate emailings, Internet based marketing, journal advertisements and many other mechanisms that we hope will prove successful in building a presence.

We are very excited by how successful the first Summer Institute concluded and hope that this may serve as a catalyst for bringing together more NIEHS Centers in attempting to coordinate COEPs' professional development efforts.

University of Washington, Center for Ecogenetics and Environmental Health

Lead COEP:

Center for Ecogenetics and Environmental Health at the University of Washington, Seattle (David L. Eaton, Director)

Project Title:

Youth Network for Healthy Communities (YNHC)

Project Specific Aims:

Project staff will:

1. Use the statewide k20 multi-point videoconference system to introduce 48 Washington State middle and high school teachers to the field of environmental health and prepare them to mentor their students in community research projects;
2. Motivate 480 Washington State middle and high school students to identify and research environmental health issues in their communities;
3. Organize quarterly videoconferences for participating students to share their projects with CEEH scientists as well as state and federal industry and education representatives;
4. Seek to create a sustainable statewide *Youth Network for Healthy Communities* to foster continued engagement in environmental health issues;
5. Evaluate the success of the project, especially with regards to the role of the videoconference technology;
6. Publish an online project summary.

Outcomes and Results

The COEP administrative supplement awarded in 2000 allowed the Center for Ecogenetics and Environmental Health (CEEH) to explore a new way to involve young people around Washington State in environmental health issues in their communities. The *Youth Network for Healthy Communities Project* is the result of a collaboration between two Washington high school teachers and Center faculty and staff. This pilot project uses Washington's relatively new statewide k20 videoconference network to train middle and high school teachers to help their students research environmental health issues in their communities. The students then present their projects to university scientists and environmental health professionals at the University of Washington using the videoconference technology. The teacher orientation is also conducted via videoconference.

The project has been a great success. Most of the stated aims were met in the first year, and because the project has been under budget thus far, a second year of sessions will be possible without additional funding. By the end of the 2001-02 sessions, the project will have met or exceeded all of its original aims.

In the past year there have been several planning committee meetings as well as the following sessions:

Fall Session
August 29, 2000: Teacher Orientation Videoconference
September 29, 2000: Fall Student Presentation Videoconference

Winter Session
January 17, 2001: Teacher Orientation Videoconference
February 28, 2001: Winter Student Presentation Videoconference

Spring Session
March 21, 2001: Teacher Orientation Videoconference
April 25, 2001: Spring Student Presentation Videoconference

Through the concerted efforts of project staff, participants from every part of the state were involved. The map below shows the sites that participated in the 2000-01 sessions.

Locations of schools participating in the 2000-01 YNHC sessions

Highlights of the 2000-01 year included:

Recruitment: Teacher participants were recruited through presentations and exhibits at two large professional conferences (Northwest Council for Computer Education and Tomorrow's Classroom), as well as by word of mouth.

Materials: Based on feedback from teacher and student participants, project materials were refined throughout the first year. The 2001-02 version of the *YNHC Teacher's Guide* extends and improves upon the original materials.

Video Production: The digital camcorder purchased with funds from the supplemental award allowed staff to edit, copy, and distribute footage of sessions to teachers for use in their classroom. A short (20 minute) promotional video was also created for use at events.

Impact of Project

Specific Aims 1 and 2 of the original proposal set a goal for the project of reaching 48 teachers and 480 students. Project staff quickly learned, however, that it was unrealistic to expect 16 teachers to participate in a singe session. The technical logistics and time allotted made that impossible. Instead, a maximum of eight sites per session, each with a single teacher participant, is optimal. Fortunately, each teacher also involved more students in the project than was originally assumed. All the teachers participating in the project worked with a minimum of 25 students. As a result, the project trained a total of 19 teachers and reached approximately 475 students during the 2000-01 sessions. The 2001-02 sessions are expected to achieve similar results, nearly doubling the total number of students reached. This means that by the end of the second year, the project will have reached twice the number of students originally projected without the need for additional funds.

Benefits to COEP and the Center

The YNHC project has increased the visibility of the Center and raised awareness about its research agenda statewide. In addition, it has generated interest from other departments at the University of Washington who are interested in using the k20 network for effective educational outreach. Finally, it has given Center researchers a new and relatively easy way to become involved in COEP activities. The student presentation sessions are a success because the students receive feedback on their work from subject matter experts assembled at the Center site. Researchers are able to have face to face contact with students from around the state, while only committing a few hours of their valuable time. This allows scientists who are hesitant to involve themselves in outreach to do so for the first time, without fear of too large a time commitment.

Assessment of Accomplishments

The success of this pilot project has exceeded expectations. It has made large numbers of teachers and students around Washington state aware, in many cases for the first time, of environmental health issues in their communities. Through their research activities, the students also raise awareness about these issues beyond the boundaries of the classroom. Students in Wenatchee, for example, researched the possible health impacts of emissions from diesel power generators that had recently been installed at a local power plant. A few days after they had presented their findings in the videoconference session, they chose to attend a public hearing on the issue on their own time to share their expertise and views. This ripple effect of the project's impact more than validates the resources required to implement the program.

The evaluation results from both teachers and students have also been encouraging. As part of the evaluation, both teachers and students were asked to give the project an overall rating on the following scale:

very poor	poor	good	excellent	outstanding
1	2	3	4	5

The average teacher response was 4.2. The average student response was 3.8. Teachers were particularly enthusiastic about the use of new technology, the community-based aspect of the project, and the interaction between schools. Students appreciated the opportunity to develop presentation and communication skills, connect with other schools, and have direct interactions with university faculty and staff. When asked what was most useful about the experience, one student wrote the following: "I found that it helped bring our class together. It made us be creative and insightful. We learned a lot about our town."

Future Directions

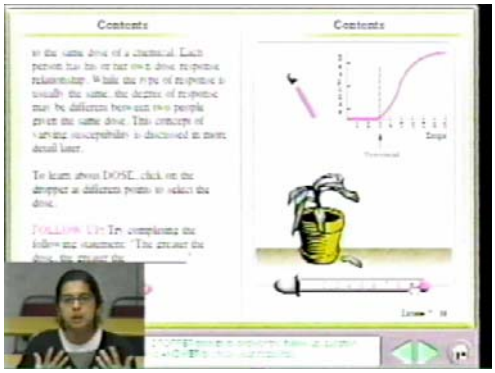
As the project enters its second year, COEP staff have identified the following specific aims:

- Introduce at least 18 more teachers to the field of environmental health and prepare them to mentor their students in community research projects;
- motivate at least 450 more Washington State middle and high school students to identify and research environmental health issues in their communities;
- conduct three teacher orientations and three student presentation videoconferences;
- continue to evaluate the success of the project;
- publish an online project summary with video clips of sample student projects;
- present the project at a regional or national education conference (to be determined).

Images from the 2000-01 YNHC Videoconferences

Dr. Ken Olden, Dr. David Eaton, Marina Cofer-Wildsmith, and other environmental health professionals attend the first student presentation videoconference in September 2001

Students from Wenatchee High School perform a song about the health effects of wildfires



COEP program manager Chetana Acharya uses an animation from a CD-ROM developed by the CEEH to demonstrate dose-response to teachers during a teacher orientation session

Students from Oroville High School demonstrate dose-response

Vanderbilt University, Center in Molecular Toxicology

Lead COEP:
Vanderbilt University

Project Title:
Center Associates Program

Specific Aims
The Center Associates Program is a curriculum and professional development program designed for a wide array of individuals in science or a science-related profession. The individuals eligible for the program include, but not limited to, faculty from Vanderbilt and other area colleges and universities, community health professionals, high school and elementary teachers, and professionals from governmental and private organizations.

This program is designed to provide educational and facility support for the program participants from the Center. The participants of the program will receive support from the Center to perform projects in the area of toxicology, environmental health, or general and specialized science. High school and elementary teachers are able to receive mini-grants of up to $500 and/or general support such as scientific expertise from the Center to perform projects in the area of toxicology, environmental health, or general and specialized science.

To become eligible for the Associates Program, individuals had to apply to the Center or be recommended by Center faculty. The applicant submitted an abstract of work to be performed in conjunction with the Center to the program committee where they reviewed the application and recommended to be accepted into the Associates Program.

Once the project was completed, a report was submitted from the participants to the Center. Upon completion of the first year of the Associates Program, the reports will then be compiled and reproduced in booklet form that will be disseminated to the public through the Center's outreach program.

Year One Outcomes I
Dr. Glenn Marsch, Macon Elementary and Sweetwater High School participated as initial members in the first year the Associates Program. Dr. Marsch is a professor in the Department of Chemistry and Physics from Union University in Jackson. Dr. Marsch and an undergraduate student, Mr. Brent Morris performed research at the Center and was mentored under Dr. F.P. Guengerich. Dr. Marsch published the paper "Characterization of Nucleoside and DNA Adducts Formed by S-(1-Acetoxymethyl) Glutathione and Implications for Dihalomethane-Glutathione Conjuagates" in *Chemical Research in Toxicology* **2001**, 14, 600-608, in which, it shows the structures of DNA damage caused by a compound modeling methylene chloride (Appendix 3). In addition, it also describes a new, rapid protocol used to break DNA into its constitutive units under acidic conditions, important because the adducts are unstable under neutral or alkaline conditions. Ms. Jane Hobson from Macon Elementary in Memphis received assistance from the Center to perform an environmental health assessment of the Wolf River and Fletcher Creek. The class performed a variety of research exercises including biotic and abiotic measurements of environmental health. The students from several of the classes participating in the activity sent their research findings to the City of Memphis officials and received a response (Appendix 4). Fred Camp's class from Sweetwater High School in Sweetwater also received assistance to perform an environmental

health assessment of local streams in their area. Students received instruction and equipment to perform a variety of research projects. Pictures and laboratory reports will be published on the Center's website (www.toxicology.mc.vanderbilt.edu) and in subsequent newsletters.

Year One Outcomes II

After the initial program period, the Center's Outreach Program accepted 11 new groups/individuals to participate in the Center Associates Program for 2001-2002. Community and school educators were primarily recruited. For example, the Cumberland Science Museum in Nashville, a science and health education facility, submitted abstracts to the Associates Program for assistance in helping educate the community on environmental health hazards such as tobacco smoke. Other applicants focused on general support in school science activities such as needs for laboratory equipment for chemistry, toxicology and biology experiments. These projects range from assistance in performing classroom/school health research focusing on Sick Building Syndrome (SBS) to examinations of pGLO bacterial transformations by 8th grade students. For example, St. Rose School in Murfreesboro plans to survey the types of molds and fungi, while Hume-Fogg High School in Nashville, students will attempt to identify environmental health hazards such as fungal growth, air, dust and paint among other parameters. Students will formulate and test hypothesis during the study gaining experience with sterile technique, microscopy maintaining a laboratory notebook and data analysis. A community group that sponsors Nashville's "Walk to School Day" submitted abstract to assist metropolitan Nashville students identify and report environmental and health hazards along their way to school. The results of the projects, pictures and laboratory reports will be published on the Center's website and in subsequent publications such as the center's *Toxikon Tattler*, a school newsletter. It is estimated that over 1000 school age children from Tennessee will participate in activities funded through the Center Associate's Program.

Benefit to Outreach Program

The Associates Program has greatly benefited Outreach Program in a variety of ways. Directly attributed to Associates Program and a host of additional outreach and education activities, the Center's Outreach Program is well on its way to becoming the environmental health and research contact for schools and educators in Middle Tennessee. The Associates Program has helped in solidifying and gaining new education contacts in Tennessee and has provided leadership in environmental health issues.

Future Directions

The Associates Program has opened doors within the community and will continue to do so. The Tennessee Arts and Science Consortium (TASC), a new group of community science and outreach educators in Middle Tennessee has been instrumental in highlighting the program and its benefits in recent months. New opportunities are developing with partners in TASC to recruit new associates. The Center hopes to increase members in the program (target number 15 groups or individuals) through the year 200-2003 by focusing on community groups and K-12 educators. The Center plans to invite several of the schools groups to present and highlight their work with the Associates Program at the 2002 Center in Molecular Toxicology Open House, an event that highlights Center research to the undergraduate students and the community.

Attachments

I. "Characterization of Nucleoside and DNA Adducts Formed by S-(1-Acetoxymethyl) Glutathione and Implications for Dihalomethane-Glutathione Conjuagates" in *Chemical Research in Toxicology* **2001**, 14, 600-608.
II. City of Memphis letter

Wayne State University, Center for Molecular and Cellular Toxicology

COEP Name:
Wayne State University, EHS Center COEP, Mary Oriold Dereski, Ph.D. COEP Director

Project Title:
Healthy Homes=Healthy Kids

Project Specific Aims:
The Healthy Homes= Healthy Kids program is specifically aimed at indoor environmental factors that affect the health of underserved/underprivileged children. The supplement was used to develop an environmental health educational program (Healthy Homes = Healthy Kids) for Head Start grantees in Detroit that specifically service families of low-income pre-school children ages three to five. The Healthy Homes=Healthy Kids program is composed of two elements: A poster highlighting the environmental health topics; and fact sheets outlining educational and prevention measures for six topics that appear on the poster. The poster and each of the fact sheets were also translated into Spanish and Arabic. Resources for more information on these topics are also available through the offices of the COEP.

Impact of the Project:
The Healthy Homes = Healthy Kids program is the outcome of a collaboration between the COEP of the EHS Center, the Healthy Homes=Healthy Kids, Detroit Project, and the Southeast Michigan Head Start delegate. The following list includes the Head Start grantees in Detroit that will receive the materials that were developed by the Healthy Homes=Healthy Kids program.

Head Start Grantees in Detroit

City of Detroit	5031 Grandy Avenue	Detroit, 48211
Detroit Public Schools Head Start	13141 Rosa Parks Boulevard	Detroit, 48238
Franklin Wright Settlement, Inc.	8726 Woodward Avenue	Detroit, 48202
Hartford Memorial Baptist Church	13800 West Seven Mile Road	Detroit, 48235
Metropolitan Baptist Church Children and Youth, Inc.	P.O. Box 38445 13110 14th Street	Detroit, 48238
Neighborhood Services Department	5031 Grandy Ave.	Detroit, 48211
New Calvary Head Start, Inc.	3975 Concord	Detroit, 48207
New St. Paul Tabernacle	15340 Southfield Dr.	Detroit, 48223
Order of Fishermen's Ministry	10025 Grand River Avenue	Detroit, 48204
United Children and Families Head Start	13110 14th Street	Detroit, 48238
Vistas Nuevas Head Start	2450 South Beatrice	Detroit, 48217

The grantees will follow through on dissemination of the program materials as well as provide information on resources for obtaining supplies and equipment necessary to implement preventative measures. Distribution of all materials will be made through workshops for parents of children targeted by Head Start parenting programs. Workshops are free and offered city-wide for the months of September, October, November, January, February, and March. The first meeting will be utilized as an overview of the program, and to introduce the topics that will be the focus of all subsequent meetings. All Delegate grantee members will receive a copies of the poster and fact sheets. Head Start has projected there will be receipt of these materials by at least 7,000 families. Further use of the Healthy Homes project materials will be made at various health fairs and health related meetings throughout the year through the regular outreach efforts of the EHS Center.

Benefit to COEP and Center:
The Environmental Health Sciences (EHS) Center at Wayne State University is focused on studying the effects of environmental chemicals on human health and disease progression. The Community Outreach and Education Program (COEP) is an integral portion of the EHS Center connecting the research activities of the Center members with the needs and concerns of the community. It is the mission of the COEP to translate into lay terms the basic science research that is conducted at the EHS Center in the area of environmental health. The targeted project for this COEP administrative supplement, the "Healthy Homes = Healthy Kids" project for a large part expands the translation of current areas of research interest of the Wayne State University Environmental Health Sciences (EHS) member topics such as: lead poisoning prevention; reduced exposure to environmental triggers of asthma; pesticide exposure and management; and arsenic exposure through indoor water sources. This new endeavor has increased the scope and number of individuals that will become aware of the educational outreach efforts of the EHS Center regarding prevention strategies available in various areas of environmental health concern.

Assessment of Accomplishments:
The endeavors of the past year have allowed the development of the poster and fact sheets outlined in the proposal for the supplement. The production of the materials was a joint effort of the partners in this proposal (EHS COEP, Detroit Head Start, and Healthy Homes=Healthy Kids, Detroit Project). Additional support is currently being requested from Region 5 EPA for dissemination of the developed materials.

Future directions:
The Healthy Homes=Healthy Kids materials will be disseminated through the Head Start Program in the city of Detroit. The EHS Center and the Healthy Homes=Healthy Kids, Detroit Project will assist with this dissemination and training in the project materials. Further discussions are being undertaken with other universities to disseminate the project materials through other educational outreach programs.

The following are examples of the materials produced for the Healthy Homes=Healthy Kids program:

Appendix

Appendix 1

COMMUNITY FORUM EVALUATION

As a result of this forum to what extent are the following statements true?
Circle your response below.

Strongly Agree (1) *Agree (2) No Opinion (3)* *Disagree (4)* *Strongly Disagree (5)*

ASTHMA					
I now have a better understanding of the environmental triggers of an asthma attack	1	2	3	4	5
I am now more aware of the prevalence of asthma in my community	1	2	3	4	5
AIR POLLUTION					
I am now more aware of how air pollution can exacerbate asthma	1	2	3	4	5
I now have a better understanding of the health effects of air pollution.	1	2	3	4	5
DIESEL					
I am more informed about how diesel pollution can effect my health	1	2	3	4	5
GAS GENERATORS					
I am more informed about the issue of generators being placed in my community.	1	2	3	4	5
LEAD					
I am more aware of the harmful health effects of lead.	1	2	3	4	5
I am now able to identify one possible source of lead in my home.	1	2	3	4	5
SOUTH BRONX AIR POLLUTION STUDY					
I understand why the ***South Bronx Air Pollution Study*** is being conducted.	1	2	3	4	5
I understand why the EPA van is being used in this study.	1	2	3	4	5
COMMUNITY INVOLVEMENT					
I am aware of how I can make a difference in my community.	1	2	3	4	5

Sponsored By:
New York University School of Medicine
National Institute of Environmental Health Sciences:
Center Grant ES01247 & SUPERFUND BRP
In conjunction with your Local Community Organizations:
We Stay/Nos Quedamos, Sports Foundation, The Point,
Youth Ministries for Peace & Justice, Inc

APPENDIX 2

Environmental Hazards:
The Implications for Women's and Children's Health
May 2, 2001
Evaluation Questionnaire

Optional Information:

Name _____

Address _____

How did you find out about this event?

Did you attend the event as a representative of a community group or organization?

What was the most important fact that you learned at this event?

Were the presentations clear and understandable? Please feel free to comment on individual presentations?

Did the event meet with your expectation? Please fell free to elaborate.

Are there any other topics that you would have liked to learn about at this forum?

Thank you very much for your time!

Appendix 3

"Characterization of Nucleoside and DNA Adducts Formed by S-(1-Acetoxymethyl) Glutathione and Implications for Dihalomethane-Glutathione Conjuagates" in *Chemical Research in Toxicology* **2001**, 14, 600-608.

600 *Chem. Res. Toxicol.* **2001,** *14,* 600−608

Characterization of Nucleoside and DNA Adducts Formed by *S*-(1-Acetoxymethyl)glutathione and Implications for Dihalomethane−Glutathione Conjugates

Glenn A. Marsch,[‡,§] Ralf G. Mundkowski,[∥] Brent J. Morris,[‡,§] M. Lisa Manier,[‡] Melanie K. Hartman,[‡] and F. Peter Guengerich*,[‡]

Department of Biochemistry and Center in Molecular Toxicology, Vanderbilt University School of Medicine, Nashville, Tennessee 37232, and Department of Chemistry and Physics, Union University, Jackson, Tennessee 38305

Received January 9, 2001

S-(1-Acetoxymethyl)glutathione ($GSCH_2OAc$) was synthesized and used as a model for the reaction of glutathione (GSH)-dihaloalkane conjugates with nucleosides and DNA. Previously, *S*-[1-(N^2-deoxyguanosinyl)methyl]GSH had been identified as the major adduct formed in the reaction of $GSCH_2OAc$ with deoxyguanosine. $GSCH_2OAc$ was incubated with the three remaining deoxyribonucleosides to identify other possible adducts. Adducts to all three nucleosides were found using electrospray ionization mass spectrometry (ESI MS). The adduct of $GSCH_2OAc$ and deoxyadenosine was formed in yield of up to 0.05% and was identified as *S*-[1-(N^7-deoxyadenosinyl)methyl]GSH. The pyrimidine deoxyribonucleoside adducts were formed more efficiently, resulting in yields of 1 and 2% for the $GSCH_2OAc$ adducts derived from thymidine and deoxycytidine, respectively, but their lability prevented their structural identification by ^1H NMR. On the basis of the available UV spectra, we propose the structures *S*-[1-(N^3-thymidinyl)methyl]GSH and *S*-[1-(N^4-deoxycytidinyl)methyl]GSH. Because adduct degradation occurred most rapidly at alkaline and neutral pH values, an enzymatic DNA digestion procedure was developed for the rapid hydrolysis of DNA to deoxyribonucleosides at acidic pH. DNA digests were completed in less than 2 h with a two-step method, which consisted of a 15 min incubation of DNA with high concentrations of deoxyribonuclease II and phosphodiesterase II at pH 4.5, followed by incubation of resulting nucleotides with acid phosphatase. Analysis of the hydrolysis products by HPLC-ESI-MS indicated the presence of the thymidine adduct.

Appendix 4

City of Memphis
TENNESSEE

DR. WILLIE W. HERENTON - Mayor
RICK MASSON - Chief Administrative Officer
DIVISION OF PUBLIC WORKS
JERRY R. COLLINS JR. - Director
Stormwater Management

March 19, 2001

Macon Road Elementary School
968 N.Mendenhall Rd.
Memphis, TN 38122
Attn. Mrs.Canary or Mrs.Sneed

Dear Students of Mrs.Canary and Mrs.Sneed,

In February 2001, you students wrote Mr.Tom Lawrence letters concerning the "spikes" in the flow of Fletcher Creek as measured at the United States Geological Survey gauging station at Sycamore View. Those spikes in flow are caused by rain running off into Fletcher Creek. The area that drains into Fletcher Creek, called a **watershed** has many parking lots and buildings. Parking lots and buildings cause water to run off quickly into storm drains which empty into Fletcher Creek because the water cannot soak into asphalt and concrete. It does not take much rain at all to make a flow spike. If the **watershed** was forest and open fields, the water would soak in and the rain would not run off nearly as fast, causing a less sharp flow spike than you all see now. There could be other sources of flow that causes a flow spike as well.

As to your concerns about detergents in Fletcher Creek, car washes are supposed to be connected to the sanitary sewer, not the storm drain. I will keep watching for car washes discharging detergent into the storm drain.

As to other sources of pollution, I am responsible for taking care of pollution sources that enter Fletcher Creek. If you, your parents, or your teachers see anyone putting paint, soap, oil or other pollution in Fletcher Creek, please let me know. You may reach me at **529-0237**.

I have enclosed some business cards to take home to your parents and some stickers with the City logo, "Storm Water Matters" as well.

Sincerely;

James H. Baker

James H.Baker, Environmental Technician, City of Memphis Storm Water Program

c. Mr.Tom Lawrence
File

c:\Macon Rd School.wpd

664 St. Jude Place • Memphis, Tennessee 38105-2800 • (901) 529-0237

Part II

Selected Presentation Slides, Given at the 59th Annual Center Directors Meeting, Austin, Texas, October 30, 2001

II.1 Mount Desert Island Biological Laboratory, Center for Membrane Toxicity Studies

Presenter: Michael McKernan

COEP Supplement Report

Center for Membrane Toxicity Studies

Michael McKernan, Director of Education

Community Environmental Toxicology Laboratory

RESEARCH EDUCATE IMPLEMENT

MDI Biological Lab

• collaborative project with Mount Desert Island (MDI) Water Quality Coalition

Specific Aims

- Establish the lab—space, equipment, supplies
- Involve local schools
- Involve local teachers
- Summer research fellowships
- Educate the community on the direct correlation of good human health and healthy water
- Conference on community based water-quality laboratories

Student Fellowships

- Swim Beach Program
- Phytoplankton monitoring
- Watershed studies
- Clam flat studies
- Public meetings

Future Aims

- Include all Union 98 schools in water quality studies at the Laboratory

- Integration with science curriculum/teaching at proposed Salt Pond School

- Enhance toxicologic studies of the Laboratory with participation from year-round investigator in toxicology/toxicogenomics

II.2 Texas A&M University, Center for Environmental and Rural Health

Presenter: Irma Ramos

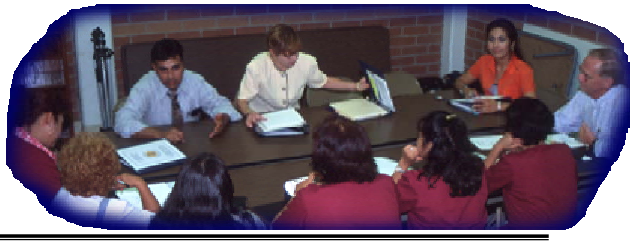
NIEHS Center for Environmental and Rural Health

Community Outreach and Education Program

Texas A&M University

Irma N. Ramos, M.D., Director

Environmental Health Training of Promotoras Along the Texas-Mexico Border



Partners

- *UTMB Community Outreach and Education Program*
  The University of Texas Medical Branch Galveston
- *Center for Research on Environmental Disease (CRED)*
  The University of Texas MD Anderson Cancer Center Science Park

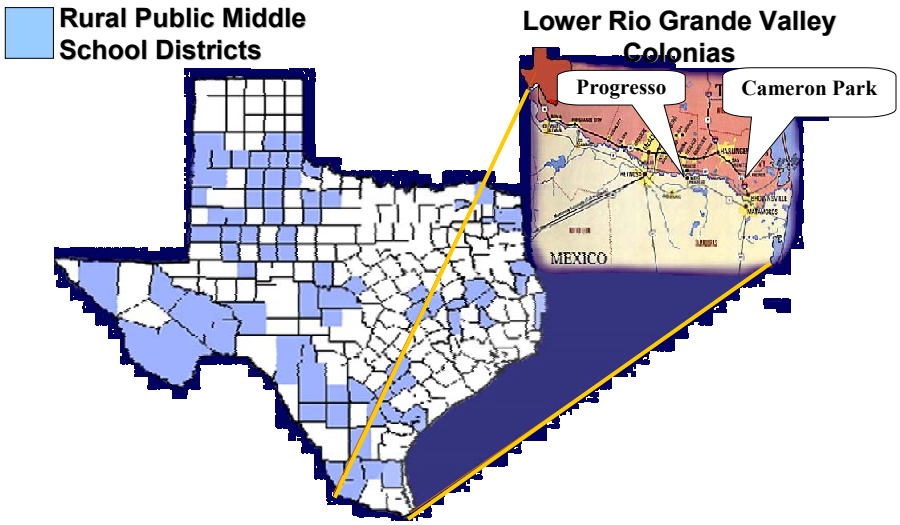
NIEHS Center for Environmental and Rural Health

Specific Objectives

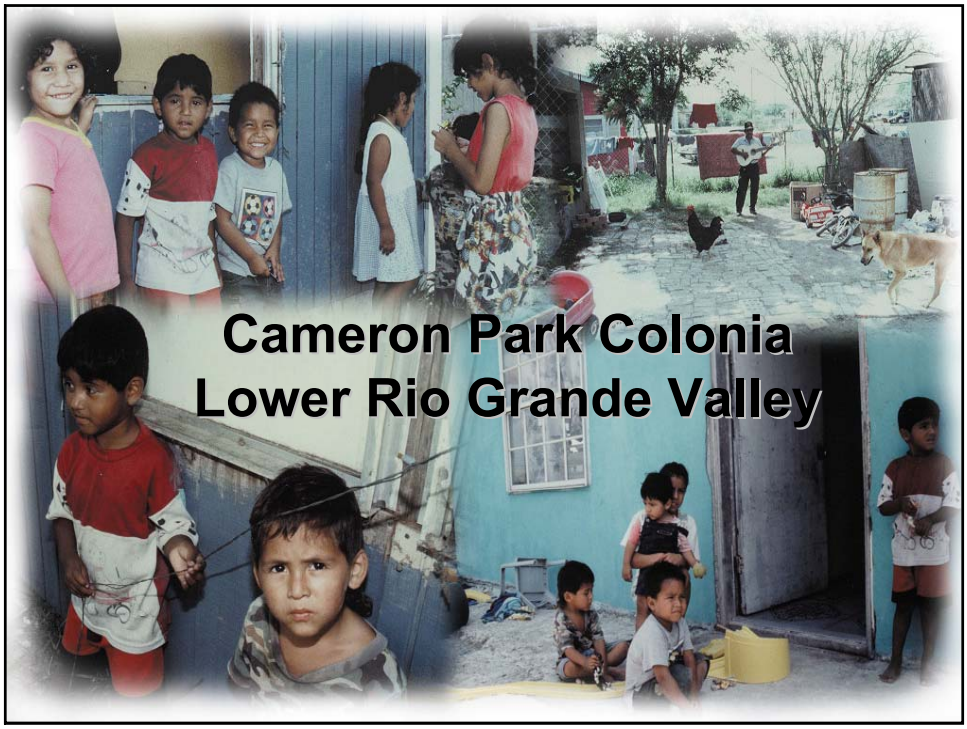
1. To enhance and implement an existing bilingual curriculum on environmental health for community outreach workers (Promotoras) in Cameron Park and Progresso, two Hispanic communities (colonias) along the Texas-Mexico border.

NIEHS Center for Environmental and Rural Health

Focus Areas



NIEHS Center for Environmental and Rural Health

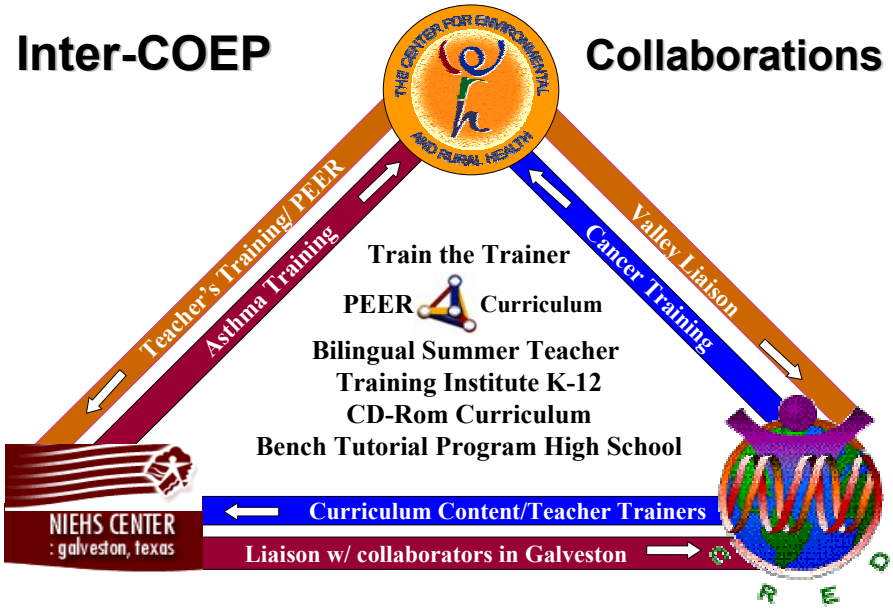


Specific Objectives

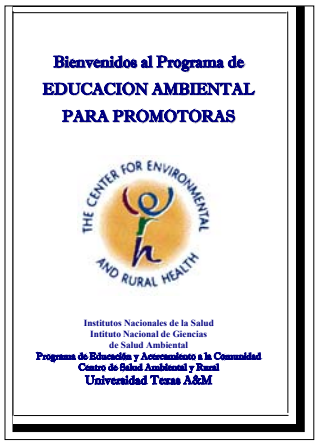
1. To enhance and implement a bilingual curriculum on environmental health for community outreach workers (Promotoras) in Cameron Park and Progresso, two Hispanic communities (colonias) along the Texas-Mexico border.
2. To expand collaborations with UT Medical Branch in Galveston and UT MD Anderson Cancer Center.

NIEHS Center for Environmental and Rural Health

Major Accomplishments



Environmental Health Science Curriculum for Promotoras


Bienvenidos al Programa de
EDUCACION AMBIENTAL
PARA PROMOTORAS

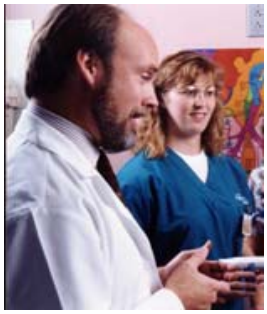
THE CENTER FOR ENVIRONMENTAL AND RURAL HEALTH

Institutos Nacionales de la Salud
Intituto Nacional de Giencias
de Salud Ambiental
Programa de Educación y Acercamiento a la Comunidad
Centro de Salud Ambiental y Rural
Universidad Texas A&M

- General principles of toxicology and environmental health
- Nutrition
- Pesticides
- Occupational safety
- Water Safety
- Birth defects
- Asthma
- Cancer

NIEHS Center for Environmental and Rural Health

Cameron Park Promotora Training



Dr. Edward Brooks
UT-MB Galveston
Childhood Asthma

Promotoras in Cameron Park

Dr. Robin Fuchs-Young, CRED
Cancer and the Environment

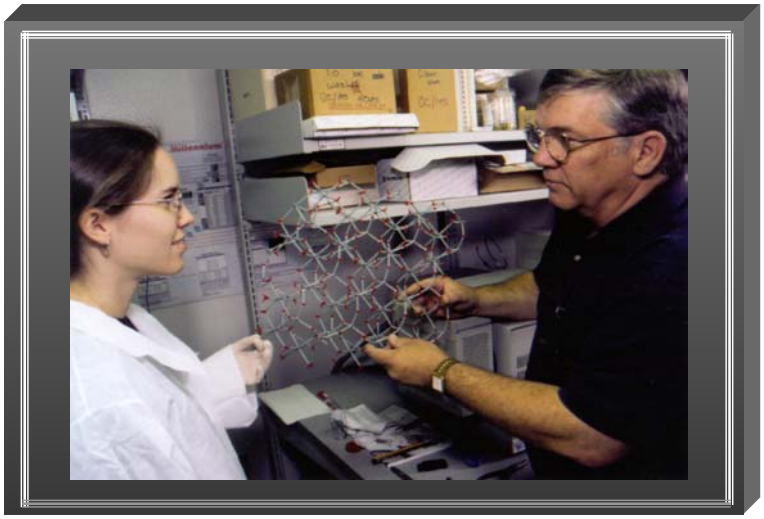
UTMB Bilingual Summer Teacher Training Institute K-12

Dr. William Klemm
PEER Co-Investigator

Dr. Jon Hunter
PEER Co-Investigator

NIEHS Center for Environmental and Rural Health

CRED Bench Tutorial Program



NIEHS Center for Environmental and Rural Health

Thank you for helping us promote a self-sustaining message of environmental disease prevention, behavior modification, and health promotion in colonias along the Texas-Mexico border.

NIEHS Center for Environmental and Rural Health

II.3 University of Arizona, Southwest Environmental Health Sciences Center

Presenter: Stefani Hines

Southwest Environmental Health Sciences Center

IMPACTT

Integrating Multiple Perspectives
Across the Curriculum for
Today & Tomorrow

Southwest Environmental Health Sciences Center

IMPACTT

- Completely integrated environmental health high school academy
- Systemic reform

Southwest Environmental Health Sciences Center

Which Means?

- Integrated
  - Subjects are not isolated packets
  - Science, math, English, P.E. & social studies are integrated together
- Environmental Health
  - Science is the backbone of the program
  - E.H. is the "hook" and continuous thread

Southwest Environmental Health Sciences Center

Which Means? Cont'd

- High School
  - 9th & 10th grade currently implemented
  - 11th & 12th grades will be added
- Academy
  - "School within a school"
  - All year, all day
  - All required academic credits
  - Any student can enroll

Southwest Environmental Health Sciences Center

Systemic Reform

- Fundamentally different approach to education.
- This is not a band aid, this is major restorative surgery.

Southwest Environmental Health Sciences Center

How?

- Fundamental principles that drive our program
  - Process oriented
  - Mastery of skills
  - Systems thinking
  - Science knowledge = educated citizenry

SOUTHWEST ENVIRONMENTAL HEALTH SCIENCES CENTER

Curriculum Structure

- Unit (5-7 per year)
  - Major Projects (1-3 per Unit)
    - »Lessons/activities (10-30 per Major Project)

SOUTHWEST ENVIRONMENTAL HEALTH SCIENCES CENTER

Example

- UNIT - Air Quality
  - MAJOR PROJECT - Video documentary on cancer induced by tobacco

SOUTHWEST ENVIRONMENTAL HEALTH SCIENCES CENTER

Content/Activities				
SCIENCE	ENGLISH	TECHNOLOGY	MATH	P.E.
Background reading (text or internet) Create a model of a cell Explore the cell cycle (multiple activities) "Good Cells Gone Bad" CD-ROM: "Cancer and the Cell Cycle" Simulate a restriction enzyme analysis CD-ROM: Explore the AMES test "Tobacco Induced Mutations" lab (Ames Assay) Investigate cancer treatment and prevention, include dietary factors.	Watch Nova "Cancer Warrior" Draw a storyboard for the video. Write the narration for the video (using content from research, activities, & experiment). Create questions for interviews (scientist, cancer survivor, etc.) Conduct library research (multiple activities)	Use word processing software. Use Excel and/or a graphing calculator to track and analyze data. Use a digital video camera to film the documentary. Edit the documentary with digital editing software. Conduct research on the internet (multiple activities)	Investigate and graph cancer population statistics "Cancer as a Multi-step Process" – calculate risk "Model exponential growth & cancer cells" Analyze data from the "Tobacco Induced Mutations" experiment Model the spread of cancer using system dynamics	Identify fruits & vegetables high in antioxidents Prepare the garden Guest speaker – Native American uses of tobacco. Guest speaker – Cancer researcher and/or a doctor Guest speaker – Tips on reporting Gather & prepare Native American recipes. Exercise & cancer prevention.

SOUTHWEST ENVIRONMENTAL HEALTH SCIENCES CENTER

Conclusions

- Preliminary Data (9th grade)
  - 20% fewer disciplinary referrals
  - 83% A's in 6 subjects (compared to 66%)
  - Excellent attendance
- Entire 10th grade class continuing from last year
- Family feedback

Southwest Environmental Health Sciences Center

Future

- 4 year academy
- Meet college admissions requirements
- Exceed science admissions requirements

II.4 University of Medicine and Dentistry of New Jersey, Environmental and Occupational Health Sciences Center

Presenter: Laura Hemminger

Training Teachers, Reaching Students:
The Spanish Bilingual ToxRAP™ Initiative

PROGRAM

- Conducted by the COEP at EOHSI/UMDNJ/Rutgers
- Supported by an NIEHS Supplement, Grant No. P30 ES05022-13S1

GOALS

- Improve quality of environmental health sciences education in K-6 Spanish bilingual classrooms
- Increase Spanish-speaking students' scientific literacy by disseminating ToxRAP™ through professional development programs for bilingual teachers

Training Teachers, Reaching Students:
The Spanish Bilingual ToxRAP™ Initiative

METHODS

- Bilingual Teacher Trainer Team
  - Teachers, COEP Educators, Center Scientist
- Bilingual Teacher Workshops
  - "The Case of the Green Feathers" (K-3)
  - "What is Wrong with the Johnson Family?" (3-6)
- Classroom Implementation

ACHIEVEMENTS

- Developed Spanish bilingual training format
- Trained 64 K-6 Spanish bilingual teachers
  - Jersey City, Paterson, Perth Amboy and Plainfield
- Impacting more than 1,300 students

Training Teachers, Reaching Students:
The Spanish Bilingual ToxRAP™ Initiative

WORKSHOP EVALUATION

- Overall value of workshops = 3.99*
- Overall impression of curriculum = 3.95*
- 100% more comfortable and more interested in teaching about environmental health
- 100% would recommend workshop to colleagues

PROGRAM EVALUATION

- To be completed after curriculum implementation

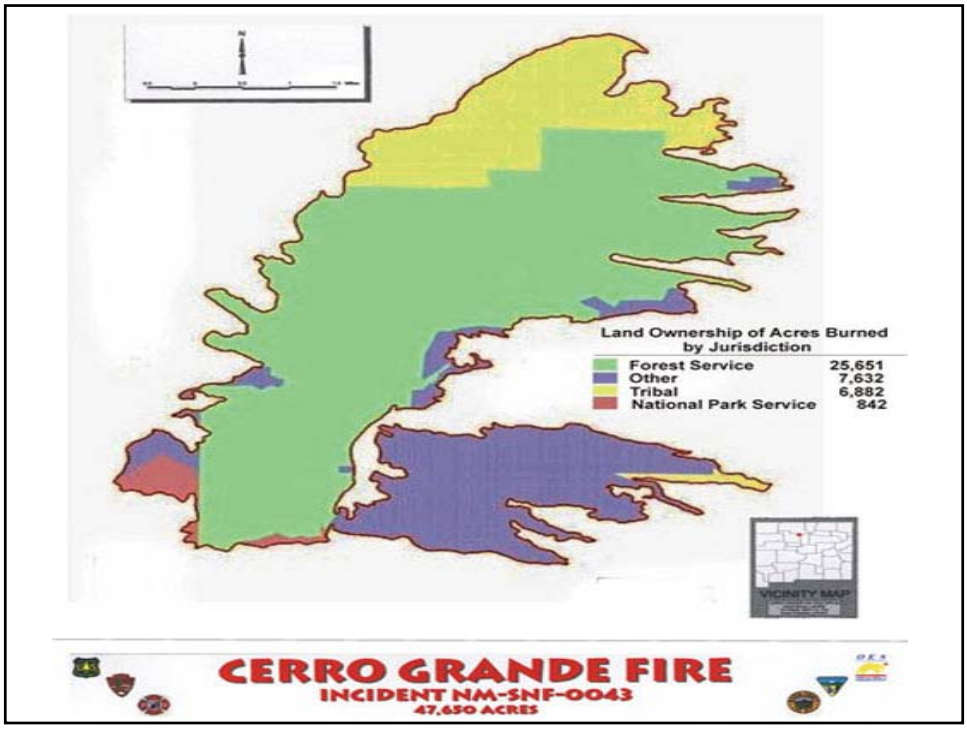
*On a scale of 1-4; 1=poor and 4=excellent

II.5 University of New Mexico, Environmental Health Sciences Developmental Center

Presenter: Johnnye Lewis

Assessing Risks from the Cerro Grande Fire

Johnnye Lewis, Ph.D., DABT
Director, Community Environmental Health Program &
Population Health Core, NIEHS Developmental Center
&
Mallery Downs, R.N., Gene Gallegos, M. A., and Miranda Cajero, B.C.H.


Land Ownership of Acres Burned
by Jurisdiction
Forest Service 25,651
Other 7,632
Tribal 6,882
National Park Service 842
VICINITY MAP
CERRO GRANDE FIRE
INCIDENT NM-SNF-0043
47,650 ACRES

CIC-9: dI03-144-003

Tech
Area
LOS ALAMOS NEUTRON
SCIENCE CENTER

DANGER

Development of a Native American Risk Assessment Resource Network

- Use the Cerro Grande Fire scenario as a model to develop a Case-Based Risk Assessment Training Module for Native American Communities.
- Use presentation of this module to Pueblo Community Health Representatives (CHRs) and Environmental staff members to begin to establish a resource network within the tribes with a basic understanding of environmental health and emergency responses.
- Begin to provide a network throughout the tribes that can continue trainings on other environmental topics of concern and meet the long-term objectives of developing an environmental health CHR position in each tribe.

CONCLUSIONS:

- Word-of-mouth effective in overcoming distrust and developing community/university partnerships.
  - Nearly 100 at 12 pueblos trained from supplement, plus Hispanic communities and promotora conferences
  - Receiving unsolicited requests on a regular basis with new topics requested
- Lay health workers - integral link in rural communities
- Easy to understand trainings & assessment tools are used
- Strong liaison between the university, clinical programs, and community
- Core information with minimal topic-specific information allows for rapid adaptation to community requests while conveying key information.
- Repetition of key concepts (modified train-the-trainer model).

II.6 University of Rochester, Environmental Health Sciences Center

Presenter: Dina Markowitz

Women's and Children's Environmental Health New York State Community Forums

University of Rochester Environmental Health Sciences Center

Dina Markowitz, Ph.D.

New York University Institute of Environmental Medicine

George Thurston, Sci. D.

This project was made possible by the generous support of

The National Institute of Environmental Health Sciences (NIEHS)

NIEHS National Institute of Environmental Health Sciences
~ Your Environment is Your Health ~

Community Outreach and Education Program (COEP) Administrative Supplement Grant

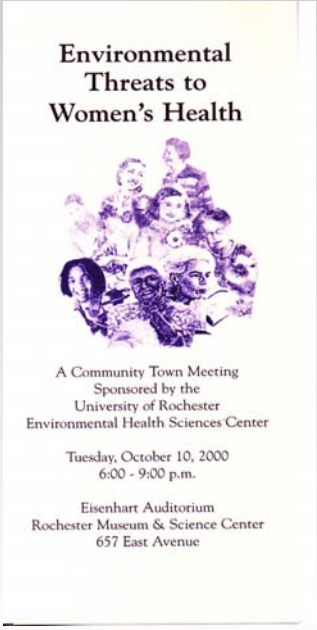
Project Specific Aims

- To inform the public about topics in environmental health that are of particular concern to women and children and how the community can take action.

- To inform the public about the Environmental Health Sciences Centers sponsored by NIEHS as well as local/regional agencies and community-based organizations that are concerned with environmental health

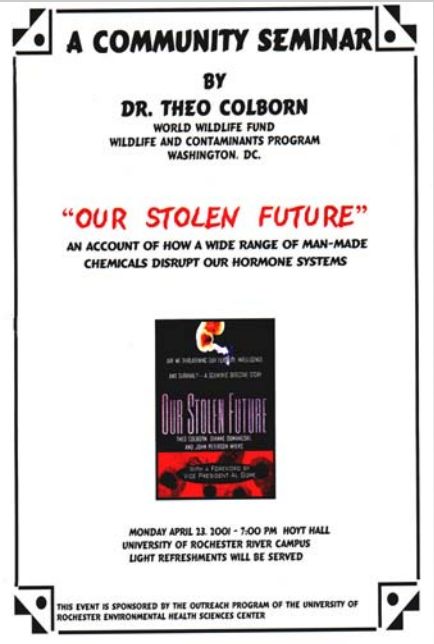
Community Forums – to date

- Rochester (3 events)
- Albany
- Bronx



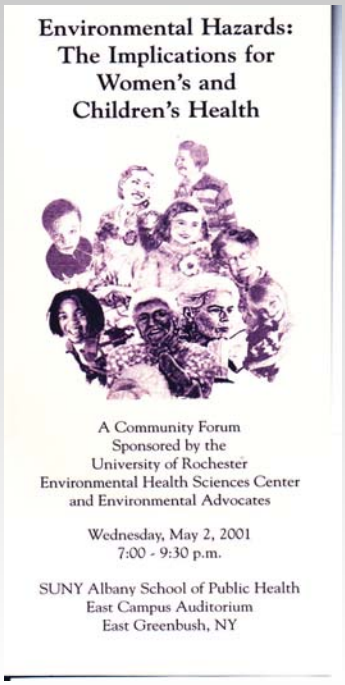
"Environmental Threats to Women's Health"
Rochester, NY October 10, 2000

- NIEHS Environmental Health Sciences Centers
- Monroe County Environmental Health Report Card
- Endocrine Disruptors
- Female Reproductive Hazards of the Workplace
- Lead and Osteoporosis
- Breast Cancer and the Environment
- DES and Cancer
- Interactive Q & A Session



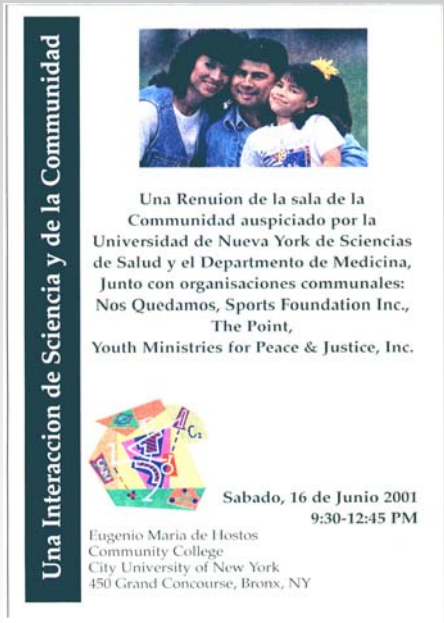
Community Symposium
Rochester, NY April 23, 2001

- Lecture on "Our Stolen Future", by Theo Coleborn, Ph.D., World Wildlife Fund
- "DES Stories" photoessay by Margaret Lee Braun



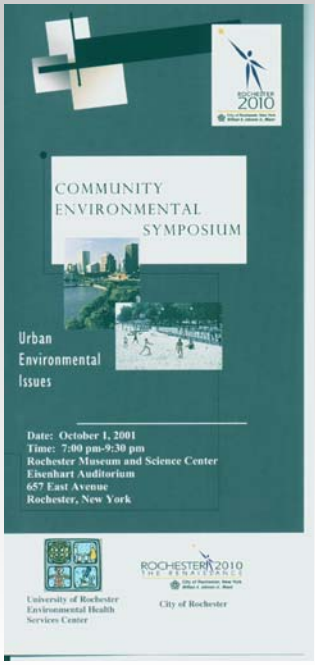
"Environmental Threats to Women's and Children's Health"
Albany, NY May 2, 2001

- Toxic Exposures and Neurobehavioral Development
- Breast Cancer and the Environment
- Hazardous Waste Sites
- Endocrine Disruption
- Mapping Environmental Hazards
- DES and Cancer
- Interactive Q & A Session



Community Meeting
Bronx, NY June 16, 2001

- South Bronx Air Pollution Project
- Asthma in the South Bronx
- Air Pollution & Health
- Metals in the Urban Environment/Lead
- Gas Generators in Your Neighborhood
- Community Involvement
- Interactive Q & A Session



"Urban Environmental Issues"
Rochester, NY October 1, 2001

- NYS Department of Environmental Conservation
- Who do you call to solve, report or learn more about environmental issues?
- Urban environmental health hazards – lead
- Property contamination – brownfields
- Household hazardous waste disposal
- Water quality education

Impact of Programs

- Community is better informed about environmental health issues, environmental stewardship and community organizations
- Community Advisory Committee was formed for Bronx Event (4 CBOs)
- Student outreach programs developed in Bronx
- Partnerships were formed with Environmental Advocates (Albany CBO) and City of Rochester
- Media coverage provided information about NIEHS Centers

II.7 University of Texas M.D. Anderson Cancer Center, Science Park Research Division, Center for Research on Environmental Disease

Presenter: Robin Fuchs-Young

Center for Research on Environmental Disease

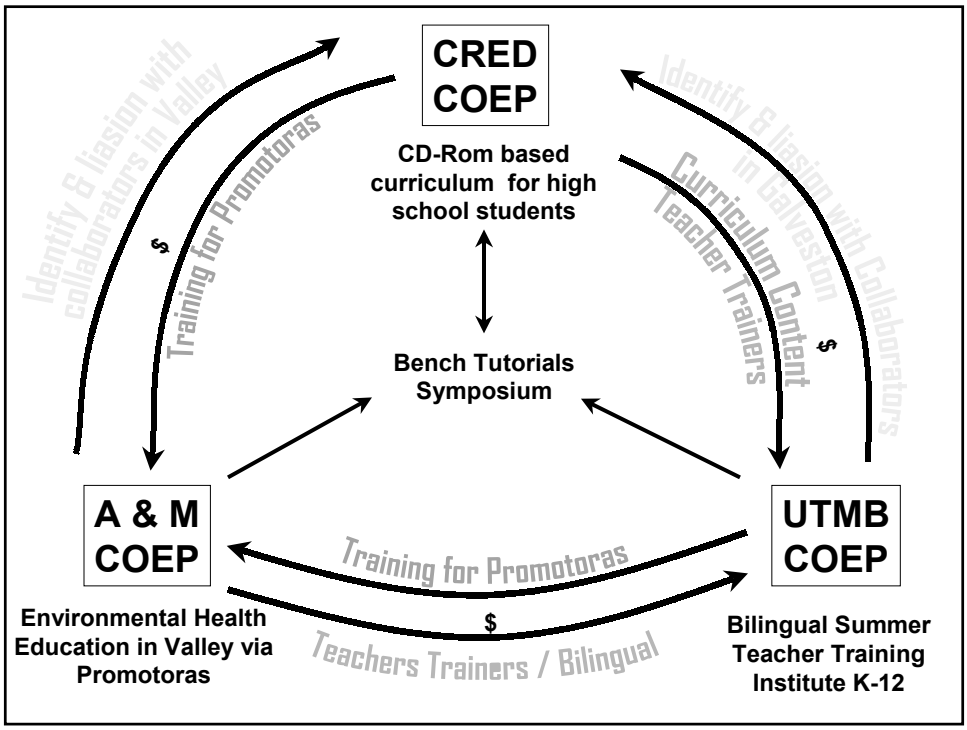
Community Outreach and Education Program

CENTER FOR RESEARCH ON ENVIRONMENTAL DISEASE

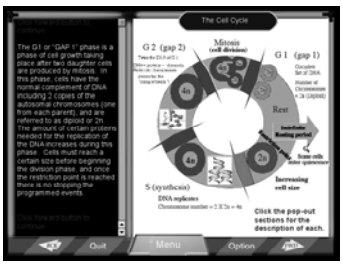
C R E D

CD-ROM based Environmental Health and Science Curriculum Enhancement for High School Students

Robin Fuchs-Young, PhD., COEP Director
Ms. Christie Snodgrass, High School Science Teacher
Griffon Animations
Center Faculty and Facility core personnel



Center for Research on Environmental Disease



From the bench to the public
Educating to prevent disease

Goals for Curriculum Enhancement

To increase availability environmental curriculum enrichment for high schools

Improve science and health education in our state

Provide information to enable students to make healthy lifestyle choices

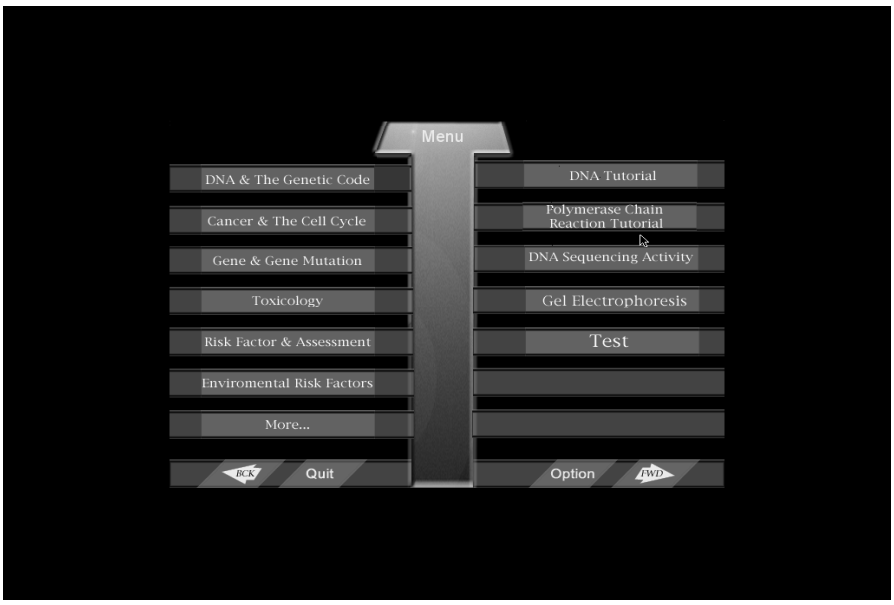
Assist teachers with concepts that they may not be comfortable with

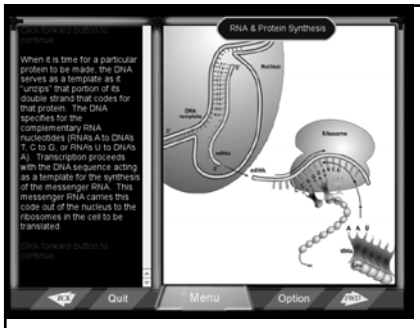
Methods

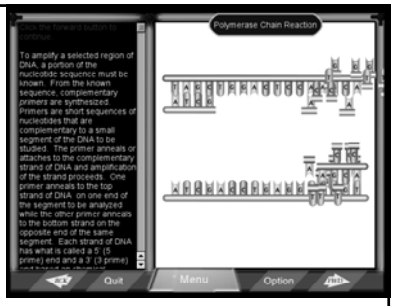
Teacher interns work at Center during summer

Design content based on lab experiences and interaction with Center scientists

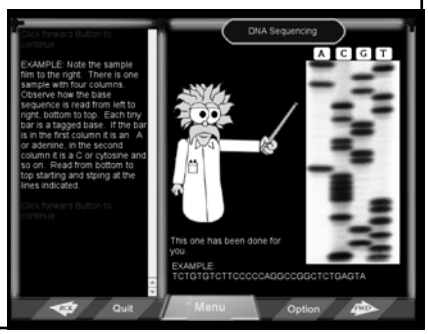
Main Menu

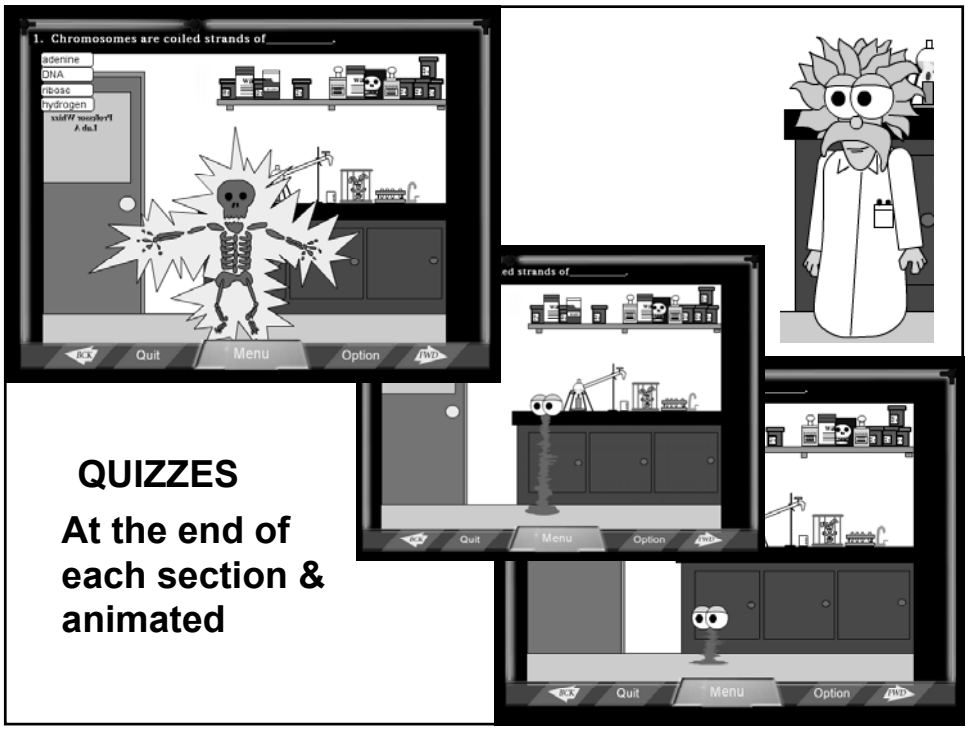






DNA Module
-Tutorial explains DNA replication/synthesis
- PCR tutorial
- DNA Sequencing activity
- Gel electrophoresis





QUIZZES

At the end of each section & animated

Outcomes and Plans

Summer Institute Evaluation:

	1	2	3	4	5
•Realization of workshop objectives					100%
•Appropriateness of content and activities			14%	86%	
•Effective use of technology			14%	14%	70%
•Value of quizzes for evaluating learning				14%	86%

Comments
- "useful for most of my classes"
- the module met my expectations "and more"
- "I expect a great product"
- "I really liked it and it is very useful in my class"

Next:
- Two workshops at CAST (Nov 1-3, 2001, Austin, TX)
- Pilot testing Galveston, Bastrop County, Austin & Brady
- Finalize and distribute
  - Maintain database of users and evaluation

II.8 University of Texas Medical Branch at Galveston, Center in Environmental Toxicology

Presenter: Jennifer Gorenstein

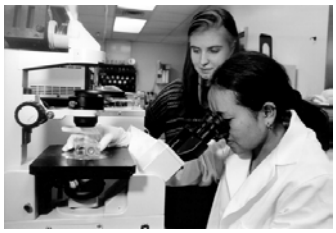
Environmental Health Training of Promotoras Along the Texas-Mexico Border

- Implementation of bilingual curriculum covering a series of environmental health issues
- Development of asthma module focusing on asthma management and environmental influences on asthma
- Presentation in Texas-Mexico border communities by Dr. Edward Brooks, Director of NIEHS Center Asthma Outreach Program
- Future Directions
  - Develop action plan for communities to address environmental remediation
  - Provide more educational materials

Bench Tutorials

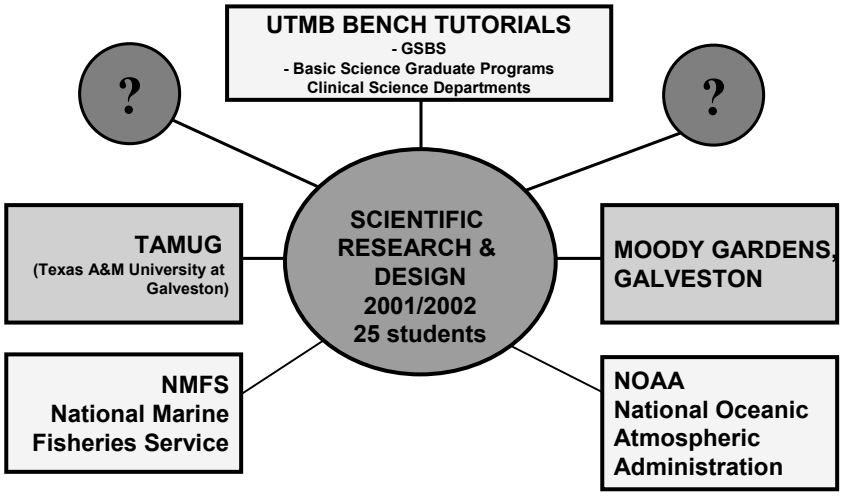
Independent Study in Scientific Research & Design

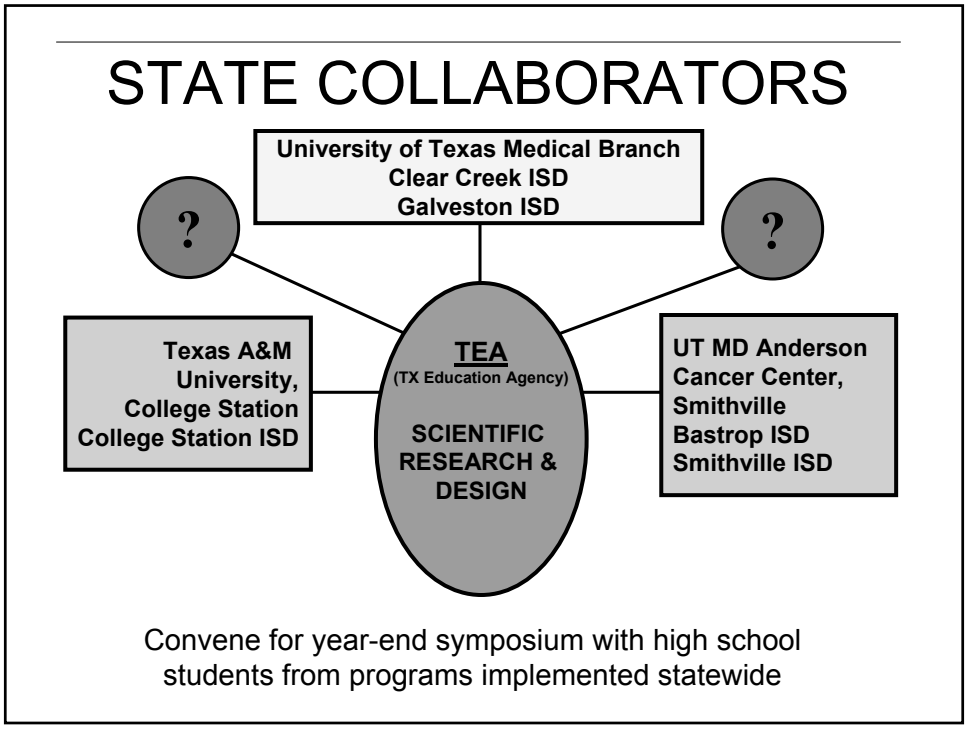
- 1997 - Texas Education Agency creates Scientific Research & Design
- UTMB & Ball High School design Independent study course in biomedical research
- High school juniors and seniors earn one-year full science credit
- Mentored by graduate student or post-doctoral fellow
- 4 hours of supervised instruction weekly
- 4 week training in general molecular biology lab techniques and safety

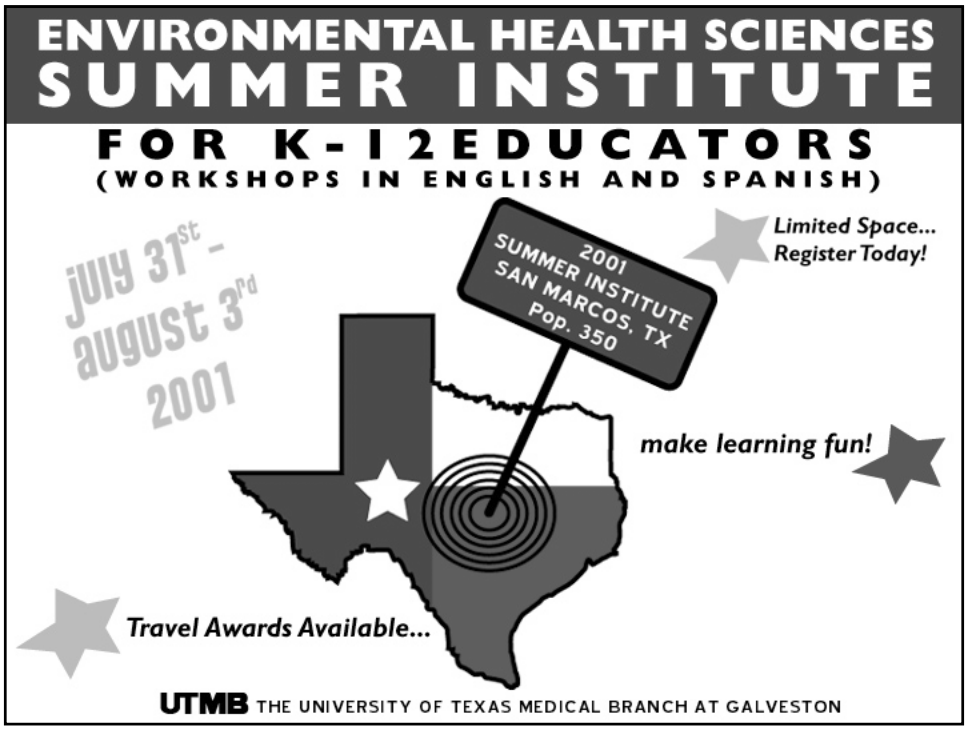


"Although I fully expect my student to become technically skilled over the course of this project, I strongly believe that the most important skill he can acquire is that of an independent thinker." - Timothy Denning, Department of Microbiology & Immunology

COMMUNITY COLLABORATORS




STATE COLLABORATORS
University of Texas Medical Branch
Clear Creek ISD
Galveston ISD
?
?
Texas A&M University, College Station
College Station ISD
TEA
(TX Education Agency)
SCIENTIFIC RESEARCH & DESIGN
UT MD Anderson Cancer Center, Smithville
Bastrop ISD
Smithville ISD
Convene for year-end symposium with high school students from programs implemented statewide


ENVIRONMENTAL HEALTH SCIENCES
SUMMER INSTITUTE
FOR K-12 EDUCATORS
(WORKSHOPS IN ENGLISH AND SPANISH)
July 31st – August 3rd 2001
2001 SUMMER INSTITUTE SAN MARCOS, TX Pop. 350
Limited Space... Register Today!
make learning fun!
Travel Awards Available...
UTMB THE UNIVERSITY OF TEXAS MEDICAL BRANCH AT GALVESTON

Environmental Health Sciences Summer Institute for K-12 Educators

- Funding provided through NIEHS Administrative Supplement
- Series of one-day workshops to train K-12 teachers on environmental health issues:
  - Cancer, genetics, cell biology, indoor and outdoor air pollution, lead poisoning, water quality and toxicology
- GOALS:
  - Raise awareness of environmental health issues
  - Provide much needed resources and opportunities for teachers
  - Increase availability and improve quality of environmental health science curricular materials used in schools
  - ADVANCE QUALITY OF SCIENCE EDUCATION
- COLLABORATION WITH:
  - **Rutgers University**
  - **Texas A&M**
  - **UTMB**
  - **UT MD Anderson at Smithville**
  - **Baylor College of Medicine**
  - **Southwest Texas State University**

Summer Institute - Building a Presence

- 101 participating teachers
- 97% rated Summer Institute as highly valuable and useful
- 10% of all workshop participants use English as a second language
  - (Bilingual workshops were combined with their English counterpart offering either Spanish or English curricular materials to teachers)
- 40% of all participating ISDs are low income, low population density or predominant minority status
- 97% chose to attend to improve knowledge of science
  - Individual workshop content ranked within a range of 1-2.2 on a scale of 1-5 (1 being the highest grade and 5 being the lowest)
- 100% stated they would implement the curriculum, but with slight modifications.
  - Phone interviews will be conducted in spring to ascertain how teachers have integrated the curricula into classroom learning

II.9 University of Washington, Center for Ecogenetics and Environmental Health

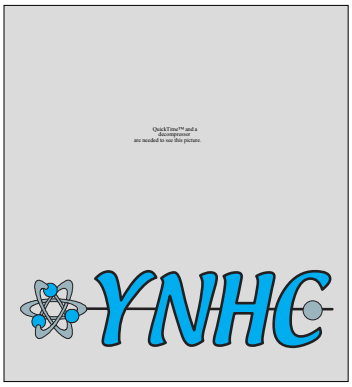
Presenter: Jon Sharpe

COEP Supplement Final Report: YNHC

Jon Sharpe
Center for Ecogenetics &
Environmental Health

Youth Network for Healthy Communities

Using videoconference technology to link Washington middle and high school students with environmental Health professionals



Community Outreach & Education Program

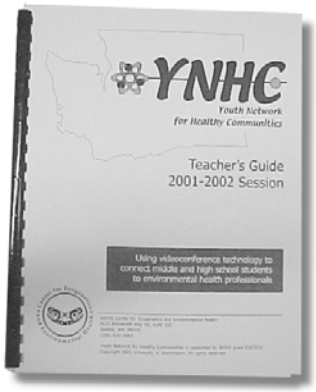
Project Overview

- Project began as part of the CEEH town meeting, *Voices for Health Environments, Healthy Communities* (9/00)
- Partnership with 2 high school teachers
- Uses new statewide K20 VC network
- Students conduct community-based EH research projects and present them to scientists in a live videoconference (3 per year)

Community Outreach & Education Program

YNHC Teacher's Guide

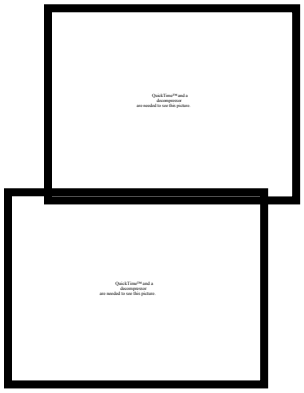
- Project overview & contact information
- Student project guidelines
- Research topic suggestions
- Videoconferencing hints
- Teacher background information and resource list
- Evaluation forms



Community Outreach & Education Program

Videoconference Sessions

- **Session One**: Teachers attend an orientation videoconference with COEP staff.
- **Session Two**: Students present their EH research projects to EH scientists at the university.



Community Outreach & Education Program

Past Research Topics

- Health hazards from diesel power generator emissions
- Health impacts of a proposed Gold Mine
- Heavy metals in the Coeur d'Alene watershed
- Safety of reclaimed water
- Classroom indoor air quality
- Migrant farmworkers at risk from pesticides
- Water quality in Lake Osoyoos

Community Outreach & Education Program

Participating Sites

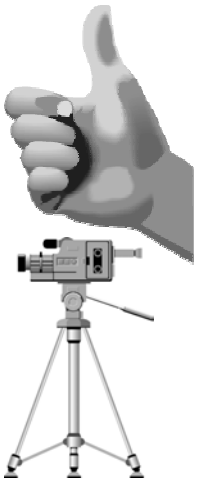
Community Outreach & Education Program

Project Impact & Evaluation

- 2000-01: 19 teachers trained, app. 475 students reached (25 students/teacher)
- 2001-02 Goal: 20 teachers trained, app. 500 students reached
- Overall project rating (5 = outstanding) :
  Teachers = 4.2
  Students = 3.8

Community Outreach & Education Program

Benefits to the Center



- Raises visibility of CEEH statewide
- Connects CEEH with relatively remote parts of the region
- Provides easy way for investigators to do outreach (minimal time commitment)
- Connects CEEH with other entities on campus interested in the potential of VC technology

Center for Ecogenetics • Gene • Environmental Health

Community Outreach & Education Program

Project Aims 2001-02

- Conduct three teacher orientations and three student presentation videoconferences
- Continue to evaluate the success of the project
- Publish an online project summary with video clips of sample student projects
- Continue to present the project at regional and national conferences (to be determined)

Center for Ecogenetics • Gene • Environmental Health

Community Outreach & Education Program

II.10 Vanderbilt University, Center in Molecular Toxicology

Presenter: Brad Hawkins

Vanderbilt University
Center in Molecular Toxicology
The Center Associates Program

F.P. Guengerich, Ph.D., J.A. Pietenpol, Ph.D., and
W.B. Hawkins, M.S.

The Center Associates Program

- A curriculum and professional development program designed for a wide array of individuals in science or a science-related profession
- Persons eligible include from Vanderbilt and other area colleges and universities, community health professionals, high school teachers, and professionals from governmental and private organizations

The Center Associates Program

- Designed to provide educational and facility support for the program participants from Center Investigators
- Program will increase the awareness of the Center's research within the State of Tennessee
- Participants will receive support from the Center to perform projects in the area of toxicology, environmental health, or general and specialized science

The Center Associates Program

Year One Outcomes

Dr. Glenn Marsch, Macon Elementary and Sweetwater High School participated as initial members in the first year Associates Program.

- "Characterization of Nucleoside and DNA Adducts Formed by S-(1-Acetoxymethyl) Glutathione and Implications for Dihalomethane-Glutathione Conjugates" in *Chemical Research in Toxicology* **2001**, 14, 600-608

Macon School students doing water quality testing at Fletcher Creek (5 June 2001).

The Center Associates Program

Year Two Outcomes

- 11 new groups/individuals to participate in 2001-2002
  Community and school educators were primarily recruited
- Cumberland Science Museum
  Assistance in helping educate the community on environmental health hazards such as tobacco smoke
- General support in school science activities such as needs for laboratory equipment for chemistry, toxicology and biology experiments
- Projects range from assistance in performing classroom/school health research focusing on Sick Building Syndrome to examinations of pGLO bacterial transformations by 8th grade students
- Results, pictures and reports will be published on the Center's website and in subsequent publications such as the Center's *Toxikon*

The Center Associates Program

Benefit to Outreach Program

Directly attributed to Associates Program and a host of additional outreach and education activities, the Center's Outreach Program is well on its way to becoming the environmental health and research contact for schools and educators in Middle Tennessee.

The Associates Program has helped in solidifying and gaining new education contacts in Tennessee and has provided leadership in environmental health issues.

The Center Associates Program

Future Directions

The Associates Program has opened doors within the community and will continue to do so.

- Tennessee Arts and Science Consortium
  New opportunities are developing with partners in TASC to recruit new associates.
- Increase members in the program
  (target number 15 groups or individuals) through the year 200-2003
- Focus on community groups and K-12 educators
- Associates to present and highlight their work at a Center community function (Center Open House)

Appendix

59th EHS Center Directors Meeting, COEP Agenda

59th EHS CENTER DIRECTORS MEETING
Hosted by the EHS Center for Research on Environmental Disease and
The University of Texas M.D. Anderson Cancer Center, Science Park – Research Division

COEP Agenda

Saturday, October 27, 2001
Radisson Hotel & Suites

5:00 pm – 6:00 pm	Poster Set-Up
6:00 pm – 10:00 pm	Registration, Reception and Poster Session – *Mezzanine, Radisson Hotel*

Sunday, October 28, 2001
COEP Meeting (Radisson Hotel & Suites)
All – Campus Tour, Reception, Poster Session, Dinner and Entertainment
UT M. D. Anderson Cancer Center, Science Park – Research Division (SPRD)

7:45 am – 8:30 am Continental Breakfast – *Mezzanine, Radisson Hotel*
Meeting – *Mezzanine, Radisson Hotel*

8:30 am – 8:35 pm Welcome - Dr. John DiGiovanni, UT M. D. Anderson Cancer Center, Smithville

8:35 am – 9:30 am COEP Organization – Liam O'Fallon, Moderator

9:30 am – 11:30 am K-12 Outreach Technologies: CD-ROM, the web, video conferencing, and beyond – Robin Fuchs-Young, Moderator

- Heidi Nepf, MIT
- Stefani Hines, University of Arizona
- Robin Fuchs-Young, UT M. D. Anderson Cancer Center, Smithville
- Jon Sharpe, University of Washington
- Kevin Niemi, University of Wisconsin - Madison
- Bill Mowczko, Office of Science Education, NIH
- Discussion

11:30 am – 12:30 pm Lunch

12:30 pm – 2:00 pm Outreach to Nursing Community – Ann Backus, Moderator

- Barbara Sattler
  "Nursing and Environmental Health: Emerging Roles in Education, Research, and Practice"
- Ellen Ceppetelli
  "Outreach to Nurses: Lessons Learned by an ERC Visiting Scholar"
- Ann Backus (10 min)
  Harvard Visiting Scholar Program & Nurses
- Ed Brooks, UTMB (10 min)
  Asthma in Schools Outreach
- Q&A (10 min)

2:00 pm – 2:30 pm COEP Resource Center, Karalyn Colopy

- Update
- Future Activities

2:30 pm – 2:45 pm	Collaborative Opportunities and Meeting Recap
2:45 pm	Meeting adjourned
3:00 pm – 4:00 pm	Transportation from Hotel to SPRD – *Lobby, Radisson Hotel*
4:00 pm – 5:00 pm	Tour of SPRD
4:30 pm – 6:00 pm	Reception and Poster Session – *SPRD*
6:00 pm – 8:30 pm	Dinner and Entertainment – *SPRD*
8:30 pm – 9:30 pm	Transportation from SPRD to Hotel – *SPRD*

Monday, October 29, 2001
Scientific Symposium (Avaya Auditorium)
Applied Computational Engineering & Sciences (ACES) Building
201 East 24th Street
University of Texas at Austin

7:30 am – 8:00 am	Transportation from Radisson Hotel to ACES Building
8:00 am – 8:30 am	Continental Breakfast
8:30 am – 12:00 pm	Scientific Symposium
12:00 pm – 1:00 pm	Lunch
1:00 am – 5:00 pm	Scientific Symposium
5:00 pm – 5:30 pm	Transportation from ACES Building to Radisson Hotel
6:30 pm – 9:00 pm	Dinner and Entertainment – *Four Seasons Hotel*

Tuesday, October 30, 2001
General Meeting of Center Directors, Administrators and COEP
Radisson Hotel & Suites
Mezzanine, Austin Room

7:15 am – 8:00 am	Continental Breakfast
8 :00 am – 8:10 am	Opening Remarks Dr. Margaret Kripke, E.V.P. and Chief Academic Officer UT M. D. Anderson Cancer Center
8:10 am – 8:55 am	Report from COEP Meeting and Discussion with Center Directors Liam O'Fallon, NIEHS
8:55 am – 10:10 am	Report from FY00 Administrative Supplements Dr. Allen Dearry, NIEHS
10:10 am – 10:30 am	Break
10:30 am – 11:30 am	Director's Report Dr. Kenneth Olden, NIEHS
11:30 am – 11:45 am	Extramural Research Update Dr. Anne Sassaman, NIEHS
11:45 am	Adjourn