

TRDRP
ANNUAL REPORT 2004



University of California



To the California State Legislature from
The University of California

TRDRP Annual Report for 2004

Progress and achievements of the Tobacco-Related Disease Research Program, established and administered by the University of California pursuant to Proposition 99, The Tobacco Tax, and Health Protection Act of 1988, Senate Bill 1613(1989) and reauthorized pursuant to Assembly Bill 3487 (1996).

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TRDRP Annual Report for 2004

Executive Summary

In 2004, California's Tobacco-Related Disease Research Program (TRDRP) continued to fund outstanding research in many scientific and medical institutions in the state. Over the past 14 years, research funded by TRDRP with tobacco tax revenue (Proposition 99) has made significant discoveries in the biomedical sciences, improvements in the treatment of diseases, and advances in evidence-based tobacco control strategies. Although only 15.4 percent of Californians were smokers in 2004 (compared to 22 percent nationally), it is estimated that smoking costs California some \$8.6 billion in health care alone, and another \$8 billion in related economic losses—a total of \$16.6 billion. To achieve even lower smoking rates will depend on solid research in choosing the most cost-effective tools and approaches to continue to advance California's success. The need for research is now even more critical to finish the job that California started in approaching a smoke-free and healthier society.

During 2004, TRDRP managed an active research portfolio of 195 grants totaling \$79.8 million and addressing the research areas of cancer, heart disease including stroke, general biomedical sciences, nicotine addiction, public policy, indoor and outdoor secondhand smoke, pulmonary diseases, social and participatory research, and social epidemiology especially tobacco studies in California's diverse population groups.

TRDRP had 66 research grants come to completion in 2004. These represent some of the most advanced science on tobacco-related disease research, tobacco policy issues, and the prevention of tobacco use among youth and particularly in communities of color. At the same time, TRDRP awarded \$17.8 million in new research grants to 49 scientists in 27 institutions. This is 26% of the 186 applications reviewed. These research grants generate productive employment and related economic activity among the academic and non-profit research institutions across the state. Over the years, it has been learned that scientists funded with TRDRP grants have used their findings to leverage additional federal research dollars for their institutions. Since 1989, TRDRP has funded over 750 scientists in more than 80 California research organizations.

Tobacco-Related Disease Research Program

TRDRP funds prevention, policy, and biomedical research to benefit public health and reduce the suffering and economic burden due to heart disease, stroke, lung cancer, emphysema, and the long list of debilitating and often lethal ailments caused or aggravated by tobacco products.

Fourteen Years of Scientific Progress

In 2004, California's Tobacco-Related Disease Research Program (TRDRP) continued to fund outstanding research in many scientific and medical institutions in the state. Over the past 14 years, research funded by TRDRP has made significant discoveries in the biomedical sciences, improvements in the treatment of diseases, and advances in evidence-based tobacco control strategies. In the face of declining funds, TRDRP continues to maintain its excellent national and international reputation for funding high quality and innovative tobacco-related disease research.

Voters Value Research and Want the Benefits

In 1988, California voters passed the Proposition 99 tobacco tax. As a result, the legislature authorized the University of California to establish and administer TRDRP. Then, as now, the citizens of this state place a high value on health research supported by tobacco tax revenue. To offset the health ravages of tobacco use, people want the benefits of tax-funded health research conducted by those California scientists who are among the best in the world. Thus, TRDRP faithfully fulfills its mission to deliver those benefits, to advance prevention strategies, to contribute to policy development, and to improve efficacy in controlling tobacco in California.

Tobacco Effects Cost California \$16.6 billion a Year

In 2004, 15.4 percent of Californians were smokers, an historic low, and well below the national prevalence of 22.0 percent. However, current smoking, plus a legacy of past higher smoking rates, greatly burden the state's health care system. An earlier TRDRP-funded study estimated that smoking costs California some \$8.6 billion in health care alone, and another \$8 billion in related economic losses—a total of \$16.6 billion¹. These cost figures dwarf the \$350 million invested in research by TRDRP since its inception in 1989. With declining tobacco tax revenue due to lower smoking rates in conjunction with ever increasing health care costs, the struggle to maintain momentum in research is challenged.

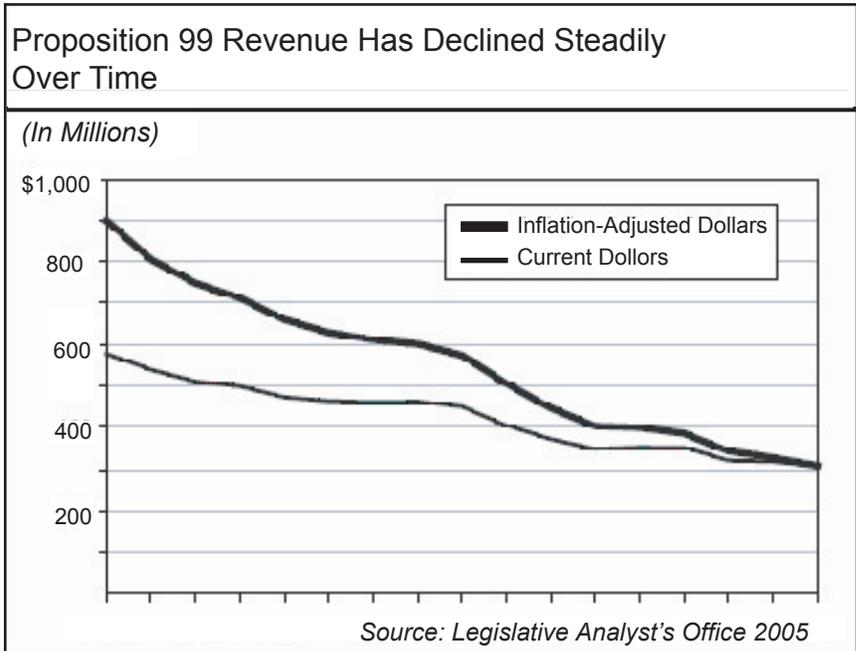
¹Max, W. et al., The Cost of Smoking in California, December 2002.

Figure 1.

The Irony Of Success

With less tobacco-related research being funded due to the successful decline in cigarette smoking and thus the reduced tobacco-tax revenue (Figure 1), hoped-for medical advances may consequently take longer to be realized. The irony is that the most likely victims of this decelerating research are the aging generation of voters who passed Proposition 99 some 15 years ago. These voters who wanted more re-

search to be done include the smokers, ex-smokers, and those who were exposed to second-hand smoke. Today, they are seeing progressively fewer tobacco-tax dollars going to TRDRP to do that potentially beneficial research (see box: TRDRP Funding History).



TRDRP Funding History

The sole source of TRDRP funds is revenue from the tobacco surtax established when California voters passed Proposition 99 in 1988. Proposition 99 specified that five percent of this tax revenue be deposited in the Research Account and that it be used for "research on tobacco-related disease". Due to success in California's tobacco control efforts, tobacco sales have declined since Proposition 99 went into effect. As a result, TRDRP's annual resources went from \$26.9 million to \$21.6 million between 1990 and 2004. Starting in 2000, an annual amount from the Research Account appropriated each year since 1990 to the California Department of Health Services (DHS) increased from \$1.7 million to approximately \$5 million-24 percent of all Research Account funds.

Now is the Greatest Need for TRDRP Research

California's lower smoking rates, due to changes in the state's social norms making smoking less acceptable plus stronger state and local public policies keeping our work and lifestyle environments smoke-free, all depend on solid research in choosing the most cost-effective tools and approaches to continue to advance this success. The incremental improvements that lie ahead will, no doubt, be more difficult and potentially more expensive. Thus, the need for research is now even more critical to finish the job that California started in approaching a smoke-free and healthier society. The biomedical advances in the understanding, detection, and treatment of lung cancer, emphysema, heart disease, and stroke still require much more work to realize the promised benefits for victims of these tobacco-related diseases.

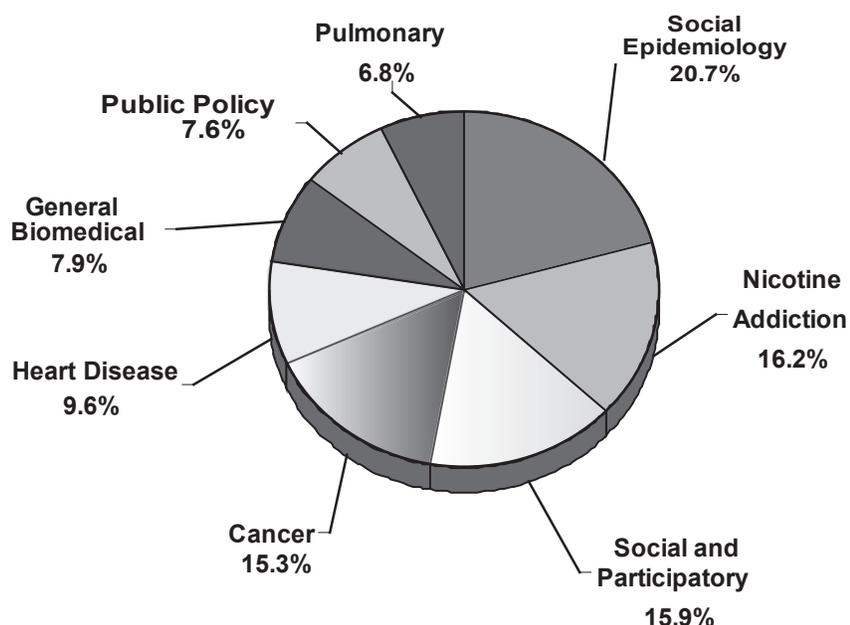
A \$79.8 million Research Portfolio

During 2004, TRDRP managed an active research portfolio of \$79.8 million addressing the following eight areas of research:

1. **Cancer** with an emphasis on lung cancer;
2. **Heart** disease including stroke research;
3. **General Biomedical** sciences including reproductive health effects;
4. **Nicotine Addiction** addressing the neurosciences and smoking cessation issues
5. **Public Policy** including economic studies, indoor and outdoor secondhand smoke;
6. **Pulmonary** diseases focusing on emphysema and chronic bronchitis;
7. **Social and Participatory** research with youth, schools, and community-based organizations;
8. **Social Epidemiology** especially tobacco studies in California's diverse population groups.

The percent distribution of TRDRP's dollars for active grants are shown in Figure 2 (page 6).

Figure 2.
Distribution of TRDRP Dollars in 2004 by Research Area



195 Active Grants

During 2004, TRDRP administered funding for 195 research grants, most were multiple-year grants (see Table 1). Eighty, or 41 percent, of these are in progress and will continue into 2005. However, sixty-six, one third of the 195 grants, were completed in 2004. Forty-nine, 25 percent, were newly funded grants and will continue into 2005.

Table 1.

Number of by TRDRP Grants by Research Area, 2004

Research Area	Number of Grants	Amount (\$)
Cancer	25	12,228,282
Heart Disease	18	7,635,459
General Biomedical Science	18	6,342,755
Nicotine Addiction	32	12,895,717
Public Policy	17	6,074,369
Pulmonary	15	5,435,500
Social and Participatory	30	12,672,984
Social Epidemiology	40	16,533,899
Total	195	\$79,818,965

66 Grants Completed

TRDRP had 66 research grants come to completion in 2004. This represents \$23.5 million or about 34 percent of the overall 2004 research portfolio. One third were in the combined areas of cancer research (12 grants) and nicotine addiction research (12 grants). The number and value of completed grants is shown in Table 2. These 66 grants represent some of the most advanced science on tobacco-related disease research, tobacco policy issues, and the prevention of tobacco use among youth and particularly in communities of color.

Table 2.

Number of Grants Completed in 2004 by Research Area

Research Area	Number of Grants	Amount (\$)
Cancer	12	5,547,778
Heart Disease	9	3,517,677
General Biomedical Science	7	2,075,642
Nicotine Addiction	12	4,790,234
Public Policy	8	2,568,286
Pulmonary	6	1,622,312
Social and Participatory	6	1,152,335
Social Epidemiology	6	2,191,223
Total	66	\$23,465,487

Some of the topics addressed in these completed studies are:

- Developing a vaccine against nicotine addiction (Scripps Research Institute);
- More effective ways to help the elderly quit smoking (UC San Francisco);
- Prevalence and determinants of tobacco use among adults of Korean descent (San Diego State University Research Foundation);
- School district-level policy decisions for tobacco-use prevention education in schools (University of Southern California);
- Identifying the enabling factors that make it possible for minors to illegally purchase cigarettes (San Diego State University Research Foundation);

- Understanding how tobacco smoke inhibits wound healing (UC Riverside);
- Novel antitumor agents for lung cancer (UC San Diego);
- DNA vaccines to prevent lung cancer metastasis (Scripps Research Institute);
- Understanding how environmental tobacco smoke causes breathing problems in children (UC Davis); and,
- Designing new and more effective tobacco control strategies (UC San Diego).

A list of the 66 completed projects with institution, award amount, project title, and principal investigator is presented in Appendix A.

49 New Research Grants

In 2004, TRDRP awarded \$17.8 million in new research grants to 49 scientists in 27 institutions. This is 26% of the 186 applications received in 2004. Unfortunately, several applications that were scored as scientifically excellent could not be funded. Table 3 shows the number of applications received, the number funded, the percent funded and dollar amount for each award mechanism (see box on page 9: TRDRP Award Mechanisms). The number of grants funded and their dollar amount by research area is shown in Table 4.

Table 3.

New Grants Funded in 2004 by Award Mechanism

Research Area	Number of Applications	Grants Funded	Percent Funded	Amount (\$)
Research Project Award in Priority Area	91	24	26%	13,192,965
New Investigator Award	19	6	32%	1,614,264
Innovative Developmental & Exploratory Award	26	5	19%	771,403
School-Academic Research	4	1	25%	559,208
Postdoctoral Fellowship Award	21	7	33%	525,000
Community-Academic Research	9	1	11%	518,953
Research Project Award in Complementry Area	7	1	14%	420,000
Dissertation Award	9	4	44%	239,988
Total	186	49	26%	\$17,841,781

TRDRP Award Mechanisms

TRDRP grants are made through several award mechanisms. These can be grouped into three categories:

- **Investigator-Initiated Research**

Research Project Awards fund investigator-initiated research projects. Innovative Developmental and Exploratory Awards fund developmental or exploratory research that is not yet sufficiently mature to compete successfully for a Research Project Award, but which could lead to breakthroughs in the field.

- **Research Training**

TRDRP offers three award types that are aimed at enhancing the scientific infrastructure for tobacco-related research in California: New Investigator Awards, Postdoctoral Fellowship Awards, and Dissertation Research Awards.

- **Participatory Research**

Community-Academic Research Awards and School-Academic Research Awards stimulate and support collaborations between academic researchers and community-based organizations and schools. Most School-Academic Research Awards are co-funded by the California Department of Education.

Table 4.

Number of New Grants Funded in 2004 by Research Area

Research Area	Number of Grants	Amount (\$)
Cancer	7	2,924,042
Heart Disease	5	1,275,268
General Biomedical Science	8	2,887,240
Nicotine Addiction	4	645,000
Public Policy	8	2,921,330
Pulmonary	7	2,026,446
Social and Participatory	5	2,367,848
Social Epidemiology	5	2,794,607
Total	49	\$17,841,781

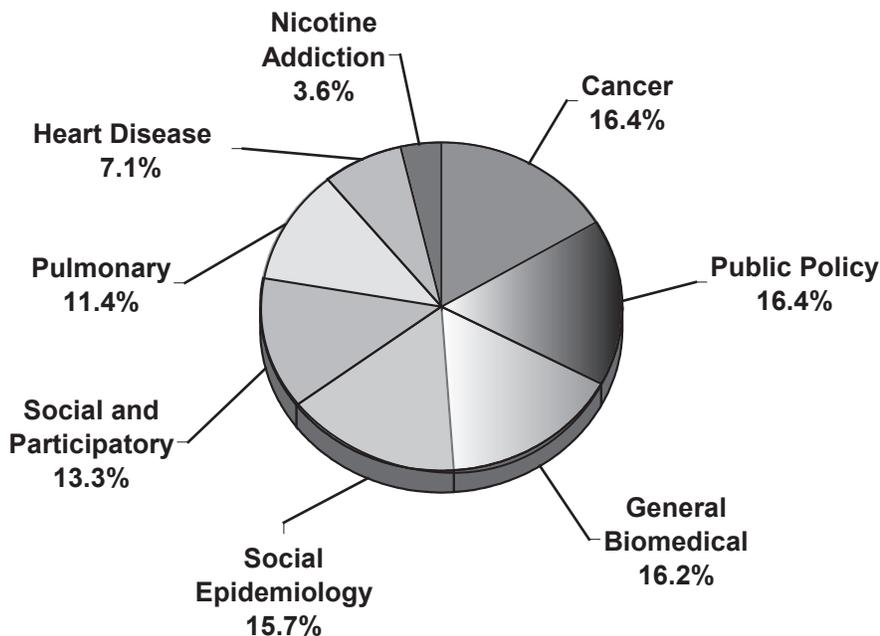
Research Priorities

The Research Project Award applications received by the January 15, 2004 deadline were overwhelmingly responsive to the priority areas announced by TRDRP in the fall of 2003. In the Research Project Award category, where these priorities apply, 91 of the 98 applications; addressed one or more of the following priority research area:

- tobacco-related health disparities among California's diverse populations;
- development of nicotine dependence treatments;
- secondhand smoke and outdoor tobacco smoke;
- lung cancer;
- chronic obstructive pulmonary disease;
- heart and cerebrovascular disease

The distribution of all new awards across research areas is shown in Figure 3. Details of these new awards, including abstracts, is published in TRDRP's *Compendium of Awards, 2004* and posted along with compendia from previous years at <http://www.trdrp.org>.

Figure 3.
Distribution of New 2004 Grant Dollars by Research Area



Advancing Science, Creating Jobs

TRDRP's mission advances science in tobacco-related diseases and in tobacco control research. These research grants also generate productive employment and related economic activity among the academic and non-profit research institutions across the state who received TRDRP grants. Over the years, it has been learned that scientists funded with TRDRP grants have used their findings to leverage additional federal research dollars for their institutions from the National Institutes of Health. Since 1989, TRDRP has funded over 750 scientists in more than 80 California research organizations.

Supporting Young Scientists and Diversity

During 2004, TRDRP had 59 active grants that supported research for 25 new scientists and 34 scientists-in-training (post-doctoral and dissertation research). These awards support their efforts to pursue careers in tobacco-related disease research and thus add to California's future capacity to remain competitive in this field (see box on page 12: Spotlight on an early career scientist).

In addition to these 59 grants, special Cornelius Hopper Diversity Award Supplements were made to six senior scientists currently funded by TRDRP (see Table 5). These supplement awards support a one- or two-year research mentoring program for young scientists and community health professionals. These talented and promising trainees are selected because they have overcome significant challenges in their educational pursuits and represent or plan to work in communities disproportionately impacted by tobacco use or historically understudied in the tobacco-related sciences.

Table 5.
2004 Cornelius Hopper Diversity Award Supplements

Institution	Senior Scientist	Trainee
Brentwood Biomedical Research Institute	Dr. Richard Olmstead	Justin Hernandez, B.S.
San Diego State University	Dr. Melbourne Hovell	Mark Adams, M.P.H.
U.C. San Francisco	Dr. Ruth Malone	Pamela Jones, M.P.H., B.S.N.
U.C. San Francisco	Dr. Ricardo Muñoz	Jessica Zulema-Borja, B.A.
University of Southern California	Dr. Steve Sussman	Yaneth Rodriguez, B.S.
University of Southern California	Dr. Jennifer Unger	Claradina Toya, B.A.

Spotlight on an early career scientist funded by TRDRP

Sophia Khaldoyanidi, M.D., Ph.D., currently an Assistant Professor with the La Jolla Institute for Molecular Medicine, received a New Investigator Award from TRDRP that enabled her to initiate a new direction focused on the effects of nicotine on hematopoietic stem cell behavior. Within a short period of time, Sophia and her collaborators generated additional data that led to a novel idea that nicotine might interfere with the development of the hematopoietic system. The innovative value of this idea was recognized by TRDRP in the form of an IDEA Award for Sophia. The results of studies were well received at the Stem Cell Transplantation meeting and were recently published in *Stem Cells and Development* and the *British Journal of Haematology*. Thanks to the TRDRP support, Sophia continued her independent studies on the role of CD44/HA pathway in regulation of hematopoietic stem cell fate. These studies were published in *Stem Cells*. Additionally, Sophia and her team generated new data that provided a basis for an NIH grant award. The TRDRP Cornelius Hopper Diversity Award also provided support to Sophia's postdoctoral fellow, **Naira Serobyian, M.D.** This support gave Naira an exceptional opportunity to work on projects that involve nicotine research and stem cell biology. Naira's enthusiasm and dedication to her work was recognized by her first authorship of two recent publications and a Postdoctoral Fellowship Award from TRDRP.

Sophia's achievements have not gone unnoticed by the scientific community. She has been an invited speaker at several national and international conferences including participation with Dr. Gunter Blobel, a winner of the 1999 Nobel Prize in Physiology or Medicine, in the 2004 Nobel Lecture tour to China. Most recently, Sophia's work was featured in the February 2005 issue of **San Diego Metropolitan Magazine**.

Sophia and her team are confident that their research will result in the development of new strategies to translate basic scientific discoveries to the bedside. These TRDRP grants were critical for Sophia to further develop her ideas and initiate new projects that paved the way to receive support from the NIH. Thanks to TRDRP, Sophia has assembled a team of lab members and collaborators that have proven to be highly productive. Sophia and her team are grateful to TRDRP for giving them an exceptional opportunity to perform research that will benefit human health.

"If TRDRP did not support me, I would never even had a chance to build my own research direction!"

- Sophia Khaldoyanidi, M.D., Ph.D.

Scientific Publications and Presentations

TRDRP-funded investigators disseminate their research findings in scholarly publications and at scientific conferences. In 2004, funded investigators reported publishing 235 peer-reviewed articles in scientific journals, 115 scientific abstracts, 25 book chapters, and making 281 oral and poster presentations. Some of the peer-reviewed scientific journals in which the 235 papers appeared include:

<i>Addictive Behaviors</i>	<i>Health Economics</i>
<i>American Journal of Epidemiology</i>	<i>Journal of Biological Chemistry</i>
<i>American Journal of Physiology</i>	<i>Journal of Consulting & Clinical Psychology</i>
<i>American Journal of Public Health</i>	<i>Journal of Neuroscience</i>
<i>Amer. Journal of Respirator & Critical Care Med.</i>	<i>Nature</i>
<i>Brain Research</i>	<i>Nature Biotechnology</i>
<i>Cancer Epidemiology, Biomarkers, and Prevention</i>	<i>Nicotine and Tobacco Research</i>
<i>Cancer Research</i>	<i>Preventive Medicine</i>
<i>Cardiovascular Research</i>	<i>Proceedings of the National Academy of Sciences</i>
<i>Cell</i>	<i>Science</i>
<i>Chest</i>	<i>Tobacco Control</i>
<i>Circulation</i>	

Collaborative Activities

TRDRP participated in tobacco control activities in California, other states, and nationally. In a collaborative effort with the **California Department of Education**, a joint Request for Applications was issued in November 2004. This was designed to solicit proposals to evaluate a school-based smoking cessation curriculum for adolescents that could be implemented statewide if it were found to be effective.

Senior staff member Dr. Francisco Buchting served as the scientist on the Board of Directors of the **California Tobacco Control Alliance**, which is funded primarily by a Smokeless States Grant from the Robert Wood Johnson Foundation. The Alliance's goal is to reduce tobacco use through statewide implementation of an evidence-based model smoking cessation program throughout California's managed care delivery system.

Senior staff member, Dr. Phillip Gardiner, participated in the review of grant proposals for the **Minnesota Partnership for Action Against Tobacco Program**, the Collaborative Research Study Section. Additionally, at the 2004 international meeting of the **Society for Research on Nicotine and Tobacco** held in Scottsdale Arizona, Dr. Gardiner organized leading neuroscientists to initiate work on a journal monograph on *in vivo* nicotine dosing.

Dissemination of Research Findings

It is in TRDRP's mission to communicate findings of funded research to California scientists, tobacco control professionals, health workers, and the public. This research critically informs the California Department of Health Services and the California Department of Education in their tobacco control and education efforts. For scientists, the dissemination of these research findings advances understanding of biological mechanisms underlying the cause of tobacco-related diseases, and enhances technologies for early detection and more effective treatment of cancer and diseases of the lungs and heart.

Newsletter

TRDRP published and distributed its newsletter, *Burning Issues*, in April and December 2004. Authored by program staff, these issues included the following feature titles:

- *Tobacco Research & the False Assumptions About Latinos*
- *Strange Bedfellows: Public Health and Big Tobacco*
- *Tobacco-Caused Cerebrovascular Disease: Funding Needed*
- *Enhancing Diversity in Tobacco-Related Disease Research*
- *Drastic Cut Proposed in TRDRP Budget*
- *California Cancer Registry: The Whole Enchilada?*
- *Research is Vital for Tobacco Control*
- *Pulling the Plug on Research Funding*



Burning Issues, December 2004

Each newsletter also has information about the program and notices of upcoming events. Approximately 3,000 copies of each issue were mailed to program stakeholders in addition to being posted on the Web at <http://www.trdrp.org/Newsletters.asp>.

Website: trdrp.org

The TRDRP Website is an important dissemination tool. All program publications as well as current information relevant to program activities are posted. Announcements for applications and the application materials are made available on the website. Procedural information and rules for contract and grant administrators are posted. The Website also has a searchable database of all past and currently funded TRDRP research grants. In a typical month, there are over 1,200 “hits” per day on the program’s Web pages.

Staff Activity and Scientific Contributions

During 2004, TRDRP senior professional staff participated in a limited number of important conferences to learn about the latest scientific developments and the current directions in research in their areas of expertise. This information gathering is crucial to keeping TRDRP on the cutting edge of tobacco-related disease research. Equally important, these elite forums allow staff to meet with attending California scientists who are potential applicants and to meet out-of-state scientists to be recruited as eligible TRDRP grant application reviewers. The expert pool of out-of-state reviewers is responsible for the high scientific quality maintained by TRDRP in its peer-review selection process for funding research. See box on page 16: Senior Professional Staff Activity.

“TRDRP funded our IDEA grant that would not be funded by any other agency because the proposed research, though innovative, was high risk because the idea was never tested before. Without this crucial funding support, the research idea would have never taken off. Based on the results of this study we are seeking additional research funding from the federal government and other agencies.”

**- Manuela Martins-Green, Ph.D., University of California, Riverside
Cigarette smoke effects on cells crucial for wound healing**

TRDRP Senior Professional Staff Activity

Dr. Kamlesh Asotra (*research administrator for TRDRP's cardiovascular, cerebrovascular, and general biomedical portfolios*) participated in the following:

- 2nd International Symposium on "ADMA – An Emerging Cardiovascular Risk Factor", New Orleans, LA
- Annual Conference of the International Society for the Prevention of Tobacco Induced Disease, Louisville, KY
- Annual Conference of the International Society of Vascular Biology, Toronto, Canada;
- International Stroke Conference, New Orleans, LA.
- Minority Investigator Career Development Workshop, sponsored by the Division of Cancer Control and population Sciences of the National Cancer Institute, Palm Desert, CA
- Scientific Sessions of the American Heart Association, New Orleans, LA
- World Conference on Oxidants and Antioxidants in Biology, Oxygen Club of California, Santa Barbara, CA

Dr. Asotra served as a reviewer for *Molecular and Cellular Biochemistry*, published two peer-reviewed scientific papers in the *American Journal of Physiology: Heart and Circulation Physiology*, and the *Journal of Cardiovascular and Electrophysiology*.

Dr. M.F. Bowen (*research administrator for TRDRP's cancer and pulmonary diseases portfolios*) Dr. Bowen participated in the following:

- 3rd International AACR Conference "Frontiers in Chemoprevention Research", Seattle, WA
- AACR Special Conference on "The Role of Telomeres and Telomerase in Cancer", San Francisco, CA
- California American Lung Association Annual Meeting, Los Angeles, CA
- California Society for Pulmonary Rehabilitation, Long Beach, CA (Dr. Bowen was a featured speaker)

Dr. Bowen's article, *Pulling the Plug on Research Funding: What it Means to the Victims of Chronic Obstructive Pulmonary Disease (first published in Burning Issues)*, was reprinted by request for distribution at the California American Lung Association Annual Meeting.

Dr. Francisco Buchting (*research administrator for TRDRP's epidemiology and public policy portfolios*) participated in the following:

- 22nd Annual Conference of the Gay and Lesbian Medical Association, Palm Springs, CA (Dr. Buchting was an invited plenary speaker)
- American Public Health Association Annual Meeting, Washington, D.C.
- Harbor-UCLA Medical Center HIV/AIDS seminar, Torrance, CA (invited speaker)

In addition to publishing a peer-reviewed scientific paper, Dr. Buchting received a prestigious Leadership Award from the Hispanic/Latino Tobacco Education Network. He also served on the *Latino Staff Association, University of California Office of the President*, Oakland, CA, and as a member of Board of Directors, Policy Advisory Committee, Strategic Planning Committee, and Speaker's Bureau of the *Next Generation California Tobacco Control Alliance*, Sacramento, CA.

Dr. Phillip Gardiner (*research administrator for TRDRP's nicotine addiction and social/participatory research portfolios*) participated in the following:

- Nicotine Dependence Conference, Mayo Clinic, Rochester, MN (guest faculty lecturer)
- Center for Health Promotion, Seattle WA (speaker)
- Veterans Administration's Conference on Smoking Cessation

Dr. Gardiner served as a lecturer for the *Social Aspects of Cancer* (Sociology 147), Mills College, Oakland, CA. and also for the Graduate Seminar (Environmental Health Sciences 411) UCLA, Los Angeles, CA. He was a guest editor for *The Shifting Landscape: Tobacco Control and Prevention Five Years after the Master Settlement Agreement* published as a supplement to the journal *Health Promotion Practice*, and was an editor for *Menthol Cigarettes-Setting the Research Agenda* published as a supplement to the journal *Nicotine & Tobacco Research*. Dr. Gardiner published two peer-reviewed scientific articles in *Nicotine & Tobacco Research* and an article in the *British Journal of Medicine*.

Public Oversight

The Tobacco Tax and Health Protection Act of 1988 created the Tobacco Education and Research Oversight Committee (TEROC), appointed by the Governor, the Legislature, and the California State Superintendent of Public Instruction. TRDRP activities, budget, and plans are reported regularly by the TRDRP director at the TEROOC meetings scheduled at least four times per year. These reports are published in the minutes of the TEROOC meetings.

Administration

The program has a total staff of twelve, including four scientist research administrators and a scientist director. TRDRP is administered through the University of California, Office of the President.

Scientific Guidance

A Scientific Advisory Committee provides guidance to the program. Members are scientists representing voluntary health organizations, government agencies, health providers, and research institutions within California. This committee meets three times a year and is responsible for making the recommendations of what grants will be funded (see box: The TRDRP Award Process). Committee members serve three-year terms and are neither currently funded by nor eligible to apply for funding from TRDRP during their tenure. A list of the 2004 committee members and the category or organization each represents are shown on page 18.

The TRDRP Award Process

An annual *Call for Applications* is issued in September; submission deadline is mid-January. Applications are evaluated for scientific merit by a panel of out-of-state peer reviewers to ensure minimum conflict of interest. This evaluation method is similar to that used by the National Institutes of Health. The Scientific Advisory Committee makes funding recommendations based on these scientific merit scores. Successful awards start on July 1.

TRDRP Scientific Advisory Committee (2004)
(Group or category represented is shown in parentheses)

Geraldine V. Padilla, Ph.D., Chairperson
UCSF School of Nursing
(professional medical or health organization)

Roshan Bastani, Ph. D.
UCLA Division of Cancer Prevention and Control Research
(behavioral and social research)

Patricia S. Etem, M.P.H.
Civic Communications
(Community-based provider of health education or prevention services)

Mark A. Hlatky, M.D.
Stanford University Department of Health Research & Policy
(independent research university)

Ronald M. Krauss, M.D.
Children's Hospital Oakland Research Institute, Atherosclerosis Research
(American Heart Association, Western States Affiliate)

Gerd P. Pfeifer, Ph.D.
Beckman Research Institute, City of Hope National Medical Center
(biomedical research)

Todd Rogers, Ph.D.
Public Health Consultant
(California Department of Health Services, Tobacco Control Section)

Thomas Scott, Ph.D.
San Diego State University College of Sciences
(tobacco-related disease research institution)

John Simmons, Jr., M.D.
Kaiser Permanente Medical Center, Internal Medicine/Oncology
(American Cancer Society, California Division)

Ken Yoneda, M.D.
UC Davis Division of Pulmonary and Critical Care Medicine
(American Lung Association of California)

Highlights from Funded Research

Cancer Treatment

Studies of novel antitumor agents for lung carcinoma

Michael Kelner, M.D., University of California, San Diego

Dr. Kelner and colleagues have been studying and developing a novel class of antitumor agents called illudins. Analogs of these promising compounds are now being evaluated in NCI- and commercially-sponsored Phase II clinical trials, where activity has been noted against a variety of drug-resistant and recurring tumors. This project has resulted in numerous publications as well as six patents.

Novel DNA vaccines for the treatment of lung cancer

Ralph A. Reisfeld, Ph.D., The Scripps Research Institute

The development of DNA vaccines against cancer has been an area of intense interest for the past decade. This sophisticated and highly targeted approach exploits the fact that DNA which codes for tumor-specific proteins can function much like a traditional vaccine and stimulate the immune system to attack tumors. When constructed, packaged, and delivered appropriately, such DNA ultimately results in synthesis of antigens which stimulate the patient's own immune system to mount a defensive response against malignant cells or their associated vasculature. Identifying appropriate proteins targets, constructing the vaccine, and delivering it to the tumors are all challenging tasks. Dr. Reisfeld has developed two novel and highly effective vaccines against lung cancer. One specifically targets proliferating blood vessels associated with tumors, thus cutting off the blood supply to these tumors. The other is directed against an inhibitor of programmed cell death, which is over-expressed in both tumor cells and their associated blood vessels. This vaccine thus enhances death of both malignant cells and cells forming a tumor's associated vasculature. These vaccines have the potential to prevent lung cancer metastasis, the usual cause of death in lung cancer patients.

Heart Disease

Cardiovascular responses through nicotine receptors

Palmer Taylor, Ph.D., University of California, San Diego

This wide ranging study looked at nicotinic receptors mediated responses in defined rat strains and the distribution and localization of spinal nicotine receptors. Some of the findings suggest that hyper-responsiveness on the part of small animals may not be the result of hypertension per se, rather it was discovered that this condition is a function of the strain of the animal; it is genetically based.

ApoE isoforms, fatty acid metabolism and atherosclerosis

Robert E. Pitas, Ph.D., The J. David Gladstone Institutes and the University of California, San Francisco

Cigarette smoking causes atherosclerosis and stroke – two leading causes of mortality and morbidity – characterized by changes in blood vessels and in lipids and lipoprotein metabolism. Dr. Pitas' research focused on three forms of apolipoprotein E (apoE2, apoE3, apoE4) which is a component of lipoproteins that play a critical role processing and maintaining lipid homeostasis. Compared to apoE3, apoE2 is associated with decrease in plasma cholesterol and a reduced risk of developing atherosclerosis, whereas apoE4 increases cholesterol levels and the risk of atherosclerosis, stroke and Alzheimer's Disease. Compared to apoE3, apoE2 increased but apoE4 decreased free fatty uptake by cultured cells. Dr. Pitas also examined the effects of apoE isoforms on the lipid composition of tissues in: wild-type mice that express normal levels of apoE; in mutant mice deficient in apoE (apoE-null mice); or, apoE-null mice expressing human apoE3 or apoE4. The results showed no significant differences in the overall levels of lipids in the brains of these mice or any significant impact of apoE on the percentages of individual phospholipids in cell membranes, or the FA composition of individual phospholipids.

Tobacco smoke, inflammation, and atherosclerosis

Linda K. Curtiss, Ph.D., Scripps Research Institute

(Originally awarded to Dr. William A. Boisvert who joined the Harvard Medical School in 2003)

These studies with mouse models demonstrated that exposure to environmental tobacco smoke (ETS), which is equivalent to the secondhand smoke in humans, can exacerbate atherosclerosis—a condition that leads to hardening of arteries. These scientists found that ETS takes longer to achieve a significant impact on atherosclerosis than the time period of their study. Using a variety of approaches, it was shown that the prototypic pro-inflammatory cytokine, interferon-gamma does not play a major role in the atherogenic process but the anti-inflammatory cytokine, interleukin-10, probably plays a more active role in atherogenesis. The role of inflammation in atherosclerosis and cardiovascular diseases is a complex phenomenon with numerous effectors and mediators.

“With this TRDRP fellowship my major professor encouraged me to grow as an independent scientist and to become the point scientist in the laboratory for the research group working on the effects of cigarette smoke on wound healing.”

**- Lina Wong, Ph.D., University of California, Riverside
*Effects of cigarette smoke on fibroblasts***

Community Academic Research

Partnership to promote smoking cessation in older adults

Sharon Hall, Ph.D., University of California, San Francisco
Glenna Dowling, Ph.D., R.N., UCSF Institute on Aging (IOA)

While strengthening the work between UCSF and the IOA, these investigators, focusing on a much understudied population of smokers, found that at Multipurpose Senior Service Programs (MSSP) clients smoked 21 cigarettes per day, started smoking at 18 years of age, and had been smoking for 56 years. Most clients had tried to stop smoking on their own and failed—never participating in a formal smoking cessation program. Most importantly, it was found that most of the case managers who worked with elderly people who smoked were not equipped to discuss or counsel their clients about smoking cessation. These findings highlight the need to train case managers and other senior center personnel in tobacco cessation education and advocacy.

Bone Marrow Cells

Effect of nicotine on bone marrow cells

Sophia Khaldoyanidi, M.D., Ph.D., La Jolla Institute for Molecular Medicine

Dr. Khaldoyanidi has been actively studying hematopoiesis, the generation of mature blood cells, a biological process vital to life that occurs in the bone marrow and is regulated by the bone marrow microenvironment in adults. Her previous demonstration that nicotine causes delayed recovery from transplanted bone marrow of leukocytes—the blood cells that fight infections—and of platelets that promote wound healing was pivotal to this project. These effects of nicotine correlated with a lower number of hematopoietic stem and progenitor cells (HPSC) in engrafted bone marrow in mice that were administered nicotine. Dr. Khaldoyanidi showed that nicotine causes poor survival of HPSC, their increased adhesion to the endothelial lining of blood vessels, and inhibition of HPSC migration across the endothelial cells, thereby significantly interfering with the HPSC ‘homing’.

Wound Healing

Cigarette smoke effects on cells crucial for wound healing

Manuela Martins-Green, Ph.D., University of California, Riverside

Using cultured cells and animal models, Dr. Martins-Green found that exposure to second-hand smoke or low dosages of nicotine delays wound healing because the migration of cells homing to the wound site slows down. These studies provide the cellular and molecular bases for faster and improved wound healing. Results were published in two research papers.

Effects of cigarette smoke on fibroblasts

Lina Wong, Ph.D., University of California, Riverside

(Dissertation award completed in the laboratory of Dr. Manuela Martins-Green)

Focused on understanding the effects of first- and second-hand cigarette smoke on fibroblasts, the cells that orchestrate wound repair. During wound healing, fibroblasts move into the wound site, replicate and produce many proteins that are critical for proper contraction, closure, and strengthening of the wound. The investigators found that tobacco smoke both inhibits the movement of fibroblasts and stimulates these cells to survive longer. In essence, the fibroblasts stay at the edges of the wound because they can't move and accumulate there because they survive better. These findings have contributed to better understanding of why wounds of smokers do not heal properly and have opened a new field of study by linking the field of cell biology to the field of tobacco research. The results from these studies were first chosen for a press release by the international journal *BioMed Central Cell Biology* and subsequently featured in stories by the BBC, NBC4, ABC News, *The Scientist*, and other media. More recently, this work was featured in the 2004 American Society for Cell Biology press book and at their press conference. The findings from this project were presented at 10 scientific conferences and were published in two research papers.

Nicotine Addiction

Nicotinic receptors on hippocampal neurons

Wagner Zago, Ph.D., University of California, San Diego (Postdoctoral Fellowship)

This study discovered new information about the localization of $\alpha 7$ -nAChR at synapses and the impact of chronic nicotine exposure on this process. Results showed that nicotine can interfere with the levels of $\alpha 7$ -nAChR and potentially disturb the physiological processes that these receptors control. While nicotine treatment did not change the number of contacts with the receptor, it did noticeably increase the variability between samples. The results indicate that the activation $\alpha 7$ -nAChRs is required for the formation of early nicotinic synapses; however, chronic exposure to nicotine may interfere in the development of such synapses, by altering the ability of nicotinic receptors to respond to acetylcholine. This information will provide useful insight into the physiological significance of such receptors and indicate some of the likely consequences of repeated exposure to nicotine that comes with habitual tobacco use.

Effects of nicotine and cigarette smoke on taste processing

Christopher Simons, Ph.D., University of California, Davis (*Postdoctoral Fellowship*)

The hypothesis that trigeminal afferents project into the gustatory nucleus of the solitary tract (NTS)—responsible for taste signaling—where they have a modulatory influence was tested. This investigator found that activation of the gustatory system has the potential to suppress central nociceptive processing and thus furthered our understanding of nicotine and taste suppression. Dr. Simons has gone on to work with a major pharmaceutical company as a research scientist.

Neuroadaptations underlying nicotine dependence

Adrie Bruijnzeel, Ph.D., Scripps Institute (*Postdoctoral Fellowship*)

Does long-term exposure to nicotine (nicotine dependence) result in a decreased responsivity of brain nicotinic acetylcholine receptors? It was hypothesized that adaptations in the brain cholinergic and dopaminergic system resulting from long-term nicotine exposure are partly responsible for the withdrawal signs experienced after quitting smoking. Specifically, this research sought to investigate which parts of the brain reward circuit and which receptor subtypes are responsible for the affective symptoms of nicotine withdrawal. The findings from this research suggest that long-term exposure to nicotine results in adaptations in nicotinic acetylcholine and dopamine D1 receptor function in the ventral tegmental area and these adaptations may induce the affective signs experienced after quitting smoking. Hence, it was the brain modifications caused by chronic nicotine exposure that are in part responsible for the affective symptoms (anxiety, irritability, etc.) that are associated with nicotine withdrawal.

Immunopharmacotherapy as a treatment for nicotine addiction

Kim Janda, Ph.D., Scripps Institute

Dr. Janda's work parallels the efforts of others around the country that are seeking to develop a vaccine against nicotine addiction. It is hypothesized that development of nicotine antibodies will block the uptake of nicotine and not have the negative central nervous system effects that currently patches and gum have; these products are just another form of nicotine. The results of this study showed that immunization with conformationally constrained haptens confers, in an animal model, a small, but distinct capacity to prevent nicotine from reaching the brain, as well as the heart and several other organs. Dr. Janda is currently developing other haptens that potentially will have a greater impact in preventing nicotine from reaching the brain.

Human neurophysiology of nicotine analgesia: sex differences
David Becker, Ph.D., University of California, San Francisco

Previous studies had indicated that nicotine reduced pain for men but not for women. Contrary to previously published results, Dr. Becker found no difference in pain suppression between men and women, and in some cases nicotine served as a pain suppressor mainly for women. Dr. Becker is continuing the analysis of his data, however, more studies are needed to elucidate further the relationship between gender and nicotine pain suppression.

Pulmonary Disease

Environmental tobacco smoke effects on breathing patterns
Jesse P. Joad, M.D., University of California, Davis

Children exposed to environmental tobacco smoke (ETS) display increased cough, wheeze, airway obstruction, phlegm, asthma, and sudden infant death. Dr. Joad has been investigating the neuronal mechanism by which ETS causes these childhood pulmonary pathologies by examining the effect of secondhand smoke on the C-fiber reflex. This reflex consists of sensory C-fibers in the lungs which, upon detecting irritants such as tobacco smoke, send nerve signals to the nucleus tractus solitarius in the brain. This center processes the information and relays it to other brain areas which, in turn, stimulate cough, airway narrowing, phlegm, and breath-holding. In the course of these studies, Dr. Joad established that ETS exerts its effects by influencing a substance P receptor mechanism within this reflex pathway. These results suggest that drugs targeting substance P may be of therapeutic benefit to children raised in homes with smoking adults. The results formed the basis of nine articles, one book chapter, and three presentations.

“The importance of TRDRP sponsorship to this project is best emphasized by noting that this project over a 10 year period was rejected nine times by NIH study sections, 7 times by the ACS, and over a dozen times by numerous other ‘cancer organizations’. Without TRDRP support these [antitumor] agents would still be sitting on the shelf.”

- Michael Kelner, M.D., University of California, San Diego
Studies of novel antitumor agents for lung carcinoma

Tobacco Industry Document Research

Analysis of tobacco industry documents on scientific research

Lisa Bero, Ph.D., University of California, San Francisco

The project analyzed internal tobacco industry documents related to the conduct, funding, interpretation and dissemination of research, particularly research on passive smoking, by the tobacco industry. This project not only described what the tobacco industry said it would do, but it also examined whether the industry actually completed its plans. Dr. Bero's research showed how tobacco industry secretly influenced the sale of tobacco in pharmacies, funded clinical trials, criticized meta-analysis, tobacco industry research on genetics, especially low nicotine tobacco, influenced scientific publication process the lay press coverage of scientific research, and opposed the ASSIST program - a large government-funded randomized. In addition, the findings have contributed to the discourse on university - tobacco industry collaborations and disclosure policies for scientific journals and other publications. The grant has produced five papers in the peer reviewed literature and 25 scientific presentations and abstracts at conferences and meetings.

Tobacco Control Research

Use of existing data to develop new tobacco control strategies

Elizabeth Gilpin, M.S., University of California, San Diego

The goals of this project were to examine multiple existing data sets, from California and nationally, for data that would allow existing tobacco control policy to be evaluated and successful policies more fully promoted. Thus far, 16 articles have been published in the peer reviewed literature including four articles in JAMA, nine papers are in the process for publication for a total of 25 papers to be produced from this project, in addition to two book chapters. These papers addressed a host of topics vital to effective tobacco control in California including topics such as: the impact of smoke-free workplaces and homes on adolescent smoking uptake, protection of nonsmokers from second-hand smoke and adult smoking behavior, price sensitivity and tax avoidance behavior, adolescent sources of cigarettes, the importance of smoke free learning environments, use of tobacco products other than cigarettes by adolescents and adults, the influence of tobacco advertising and promotions on adolescent smoking uptake, the role of curiosity in the smoking uptake process, the role of tobacco control programs in harm reduction, delay of regular smoking and its potential impact on lifetime exposure to cigarette toxins and development of smoking-related diseases, the population effectiveness of pharmaceutical aids, and the incidence of smoking cessation and news media coverage of smoking and health.

Tobacco Use Prevention in Youth and Minors

Experimental evaluation of minors' access to tobacco (Project EEMAT)

Hope Landrine, Ph.D., San Diego State University

Dr. Landrine hypothesized that the protocol that other researchers had used to investigate this phenomenon may be deficient, in that youth serving as buyers were sent to stores where they were not known. It was felt that youth more often than not frequented stores where they were known and knew they could buy cigarettes. In a series of structured interviews, it was determined that youth use Familiarity as the main way to buy cigarettes; they didn't pick stores where they were not known. It was also hypothesized that youths would be more successful in buying cigarettes at stores where they were known versus stores where they were not known. To date, data analysis is not complete; however, initial results suggest that youths were more successful at purchasing tobacco products at stores where they are known compared to stores where they were not known.

Prospective relationship between risk perception and tobacco use

Bonnie L. Halpern-Felsher, Ph.D., University of California, San Francisco

This is one of the few studies in the U.S. thus far that employed prospective, longitudinal methodology to determine whether and how adolescents' perceptions of smoking-related long- and short-term risks and benefits influence their initiation, continuation and cessation of smoking. Such information is critical for the development of new and more effective programs aimed at reducing adolescent smoking. The adolescents participating in the study are gender and ethnically diverse. At this time, some of the key findings from the study published in the peer reviewed literature are: adolescents believed that they would be significantly less likely to experience negative health related outcomes when smoking light versus regular cigarettes, that it would take longer to become addicted to light versus regular cigarettes, and that light cigarettes deliver less tar and nicotine than regular cigarettes; based on both frequency of smoking and the number of cigarettes smoked, adolescents ascribed a far greater chance of quitting smoking to casual smokers than they did to either regular or addicted smokers; and while adolescents perceived the risk from primary smoke to be greater than that of secondhand smoke, they were still aware of the serious risks posed by exposure to secondhand smoke.

Effective diffusion of evidence-based tobacco curricula
Silvana Skara, M.P.H., University of Southern California (*Ph.D. Dissertation Award*)

This project investigated the process of diffusion of evidence-based tobacco-use prevention programs in junior/middle and senior high schools throughout California. Cross-sectional data were obtained from both teachers and principals in schools that participated in the large-scale “Independent Evaluation study of the California Tobacco Control Program”. Results indicated that multiple dissemination channels were influential in the process of adoption and implementation of tobacco use prevention programs, including a recommendation from a colleague (89.7%), evaluation studies demonstrating that the curriculum was effective (84.2%), a recommendation from the school district (73.2%), an endorsement by the California Department of Education (72.7%), and information from marketing representatives (48.3%). Results also indicated that the final decisions about the tobacco use prevention curricula used at the schools were primarily made by teachers, with less than 5% of schools reporting that the principal made this final decision. Further, results indicated that a relatively small proportion of teachers (20%) in this sample reported use of at least one evidence-based curriculum. The results of this study have important implications for [both] diffusion of innovations in school settings, policy decisions regarding tobacco use prevention education in schools.

Tobacco Use in Diverse California Populations

Tobacco Use & Acculturation: California Residents of Korean Descent
Richard C. Hofstetter, Ph.D., San Diego State University Foundation

This study investigated the prevalence and determinants of tobacco use among California residents of Korean descent and explored the relationship between tobacco use and acculturation. Traditional social norms in Korea dictate that men may smoke and women and children may not. Results from telephone interviews with randomly sampled 2,830 adults and 584 adolescents in California with Korean surnames were compared to those from a sample of 500 Koreans living in Seoul, Korea. Eighty six percent of attempted interviews were completed and 85% of the interviews were conducted in Korean. Analyses revealed that many more men than women met the CDC definition of “smokers” (ever smoked 100 cigarettes and are currently smokers, 31.2% vs. 3.7%). Less acculturated men and more acculturated women reported higher present and predicted future rates of smoking after multivariate statistical controls were applied. Although men do not smoke their first cigarette or smoke cigarettes regularly earlier than women, both begin smoking later than adults born in the United States. However, quitting was associated negatively with acculturation. The grant has produced six papers in the peer reviewed literature and 10 scientific presentations at conferences and meetings.

Appendix A Completed Grants

Appendix A Completed Grants

ENVIRONMENTAL TOBACCO SMOKE, GENERAL BIOMEDICAL SCIENCES

INSTITUTION	AMOUNT	PROJECT TITLE	PRINCIPAL INVESTIGATOR
California Institute of Technology	\$60,000	(-) Lobeline: total synthesis and derivitization	Jeffrey Bagdanoff, B.S.
Human BioMolecular Research Institute	\$412,200	Nicotine & its metabolites: apoptosis in developing neurons	Jun Zhang, Ph.D.
San Diego State University Foundation	\$624,780	Behavioral effects of neonatal nicotine exposure	Edward Riley, Ph.D.
Stanford University	\$672,390	Comprehensive evaluation of the ischemic leg	Dwight Nishimura, Ph.D.
University of California, Davis	\$70,000	Effect of cigarette smoke and nicotine on taste processing	Christopher Simons, Ph.D.
University of California, Riverside	\$74,500	Cigarette smoke effects on cells crucial for wound healing	Manuela Martins-Green, Ph.D.
University of California, Riverside	\$25,390	Quantification of toxicants in harm reduction cigarettes	Karen Riveles, Ph.D., B.A.S., M.P.H.
University of California, San Francisco	\$515,124	Effect of maternal smoking on human placental development	Susan Fisher, Ph.D.
University of California, Santa Barbara	\$316,038	Smoking and the pathogenesis of macular degeneration	Lincoln Johnson, Ph.D.
HEART DISEASE			
J. David Gladstone Institutes	\$691,616	ApoE isoforms, fatty acid metabolism and atherosclerosis	Robert Pitas, Ph.D.
J. David Gladstone Institutes	\$400,500	Remnant lipoproteins, apolipoprotein E4 & atherosclerosis	Robert Raffai, Ph.D.
La Jolla Institute for Molecular Medicine	\$520,381	Effect of nicotine on bone marrow cells	Sophia Khaldoyanidi, M.D., Ph.D.
Scripps Research Institute	\$754,932	Tobacco smoke, inflammation & atherosclerosis	Linda Curtiss, Ph.D.
Scripps Research Institute	\$68,437	Regulation of integrin activation by calcineurin	Kayoko Kimbara, Ph.D.
The Burnham Institute	\$801,893	Smoking-induced oxidant stress & platelet integrin alpha	Jeffrey Smith, Ph.D.
University of California, Riverside	\$50,418	Cigarette smoke, MCP-1 expression in vivo and atherogenesis	Lina Seang Wong, B.S.
University of California, San Diego	\$448,941	Cardiovascular responses through spinal nicotinic receptors	Palmer Taylor, Ph.D.
University of California, San Francisco	\$224,500	Vascular endothelial growth factor receptor signaling	Timothy Quinn, Ph.D.

Appendix A Completed Grants

CANCER

INSTITUTION	AMOUNT	PROJECT TITLE	PRINCIPAL INVESTIGATOR
California Institute of Technology	\$74,927	Total synthesis of cribrastatin 4, a potent anticancer agent	Yeeman Ramtohol, Ph.D.
California Institute of Technology	\$59,947	Total Synthesis of Mitomycin C, an Anti-CancerTherapeutic	Eric Ashley, Ph.D.
California Toxicology Research Institute	\$295,815	The role of P450s in tobacco-mediated lung cancer	Scott Allen, M.S., Ph.D.
California Pacific Medical Center Research Institute	\$668,814	Improved therapy of lung cancer	Li-Xi Yang, M.D., Ph.D.
J. David Gladstone Institutes	\$267,304	Enzymatic targets for anticancer therapy	Martin Bergo, M.D., Ph.D.
Lawrence Berkeley National Laboratory	\$474,492	Role of Smad protein in growth inhibition of tumor cells	Kunxin Luo, Ph.D.
Scripps Research Institute	\$1,063,300	Novel DNA vaccines for the treatment of lung cancer	Ralph Reisfeld, Ph.D.
Stanford University	\$950,821	Mobilized dendritic cells for lung cancer	Edgar Engleman, M.D.
University of California, Los Angeles	\$590,523	Cytokine gene-modified dendritic cells for lung cancer	Steven Dubinett, M.D.
University of California, Los Angeles	\$225,000	New therapy for lung cancer using radioiodide	Min Huang, M.D., M.S.
University of California, San Diego	\$833,491	Studies of novel antitumor agents for lung carcinoma	Michael Kelner, M.D., M.S.
University of California, San Diego	\$43,344	Tobacco carcinogens influence Ah-receptor function	Alema Galijatovic, Ph.D.
NICOTINE ADDICTION			
Cedars-Sinai Medical Center	\$897,484	Stress and the use of nicotine	Robert Pechnick, Ph.D.
Cedars-Sinai Medical Center	\$149,175	Neuropharmacology of nicotine relapse	Xiu Liu, M.D., Ph.D.
Scripps Research Institute	\$515,270	Immunopharmacotherapy as a treatment or nicotine addiction	Kim Janda, Ph.D.
Scripps Research Institute	\$60,379	Neuroadaptations underlying nicotine dependence	Adrie Bruijnzeel, Ph.D.
University of California, San Diego	\$69,940	Nicotinic receptors on hippocampal neurons	Wagner Zago, Ph.D.
University of California, San Francisco	\$595,994	Human neurophysiology of nicotine analgesia: sex differences	David Becker, Ph.D.

Appendix A Completed Grants

PULMONARY DISEASE

INSTITUTION	AMOUNT	PROJECT TITLE	PRINCIPAL INVESTIGATOR
The Burnham Institute	\$430,539	To identify Egr-1 target genes important in pulmonary disease	Ian De Belle, Ph.D.
University of California, Davis	\$590,779	ETS effects on breathing patterns	Jesse Joad, M.D.
University of California, Davis	\$392,117	Mechanism of smoke-induced MUC5B gene expression	Reen Wu, Ph.D.
University of California, Los Angeles	\$330,458	Mechanisms underlying modulations of respiration by nicotine	Xuesi Shao, M.D.
University of California, San Diego	\$56,118	Long-term adherence after pulmonary rehabilitation for COPD	Pia Santiago, B.A.

SMOKING CESSATION/INTERVENTION

Human BioMolecular Research Institute	\$802,840	Novel nicotine cessation therapeutics	John Cashman, Ph.D.
Institute On Aging	\$101,367	Partnership to promote smoking cessation in older adults	Sharon Hall, Ph.D.
Progressive Research & Training for Action	\$445,068	Smoking interventions in diverse LGBT communities	Brenda Crawford
University of California, San Diego	\$414,203	The role of media in smoking initiation & cessation	David Burns, M.D.
University of California, San Francisco	\$413,119	Self-hypnosis for smoking cessation	Timothy Carmody, Ph.D.
University of California, San Francisco	\$69,800	Efficacy of the nicotine patch in adolescents & young adults	Mark Rubinstein, M.D.
University of California, San Francisco	\$30,905	Smoking interventions in diverse LGBT communities	Gregory Greenwood, Ph.D.

TOBACCO CONTROL POLICY

University of California, San Diego	\$402,610	Use of existing data to develop new tobacco control strategies	Elizabeth Gilpin, M.S.
University of Southern California	\$47,747	Effective diffusion of evidence-based tobacco curricula	Silvana Skara, M.P.H.

Appendix A Completed Grants

TOBACCO USE IN DIVERSE POPULATIONS

INSTITUTION	AMOUNT	PROJECT TITLE	PRINCIPAL INVESTIGATOR
Assoc of Asian Pacific Community Health Organizations	\$92,076	Exploration of tobacco use in Asian Pacific Islander youth	Sora Tanjasiri, Dr.P. H., M.P.H.
RAND Corporation	\$431,132	Patterns of tobacco use from adolescence to young adulthood	Phyllis Ellickson, Ph.D.
San Diego State University Foundation	\$826,522	Tobacco use & acculturation: CA residents of Korean descent	Richard Hofstetter, Ph.D.
San Diego State University Foundation	\$655,347	Experimental evaluation of minors' access to tobacco	Hope Landrine, Ph.D.
Sequoia Foundation	\$129,090	Prenatal smoke exposure and age at Menarche	Gayle Windham, Ph.D.
University of California, San Francisco	\$509,771	Determinants of smoking among gay & lesbian youth	Jay Paul, Ph.D.
University of California, San Francisco	\$224,884	Prospective relationship between risk perception & teen tobacco use	Bonnie Halpern-Felsher, Ph.D.
University of California, San Francisco	\$69,824	Multibehavioral changes for disease prevention among smokers	Judith Prochaska, Ph.D.

TOBACCO-RELATED HEALTHCARE ECONOMICS

University of California, San Francisco	\$595,843	A dynamic model of smoking and healthcare expenditures in CA	Wendy Barbara Max, Ph.D.
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TOBACCO INDUSTRY DOCUMENTS

University of California, San Francisco	\$442,646	Analysis of tobacco industry documents on scientific research	Lisa Bero, Ph.D.
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CONFERENCES

American Lung Association of California	\$5,000	ALAC 2003 Annual Conference	Steve O'Kane
Next Generation Alliance	\$3,890	Next Generation California Tobacco Control Alliance	Traci Verardo
Oxygen Club	\$5,000	Oxygen Club of California	John Maguire, D.D.S.
University of Southern California	\$6,000	Priority Populations Conference	Lourdes Baezconde-Garbanati, Ph.D., M.P.H.

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