Burning Issues

Tobacco's Hottest Topics

Tobacco-Related Disease Research Program Newsletter **Volumn 7, Number 3 August 2005**

Hooked on Hookah?

What You Don't Know Can Kill You

by Kamlesh Asotra, Ph.D.

"Harmful hookahs lure a young crowd"—announces the headline of a recent Contra Costa Times article. According to the article, public health professionals in California are very concerned about hookah smoking among our youth.[1] Researchers across the globe have echoed similar concerns.[2,3] A growing number of college students and others in the United States who have tried or now regularly participate in hookah smoking claim that they do not smoke cigarettes or use tobacco. Most of these individuals believe that hookah smoke is neither addictive nor as harmful as cigarette or cigar smoke.[4] This sense of false security may be perpetuated by the myth that the hookah smoke, after bubbling through water becomes devoid of the harmful elements that are present in cigarette smoke.

Among more than 1 billion smokers worldwide, 100 million people in Africa, Asia, and the Middle East use water pipe or hookah to smoke tobacco. Water pipe is variously known in different regions as hookah (Indian subcontinent and Africa), shisha, borry, goza (Egypt, Saudi Arabia), narghile, arghile (Jordan, Lebanon, Syria, and Israel), shui yan dai (China), or hubble-bubble. It's believed to have originated in India in the 16th century and found its way to Persia (Iran), Turkey, and the Eastern Mediterranean.[5] In the last 25 years, hookah smoking has become increasingly popular in Arab societies, Europe, and the United States due mainly to the cultural and social practices of new immigrants from countries where hookah smoking is an accepted tradition. Recently, hookah bars have mushroomed across California and in several other states with sizable Arab-American populations. More than 300 hookah bars are operating in the United States, with at least 50 in California. Many are located near colleges, universities, and shopping malls and are frequented by college students and locals. The bars offer an "exotic ambience" where customers can smoke a variety of fruit flavors and aromas in smoking sessions that last 45 to 60 minutes, for

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In This Issue

54 Grants Awarded in the 2005 Funding Cycle

In the 2005 funding cycle, TRDRP awarded 54 grants to individual investigators at 23 California institutions. The number of applications reviewed this year increased slightly from 186 in 2004 to 195 with 38% of the applications ranked as either "outstanding" or "excellent" by TRDRP study sections.

The overall proportion of applications funded improved over the previous year from 26.3% to 27.7% despite fewer funds being available. There were $17 million available last cycle, $15 million this cycle. The proportion funded varied by award mechanism due to the different number of applications reviewed for each mechanism (see Table 1).

Compared with last year, the number of multi-year Research Project awards funded dropped from 24 to 21 thus making it possible to fund many more excellent training award applications. More than a third (36.4%) of the post-doctoral fellowship applications were funded and half of the dissertation award applications were funded. Out of the 21 successful Research Project awards, 20 addressed one of TRDRP's primary research areas published in the *2005 Call for Applications*.

TABLE 1.

Award Mechanism	Number of Applications Reviewed	Number Funded	Percent Funded
Research Project – Primary Area	85	20	23.5
Research Project – Complementary Area	6	1	16.7
Innovative Developmental Exploratory (IDEA)	26	7	26.9
New Investigator	22	6	27.3
Postdoctoral Fellowship	33	12	36.4
Dissertation	16	8	50.0
Community-Academic Research	4	0	0.0
School-Academic Research	3	0	0.0
All Award Mechanisms	**195**	**54**	**27.7**

A complete list of grant recipients and the abstracts describing their research projects will be published in the *2005 Compendium of Awards*, which will be available on the TRDRP website (www.trdrp.org). All funded investigators will be mailed a copy; other interested parties may obtain printed copies upon request.

Cornelius Hopper Diversity Award Supplements

This year marked the sixth year of funding for the Cornelius Hopper Diversity Award Supplements (CHDAS). In 2005, three currently funded TRDRP investigators will receive these supplements to their grants to mentor trainees (see Table 2).

TABLE 2.

CHDAS Trainee	Principal Investigator	Institution
Maria Herrera, B.A.	Dr. Ricardo Munoz	University of California, San Francisco
Minal Patel, M.P.H.	Dr. William J. McCarthy	University of California, Los Angeles
Jessica Wong, Ph.D.	Dr. Jacquelyn Gervay-Hague	University of California, Davis

Charles DiSogra, Dr.P.H., M.P.H.

The 2005 Awards Have Been Made

I am pleased that TRDRP is able to fund 54 meritorious research proposals this year. This is five more than last year even though we had over $2 million less money available (see TRDRP Update). For younger scientists, 2005 brought good news in that the number of awards to new investigators and postdoctoral fellows increased over last year.

Unsuccessful? Resubmit!

Although the above is good news for California's future in tobacco-related disease research, I am disappointed that many senior scientists addressing important research questions were unable to muster tighter proposals. This is especially frustrating in areas where data are sorely needed in the struggle for more effective, evidence-based tobacco control efforts. The absence of successful CARA and SARA applications this year throws a spotlight on this need. I sincerely hope that the unsuccessful proposals will be resubmitted next year taking into account the recommendations of study section reviewers.

Having attended all the study section meetings this year, I was impressed with the expertise of our reviewers. This review process is the quality assurance that has earned TRDRP its excellent reputation and benefited all resubmitted proposals. As an informational note, TRDRP reviewers are recruited from outside of California; some have been reviewers for several years and some are new. I offer my appreciation for their time and expert recommendations.

Opportunity calls, but falls short

This year saw a drop from last year in the number of Cornelius Hopper Diversity Award Supplements (CHDAS), from six to only three. These awards supplement the grants of existing principal investigators. Sadly, too few investigators took advantage of this opportunity. We could have supported more than the three excellent trainees selected in 2005.

The CHDAS is designed to support a one- or two-year mentoring of emerging professionals, potential young scientists, and practicing community health workers. The purpose is for senior scientists to introduce these trainees to tobacco-related disease research. Key to eligibility is some demonstration that the trainee has overcome significant social, educational, or financial barriers in their career development, and that they share a commitment to tobacco control, prevention, or relevant disease detection and prevention work. We strongly encourage applications from individuals who come from or are committed to serve communities and population groups that historically have been underrepresented in the tobacco research field. Certainly, we can do more to promote the CHDAS, and we will. This is an effort I'd like to see improve in the next application cycle, and I urge principal investigators not to pass up this opportunity in 2006.

SAC transitions and new staff

Guidance for TRDRP comes from a Scientific Advisory Committee (SAC) that for the past year has been expertly chaired by Dr. Geraldine Padilla from the UCSF School of Nursing. For 2005–2006, Dr. Padilla steps down as chair to begin a second three-year term as a SAC member. The new chair will be Dr. Thomas Scott from San Diego State University. Members who have completed their term are Pat Etem of Civic Communications in Long Beach; Dr. Mark Hlatky of Stanford University; Dr. Ronald Krauss representing the American Heart Association; Dr. John Simmons, Jr., representing the American Cancer Society; and Dr. Todd Rogers, the appointed representative for the Tobacco Control Section of the California Department of Health Services. We thank these persons for their time and dedication. New SAC members are in the process of being nominated. Finally, I would like to welcome Kellie Medrano who recently joined the TRDRP staff as a grants management analyst for our cancer, pulmonary disease, cardiovascular, and biomedical science portfolios.

Online submission in development

Online submission of grant applications is currently in development and could be available as early as this fall for the next application cycle.

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the cost of about $15.[4]

Is hookah smoke really so innocuous? This article describes hookah smoke chemistry and highlights facts related to hookah smoking and diseases that deserve attention and further scientific research.

Hookah tobacco combustion—"cool" burning

Hookah or water pipe is made of a clay bowl, body, water reservoir, and a stem or hose for inhalation of tobacco smoke. Hookah tobacco—mu'essel or maassel (assal means honey in Arabic)—is a moist, paste-like mixture of about 30% crude, cut tobacco, fermented with approximately 70% honey, molasses, and pulp of different fruits to create the fruity flavor and aroma of the smoke when subjected to slow combustion with burning charcoal. The combustion processes that produce cigarette smoke and hookah smoke are very different. Mainstream cigarette smoke is produced at 900°C. Hookah smoke is produced at nearly half that temperature at 450°C. Hookah smoke bubbles through water at the base reservoir. During a smoking session, more glowing charcoal is added to the partially consumed hookah tobacco once the original charcoal in the bowl is used up. As the hookah smoking session progresses, the reservoir water becomes increasingly brown in color on account of "tar," dissolved chemicals, and other particulates in the hookah tobacco aerosol. The chemical waste-laden water is discarded and the hookah reservoir is then replenished with fresh water for the next smoking session.

What is in hookah smoke?

During the last 40 years of research, nearly 4,800 chemical compounds have been identified in cigarette smoke, including 69 carcinogens.[6] In contrast, only five studies have been published in English on the chemical composition of hookah smoke, and those focused on only a relatively small number of chemical compounds.[7–11] Combustion chemistries in-volved in the production of mainstream cigarette smoke and mainstream hookah smoke differ due to widely different combustion temperatures and the dry or humid characteristics of tobacco. In both cases, plant-derived organic matter undergoes pyrolysis or volatilization, producing addictive nicotine as well as a number of the same toxicants from combustion. These include carbon monoxide (CO), "tar," and myriad carcinogenic polycyclic aromatic hydrocarbons (PAH). Also, hookah smoke contains significantly higher quantities of toxic heavy metals like arsenic, nickel, cobalt, chromium, lead,[10] and cadmium[12], as compared with cigarette smoke.[13] These facts about hookah smoke are a "screaming warning" that hookah smoking is harmful.

In a carefully designed recent study, researchers Shihadeh and Saleh used a smoking machine that replicated the puffing mechanics derived from precise measurements of 52 hookah smokers in Lebanon.[11] Shihadeh and Saleh carried out stringently controlled quantitative chemical analyses of hookah smoke. They found that hookah smoke produced nearly two orders of magnitude greater amount of "tar" from a single smoking session than that produced from a single cigarette. Simply put, hookah smoke produces nearly 100 times more "tar" than cigarette smoke, for each gram of the respective tobaccos. **Table A** shows that hookah smoke contains several-fold greater quantities of harmful chemicals thus far studied than found in cigarette smoke.

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TABLE A

Chemicals found in hookah smoke *versus* cigarette smoke. Adapted from Shihadeh and Saleh[11]

Chemical	Yield from 1 gm hookah tobacco	Yield from cigarette smoke, 1 gm tobacco	Multiple of average cigarette smoke value
"Tar," mg	802	Range:1-27 Average:11.2	100-fold
Nicotine, mg	2.96	Range: 0.1-2 Average: 0.77	4-fold
Carbon monoxide CO,mg	143	Range: 1-22 Average: 12.6	11-fold
PAH Phenanthrene, µg (co-carcinogen)	0.748	0.2-0.4	2.5-fold
Fluranthracene, µg (co-carcinogen)	0.221	0.009-0.099	4-fold
Chrysene, µg (tumor initiator)	0.112	0.004-0.041	5-fold

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In light of these recent chemical data on selected constituents of hookah smoke as compared with those of mainstream cigarette smoke, hookah smoke of various fruity flavors, tastes, and aromas may be even more harmful than disease-causing cigarette tobacco smoke.

Who says hookah smoking isn't addictive?

Hookah smoking is an efficient nicotine delivery system. After a 45-minute hookah smoking session, the concentrations of nicotine and its longer-lived metabolic product, cotinine, become significantly elevated in saliva, plasma, and urine.[14] Comparison of urinary levels of cotinine between hookah smokers and cigarette smokers suggests that in a single hookah smoking session using 20 grams of hookah tobacco, the hookah smoker is exposed to several-fold greater quantities of the addictive stimulant nicotine for up to 45 to 60 minutes. That is equivalent to chain-smoking 15 cigarettes.[15] A cross sectional study on hookah smokers from 112 restaurants and cafes in Aleppo, Syria, reported that 96% of weekly hookah smokers and 50% of daily hookah smokers did not smoke cigarettes.[2] This survey found that 91% of weekly hookah smokers and 51% of daily hookah smokers did not have the will to quit, which highlights the addictive nature of hookah smoking[2] among myriad factors.[16]

Carbon monoxide in hookah smoke: Effects on lungs, heart, and brain

Hookah smokers are exposed to three-fold greater amounts of CO—an odorless gas—than are cigarette smokers. Based on their chemical analysis, Shihadeh and Saleh[11] provide strong evidence that the CO-to-nicotine ratio in hookah smoke is 50:1, and that for cigarette smoke is 16:1. One of the reasons for the greater CO concentrations in Hookah smoke is the charcoal that is added to enhance the burning of the moist tobacco concoction. Hemoglobin, the iron-containing protein in blood that transports oxygen from lungs to all parts of the body in vertebrates, has extremely high affinity for CO, and forms carboxyhemoglobin (COHb), which can no longer serve as either the oxygen acceptor or as the oxygen carrier. Hookah smokers have significantly higher levels of COHb in their blood than heavy cigarette smokers who smoke 15 to 40 cigarettes.[17]

Because the duration of a single puff of hookah smoke is double that of a cigarette, and the suction pressure for inhalation of hookah smoke is four times that for a cigarette, the hookah smoke reaches deeper into lung tissue.[18] Consequently, hookah smoking may cause greater ventilatory incapacitation, especially in older individuals, than cigarette smoking causes.[19] Since smoking rates among 18- to 24-year-olds are the highest of any age group in California[20], the recent trend of hookah smoking among youth, unless checked, may exacerbate the future incidence of chronic obstructive pulmonary disease.

> ***Simply put, hookah smoke produces nearly 100 times more "tar" than cigarette smoke, for each gram of the respective tobaccos.***

Blood pressure (systolic, diastolic, and mean), expired CO, and heart rate all increase upon hookah smoking.[21] Heart and brain have extremely critical requirements for a minimal threshold of oxygen. Episodes of sudden and short periods of oxygen deprivation can result in heart attack or brain stroke.[22] Chronic exposure to nicotine also has a direct effect on the heart, causing atrial flutter.[23] This exposure leaves hookah smokers vulnerable to this debilitating condition.

How hookah smoke may affect fertility, virility and babies

It is becoming increasingly clear that, like tobacco smoking, mainstream hookah smoke and second-hand hookah smoke cause deleterious effects on reproductive systems in men and women and produce genotoxic[24], mutagenic, and teratogenic[25] effects on babies of smoking parents. These effects include infertility in females and sterility of males, and low birth weight [26, 27] and birth defects in babies born to smoking mothers.[28, 29] A recent study of 100 Egyptian infertile women determined that the couples' infertility was due to sterility of husbands who were hookah smokers.[30]

High concentration of CO is a major component of second-hand smoke from hookah. The contribution from burning charcoal in hookah may also have significant and deleterious effects on young babies that may be exposed to mild CO levels. Even at very low levels, such as 25 to 50 parts per million parts of air, CO can produce permanent damage to the inner ear in young babies and irreversible loss of hearing.[31-35]

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Nicotine Vaccines: Cessation

by Phillip Gardiner, Dr.P.H.

On May 15, 2005, Cytos Biotechnology AG of Zurich reported that after four weeks, 40% of 341 heavy smokers using an experimental nicotine vaccine were abstinent compared with 31% who were taking a placebo. Even though this finding was not statistically significant, the real exciting news was that 57% of those receiving the vaccine developed a high antibody response and were abstinent for 24 continuous weeks.[1] Cytos CEO Wolfgang Renner said that if other trials go well, the product could hit the market as soon as 2010. The Cytos announcement followed the September 2004 report out of Nabi Biopharmaceuticals that their nicotine vaccine, NicVAX, had shown a 33% quit rate in smokers *versus* a 9% reduction in smoking among those smokers receiving a placebo.[2] Xenova, another company in the hunt, stated that self-report data showed a 19% quit rate for smokers using their vaccine, TA-NIC, *versus* an 8% reduction in those smokers receiving a placebo.[3] This burst of activity has buoyed the spirits of cessation researchers worldwide and of the Tobacco-Related Disease Research Program (TRDRP), since the development of nicotine dependence treatments is one of our priority research areas.

Already, some California researchers are receiving TRDRP support to tackle the many thorny issues involved in the development of a nicotine vaccine. This quest for a 21st century solution to the alarming worldwide spread of nicotine addiction and tobacco-related diseases may have far reaching implications for researchers, tobacco users, and non-users alike.

Nicotine vaccine: The rationale

Tobacco use and all its attending diseases are the number one preventable cause of death in the world today. Indeed, it is estimated that if worldwide smoking patterns persist, about half a billion of the world's population alive today will be eventually killed by tobacco-related diseases.[4] As incredible as this statistic seems, most people know that smoking is bad for them. Yet millions light-up everyday, a gruesome testament to the power of nicotine addiction. The current array of tobacco/nicotine cessation treatments, including nicotine replacement therapies (NRT) such as the transdermal nicotine patch, gum, lozenges, and sprays have only been moderately successful, at best. Bupropion and other monoamine oxidase inhibitors (MAOIs) likewise have had only limited success. Alternative therapies, including meditation, acupuncture, hypnosis, even though less studied, fall within the same modest range. All these regimens, even when coupled with counseling, on average show only a 30% quit rate at best.[5, 6] Increasingly, scientists are turning to techniques that can block the uptake of nicotine, thus preventing the addiction in the first place. It is hypothesized that the development of nicotine vaccines will be much more efficacious than the current cessation methods.

Treatment of the Future?

Nicotine vaccine: What it does and doesn't do

Nicotine addiction is oc-casioned by nicotine binding to neuronal receptors in the brain, replacing acetylcholine and activating the dopaminergic system, the pleasure center of the brain. The repeated uptake of nicotine by the nicotinic re-ceptors and the corresponding constant activation of the dopaminergic system through the release of dopamine is the basis for physical dependence. And since tobacco products are legal and heavily promoted, habits are relatively easily maintained. Moreover, unlike other drugs of abuse, cocaine and heroin, nicotine enables the users to be totally functional, indeed, in many cases more productive through increased alertness and improved cognition.[7] The paradox is this: a toxic, relatively inexpensive legal substance that is more addicting than many illegal substances is at the same time the most deadly, especially when packaged in a cigarette.

A nicotine vaccine consists of immunogenic compounds that are similar to nicotine in their molecular structure. When introduced into the body via the bloodstream, these molecules induce nicotine-specific antibodies. These antibodies prevent the nicotine from traveling to the brain and thus thwart the addictive process. Specifically, scientists are creating immunogenic molecules that will produce antibodies that bind to the nicotine molecule. Once these two molecules are joined, the resulting particle is much larger and unable to penetrate the blood-brain barrier. If the nicotine can not get to the brain, it cannot get to the neuronal receptors, and ergo, cannot activate the release of dopamine, the pleasure reinforcement center in the brain.

The trick is to successfully devise a substance that produces antibodies that specifically and effectively bind and stay bound to the nicotine. Initial clinical trials with immunogenic vaccines were more successful with cocaine, but not as successful with nicotine.[8] It subsequently has been discovered that co-caine is a relatively in-flexible molecule while nicotine has a flexibility that allows it to adopt multiple shapes. Hence, the chemical agents must be made in such a way to ensure the antibodies produced are flexible and bind better and longer to the nicotine (have a higher affinity). The biotech firms mentioned earlier are chemically altering viruses or other toxins that can be used as immunog e n i c material to induce the nicotine specific antibodies.[9]

Currently, vaccines are short-acting, only binding to the nicotine molecule and staying active in the bloodstream of the smokers for only a few weeks or months at a time.[9] These novel vaccines could be used in conjunction with existing behavioral modification regimens. Additionally, relapsed smokers could periodically get "booster" shots that ostensibly would return them to a smoke-free existence. The optimal strategy is to produce a vaccine that when injected into the body irrevocably alters the immune system, such that a smoker or a potential smoker will never be able to feel the pleasurable effects of nicotine nor experience the attending addiction and debilitating diseases.

While blocking the uptake of nicotine will prevent the pleasurable effects of smoking, those smokers taking the vaccine will still have to overcome the cravings, anxiety, and irritability that attend nicotine deprivation.

TRDRP's contribution

Even with clinical trials underway to test the efficacy of nicotine vaccines, scientists are still looking for better methods to develop and construct immunogenic agents. Kim Janda, Ph.D., research scientist at The Scripps Research Institute (TSRI) and currently funded by the TRDRP, is working on developing conformationally constrained nicotine vaccines.[10,11] Dr. Janda explained that "conformationally constrained nicotine vaccines are just big words for arranging the chemical structure of the nicotine antibodies in such a way that they more successfully bind to the nicotine molecule."[12] Dr. Janda explains that one of the reasons that previous vaccines had been only partially successful is because of the nature of the nicotine molecule itself; it is very small and mutable, continually changing. Thus, finding a method that will allow antibodies to change and adhere at the same time has been daunting.

Dr. Janda is using constrained haptens as a novel approach to vaccine development. Haptens are molecules that are chemically conjugated to an antigen to ensure an immune response; nicotine in and of itself does not generate antibodies. Janda and his colleagues at TSRI are using a different approach than the current

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Vaccines

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vaccines being created by the pharmaceutical industry. Currently, most pharmaceutical companies are using well-known viral and toxin haptens that increase the number of antibodies but do not address the flexibility of the nicotine molecule, a property that seems very important in determining how tightly the antibodies bind nicotine. Janda believes that it is the reliance on these types of inflexible haptens, which have prevented the long-term adherence of the antibodies to nicotine and thus slowed the progress of the development of a long-term nicotine vaccine. Janda was cautiously optimistic about Cytos results: "hopefully the findings are true; however, I will wait to read their peer reviewed article on the subject and not rely solely on the press release."[12]

The future of tobacco cessation?

Fast forward to the year 2050, where a vaccine for nicotine (and other drugs of abuse) is commonplace. The tobacco industry and health groups have been locked in a fight for a decade over whether nicotine vaccines should be mandatory. The tobacco industry and its allies are arguing that people should have the individual right to choose whether they get vaccinated or not; it is their fourth amendment right. Health groups respond that nicotine addiction has killed and continues to kill more people than polio and influenza combined and people routinely get vaccinated for these maladies.

A shot to prevent tobacco addiction seems quite attractive on the surface and the futuristic standoff described above may be a bit far-fetched, but the truth of the matter is that the development of a nicotine vaccine raises many vexing ethical questions. Paramount among them is whether all children of a certain age should be inoculated with the nicotine vaccine? The logic being that if children already have the antibodies circulating in their system, their initial experimentations with tobacco products will not produce pleasurable effects and therefore not lead to a life-long addictive habit, which will, more often than not, make their lives less healthy and shorter. On the other hand, some authors have questioned whether parents have the ethical and moral right to have children vaccinated against smoking with statements such as: "altering the immune system of children in order to modify future behavior seems a major intrusion."[13] In between these two extremes stand those that advocate that only children at risk should be inoculated.[14] This position is no less ethically cumbersome. One might ask who are the children at risk? Is it those children with a genetic predisposition or those bombarded with advertisements, or those who are poor and statistically more likely to be smokers. Attending these ethical questions are the questions of insurance, liability, and societal cost (who is going to pay for the mass inoculation program anyway?)

And while the futuristic example above might have been in jest, the tobacco industry in no way sees the potential development of a nicotine vaccine as a laughing matter. Tobacco control researchers combing through documents released as a result of the Master Settlement Agreement (MSA) have found that the tobacco industry was well aware of the possibility of developing a vaccine that would block the uptake of nicotine and ultimately threaten their livelihood.[15] In the early 1980s, industry researchers were already studying nicotine analogues and their partition coefficient properties, the attribute possessed by a chemical or molecule that allows it to cross biological membranes (e.g., the blood-brain barrier).[15] Indeed, by the 1990s, industry scientists had already identified specific immunogenic compounds that triggered the production of nicotine antibodies.[15] And as it was to be expected, the tobacco industry turned their attention and research toward how to construct compounds that could evade the newly developed vaccines![15]

Coda

Neither thorny ethical questions nor the tobacco industry's head-start should dissuade researchers from tackling the issue of blocking the uptake of nicotine as part of the fight to blunt the scourge of nicotine addiction and tobacco-related diseases. The construction and testing of immunogenic compounds that elicit antibodies that adhere, over the long-term, to nicotine molecules and thus stymie its pleasurable and reinforcing effects, is certainly a worthwhile research endeavor. The TRDRP welcomes all applications that seek to develop and explore the parameters of existing and novel nicotine vaccines. Along with this new and promising area of investigation, TRDRP continues to encourage cessation scientists to seek grant funding for strategies to increase the efficacy of pharmacological interventions, behavioral strategies, internet regimens, worksite programs, and the California Quitline.

(I would like to thank Dr. Kim Janda for his innovative research and review of this article.)

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Filtered Tips

MF Bowen, Ph.D.

The following brief reports were selected from tobacco research and control stories that appeared in the media and scientific literature. This selection encompasses politics and policy, health disparities, breast cancer, and biomedical advances. Please visit our website at *www.trdrp.org* to access the complete URLs in the electronic version of this newsletter.

Tobacco industry to the Bush Administration: "Thanks a million!" Make that $120 billion: The Justice Department recently shocked both sides of their six-year-old civil racketeering and conspiracy suit against the tobacco industry by abruptly requesting a $10 billion penalty instead of the expected $130 billion recommended by experts. This is the same lawsuit that then-Attorney General John D. Ashcroft almost derailed before public outcry forced it back on track.
www.washingtonpost.com

Exposure to secondhand smoke doubles the risk of developing breast cancer in younger, premenopausal women. The finding, by the California Environmental Protection Agency, was echoed in a recent meta-analysis published in the International Journal of Cancer, which also found a link between active smoking and breast cancer. The tobacco industry declined comment. The biological mechanisms by which active and passive smoking are linked to breast-cancer pathogenesis remain a mystery.
www.arb.ca.gov/toxics/ets
www3.interscience.wiley.com

Cancer death rates in African-American males are 40% higher than rates in Caucasian men. The reasons underlying this shocking disparity are complex, but a recent study by researchers at UC Davis shows that most premature cancer deaths in African-American males can be attributed to secondhand smoke exposure, active smoking, or both.
www.sciencedirect.com

The success of the chemotherapeutic agent gefitinib (Iressa) in the treatment of victims of non-small cell lung cancer (NSCLC) has been nothing short of stunning. But researchers have been puzzled as to why some NSCLC patients respond so well to the drug while others respond poorly or not at all. Recent research has identified a marker of gefitinib efficacy in lung cancer patients: extra copies of the gene coding for the epidermal growth factor receptor. Identifying those patients who will respond to gefitinib treatment takes the field of lung cancer therapeutics one big step closer to the goal of individualized medicine—cancer treatments tailored to the specific needs of each cancer patient. *http://jncicancerspectrum.oxfordjournals.org*

Encouraging news for victims of multiple sclerosis: The first modifiable risk factor for CNS deterioration in multiple sclerosis has been identified. Quitting smoking may limit or delay the neuronal deterioration that characterizes the progression of this serious and debilitating disease. Further research is needed to elucidate the causal mechanism but speculation revolves around nitrous oxide in tobacco smoke, which may accelerate neuronal degeneration, smoke-induced damage to the myelin-producing cells surrounding the nerves, or smoke-induced autoimmunity.
www.medicalnewstoday.com

Speaking of autoimmune diseases: Evidence that smoking is linked to these mysterious and intractable conditions keeps accumulating. In addition to being associated with rheumatoid arthritis and Graves' disease, smoking has recently been found to increase the risk of lupus, a chronic autoimmune condition characterized by inflammation, systemic tissue damage, and a great deal of pain.
http://my.webmd.com

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TRDRP research on hookah smoking

TRDRP is at the forefront of recognizing and supporting innovative and novel ideas in a proactive manner. Keeping with its mandate, TRDRP funds innovative and high-quality biomedical, policy, and prevention research in California. This research aims to mitigate the suffering and economic burden due to myriad diseases caused by tobacco products.

This year, as over the past 15 years, TRDRP has once again distinguished itself among all federal and public funding agencies in leading the charge against tobacco by awarding the first ever research grant on hookah smoke. TRDRP has made a three-year new investigator grant award to Nada Kassem, Dr.P.H., M.S., R.N., C.H.E.S., to study "Water Pipe Use, ETS Exposure and Home Policies among Arab Americans." Dr. Kassem is currently a faculty research investigator at the Center for Behavioral Epidemiology and Community Health, Graduate School of Public Health, San Diego State University. This is the first tobacco-related research grant award to Dr. Kassem.

TRDRP invites research grant applications from California scientists on all aspects of hookah smoke for various funding mechanisms.

Dedicated to the fond memory of Surender S. Katoch, B.Sc., M.Sc., M.Phil., Ph.D. - a dear friend and scientific collabo - rator - who dedicated his life to mitigating cardiovascular disease, and suddenly died on May 14, 2005 due to a mas - sive heart attack. Dr. Katoch was Professor and Chairman, Department of Bio-Sciences, Himachal Pradesh University, Shimla, India. Surender will be sorely missed by family members and numerous friends all over the world.

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HOLD THE DATES

September 9 - 11, 2005
California Breast Cancer Research Program bi-annual meeting
"From Research to Action: Seeking Solutions"
Sacramento, CA

October 10 - 11, 2005
Tobacco Related Disease Research Program bi-annual meeting
"15 Years of Progress in the Fght Against Tobacco"
Los Angeles, CA

October 24 - 25, 2005
Frontiers in Aerosol Dosimetry Research Conference
Irvine, CA

November 5 - 9, 2005
American Public Health Association
133rd Annual Meeting & Exposition
Evidence-Based Policy & Practice