

**INVESTIGATE** 

**TRANSLATE** 

**DISSEMINATE** 



**RESEARCH FOR A HEALTHIER TOMORROW**

**TOBACCO-RELATED DISEASE RESEARCH PROGRAM**

**8<sup>th</sup> ANNUAL INVESTIGATOR MEETING**  
**DECEMBER 3 - 4, 2003**

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## DECEMBER 3 - 4, 2003

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**SHERATON SAN DIEGO HOTEL & MARINA**  
1380 Harbor Island Drive - West Tower  
San Diego, California 92101  
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\* All sessions held in West Tower.



WELCOME FROM THE DIRECTOR

On behalf of the Tobacco-Related Disease Research Program and the University of California, I would like to extend a warm welcome to TRDRP's 8th Annual Investigator Meeting. The conference theme is Investigate, Translate, Disseminate: Research for a Healthier California. Although scientists have made significant advances in understanding the mechanisms of tobacco-related disease and demonstrated the efficacy of novel approaches to tobacco control, translation of these discoveries into practical application lags. A primary conference goal, therefore, is to promote translation and application of research findings. At AIM 2003 we will learn about recent advances in translational, clinical, and applied research in tobacco-related disease and tobacco control.

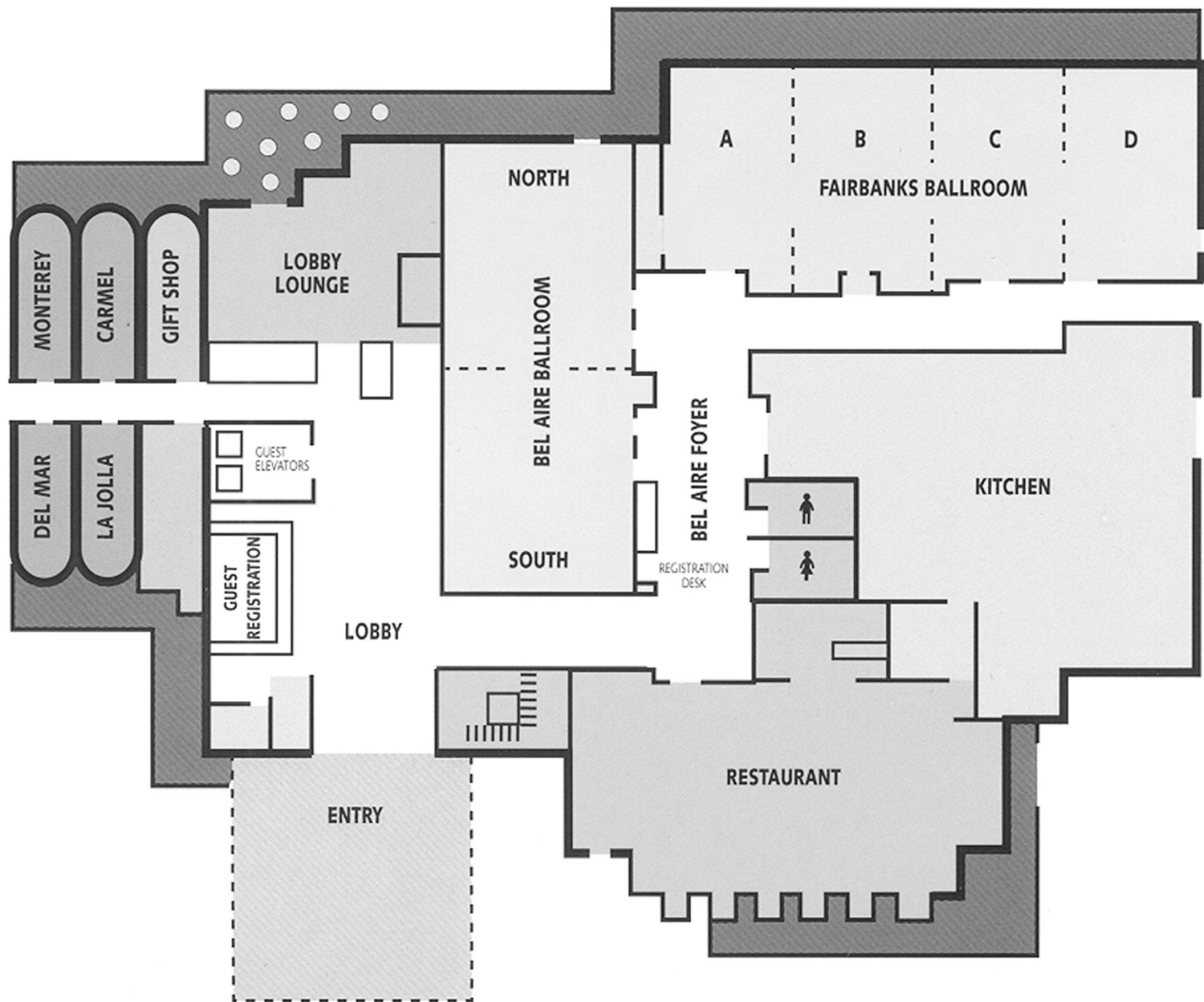
I encourage you to talk to the poster presenters, especially those outside your own area of expertise, to learn about advances being made in other fields to combat the detrimental effects of tobacco use.

I am confident you will leave the conference with an increased understanding of the recent advances made in tobacco research in California. In my view, the meeting will be a rousing success if it stimulates discussions about emerging research issues that lead at least some of you to new research collaborations with colleagues from other disciplines.

Charles L. Gruder, Ph.D.  
 Executive Director - Special Research Programs  
 Acting Director - Tobacco-Related Disease Research Program



SHERATON HOTEL FLOOR PLAN

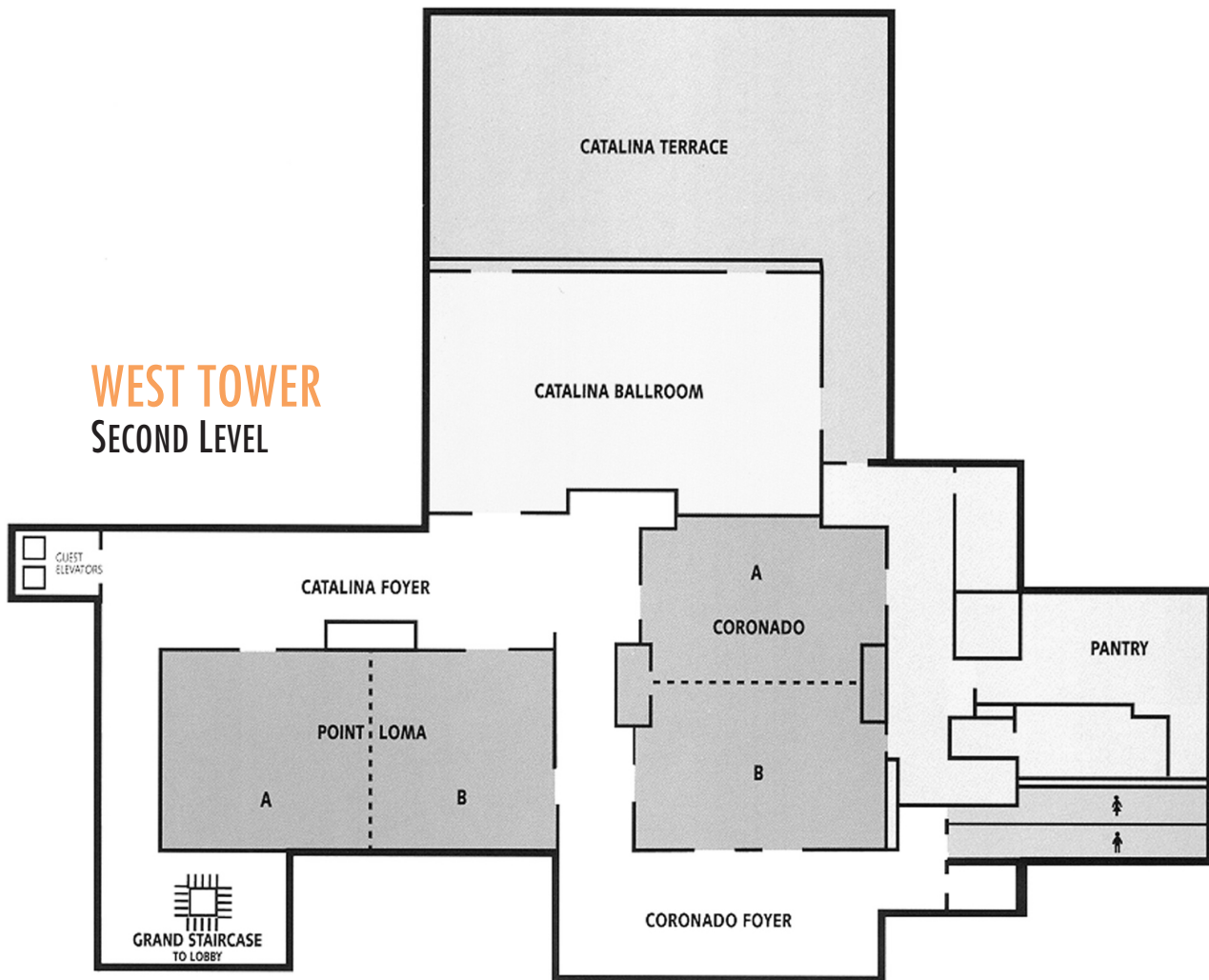


WEST TOWER  
FIRST FLOOR



SHERATON HOTEL FLOOR PLAN

**WEST TOWER**  
SECOND LEVEL





SCHEDULE OF EVENTS

## WEDNESDAY, DECEMBER 3RD WEST TOWER

**7:30am-6:00pm Registration & Continental Breakfast**

-Bel Aire Foyer

**8:00-10:00am Exhibit and Poster Setup**

-Fairbanks A, B, C

**9:00-10:30am Keynote Address**

-Bel Aire Ballroom

**10:30-10:45am Break**

**10:45am-5:00pm Exhibits Open**

-Fairbanks A

**10:45am-12:15pm Poster Viewing (W1-50)**

-Fairbanks B, C

*\* PIs will be at their posters from 10:45am – 12:00am*

**12:15-1:30pm Lunch & TRDRP Listens**

-Bel Aire Ballroom

MODERATOR

**Pat Etem, CEO, Civic Communications**

**1:30-3:30pm WORKSHOP SESSIONS**

**A. Nicotine Dependence Treatment, New Perspectives**

-Coronado

**B. Advances in Secondhand Smoke Exposure Assessment:  
From the Lab to the Field**

-Point Loma

**3:45-5:45pm WORKSHOP SESSIONS**

**C. Nicotine Dependence Treatment, New Perspectives**

-Coronado

**D. Bringing New Evidence to Benefit Patients: From the Lab  
to Treatment, Screening and Prevention**

-Fairbanks D

**E. Research Approaches to a Smokefree Workplace Policy**

-Point Loma

**6:00-8:00pm Reception**

-Catalina Ballroom



SCHEDULE OF EVENTS

## THURSDAY, DECEMBER 4TH WEST TOWER

**7:30am-2:30pm**      **Registration & Continental Breakfast**

-Bel Aire Foyer

**8:00am**              **Exhibit Opens**

-Fairbanks A

**9:00-10:45am**      **Plenary Session: Research Translation**

-Bel Aire Ballroom

MODERATOR

**Jeannette Noltenius, Ph.D.**

*Vice President, Swartz & Associates*

PANELISTS

**Ted Greer, Jr.**

*Director, Healthy Body, Healthy Soul*

**Ronald Goldfarb, Ph.D.**

*President & CEO, Sopherion Therapeutics, Inc.*

**Glen Morgan, Ph.D.**

*Program Director, Tobacco Control Branch/  
National Cancer Institute*

**10:45-11:00am**      **Break**

**11:00am-12:30pm**      **Poster Viewing (T51-98)**

-Fairbanks B & C

**PIs will be at their posters until 12:15**

**12:30-2:30pm**      **Lunch & Town Hall – Nicotine Replacement  
Therapy: To Patch or Not to Patch?**

-Bel Aire Ballroom

MODERATOR

**Thomas Scott, Ph.D.**

*Dean, College of Sciences, San Diego University*

PANELISTS

**Betsy Gilpin, M.S.**

*Director, Biostatistics Shared Resource  
University of California, San Diego*

**John Pierce, Ph.D.**

*Professor, University of California, San Diego*

**Saul Shiffman, Ph.D.**

*Professor, Pinney Associates*





WORKSHOPS A & C

## WORKSHOPS A & C

Scripps Research Institute

December 3, 2003

A: 1:30-3:30 PM C: 3:45-5:45 PM

### NICOTINE DEPENDENCE WORKSHOP, NEW PERSPECTIVES

#### MODERATORS

**Athina Markou, Ph.D.,**

*Associate Professor; Scripps Research Institute*

**Phillip Gardiner, Dr. P.H.**

*Social & Behavioral Research Administrator*

*Tobacco-Related Disease Research Program*

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#### Synaptic Plasticity Contributing to Nicotine Addiction

**John Dani, Ph.D.**

*Professor; Baylor College of Medicine*

#### Role of GABA and Metabotropic Glutamate Receptors in Nicotine Dependence Processes: Potential Pharmacotherapies for Smoking Cessation

**Athina Markou, Ph.D.**

*Associate Professor; Scripps Research Institute*

#### Mapping the Effects of Nicotine in the Brain by Noninvasive Imaging

**Edythe London, Ph.D.**

*Visiting Professor; University of California, Los Angeles*

#### Genome-Scale Mapping of Brain Gene Expression in Nicotine Addiction

**Desmond Smith, Ph.D.**

*Assistant Professor; University of California, Los Angeles*

#### Nornicotine As A Potential Chemical Link Between Smoking and Disease States

**Kim Janda, B.S., M.S., Ph.D.**

*Professor; Scripps Research Institute*

#### The Nicotine and Tobacco Addiction Program at NIDA

**William Corrigal, Ph.D.**

*Director; Nicotine and Tobacco Addiction Program*



## WORKSHOP B

Lawrence Berkeley National Laboratory

December 3, 2003

1:30-3:30 PM

### ADVANCES IN SECONDHAND SMOKE EXPOSURE ASSESSMENT: FROM THE LAB TO THE FIELD

#### MODERATOR

**Michael G. Apte, Ph.D.**

*Scientist, Lawrence Berkeley National Laboratory*

.....

#### How Buildings Influence Exposure: Surfaces, Ventilation, Room-To-Room Transport

**Brett C. Singer, Ph.D.**

*Scientist & Mechanical Engineer, Lawrence Berkeley National Laboratory*

#### How Chemistry Influences Field Measurements

**James F. Pankow, Ph.D.**

*Professor, Oregon Health & Science University*

#### Blood and Urinary Biomarkers

**Peyton Jacob III, Ph.D.**

*Research Chemist, University of California, San Francisco*

#### Airborne Tracers and Simple Exposure Tools

**Lara Gundel, Ph.D.**

*Staff Scientist, Lawrence Berkeley National Laboratory*

**Katherine S. Hammond, Ph.D.**

*Professor, University of California, Berkeley*

#### Exposure Assessment in Asthma Intervention

**Sandra Wilson, Ph.D.**

*Senior Staff Scientist & Chair, Palo Alto Medical Foundation*

#### Lessons From Field Studies: Effective Exposure Reduction

**Georg Matt, Ph.D.**

*Professor, San Diego State University*



WORKSHOP D

## WORKSHOP D

American Cancer Society

December 3, 2003

3:45-5:45 PM

### BRINGING NEW EVIDENCE TO BENEFIT PATIENTS: FROM THE LAB TO TREATMENT, SCREENING & PREVENTION

#### MODERATOR

**John Simmons, M.D.**

*Senior Physician & Medical Oncologist*  
The Permanente Medical Group, Inc.

.....

#### Overview of the Importance of Role Clinical Trials and Key Issues

**Georgia Robins Sadler, Ph.D.**

*Associate Director of Community Outreach*  
Clinical Professor of Surgery, School of Medicine  
University of California, San Diego

#### Why and How ACS is Involved in and Supportive of Clinical Trials and Impact on Cancer, 2015 Goals

**Jerome Yates, Ph.D.**

*National Vice President for Research*  
American Cancer Society

#### National Lung Screening Trials and Implications of Treatment

**Raymond Melrose, D.D.S.**

*Past President of California Division*  
American Cancer Society

#### Chemo Prevention as One Type of Clinical Trial

**Rowan Chlebowski, M.D., Ph.D.**

*Professor of Medicine*  
David Geffen School of Medicine  
Division Chief, Medical Oncology  
Harbor UCLA Medical Center



## WORKSHOP E

Prevention Research Center &  
Tobacco-Related Disease Research Program

December 3, 2003

3:45-5:45 PM

### RESEARCH APPROACHES TO SMOKEFREE WORKPLACE POLICY

#### MODERATOR

**Roland S. Moore, Ph.D.**

*Research Anthropologist and Study Director*  
Prevention Research Center  
Pacific Institute for Research and Evaluation

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#### Economic Research on Smokefree Policies: Good for Business

**Stanton A. Glantz, Ph.D.**

*Professor of Medicine and Director*  
Center for Tobacco Control Research and Education, UCSF  
Co-Leader, Tobacco Control Program, UCSF Comprehensive Cancer  
Center

#### Research on the Smokefree Bars Law in Long Beach: Methods and Findings

**Julia A. Lee, Ph.D.**

*Adjunct Faculty*, Health Science Department  
California State University, Long Beach

#### Observational Research Evaluating Smokefree Bar Policy in San Francisco

**Roland S. Moore, Ph.D.**

*Research Anthropologist and Study Director*  
Prevention Research Center, Pacific Institute for Research and  
Evaluation

#### Statewide Compliance in California: Perspectives on Worldwide Second-Hand Smoke Policies

**Dian Kiser, M.S., CFRE**

*Co-Director*; BREATH-The California Smoke-Free Bars, Workplaces  
and Communities Program  
A Statewide Project of the American Lung Association-EB



TOWN HALL MEETING

## TOWN HALL MEETING

December 4, 2003

12:30-2:20 PM

### NICOTINE REPLACEMENT THERAPY TO PATCH OR NOT TO PATCH?

#### MODERATOR

**Thomas Scott, Ph.D.**

*Dean, College of Sciences  
San Diego State University*

#### FEATURED PARTICIPANTS

**John Pierce, Ph.D.**

*Professor, University of California, San Diego*

**Betsy Gilpin, Ph.D.**

*Director, Biostatistics Shared Resource  
University of California, San Diego*

**Saul Shiffman, Ph.D.**

*Professor of Psychology, University of Pittsburgh  
Pinney Associates*

.....

Is over-the-counter (OTC) nicotine replacement therapy (NRT) effective for tobacco use cessation? Do patches, gums, lozenges, inhalers, and/or anti-depressants work to promote smoking cessation? Drs. John Pierce and Betsy Gilpin have published data that question the effectiveness of OTC NRT. Dr. Saul Shiffman, on the other hand, maintains that NRT is clinically tested and proven to be an effective treatment for smoking cessation.

What do you think?

Join these researchers along with moderator, Dr. Thomas Scott, Dean, College of Sciences, at San Diego State University and member of the TRDRP Scientific Advisory Committee for a lively debate and discussion on the efficacy and/or effectiveness of NRT for smoking cessation.



## PLENARY SESSION

December 4, 2003

9:00-10:45 AM

### RESEARCH TRANSLATION

#### MODERATOR

**Jeanette Noltenius, Ph.D., M.A.**

*Vice President, Swartz & Associates*

#### SPEAKERS

**Ronald Goldfarb, Ph.D.**

*President, Chief Scientific Officer & CEO, Sopherion Therapeutics, Inc.*

**Challenges in Translation of Molecular Concepts into Drug Development**

**Ted Greer, Jr.**

*Director, Healthy Body, Healthy Soul*

**An Integrated Approach to Tobacco Use Prevention,  
Smoking Cessation and Early Detection of Lung Cancer:  
A Community-Based Approach**

**Glen Morgan, Ph.D.**

*Program Director, National Cancer Institute*

**Transdisciplinary Tobacco Use Research: Opportunities to  
Progress From Discovery Through Development to Delivery**

PLENARY SESSION

## KEYNOTE SPEAKER

### Senator Deborah Ortiz



Deborah Ortiz was elected to the 6th State Senate District in November 1998 and re-elected in 2002. Senator Ortiz's strong interest in health and the environment are reflected in her Senate committee assignments. She is the Chair of the Senate Health and Human Services Committee and is also a member of the Banking, Budget, and Natural Resources committees.

Senator Ortiz is the author of the nationally recognized law protecting stem cell research in California and is also responsible for the state's landmark program guaranteeing college scholarships, Cal Grants, for students with good grades and financial need.

As Committee Chair, Senator Ortiz is committed to ensuring that California's vital public health infrastructure - which in the past was responsible for stopping epidemics such as cholera, small pox and typhoid - remains secure and is protected from shortsighted budget cuts.

Senator Ortiz has been deeply involved in shaping the state's policy on tobacco. She has led the efforts to reinvigorate and restore California's international leadership on tobacco policy.

Senator Ortiz recognized that tobacco manufacturers target minors when seeking new smokers. In 2001 she successfully passed Senate Bill 322 which strictly limits the sale of cheap flavored cigarettes known as "bidis" and Senate Bill 757 which prohibits self-service displays of tobacco and the sale of individual cigarettes, two strategies tobacco manufacturers and retailers use to attract underage smokers. The "bidis" bill is the first of its kind in the nation and the tobacco-marketing bill is the strongest in the nation.

In 2002, Senator Ortiz affirmed her leadership on tobacco issues by seeking the first legislation in the country to assure compliance with state tobacco tax laws by out-of-state distributors. Senate Bill 1766 authorizes the Attorney General to enforce existing federal requirements that tobacco distributors report interstate sales to our state tax agencies.

Born and raised in Sacramento, Senator Ortiz attended the University of California at Davis and graduated from McGeorge School of the Law.

For more information on Senator Ortiz you can go to [www.sen.ca.gov](http://www.sen.ca.gov)



## SPEAKER BIOGRAPHIES

### **Jeannette Noltenius, Ph.D.**

*Vice President, Rick Swartz & Associates*

Dr. Jeannette Noltenius is Vice President of Rick Swartz & Associates an independent public health and public policy firm based in Washington, DC. She was the Executive Director of the National Latino Council on Alcohol and Tobacco Prevention (LCAT) from 1996 to 2002. LCAT is a national non-profit organization that combats alcohol and tobacco use in adolescents and adults and addresses the health consequences these products have in the Latino community. Under her direction, LCAT became a national voice on these issues on Capitol Hill. Dr. Noltenius is a founding member of the Out of Many, One multicultural coalition working on a common agenda to address inequities in health and health care in communities of color. Dr. Noltenius has a Doctorate from the University of Paris, Sorbonne 1, France, in Social Sciences, a Masters in Economics and a Master of Arts degree in Counseling Psychology from Antioch College. Before working at LCAT she worked at the Pan American Health Organization / World Health Organization on health planning environmental health, violence prevention, and health promotion. She has also worked in community mental health settings utilizing psychodrama with children and families and at a psychiatric hospital and community mental health center. Dr. Noltenius is originally from El Salvador and has worked in Guatemala, Honduras, Colombia and France. She speaks Spanish and French.

### **Ronald H. Goldfarb, Ph.D.**

*President, Chief Scientific Officer (CSO) and Chief Executive Officer (CEO)  
Sopherion Therapeutics, Inc*

Ronald H. Goldfarb, Ph.D. is President, CSO and CEO of Sopherion Therapeutics, a privately held emerging biotechnology company which leverages its proprietary and novel technology platforms to research and develop innovative, targeted pharmaceutical products. Prior to joining Sopherion, Dr. Goldfarb served as a Manager and/or Scientist at the National Cancer Institute, in the private sector as Manager of Cancer Research and Drug Discovery with Pfizer Inc., and a broad range of Academic Management posts include: Director, Institute for Cancer Research, University of North Texas Health Science Center (UNTHSC), Fort Worth; Chairman, Department of Molecular Biology and Immunology, UNTHSC; Deputy Director, University of Pittsburgh Cancer Institute (UPCI); Associate Director UPCI; Director, UPCI Program in Cancer Metastasis and Cell Biology; Director, UPCI Program in Experimental Therapeutics; Professor of Molecular Biology and Immunology, UNTHSC; Professor of Pathology and Neurosurgery, University of Pittsburgh School of Medicine and Senior Lecturer in Biomedical Engineering in Medicine at Carnegie Mellon University.

Dr. Goldfarb holds US and worldwide patents in anti-cancer drug discovery and has published more than 130 full papers. He has chaired multiple peer-review study sections for agencies including: the University of California (Tobacco-Related Disease Research Program; Innovative Treatment Review Committee for the Breast Cancer Research Program; Breast Cancer Tumor Immunology and Clinical Studies Study Section); the National Cancer Institute (Mechanism of Protease Inhibitors in Anticarcinogenesis; Tumor Metastasis; and Proteolytic Enzymes of Natural killer cells); the Veteran's Administration Merit Oncology Review Subcommittee; the Department of Defense Breast Cancer Cell and Tissue Biology Study Section; and an American Cancer Society Institutional Research Grant Peer Review Committee. Dr. Goldfarb has also served as Associate Editor and on the Editorial Boards of numerous peer-reviewed journals. In 2002 he was recognized by the American Cancer Society for Outstanding Service to the Cause of Cancer Control. Dr. Goldfarb has been a member of the Scientific Advisory Boards of five Biotechnology companies, on two of which he also served as Chairman. Currently, Dr. Goldfarb is a Member of the United States National Committee for the International Union against Cancer (UICC) and a member of the Scientific Advisory Board of the International Institute of Cancer Research, Kapandriti, Greece.



## SPEAKER BIOGRAPHIES

### **Reverend Ted Greer, Jr.**

Health Choice Network, Inc.

Rev. Greer is the Director of the Healthy Body, Healthy Soul Program for the Health Choice Network, Inc. in Miami Florida. As Director, he is responsible for managing the implementation of a disease prevention and health promotion programs in the African-American and Hispanic communities through community health centers and churches. Disease prevention focus areas include asthma, diabetes, and lung and other cancers. Rev. Greer also facilitates partnerships with the faith community, community health centers, and other community-based organizations. He has established disease prevention strategies that include outreach to indigent and uninsured populations, training for clergy, lay health educators, coordinate educational seminars/conferences, and community (church) based health screenings.

Rev. Greer is currently involved with the Jessie Trice Cancer Prevention Project, which is a Florida Comprehensive Cancer Control imitative special project operated by the Health choice Network. This project honors the late community health advocate, Jessie Trice, with a community-based effort to reduce lung cancer rates through education, smoking cessation, and early detections.

Rev. Greer is also a strong community leader and volunteer. He is the current chairman of the Goulds coalition of Ministers and Lay People, Inc., secretary of the South Miami-Dade Coalition of Ministers, Vice-chair of Unique coalition of Minority Businesses of South Dade, Inc., Co chair of the south Dade Homeless Task Force, Trustee of the Miami-Dade county Homeless Trust, and board member of the Goulds community Development Corporation.

### **Glen Morgan, Ph.D.**

*Program Director-Tobacco Control Branch/National Cancer Institute*

Glen Morgan joined NCI in 1998 and oversees tobacco use treatment research and is the program director for the Transdisciplinary Tobacco Use Research Centers. He also is co-director of NCI s Tobacco Intervention Research Clinic. Prior to joining NCI, Dr. Morgan was full-time faculty at the Wyoming Valley Family Practice Residency, with an appointment in the Department of Family & Community Medicine, Pennsylvania State University College of Medicine, Hershey, PA. While there, he conducted research on smoking cessation interventions and training health risk reduction to primary care practitioners in addition to maintaining a clinical practice. Dr. Morgan completed his Ph.D. in Clinical Psychology from Washington University in St. Louis.



EXHIBITORS

## EXHIBITORS

American Cancer Society

American Heart Association

California Black Health Network

California Breast Cancer Research Program

California Smokers' Helpline

Hispanic-Latino Tobacco Education Network

Next Generation Alliance

Tobacco-Related Disease Research Program

Universitywide AIDS Research Program



POSTER SESSION W1-16: NICOTINE DEPENDENCE

## NOTES



POSTER SESSION ABSTRACTS

# POSTER PRESENTATIONS

W1-50  
T51-98

**W1****NK-1 receptor bearing interneurons in superficial dorsal horn layer of spinal cord mediate nociceptive responses to intrathecal nicotinic agonists.**

**Palmer, Taylor and Khan, Imran**  
University of California, San Diego

Intrathecal nicotinic agonists elicit pressor and nociceptive responses suggesting that nicotinic receptors in the spinal cord modulate autonomic and sensory neurotransmission. Cardiovascular and nociceptive responses to spinal nicotinic agonists are exaggerated in genetically hypertensive SHR compared to normotensive rats. The augmented responses in the genetically hypertensive rats can be linked to a specific segment of chromosome 8 that contains the gene cluster for  $\alpha 3$ ,  $\alpha 5$ , and  $\beta 4$  nicotinic receptor subunit genes. Interestingly, the augmented responses in SHR are accompanied by a paradoxical decrease in the expression of nicotinic receptors in the superficial dorsal horn region. This spinal region contains the primary afferent terminals as well as substance P receptor (NK-1) bearing interneurons that play a role in processing of nociceptive stimuli. Having demonstrated that functional nicotinic receptors are expressed on primary afferent terminals, we have focused on the NK-1 bearing interneurons to identify the expression of specific nicotinic receptor subunits in these neurons as well as determine if these neurons help mediate the pharmacological responses to spinal nicotinic agonists. Accordingly, we have treated rats with intrathecal substance P-saporin conjugate to eliminate substance P receptors. Five to seven days following treatment, substance P-saporin and just saporin-treated control rats were subjected to either immuno-histochemical studies or behavioral studies. Substance P-saporin conjugate treatment resulted in significant ablation of NK-1 bearing interneurons in the superficial layer. Moreover, the immunohistochemical data indicate that  $\alpha 5$  nicotinic receptor subunit is expressed on these neurons. At present, we are determining if the expression of  $\alpha 3$ ,  $\alpha 4$ ,  $\beta 2$ , and  $\beta 4$  is altered in the superficial layer of saporin-treated compared to control rats. In addition, the behavioral studies indicate that nociceptive responses to spinal cytosine and epibatidine are significantly attenuated in the substance P-saporin treated rats. Thus, our ongoing studies indicate that functional nicotinic receptors are expressed on the NK-1 receptor bearing interneurons in the superficial dorsal horn region in rats.

**W2****Regulation of  $\alpha 7$ -nAChR levels in septohippo-campal cultures: role of synaptic activity and brain-derived neurotrophic factor.**

**Zago, Wagner and Berg, Darwin K.**  
University of California, San Diego

Annually, tobacco smoking is responsible for approximately 3 million deaths worldwide. Although environmental and genetic factors may contribute to smoking, a major component of continued tobacco use is the dependence on nicotine. This alkaloid exerts its effects in the brain by binding to a family of proteins called nicotinic receptors. One of the most abundant nicotinic receptors in the central nervous system (CNS) is a class comprised of  $\alpha 7$ -subunits ( $\alpha 7$ -nAChR). Such receptors have a high relative permeability to calcium which, together with their strategic placement on neurons, enables  $\alpha 7$ -nAChRs to control a variety of cellular events, including neurotransmitter release, neurite extension, second messenger cascades, and neuronal survival. They contribute to complex behaviors such as learning and memory, and have been implicated in major neuropathologies such as Alzheimer's disease.

The hippocampus is the richest source of  $\alpha 7$ -nAChRs in CNS. Hippocampal neurons are innervated by septal projections which, in addition to supplying GABAergic input, also provide the primary source of acetylcholine for  $\alpha 7$ -nAChR activation. Here we have used fluorescent  $\alpha$ -bungarotoxin, a toxin that binds  $\alpha 7$ -nAChRs, to image the receptors and examine their regulation in septohippocampal co-cultures. We found that septal input provides a marked reduction in the levels of  $\alpha 7$ -nAChRs on hippocampal neurons.

The decrement depends on GABAergic transmission because it can be prevented by the GABA(A) receptor blocker bicuculline. Moreover, it can be mimicked by applying GABA to the hippocampal neurons in the absence of septal cells. The opposite is seen for  $\alpha 7$ -nAChR clusters on septal neurons. Co-culture with hippocampal cells increases dramatically the proportion of septal cholinergic neurons displaying prominent  $\alpha 7$ -nAChR clusters. The hippocampal effect can be mimicked by exposing septal neurons to culture medium conditioned by hippocampal neurons or by treating septal neurons with BDNF. The results indicate that  $\alpha 7$ -nAChRs are regulated differently on septal and hippocampal neurons, and are consistent with developmental patterns seen in vivo where hippocampal  $\alpha 7$ -nAChR levels decline coincident with septal innervation of the hippocampus.

The studies outlined here will provide useful insight into the physiological significance of nicotinic receptors during CNS development. Since prenatal exposure to nicotine is associated with increased risk of cognitive deficits and neural disorders, understanding where the receptors are located and how they are influenced by nicotine exposure is likely to have useful biomedical implications.