

**Invitation for Comments on the “Short List” Candidates for the  
Clean Air Scientific Advisory Committee (CASAC) NO<sub>x</sub> and SO<sub>x</sub> Primary Review Panel  
EPA Science Advisory Board (SAB) Staff Office**

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The EPA Science Advisory Board (SAB) Staff Office is forming the **Clean Air Scientific Advisory Committee (CASAC) NO<sub>x</sub> and SO<sub>x</sub> Primary Review Panel (Panel)**. Nominations for technical experts to supplement the existing chartered (statutory) CASAC membership were requested in the *Federal Register* (71 FR 44695) on August 7, 2006. The Panel will be charged with providing advice, information and recommendations to the EPA Administrator on the scientific and technical aspects of the primary (health-based) air quality criteria and national ambient air quality standards (NAAQS) for both oxides of nitrogen (NO<sub>x</sub>) and sulfur oxides (SO<sub>x</sub>). Information on the CASAC, the Panel, and the nomination process appear in the above-referenced *Federal Register* notice, which can be accessed via the SAB Web site at URL: [http://www.epa.gov/sab/panels/casac\\_nox\\_and\\_sox\\_primary\\_panel.htm](http://www.epa.gov/sab/panels/casac_nox_and_sox_primary_panel.htm). Per this *Federal Register* notice, the SAB Staff Office requested nominees for this Panel who are nationally-recognized experts in one or more of the following disciplines:

- (a) **Atmospheric Science**. Expertise in physical/chemical properties of nitrogen oxides and sulfur oxides and atmospheric processes involved in the formation, transport on urban to global scales, transformation of these pollutants in the atmosphere, and movement of the pollutants between media through deposition and other such mechanisms. Also, expertise in the evaluation of natural and anthropogenic sources and emissions of nitrogen oxides and sulfur oxides and resulting ambient levels due to natural sources, pertinent monitoring or measurement methods for these pollutants, and spatial and temporal trends in their atmospheric concentrations.
- (b) **Exposure and Risk Assessment/Modeling**. Expertise in measuring human population exposure to nitrogen oxides and sulfur oxides and/or in modeling human population exposure to pollutants from ambient and indoor sources. Expertise in human health risk analysis modeling for nitrogen oxides and sulfur oxides related to respiratory and other non-cancer health effects.
- (c) **Dosimetry**. Expertise in evaluation of the dosimetry of animal and human subjects, including identification of factors determining differential patterns of inhalation and/or deposition/uptake in respiratory tract regions that may contribute to differential susceptibility of human population subgroups and animal-to-human dosimetry extrapolations.
- (d) **Toxicology**. Expertise in evaluation of experimental laboratory animal studies and *in vitro* studies of the effects of sulfur oxides and/or oxides of nitrogen on pulmonary and extra-pulmonary (*e.g.*, cardiovascular, immunological) endpoints.
- (e) **Controlled Human Exposure**. Expertise in evaluations of controlled human exposure studies of the effects of nitrogen oxides and sulfur oxides on health and compromised (*e.g.*, having pertinent preexisting disease such as asthma) human adults and children, including physicians with experience in the clinical treatment of asthma and chronic lung diseases.
- (f) **Epidemiology and Biostatistics**. Expertise in epidemiologic evaluation of the effects of exposures to ambient nitrogen oxides and sulfur oxides and/or other major air pollutants (*e.g.*,

particulate matter, ozone, carbon monoxide) on human population groups, including mortality and morbidity effects (*e.g.*, respiratory symptoms, lung function decrements, asthma medication use, emergency department visits, respiratory-related hospital admissions). Also, expertise in associated biostatistics and/or health risk analysis.

**The SAB Staff Office has reviewed the nominations and identified 27 candidates to serve on the CASAC NO<sub>x</sub> and SO<sub>x</sub> Primary Review Panel.** Brief biographical sketches (“biosketches”) on these candidates are provided below. *We hereby invite comments from members of the public for relevant information or other documentation that the SAB Staff Office should consider in the selection of this Panel.* In addition, the biosketches for the current members of the chartered CASAC may be viewed at the following URL: [http://www.epa.gov/sab/pdf/casac\\_biosketches\\_2007.pdf](http://www.epa.gov/sab/pdf/casac_biosketches_2007.pdf).

Any information furnished by the public in response to this Web site posting will be combined with information already provided by the candidates, and gathered independently by the SAB Staff Office. Prior to final selection of this Panel, the combined information will be reviewed and evaluated for any possible financial conflict of interest or a possible appearance of a lack of impartiality. The information will also be used to ensure appropriate balance and breadth of expertise and scientific viewpoints needed to address the charge to the Panel. The SAB Staff Office Director will make the final decision concerning who will serve on the CASAC NO<sub>x</sub> and SO<sub>x</sub> Primary Review Panel.

Please e-mail your comments no later than **January 16, 2007** to Mr. Fred Butterfield, CASAC Designated Federal Officer (DFO), at: [butterfield.fred@epa.gov](mailto:butterfield.fred@epa.gov).

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## **CASAC NO<sub>x</sub> AND SO<sub>x</sub> PRIMARY REVIEW PANEL CANDIDATE BIOSKETCHES**

### **Dr. Praveen Amar**

Dr. Praveen Amar is the Director of Science and Policy at NESCAUM (Northeast States for Coordinated Air Use Management). NESCAUM, located in Boston, Massachusetts, is an interagency association of eight northeastern states (New York, New Jersey, Connecticut, Maine, Massachusetts, Vermont, Rhode Island, and New Hampshire). NESCAUM provides high-level scientific and policy-relevant input to its member states on regional air pollution issues. He received his Ph.D. in engineering from UCLA in 1977. He is a licensed Mechanical Engineer in the State of California.

Dr. Amar’s key area of expertise is to “translate” the implications of findings of science and developments in technology into workable and cost-effective policy options for the states in the Northeast. These policy options have involved cost-effective technologies to reduce emissions of oxides of nitrogen, sulfur dioxide, particulate matter, and mercury from large utility boilers, other large industrial sources, and municipal waste combustors; regional control of emissions of oxides of nitrogen and sulfur, including market-based approaches, relative roles of local and regional sources by evaluating local and long-range transport of pollutants, planning for achieving ambient standards for fine particles and ozone, and promotion of environmentally

friendly distributed generation technologies. Since 2003, he has been acting as a Co-Principal Investigator at NESCAUM in an EPA-funded joint effort with Georgia Institute of Technology and Massachusetts Institute of Technology on a policy-relevant research project that is evaluating future impacts of global climate and emission changes on regional air quality in the US (ozone and fine PM). The work includes sensitivity analyses of predicted pollutant concentrations (for Years 2049-2050-2051) to current control measures for NO<sub>x</sub>, SO<sub>2</sub>, PM, and VOCs, under future climate change scenarios with their associated uncertainty.

While at NESCAUM, he served as a member of the EPA's New Source Review Advisory Subcommittee (1993-1996) that provided guidance to the EPA's effort to reform the NSR permitting program. He was a member of the Science Advisory Committee (1993-2001) for the EPA-funded, MIT-Caltech-New Jersey Institute of Technology Center on Airborne Organics. He served as a member of the Synthesis Team (1996-2000) for the NARSTO (North American Research Strategy on Tropospheric Ozone) that produced the July 2000 report "An Assessment of Tropospheric Ozone Pollution," and in February 2003, published "Particulate Matter Science for Policy Makers: A NARSTO Assessment." He has made presentation before International Joint Commission (IJC; Canada and US) on control technologies for mercury emissions from coal-fired electric utilities. In 2002, he testified before the US House Science Committee on control strategies for particulate air pollution. In April 2005, he testified before the Democratic Policy Committee of the US Senate on EPA's proposed rule to control mercury emissions from coal-fired utility boilers.

From August 2001 to March 2003, Dr. Amar served as a member representing states, of the EPA's Utility Mercury MACT (Maximum Achievable Control Technology) stakeholders workgroup of the Clean Air Act Advisory Committee (CAAAC). The joint states-industry-environmental organization workgroup advised US EPA on MACT development for coal-fired power plants. From August 2003 to March 2005, he served as a Project Director on an EPA-funded project with Harvard Center for Risk Analysis resulting in NESCAUM's March 2005 report "Economic Valuation of Human Health Benefits of Controlling Mercury Emissions from US Coal-Fired Power Plants." During June-December 2003, he served as a member of the US EPA's Clean Air Scientific Advisory Committee (CASAC)'s Subcommittee on National Ambient Air Monitoring Strategy. Since 1999, he is serving as a member of the Science Advisory Committee for the NYSERDA's (New York State Energy Research and Development Authority) EMEP (Environmental Monitoring, Evaluation and Protection) program. From 2003 to 2006, he has served on a number of external peer review panels that have evaluated EPA ORD's various research programs, including CMAQ and REMSAD models, and combustion and air toxics research programs.

Before joining NESCAUM, Dr. Amar was with the California Air Resources Board for fifteen years (1977-1992) where he managed programs on air pollution research (including research on acid deposition, atmospheric processes and ecological effects), strategic planning, and industrial source pollution control. For over 20 years, he has been a part-time faculty member at the University of California, Davis, California State University at Sacramento, and Tufts University in Boston, teaching undergraduate and graduate courses in atmospheric chemistry and physics of air pollution, fluid mechanics and heat transfer processes, and air pollution policy.

Dr. Amar's work at NESCAUM receives its financial support from its member states (the six New England states and these states of New Jersey and New York) and through grants from EPA to member states through "Sections 103 and 105 Grants" given under the Clean Air Act grant programs to states as well as from EPA ORD's competitive grants process.

### **Dr. Ed Avol**

Dr. Ed Avol is a Professor in the Environmental Health Division of the Department of Preventive Medicine at the Keck School of Medicine at the University of Southern California (USC). He received his B.A. (1973) in Mathematics, with a Minor in Chemistry, from the University of California, San Diego (UCSD) and his M.S. (1974) from the California Institute of Technology (Caltech) in Environmental Engineering Sciences. He is a member of the International Society of Exposure Analysis (ISEA), the Air and Waste Management Association (AWMA), and the American Association for Aerosol Research (AAAR).

Professor Avol is a member of the Science Advisory Panel of the Mickey Leland National Urban Air Toxics Research Center (NUATRC), a member of both the (Southern California regional air quality agency) South Coast Air Quality Management District's 2007 Air Quality Management Plan (AQMP) Technical Advisory and General Committees, a member (2004-2005) of the Los Angeles Mayor's No Net Increase Task Force (to assess health impacts and emission reduction strategies for the Port of Los Angeles), a member of the San Pedro Bay (Ports of Los Angeles and Long Beach) Clean Air Action Plan Technical Working Group, and the ISEA Technical Chair for the 2008 Joint ISEA-ISEE Annual Meeting. He is a recipient of the Dr. Zweig Community Health Advocate Award for his work on the California Children's Health Study. Professor Avol's research interests include air pollution exposure assessment and both chronic and acute human respiratory health outcomes. His research has involved controlled chamber exposures of human volunteers to assess acute reversible air pollution respiratory effects in healthy and asthmatic children, adolescents, and adults, long-term community studies to assess chronic respiratory effects in children, and air pollution exposure generation, monitoring, and characterization to quantify and understand ambient pollutant burdens.

In the last two years, Professor Avol has received funding from the National Institutes of Health and U.S. Environmental Protection Agency for longitudinal health studies to assess intra-community variability in ambient pollution exposure among community residents and to direct Exposure Facility Core efforts in an NIEHS-supported Science Center and NIEHS-EPA supported Children's Center. He has also received funding as part of the Southern California Particle Research Center (a USEPA-supported Center), to assess PAH and PM exposures in Southern California communities of longitudinal health study interest. In addition to his respiratory research, he currently directs research on three cardiopulmonary research efforts (funded by USEPA, NHLBI, and NIEHS), to assess atherosclerosis progression in children, college students, and adults and to investigate the association between cardiovascular health and long-term exposure to ambient PM.

## **Dr. John R. Balmes [M.D.]**

Dr. John Balmes is a Professor of Medicine at the University of California, San Francisco (UCSF) where he is the Chief of the Division of Occupational and Environmental Medicine at San Francisco General Hospital (SFGH), Director of the Human Exposure Laboratory of the Lung Biology Center, and the Principal Investigator of the UCSF Pediatric Environmental Health Specialty Unit. He is also Professor of Environmental Health Sciences at the University of California, Berkeley where he is the Director of the Northern California Center for Occupational and Environmental Health and the Center for Excellence in Environmental Public Health Tracking. Dr. Balmes received his BA from the University of Illinois (Urbana) in 1972. He received his M.D. from the Mount Sinai School of Medicine of the City University of New York in 1976. He completed a Residency in Internal Medicine at the Mount Sinai Hospital at New York City in 1979 and a fellowship in Pulmonary Medicine with additional training in occupational medicine in 1982. He is board-certified in Internal Medicine and Pulmonary Medicine and actively practices pulmonary and critical care medicine at SFGH.

Dr. Balmes leads a research program involving the respiratory effects of ambient air pollutants. In his laboratory at UCSF, he conducts controlled human exposure studies of the acute effects of ozone and other pollutants. At UC Berkeley, he collaborates in epidemiological studies of the chronic effects of air pollutants. He has published over 160 papers or chapters on occupational and environmental respiratory disease-related topics with many of these dealing with the potential health effects of ambient air pollutants, especially ozone. Dr. Balmes' expertise in the health effects of ambient air pollutants has been recognized by multiple awards including the following: an Environmental/Occupational Medicine Academic Award from the National Institute of Environmental Health Science (1991-1996); the Clean Air Research Award from the American Lung Association of San Francisco and San Mateo in 1997; and the Clean Air Award from the American Lung Association of California in 1999.

Dr. Balmes currently serves as a member of the Research Screening Committee of the California Air Resources Board (CARB) and was a member of the Air Quality Advisory Committee of the Office of Environmental Health Hazard Assessment of the California Environmental Protection Agency from 1992-2004. He has served the U.S. Environmental Protection Agency in many capacities. He currently serves as an expert panelist on the Clean Air Scientific Advisory Committee (CASAC) Ozone Review Panel. In 1992, he served on the CASAC Oxides of Nitrogen Review Panel and was invited to participate in a Workshop on Health Issues on Air Quality Criteria for Ozone and Related Photochemical Oxidants. He contributed to the writing of the Air Quality Criteria Document for Ozone in 1993-1994. He was a Consultant Reviewer of the Air Quality Criteria Document for Particulate Matter in 1995, was invited to participate in a Workshop on Asthma and the Environment in 1996, and was a Consultant Reviewer of the Air Quality Criteria Document for Ozone in 2003. In addition, he served as a consultant advisor regarding epidemiologic research on the health effects of ozone to the Health Effects Institute from 1990-1992.

Dr. Balmes' research program has been supported by the National Institutes of Health, the Health Effects Institute, the Centers for Disease Control and Prevention, the California Air Resources Board, and the Flight Attendants Medical Research Institute. Currently funded projects include a study of the effects of chronic exposure to ozone on lung function (NHLBI), a

study of the respiratory effects of early life exposure to biomass smoke (NIEHS), a study of both short-term and long-term responses of asthmatic children to air pollutants (CARB), a study of the effects of polymorphisms in antioxidant enzymes on ozone-induced allergic airway inflammation (CARB), and a center of excellence for environmental public health tracking (CDC).

Dr. Balmes is on the editorial board of the International Journal of Occupational and Environmental Health and is an active reviewer for multiple clinical and environmental health journals, including the New England Journal of Medicine, JAMA, the American Journal of Respiratory and Critical Care Medicine, the European Respiratory Journal, Occupational and Environmental Medicine, and Environmental Health Perspectives. Dr. Balmes is a member of multiple professional societies and organizations, including the American and California Thoracic Societies, the American College of Chest Physicians, the American College of Occupational and Environmental Medicine, the Society for Occupational and Environmental Health, and the International Society for Environmental Epidemiology. He was Chair of the Environmental and Occupational Health Scientific Assembly of the American Thoracic Society in 1997-1999 and President of the California Thoracic Society in 2001-2002.

### **Dr. Ronald C. Cohen**

Dr. Ronald C. Cohen, B.A. Wesleyan University (1985), Ph.D. in Chemistry, UC Berkeley (1991), was a postdoctoral fellow and research associate at Harvard University from 1991-1996. He joined the UC Berkeley faculty in 1995 and is currently and Associate Professor in both the Chemistry and in the Earth & Planetary Science Departments. He is also a faculty scientist in the Energy and Environment Division at the Lawrence Berkeley National Laboratory and serves as the Director of the Berkeley Atmospheric Science Center. His research has been recognized with the Regents Junior Faculty Fellowship (1998), a Hellman Faculty Fellowship (1999) and NASA group achievement awards (1998, 2005).

Dr. Cohen's research focuses on the chemistry of atmospheric nitrogen oxides, and the effects of this chemistry on ozone, aerosol and climate. He also studies the use of water isotopes as a diagnostic of processes within the hydrologic cycle. Dr. Cohen's research emphasizes development of new technologies that he uses to obtain detailed observations of atmospheric composition and to validate and interpret global observations of NO<sub>2</sub> obtained from space-borne instruments. Cohen has extensive experience and expertise on the measurement of atmospheric NO<sub>x</sub> and its oxidation products and on the influence of NO<sub>x</sub> on the formation of ozone. Dr. Cohen's classroom teaching is primarily general chemistry for freshman undergraduates. He has mentored nine students who have completed their Ph.D. and another eleven are currently working on doctoral projects with him. Dr. Cohen is a member of the American Association of the Advancement of Science, the American Geophysical Union, the European Geophysical Union, and the American Chemical Society.

### **Dr. Mark Frampton**

Dr. Mark Frampton is Professor of Medicine and Environmental Medicine in the Pulmonary and Critical Care Division of the Department of Medicine at the University of Rochester Medical Center. His undergraduate education was at the University of California Long Beach, and he attended Medical School at New York University. He trained in Internal

Medicine at the State University of New York at Buffalo and then entered the private practice of internal medicine for nine years. In 1985 to 1988 he trained in Pulmonary and Critical Care Medicine at the University of Rochester, and began working with Dr. Mark Utell using human clinical studies to study the health effects of air pollution. Current research activities in Dr. Frampton's laboratories are focusing on the pulmonary and cardiovascular effects of exposure to ultra-fine particles, using both laboratory-generated particles and concentrated ambient ultra-fine particles. Previous studies have focused on the airway and systemic effects of inhaled pollutant gases, including ozone and nitrogen dioxide. Studies have focused on healthy subjects as well as subjects with increased susceptibility to inhaled pollutants, including people with asthma and diabetes. His research is funded by the National Institutes of Health and the Environmental Protection Agency, and previously by the Health Effects Institute.

Dr. Frampton is past president of the New York State Thoracic Society and past chair of the Environmental and Occupational Health Assembly of the American Thoracic Society. He is also past chair of the Section of Bioterrorism of the American Thoracic Society. Dr. Frampton currently serves on the on Environmental Health Policy Committee of the American Thoracic Society. He has served on numerous grant review panels for the National Institutes of Health, the U.S. Environmental Protection Agency, and the Health Effects Institute (HEI). Most recently, he served on the NHLBI Asthma Centers Review Panel in March 2006, and chaired the NIEHS Special Emphasis Panel in October of 2005. He served on the HEI Task Force on Hazardous Air Pollutants from 2005 to 2006. He served as a reviewer for the document "Air Quality Criteria for Ozone" from the EPA in 2003-2004. He participated in research needs workshops for the National Center for Environmental Assessment of the EPA, on particulate matter in September 1996, and ozone in March 1997.

### **Dr. Noor Gillani**

Dr. Noor Gillani is currently the Principal Research Scientist at the Earth System Science Center of the University of Alabama in Huntsville (UAH), which is also an integral component of the Global Hydrology and Climate Center of the Joint NASA-Alabama National Space Science & Technology Center (NSSTC). He is also Adjunct Professor of Atmospheric Science at UAH, and was formerly Professor of Mechanical Engineering at Washington University in St. Louis (WUSTL). In addition, Dr. Gillani has also been a Visiting Scientist at DOE's Brookhaven National Lab, EPA's National Environmental Research Lab (RTP), North Carolina State University, and TVA's Environmental Research Center. He completed high school in England, attended Harvard as an undergraduate, and completed his M.S. and D.Sc. at WUSTL.

Dr. Gillani's area of research expertise over the last 32 years has been in air quality, with a focus on field studies and data analysis involving multi-scale diagnostic modeling. His research has focused mostly on emissions, transport and chemistry of SO<sub>x</sub>, NO<sub>x</sub> and VOCs, both in the context of plumes (*e.g.*, power plant, urban and petrochemical sources) and regional domains such as the U.S. A current key interest is in quantifying the relative contributions to observed local ozone due to continental, regional and local sources, and also on quantitative understanding of free tropospheric chemistry and its impact on PBL chemistry. Dr. Gillani has served on numerous advisory committees — international (*e.g.*, U.S. delegate to NATO/CCMS), national (various government agencies and EPRI), and regional (*e.g.*, SOS, TexAQS). He has been a principal contributor to past EPA criteria documents on ozone and PM<sub>2.5</sub>. Dr. Gillani's

active participation in professional societies has been limited to memberships and participation in annual and specialty conferences.

### **Dr. Henry Gong [M.D.]**

Dr. Henry Gong, Jr., M.D., received his B.A. (Biology) from the University of the Pacific, Stockton, CA, and his M.D. in 1973 from the University of California at Davis. He then completed a Medicine residency at Boston University Medical Center and a Pulmonary Medicine Fellowship at the University of California at Los Angeles (UCLA). Dr. Gong remained on the full-time UCLA faculty for 15 years. He was the Associate Chief of the Pulmonary and Critical Care Medicine Division, UCLA Medical Center (1985-1992), and promoted to Professor of Medicine in 1989. Dr. Gong moved to Rancho Los Amigos Medical Center (RLAMC), Downey, CA, in 1992, where he has since been the Chief of the Environmental Health Service, an established research facility investigating the health effects of air pollution. Since 1992, he is/was the Chair of the Department of Medicine, Medical Director of Respiratory Therapy, and Chair of the Research (IRB), Hospital Infection, and the Continuing Medical Education Committees at RLAMC, as well as a Professor of Medicine and Preventive Medicine, Keck School of Medicine of University of Southern California (USC).

Dr. Gong is an established, practicing Board-certified pulmonologist/internist with expertise in clinical asthma and altitude effects in patients with cardiopulmonary disorders. He has served on the Asthma Advisory Panel of Blue Cross of California since 1999. He was a Visiting Professor to Henry Ford Hospital and Medical Centers, Detroit, MI (June, 2000) and Singapore National University, Singapore (November, 2000). His long-time efforts in pollution-related health effects have been recognized by his receipt of the Clean Air Award from the American Lung Association of California (September, 2000); the Carl Moyer Award from the Coalition for Clean Air (May, 2001); the Environmental Achievement Award from the U.S. Environmental Protection Agency, Region 9 (April, 2004); and the Robert M. Zweig, M.D., Memorial Award, from the South Coast Air Quality Management District (October, 2004).

Dr. Gong has written over 250 papers, chapters, or books on respiratory-related and air pollution topics, including ozone-related health effects. He was a key contributor to the monograph "Considerations for Diagnosing and Managing Asthma in the Elderly" (February, 1996, Division of Lung Diseases, NHLBI, NIH). Dr. Gong is/was on the Editorial Board of several journals (*Journal of Clinical Pharmacology*; *The American Journal of Critical Care*; *Archives of Environmental Health*, *Inhalation Toxicology*) and a reviewer for over 20 clinical and environmental journals, including the *New England Journal of Medicine*, *American Journal of Respiratory and Critical Care Medicine*, *Chest*, *Journal of Clinical Allergy and Immunology*, *Annals of Internal Medicine*, *Environmental Research*, *Archives of Environmental Health*, *Journal of the Air & Waste Management Association*, *European Respiratory Journal*, and *Environmental Health Perspectives*.

Dr. Gong currently serves as an expert panelist on EPA's Clean Air Scientific Advisory Committee (CASAC) Ozone Review Panel. In addition, he served on the Special Review Committee on "RFA 92-04, Ozone: Mechanisms of Action" (NIEHS, March, 1993) and as a Consultant/Contributor to the Air Quality Criteria for Ozone and Related Photochemical Oxidants, Environmental Criteria and Assessment Office (EPA, 1993-1994; 2003), as well as an

external peer reviewer of the EPA's long-term Asthma Research Strategy (2000). He was the first Director and Principal Investigator of the Southern California Center for Children's Environmental Health and Disease Prevention Research: Respiratory Disease and Prevention, which is co-funded by the NIEHS and EPA. He has served on local and state air pollution committees, such as the PM10 Task Force and the Asthma and Outdoor Air Quality Consortium (South Coast Air Quality Management District). Dr. Gong was appointed by the Governor in August, 2004, to serve on the California Air Resources Board.

Dr. Gong is a member of numerous professional organizations or societies, such as the American Thoracic Society, American College of Chest Physicians, and Western Society for Clinical Investigation. Dr. Gong was President of the California Chapter of the American College of Chest Physicians in 1991-92. He is currently a Fellow and former Governor of Southern California of the American College of Chest Physicians.

### **Dr. Terry Gordon**

Dr. Terry Gordon holds the rank of Professor of Environmental Medicine at the NYU School of Medicine. He has a Ph.D. degree in toxicology from MIT, and was appointed to the faculty of the Department of Environmental Medicine in 1989. Dr. Gordon currently is the Director of Pulmonary Toxicology; this research core integrates studies primarily in respiratory toxicology, including respiratory immunotoxicology. Dr. Gordon has served as an *ad hoc* member of grant review panels and/or site visit teams for NIEHS, NIAID, NCCR, DOD, Bureau of Mines, and the U.S. EPA. He currently serves as Chair of the ACGIH Threshold Limit Value committee, a volunteer organization that publishes occupational exposure levels that are used as workplace safety guidelines throughout the world. Dr. Gordon is an active member of the Society of Toxicology (SOT), and has served on the Program Committee (2002-2005), the Placement Service (1998-2001), and as President of its Inhalation Specialty Section during 2002-2003. He has served as a consultant/author to the U.S. EPA on issues of pulmonary toxicology related to the development of various documents, including the Criteria Document on Particulate Matter.

Dr. Gordon's broad research interest is in inhalation toxicology. The major focus of his research lab is the identification and understanding of the role of genetic host factors in the pathogenesis of the adverse pulmonary effects produced by inhaled environmental and occupational agents. Because inter-individual responses to inhaled particles and gases varies so greatly in both human subjects and test animals, Dr. Gordon has hypothesized that genetic susceptibility factors play a major role in environmental and occupational lung disease. In collaboration with a number of investigators in the department, his laboratory uses classic murine genetics models, computational genomics, and DNA microarrays to identify genes involved in the acute response as well as in the development of tolerance to repeated exposure to inhaled toxicants. Dr. Gordon also plays a major role in the PM research program at NYU and was among the first researchers to use concentrator technology to study the adverse cardiopulmonary effects of ambient PM. He has also led a large collaborative effort amongst the original 5 PM Centers to evaluate the *in vitro* and *in vivo* toxicity of size-segregated PM collected in the U.S. and Europe.

## **Dr. Dale Hattis**

Dr. Dale Hattis is Research Professor with the Center for Technology Environment and Development (CENTED) of the George Perkins Marsh Institute at Clark University. He holds a Ph.D. in genetics from Stanford University (1974) and a B.A. in biochemistry from the University of California at Berkeley (1967). For the past twenty-nine years, Dr. Hattis has been engaged in the development and application of methodology to assess the health, ecological and economic impacts of regulatory actions. His work has focused on the development of methodology to incorporate interindividual variability data and quantitative mechanistic information into risk assessments for both cancer and non-cancer endpoints. An important focus in recent years has been on age-related differences in pharmacokinetic processes and susceptibility for carcinogenesis. Specific quantitative risk assessment studies have included hearing disability in relation to noise exposure, renal effects of cadmium, reproductive effects of ethoxyethanol, neurological effects of methyl mercury and acrylamide, chronic lung function impairment from coal dust, four pharmacokinetic-based risk assessments for carcinogens (for perchloroethylene ethylene oxide butadiene and diesel particulates), an analysis of uncertainties in pharmacokinetic modeling for perchloroethylene and an analysis of differences among species in processes related to carcinogenesis.

Dr. Hattis has recently been reappointed as a member of the Environmental Health Committee of the EPA Science Advisory Board and for several years he has served as a member of the Food Quality Protection Act Science Review Board. In the recent past, Dr. Hattis has served as a member of the National Research Council Committee on Estimating the Health-Risk-Reduction Benefits of Proposed Air Pollution Regulations. Current major sources of research support include the U.S. Department of Energy and the U.S. Environmental Protection Agency. He has been a councilor and is presently a Fellow of the Society for Risk Analysis, and serves on the editorial board of its journal *Risk Analysis*.

## **Dr. Janice Kim [M.D.]**

Dr. Janice Kim is a pediatrician and public health medical officer with the Air Toxicology and Epidemiology Branch of the California Environmental Protection Agency's Office of Environmental Health Hazard Assessment (OEHHA). In that capacity, she conducts epidemiological research on health impacts of air pollution and assists in reviewing the scientific studies that form the basis for establishing ambient air quality standards for the state of California. Dr. Kim's research focus includes health impacts of traffic-related air pollution and children's environmental health. She was the lead investigator of the OEHHA study "Traffic-related Air Pollution near Busy Roads: The East Bay Children's Respiratory Health Study," and is currently co-investigator and project director on a study funded by the California Air Resources Board (CARB) estimating health risks to this study population based on residential proximity to traffic using geographic information systems methods. Dr. Kim is actively involved in the review of the California Ambient Air Quality Standard for Nitrogen Dioxide, a joint effort between OEHHA and the CARB. Dr. Kim is a contributing author to the document with primary responsibility for the chapter on Controlled Human Exposure Studies. She also assisted in the review of the epidemiological studies.

Dr. Kim received degrees in chemistry from the University of California Davis (B.S., (1971) and Berkeley (Ph.D., 1975) and an M.D. from the University of California, San Diego (1980). Following pediatric residency at Harbor-UCLA Medical Center and post-doctoral training, she served as a research scientist at the University of California, San Francisco. She received a Masters in Public Health (Epidemiology) at the University of California Berkeley (1998) before joining OEHHA, CalEPA. In addition to her work at OEHHA, she serves as a member of the American Academy of Pediatrics' (AAP) National Committee on Environmental Health, and is the lead author of the AAP policy statement, Ambient Air Pollution: Health Hazards to Children, (*Pediatrics*, December 2004). Dr. Kim is also a member of the Advisory Council (Public Health Committee), Bay Area Air Quality Management District. She has served as a reviewer on manuscripts for the *American Journal of Respiratory and Critical Care Medicine* and *Atmospheric Environment*. In addition, Dr. Kim has advised and contributed in a number of different forums on health effects of air pollution and other environmental health issues to public health and health care professionals and community organizations.

### **Dr. Patrick Kinney**

Dr. Patrick Kinney is an Associate Professor of Public Health at the Department of Environmental Health Sciences at Columbia's Mailman School of Public Health. He holds a Sc.D. in Environmental Health Sciences/Air Pollution Control and Physiology from the Harvard School of Public Health (1986), where his thesis work involved analyzing the acute effects of ozone and fine particles on lung function in children enrolled in the Harvard Six Cities Study.

Dr. Kinney teaches and carries out research in air pollution epidemiology, with a strong interest in transportation-related pollutants and asthma. His recent research has focused on characterizing levels and determinants of indoor, outdoor, and personal exposures to air pollution in the underprivileged neighborhoods of New York City, including studies of indoor allergens, diesel vehicle emissions, volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), and other air toxins. Dr. Kinney has carried out numerous studies examining the human health effects of air pollution, including studies of the effects of ozone and/or particulate matter on lung health and on daily mortality in large cities. His recent work has included assessments of potential health effects of climate change, and he has established a new research program at Columbia to develop, test, and apply an integrated modeling system for assessing human health impacts of climate change, focusing on heat stress and air quality impacts.

Dr. Kinney has been a contributing author of the epidemiology sections of EPA's ozone and particulate matter air quality criteria documents. In addition, he is a member of the National Academy of Science panels on Health Benefits Analysis and on Asthma and Indoor Air Pollution.

### **Dr. Steven Kleeberger**

Dr. Steven Kleeberger received his A.B. degree in zoology from Miami University, his M.A. in ecology from Northern Michigan University, and a Ph.D. in ecology from Kent State University in 1982. He did his postdoctoral research at Johns Hopkins University where he became a full Professor in 2000. Dr. Kleeberger was recruited to NIEHS as Chief of the Laboratory of Respiratory Biology in 2001. He also directs the Environmental Genetics research

group at NIEHS, and is the PI for the Director's Challenge Program Mechanisms of susceptibility to oxidative stress-induced disease. The overall goal of his research has been to utilize positional cloning approaches in inbred mice to identify candidate genes that determine susceptibility to environmental lung disease. Dr. Kleeberger's lab has developed a number of models of genetic predisposition to inhaled agents including acid-coated particles nitrogen dioxide, ozone, as well as a murine model of genetic susceptibility to hyperoxia. The work has led to the identification of significant susceptibility quantitative trait loci (QTLs), and functional characterization of candidate genes for susceptibility to lung injury induced by environmental pollutants. In addition, his laboratory is focused on gene-environment interaction and the pathogenesis of disease in human populations, is participating in genetic analysis of asthma pathogenesis and susceptibility to coal workers pneumoconiosis, and is also directing investigation of the role of innate immunity genes in determination of susceptibility to RSV infection and chronic lung disease in infants, and ARDS in acute lung injury patients.

Dr. Kleeberger has served as a consultant to the World Health Organization (WHO) and U.S. Environmental Protection Agency (EPA) regarding susceptible sub-populations and airborne pollutants. He has authored over 100 peer-reviewed manuscripts and two dozen book chapters. Dr. Kleeberger is a reviewer for over 20 journals, and he has held a number of editorial positions. He has given over 80 invited lectures in the United States, Europe, Asia, and South America. Dr. Kleeberger has also served or currently serves on multiple study sections and international advisory committees on genetic susceptibility.

#### **Dr. Michael T. Kleinman**

Dr. Michael Kleinman is a Professor in the Department of Community and Environmental Medicine, College of Medicine, University of California, Irvine (UCI), and an Adjunct Professor of Social Ecology. In addition, he is the co-Director of the Air Pollution Health Effects Laboratory and Faculty Member of the UCI Center for Occupational and Environmental Health. Dr. Kleinman holds a B.S. in Chemistry from Brooklyn College, City University of New York (1965), an M.S. in Chemistry from the Polytechnic Institute of Brooklyn (1971), and a Ph.D. in Environmental Health Sciences from New York University (1977).

Dr. Kleinman has been studying the health effects of exposures to environmental contaminants found in ambient air for more than 25 years. His research program examines the mechanisms by which inhaled toxic chemicals, alone and in mixtures, interfere with the cardiopulmonary system and with respiratory system defenses, using both laboratory animals and human subjects. Dr. Kleinman has studied the effects of ozone, alone and in combination with particles, with human volunteers as well as in animal models. His current studies focus on injury-induced oxidative stresses from endogenous and exogenous factors that can cause asthma, cardiopulmonary injury and exacerbate lung and heart diseases, and on the cardiopulmonary effects of concentrated ambient ultra-fine, fine and coarse particles using geriatric rats and a mouse model of allergic airways disease.

Prior to joining the faculty at UCI in 1982, Dr. Kleinman directed the Aerosol Exposure and Analytical Laboratory at Rancho Los Amigos Hospital in Downey, CA. He has published 70 articles in peer-reviewed journals dealing with the uptake and dosimetry of inhaled pollutants

in humans and laboratory animals, and effects on cardiopulmonary and immunological systems after controlled exposures to ozone and other photochemical oxidants, carbon monoxide and ambient or laboratory-generated aerosols. He recently chaired a National Academy committee to examine issues in protecting deployed U.S. military forces from the effects of chemical and biological weapons.

Dr. Kleinman currently serves as an expert panelist on EPA's Clean Air Scientific Advisory Committee (CASAC) Ozone Review Panel. He is a consultant to the EPA Science Advisory Board (Health Effects Subcommittee) and currently serves as the Chair of the California Air Quality Advisory Committee, which reviews California's air quality criteria documents. Dr. Kleinman is a member of the Air and Waste Management Association, the American Association for the Advancement of Science (AAAS), the American Association for Aerosol Research, the American Chemical Society (ACS), Sigma Xi, and the New York Academy of Sciences.

### **Dr. Timothy Larson**

Dr. Timothy Larson is a Professor in the Department of Civil and Environmental Engineering at the University of Washington. He is also an adjunct Professor in the Department of Occupational and Environmental Health Sciences at the University of Washington. Dr. Larson received his B.S.Ch.E. from Lehigh University in 1968, and his M.S.Ch.E. (1972) and Ph.D. (1976) from the University of Washington. Dr. Larson is currently the holder of the Alan and Inger Osberg Endowed Chair in Civil and Environmental Engineering at the University of Washington. He is a member of the Air and Waste Management Association, the International Society of Exposure Analysis and the American Association for Aerosol Research. Dr. Larson's expertise is in characterization of urban air pollution, exposure assessment of airborne particles and gases, and source/receptor relationships of ambient air pollutants. Dr. Larson major focus in recent years has been on assessment of human exposure to outdoor generated air pollutants.

Dr. Larson has previously served as a member of EPA's Advisory Council on Clean Air Compliance Analysis (COUNCIL) and the Agency's Indoor Air Quality/Total Human Exposure advisory committee. In addition, he served on the EPA Science Advisory Board as a member of the Health and Ecological Effects Subcommittee and the Air Quality Modeling Subcommittee. In the last two years, Dr. Larson has received funding from EPA as PI of the Exposure Core of the Northwest Center for Particulate Matter and Health, and as a co-PI for Exposure related research for the Prospective Study of Atherosclerosis, Clinical Cardiovascular Disease, and Long-Term Exposure to Ambient Particulate Matter and Other Air Pollutants in a Multi-Ethnic Cohort. He has received funding from Health Canada for studies of chronic exposure to traffic related pollutants and to woodsmoke, and is currently co-PI of a new project funded by the Health Effects Institute integrating epidemiologic and toxicologic cardiovascular studies to identify toxic components and sources of fine particulate matter.

### **Dr. Thomas Lumley**

Dr. Thomas Lumley received his B.S. (Hons.) in Pure Mathematics (Monash University, Australia, 1991), his M.Sc. in Applied Statistics (University of Oxford, UK, 1994), and his Ph.D. in Biostatistics (University of Washington, 1998). He was appointed Assistant Professor of

Biostatistics at the University of Washington (Seattle) in 1998 and is now an Associate Professor in that department. He currently serves as an expert panelist on the U.S. EPA's Clean Air Scientific Advisory Committee (CASAC) Ambient Air Monitoring and Methods (AAMM) Subcommittee (2004-present).

Dr Lumley's current research activities include: statistical computing, methods for longitudinal data analysis, source apportionment and other issues in air pollution epidemiology, pharmacogenomics and other issues in cardiovascular epidemiology. Recent and current funding for his research includes grants and contracts from the National Heart Lung & Blood Institute, the Health Effects Institute, and the EPA. He does not have any major consulting activities but has been a paid external reviewer for EPA, the Health Effects Institute, the ARHQ Effective Health Care program, and the Howard Hughes Medical Institute.

Dr. Lumley is a member of the International Biometric Society, the Royal Statistical Society, and the American Statistical Association. He is an Associate Editor for The American Statistician, Stata Journal, and BMC Trials. He is a core developer for R Project in Statistical Computing. Dr. Lumley's current research activities include: statistical computing, methods for longitudinal data analysis, cardiovascular epidemiology (funded by grants and contracts from NHLBI), and air pollution source apportionment and epidemiology (funded by an EPA grant to the Northwest PM Center).

### **Mr. Fred Lurmann**

Mr. Fred Lurmann is President Emeritus and Manager of Exposure Assessment Studies at Sonoma Technology, Inc., an air quality consulting firm located in Petaluma, California. He received a B.S. in Mechanical Engineering (1971) and a M.S. in Mechanical and Environmental Engineering (1975) from the University of California, Santa Barbara. Mr. Lurmann has 29 years of experience in air quality and exposure analysis. He has designed regional air quality studies, developed air quality simulations models for ozone and PM, and evaluated alternate emission control strategies. In addition, he has designed and managed the exposure assessments of numerous epidemiologic studies, including the 10-year Southern California Children's Health Study (CHS). Mr. Lurmann has also developed human exposure models for both Criteria air pollutants and air toxics for application to the general population and to cohorts with individual-level time-activity and housing data. The focus of his current research is exposure assessment for prospective cohorts recruited for acute and chronic air pollution health effects studies.

Mr. Lurmann is currently co-directing exposure assessments for National Institute of Environmental Health Sciences (NIEHS)-sponsored study of Genetics/Air Pollution/Respiratory Effects in Children and Young Adults, which includes investigation of asthma incidence in 6000 children and pulmonary function in young adults from the CHS (under subcontract to the University of Southern California's Keck School of Medicine). He recently completed characterization of the lifetime exposures of a cohort of Berkeley college students to ozone and other Criteria pollutants in an NIEHS-sponsored study of chronic air pollution effects. For the California Air Resources Board, Mr. Lurmann is managing exposure assessment for the evaluation of health benefits associated with 20 years of improving ambient air quality.

Mr. Lurmann recently completed advising the U.S. EPA-sponsored PM Research center at UCLA on traffic and exposure modeling. In addition, he directs the exposure data analysis and modeling for the Fresno Asthmatic Children's Environment Study (FACES) that involves assessing daily exposure of 300 subjects to ozone, NO, NO<sub>2</sub>, PM<sub>2.5</sub>, PM<sub>10</sub>, sulfate, nitrate, elemental carbon, organics including polycyclic aromatic hydrocarbons, endotoxin, pollen grains, and fungal spores (under subcontract to the University of California, Berkeley, School of Public Health). Mr. Lurmann also recently completed analyses of aerometric data from the California Regional PM<sub>10</sub>/PM<sub>2.5</sub> Air Quality Study (CRPAQS).

Mr. Lurmann has co-authored over 40 peer-reviewed articles and has been a member of several state and local air pollution agency advisory committees. Currently, he is a member the South Coast Air Quality Management District's Science, Technical, and Modeling Peer Review Advisory Group. Mr. Lurmann is also a member of the board of directors of the International Society of Exposure Analysis and the American Lung Association's Redwood Empire Branch. He is a member of the following professional associations: Air & Waste Management Association, American Association for Aerosol Research, American Geophysical Union, American Chemical Society, and International Society of Exposure Analysis.

### **Dr. Roger O. McClellan**

Dr. Roger O. McClellan received his DVM from Washington State University in 1960 and has more than 4 decades of experience in the fields of inhalation toxicology and risk assessment. He is the author of more than 350 papers and edited 10 books in these fields including the 2 leading texts on inhalation toxicology/respiratory toxicology. Dr. McClellan is a Diplomat, by examination, of the American Board of Toxicology and American Board of Respiratory Toxicology, and a Fellow of the Academy of Toxicological Sciences and Society for Risk Analysis. He currently is, or has been, an adjunct faculty member at 10 major research universities. Dr. McClellan is an elected member of the Institute of Medicine of the National Academy of Sciences.

Dr. McClellan currently works as an Advisor in Inhalation Toxicology and Human Health Risk Analysis from his home office in Albuquerque, NM. He divides his time between pro bono service and work for fee for service clients in government and the private sector. Dr. McClellan has served on numerous NRC Committees including Committee on Toxicology (Chair for seven years), Committee on Environmental Justice, and the Committee that prepared "Science and Judgment in Risk Assessment." Dr. McClellan has served on numerous EPA Advisory Committees from the founding of EPA to the present under every EPA Administrator including: Chairing Environmental Health Committees and Clean Air Scientific Advisory Committee and the committees that reviewed the Cancer Risk Assessment Guidelines promulgated in 1986 and proposed for promulgation in 2003. He has served on previous CASAC panels reviewing each of the Criteria Pollutants including ozone. Dr. McClellan is currently serving on an Advisory Committee to the CDC Center for Environmental Health Research and on the DOE's Biological and Environmental Research Advisory Committee.

Dr. McClellan is a strong proponent of integrating information from multiple sources: epidemiological studies, controlled human exposure investigations, laboratory animal bioassays and mechanistic investigations to assess human health risks. His expertise in inhalation

toxicology, inhalation dosimetry modeling, carcinogenesis, comparative medicine, biologically-based dose-response modeling, and quantitative risk assessment are directly relevant to review of the science base for ozone.

### **Dr. Suzanne Paulson**

Dr. Suzanne Paulson has been a professor in the Department of Atmospheric & Oceanic Sciences at UCLA since 1994. She earned a B.A. in Chemistry from the University of Colorado (1983), and a Ph.D. in Environmental Engineering Science from the California Institute of Technology (1991). Dr. Paulson also holds a M.S. in Plant Biology from the University of Illinois (1986). She currently serves as Associate Director for the University of California Toxics Research and Teaching Program, and on the Advisory Committee for a European Union Research sub-program. Dr. Paulson has served as a peer reviewer for the California Air Resources Board, on a Department of Energy Visitors Committee and on the World Health Organization Final Task Force to develop guidelines for nitrogen oxide air quality standards.

Dr. Paulson's current research focuses on investigations photochemical oxidation chemistry, toxics in airborne particles, aerosol formation, and radiative properties and measurements of black and organic carbon aerosols. She is the recipient of a National Science Foundation CAREER award for her research.

### **Dr. Kent E. Pinkerton**

Dr. Kent E. Pinkerton is Professor of Anatomy, Physiology and Cell Biology in the School of Veterinary Medicine and Professor of Pediatrics in the School of Medicine at the University of California, Davis. He teaches courses both in the School of Veterinary Medicine and the School of Medicine at University of California, Davis, as well as undergraduate and graduate courses and principles of laboratory research. Dr. Pinkerton is a faculty member in the graduate groups for pharmacology, toxicology, immunology and comparative pathology. He serves as Director of the Center for Health and the Environment at the University of California, Davis, Associate Director for the Western Center for Agricultural Health and Safety and Associate Director for the San Joaquin Valley Health Effects Research Center.

Dr. Pinkerton has been a member of the faculty at U.C. Davis for 20 years. His research interests are in environmental air pollutants and their impact on the respiratory system, and in examining the effects of indoor air pollutants such as environmental tobacco smoke on perinatal lung development and the impact of outdoor environmental pollutants, including gases and particles, on the cardiopulmonary systems.

### **Dr. Edward M. Postlethwait**

Dr. Edward M. Postlethwait is professor and chairman of the Department of Environmental Health Sciences, School of Public Health, University of Alabama at Birmingham. He is also Co-Director of the UAB Center for Free Radical Biology and Director of the UAB Environmental Exposure Facility. Dr. Postlethwait received his BS from the University of North Carolina at Chapel Hill (1971) and his MS (1980) and Ph.D. (1983) from the University of California at Los Angeles.

Dr. Postlethwait serves as the Program Director of an NIH/NIEHS funded interdisciplinary program project, which links eight institutions and over twenty-five investigators, focused on delineating the mechanisms of environmental oxidant-mediated effects on respiratory tract growth and development. This research spans investigations of ozone chemistry, respiratory tract surface biochemistry, morphology and morphometrics, NMR-based imaging and 3-dimensional reconstructions of the entire respiratory tract, and chemical engineering based development of dosimetry and health outcomes extrapolation models. He also has other NIH funded grants focused on the basic mechanisms of lung surface interactions that mediate acute lung injury. Dr. Postlethwait's expertise is in lung toxicology, free radical biochemistry, environmental oxidant induced acute cell injury, lung biology, dosimetry, and imaging.

Dr. Postlethwait is currently a member of the NIH Lung Injury, Repair, and Remodeling Study Section and formerly chaired the Alcohol and Toxicology 4 Study Section for a three year period. He has recently served on numerous other NIH study sections, has been an invited expert to develop assessment criteria for the NIEHS funded asthma portfolio and to evaluate lung injury markers for the National Toxicology Program. Dr. Postlethwait serves as an external scientific advisor for two NIH program projects and an EPA Center.

#### **Dr. Richard B. Schlesinger**

Dr. Richard B. Schlesinger is Associate Dean for Academic Affairs and Research, and Chair, Department of Biology and Health Sciences, at Pace University, New York. He is also Director of the Graduate Program in Environmental Sciences at Pace. He received a B.A. in Biology from Queens College (1969) and an M.S. (1972) and Ph.D. (1975) in Biology/Environmental Health Science from New York University. Dr. Schlesinger is a Fellow of the Academy of Toxicological Sciences and a member of the Society of Toxicology. He is an Associate Editor of the journal, "Inhalation Toxicology" and a past Associate Editor of the journal, "Toxicology and Applied Pharmacology."

Dr. Schlesinger's expertise is in the area of respiratory toxicology and his research studies have involved examination of the role of ambient (sulfur oxides, nitrogen oxides, and various particulate matter) and occupational (some metals) air contaminants on the etiology and pathogenesis of respiratory tract disease. He has served on a number of National Academy of Science committees, including the Committee on Pulmonary Toxicology, the Committee on Research Priorities for Airborne Particulate Matter, the Gulf War III Committee, the Committee on Acute Exposure Guideline Levels, and the Committee to Evaluate the NIOSH Respiratory Disease Research Program. Dr. Schlesinger has been a contributor to a number of USEPA Criteria Documents, notably those for particulate matter, sulfur dioxide and nitrogen dioxide. He has also contributed to the Clean Air for Europe document developed by WHO, working on sections related to particulate matter dosimetry and mechanisms of particulate matter induced disease, and serves as a scientific advisor to the New York State Energy Research Development Agency. He is also a scientific advisor to the American Petroleum Institute serving to review toxicology studies related to various fuels.

Dr. Schlesinger has been recipient of an NIEHS Research Career Development Award, the ILSI Morgaeridge Award for contributions to the field of inhalation toxicology, the Society

of Toxicology Inhalation Specialty Section Career Achievement Award, and most recently the ACGIH Herbert E. Stokinger Award (2006) for contributions to the field of environmental toxicology. Within the past two years, he has received support from USEPA Region II to study feasibility of an urban green roof at Pace University, from the Electric Power Research Institute to develop a critical review of major nonmetallic inorganic components of ambient particulate matter, and the U.S. Department of Energy to develop a paper on integrating epidemiology and toxicology related to secondary particulate matter in ambient air. Dr. Schlesinger also served as contributor to an EPA-funded study to examine issues related to mortality from ambient particulate matter.

### **Dr. Christian Seigneur**

Dr. Christian Seigneur is Vice President of the Air Quality Division at Atmospheric & Environmental Research, Inc. (AER) in San Ramon, California. He holds an M.S. in chemistry from the Paris Institute of Technology (1974) and a Ph.D. in chemical engineering from the University of Minnesota (1978). Dr. Seigneur has over 25 years of experience in air quality studies. His experience in the development, evaluation, and application of air quality models spans a wide range of issues including photochemical smog, particulate matter, air toxics, atmospheric visibility, and acid deposition. Dr. Seigneur has developed several atmospheric chemical kinetic mechanisms including mechanisms for mercury, chromium, stack plumes, and acid formation in droplets and particles. He led the effort that provided the first published demonstration of the non-linearities of the SO<sub>2</sub>/sulfate and NO<sub>x</sub>/nitrate relationships.

Dr. Seigneur was a member of the Clean Air Scientific Advisory Committee (CASAC) Panel on Particulate Matter (PM) that reviewed the original PM<sub>2.5</sub> National Ambient Air Quality Standards. He was also a member of the EPA Board of Scientific Counselors (BOSC) Subcommittee on ozone and PM in 2005. Dr. Seigneur is one of the principal authors of the NARSTO PM Assessment report titled “Particulate Matter Science for Policy Makers.” He has published over one hundred articles in peer-reviewed scientific journals and has co-authored 200 conference papers.

Major sources of funding for Dr. Seigneur’s Air Quality Division at AER include EPRI, the California Air Resources Board (CARB), the French Ministry of Ecology and Sustainable Development, the Health Effects Institute (HEI), the American Petroleum Institute (API), and the U.S. Environmental Protection Agency.

### **Dr. Elizabeth A. (Lianne) Sheppard**

Dr. Lianne Sheppard is a Research Professor in the Department of Biostatistics, and the Department of Occupational and Environmental Health Sciences. She holds a Ph.D. (1992) in Biostatistics from the University of Washington. Her scientific interests include estimating the health effects of occupational and environmental exposures, air pollution health effects, observational study design, and group information in observational studies. She is an active member of the EPA Northwest Center for Particulate Matter and Health, as well as a collaborator on several occupational and environmental health studies. Her statistical methods research addresses the role of exposure and study design in estimating health effects from observational studies.

Dr. Sheppard currently serves as an expert panelist on EPA's Clean Air Scientific Advisory Committee (CASAC) Ozone Review Panel. In addition, she recently completed the project "Methods for Using Group Information in Epidemiology," an R29 grant funded by NIEHS. Dr. Sheppard is principal investigator on the sub-contract "Testing the Metals Hypothesis in Spokane" funded by the Mickey Leland Center, as well as PI on two sub-projects of the PM Center: "Statistics and Data Core," and "PM Statistical Methods." She is an external scientific reviewer for the Fresno Asthmatic Children's Environment Study based at University of California, Berkeley, and for the Environmental Lung Center at National Jewish in Denver.

### **Dr. George Thurston**

Dr. George Thurston is an Associate Professor at the New York University School of Medicine's Department of Environmental Medicine. He conducts epidemiological research into the human health effects of air pollution. Dr. Thurston received his Bachelor of Science in Environmental Engineering from Brown University, and his Masters and Doctorate in Environmental Health Sciences from Harvard University's School of Public Health. He has published widely in the scientific literature on the assessment of exposures to ambient air pollution and their human health consequences. Dr. Thurston has served as the Director of the NYU-NIEHS Community Outreach and Education Program (1995-2004), and as Deputy Director of NYU's EPA Particulate Matter (PM) Health Effects Center (2002-2005).

In 1999, Dr. Thurston was honored by the local organization "Orange Environment" for his continuing efforts to promote the translation of environmental science information for the education of the public. As part of his community service outreach, he has appeared on numerous national and international TV shows, including on C-Span, CNN, C-NBC, and NBC to discuss air pollution-related issues such as asthma, the Kuwait War fires, and the World Trade Center disaster. Dr. Thurston has also testified before both the U.S. Senate and the U.S. House of Representatives on multiple occasions regarding the potential human health effects of air pollution in the U.S. In addition, Dr. Thurston has actively participated in multiple professional organizations, including serving as an Associate Editor of the International Society of Exposure Analysis' *Journal of Exposure Analysis and Environmental Epidemiology*, and serving as a co-organizer and host of the International Society for Environmental Epidemiology's annual meeting held in New York City during August, 2004.

### **Dr. James Ultman**

Dr. James Ultman is a Professor Emeritus in the Department of Chemical Engineering and the Department of Bioengineering at the Pennsylvania State University. Dr. Ultman previously served as a Penn State Distinguished Professor and as Chair of the Intercollege Graduate Degree Program in Physiology. Dr. Ultman earned his B.S. in Chemical Engineering (1965) from the Illinois Institute of Technology; and earned his M.S. (1967) and Ph.D. (1969) in Chemical Engineering, from the University of Delaware. He was an NIH Postdoctoral at the University of Minnesota from 1969-70. Dr. Ultman's areas of expertise are: chemical engineering, biomedical engineering, respiratory physiology, the measurement and simulation of the respiratory dosimetry of ozone, and the quantification of ozone reaction with respiratory antioxidants.

Dr. Ultman currently serves as an expert panelist on EPA's Clean Air Scientific Advisory Committee (CASAC) Ozone Review Panel. His most-recent prior service on advisory committees includes: (1) Scientific Advisory Committee, CIIT Centers for Health Research, Research Triangle Park, NC, (2001-2003); (2) NIEHS Superfund Hazardous Substances Basic Research Program: Study Section Member (1999); (3) EPA Scientific Review Panel: Air Quality Criterion for Ozone (1993); (4) EPA Scientific Review Panel: Research Needs for Ozone (1996); (5) EPA and Basic Acrylic Monomer Manufacturers Workshop: Nasal Dosimetry-Issues and Approaches (1998); (6) EPA and Health Canada Review Panel: Formaldehyde-Assessment for Carcinogenicity (1998); and (7) NIH PPG Scientific Advisor: Mechanism of Heterogeneity in the Lungs, University of Washington (1999-2004).

Dr. Ultman's sources of recent grant and/or other contract support funding include: (1) "Distribution of Chlorine in Intact Human Lungs" (grant title), Chlorine Institute, 1996-1998 (Sponsor/Dates); (2) "Ozone Exposure and Dose Delivered to Human Lungs," National Institutes of Health (NIH), 1998-2003; (3) "Distribution of Ozone in Intact Human Lungs: Effect of Intersubject Variability," Health Effects Institute (HEI), 1999-2001; (4) "Ozone Dose to the Respiratory Tract-Effect of Cigarette Smoking," Philip Morris External Research Program, 2004-2007); and (5) "Mechanism of Species-Dependent Lung Injury," NIH, 2003-2012.

#### **Dr. Hanspeter Witschi [M.D.]**

Dr. Hanspeter Witschi, professor emeritus of toxicology, received his MD degree from the University of Bern, Switzerland. He then obtained postdoctoral training in toxicology at the Toxicology Research Unit of the British Medical Research Council, the Department of Environmental Health of the University of Cincinnati and the Department of Pathology, University of Pittsburgh. Dr. Witschi became Assistant/Associate Professor at the University of Montreal and, in 1977, Senior Research Associate and Section Head of Toxicology at the Biology Division of the Oak Ridge National Laboratory. In 1987 he moved to the University of California, Davis, as Associate Director of the State of California's Toxic Substances Research and Teaching Program with appointments as full professor in the Departments of Internal Medicine, School of Medicine and of Pharmacology (now Molecular Biosciences), School of Veterinary Medicine. After retirement in 2002, Dr. Witschi was recalled as research professor to the Center of Environmental Health of U.C. Davis, a position he still holds. Dr. Witschi is certified by both the American Board of Toxicology and the Academy of Toxicological Sciences.

Dr. Witschi participated in numerous national and international committees. For NIH, he served on the Toxicology Study Section and the Environmental Health Sciences committee (chair). Services in other agencies included the US EPA, ASTDR, and the WHO. His National Research Council committee participation was among many others on the Committee of Toxicology, the Panel on Evaluation of Hazards Associated with Maritime Personnel Exposed to Cargo Vapors, the Risk Assessment of Hazardous Air Pollutants (CAPRA) and the Committee on Air Quality in Passenger Cabins of Commercial Aircraft. Dr. Witschi was a member of the TLV committee of the ACGIH, the Science Advisory Board to the State of California's Air Resources Board, and the Scientific Advisory Panel of the Western Canada Study of Animal Health Effects Associated with Exposure to Emissions from Oil and Natural Gas Field Facilities. He served on the editorial boards of multiple journals and was the U.S. editor of *Toxicology*.

Dr. Witschi's research in inhalation toxicology dealt mainly with the pathogenesis of acute and chronic lung injury caused by environmental chemicals. For the last 10 years, he has studied the carcinogenic effects of environmental tobacco smoke and examined to what extent putative chemopreventive agents could mitigate the effects of tobacco smoke inhalation. Dr. Witschi has published more than 250 original papers in peer-reviewed journals, written several chapters and edited 3 books. During the last two years, he was funded by the National Cancer Institute (2002-2007) and by the Philip Morris External Review Program (2002-2005) for his work on chemoprevention.

### **Dr. Ronald Wyzga**

Dr. Ronald Wyzga is Technical Executive in the Air Quality Health Effects program area of the Environment Sector. He received an AB degree in mathematics from Harvard College in 1964 and an M.S. degree in statistics from Florida State University in 1966. He also received a Sc.D. degree in biostatistics from Harvard University in 1971.

Dr. Wyzga has authored an extensive list of publications on his research. His current research activities focus on understanding the relationship between health effects and air pollution, an area in which he has worked for over 30 years. Dr. Wyzga is particularly interested in the design, conduct, and interpretation of epidemiological studies that examine this relationship. He is also interested in health risk assessment methods. Dr. Wyzga has studied the relationship between health effects and air pollution since he joined EPRI in 1975. In addition, he has worked on methods to attach economic values to air pollution damage and effects.

Dr. Wyzga has served on, and has chaired, several committees for the EPA Science Advisory Board and National Academy of Sciences. He has also served on advisory oversight committees for several research programs on the health effects of air pollution. In 1990, Dr. Wyzga was elected a Fellow of the American Statistical Association by his peers. Prior to joining EPRI, he worked at the Organization for Economic Cooperation and Development (OECD) in Paris, where he co-authored a book on economic evaluation of environmental damage. Dr. Wyzga is employed directly by EPRI and receives no income/support from grants or contracts.