

**Disemboweling is not the Same as Streamlining:**  
**Administrator Wheeler's Attack on EPA's IRIS Program**

**Presentation to the Joint Hearing**  
**of the**  
**Subcommittee on Investigations & Oversight**  
**and the**  
**Subcommittee on Environment**  
**of the**  
**House Committee on Science, Space and Technology**

**"EPA's IRIS Program: reviewing its Progress and Roadblocks Ahead"**

**March 27, 2019**

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\*For identification purposes only

Chairwoman Sherrill, Chairwoman Fletcher, Committee Members

I am Bernard Goldstein MD, Professor Emeritus and Dean Emeritus of the University of Pittsburgh Graduate School of Public Health. In my testimony today I plan to focus on why IRIS was developed and on the specific issue of formaldehyde. I also will briefly put the IRIS issue in the context of other issues related to science at EPA

I began my involvement in environmental protection in 1966-68 as a Commissioned Officer in the US Public Health Service Division of Air Pollution, an organization that in 1970 was moved by President Nixon into the newly formed EPA.

My relevant background includes in 1983-85 serving as President Reagan's appointee as EPA Assistant Administrator for Research and Development, confirmed by the US Senate. I served under EPA Administrators William Ruckelshaus and Lee Thomas. I had previously been appointed under Administrator Anne Gorsuch to be head of the Clean Air Scientific Advisory Committee. I am also an elected member of the National Academy of Medicine and of the American Society for Clinical Investigation, and am Past President and Fellow of the Society for Risk Analysis. In relation to formaldehyde leukemogenesis, I began my medical career as a specialist in hematology, have performed research on leukemogenesis and have taken care of patients with leukemia. I have been board certified in both Hematology and in Toxicology. I have also served as a voting expert member of working groups on two occasions when the leukemogenesis of formaldehyde was considered by the World Health Organization's International Agency for Research on Cancer (IARC).

Through the years I have worked closely with industry. Examples include service on the Board of the Chemical Industry Institute for Toxicology and of the International Life Science Institute (ILSI), including ILSI's Risk Science Institute; receipt of research funding or donations to our programs in New Jersey from the American Petroleum Institute and a variety of chemical and petrochemical companies; and service on industry-based committees or on other committees which have active industry representatives. In my consultant work in toxic tort cases, depending upon the facts of the case I have about equally been an expert defending an industry as I have been an expert on the plaintiff's side suing industry.

My relationship with industry has not always been smooth. For example, our research funding from the American Petroleum Institute on benzene was not continued after we concluded that benzene was a cause of human leukemia; funding was also cut to our center in New Jersey because of our findings on the gasoline additive MTBE; and I resigned from ILSI because of actions that I disagreed with. However, I maintain great respect for the scientific and technical skills of the US chemical and petrochemical industry in general, and the ability of some individual companies to appropriately couple scientific advances with protection of the public, and to consider issues such as sustainability.

What I plan to tell you today is based on more than half a century of highly active involvement in issues related to the scientific basis for environmental protection. I have seen many ups and downs in American industry's willingness to subsume their interests in immediate profits to the goal of appropriate use of science in environmental decision making – which in the long term is in their best interests. There is no question that today we are at the lowest point ever since the formation of EPA. There can no longer be any doubt that EPA's leadership, at the behest of large portions of the American chemical, petrochemical and fossil fuel industries, is out to destroy EPA's carefully developed consensus processes to insure that science contributes its appropriate share to providing the most effective and

most efficient regulation of the American environment permitted under our laws. While I previously held out hope that EPA leadership would not be captured by its rhetoric, its current actions related to CASAC and to IRIS go well beyond my worst fears.

### **Why IRIS was developed**

I arrived at EPA in 1983 soon after the NAS Red Book had laid out the principles that led to standardization of risk assessment. EPA was already doing risk assessments, as was FDA and other federal agencies. In fact, many of the principles on which risk assessment is built came originally from EPA, particularly its Carcinogen Assessment Group, and from FDA. But the silo structure that characterized EPA then, and still persists, made risk assessment at EPA in 1983 a shambles. As examples, each silo had different default assumptions that were used in extrapolating from animals to humans, or from high doses to low doses. This led to unacceptable differences in the risk assessments for the same chemical depending upon which part of the agency was regulating it. (Note that some differences are appropriate, e.g., based on different toxicokinetics due to different routes of exposure). We spent much effort, with the help of the external scientific community and the National Academies of Science, to address the appropriate default assumptions to be used – a process that needs to continue as newer toxicological and epidemiological methods are developed.

A related issue greatly concerned Administrator Ruckelshaus. For risk assessment to be useful, it needed to be sufficiently standardized and transparent so that, as in his words, it would not be like beating a spy to get whatever answer you wanted.

Yet another reason for a centralized ORD-led approach to risk assessment is that risk plays a major role in assigning agency priorities. As budget follows priority ranking for regulatory activities, questions might be raised as to the rationale for inconsistencies

We recognized another very important role for IRIS, one that is often overlooked inside the Beltway. I am reasonably certain, with no data, that by far the most frequent use of IRIS is for local purposes. A recent example in my experience is responding to a gentrifying community within Pittsburgh concerned about whether emissions from some of the older industrial plants are causing adverse health effects. Pressure from community groups led local authorities to perform fence-line measurements of chromium, manganese and lead. The report of the Allegheny County Health Department describing the measured levels leans heavily on comparison with IRIS data, including direct copies of risk factor tables from IRIS. Other uses by local authorities include deciding on how to advise a community after a buried drum of chemicals is discovered in an empty lot. This is a recommendation that is best given quickly without leaving the neighbors in limbo while health concerns increase and their property values go down. The current decrease in funding of IRIS to evaluate additional chemicals is not at all responsive to local community needs. It contradicts the Trump Administration's focus on having Washington serve states and local areas, as well as contradicting Congressional direction.

IRIS is also important to another area of great emphasis by President Trump. IRIS is currently respected and accepted throughout the world, as I have observed in my work in Southeast Asia and in the EU. Having a standardized approach recognized as authoritative world-wide helps protect US trade products from being unfairly treated through other countries developing biased ad hoc approaches to risk.

Destroying the reputation of IRIS as being independent of the political process does not help the administration's goal of reducing trade barriers.

It seemed obvious then, as it is still obvious now, that there is more than ample justification for a standardized transparent approach to risk analysis useful to help moving forward decisions about regulation at the national and local levels. Further, to achieve this goal it is necessary to have a science-based organizational structure that can independently assess the scientific literature pertinent to risk, using appropriate external peer reviews. This is what we set out to do in forming IRIS under Administrators Ruckelshaus and Thomas. Administrator Wheeler's decision to move the formaldehyde issue from IRIS to the TSCA staff is a complete contradiction of the founding principles of IRIS that have sustained this organization as a world authority. This would be true even if understanding the risk of formaldehyde was not pertinent to decisions being made by other program offices under different laws.

### **Formaldehyde.**

The formaldehyde saga has become a poster child for the intentional failure of an industry to find out whether its products are causing harm, and to do so by any means at its disposal.

I was an expert voting member of the IARC panel that reviewed formaldehyde in 2006. We voted for formaldehyde to be considered a known human carcinogen based upon causation of nasal cancer. My belief then was that that formaldehyde was unlikely to be a leukemogen, a belief that persisted until shortly before the 2010 IARC meeting which reconsidered the issue.

The reasons for my initial skeptical response to epidemiological evidence linking formaldehyde with leukemia included the observation that bone marrow damage was caused by all other known external causes of leukemia (benzene, ionizing radiation, chemotherapy). But there was then no evidence of formaldehyde producing bone marrow damage.

Just prior to the 2010 IARC meeting which reconsidered formaldehyde, a paper was published showing low blood counts and chromosome abnormalities in Chinese workers exposed to formaldehyde as compared to those working in a factory without formaldehyde (Zhang et al, 2010). The Zhang et al paper was instrumental in swinging the IARC expert vote to in essence calling formaldehyde a known cause of human leukemia. At this 2010 IARC meeting I voted with the minority for the evidence being limited. I did so because the study needed to be repeated. My reasoning on this and other formaldehyde-related issues was detailed in a published paper (Goldstein, 2011) and was directly communicated to the formaldehyde industry. Since then the original authors of the Zhang et al paper have expanded and confirmed their findings, but industry has steadfastly refused to fund such a study in a different formaldehyde-exposed group.

Rather than repeat the Zhang et al study, industry has spent much money on consultants to attack the findings. I do not completely disagree with all of the resulting science. For example, Dr Swenberg and his colleagues have produced convincing evidence that little if any inhaled formaldehyde gets into the blood of rodents. But, as I have pointed out previously, it is only in formaldehyde-exposed humans that there is evidence of chromosomal abnormalities in circulating blood – in rats virtually all the studies of such abnormalities are negative. This suggests the possibility of a species difference that, once again, could be resolved by further studies in formaldehyde-exposed humans which industry has obstinately

refused to support. Further, the issue of species differences is one that has been addressed by IRIS scientists for more than thirty years. It is in IRIS that further understanding and resolution should occur – not in a program office.

My published letter describing the fallacious science in one of the industry consultant-generated papers also contains their reply. Their response claiming that I partially agreed with them is simply an obvious mis-statement of what I wrote, more befitting a legal brief than a scientific response. A more detailed response to Mundt et al by some of the authors of the original paper is at <http://cebp.aacrjournals.org/content/27/1/120.long>.

I make the point about the legal brief because I believe that a brief summary of what is happening to EPA's use of science is the replacement of processes that lead to obtaining the consensus of the scientific community with confrontational approaches that are more appropriate to law or to politics.

The ACC press release trumpeting Mundt et al is part of the longstanding effort, in which this Committee was previously involved, aimed at obtaining raw data so that paid industry consultants can find blemishes in studies which they can then claim to be scars (<https://www.americanchemistry.com/Media/PressReleasesTranscripts/ACC-news-releases/New-Study-Challenges-Formaldehyde-Cancer-Findings.html>.) Their claims for transparency are based on the erroneous assumption that EPA is FDA. For FDA regulatory approval of a new drug, the usual requirement is a double blind randomized study in which one half of volunteers with a disease are given a potentially valuable new medication and the other half are given placebo – and neither the patient nor the treating physician is aware of which until the code is broken. This approach cannot be used for testing a pollutant. Would you agree to be randomly chosen to be exposed to a potentially harmful pollutant? Instead, in environmental health for replication we primarily depend on evaluation and synthesis of studies in which different investigators ask the same question in different populations using different methodologies. Instead of doing so, the formaldehyde industry continues to pay consultants to find the potential confounders that are less likely to be present in an FDA double blind placebo study.

I also note that EPA leadership's insistence on full transparency is not consistent with its holding secret the draft IRIS report on formaldehyde

### **Why EPA particularly needs strong science-based approaches that are independently reviewed.**

The founding year for EPA and for OSHA was 1970. It is almost as if the US decided to experiment in how it would organize its scientific activities in a regulatory agency. OSHA is led by an Asst. Secretary of Labor. It has a completely separate scientific component, NIOSH, which is administratively light years away from OSHA and is led by someone not subject to Senate confirmation. In contrast, EPA has the Office of Research and Development within its organizational structure. The AA/ORD is intended to be a political appointee at the same level as the Asst Administrators who head policy offices.

EPA clearly has been more successful than OSHA in developing science-based regulations, in part reflecting the close proximity of its scientific arm to program offices, and the more efficient congressional and executive branch oversight that ensures this close working relationship. But an inherent disadvantage of the EPA organizational structure is that the close proximity of ORD allows more pressure to be developed to conform to political objectives. This has led to Congress and to EPA

requiring extensive independent review processes that have evolved over decades. Mr Wheeler's abrupt dismantling of these processes, without any believable problem statement, without test runs and without the extensive consultations inside and outside EPA that have characterized the previous evolution of EPA's science-based processes, is unforgivable. It changes what had been a relatively successful organizational structure based on the value of proximity between science and policy development into a failure. As a scientist who has been heavily involved in the evolution of this process, I find the current actions of EPA's leadership to be incredibly shortsighted – at best.

### **Conclusion**

I begin my concluding remarks by commending EPA's professional scientific career staff leadership of the Office of Research and Development for having stayed the course in these difficult times, despite the need to compromise. I would have resigned as Asst Administrator of ORD had either Administrator Ruckelshaus or Administrator Thomas tried to make the changes now being insisted on by Administrator Wheeler. I cannot recommend that the current AA/ORD resign. There is none, nor in the third year of this administration even a rumor as to whose name might be sent to the Senate. I can understand why Administrator Wheeler does not want a Presidential appointee confirmed by the US Senate to be able to stand up for science at EPA. But he can be reassured that it is unlikely that any reputable scientist would be willing to allow him or herself to be nominated

Administrator Wheeler claims that his goal in changing the IRIS process is to streamline inefficient management practices. Certainly any complex process such as IRIS can be improved, and among many others I also have made suggestions as to how to do it. But It is poor management to choose the most challenging example to experiment with process changes, particularly with a longstanding process that has been so central to environmental progress. The choice of formaldehyde as a test for management changes in IRIS is as inappropriate as the choice of particulates to revise the CASAC process. What the changes in IRIS and in CASAC have in common is the longstanding strong support of major industry groups to counter science-based decisions, irrespective of whether this causes the wholesale disruption of EPA's interface with science. The only reasonable question is whether Mr Weaver recognizes the difference between disemboweling and streamlining. Based upon the evidence to date, I think he does. I think that his goal is to change the consensus processes of science to the confrontational processes central to law and to politics. Madame Chair, with the help of this Committee perhaps this destruction of EPA's science can be prevented.

### **References**

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Goldstein, BD (2018) Mundt et al paper: "Does occupational exposure to formaldehyde cause hematotoxicity and leukemia-specific chromosome changes in cultured myeloid progenitor cells. (Letter). *Crit Rev Toxicol* 48:339-34067

Zhang L, Tang X, RothmanN, Vermeulen R, Ji Z, Shen M, et al. Occupational exposure to formaldehyde, hematotoxicity, and leukemia-specific chromosome changes in cultured myeloid progenitor cells. *Cancer Epidemiol Biomarkers Prev* 2010;19:80–8.

Biomarkers Prev 2010;19:80–8.

## CURRICULUM VITAE

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### EDUCATION AND TRAINING

#### Undergraduate

|           |  |          |            |
|-----------|--|----------|------------|
| 1954-1958 | University of Wisconsin<br>Madison, WI | BS, 1958 | Psychology |
|-----------|--|----------|------------|

#### Graduate

|           |   |          |          |
|-----------|---|----------|----------|
| 1958-1962 | New York University<br>School of Medicine<br>New York, NY | MD, 1962 | Medicine |
|-----------|---|----------|----------|

#### Post-Graduate

|           |   |  |  |
|-----------|---|--|--|
| 1962-1965 | Third & Fourth<br>(NYU) Medical<br>Divisions, Bellevue<br>Hospital, New York,<br>NY | Internship,<br>Assistant<br>Residency, and<br>Residency            | Dr Lewis Thomas;<br>Dr Saul Farber.<br>Internal Medicine |
| 1965-1966 | Bellevue Hospital,<br>New York, NY  | National Institutes<br>of Health Post<br>Doctoral in<br>Hematology | Dr Robert Silber;<br>Hematology                          |



## APPOINTMENTS AND POSITIONS

**Academic**

|                                |   |  |
|--------------------------------|---|--|
| 1966-68                        | Instructor                              | Department of Medicine, University of Southern California School of Medicine, Los Angeles, CA  |
| 1968-1970                      | Instructor in Medicine                  | Department of Medicine, New York University School of Medicine, New York, NY   |
| 1968-1971                      | Hematologist                            | Goldwater Memorial Hospital, New York, NY  |
| 1968-1980                      | Attending Physician                     | Bellevue and University Hospitals, New York, NY  |
| 1970-1980                      | Assistant and Associate Professor       | Departments of Environmental Medicine and Medicine, New York University School of Medicine, New York, NY                                     |
| 1973-1983                      | Research Collaborator                   | Medical Department, Brookhaven National Laboratory, Upton, NY  |
| 1977-1978                      | NIH Fogarty Senior International Fellow | Department of Biochemistry, Brunel University and Department of Community Medicine, St. Thomas' Hospital and Medical School, London, England |
| 1981-1983                      | Chief                                   | Division of Environmental and Community Medicine, Ambulatory Service, Middlesex General Hospital, New Brunswick, NJ                          |
| 1980-1983<br>1985-1988         | Adjunct Associate Professor             | Department of Environmental Medicine, New York University Medical Center, New York, NY   |
| 1981-1992 (on leave 1983-1985) | Associate Director                      | Joint Graduate Program in Toxicology, Rutgers University/UMDNJ-Robert Wood Johnson Medical School  |
| 1982-1989 (on leave 1983-1985) | Director                                | Graduate Program in Public Health, UMDNJ-Robert Wood Johnson Medical School/Rutgers University   |
| 1983-2001                      | Adjunct Professor                       | Department of Pharmacology and Toxicology, College of Pharmacy, Rutgers-The State University of New Jersey                                   |

|                                      |  |  |
|--------------------------------------|--|--|
| 1988-1994                            | Director   | National Institute of Environmental Health Sciences Center of Excellence in Environmental Health Research, UMDNJ-Robert Wood Johnson Medical School and Rutgers University |
| 1980-2001<br>(on leave<br>1983-1985) | Professor and Chairman                                   | Department of Environmental and Community Medicine, University of Medicine and Dentistry of New Jersey-Robert Wood Johnson Medical School, Piscataway, NJ                  |
| 1986-2001                            | Director   | Environmental and Occupational Health Sciences Institute (EOHSI), a joint program of UMDNJ-Robert Wood Johnson Medical School and Rutgers University                       |
| 1994-1995                            | Visiting Professor                                       | Department of Health Policy and Management, School of Public Health, Harvard University, Cambridge, MA   |
| 1998-1999                            | Acting Dean  | UMDNJ-School of Public Health  |
| Sept-Nov 2000                        | Mini-Sabbatical  | Scientific Committee on Problems of the Environment, Paris, France   |
| 2000-2001                            | Professor  | UMDNJ-School of Public Health, Piscataway, NJ  |
| Feb-May 2001                         | Visiting Professor                                       | Environmental & Occupational Health Unit, Department of Community Health, Universiti Putra Malaysia, Selangor Darul Ehsan, Malaysia  |
| 2000- 2017                           | Clinical Professor                                       | Department of Environmental and Community Medicine, University of Medicine and Dentistry of Jersey-Robert Wood Johnson Medical School, Piscataway, NJ                      |
| Feb 16-20,<br>2004                   | Visiting Lecturer  | National University of Singapore, Department of Community, Occupational and Family Medicine, School of Medicine, Singapore   |
| 2001- 2011                           | Professor of<br>Environmental and<br>Occupational Health | Graduate School of Public Health, University of Pittsburgh   |
| 2001-2005                            | Dean   | Graduate School of Public Health, University of Pittsburgh   |

|                           |   |   |
|---------------------------|---|---|
| April 2002-               | Professor of Medicine<br>(Secondary Appt)                         | School of Medicine, Department of<br>Medicine, University of Pittsburgh             |
| April - August<br>2011    | Interim Director  | Center for Healthy Environments and<br>Communities (CHEC)                           |
| October 2011 -<br>Present | Professor Emeritus of<br>Environmental and<br>Occupational Health | Graduate School of Public Health<br>University of Pittsburgh                        |
| May-Nov 2015              | Visiting Professor  | Univ Cologne Dept of Political Science<br>and European Affairs; Cologne,<br>Germany |
| 2017-                     | Clinical Professor  | Dept Environmental and Occupational<br>Health; Rutgers School of Public Health      |

### **Non-Academic**

|           |  |   |
|-----------|--|---|
| 1966-1968 | Surgeon  | United States Public Health Service;<br>Division of Air Pollution; assigned to<br>Pulmonary Disease Service, Los Angeles<br>General Hospital, Los Angeles, CA |
| 1983-1985 | Assistant Administrator<br>for Research and<br>Development | United States Environmental Protection<br>Agency, Washington, DC  |

## **CERTIFICATION AND LICENSURE**

### **Specialty Certification**

|      |                   |  |
|------|-------------------|--|
| 1969 | Internal Medicine | American Board of<br>Internal Medicine |
| 1971 | Hematology        | American Board of<br>Internal Medicine |
| 2016 | Toxicology        | American Board of<br>Toxicology        |

### **Medical or Other Professional Licensure**

|                                    |            |
|------------------------------------|------------|
| M.D. License #36979<br>(inactive)  | New Jersey |
| M.D. License #092995<br>(inactive) | New York   |

## MEMBERSHIP IN PROFESSIONAL AND SCIENTIFIC SOCIETIES

American College of Environmental and Occupational Medicine  
American Public Health Association  
American Society for Clinical Investigation  
American Society of Hematology  
Association for Environmental Studies and Sciences  
Collegium Ramazzini  
Fellow, American Association for the Advancement of Science  
Fellow, American College of Physicians  
Fellow, American College of Preventive Medicine  
Fellow, Society for Risk Analysis  
Fellow, The Academy of Toxicological Sciences  
Institute of Medicine  
International Society Environmental Epidemiology  
Society of Toxicology

## HONORS

|      |  |
|------|--|
| 1977 | Elected Member<br>American Society for Clinical Investigation  |
| 1991 | Elected Member<br>Institute of Medicine, National Academies<br>of Science  |
| 1989 | The Solomon A. Berson Medical Alumni<br>Achievement Award;<br>School of Medicine Alumni Association<br>New York University |
| 1993 | Ambassador of Toxicology;<br>Mid-Atlantic Chapter Society of<br>Toxicology   |
| 1993 | Robert A. Kehoe Award of Merit;<br>American College of Occupational and<br>Environmental Medicine                          |

- 1994 New Jersey Pride Award for Health;  
New Jersey Monthly Magazine
- 1995 Katherine Boucot Sturgis Lectureship;  
American College of Preventive Medicine
- 1996 1996 Ewing Halsell Lecturer Award;  
University of Texas Health Science Center
- 1998 Gonfalon Bearer  
UMDNJ Commencement
- 1998 Dennis J. Sullivan Award;  
New Jersey Public Health Association
- 1999 Twentieth Century Distinguished Service  
Award; Penn State, Ninth Lukacs  
Symposium
- 1999 1999 Distinguished Achievement Award  
Society for Risk Analysis
- 2002 Fellow; Academy of Toxicological  
Sciences, recertified in 2014
- 2003 Fellow; Society for Risk Analysis
- 2005 2005 Samuel Kuna Distinguished  
Lectureship in Toxicology;  
UMDNJ/Robert Wood Johnson Medical  
School
- 2005 2005 Senator Frank R. Lautenberg Annual  
Award and Lecture in Public Health;  
UMDNJ School of Public Health
- 2005 2005 Distinguished Service Award;  
American College of Toxicology
- 2008 National Associate of the National  
Research Council of the National  
Academies
- 2008 Ramazzini Award; Collegium Ramazzini
- 2010 Frank L. Parker Distinguished Professor  
Award; Vanderbilt University
- 2012 James P. Keogh, M.D. Memorial Lecturer;  
University of Maryland School of  
Medicine

|      |   |
|------|---|
| 2012 | Best Research Paper Award- Second Place for article in <i>Environmental Development</i> |
| 2017 | Public Communications Award; Society of Toxicology                                      |
| 2018 | Biographical Profile selected for publication, <i>Risk Analysis</i> 38:1765-1771, 2018  |

## PROFESSIONAL ACTIVITIES

### PUBLICATIONS

#### Publications in Scientific and Technical Journals

1. Silber, R., Berman, E., **Goldstein, B.D.**, Stein, H., Farnham, G., & Bertino, J.R. (1966). Methylation of nucleic acids in normal and leukemic leukocytes. *Biochemica et Biophysica Acta*, 123(3):638-640. PMID: 5230235.
2. Silber, R., **Goldstein, B.D.**, Berman, E. Decter, J., & Friend, C. (1967). The effect of a murine leukemia virus on RNA metabolism. *Cancer Research*, 27(7):1264-1269. PMID: 4952518.
3. **Goldstein, B.D.**, & Balchum, O.J. (1967). Effect of ozone on lipid peroxidation in the red blood cell. *Proceedings of the Society for Experimental Biology and Medicine*, 126(2):356-358. PMID: 6079903.
4. **Goldstein, B.D.**, Pearson, B., Lodi, C. Buckley, R.D., & Balchum, O.J. (1968). The effect of ozone on mouse blood in Vivo. *Archives of Environmental Health*, 16(5):648-650. PMID: 5652387.
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7. **Goldstein, B.D.**, Lodi, C., Collinson, C., & Balchum, O.J. (1969). Ozone and lipid peroxidation. *Archives of Environmental Health*, 18(4):631-635. PMID: 4304420.
8. Silber, R., & **Goldstein, B.D.** (1970). Vitamin E and the Hematopoietic System. *Seminars in Hematology*, 7(1):40-48. PMID: 4984354.
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13. Harber LC, Hsu J, Hsu H., **Goldstein, B.D.** (1972) Studies of photoprotection against porphyrin photosensitization using dithiothreitol and glycerol. *J. Investigative Dermatol.* 58:373-380
14. **Goldstein, B.D.**, & Harber, L.C. (1972). Erythropoietic protoporphyria: Lipid peroxidation and red cell membrane damage associated with photohemolysis. *Journal of Clinical Investigation*, 51(4):892-902. PMID: 5014616.
15. **Goldstein, B.D.** (1973). Hydrogen peroxide in erythrocytes: Detection in of rats and mice inhaling ozone. *Archives of Environmental Health*, 26(5):279-280. PMID: 4696387.
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- 267(5):291-297. PMID: 4151976.
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### **Invited Lectureships and Major Presentations (2001-Present)**

Goldstein, B.D. Speaker. Environmental Health in the New Millennium. Presentation at Universiti Putra Malaysia, March 19, 2001.

Goldstein, B.D. Speaker. Workshop on Chemical Health Risk Assessment. Presentation at the Second National Public Health Conference of Malaysia, Subang Jaya, Selangor, Malaysia, April 17, 2001.

Goldstein, B.D. Speaker. Risk Assessment of Environmental Carcinogens. Presentation at the Second National Public Health Conference of Malaysia, Subang Jaya, Selangor, Malaysia, April 19, 2001.

Goldstein, B.D. Speaker. The Precautionary Principle and Risk Assessment. International Life Sciences Southeast Asia Region, Eighth Annual General Meeting, Singapore, April 27, 2001.

Goldstein, B.D. Speaker and Member of the Organizing Committee. Dose Response, Risk Characterization and Risk Management. Workshop on Health Risk, Universiti Putra Malaysia, May 2-4, 2001.

Goldstein, B.D. Speaker. Understanding and Communicating Risk. DEP, Air Quality Program Statewide Staff Meeting, Pocono, Pennsylvania, October 29, 2001.

Goldstein, B.D. Speaker. Emerging Problems of Environmental Health. Mid-Atlantic Regional Conference on Lead-Safe Housing and Healthy Homes, Pittsburgh, Pennsylvania, October 30, 2001.

Goldstein, B.D. Speaker. Use of the Precautionary Principle in Public Health. Institute of Medicine, Board on Health Promotion and Disease Prevention, Irvine, California, November 8, 2001.

Goldstein, B.D. Speaker. Pennsylvania Public Health Association Annual Meeting, Philadelphia Pennsylvania, November 15, 2001.

Goldstein, B.D. Speaker. Long-Term Risk Issues Related to Environmental Stewardship, Environmental Stewardship: Promising Solutions to Uncertainty, New Orleans, Louisiana, February 5, 2002.

Goldstein, B.D. Speaker. The Precautionary Principle and/or vs. Risk Assessment: A Public Health View, Risk Assessment Forum, Yale University, New Haven, Connecticut, February 5, 2002.

Goldstein, B.D. Lecturer. The Precautionary Principle and/or vs. Risk Assessment: Implications of the 1990 Clean Air Act Amendments. The Third Annual Mary O. Amdur Award and Lectureship in Inhalation Toxicology. Nelson Institute of Environmental Medicine, New York University School of Medicine. May 17, 2002.

Goldstein, B.D. Speaker. Scientific & Legal Tutorials. Fourth Annual National Conference on Science and the Law. U.S. Department of Justice. Miami, Florida, October 3, 2002.

Goldstein, B.D., Carruth, R.S. Implications of the precautionary principle: Is it a threat to science? Presented at "The Precautionary Principle: Implications for Research and Prevention in Environmental and Occupational Health." Collegium Ramazzini, Bologna, Italy; October 24, 2002, p 60.

Goldstein, B.D., Carruth, R.S. Potential role of public perception in the WTO trade process. Can Genetically Modified Crops Promote Sustainable Agriculture in the Developing World?: Part II Mini Symposium. World Congress on Risk. Society for Risk Analysis, Brussels, Belgium; June 25, 2003.

Goldstein, B.D. Sustainable development and public health. Success stories in environmental sustainability. Science 2003. University of Pittsburgh, Pittsburgh, Pennsylvania; September 24, 2003.

Goldstein, B.D. The precautionary principle and public health. Symposium on current research directions in geography, public health, and urban planning. Graduate School – New Brunswick 50<sup>th</sup> anniversary celebration. Rutgers University, New Brunswick, New Jersey; October 25, 2003.

Goldstein, B.D. Is Europe safer than the U.S.? European-American differences in public health policy. The European Union Center and the Center for West European Studies special lecture. University of Pittsburgh, Pittsburgh, Pennsylvania; February 3, 2004.

Goldstein, B.D. Panel Chair. Risk analysis in a global community. World Congress on Risk. Society for Risk Analysis, Brussels, Belgium; June 24, 2003.

Goldstein, B.D. European: US differences. Can Genetically Modified Crops Promote Sustainable Agriculture in the Developing World?: Part I Mini Symposium. World Congress on Risk. Society for Risk Analysis, Brussels, Belgium; June 25, 2003.

Goldstein, B.D. Environmental Health and Risk Assessment. Invited Presentation. Ngee Ann Polytechnic University, Singapore. February 19, 2004

Goldstein, B.D. The future of environmental public health from partners' perspectives. Invited Presentation. 2004 ATSDR Partners in Public Health Meeting. Agency for Toxic Substances and Disease Registry. Atlanta, Georgia. March 31, 2004.

Goldstein, B.D. 25 year window: Linking conflict with the environment and population. Luncheon speaker and moderator of HIV/AIDS: UN 3X5 Initiative panel. 13<sup>th</sup> Annual Conference on Health and the Environment: Global Partners for Global Solutions. World Information Transfer. New York, New York. April 29, 2004.

Goldstein, B.D. Global climate change: The unity of health and the environment. Invited speaker. Fourth Goddard Forum: Developing Sustainable Communities. The Pennsylvania State University. Harrisburg, Pennsylvania. May 11, 2004.

Goldstein, B.D. Closing remarks. Public health risks of disasters: Building capacity to respond. The Disasters Roundtable and the Roundtable on Environmental Health Sciences, Research and Medicine. The National Academy of Sciences. June 22, 2004.

Goldstein, B.D. What are the major links between human health and the environment in Pennsylvania? Invited speaker. Pennsylvania Consortium for Interdisciplinary Environmental Policy (PCIEP) Annual Meeting. Harrisburg, Pennsylvania. September 30, 2004.

Goldstein, B.D. The Potentially Negative Impact of the Precautionary Principle on Research and Development: Examples from the Control of Hazardous Air Pollutants. Professor Frank L. Parker Distinguished Lecturer. Vanderbilt University. October 4, 2004.

Goldstein, B.D. Balancing Risk: Assessment with the Realities of Uncertainties. Invited speaker. Institute of Medicine Roundtable: Global Environmental Health in the 21<sup>st</sup> Century: From Governmental Regulation to Corporate Social Responsibility. Washington, DC. October 13, 2004.

Goldstein, B.D. Roundtable Leader. Shifting Tides of Formaldehyde Science and Regulation. Society of Environmental Journalists 14<sup>th</sup> Annual Conference. Pittsburgh, PA. October 22, 2004.

Goldstein, B.D. Panelist. What's in Your Hair? Personal Testing for Environmental Toxicants. Society of Environmental Journalists 14<sup>th</sup> Annual Conference. Pittsburgh, PA. October 23,



2004.

Goldstein, B.D. Invited Speaker. Urban Encroachment into Rural Areas. Rebuilding the Unity of Health and the Environment in Rural America. Institute of Medicine Roundtable on Environmental Health Sciences. Iowa City, Iowa. November 30, 2004.

Wright-Walters, M.M., Sussman, N.B., Day, R., Carruth, R.S., Goldstein, B.D. Poster Presentation. An Alternative Approach to Determining the Legal Criterion of “More Likely Than Not” in the Absence of Statistical Significance. Society for Risk Analysis 2004 Annual Meeting. Palm Springs, CA. December 7, 2004.

Goldstein, B.D. Scientific Issues Related to Environmental Justice. Fifth Annual Minority Health Summit. University of Pittsburgh. Pittsburgh, PA. January 13, 2005.

Goldstein, B.D. Panel Moderator, ILSI’s Contribution to Solving the Obesity Crisis. 2005 International Life Sciences Institute Annual Meeting. New Orleans, LA. January 16, 2005.

Goldstein, B.D. Invited Speaker. Toxic and Hazardous Air Pollutants. Toxic Air Pollution: How We Can Protect Our Neighborhoods from Its Cumulative Impact. Clean Water Action. Pittsburgh, PA. March 5, 2005.

Goldstein, B.D. Invited Speaker. How Do We Know a Chemical Causes Cancer? Annual Meeting of the Association of Occupational Physicians, Pennsylvania Chapter. Pittsburgh, Pennsylvania. March 16, 2005.

Goldstein, B.D. Invited Speaker and Moderator. Science for Judges V. Brooklyn Law School Center for Health, Science and Policy. Brooklyn, NY. April 1, 2005.

Goldstein, B.D. Invited Speaker. Clean Water and Human Health. Engineering Sustainability 2005. University of Pittsburgh. Pittsburgh, Pennsylvania. April 11, 2005.

Goldstein, B.D. “The Epic of Public Health.” Convocation Address. University of Pittsburgh Graduate School of Public Health. Pittsburgh, Pennsylvania. April 30, 2005.

Goldstein, B.D. Invited Speaker. Public Health in the 21<sup>st</sup> Century: NTP’s Contributions and Challenges. NTP: A Quarter Century of Toxicology for Public Health. National Academy of Sciences. Washington, DC. May 10, 2005.

Goldstein, B.D. Keynote Address. Bridging the Gaps Ninth Annual Symposium. University of Pittsburgh. Pittsburgh, PA. July 29, 2005.

Goldstein, B.D. Invited Speaker. “European/US Differences in Approach to Health & Environmental Risk.” Honors College Friday Afternoon Lecture Series. University of Pittsburgh. Pittsburgh, PA. October 14, 2005.

Goldstein, B.D. Keynote Speaker and Distinguished Service Awardee. “The Precautionary Principle: Is It a Threat to Toxicological Science?” 26<sup>th</sup> Annual Meeting of the American

College of Toxicology. Williamsburg, VA. November 7, 2005.

Goldstein, B.D. Keynote Speaker. “The Challenge of Evaluating Public Health Outcomes Derived from Basic Environmental Health Sciences Research.” National Institute of Environmental Health Sciences, DERT Science Retreat. Research Triangle Park, NC December 1, 2005.

Goldstein, B.D. Keynote Speaker. “Tennessee Public Health Workforce.” Development Consortium & the Tennessee Department of Health’s fall 2005 Certificate Completion Ceremony and Strategic Planning Session. Nashville, Tennessee. December 19, 2005.

Goldstein, B.D. A Cautionary Approach to the Precautionary Principle. In the Series on Environmental and Health Policy, Co-sponsored by GSPIA and GSPH Pittsburgh, March 22, 2006.

Goldstein, B.D. The State of Our Air in 2006. A Law and Policy Update for Southwestern Pennsylvania. The Pittsburgh Journal of Environmental & Public Health Law Inaugural Symposium, March 24, 2006.

Goldstein, B.D. Co-Chair; World Information Transfer: United Nations Fifteenth International Conference of Health and Environment; Living with Radiation: Diagnosis and Treatment of Thyroid Cancer after the Chernobyl Nuclear Accident, April 2006.

Goldstein, B.D. Commemoration of 35 years of EPA. Discussing Critical Issues in Environmental Policy. Indiana University, April 19-20 2006, Indianapolis, IN.

Goldstein, B.D. Invited speaker; EPA R&D, Past, Present and Future. ORD Science Forum Update; USEPA Washington, DC. May 17, 2006

Goldstein, B.D. Global Health Challenges. Presented at the Summer Institute for Teachers; Teaching Contemporary Global Issues; Duquesne University; June 28, 2006

Goldstein, B.D. Keynote Speaker; Tracks 2006 – Implementing the Tracking Network. “What Makes Tracking Data Actionable.” Centers for Disease Control; Atlanta GA. August 10, 2006

Goldstein, B.D. Lead presenter. IOM Report on NIOSH Hearing Loss Research Program; NIOSH Robert Taft Center, Cincinnati, Ohio; August 24, 2006

Goldstein, B.D. “What did John Snow Know? A Cautionary Approach to the Precautionary Principle” International Conference on Environmental Epidemiology and Exposure. Paris, Sept 3, 2006.

Goldstein, B.D. Speaker. “The Precautionary Principle and/or Risk Assessment: An Example of US-European Differences in Environmental Regulation.” University Pompeu Fabre, Barcelona, Spain. September 23, 2006

Goldstein, B.D. Co-Chair. SCOPE Open 52<sup>nd</sup> Executive Committee Meeting. Air Pollution and Human Exposure Complexity Scientific Symposium. Rome, Italy. October 2-6, 2006

Goldstein, B.D. Abstract. "Importance to the Field of Environmental and Occupational Health of Credentialing of the Public Health Workforce." Carpi, Italy. October 28, 2006

Goldstein, B.D. Abstract. Town Hall Meeting on NBPHE and Credentialing of the Public Health Workforce. American Public Health Assn Annual Meeting. Boston, MA. November 6, 2006

Goldstein, B.D. Speaker. "John Snow was an Inhalation Toxicologist: A Cautionary Approach to the Precautionary Principle." Grand Rounds; George Washington School of Public Health. Washington, DC. November 14, 2006

Goldstein, B.D. Speaker. The National Board of Public Health Examiners. George Washington School of Public Health. Washington, DC. November 14, 2006

Goldstein, B.D. Speaker. The National Board of Public Health Examiners, Univ North Carolina School of Public Health. November 28, 2006

Goldstein, B.D. Speaker. Mealey's Benzene Litigation Conference. "Benzene 101: the Hematologic Diseases Allegedly Associated with Benzene Exposure." The Ritz-Carlton, Battery Park, NY. December 4-5, 2006

Goldstein, B.D. "Where will the benzene go" Presented at Indoor Air Symposium, Annual Meeting Society for Risk Analysis. December 6, 2006, Baltimore MD

Goldstein, B.D. Speaker. Bending Science Conference. Albany Law School, New York, NY. December 13, 2006

Goldstein, B.D. Keynote Speaker. "Credentialing Public Health Professionals in a Changing World." University of Pittsburgh Center for Public Health Practice. Pittsburgh, PA. January 8, 2007

Goldstein, B.D. Panelist. "Evidence Based Toxicology: Application to Risk Assessment." 32<sup>nd</sup> Annual Winter Meeting, The Toxicology Forum. Westin Embassy Row Hotel. Washington, DC. January 30- February 1, 2007.

Goldstein, B.D. Moderator. Plenary Roundtable- "Systems Thinking." Integrating Environment and Human Health. 7<sup>th</sup> National Conference on Science, Policy, and the Environment. Washington, DC. February 1-2, 2007.

Goldstein, B.D. Discussant. "Measuring the Outcomes of Policies and Programs." Integrating Environment and Human Health. 7<sup>th</sup> National Conference on Science, Policy, and the Environment. Washington, DC. February 1-2, 2007.

Goldstein, B.D. Presentation “Is there a role for the precautionary principle in public health and preventive medicine. Universiti Kebangsaan Malaysia, Cheras, Malaysia May 16, 2007

Goldstein, B.D. Presentation “Impact of Environmental Health Research on Public Policy” Environmental Health, Health Services and Toxicology Research Program Colloquium. Atlanta, GA. September 9-11, 2007.

Goldstein, B.D. Presentation “Evidence and the Precautionary Principle: J.H. Kellogg and Other Lessons from the Past” Berlin, Germany. September 20, 2007.

Goldstein, B.D. Presentation “Credentialing Public Health Professionals in a Changing World” National Board of Public Health Examiners. Yale School of Public Health, New Haven, CT. September 27, 2007.

Goldstein, B.D, Lippman, M, Burke, TA. Panel Discussion. “The Path Forward in Disaster Preparedness Since WTC – Exposure Characterization and Mitigation: Substantial Unfinished Business! 17<sup>th</sup> Annual Conference of the International Society of Exposure Analysis. Durham, NC. October 14-18, 2007.

Goldstein, B.D. Presentation “Progress in Credentialing of Graduates of Accredited Schools and Programs in Public Health” APHA 135<sup>th</sup> Annual Meeting and Exposition: Leadership Series. Washington, DC. November 6, 2007.

Birnbaum, L., Williams, G., Goldstein, B.D. Discussant. “Dioxins are Forever: Dioxin Exposure and Public Health.” Society of Risk Analysis T3-G Symposium. San Antonio, TX. December 9-12, 2007.

Goldstein, B.D. Speaker. “The Challenges of Integrating Exposure Science and Risk Policy.” Environmental and Occupational Health Sciences Institute Symposium. Rutgers University, NJ. March 7, 2007.

Goldstein, B.D. Speaker. “Credentialing Public Health Professionals: The National Board of Public Health Examiners.” Boston University, School of Public Health. Boston, Massachusetts. September 24, 2007.

Goldstein, B.D. Speaker. “Credentialing Public Health Professionals: The National Board of Public Health Examiners.” University of Medicine and Dentistry of New Jersey. Piscataway, New Jersey. September 26, 2007.

Goldstein, B.D. Speaker. “Credentialing Public Health Professionals: The National Board of Public Health Examiners.” Yale School of Public Health. New Haven, Connecticut. September 27, 2007.

Goldstein, B.D. Speaker. “Credentialing Public Health Professionals: The National Board of Public Health Examiners.” University at Albany School of Public Health. Albany, New York. September 28, 2007.

Goldstein, B.D. Speaker. "Credentialing Public Health Professionals: The National Board of Public Health Examiners." Drexel University School of Public Health. Philadelphia, PA. October 4, 2007.

Goldstein, B.D. Speaker. "Climate Change and Public Health." Climate Change and Risk Symposium. Syracuse, New York. October 5, 2007.

Goldstein, B.D. Speaker. "Credentialing Public Health Professionals: The National Board of Public Health Examiners." The Ohio State University School of Public Health. Columbus, OH. October 17, 2007.

Goldstein, B.D. Speaker. "Credentialing Public Health Professionals: The National Board of Public Health Examiners." St. Louis University. St. Louis, Missouri. October 23, 2007.

Goldstein, B.D. Speaker. "Credentialing Public Health Professionals: The National Board of Public Health Examiners." University of Oklahoma Health Sciences Center College of Public Health. Oklahoma City, Oklahoma. November 13, 2007.

Goldstein, B.D. Speaker. "Credentialing Public Health: Professionals in a Changing World." Case Western Reserve University. Cleveland, Ohio. November 26, 2007.

Goldstein, B.D. Keynote Presenter. "The Superfund Biomedical Research Program as an Early Model of Translational Research." Superfund Basic Research and Training Program "20 Years of Success and a Vision for the Future." Durham, North Carolina. December 4, 2007.

Goldstein, B.D. Speaker. "Credentialing Public Health Professionals: The National Board of Public Health Examiners." University of Texas School of Public Health. Houston, Texas. December 7, 2007.

Goldstein, B.D. Speaker. "Credentialing Public Health Professionals in a Changing World." Webinar. Council of Accredited MPH Programs. 2008. Available at, <http://elm.illuminate.com/HOSTEDSJSU/recordings.html?s=119753280000&e=119761919999>

Goldstein, B.D. Speaker. "Beyond Precaution." Environmental Health Science Decision Making: Risk Management, Evidence, and Ethics. Institute of Medicine. Washington, D.C. January 15, 2008.

Goldstein, B.D. Speaker. "Credentialing Public Health Professionals: The National Board of Public Health Examiners." University of Florida. February 4, 2008.

Goldstein, B.D. Speaker. "Credentialing Public Health Professionals: The National Board of Public Health Examiners." University of Michigan School of Public Health. Ann Arbor, Michigan. February 18, 2008.

Goldstein, B.D. Speaker. "Credentialing Public Health Professionals: The National Board of Public Health Examiners." University of Illinois at Chicago. Chicago, Illinois. February 20, 2008.

Goldstein, B.D. Presenter. "The National Board of Public Health Examiners (NBPHE) Credentialing Exam." Council of Graduate Programs in Public Health. Austin, Texas. February 21, 2008.

Goldstein, B.D., Spencer, H., Harmon, R.G., Guerra, F., Libbey, P.M. Presentation. Credentialing: Activities of the National Board of Public Health Examiners. American College of Preventive Medicine 2008 Conference. Austin, TX. February 20-23, 2008.

Goldstein, B.D. Speaker. "Building Bridges across the Geological and Health Sciences, and to Our Target Audiences (Public, Policy Makers, Decision Makers)." The Geological Society of America and U.S. Geological Survey conference on GeoHealth I: Building Bridges across the Geological and Health Sciences. Reston, VA. March 6, 2008.

Goldstein, B.D. Speaker. "Credentialing Public Health Professionals: The National Board of Public Health Examiners." University of Oklahoma Health Sciences Center, College of Public Health. April 3, 2008.

Goldstein, B.D. Speaker. "National Board of Public Health Examiners: A Progress Report." 2008 Public Health Combined Conference. Columbus, OH. May 14, 2008.

Goldstein, B.D. Presentation. "Benzene Toxicology." American Association for Justice Annual Meeting. Philadelphia, PA. July 13, 2008.

Goldstein, B.D., "The Utility of Health and the Environment", Environmental Health Curriculum Development Workshop. Institute of Medicine, Atlanta, GA. July 22-24, 2009

Goldstein, B.D. Invited Presentation. "Update on Benzene Toxicity, New Studies and Diseases." BVR Legal/Mealey's Conference: Benzene. Los Angeles, CA. July 29, 2008.

Goldstein, B.D. Presentation. "Update on the National Board of Public Health Examiners." University of Kansas (via Elluminate). September 3, 2008.

Goldstein, B.D. Presentation. "Toxicology and the Courts: The Devil is in the Dose." Integrated Toxicology Environmental Health Program at Duke University. Durham, NC. September 26, 2008.

Goldstein, B.D. Speaker. "Benzene: challenges at the interface between environmental and occupational health." Ramazzini Days 2008. Capri, Italy. October 25, 2008.

Goldstein, B.D. "Credentialing of the Public Health Work Force." American Public Health Association Annual Meeting. San Diego, CA. October 28, 2008.

Goldstein, B.D. Speaker. "Credentialing Public Health Professionals: The National Board of Public Health Examiners." University of California at Los Angeles. Los Angeles, CA. December 1, 2008.

Goldstein, B.D. Speaker. "Credentialing Public Health Professionals: The National Board of Public Health Examiners." Loma Linda University. Loma Linda, CA. December 1, 2008.

Goldstein, B.D. Invited Presentation. "National Board of Public Health Examiners." Council of Accredited MPH Programs (CAMP) (via Elluminate). December 5, 2008.

Goldstein, B.D, Wu, F., and Liu, Y. Presentation. "Effectiveness of the US Clean Air Act (CAA) in comparison with the decline in cigarette smoking in producing a decrease in the risk of benzene-induced acute myelogenous leukemia (AML)." Society for Risk Analysis 2008 Annual Meeting. Boston, MA. December 7-10, 2008.

Goldstein, B.D. Speaker. "Credentialing Public Health Professionals: The National Board of Public Health Examiners." Harvard University. Cambridge, MA. December 8, 2008.

Goldstein, B.D. Speaker. "Credentialing Public Health Professionals: The National Board of Public Health Examiners." Boston University. Boston, MA. December, 8, 2008.

Goldstein, B.D. Presentation. "Benzene Toxicity." Trial of a Benzene Case Conference, New York, NY. December 8-9, 2008.

Goldstein, B.D. Presentation. "NBPHE: Examination Results." University of Kansas (via Elluminate). January 21, 2009.

Goldstein, B.D. Speaker. "Overview: Working Group for Curriculum Development." EHSRT Institute of Medicine, the National Academies Roundtable on Environmental Health Sciences, Research, and Medicine. February 20, 2009.

Goldstein, B.D. Presenter: "Integration of Risk Assessment and Risk Management: The Need for Caution," New Ideas for Risk Regulation; Society for Risk Analysis, Washington, DC. June 22-23, 2009

Goldstein, B.D., "Polycythemia vera", Pennsylvania Environmental Public Health Tracking Technical Advisory Group Meeting. Pennsylvania Department of Health, Harrisburg, PA. July 30, 2009.

Goldstein, B.D., "Snapshot of the National Board of Public Health Examiners", Becoming Certified in Public Health: How to Get and maintain the First Core Certification for Public Health Professionals. American Public Health Association Annual Meeting, Philadelphia, PA. November 8, 2009.

Goldstein, B.D., Introduction to Science & History of Air Toxics Control. Allegheny County Air Toxics Information Conference, Pittsburgh, PA, November 17, 2009.

Goldstein, B.D., Speaker. “National Board of Public Health Examiners Update”, Council of Graduate Programs in Public Health, Association for Prevention Teaching and Research. American Public Health Association Annual Meeting, Philadelphia, PA. November 8, 2009.

Goldstein, B.D., Speaker. “National Board of Public Health Examiners (MOC)”, Annual Meeting of the Education Board. American Public Health Association Annual Meeting, Philadelphia, PA. November 9, 2009.

Goldstein, B.D., Speaker. “National Board of Public Health Examiners”, Executive Board Meeting, American Public Health Association. American Public Health Association Annual Meeting, Philadelphia, PA. November 9, 2009.

Goldstein, B.D. Presentation. “Credentialing in Public Health.” University of Utah School of Medicine, Salt Lake City, Utah. March 9, 2010.

Goldstein, B.D. Presentation. “National Academy of Sciences Review of the Biowatch Program of the Department of Homeland Security.” Center for National Preparedness Seminar Series. March 11, 2010.

Goldstein, B.D. Presentation. “Regulating Chemicals at Levels and Responses Normally Found in the Human Body.” 49<sup>th</sup> Navy and Marine Corps Public Health Conference, Hampton, VA. March 23, 2010.

Goldstein, B.D. Presentation. “The Global Environment: Health and Policy.” Frank L. Parker Seminar, Vanderbilt University. April 19, 2010.

Goldstein, B.D. Luncheon Keynote Speaker. “Cell Origin of Hematopoietic Disease.” Benzene Causation Conference, A Look at Recent Admissibility Challenges on a Disease-by-Disease Basis. Las Vegas, NV. May 24-25, 2010.

Goldstein, B.D. Speaker: “The Compelling Need to Understand the Potential Effects of Oil Spills on Human Health.” Institute of Medicine of the National Academies, Assessing the Human Health Effects of the Gulf of Mexico Oil Spill: An Institute of Medicine Workshop, New Orleans, LA. June 22, 2010.

Goldstein, B.D. Speaker: “The value and challenge of constituent input.” Make Your Voice Heard, The Impact of Public Contributions on the Public Health Policy Process, Pittsburgh, PA. July 29, 2010.

Goldstein, B.D. Invited Speaker: The EPA Office of Research & Development: The Next 40 Years, Washington, DC. August 24, 2010

Goldstein, B.D. Session Chair, Public Workshop: “Committee to review the Federal Response to the Health Effects Associated with the Gulf of Mexico Oil Spill.” Institute of Medicine, Tampa, FL. September 22, 2010.



Goldstein, B.D. Plenary Speaker: “The Deepwater Horizon Oil Spill: Long-term Effects, Response and Recovery.”; Panel Member: “Panel II: Physical and Mental Health Issues, Symptoms, Treatment and Their Interaction”; Panel Member: “Panel V Life Change/Best Practices and Resilience.” Behavioral Health Summit, Understanding and Utilization of Best Practice Models in the Response and Recovery Phases of the Oil Spill Crisis”, Chalmette, LA. October 1, 2010.

Goldstein, B.D. Invited Luncheon Speaker: “Smoking Guns and Time Bombs: Embracing Public Health.” Sixth Scientific Symposium, Prenatal & Early Life Exposures; How Environmental Toxins Affect the Course of Childhood. Houston, TX. October 22, 2010.

Goldstein, B.D. Speaker: “Benzene” EPA’s NexGen Prototypes Workshop, Durham, NC. November 1-3, 2010.

Goldstein, B.D. Speaker: “Celebrating Environmental Health.” Institute of Medicine of The National Academies Roundtable Meeting #25, Washington, DC. November 15-16, 2010.

Goldstein, B.D. Speaker: “Health and Safety Considerations in the Extraction of Fossil Fuels.” University of Pittsburgh Graduate School of Public Health 2010 Conference Health Effects of Shale Gas Extraction: What is Known and What Can We Predict? Pittsburgh, PA. November 19, 2010.

Goldstein, B.D. Speaker: Sustainability at EPA Launch – National Academy of Sciences Koshland Science Museum, Washington, DC. November 30, 2010.

Goldstein, B.D. The importance of taking aim: Lessons from setting the benzene workplace standard. Risk Analysis: Risk Analysis in Action! 2010 Annual Meeting, Salt Lake City, UT. December 5-8, 2010.

Goldstein, B.D., Speaker: “Approaches and Strategies for Environmental Protection in American Law.” Fogarty ITREOH Workshops on Environmental and Occupational Health: Guidelines, Regulations, and Laws, College of Public Health Sciences, Chulalongkorn University, Bangkok, Thailand, January 6, 2011

Goldstein, B.D., Invited Speaker: “EPA and Emerging Science.” Duke Environmental Law & Policy Form (DELPPF) 2011 Annual Symposium: “The EPA at 40”, Duke University, Durham, NC. January 24, 2011.

Goldstein, B.D., Speaker: “Incorporating sustainability in the U.S. environmental protection agency.” The National Academies, Advisers to the Nation on Science, Engineering, and Medicine. Roundtable on Science and Technology for Sustainability, Washington, DC. May 4-6, 2011.

Goldstein, B.D., Speaker: “The oil spill’s effects on human health: What we know and need to know. 36<sup>th</sup> Annual AAAS Forum on Science and Technology Policy, Washington, DC. May 5-6, 2011

Goldstein, B.D., Invited Speaker: NIH Indoor Air Pollution Workshop, Washington, DC. May 9-11, 2011.

Goldstein, B.D., Speaker: “Worker Policy Implications: Gulf Oil Spill.” New Jersey – New York hazardous Materials Worker Training Center, Board of Advisors Meeting, UMDNJ, Piscataway, NJ. June, 17, 2011

Goldstein, B.D., Speaker: “A new sustainability paradigm for EPA” 2011 Council of Environmental Deans and Directors Summer Program Conference, The Environmental Field Today and Tomorrow, Champlain, VT. June 21-23, 2011.

Goldstein, B.D., Speaker: “NRC Committee on Incorporating Sustainability into the US Environmental Protection Agency.” Association for Environmental Studies and Sciences’ 2011 Annual Meeting and Conference, Confronting Complexity. Burlington, VT. June 23-26, 2011.

Goldstein, B.D., Speaker: “Briefing on the findings and conclusions of the IOM/NRC report: BioWatch and Public Health Surveillance: Evaluating Systems for the Early Detection of Biological Threats.” Institute of Medicine Board on Global Health Forum on Microbial Threats. Washington, DC. June 28, 2011.

Goldstein, B.D., Speaker: “Benzene Litigation.” HB Benzene Litigation Teleconference. July 13, 2011.

Goldstein, B.D., Presenter: “Smoking Guns and time bombs: The need for public health.” 2011 Conference on environmental Toxicity and Neurodevelopment Disorders, The Children’s Institute Duquesne University. Morgantown, WV. July 15, 2011.

Goldstein, B.D., Invited Speaker: “Proactive Approaches to Mitigating Impacts of Marcellus Shale.” 2011 Finger Lakes Institute Development Conference, Geneva, NY. July 21-22, 2011.

Goldstein, B.D., Invited Speaker: “Water Pollution and Health in the Polluted and Scarce Water.” World Federation of Scientists, Erice, Sicily. August 18-25, 2011.

Goldstein, B.D., Speaker: “Launch of a National Research Council Report: Sustainability and the U.S. EPA.” Science and Technology for Sustainability Program Special Event. Marian Koshland Science Museum, Washington, D.C. September 15, 2011.

Goldstein, B.D., Speaker: “Health Implications of Marcellus Shale Activities” Pennsylvania Occupational and Environmental Medical Society (POEMS)/ Tri-State Occupational Medicine Association (TSOMA), Harrisburg, PA. September 16-17, 2011.

Goldstein, B.D., Invited Panel Participant: “The risk toolbox: What are we good at, and what do we need to learn to do better?” and “Thinking differently about risk and sustainability II: Are there new models we should be exploring?” 2011 Risk Science Symposium, University of Michigan. Ann Arbor, MI. September 20-21, 2011.

Goldstein, B.D., Speaker: “The Public Health implication of Marcellus Shale Activities.” Pennsylvania Public Health Association Annual Fall Conference. Philadelphia, PA. September 26-27, 2011.

Goldstein, B.D., Presenter: “What’s known about public health impacts.” Environmental and Natural Resources Impacts of Marcellus Shale Extension In-Service, Penn State Extension. University Park, PA. October 3-4, 2011.

Goldstein, B.D., Presenter: “The Green Book: The National Academy of Science Framework for Sustainability at EPA.” Association for the Advancement of Sustainability in Higher Education 2011 Conference & Expo. Pittsburgh, PA. October 9-12, 2011

Goldstein, B.D., Invited Speaker: “Evaluation of formaldehyde as a potential cause of human leukemia.” The 42<sup>nd</sup> Annual Meeting of the Environmental Mutagen Society, Montreal, Quebec, Canada. October 15-19, 2011.

Goldstein, B.D., Speaker: “Public Health Impact of Unconventional Shale Gas and Oil Extraction.” Tri-State Occupational Medicine Association. Cleveland, OH. October 21-22, 2011.

Goldstein, B.D., Presenter: “Exposure Science in the Sustainability Era: Dinosaur or Dynasty?” The 21<sup>st</sup> Annual Meeting of International Society of Exposure Science,. Baltimore, MD. October 23-27, 2011.

Goldstein, B.D., Presenter: “The NAS sustainability framework and EPA” Environmental and Occupational Health Council, Association of Schools in Public Health, Washington, DC. October 29, 2011.

Goldstein, B.D., Invited Presenter: “Mental Health Implications of the Gulf Oil Spill” International Society for Traumatic Stress Studies (ISTSS) Meeting, Baltimore, MD. November 3-5, 2011.

Goldstein, B.D., Moderator: “The 2011-2012 Pittsburgh Schweitzer Environmental Fellows Present: Environmental Justice: Health Communities, Healthy People.” University of Pittsburgh, Pittsburgh, PA. November 15, 2011.

Goldstein, B.D., Speaker: “Roundtable on Public Health Implications of Marcellus Shale Fracking.” Pennsylvania Medical Society, C. Ted Lick Conference Center, Harrisburg Community College. Harrisburg, PA. November 16, 2011.

Goldstein, B.D., Presenter: “Sustainability and the U.S. EPA.” Roundtable on Science and Technology for Sustainability, the National Academies. Washington, DC. November 16-17, 2011.

Goldstein, B.D., Panel Speaker and Luncheon Keynote: “Introductory Panel” and “Public Health, Sustainability and the Marcellus Shale.” University of Pittsburgh Graduate School of

Public Health Second Annual Conference on the Health Effects of Shale Gas Extraction. Pittsburgh, PA. November 18, 2011.

Goldstein, B.D., Invited Speaker: “Public Health experiences from Shale Gas Development in Pennsylvania—video presentation.” Natural Gas Development—Public Health Workshop. Fredericton, New Brunswick, Canada. December 1, 2011.

Goldstein, B.D., Presenter: “Presidential Roundtable on Sustainability and the U.S. EPA, the “Green book” Report from the National Academies.” Society of Risk Analysis Annual Meeting. Charleston Area Convention Center. Charleston, SC. December 5, 2011.

Goldstein, B.D. (December 15, 2011). Invited Speaker: “An overview for Physicians on Marcellus Shale Fracking” Lycoming County Medical Society Meeting. Williamsport, PA. December 15, 2011.

Goldstein, B.D. (January 31, 2012). Invited Speaker. *Health Implications of Marcellus Shale Natural Gas Development*. Speaker at: AMSA Primary and Community Care Week Lectures. University of Pittsburgh, Pittsburgh, PA.

Goldstein, B.D. (January 30-February 2, 2012). Panelist. *When Epidemiology and Toxicology Collide: Navigating the Path Forward for Formaldehyde*. Panelist at: 37<sup>th</sup> Annual Meeting of the Toxicology Forum, Washington, D.C.

Goldstein, B.D. Speaker. *National Academies of Science Framework for Sustainability at EPA: The Green Book*. Speaker at: Pitt Law Sustainability Forum: Building Sustainable Neighborhoods: Powering Sustainable Development in Allegheny County. Pittsburgh, PA. February 13, 2012.

Goldstein, B.D. (February 29, 2012). Keynote Speaker. *Transdisciplinary Research and Sustainability: The Story of John Snow*. Keynote Speaker at: Pittsburgh Regional Center for Science Teachers Science-Technology-Engineering-Mathematics (STEM) Education Series, Pittsburgh, PA.

Goldstein, B.D. (March 14-15, 2012). Speaker. *Integrating Sustainability with Environmental Management*. Speaker at: CRESPIII Planning Meeting, Vanderbilt University, Nashville, TN.

Goldstein, B.D., & Starboin, N. Speaker. (March 20, 2012). *A Conversation on Analytic-Deliberative Process*. Speaker at: Risk Analysis and Fracking Meeting, Syracuse University, Syracuse, NY.

Goldstein, B.D. (April 16-18, 2012). Speaker. *Biological Models of Leukemia/Lymphoma. Implications of the Changing Understanding and Classification of Hematological Cancer*. Speaker at: IARC Monographs Workshops on Tumor Concordance and Mechanisms of Carcinogenesis, International Agency for Research on Cancer, Lyon, France.

Goldstein, B.D. (April 20, 2012). Participant. *Environmental Health Issues: A Vision for the Next 25 Years*. Participant in: Environmental and Occupational Health Sciences Institute 25<sup>th</sup> Anniversary Symposium, Piscataway, NJ.

Goldstein, B.D. (April 27, 2012). Speaker. Environmental Health Implications of Marcellus. Marcellus Shale III Seminar. California University of Pennsylvania, Pittsburgh, PA.

Goldstein, B.D. (April 30-May 3, 2012). Panelist Speaker. *Public Health Implications of Unconventional Natural Gas Development*. Panelist Speaker at: The American Geophysical Union Science Policy Conference, Washington, D.C.

Goldstein, B.D. (May 2, 2012). Speaker. *Potential Health Implications of Marcellus Shale Activities*. Speaker at the Public Forum on the Health Effects of Marcellus Fracking, 14<sup>th</sup> Ward Democratic Committee, Pittsburgh, PA.

Goldstein, B.D. (May 5, 2012). Speaker. *The Potential Public Health Impacts of Hydraulic Fracturing*. Science and Management Forum: Hydrofracking in Focus, What Every Citizen Needs to Know. Cary Institute of Ecosystem Studies, Milbrook, NY.

Goldstein, B.D. (May 9, 2012). Invited Attendee. *Global Sustainable Development and Environmental Health: A Conversation Around the 2010 Rio+20 United Nations Conference*. PanAmerican Health Organization, Washington, D.C.

Goldstein, B.D. May 22, 2012. Speaker. *Public Health Implications of Marcellus Shale Activities in Pennsylvania*. Speaker at the Public Health Forum, 2012. Philadelphia Department of Public Health, Division of Disease Control and Health Federation of Philadelphia, Philadelphia, PA.

Goldstein, B.D. (June 28, 2012). Speaker. *Benzene as a Pluripotent Hematological Carcinogen*. Speaker at Childhood Leukemias and Hematopoietic Lymphoreticular Cancers Conference, Collegium Ramazzini, New York, NY.

Goldstein, B.D. (July 18, 2012). Presenter. *Shale Gas Drilling and Public Health*. Hydraulic Fracturing for Shale Gas Webinar, Online, Science Media Centre of Canada.

Goldstein, B.D. (October 10, 2012). Invited Lecturer. *Health Considerations Related to Hydrofracturing for Shale Gas*. 13<sup>th</sup> Annual James P. Keogh, M.D. Occupational Medicine Memorial Lecture, University of Maryland School of Medicine, Baltimore, MD.

Goldstein, B.D. (November 9, 2012). *Introductory Remarks*. *Third Annual Conference on the Health Effects of Shale Gas Extraction*. University of Pittsburgh Graduate School of Public Health, Pittsburgh, PA.

Goldstein, B.D. (November 11, 2012) Invited Speaker; *Environmental Health*. Tulane University School of Health Centennial Symposium

Goldstein, B.D. (November 15, 2012). Invited Attendee. *Global Environmental Health and Sustainable Development Innovation Collaborative Integrating the MDGs with the Pillars and Principles of Sustainable Development*. Pan American Health Organization, Washington, D.C.

Goldstein, B.D. (December 9-12, 2012). Invited Attendee. *Risk Analysis: Advancing Analysis*. Society for Risk Analysis, San Francisco, CA.

Goldstein, B.D. (December 14, 2012). Presenter. *The Health Impacts of Natural Gas Drilling in Southwestern Pennsylvania*. Perlman Roundtable, University of Pittsburgh, Pittsburgh, PA.

Goldstein, B.D. (March 11, 2013). Speaker. *The Potential Toxicological Impacts of Shale Gas Drilling: An Overview*. Society of Toxicology, San Antonio, TX.

Goldstein, B.D. (April 23, 2013). Presenter. *Leveraging the BP Settlement Health Outreach Program to Address Disparities in the Gulf Coast*. Grant Makers in Health, Washington, D.C.

Goldstein, B.D. April 28, 2013. Speaker. "The New NAS Gulf of Mexico Program and Related Activities" 150<sup>th</sup> Annual Meeting. National Academy of Sciences, Washington, D.C.

Goldstein, B.D. (May 21, 2013). Speaker. *Does Living Near Hydrofracturing Activity Put Our Health at Risk?* Center of the American West. University of Colorado Boulder, Boulder, CO.

Goldstein, B.D. (June 5, 2013). Presenter. *The Lack of Sustainability Approach to Tight Shale Gas Production in a Developing Country: The United States as an Example*. Presented to the International Petroleum Industry Environmental Conservation Association, Washington, D.C.

Goldstein, B.D. (September 22, 2013). Presenter. *The Interface between Science and Public Policy: Whose Ethics is it?* Presented at the American College of Epidemiology 2013 Annual Meeting, Louisville, KY.

Goldstein, B.D. (September 27, 2013). Panel Speaker. *Transparency, Sustainability, and Public Health: Why Act 13 is not Sustainable*. Participated as Panel Speaker for Marcellus Shale Development and Pennsylvania: What Lessons for Sustainable Energy? At Widener University School of Law, Harrisburg, PA.

Goldstein, B.D. (November 6, 2013). Speaker. *Environmental Resilience and Public Health*. Speaker at 141<sup>st</sup> American Public Health Association Meeting and Expo, Think Global Act Local: Best Practices Around the World, Boston, MA.

Goldstein, B.D. (November 18, 2013). Speaker. A Celebration of the Life of Allan H. Conney. Rutgers University, New Brunswick, New Jersey.

Goldstein, B.D. (November 23, 2013). Speaker. *The Elements of Environmental Health*. Speaker at Shale Drilling and Public Health: A Day of Discovery by the League of Women Voters, Pittsburgh, PA.

Goldstein, B.D. (January 9, 2014). Speaker. *History of Risk and Sustainability in Decision Making for Complex Sites*. Speaker at Best Practices for Risk-Informed Remedy Selection, Closure, and Post-Closure Control of Contaminated Sites: Workshop #2. National Academy of Sciences, Washington, D.C. <http://dels.nas.edu/Past-Events/Best-Practices-Risk-Informed-Remedy/AUTO-8-12-72-G?bname=nrsb>

Goldstein, B.D. (January 29, 2014). Panelist. *2014 Plenary Panel*. Gulf of Mexico Research Initiative, Mobile, AL.

Goldstein, B.D. (February 3, 2014). Participant. *Health Registry/Surveillance System Planning Meeting*. Southwest Pennsylvania Environmental Health Project, Pittsburgh, PA.

Goldstein, B.D. (March 6, 2014). Presenter. *Environmental Health Research and Public Policy: How Not to Have a Boring Career*. Presented at Seminar for Department of Environmental and Occupational Health, University of Pittsburgh, Pittsburgh, PA.

Goldstein, B.D. (March 17, 2014). Presenter by webinar. *Methods Used to Classify Cancer Outcomes – Specifically Lymphohematopoietic Cancers*. Presented as part of the Human Cancer Studies on Exposure to Trichloroethylene: Methods used to assess exposure and cancer outcome, National Toxicology Program, U.S. Department of Health and Human Services.

Goldstein, B.D. (March 18, 2014). Panelist. *Straight Scoop on Shale*. Panelist at The Future of Energy in the Americas held by U.S. Department of State League of Women Voters, Pittsburgh, PA.

Goldstein, B.D. (March 21-22, 2014). Presenter. *Transparency, Sustainability & Public Health. Presented at the EUCE Conference on Environment & Energy A Comparison of US and EU Policies*. Presented at the European Union Center of Excellence, Pittsburgh, PA.

Goldstein, B.D. (April 5, 2014). Representative of New York University at Investiture of President of Carlow University, Pittsburgh, PA.

Goldstein, B.D. (April 23, 2014). Presenter. *Public Health Implications of Unconventional Gas Drilling*. Presenter at Province of New Brunswick Energy Institute Environmental Health Forum for Community Leaders, Fredericton, New Brunswick, Canada April 23, 2014

Goldstein, B.D. (April 23, 2014). Panelist. *Ask the Experts*. Panelist at Province of New Brunswick Energy Institute Environmental Health Session for Government, Fredericton, New Brunswick, Canada.

Goldstein, B.D. (April 24, 2014). Presenter. *Environmental and Public Health Implications of Shale Gas Drilling*. Presented at the Province of New Brunswick Energy Institute Public Lecture Series, Moncton, New Brunswick.

Goldstein, B.D. (April 30-May 1, 2014). Invited Presentation. *Mechanistic Evidence for Lymphohematopoietic (LHP) cancers Following Formaldehyde Exposure*. Presented at the US

EPA National Center for Environmental Assessment State-of-the-Science Workshop to Discuss Issues Relevant for Assessing the Health Hazards of Formaldehyde Inhalation, Arlington, VA.

Beach, S., Schlarb, J., & Goldstein, B.D. (May 2014). *Perceptions of Marcellus Shale (MS) drilling as economic opportunity, environmental threat, or both? Socio-demographic profiles and relationships with environmental attitudes / behaviors in the general population and among residents of a high MS activity location*. Presented at the Annual Conference of the American Association of Public Opinion Research (AAPOR), Anaheim, CA.

Goldstein, B.D., & Carruth, R.S. (May 23-24, 2014). Presenter. *Transparency Failures of the Third Kind in Unconventional Gas Drilling*. Presented at the Arizona State University Second Annual Conference on Emerging Technologies, Scottsdale, AZ.

Bernard, B.D. (June 10, 2014). Invited Speaker. *Human Health*. Special Scientific Committee on Unconventional Oil & Gas Development Public Workshop, Health Effects Institute, Pittsburgh, Pa.

Goldstein, B.D. (June 22-24, 2014). Panel Member. *The ABCs of the Health Impact: What We Know, Don't Know*. Presented at the Society of Environmental Journalists Conference on Shale Oil and Gas Development, Pittsburgh, PA.

Goldstein, B.D. (September 5, 2014). Presenter. *Lessons From Putting Our Head in the Shale: Why Environmental Health Research is Necessary*. Presented at Michigan State University Center for Integrative Toxicology Department, East Lansing, MI.

Goldstein, B.D. (September 12, 2014). Speaker and Moderator. Symposium on Health and Marcellus Shale. Baltimore, MD.

Goldstein, B.D. (September 19, 2014). Presenter. *Head in the Shale: A Case Study Demonstrating the Value of Environmental and Occupational Health Research*. Presented at the University of Iowa, Iowa City, IA.

Goldstein, B.D. (September 22, 2014). Keynote address. *Human Health, Public Health Practice, and Community Resilience*. Gave address at the Community Resilience and Health Opportunity Analysis Workshop, National Academies of Science, Washington, D.C.

Goldstein, B.D. (October 14, 2014). Presenter. *Technology and Policy Impediments to Monitoring for the Potential Health Impact of Unconventional Gas Development*. Presented at International Society of Exposure Science, Cincinnati, OH.

Goldstein, B.D. (October 15, 2014). Presenter. *Comments on the Meaning of "...as appropriate..."* Presented at EPA IRIS Workshop on the NRC Recommendations on Formaldehyde Leukemogenesis, Arlington, VA.

Goldstein, B.D. (October 16, 2014). Presenter. *Marcellus Shale: Evidence of the Importance of Public Health*. Presented at the Northeast Epidemiology Conference. Philadelphia, PA.



Goldstein, B.D. (October 26, 2014). Speaker. Shale Drilling and Public Health: Days of Discovery, Pittsburgh, PA.

Goldstein, B.D. (October 28, 2014). Speaker. Jonas Salk Centenary Symposium on Sustainability Survival of the West, Pittsburgh, PA.

Goldstein, B.D. (November 5, 2014). Presenter. *HEAD IN THE SHALE: A Case Study of Why Environmental Health Research is in Everyone's Best Interest*. Presented as part of the Yale School of Public Health Environmental Health Seminar Series, New Haven, CT.

Goldstein, B.D. (November 10-11, 2014). Roundtable workshop member on Environmental Health, Washington, D.C.

Goldstein, B.D. (November 18, 2014). Presenter. *Science of Resilience and the Science of Public Health: An Excellent Match*. Presented at the American Public Health Association Annual Conference, New Orleans, LA.

Goldstein, B.D. (November 19, 2014). Presenter. *Improving Environmental Health Access and Literacy in the Gulf Region: Evidence-based Strategies and Illustrative Examples*. Presented at the American Public Health Association Annual Conference, New Orleans, LA.

Goldstein, B.D. (December 7-9, 2014). Plenary Speaker. *Technological Advances, Risk Tradeoffs, and Societal Concerns Associated with Hydraulic Fracking*. Speaker at the Society for Risk Analysis Annual Meeting, Denver, CO.

Goldstein, B.D. (February 3, 2015). Presenter. *Lessons from the Marcellus Shale: Technology Acceptance Requires Environmental Health Research*. Presented at the Risk Regulation Seminar Series, University of Pennsylvania, Philadelphia, PA.

Goldstein, B.D. (February 5, 2015). Presenter. *Marcellus Shale Drilling*. Presented at the Penn Township Public Meeting on Shale Gas Drilling, Pittsburgh, PA.

Goldstein, B.D. (February 18, 2015). Presenter. *The Value of Transdisciplinary Research Integrating Public Health and Ecosystem Services Research*. Presented at the Gulf of Mexico Oil Spill and Ecosystem Conference, Houston, TX.

Goldstein, B., D. (April 9, 2015). Presenter. *What Willie Sutton Would Say About Hydraulic Fracturing of the Marcellus Shale*. William N. Rom Symposium at NYU Medical Center, New York.

Goldstein, B., D. (April 14, 2015). Speaker. *Marcellus Shale, Sustainability Science, and the PA Supreme Court*. Provosts Sustainable Series at Green Speakeasy, Pittsburgh, PA.

Goldstein, B., D. (May 19, 2015). Presenter. *Comparison of EU and US Approaches to Unconventional Shale Gas Drilling*. Seminar at Cologne Department of Political Science and EU Affairs, Cologne, Germany.

Goldstein, B., D. (May 20, 2015). Presenter. *Comparison of EU and US Approaches to Unconventional Shale Gas Drilling*. Seminar at Energy Group, Cologne, Germany.

Goldstein, B., D. (July 10, 2015). Discussant. *Health Effects of Deep Water Horizon Oil Spill*. Gulf of Mexico Research Institute, Washington, DC.

Goldstein, B.D. (August 16, 2015). Presentation. *Environmental Chemicals and Obesity*. Presented at the Schweitzer Fellowship Monthly Meeting, Pittsburgh, PA.

Goldstein, B., D. (October 28, 2015). Presenter. *EU/US Comparisons of the Role of Property Rights in the Role of Environmental Decision Making*. Seminar Presentation, University of Cologne, Cologne, Germany.

Goldstein, B.D. (November 10, 2015). Presenter. *Risk Analysis and Unconventional Gas Drilling*. Society for Risk Analysis Monthly National Webinar.

Goldstein, B.D. (November 16, 2015). Presentation. *Vision of the U.S. National Research Council on Animal Research*. Presented at the European Animal Task Force General Meeting, Brussels, Belgium.

Goldstein, B.D. (November 17, 2015). Presenter. *USA/Europe: Sharing visions on research agendas for animal productions*. Presented at the 5<sup>th</sup> European Animal Task Force Seminar, Brussels, Belgium.

Goldstein, B.D. (November 18, 2015). Presenter. *Shale Health Policy and Practices in Germany, the EU, and the US*. League of Women Voters Annual Shale and Public Health Conference, University Club, Pittsburgh, PA.

Goldstein, B., D. (February 4, 2016). Invited Speaker. *One Health: Unraveling the Interconnectedness between Human and Ecosystem Health Through the Lens of Oil Spills*. 2016 Gulf of Mexico Oil Spill and Ecosystem Science Conference. Tampa, Florida.

Goldstein B.D. (February 17, 2016). Invited Lecturer. *Differing European Union and United States Approaches to Environmental and Energy Issues. Insights from Shale Gas Development*. Youngstown State University and Oberlin College skype webinar.

Goldstein B.D. (March 14, 2016). Session Chair. *Introductory Presentation: The Toxicological Implications of the Gulf Oil Spill: Research Accomplishments and Research Needs*. Society of Toxicology Annual Meeting, New Orleans, LA.

Goldstein, B.D. (March 14, 2016). *Opportunities and Needs for Toxicological Research Related to the Gulf Oil Spill*. Society of Toxicology Annual Meeting, New Orleans, LA.

Goldstein, B.D. (April 26, 2016). Moderator & Closing Remarks Session: *Toxic Contaminants of Children*. World Information Transfer, Inc. Annual Meeting. United Nations Headquarters, New York.

Goldstein, B.D. (May 4, 2016). Presenter. *Overview of Sustainability for the Nation and Discussion of Decision Framework*. State Tribal Government Working Group, Department of Energy. Niagara Falls, New York.

Goldstein B.D. Speaker.(May, 2016) Arizona State University Global Policy and Ethics Conference

Goldstein, B.D. and Infante, P.F. (June 7-10, 2016) *Benzene as a cause of hematological cancers: a recurring example of the importance of mechanistic understanding and animal studies*.Poster Session. IARC 50<sup>th</sup> Anniversary Meeting. Lyon, France

Goldstein, B.D., Hudak, J., Renn, O., Jovanovic, A. *Underlying EU/US Differences Contributing to the Lesser Acceptance of Unconventional Shale Gas Development in the European Union*. Presented at the European Society for Risk Analysis Annual Meeting. Bath, England. June 20, 2016

Goldstein, B.D. *Property rights. A factor increasingly underlying EU/US environmental policy differences*. Presented at the European Society for Risk Analysis Annual Meeting. Bath, England. June 22, 2016

Goldstein, B.D (August 9-10, 2016) Expert Panel: Training Louisiana's Middle-Skilled Workforce in Environmental Health & Disaster Management: A Roundtable on Competencies for Nursing, Oil Production, and Marine Operations. Fletcher Technical Community College; Houma, Louisiana

Goldstein, B.D. (October 18, 2016) Presentation. *Environmental Justice and Citizen Science*. Presented at Harvard Law School, Cambridge, MA.

Goldstein, B.D. (October 19, 2016) Presentation. *Unconventional Shale Gas Development (UGD): Public Health Science, Policy, and Law*. Presented at Harvard Law School, Cambridge, MA.

Goldstein, B.D. (October 21, 2016) Invited Presentation: *Pipelines and Public Health: Lessons from the Deepwater Horizon and Unconventional Gas Drilling*; Pipeline Safety Trust Annual Conference: Pipeline Safety in Transition: Will changes lead to safer pipelines? New Orleans, Louisiana

Goldstein, B.D (October 24, 2016) Invited Participant. World Environment Center workshop on "Increasing Confidence in Chemical Technology." Washington DC

Goldstein, B.D (November 8, 2016) *Challenges to Developing and Interpreting US Public Health Data Related to Unconventional Gas Drilling (UGD)*. EU health of shale gas, Brussels, Belgium.

Goldstein, B.D (November 16, 2016) *Site Variability, Research, and Individual Family Risk*. League of women voters Shale Gas, Pittsburgh, PA.

Goldstein, B.D. (January 10, 2017) Presentation. *A Medical Scientist's Thoughts on Expert Witnessing*. Presented at Evaluating Expert Witnesses: The New Daubert Standard in D.C. Superior Court. DC Bar Association, Washington, DC.

Goldstein, B.D. (January 13, 2017). Expert Panel: Training Louisiana's Middle-Skilled Workforce in Environmental Health & Disaster Management: A Roundtable on Competencies for Nursing, Oil Production, and Marine Operations. Houma, Louisiana

Goldstein, B.D. (January 23-26, 2017) Conference Organizing Committee, session organizer and chair, and presentation on *A Solution-Based Integrated Approach to Community Resilience and Mental Health Care*. National Council for Science and the Environment. Washington, DC

Goldstein, B.D. (April 13, 2017) Speaker; *Will the Necessary Research be Supported by the Present US Administration?*. 26<sup>th</sup> International Conference on Health and Environment; United Nations Headquarters, New York, New York.

Goldstein, B.D. (May 10, 2017) Presentation: *The Deepwater Horizon Oil Spill*. UN Programme on Crisis Management. Maastricht University, Maastricht, The Netherlands

Goldstein, B.D. (May 10, 2017) Presentation. *EU/US Policy Differences in the Beginning of the Trump Era*. University of Maastricht, Maastricht, The Netherlands

Goldstein, B.D. (June 9, 2017) Keynote Presentation. *Overview of the Science of Toxic Chemicals*. Symposium on Toxics in Everyday Life. UCLA Center for Occupational and Environmental Health. Los Angeles, CA

Goldstein, B.D. (June 27, 2017) Summer Speaker Series. *President Trump and the Paris Agreement*. World Information Transfer, New York, NY

Goldstein, B.D. (August 2-3, 2017) Panelist: *Community, Decision Making and Data*. Workshop on Preparing for a Rapid Response to Marine Oil and Gas Spills: A Workshop on Research Needs to Protect the Health and Well-being of Communities. National Academies of Science, Washington, DC.

Goldstein, B.D. (September 24, 2017). Invited Panel Speaker: *Government Attempts to Control Information & Suppress Free Speech*. American Civil Liberties Union, Pittsburgh, PA

Goldstein, B.D. (October 5, 2017). Invited Panel Speaker “*Effects of Lead in Water*” PA Dept of Environmental Protection; Society of Environmental Journalists Annual Meeting, Pittsburgh. PA

Goldstein, B.D. (October 6, 2017). Invited Panel Speaker “*Growing Awareness of America's Lead Problem: Next Steps, New Stories*” Society of Environmental Journalists Annual Meeting, Pittsburgh. PA

Goldstein, B.D. (December 04, 2018) Speaker; The “Bad Luck” Cancer Hypothesis: Relevance to Environmental Risk Assessment and to Toxic Torts. Society For Risk Analysis Annual Meeting, New Orleans, Louisiana

Goldstein, B.D. (November 14, 2018) Speaker; The EPA and Public Health Research. Shale & Public Health, University of Pittsburgh, Pittsburgh, PA

## 1. SERVICE (PROFESSIONALLY RELATED)

### **University/Institute of Higher Learning**

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|-----------|--|
| 1989-2001 | Chair, Advisory Committee, NIEHS Center of Excellence, Marine and Freshwater Biomedical Core Center, U. of Wisconsin-Milwaukee |
| 1992-1995 | Chair, External Advisory Committee, NASA Center for Space and Environmental Health, University of Rochester                    |
| 1993-2001 | Member, Internal Advisory Board of The Cancer Institute of New Jersey  |
| 1994-1997 | Member, Advisory Committee, Environmental Hazards Assessment Program, Medical University of South Carolina                     |
| 1995-1997 | Member, International Advisory Board, Center for Toxicology, College of Pharmacy, University of Arizona                        |
| 1995-2001 | Chair, Science Advisory Board, University of Washington, NIEHS Center of Excellence 2011                                       |
| 1995-2011 | Member, Board of Advisors, New Jersey/New York Hazardous Materials Worker Training Center, UMDNJ School of Public Health       |
| 1996-2001 | Chair, Harvard Advisory Committee on Agricultural Health Risks, Harvard Center for Risk Analysis                               |

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| 2000-2001 | Member, Board of Visitors, Graduate School of Public Health, University of Pittsburgh  |
| 2001-2006 | Member, Residency Advisory Committee, University of Pittsburgh Graduate School of Public Health  |
| 2004-2005 | Member, Advisory Board, Center for the Study and Improvement of Regulation, Carnegie Mellon University   |
| 2005-2008 | Member, Advisory Board, Center for Rural Health Practice, University of Pittsburgh, Bradford   |
| 2005-2009 | Advisor, Center for Environmental Oncology, University of Pittsburgh, Cancer Institute   |
| 2006-     | Member, Dean's Advisory Board, Ohio State University College of Public Health  |
| 2006-2010 | Member, Editorial Committee, Annual Reviews of Public Health   |
| 2006-2011 | Member, External Advisory Committee, University of North Carolina School of Public Health  |
| 2007-2009 | Member, Scientific Advisory Committee, Environmental Bioinformatics and Computational Toxicology Center, Robert Wood Johnson Medical School        |
| 2007      | External Examiner, Dept Community Health, Universiti Kebangsaan Malaysia; Cheras, Malaysia   |
| 2007      | Member, External Review Board, Tulane-Xavier Center for Bioenvironmental Research  |
| 2007      | Chair, Advisory Board, University of Pittsburgh Academic Consortium for Excellence in Environmental Public Health Tracking                         |
| 2008      | Member, External Review Board, Columbia University Earth Institute   |
| 2008      | Visiting Committee for the Departments of Community and Family Medicine and of Psychological Medicine, National University of Singapore, Singapore |
| 2008-2010 | Member, Dean's Advisory Board, University of North Carolina School of Public Health  |

- 2008-2010 Member, Science Advisory Committee, Environmental Bioinformatics and Computational Toxicology Center, Environmental and Occupational Health Sciences Institute, UMDNJ-Robert Wood Johnson Medical Center and Rutgers University
- 2008- Member, University of Pittsburgh GSPH Senior Council
- 2008- Member, Committee Member, University of Pittsburgh Institute of Politics Health Committee.
- 2008- Member, University of Pittsburgh Wuhan Collaboration Strategy Group.
- 2008- Member, Faculty Advisory Committee, University of Pittsburgh European Union Center of Excellence
- 2009-2011 Dean's Associate Committee, University of Indiana, School of Health, Physical Education, and Recreation
- 2009- Research Advisory Committee, Environment and Health Fund – Israel
- 2009- Member, Faculty Advisory Committee, Global Studies Program, University Center for International Studies
- 2009- Member, INCIGHT Steering Committee, University of Pittsburgh
- 2009- Member, Advisory Committee, European Union Center of Excellence
- 2010-2012 Chair, University of Pittsburgh Academic Partner for Excellence in Environmental Public Health Tracking Advisory Committee
- 2010 Member, Planning Committee, University of Pittsburgh Graduate School of Public Health 2010 Conference
- 2011 - Member, Health and Human Services Committee, University of Pittsburgh Institute of Politics
- 2011- Chair, Board of Advisors, New Jersey/New York Hazardous Materials Worker Training Center, UMDNJ School of Public Health
- 2011 Committee Member, International Nuclear Symposium, University of Pittsburgh Graduate School of Public Health
- 2011 Member, Conference Planning Committee - Marcellus Shale, University of Pittsburgh

- 2011-2016 Chair, Advisory Committee, Tulane University Research Consortium for Gulf Resilience on Women's Health (GROWH)
- 2011 Member, Biostatistics and Epidemiology Chair Search Committee, University of Indiana School of Public Health, Physical Education, and Recreation.
- 2012 Organizing Committee Member, Third Annual Conference on the Health Effects of Shale Gas Extraction, University of Pittsburgh Graduate School of Public Health
- 2012 Planning Committee Member, Health Across the Lifespan: Allegheny Country 2012 Conference, University of Pittsburgh Graduate School of Public Health
- 2013- 2017 Member, Shale Gas Advisory Committee, NSF Center, University of Colorado
- 2013- Member Promotion Advisory Committee, Dept of Environmental and Occupational Health, University of Pittsburgh Graduate School of Public Health
- 2013- Member, Health and Human Services Policy Committee, Institute of Politics, University of Pittsburgh
- 2013-2014 Planning Committee, University of Pittsburgh European Union Center for Excellence, 2014 Shale Gas Conference
- 2014 Planning Committee, University of Pittsburgh European Union Center for Excellence, 2015 Shale Gas Conference
- 2014 Advisor, Health Effects Institute, Committee on Shale Gas
- 2014 Member, Review Panel, Division of National Toxicology Program, Long Term Planning Report
- 2014 Member, Advisory Committee, Groundwater Protection and Shale Gas Development. Center for Public Health Practice, University of Pittsburgh
- 2015-17 Member, Tulane/Fletcher Technical Community College Environmental Health Expert Panel
- 2016- Member, Advisory Committee on Publishing Ethics, American Journal of Public Health.
- 2016- President, C.F. Reynolds Medical History Society, Pittsburgh. PA



2017- Society of Toxicology representative, Science Policy Committee and Animal Research Committee. Federation of American Societies of Experimental Biology (FASEB)

**Editorial Boards, Editorships**

1981-1993 Member, Editorial Board, Toxicology Letters

1981-1999 Contributing Editor, American Journal of Industrial Medicine

1984-1986 Member, Editorial Board, Advances in Free Radical Biology and Medicine

1985-1986 Member, Editorial Advisory Board, Environmental Forum

1987-1993 Member, Editorial Board, Free Radical Biology and Medicine

1987-2000 Associate Editor, Journal of Inhalation Toxicology

1989- 2002 Member, Editorial Board, Journal of Toxicology and Environmental Health

1993-2006 Associate Editor, Environmental Health Perspectives Journal

1995-2000 Member, International Advisory Board, Comprehensive Toxicology

1996-1998 Member, Editorial Advisory Group, International Life Sciences Institute

2006-2011 Editor-in-Chief, Scientific Committee on Problems of the Environment, Paris, France

2008- Member, Editorial Board, Society for Risk Analysis, Risk Analysis

2011-2015 Member, Editorial Board, Scientific Committee on Problems of the Environment, SCOPE-Elsevier

2011-2014 Member, Editorial Board, Environmental Development

2013- Member, Editorial Board, American Journal of Industrial Medicine

**Study Sections, Review Panels, and Related Advisory Boards**

1980-1984 Member, Toxicology Study Section, National Institutes of Health; Chairman, 1982-1984

1987-1992 Member, Health Review Committee, Health Effects Institute

- 1992-2000 Chair, Research Committee, Health Effects Institute
- 2008- 2010 Member, Environmental Health Centers Review Panel, Environmental Health Foundation, Israel

### **Leadership in Professional Organizations and Honorary Societies**

- 1981-1982 Member, Organizing Committee, International Symposium on Biomedical Effects of Ozone and Related Photochemical Oxidants
- 1983 Member, Executive Committee, American Board of Toxicology, Inc.
- 1986-2006 Scientific Advisor, Risk Science Institute, International Life Sciences Institute
- 1988-1991 Member, Board of Directors, Chemical Industry Institute of Toxicology
- 1988-1990 Member, Society of Toxicology, Public Communications Committee
- 1988-1996 Member, Board of Directors, Lovelace Biomedical and Environmental Research Institute, Inc.
- 1989-1995 Vice Chair, Scientific Group on the Methodology for the Safety Evaluation of Chemicals
- 1989-1992 Council Member, The Oxygen Society
- 1990-1993 Member, Board of Trustees, Nutrition Foundation, International Life Sciences Institute
- 1990-1999 Member, Committee of Science Advisors, Institute for Evaluating Health Risks (IEHR).
- 1990-1994 Member, Scientific Advisory Committee, The Workplace Health Fund
- 1991-1993 Member, Advisory Council on Health Promotion, American Council of Life Insurance
- 1991-1992 President, Association of University Environmental Health Sciences Centers
- 1991-1999 Advisory Council, Committee for the National Institute for the Environment
- 1992-2005 Board of Trustees, International Life Sciences Institute
- 1992-1995 Member and Chair, Research Committee, Association of Teachers of Preventive Medicine

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| 1996-      | Board Member, World Information Transfer (UN-accredited NGO)  |
| 1996-2001  | Chair, Scientific Group on the Methodologies for the Safety Evaluation of Chemicals; Scientific Committee on Problems of the Environment  |
| 1996-1999  | Member, Enterprise for the Environment, Center for Strategic and International Studies  |
| 1996-1998  | Member, Task Force on Human Research Policy, International Life Sciences Institute  |
| 1998-2006  | Member, Executive Committee and Cluster Coordinator, Human Health and the Environment Group; Treasurer (2000); Second Vice President (2001-); Scientific Committee on Problems of the Environment |
| 1999-2001  | Member, Board of Directors, New Jersey Association for Biomedical Research  |
| 2003       | President, Society for Risk Analysis  |
| 2003       | Co-Chair, Government & Public Affairs Committee – Council of Scientific Society Presidents  |
| 2003 -     | Member, Board of Directors, Mickey Leland National Urban Air Toxics Research Center   |
| 2005-2006  | Member, Board of Trustees, International Life Sciences Institute Research Foundation  |
| 2005 -2007 | Chair, Communications Strategy Committee, Society of Toxicology   |
| 2005       | Member, National Board of Public Health Examiners (Chair, 2005-2007)  |
| 2006-2007  | Member, Planning Committee for the 7 <sup>th</sup> National Conference on Science, Policy and the Environment: Integrating Environmental and Human Health   |
| 2008-      | Member, Planning Committee, International Symposium on Benzene Toxicity and Leukemia, To Be Held in Munich, Germany; September 2009   |
| 2009-2010  | Poster Session Judge, Society of Toxicology Annual Meeting, Baltimore, Maryland, December, 2009.  |
| 2009-2016  | Member and Board Chair, Foundation to Advance Public Health Through Certification   |
| 2010-2011  | Member, Society of Toxicology Communications Committee, Working Group on Deepwater Horizon  |

- 2013-2014      Chair, Society of Toxicology Communications Committee, Working Group on Hydrofracturing
- 2017-            Member, Board of Directors, Center for Responsible Shale Development, Pittsburgh, PA
- 2017-            Member, Dean's Advisory Council, Rutgers School of Public Health
- 2018-            Member, External Advisory Board, Environmental and Occupational Health Sciences Institute, Rutgers University

### **Service to Governmental and Other Public Organizations**

- 1980            Committee Member, National Academy of Sciences, Committee on Research Needs on the Health Effects of Fossil Fuel Combustion Products
- 1980            Committee Member, National Academy of Sciences, Committee on Alkyl Benzene Derivatives
- 1980            Member, Health Systems Agency of New York City, Working Group on Environmental and Occupational Health
- 1980            Consultant, US Environmental Protection Agency, Review of Hematological Effects of Benzene in Man
- 1980-1983      Member, State of New Jersey Governor's Science Advisory Committee
- 1980-1981      Member, US Environmental Protection Agency Clean Air Scientific Advisory Committee Subcommittee on Health Effects of Sulfur Oxides and Particulates
- 1980-1981      Member, US Environmental Protection Agency Clean Air Scientific Advisory Committee Subcommittee on Health Effects of Nitrogen Oxides
- 1981-1983      Member, Committee on Sampling Strategies, Board of Toxicology and Environmental Health Hazards, National Academy of Sciences/ National Research Council
- 1982-1983      Chairman, Clean Air Scientific Advisory Committee, US Environmental Protection Agency
- 1982            Member, National Academy of Sciences Briefing Panel on Urgent Research Opportunities on Human Health Effects of Hazardous Exposures

- 1982-1983 Chairman, Committee on Vapor Phase Organics from Diesels, National Academy of Sciences/National Research Council
- 1982-1983 Member, Board on Toxicology and Environmental Health Hazards, National Academy of Sciences/National Research Council
- 1983 Member, Science Advisory Board, US Environmental Protection Agency
- 1985-1987 Member, Working Group on Air Quality Guidelines for Major Urban Air Pollutants, and Editorial Consultation Group, World Health Organization
- 1986-1989 Chair, Institute of Medicine, National Academy of Sciences, Committee on Fostering the Role of Primary Care Practitioners in Occupational and Environmental Health
- 1987-1989 Member, Board on Environmental Science and Toxicology, National Academy of Sciences/National Research Council
- 1987-1990 Chair, Committee on Biological Markers, National Research Council/National Academy of Sciences
- 1987-1989 Member, Long Range Planning Advisory Committee, US Environmental Protection Agency; Chair, Exposure Assessment Subcommittee; Co-Chair, Health Research Subcommittee
- 1987-1991 Member, National Advisory Environmental Health Sciences Council, National Institutes of Health
- 1988-1989 Chair, Science Advisory Board, Dioxin Panel, US Environmental Protection Agency
- 1989-1991 Chair, Institute of Medicine, National Academy of Sciences, Committee on Enhancing the Role of Primary Care Practitioners in Environmental and Occupational Health
- 1989-1993 Chair, Committee on Risk Assessment Methodology, National Research Council, Commission on Life Sciences
- 1990-1992 Member, WHO Commission on Health and Environment; Chair, Panel on Industrialization
- 1991 Member, IARC Working Group on the Evaluation of Carcinogenic risks to humans: Occupational Exposures to Mists and Vapours from Strong Inorganic Acids; and Other Industrial Chemicals. Lyon, 15-22 October 1991
- 1992-1998 Member, Dow Chemical Company, Corporate Environmental Advisory Committee

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| 1992-1998  | Member, Presidential/Congressional Risk Assessment and Risk Management Commission   |
| 1993-1994  | Chair, Letterman Design Group, National Park Service, Presidio, San Francisco, California   |
| 1993-1995  | Member, New Jersey Environmental Risk Assessment and Risk Management Study Commission   |
| 1993- 2000 | Member, Advisory Board, Center for Communications, Health and the Environment   |
| 1994-1995  | Member, Environmental Management Advisory Board, Department of Energy   |
| 1994-1996  | Chair, Scientific Advisory Committee, Environmental Hazards Research Center, East Orange VA Medical Center  |
| 1994-1995  | Member, Legal Demonstration Project Steering Committee, American Association for the Advancement of Science   |
| 1995-1997  | Member, Standing Committee on Program and Technical Review of the U.S. Chemical and Biological Defense Command, Board on Army Science and Technology, National Research Council |
| 1995-2001  | Member, Green and Gold Task Force, Department of Environmental Protection, State of New Jersey  |
| 1996       | Chair, IARC Working Group on the Evaluation of Carcinogenic Risks to Humans: Wood Dust and Formaldehyde. Lyon, France   |
| 1996-1998  | Chair, Subcommittee on Environmental Health and Risk Assessment, Membership Committee, Institute of Medicine  |
| 1996-1999  | Member, Committee on Environmental Justice: Research, Education, and Health Policy Needs, Institute of Medicine   |
| 1996-1999  | Chairman, Section 9: Public Health, Biostatistics, and Epidemiology, Institute of Medicine  |
| 1997-1999  | Chairman, Committee on Evaluation of EPA Guidelines for Exposure to Naturally-Occurring Radioactive Materials, National Research Council  |
| 1999-      | Member, Roundtable on Environmental Health Sciences, Research and Medicine, Institute of Medicine, National Academies of Science  |
| 1999-2001  | Member, National Environmental Justice Advisory Council, Subcommittee on Health and Research, U.S. Environmental Protection Agency  |

- 1999-2006 Board Member, Health Sciences Policy, Institute of Medicine, National Academies of Science
- 1999-2001 Member, Council of Academic Policy Advisors, 2000-2001 Legislative Session, New Jersey State Legislators
- 2000- Member, Panel on Court Appointed Scientific Experts, American Association for the Advancement of Science
- 2000- Member, CECHE Council, Center for Communications, Health and the Environment
- 2002-2005 Member, National Advisory Environmental Health Sciences Council, National Institute of Environmental Health Sciences
- 2002 - Member, Planning Consortium, National Environmental Public Health Tracking Program, Pennsylvania Department of Health
- 2002- 2008 Member, Tobacco Prevention and Cessation Advisory Board, Pennsylvania Department of Health
- 2003 -2005 Member, Allegheny County Health Department – Board of Health Evaluation and Strategic Planning Committee/Advisory Committee
- 2004 Member, Working Group on the *IARC Monographs on the Evaluation of Carcinogenic Risks to Humans*, Volume 88, *Formaldehyde, 2-Butoxyethanol and propylene glycol mono-t-butyl ether*
- 2004 Chair, Workshop on Environmental Causes of Emerging and Re-emerging Infections. Joint collaboration of the Scientific Committee on Problems of the Environment (SCOPE) and the United Nations Environmental Programme; Pittsburgh
- 2004 Consultant, Ad Hoc Expert Consultation on the United Nations Environmental Programs' Fourth Global Environment Outlook Report. United Nations Environmental Programs.
- 2004- Member, PA Department of Health Technical Advisory Group, Environmental Public Health Tracking Program
- 2005 Member, Commonwealth of Pennsylvania Governor's Office of Health Care Reform, Accessible, Cost-Effective Publicly Funded Health Care Panel
- 2005 Chair, Peer Consultation Workshop on Research Needs Related to the IRIS Draft Toxicological Review of Naphthalene

- 2005 - External Contributor, United Nations Environment Programme – Division of Early Warning and Assessment
- 2005-2007 Chair, National Board of Public Health Examiners
- 2006-2007 Chair, Institute of Medicine Committee to Review the Hearing Loss Prevention Research Program of the National Institute of Occupational Safety and Health
- 2006 Chair, External Peer Review Committee of the Division of Toxicology and Environmental Medicine; Agency for Toxic Substances and Disease Registry
- 2006 Chair, Workshop on Environmental Implications of Nanotechnology. Joint collaboration of the Scientific Committee on Problems of the Environment (SCOPE) and the United Nations Environmental Programme, Paris, France
- 2006-2008 Member, Institute of Medicine Committee on Evaluation of the VA’s Presumptive Disability Decision-Making Process
- 2006 Member, Global Environmental Outlook-4 Consultation Committee for the North America Region; United Nations Environmental Programme
- 2006 Member, NIEHS Metrics Experts Panel; Batelle
- 2006-2007 Member, Pennsylvania Economy League; Issues PA Advisory Committee on Health Care
- 2007-2009 Chair, Standing Committee on Risk Analysis Issues and Reviews, National Academies of Science, National Research Council
- 2007 Member, Advisory Committee, United States Environmental Protection Agency Nanotechnology Project.
- 2007- 2009 Chair, Institute of Medicine Interest Group on Environmental and Occupational Health and Toxicology
- 2007-2009 Committee member, International Society of Exposure Analysis Panel on Response to Disasters
- 2008 Invited Participant, Partnerships for Environmental Public Health, National Institute of Environmental Health Sciences
- 2008 Member, IOM EHSRT Working Group on Environmental Modeling
- 2008 Planning Committee, National Academies of Science Board on International Scientific Organizations Symposium on Geosciences and Health
- 2008–2009 Planning Committee, International Meeting on Benzene



- 2008-2009 Member, Union of Concerned Scientists, Scientists and Economists' Call
- 2008 Member, Society for Risk Analysis Awards Committee
- 2008 Member, Commission's Advisory Committee on Pennsylvania's Public Health Law.
- 2009 Member, Israel Environment and Health Fund Visiting Committee
- 2009 Participant, International Agency for Research on Cancer and U.S. National Institute of Occupational Safety and Health Meeting on Research Recommendations for Selected IARC-Classified Agents.
- 2009 Chair, Planning Committee, and Conference Moderator; Allegheny County Air Toxics Information Conference
- 2009 Participant, Review of Human Carcinogens – Part F: Chemical Agents and Related Occupations
- 2009 Member, Union of Concerned Scientists, Subcommittee on Global Climate Change (PA)
- 2009- Member, IOM EHSRT Working Group for Workshop on Curriculum Development
- 2009- Member, Planning Committee, Institute of Medicine (IOM) Interest Group on Environmental & Occupational Health, Toxicology (IG14)
- 2009- Member, Public Health Laws Study – Disease Prevention and Health Promotion Subcommittee, Commonwealth of PA Joint State Government Commission
- 2009 Chair, Biowatch and Public Health Surveillance. Evaluating Systems for the Early Detection of Biological Threats. Institute of Medicine and National Research Council of the National Academies
- 2009-2010 Member; NIEHS Deputy Director Search Committee
- 2010 Member, Planning Committee and Discussion Facilitator, IOM Roundtable on EHSRT Workshop of Reframing Environmental Health for the 21<sup>st</sup> Century; Session on “Extending Our Reach – Fostering Collaboration Across Domains of Environmental Health”
- 2010 Chair, United Nations Environmental Program Scoping Exercise on Emerging Environmental Issues for the UNEP Yearbook, Paris, May, 2010
- 2010- Member, Regulation of Air Toxics in Allegheny County New Guidelines Proposal Committee

- 2010- Member, National Academy of Sciences Planning Committee for Workshop on Sustainability Linkages
- 2010- Member, National Academy of Sciences Roundtable, Sustainability in the Federal Government
- 2010- Member, Rand National Health Securities Strategy Subcommittees on Workforce and on Preparedness
- 2010-2011 Chair, National Research Council Committee on Sustainability at the Environmental Protection Agency
- 2011 Member, Advisory Committee, National Conference on Science Policy and the Environment, Washington, DC January 18-20, 2012
- 2012-13 Chair, Coordinating Committee, Gulf Region Health Outreach Program, New Orleans, LA
- 2012 -2014 Panelist, Council of Canadian Academies Expert Panel on Harnessing Science and Technology to Understand the Environmental Impacts of Shale Gas Extraction
- 2012 Member, Planning Committee, Institute of Medicine Interest Group on Environmental and Occupational Health and Toxicology
- 2013-2014 Member, Committee on Risk Management and Governance Issues in Shale Gas Development. National Research Council
- 2013-2015 Fellow, Scientific Advisory Council. New Brunswick Energy Institute.
- 2013-2017 Member. DOW Chemical Company, Sustainability External Advisory Committee
- 2013- Member, Coordinating Committee, Gulf Region Health Outreach Program, New Orleans, LA
- 2013- Member, Institute of Medicine, Environmental and Occupational Health and Toxicology Interest Group, Washington, D.C.
- 2013-2014 Member, National Academies of Science, Advisory Group on the Gulf Research Program
- 2013- Chair, National Academy of Sciences, National Research Council Committee on Considerations for the Future of Animal Science Research
- 2014 Member, Planning Committee, Salk Centennial, Pittsburgh, PA

- 2014 Member, Planning Committee, Use of Risk Assessment and Risk Informed Management in the Department of Energy, Office of Environmental Management's Cleaning Program for Former Defense Nuclear Sites
- 2014 Member, Review Panel, EPA PathFinder Innovation Projects
- 2014-2017 Member, Advisory Board. National Academies of Science Gulf Research Program
- 2015 Invited Participant, National Academies of Sciences. Scoping Sessions: Housing, Health and Homelessness, Washington DC
- 2017 Member, Allegheny County Lead Task Force
- 2017 Member, National Academies of Science, Committee on the Use of Chemical Dispersants in Oil Spill Response

### **Service to Community-Based Organizations**

- 2003 - Member, Scientific Advisory Board, Group Against Smog and Pollution
- 2007-2013 Member, Environmental Committee, United Jewish Federation of Pittsburgh
- 2007-2009 Member, Advisory Board, Pittsburgh Schweitzer Fellows Program
- 2012-2013 Member, Environmental Fellows Advisory Board, Pittsburgh Schweitzer Fellows Program