
BIOGRAPHICAL SKETCH

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NAME: Howard M. Kipen

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POSITION TITLE: Environmental and Occupational Health; Director, Clinical Research and Occupational Medicine

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
University of California, Berkeley	B.A.	12/1975	Neurobiology
University of California, San Francisco	M.D.	6/1979	Medicine
Columbia University, New York	M.P.H.	6/1983	Environmental Health
Presbyterian Hospital, New York		6/1982	Intern/Resident, Medical Service
Mt. Sinai Medical Center, New York		6/1984	Resident, Occupational & Community Medicine, Environmental Sciences Laboratory

A. Personal Statement

I am Professor in the Department of Environmental & Occupational Health and Justice at Rutgers School of Public Health and Director of the Division of Clinical Research & Occupational Medicine at the Rutgers Environmental & Occupational Health Sciences Institute (EOHSI). I also direct the Translational Research Support Core (TRSC) of our NIEHS Core Center, which has a staff of 3 clinical research assistants as well as a PhD coordinator. My division houses our Clinical Center for Environmental & Occupational Health, which currently follows 6,000 Rutgers employees, 5,000 World Trade Center Rescue and Recovery Workers, and about 1,000 annual visits for routine surveillance or research participation. Relevant services of the TRSC include 1) subject recruitment, screening, care, and maintenance, and IRB coordination; 2) sample collection, accessioning and archiving. Examining heterogeneous environmental exposures and outcomes, my previous human subject studies have included exposures in our Controlled Environmental Facility (CEF) or on the NJ Turnpike to secondary organic aerosols, diesel exhaust (Kipen et al., 2011), hydrogen sulfide, and VOC mixtures. These have been done in healthy, diabetic, asthmatic, chemically sensitive, veteran, and COPD subjects. I have also been involved in studies analyzing human pulmonary and cardiovascular effects of real-world air pollution exposure (Rich et al., 2012; Laumbach et al., 2014). This has included analysis of traffic-related air pollution, World Trade Center dust, and the impact of the reduction in air pollution during the Beijing Olympics. Endpoints that we typically assess include neurobehavioral function, pulmonary and cardiovascular function, inflammation, and oxidative stress. A recently completed supplemental grant from NIEHS demonstrated the use of portable air cleaners to reduce levels of Covid 19 virus aerosols in patient homes. I am co-investigator for clinical studies on a grant to explore ozone-induced effects on sputum macrophage phenotypes (D. Laskin, PI). A current project examines inflammatory mechanisms for the experimental findings that acute exposure to moderate levels of carbon dioxide lead to cognitive impairment in healthy humans. As the founding director of the IHSFC/TRSC I am familiar with the staff and capabilities, and I welcome the opportunity to expand our portfolio of studies to support an even greater emphasis on translational, community- engaged studies of populations burdened by environmental exposures, with attention to implementation of relevant findings.

Select citations relevant to the current proposal:

- a) Rich, D.Q., Kipen, H.M., Huang, W., Wang, G., Wang, Y., Zhu, P., Ohman-Strickland, P., Hu, M., Philipp, C., Diehl, S.R., Lu, S.E., Tong, J., Gong, J., Thomas, D., Zhu, T., Zhang, J. (2012). Association

between changes in air pollution levels during the Beijing Olympics and biomarkers of inflammation and thrombosis in healthy young adults. Journal of American Medical Association, 307, 2068-2078. PMID: PMC4049319

- b) Hussain, S., Laumbach, R., Coleman, J., Youssef, H., Kelly-McNeil, K., Ohman-Strickland, P., Zhang, J., & Kipen, H.M. Controlled Exposure to Diesel Exhaust Causes Increased Nitrite in Exhaled Breath Condensate among Subjects with Asthma. J Occup Environ Med 54(10): 1186-91, Oct 2012. PMID: PMC4443752.
- c) Pettit, A.P., Kipen, H., Laumbach, R., Ohman-Strickland, P., Kelly-McNeil, K., Cepeda, C., Fan, Z-H., Amorosa, L., Lubitz, S., Schneider, S., Gow, A. Disrupted nitric oxide metabolism from Type II diabetes and acute exposure to particulate air pollution. PLoS One, 10(12): e0144250. PMID: PMC4682772
- d) Myers NT, Laumbach RJ, Black KG, Ohman-Strickland P, Alimokhtari S, Legard A, De Resende A, Calderón L, Lu FT, Mainelis G, Kipen HM. Portable air cleaners and residential exposure to SARS-CoV-2 aerosols: A real-world study. Indoor Air. 2022 Apr;32(4):e13029. doi: 10.1111/ina.13029. PMID: PMC9111720.

Ongoing Research Support:

Department of Veterans Affairs 36C24519C0225 9/30/19-9/30/23 Burn Pit Exposure and Post Deployment Dyspnea Role: PI.

NIH/CATS UL1TR003017 Panettieri (PI) 3/11/19-2/29/24 New Jersey Alliance for Clinical and Translational Science (CTSA)

Dr. Kipen is co-director of patient and clinical interactions and directs the EOHSI Clinical Research Unit Role: Co-I

NIOSH U100H008239 Udasin (PI) 4/01/17-03/31/22 Clinical Center for Monitoring Health in WTC Responders. Role: Co-I

NIH 5P30 ES005022 Zarbl (PI) 04/01/19-03/31/24 NIEHS Center for Environmental Exposures and Disease – Integrated Health Sciences Facility Core (IHSFC) Role: P.I. of IHSFC.

NIEHS 1 R21 ES033777 08/23/2022 – 07/31/2024 Acute Cognitive Impairments Following Exposure to Inhaled CO₂: Translating Mouse Mechanisms to Humans. Role: PI

NIEHS 1 R01 004738 D. Laskin (PI) 7/1/2022 – 6/30/2027 Activated Macrophages and Ozone Toxicity: Role: Co-I

B. Positions, Scientific Appointments, and Honors

- 1984 - current Assistant/Associate/Full Professor (tenured) , Department of Environmental and Occupational Health and Justice. Rutgers University School of Public Health (joint appointments in Rutgers - Robert Wood Johnson Medical School: Departments of Medicine and Family Medicine)
- 2007–2017 Chair (Interim), Department of Environmental and Occupational Medicine, Rutgers (formerly UMDNJ)-Robert Wood Johnson Medical School
- 2001–2003 Acting Chair, Department of Environmental and Occupational Medicine, Rutgers
- 1994– Director, Clinical Research and Occupational Medicine Division, Environmental and Occupational Health Sciences Institute (EOHSI)
- 1987– Resident Member, Rutgers Environmental and Occupational Health Sciences Institute (EOHSI)
- 1985 Member, Graduate Faculty, Rutgers University (Public Health, Environmental Science, Toxicology)

Other Recent Activities including Participation in Federal Committees (since 1995)

- 2021- Workshop Co-Chair Health consequences and the relative contribution of indoor versus outdoor pollutants. An official American Thoracic Society workshop
- 2020- Position Document Committee on CO₂. American Society of Heating Refrigeration, and Air Conditioning Engineers (ASHRAE).
- 2019- Co-Director, Patient and Clinical Interactions Core, Rutgers Clinical and Translational Science Award (CTSA)
- 2017-2019 Chair, American Thoracic Society, Assembly on Environmental, Occupational, and Population Health

- 2016- 2019 Member, National Academies Standing Committee on Medical and Epidemiological Aspects of Air Pollution on U.S. Government Employees and their Families
- 2015-2017 Co-chair, American Thoracic Society Ad Hoc Committee on What Constitutes an Adverse Health Effect of Air Pollution. Update 3
- 2013–2014 Member, Committee on Developing a Case Definition for Complex Multisystem Illness in Veterans of the 1990-1991 Gulf War, Institute of Medicine
- 2012- Member, Scientific Advisory Committee, Pacific Northwest Agricultural Safety and Health Center, University of Washington School of Public Health
- 2012 Chair, Clinical Trials Award Committee, Gulf War Illness Research Program, Congressionally Directed Medical Research Programs
- 2011 Chair, Clinical Trials Award Committee, Gulf War Illness Research Program Congressionally Directed Medical Research Programs
- 2009–2015 Chair, NASA Human Research Program's Advanced Environmental Health/Advanced Food Technology Standing Review Panel
- 2008 Chair Clinical Trials Award Committee, Department of Defense, CDMRP
- 2004, 2006 Chair, NIEHS K23 Mentored Patient-Oriented Research Career Development Award Review Committee
- 2003–2007 Member, National Academies of Science Subcommittee on Emergency and Continuous Exposure Guidance Levels for Selected Submarine Contaminants (Primary author on CO₂ and Benzene chapters)
- 1998–1999 Chair, Committee on Toxicology and Environmental Health Information Resources for 1998–1999 Chair, Committee on Internet Access to the National Library of Medicine's Toxicology/ Environmental Health Databases. Institute of Medicine Health
- 1997–1998 Member, Gulf War Expert Scientific Advisory Committee. Department of Veterans' Affairs Professionals, Institute of Medicine
- 1997 Chair, Special Review Committee for Environmental/Occupational Medicine Academic Awards. NIEHS

Honors

- 1992 Adolph G. Kammer Merit in Authorship Award, American College of Occupational and Environmental Medicine
- 1992-1997 Environmental/Occupational Medicine Academic Award (K07), National Institute of Environmental Health Sciences
- 1978 Alpha Omega Alpha

C. Contributions to Science

1. Medically Unexplained Symptoms and the Environment

From 1988 to approximately 2006, I actively investigated epidemic outbreaks and endemic prevalence of medically unexplained symptoms, not explained by traditional medical diagnoses, and how such symptoms might be caused or exacerbated by environmental factors. Mostly together with colleague Nancy Fiedler, Ph.D., we studied and helped to define the syndrome known as Multiple Chemical Sensitivities (MCS) and its relation to Chronic Fatigue Syndrome, psychiatric illness, sick building syndrome, odors and odor perception, and clinical and immunologic biomarkers. We received funding from NIOSH and NIEHS to support this work and related international conferences, which we organized. Because of similarities between the unexplained symptoms of the 1990-1991 Gulf War Illness and MCS we conducted a number of controlled exposure and epidemiologic survey research studies on Gulf War veterans and controls, identifying an excess of psychiatric morbidity, and long persistence of severe unexplained symptoms, as well as some physiologic and symptomatic responses to diesel odors in the veterans, but surprisingly not a great excess of MCS symptoms. The Gulf War work was funded by CDC, VA, and DOD, the latter study being a controlled exposure to diesel exhaust which failed to show an interaction between fresh diesel exhaust exposure and experimental stress. I have served on many federal committees related to unexplained symptoms research including IOM's Gulf War and Health Committee, volume 10. As a direct result of my familiarity with military exposures I was also lead author for the CO₂ and benzene chapters of the 2007 NAS report: "Emergency and Continuous Exposure Guidance Levels for Selected Submarine Contaminants" as well as current PI on a large VA contract to investigate pulmonary abnormalities in soldiers exposed to "burn pits".

1. Kipen, H.M., & Fiedler, N. (2002). The role of medically unexplained symptoms and related syndromes: Conference summary and recommendations. *Environmental Health Perspectives*, 110 Supplement 4, 591-596. PMID: PMC1241210
2. Fiedler, N., Laumbach, R., Kelly-McNeil, K., Liroy, P., Fan, Z.H., Zhang, J., Ottenweller, J., Ohman-Strickland, P., Kipen, H. (2005). Health effects of a mixture of indoor air volatile organics, their ozone oxidation products, and stress. *Environmental Health Perspectives*, 113,1542-1548. PMID: PMC1310916.
3. Fiedler, N., Ozakinci, G., Hallman, W., Wartenberg, D., Brewer, N.T., Barrett, D.H., & Kipen, H.M. (2006). Military deployment to the Gulf War as a risk factor for psychiatric illness among US troops. *British Journal of Psychiatry*, 188, 453-459. PMID: 16648532
4. Ozakinci, G., Hallman, W.K., & Kipen, H.M. (2006) Persistence of symptoms in veterans of the first Gulf war: 5-year follow-up. *Environmental Health Perspectives*, 114(10),1553-1557. PMID: PMC1626433.

2. Controlled and Experimental Field Studies of Mechanistic Biomarkers of Ambient, Traffic-related and Indoor Air Pollution Conducting the above-controlled exposure studies to elucidate unexplained symptoms piqued my interest in the power of experimental exposure designs to investigate acute and subacute effects of ambient and indoor air pollutants, both in controlled chambers and in the field. I made a conscious shift in my research focus from working on unexplained symptoms to working on explanations for the observational epidemiology of acute effects of ambient and traffic air pollution. Simply put, multiple case-crossover and time series studies show that the incidence of MI, stroke, and other adverse cardiovascular events goes up rapidly, within 1 to 24 hours of exposure to traffic pollution. Our overall research goal is to seek mechanistic support for such rapid clinical outcomes. We hypothesized that changes in oxidative stress, inflammation, and coagulation could all be prothrombotic and explain the acute development of adverse CV endpoints. Initially, our experimental work was done in the controlled exposure facility with diesel exhaust and other aerosols showing proteasome activity changes within hours of diesel or secondary organic aerosol exposure. Since then we have completed an HEI and NIEHS-funded large field study during the Beijing Olympics where I was responsible for biomarker development and interpretation. We showed that regulatory lowering of ambient pollution levels during the games resulted in a dramatic lowering of inflammatory, oxidative stress, and prothrombotic biomarker levels in the blood, breath, and urine of healthy subjects (Rich et al., 2012; Huang et al., 2012). More practically, we have studied the effect of a 2-hr simulated commuter drive on the New Jersey Turnpike and demonstrated increased oxidative stress in exhaled breath condensate and disrupted nitric oxide metabolism in separate subject groups (Laumbach et al., 2014; Pettit et al., 2015; Patton et al., 2016). More recently, we have completed data collection for a study of indoor air filter effectiveness to reduce concentrations of indoor particle pollutants. This has led to our current trial of air cleaners to reduce SARS CoV-2 levels in infected patients' homes (Laumbach et al, 2022; Myers et al., 2022.).

1. Patton, A.P., Laumbach, R., Ohman-Strickland, P, Black, K., Alimokhtari, S., Liroy, P., Kipen, H.M., Scripted drives: A robust protocol for generating exposures to traffic-related air pollution. *Atmospheric Environment*, (2016) 143:290-299,doi 10.1016/j.atmosenv.2016.08.038. Epub 2016. PMID: PMC5019181.
2. Huang, W., Wang, G., Lu, S., Kipen, H.M., Wang, Y., Hu, M., Lin, W., Rich, D., Ohman-Strickland, P., Diehl, S.R., Zhu, P., Tong, J., Gong, J., Zhu, T., & Zhang, J. (2012) Inflammatory and oxidative. *Am. J Respiratory and Critical Care Medicine*, 186(11): 1150-59, 2012. PMID: PMC3530204.
3. Myers NT, Laumbach RJ, Black KG, et al. Portable air cleaners and residential exposure to SARS-CoV-2 aerosols: A real-world study. *Indoor air*. 2022;32(4):e13029. PMID: PMC9111720
4. Laumbach, R.J., Mainelis, G., Black, K.G., Myers NT, Ohman-Strickland P, Alimokhtari S, Hastings S, Legard A, De Resende A, Calderón L, Lu FT, **Kipen HM**. (2021). Presence of SARS-CoV-2 aerosol in residences of adults with COVID-19. *Ann Am Thorac Soc*. 2022 Nov 11. PMID: PMC8867362

Complete List of Published Work in My Bibliography:

<https://www.ncbi.nlm.nih.gov/myncbi/howard.kipen.1/bibliography/public/>