Attachment A

Experience of Panelist/Speakers for IRIS Workshop by Proposed Topic

Evidence of Lymphohematopoietic Cancers from Epidemiological Studies

Harvey Checkoway, PhD is a Professor of Epidemiology in the Division of Global Health, Department of Family and Preventive Medicine, San Diego School of Medicine, University of California. He was previously Professor (1992-2013) and Associate Professor (1987-1991) of Environmental and Occupational Health Sciences and Epidemiology at the University of Washington (UW), and a faculty member in the Epidemiology Department at the University of North Carolina (1980-87). His main areas of research and teaching are occupational and environmental risk factors for chronic diseases, especially cancer and neurologic disorders. Dr. Checkoway was Director of the Training Grant in Environmental and Molecular Epidemiology (1990-2007) funded by the National Institute of Environmental Health Sciences (NIEHS), and since 1998 has been Director of the UW Superfund Research Program, also funded by NIEHS. Dr. Checkoway is first author of a textbook on occupational epidemiology, "Research Methods in Occupational Epidemiology", New York: Oxford University Press (1st edition 1989, 2nd edition 2004), and has published over 200 papers in the peer-reviewed scientific literature. Dr. Checkoway served on the NAS Committee to Review EPA's Draft IRIS Assessment of Formaldehyde.

Checkoway H, Boffetta P, Mundt DJ, Mundt KA. Critical review and synthesis of the epidemiologic evidence on formaldehyde exposure and risk of leukemia and other lymphohematopoietic malignancies. Cancer Causes Control 23(11):1747-1766. PMID: 22983399

Li W, Ray RM, Thomas DB, Yost M, Davis S, Breslow N, Gao DL, Fitzgibbons ED, Camp JE, Wong E, Wernli KJ, Checkoway H. 2013. Occupational exposure to magnetic fields and breast cancer among women textile workers in Shanghai, China. Am J Epidemiol. 178(7):1038-45. PMID: 24043439

Applebaum KM, Ray RM, Astrakianakis G, Gao DL, Thomas DB, Christiani DC, Lavalley MP, Li W, Checkoway H, Eisen EA. 2013. Evidence of a paradoxical relationship between endotoxin and lung cancer after accounting for left truncation in a study of Chinese female textile workers. Occup Environ Med. 70(10):709-1. PMID: 23759537

David Savitz, PhD. is Professor of Community Health, Epidemiology Section, and Obstetrics and Gynecology, Brown University. He has held faculty appointments at the University of Colorado School of Medicine, the University of North Carolina School of Public Health, where he served as the Carey C. Boshamer Distinguished Professor and Chair of the Department of Epidemiology, and as the Charles W. Bluhdorn Professor of Community and Preventive Medicine, and Director of Disease Prevention and Public Health Institute at Mount Sinai School of Medicine. His primary research activities and interests are in reproductive and

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environmental epidemiology. He was elected to membership in the Institute of Medicine (IOM) in 2007.

Savitz DA, Bobb JF, Carr JL, Clougherty JE, Dominici F, Elston B, Ito K, Ross Z, Yee M, Matte TD. 2013. Ambient Fine Particulate Matter, Nitrogen Dioxide, and Term Birth Weight in New York, New York. Am J Epidemiol. Nov 10. [Epub ahead of print]. PMID: 28218031

Savitz DA, Stein CR, Bartell SM, Elston B, Gong J, Shin HM, Wellenius GA. 2013. Perfluorooctanoic acid exposure and pregnancy outcome in a highly exposed community. Epidemiology. 23(3):386-92. PMID: 22370857

Savitz DA, Danilack VA, Engel SM, Elston B, Lipkind HS. 2013. Descriptive Epidemiology of Chronic Hypertension, Gestational Hypertension, and Preeclampsia in New York State, 1995-2004. Matern Child Health J. Jun 22. [Epub ahead of print]. PMID: 23793484

Aaron Blair, Ph.D., MPH joined the National Cancer Institute (NCI) as a Staff Fellow in 1976. He was appointed to head the Occupational Studies Section in 1978 and became Chief of the group when it became a branch in 1996. He retired from the NCI in 2007. Since then he has had a Scientist Emeritus appointment at NCI and he served as the Interim Director of the Occupational Cancer Research Centre in Toronto in 2009 and 2010. He has served on many IARC Monograph Working Groups, the Board of Scientific Counselors for the National Toxicology Program, Advisory Board for Jacksonville State Study of Environmental Pollution, and Ontario Independent Fact Finding Panel into the Use of 2,4,5-T Herbicide, among others. Dr. Blair has authored more than 400 publications on occupational and environmental causes of cancer.

Beane Freeman LE, Blair A, Lubin JH, Stewart PA, Hayes RB, Hoover RN, Hauptmann M. 2013. Mortality from solid tumors among workers in formaldehyde industries: an update of the NCI cohort. Am J Ind Med. 56(9):1015-26. PMID: 23788167

Hauptmann M, Stewart PA, Lubin JH, Beane Freeman LE, Hornung RW, Herrick RF, Hoover RN, Fraumeni JF Jr, Blair A, Hayes RB. 2009. Mortality from lymphohematopoietic malignancies and brain cancer among embalmers exposed to formaldehyde. J Natl Cancer Inst. 101(24):1696-708. PMID: 19933446

Beane Freeman LE, Blair A, Lubin JH, Stewart PA, Hayes RB, Hoover RN, Hauptmann M. 2009. Mortality from lymphohematopoietic malignancies among workers in formaldehyde industries: the National Cancer Institute Cohort. J Natl Cancer Inst. 101(10):751-61. PMID: 19436030

Laura Beane Freeman, Ph.D. completed her doctorate in epidemiology at the University of Iowa in 2003, after which she joined the Cancer Prevention Fellowship Program at NCI. Dr. Beane Freeman conducted her post-doctoral training within the Occupational and Environmental Epidemiology Branch where she became a Research Fellow in 2006. In 2009, Dr. Beane Freeman was appointed to the position of tenure-track investigator. Her research has

been recognized with Fellows Awards for Research Excellence from both the National Institutes of Health (NIH) and the Division of Cancer Epidemiology and Genetics.

Beane Freeman LE, Blair A, Lubin JH, Stewart PA, Hayes RB, Hoover RN, Hauptmann M. 2013. Mortality from solid tumors among workers in formaldehyde industries: an update of the NCI cohort. Am J Ind Med. 56(9):1015-26. PMID: 23788167

Hauptmann M, Stewart PA, Lubin JH, Beane Freeman LE, Hornung RW, Herrick RF, Hoover RN, Fraumeni JF Jr, Blair A, Hayes RB. 2009. Mortality from lymphohematopoietic malignancies and brain cancer among embalmers exposed to formaldehyde. J Natl Cancer Inst. 101(24):1696-708. PMID: 19933446

Beane Freeman LE, Blair A, Lubin JH, Stewart PA, Hayes RB, Hoover RN, Hauptmann M. 2009. Mortality from lymphohematopoietic malignancies among workers in formaldehyde industries: the National Cancer Institute Cohort. J Natl Cancer Inst. 101(10):751-61. PMID: 19436030

Characterization of Formaldehyde Exposure from Epidemiological Studies

Harvey Checkoway, Ph.D. (see above)

Patricia A. Stewart, Ph.D., Consultant, Stewart Exposure Assessments, LLC. (Consultation on exposure assessment and industrial hygiene, development of exposure metrics for study participants). For the last several years, Dr. Stewart has served as the lead industrial hygienist for NIH on the Diesel Study, the New England Bladder Cancer Study, the US Renal Cell Cancer Study, the NCI DCEG NHL Study, and the NCI DCEG Brain Cancer Study. Dr. Stewart has an in-depth knowledge of these studies through years of researching industries and occupations, working with lead epidemiologists, reviewing company records, and traveling to industrial sites.

Beane Freeman LE, Blair A, Lubin JH, Stewart PA, Hayes RB, Hoover RN, Hauptmann M. 2013. Mortality from solid tumors among workers in formaldehyde industries: an update of the NCI cohort. Am J Ind Med. 56(9):1015-26. PMID: 23788167

Hauptmann M, Stewart PA, Lubin JH, Beane Freeman LE, Hornung RW, Herrick RF, Hoover RN, Fraumeni JF Jr, Blair A, Hayes RB. 2009. Mortality from lymphohematopoietic malignancies and brain cancer among embalmers exposed to formaldehyde. J Natl Cancer Inst. 101(24):1696-708. PMID: 19933446

Beane Freeman LE, Blair A, Lubin JH, Stewart PA, Hayes RB, Hoover RN, Hauptmann M. 2009. Mortality from lymphohematopoietic malignancies among workers in formaldehyde industries: the National Cancer Institute Cohort. J Natl Cancer Inst. 101(10):751-61. PMID: 19436030

Peter Lees, Ph.D. is a Professor in the Department of Environmental Health Sciences, Johns Hopkins Bloomberg School of Public Health. Dr. Lees's research focus has been on occupational and environmental exposure assessment methodology and its application to epidemiologic studies of the relationship between chemical exposure and disease. Methodological questions

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of interest include the development of exposure assessment techniques and strategies useful for the retrospective reconstruction of exposures for epidemiologic analysis and determination of quantitative exposure-response relationships needed for risk assessment.

Lee NL, Samet JM, Yang G, Zhou M, Yang J, Correa A, Lees PS. 2012. Prenatal secondhand smoke exposure and infant birth weight in China Int J Environ Res Public Health. 9(10):3398-420. PMID: 23202753

Stewart PA, Lees PS, Correa A, Breysse P, Gail M, Graubard BI. 2003. Evaluation of three retrospective exposure assessment methods. Ann Occup Hyg. 47(5):399-411. PMID: 12855490

Stewart PA, Lees PS, Francis M. 1996. Quantification of historical exposures in occupational cohort studies. Scand J Work Environ Health. 22(6):405-14. PMID: 9000307

Pharmacokinetics of Formaldehyde

Harvey Clewell, III, Ph.D., DABT is a professional research manager at The Hamner Institutes for Health Sciences with more than 40 years of experience in environmental quality research, toxicology research, chemical risk assessment, and hazardous materials management. Dr. Clewell has gained an international reputation for his work in the application of physiologically-based pharmacokinetic (PBPK) modeling to safety and risk assessment, including uses by U.S. EPA, the Agency for Toxic Substances and Disease Registry (ATSDR), the Occupational Safety and Health Administration (OSHA), and the Food and Drug Administration (FDA).

Andersen ME, Clewell HJ 3rd, Bermudez E, Dodd DE, Willson GA, Campbell JL, Thomas RS. 2010. Formaldehyde: integrating dosimetry, cytotoxicity, and genomics to understand dose-dependent transitions for an endogenous compound. Toxicol Sci. 118(2):716-31. PMID: 20884683

Wetmore BA, Wambaugh JF, Ferguson SS, Li L, Clewell HJ 3rd, Judson RS, Freeman K, Bao W, Sochaski MA, Chu TM, Black MB, Healy E, Allen B, Andersen ME, Wolfinger RD, Thomas RS. 2013. Relative impact of incorporating pharmacokinetics on predicting in vivo hazard and mode of action from high-throughput in vitro toxicity assays. Toxicol Sci. 132(2):327-46. PMID: 23358191

Campbell JL Jr, Clewell RA, Gentry PR, Andersen ME, Clewell HJ 3rd. 2012. Physiologically based pharmacokinetic/toxicokinetic modeling. Methods Mol Biol. 929:439-99. PMID: 23007440

Rory Conolly, Ph.D., is a Senior Research Biologist in the U.S EPA's National Center for Computational Toxicology in Research Triangle Park. Dr. Conolly developed the published biologically-based dose-response model for formaldehyde. His major research interests are (1) biological mechanisms of dose-response and time-course behaviors, (2) the use of computational modeling to study these mechanisms, and (3) the application of computational models to quantitative dose-response assessment.

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Conolly RB, Kimbell JS, Janszen D, Schlosser PM, Kalisak D, Preston J, Miller FJ. 2003. Biologically motivated computational modeling of formaldehyde carcinogenicity in the F344 rat. Toxicol Sci. 75(2):432-47. PMID: 12857938

Conolly RB, Kimbell JS, Janszen D, Schlosser PM, Kalisak D, Preston J, Miller FJ. 2004. Human respiratory tract cancer risks of inhaled formaldehyde: dose-response predictions derived from biologically-motivated computational modeling of a combined rodent and human dataset. Toxicol Sci. 2004 82(1):279-96. PMID: 15254341

Miller FJ, Kimbell JS, Preston RJ, Overton JH, Gross EA, Conolly RB. 2011. The fractions of respiratory tract cells at risk in formaldehyde carcinogenesis. Inhal Toxicol. 23(12):689-706. PMID: 21888524

Melvin E. Andersen, CIH, Ph.D., DABT, FATS is a senior investigator at The Hamner Institutes for Health Sciences. During his 40-year career in toxicology and risk assessment, Dr. Andersen has developed biologically realistic models pertaining to the uptake, distribution, metabolism, and biological effects of toxic chemicals and drugs, and applied these models to safety evaluations and quantitative health risk assessments. He is recognized for developing short courses and computer demonstrations in both pharmacokinetic and pharmacodynamic modeling. His research has pioneered new uses of pharmacokinetic and mechanistic data in risk assessment programs.

Andersen ME, Clewell HJ 3rd, Bermudez E, Dodd DE, Willson GA, Campbell JL, Thomas RS. 2008. Genomic signatures and dose-dependent transitions in nasal epithelial responses to inhaled formaldehyde in the rat. Toxicol Sci. 118(2):716-31. PMID: 18499655

Thomas RS, Philbert MA, Auerbach SS, Wetmore BA, Devito MJ, Cote I, Rowlands JC, Whelan MP, Hays SM, Andersen ME, Meek ME, Reiter LW, Lambert JC, Clewell HJ 3rd, Stephens ML, Zhao QJ, Wesselkamper SC, Flowers L, Carney EW, Pastoor TP, Petersen DD, Yauk CL, Nong A. 2013. Incorporating New Technologies Into Toxicity Testing and Risk Assessment: Moving From 21st Century Vision to a Data-Driven Framework. Toxicol Sci. Sep 19. [Epub ahead of print] PMID: 23958734

Andersen ME, Clewell HJ 3rd, Bermudez E, Dodd DE, Willson GA, Campbell JL, Thomas RS. 2010. Formaldehyde: integrating dosimetry, cytotoxicity, and genomics to understand dose-dependent transitions for an endogenous compound. Toxicol Sci. 118(2):716-31. PMID: 20884683

Paul Schlosser, Ph.D., is a scientist with the National Center for Environmental Assessment. Dr. Schlosser is a member of the U.S. EPA PBPK Working Group, which reviews these types of models for quality and their application in IRIS assessments. He is also a published author in the application of PBPK models in risk assessment and approaches to cancer assessment in U.S. EPA's IRIS program.

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Thompson CM, Sonawane B, Barton HA, DeWoskin RS, Lipscomb JC, Schlosser P, Chiu WA, Krishnan K. 2008. Approaches for applications of physiologically based pharmacokinetic models in risk assessment. JToxicol Environ Health B Crit Rev. 11(7):519-47. PMID: 18584453

Gehlhaus MW 3rd, Gift JS, Hogan KA, Kopylev L, Schlosser PM, Kadry AR. 2011. Approaches to cancer assessment in EPA's Integrated Risk Information System. Toxicol Appl Pharmacol. 15;254(2):170-80. PMID: 21034767

McLanahan ED, White P, Flowers L, Schlosser PM. 2013. The Use of PBPK Models to Inform Human Health Risk Assessment: Case Study on Perchlorate and Radioiodide Human Lifestage Models. Risk Anal. doi: 10.1111/risa.12101. [Epub ahead of print]. PMID: 23901895

Defining the mode of action for lymphohematopoietic cancers

Luoping Zhang, Ph.D., is an adjunct Professor in the University of California at Berkeley School of Public Health, Division of Environmental Health Sciences. Dr. Zhang has multiple publications regarding the potential mode of action for lymphohematopoetic cancers following exposure to formaldehyde. Her research explores the molecular mechanisms of bone marrow toxicity caused by exposures to chemicals, such as benzene, formaldehyde, and trichloroethylene. Most recently, Zhang's group has investigated the biological consequences of these chemical exposures in her current population studies by applying a novel System Biology approach employed with high-throughput array-based omic technologies.

Ye X, Ji Z, Wei C, McHale CM, Ding S, Thomas R, Yang X, Zhang L. 2013. Inhaled formaldehyde induces DNA-protein crosslinks and oxidative stress in bone marrow and other distant organs of exposed mice. Environ Mol Mutagen. 54(9):705-18. PMID: 24136419

Zhang Y, Liu X, McHale C, Li R, Zhang L, Wu Y, Ye X, Yang X, Ding S. 2013. Bone Marrow Injury Induced via Oxidative Stress in Mice by Inhalation Exposure to Formaldehyde. PLoS One 11;8(9):e74974. PMID: 24040369

Ji Z, Li X, Fromowitz M, Mutter-Rottmayer E, Tung J, Smith MT, Zhang L. 2013. Formaldehyde induces micronuclei in mouse erythropoietic cells and suppresses the expansion of human erythroid progenitor cells. Toxicol Lett. doi:pii: S0378-4274(13)01371-4. [Epub ahead of print] PMID: 24188930

Martyn Smith, Ph.D., is a Professor of Toxicology in the School of Public Health, Division of Environmental Health Sciences, University of California at Berkeley. Dr. Smith has multiple publications regarding the potential mode of action for lymphohematopoetic cancers following exposure to formaldehyde. His current research interests include development and the application of biomarkers, benzene toxicity and the cause of leukemia and lymphoma.

Ren X, Ji Z, McHale CM, Yuh J, Bersonda J, Tang M, Smith MT, Zhang L. 2013. The impact of FANCD2 deficiency on formaldehyde-induced toxicity in human lymphoblastoid cell lines. Arch Toxicol. 87(1):189-96. PMID: 22872141

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Zhang L, Tang X, Rothman N, Vermeulen R, Ji Z, Shen M, Qiu C, Guo W, Liu S, Reiss B, Freeman LB, Ge Y, Hubbard AE, Hua M, Blair A, Galvan N, Ruan X, Alter BP, Xin KX, Li S, Moore LE, Kim S, Xie Y, Hayes RB, Azuma M, Hauptmann M, Xiong J, Stewart P, Li L, Rappaport SM, Huang H, Fraumeni JF Jr, Smith MT, Lan Q. 2010. Occupational exposure to formaldehyde, hematotoxicity, and leukemia-specific chromosome changes in cultured myeloid progenitor cells. Cancer Epidemiol Biomarkers Prev. 19(1):80-8. PMID: 20056626

Hosgood HD 3rd, Zhang L, Tang X, Vermeulen R, Hao Z, Shen M, Qiu C, Ge Y, Hua M, Ji Z, Li S, Xiong J, Reiss B, Liu S, Xin KX, Azuma M, Xie Y, Freeman LB, Ruan X, Guo W, Galvan N, Blair A, Li L, Huang H, Smith MT, Rothman N, Lan Q. 2013. Occupational exposure to formaldehyde and alterations in lymphocyte subsets. Am J Ind Med. 56(2):252-7. PMID: 22767408

Richard Irons, Ph.D., is a Professor or Toxicology at the University of Colorado Anschutz Medical Campus, Department of Pharmaceutical Sciences. Research in Dr. Irons' laboratory focuses on understanding the pathogenesis of diseases of the blood and the immune system and mechanisms of drug and chemical toxicity. He is also director of the Sino-US Joint Clinical and Molecular Laboratory (JCML) which is a state-of-the-art clinical and molecular research facility that uses medical technology not routinely available in China, to support the diagnosis and management of patients with hematopoietic and lymphoid diseases at over 30 hospitals in Shanghai.

Gentry PR, Rodricks JV, Turnbull D, Bachand A, Van Landingham C, Shipp AM, Albertini RJ, Irons R. 2013. Formaldehyde exposure and leukemia: critical review and reevaluation of the results from a study that is the focus for evidence of biological plausibility. Crit Rev Toxicol. 43(8):661-70. PMID: 23902349

Irons RD, Chen Y, Wang X, Ryder J, Kerzic PJ. 2013. Acute myeloid leukemia following exposure to benzene more closely resembles de novo than therapy related-disease. Genes Chromosomes Cancer 52(10):887-94. PMID: 23840003

Robert Schnatter A, Kerzic PJ, Zhou Y, Chen M, Nicolich MJ, Lavelle K, Armstrong TW, Bird MG, Lin L, Fu H, Irons RD. 2010. Peripheral blood effects in benzene-exposed workers. Chem Biol Interact. 184(1-2):174-81. PMID: 20034484

Richard Albertini, MD, Ph.D., is a Professor Emeritus of Pathology at the University of Vermont, Vermont Cancer Center. He is a published author on the evaluation of genotoxicity of numerous chemical compounds and the use of these data in risk assessment. He has extensive experience regarding the methods for measuring genotoxic potential of a compounds and the relevance of in vitro measurements to in vivo. He has also published on the application of biomarkers in risk assessment.

Swenberg JA, Bordeerat NK, Boysen G, Carro S, Georgieva NI, Nakamura J, Troutman JM, Upton PB, Albertini RJ, Vacek PM, Walker VE, Sram RJ, Goggin M, Tretyakova N. 2011. 1,3-Butadiene: Biomarkers and application to risk assessment. Chem Biol Interact. 192(1-2):150-4. PMID: 20974116

Albertini RJ. 2013. Vinyl acetate monomer (VAM) genotoxicity profile: relevance for carcinogenicity. Crit Rev Toxicol. 43(8):671-706. PMID: 23985073

Sweeney LM, Kirman CR, Albertini RJ, Tan YM, Clewell HJ, Filser JG, Csanády G, Pottenger LH, Banton MI, Graham CJ, Andrews LS, Papciak RJ, Gargas ML. 2009. Derivation of inhalation toxicity reference values for propylene oxide using mode of action analysis: example of a threshold carcinogen. Crit Rev Toxicol. 39(6):462-86. PMID: 19545197

Michael Thirman, MD, is an Associate Professor of Medicine at the University of Chicago Medical Center. Dr. Thirman specializes in the medical management of adults with leukemia, lymphoma, myelodysplastic syndromes, and myeloproliferative disorders. His laboratory focuses on the role of MLL and ELL in the development of leukemia and on the characterization of 11q23 translocations, frequent chromosomal aberrations in both acute myeloid and acute lymphoblastic leukemia.

Wang QF, Li YJ, Dong JF, Li B, Kaberlein JJ, Zhang L, Arimura FE, Luo RT, Ni J, He F, Wu J, Mattison R, Zhou J, Wang CZ, Prabhakar S, Nobrega MA, Thirman MJ. 2013. Regulation of MEIS1 by distal enhancer elements in acute leukemia. Leukemia. doi: 10.1038/leu.2013.260. [Epub ahead of print]. PMID: 24022755

Odenike O, Thirman MJ, Artz AS, Godley LA, Larson RA, Stock W. 2011. Gene mutations, epigenetic dysregulation, and personalized therapy in myeloid neoplasia: are we there yet? Semin Oncol. 38(2):196-214. PMID: 21421110

Li Z, Lu J, Sun M, Mi S, Zhang H, Luo RT, Chen P, Wang Y, Yan M, Qian Z, Neilly MB, Jin J, Zhang Y, Bohlander SK, Zhang DE, Larson RA, Le Beau MM, Thirman MJ, Golub TR, Rowley JD, Chen J. 2008. Distinct microRNA expression profiles in acute myeloid leukemia with common translocations. Proc Natl Acad Sci 105(40):15535-40. PMID: 18823181

James Swenberg, Ph.D., DVM is a Kenan Distinguished Professor of Environmental Sciences and Engineering and Professor of Nutrition, and Pathology and Laboratory Medicine at the University of North Carolina (UNC) at Chapel Hill. He also serves as the Director of the Center for Environmental Health and Susceptibility and is a member of the Lineberger Comprehensive Cancer Center. His research focuses on mechanisms of carcinogenesis and toxicology, with emphasis on the roles of DNA damage and repair and cell proliferation. He has published extensively on the use of mass spectrometry for DNA and protein adducts, including those arising from environmental and endogenous chemicals. Most recently, he has been investigating direct and indirect DNA damage arising from oxidative stress and environmental chemicals, including vinyl chloride, formaldehyde and PCBs. In addition, he has been actively involved in research related to differences in the dose response for DNA adducts and mutations and the implications of these differences for cancer risk assessment.

Edrissi B, Taghizadeh K, Moeller BC, Kracko D, Doyle-Eisele M, Swenberg JA, Dedon PC. 2013. Dosimetry of n(6)-formyllysine adducts following [(13)c(2)h2]-formaldehyde exposures in rats. Chem Res Toxicol. 26(10):1421-3. PMID: 24087891

Lu K, Moeller B, Doyle-Eisele M, McDonald J, Swenberg JA. 2011. Molecular dosimetry of N2-hydroxymethyl-dG DNA adducts in rats exposed to formaldehyde. Chem Res Toxicol.18; 24(2):159-61. PMID: 21155545

Moeller BC, Lu K, Doyle-Eisele M, McDonald J, Gigliotti A, Swenberg JA. 2011. Determination of N2-hydroxymethyl-dG adducts in the nasal epithelium and bone marrow of nonhuman primates following 13CD2-formaldehyde inhalation exposure. Chem Res Toxicol. 18;24(2):162-4. PMID: 21222454

Consideration of Endogenous Formaldehyde Production in Dose-Response Modeling

James Swenberg, Ph.D., DVM (see above)

Thomas B. Starr Ph.D., is a Principal with TBS Associates and a published author in the development of innovative approaches for dose-response modeling. He recently published a novel bottom-up approach for bounding the low-dose human cancer risks from chemical exposures.

Starr TB, Swenberg JA. 2013. A novel bottom-up approach to bounding low-dose human cancer risks from chemical exposures. Regul Toxicol Pharmacol. 65(3):311-5. PMID: 23352840

Swenberg JA, Moeller BC, Lu K, Rager JE, Fry RC, Starr TB. 2013. Formaldehyde carcinogenicity research: 30 years and counting for mode of action, epidemiology, and cancer risk assessment. Toxicol Pathol. 41(2):181-9. PMID: 23160431

Budinsky RA, Schrenk D, Simon T, Van den Berg M, Reichard JF, Silkworth JB, Aylward LL, Brix A, Gasiewicz T, Kaminski N, Perdew G, Starr TB, Walker NJ, Rowlands JC. 2013. Mode of action and dose-response framework analysis for receptor-mediated toxicity: The aryl hydrocarbon receptor as a case study. Crit Rev Toxicol. Nov 19. [Epub ahead of print]. PMID: 24245878

Harvey Clewell, III, Ph.D., DABT (see above)

Jennifer Jinot, Ph.D., is a Scientist with the National Center for Environmental Assessment. She is a published author in the development of mode of action frameworks and use of mode of action data for assessing the potential for health effects in humans. She has also evaluated recent applications of the use of DNA adducts in conducting dose-response assessments for formaldehyde.

Guyton KZ, Barone S Jr, Brown RC, Euling SY, Jinot J, Makris S. 2008. Mode of action frameworks: a critical analysis. J Toxicol Environ Health B Crit Rev. 11(1):16-31. PMID: 18176885

Guyton KZ, Chiu WA, Bateson TF, Jinot J, Scott CS, Brown RC, Caldwell JC. 2009. A reexamination of the PPAR-alpha activation mode of action as a basis for assessing human

cancer risks of environmental contaminants. Environ Health Perspect. 117(11):1664-72. PMID: 20049115

Gift JS, Caldwell JC, Jinot J, Evans MV, Cote I, Vandenberg JJ. 2013. Scientific Considerations for Evaluating Cancer Bioassays Conducted by the Ramazzini Institute. Environ Health Perspect. Sep 17. [Epub ahead of print]. PMID: 24045135

Ravi Subramaniam, Ph.D., is a Scientist with the National Center for Environmental Assessment. He is a published author in the evaluation of the biologically-based dose-response model for formaldehyde and the applications of the use of DNA adducts in conducting dose-response assessments for formaldehyde.

Klein MD, Sinha BK, Subramaniam RP. 2011. Statistical inferences from formaldehyde DNA-protein cross-link data: improving methods for characterization of uncertainty. J Biopharm Stat. 21(1):42-55. PMID: 21191853

Thompson CM, Subramaniam RP, Grafström RC. 2008. Mechanistic and dose considerations for supporting adverse pulmonary physiology in response to formaldehyde. Toxicol Appl Pharmacol. 233(3):355-9. PMID: 18851987

Subramaniam RP, Chen C, Crump KS, Devoney D, Fox JF, Portier CJ, Schlosser PM, Thompson CM, White P. 2008. Uncertainties in biologically-based modeling of formaldehyde-induced respiratory cancer risk: identification of key issues. Risk Anal. 28(4):907-23. PMID: 18564991

Integration of the Scientific Evidence for the Plausibility of Lymphohematopoietic Cancer Following Formaldehyde Exposure

Paulo Boffetta, M.D., Ph.D. has been Director of the Institute for Translational Epidemiology and Associate Director for Population Sciences of The Tisch Cancer Institute, Mount Sinai School of Medicine since 2010. Dr. Boffetta's previous employments include Columbia University, the American Cancer Society, the International Agency for Research on Cancer, and the German Cancer Research Center. Dr. Boffetta is Adjunct Professor at the Department of Epidemiology, Harvard School of Public Health, Visiting Professor at the Department of Biomedical Sciences and Human Oncology, University of Turin, Adjunct Professor at the Department of Medicine, Vanderbilt University, Affiliate Member of the R. Samuel McLaughlin Centre for Population Health Risk Assessment, University of Ottawa, Senior Fellow of the Hellenic Health Foundation, Honorary Professor at the College of Medicine, Dentistry and Nursing, University of Dundee, Adjunct Professor at Biodesign Institute, Arizona State University , and Vice-President of the International Prevention Research Institute. Dr. Boffetta is the author of over 700 peer-reviewed publications, mainly in the field of epidemiology of chronic diseases. He has edited 15 books and authored over 80 book chapters. He is associate editor of Lung Cancer, European Journal of Clinical Investigation, and Frontiers in Cancer Epidemiology, and is a member of more than 10 editorial boards of scientific journals.

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Checkoway H, Boffetta P, Mundt DJ, Mundt KA. Critical review and synthesis of the epidemiologic evidence on formaldehyde exposure and risk of leukemia and other lymphohematopoietic malignancies. Cancer Causes Control 2012; 23(11):1747-1766. PMID: 22983399

Shangina O, Brennan P, Szeszenia-Dabrowska N, Mates D, Fabiánová E, Fletcher T, t'Mannetje A, Boffetta P, Zaridze D. 2006. Occupational exposure and laryngeal and hypopharyngeal cancer risk in central and eastern Europe. Am J Epidemiol. 164(4):367-75. PMID: 16801374

Korhonen K, Liukkonen T, Ahrens W, Astrakianakis G, Boffetta P, Burdorf A, Heederik D, Kauppinen T, Kogevinas M, Osvoll P, Rix BA, Saalo A, Sunyer J, Szadkowska-Stanczyk I, Teschke K, Westberg H, Widerkiewicz K. 2004. Occupational exposure to chemical agents in the paper industry. Int Arch Occup Environ Health. 77(7):451-60. PMID: 15368059

Lorenz Rhomberg, Ph.D., FATS, is a Principal with Gradient and an expert in quantitative risk assessment, including dose-response analysis, pharmacokinetic modeling, and probabilistic methods, with special experience in chlorinated solvents and endocrine-active agents. He is the author of books and of more than 50 articles on these topics. His practice includes work in support of environmental litigation as well as work relating to a variety of regulatory programs including CERCLA, FIFRA, TSCA, and REACH, among others. Before joining Gradient, Dr. Rhomberg was on the faculty of the Harvard School of Public Health and was employed by U.S. EPA. Dr. Rhomberg is active in professional groups and environmental policy development, focusing on current issues in the interpretation of toxicological data in human health risk assessment through service on panels sponsored by government, industry, and such organizations as the National Academy of Sciences and the International Life Sciences Institute. Dr. Rhomberg was recognized as the Outstanding Practitioner of the Year by the Society for Risk Analysis in 2009.

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Hans-Olov Adami, M.D., Ph.D. is Professor of Cancer Epidemiology at the Department of Medical Epidemiology and Biostatistics, Karolinska Institute and previously was Professor and Chair, Department of Epidemiology, Harvard School of Public Health. Professor Adami's research has, over the years, encompassed many different forms of cancer, but in recent times it has focused on cancer of the breast, prostate, cervix and uterus in particular, as well as malignant lymphomas. He has also taken part in several randomised trials of treatment, as well

as in studies into the natural history of malignant diseases and in evaluation of screening. Professor Adami is currently the principal investigator of a large new study of nasopharyngeal cancer in southern China.

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Ivan Rusyn, Ph.D., is professor in the Department of Environmental Sciences and Engineering in the UNC School of Public Health. He directs the Laboratory of Environmental Genomics and the Carolina Center for Computational Toxicology in the Gillings School of Global Public Health. He also serves as associate director of the Curriculum in Toxicology and is a member of the Lineberger Comprehensive Cancer Center, the Center for Environmental Health and Susceptibility, the Bowles Center for Alcohol Studies, and the Carolina Center for Genome Sciences. Dr. Rusyn's laboratory focuses on the mechanisms of action of environmental toxicants and the genetic determinants of susceptibility to toxicant-induced injury. He is a member of the National Research Council (NRC) Committee on Use of Emerging Science for Environmental Health Decisions and was previously a member of the Committee on Tetrachlorethylene. Dr. Rusyn received his M.D. from Ukrainian State Medical University in Kiev and his Ph.D. in toxicology from UNC. He was a member of the NAS Committee to Review EPA's Draft IRIS Assessment of Formaldehyde.

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Jonathan M. Samet, M.D., MS is a pulmonary physician and epidemiologist. He is professor and Flora L. Thornton Chair of the Department of Preventive Medicine at the Keck School of Medicine of the University of Southern California (USC) and director of the USC Institute for Global Health. From 1994 through 2008, he was Professor and Chairman of the Department of Epidemiology at the Johns Hopkins Bloomberg School of Public Health. Dr. Samet's research has focused on the health risks associated with inhaled pollutants. He has served on numerous committees concerned with public health: the U.S. EPA Science Advisory Board; committees of the NRC, including chairing Committee on Health Risks of Exposure to Radon (BEIR VI), the Committee on Research Priorities for Airborne Particulate Matter, and the Board on Environmental Studies and Toxicology; and committees of the IOM. He is a member of the IOM

and is chair of the NRC Committee to Develop a Research Strategy for Environmental, Health, and Safety Aspects of Engineered Nanomaterials and a member of the National Academies Committee on Science, Technology, and Law. He was Chair of the NAS Committee to Review EPA's Draft IRIS Assessment of Formaldehyde.

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