NOTE: Chen and Gibb (2003) has been added to the Risk Assessment section. Xu and Weisel (2005) has been added to the Exposure Routes section. National Toxicology Program (2004) has been added to the Cancer and Other Toxicology section.

Additional studies may be added as more information becomes available.

NOTE: This is not a comprehensive list of all recent research on disinfection byproducts.

Reproductive and Developmental Epidemiology

Cedergren, M.I., A.J. Selbing, O. Lofman, et al. 2002. Chlorination byproducts and nitrate in drinking water and risk for congenital cardiac defects. Environmental Research. 89(2): 124-130.

Dodds, L., W. King, A.C. Allen, B.A. Armson, D.B. Deshayne and C. Nimrod. 2004. Trihalomethanes in public water supplies and risk of stillbirth. Epidemiology. 15(2):179-186.

Fenster, L., K. Waller, G. Windham, T. Henneman, M. Anderson, P. Mendola, J.W. Overstreet and S.H. Swan. 2003. Trihalomethane levels in home tap water and semen quality. Epidemiology. 14:650-658.

Hwang, B.F. and J.J.K. Jaakkola. 2003. Water chlorination and birth defects: A systematic review and meta-analysis. Archives of Environmental Health. 58(2):83-91.

Infante-Rivard, C. 2004. Drinking water contaminants, gene polymorphisms, and fetal growth. Environmental Health Perspectives. 112(11):1213-1216.

Shaw, G.M., D. Ranatunga, T. Quach, E. Neri, A. Correa and R.R. Neutra. 2003. Trihalomethane exposure from municipal water supplies and selected congenital malformations. Epidemiology. 14(2):191-199.

Toledano, M.B., M.J. Nieuwenhuijsen, N. Best, H. Whitaker, P. Hambly, C. de Hoogh, J. Fawell, L. Jarup and P. Elliott. 2004. Relation of trihalomethane concentrations in public water supplies to stillbirth and birth weight in three water regions in England. Environmental Health Perspectives. In Press (Online 21 October 2004).

Wright, J.M., J. Schwartz and D.W. Dockery. 2003. Effect of trihalomethane exposure on fetal development. Occupational and Environmental Medicine. 60(3):173-180.

Wright, J.M., J. Schwartz and D.W. Dockery. 2004. The effect of disinfection by-products and mutagenic activity on birth weight and gestational duration. Environmental Health Perspectives. 112(8):920-925.

Yang, C.-Y. 2004. Drinking water chlorination and adverse birth outcomes in Taiwan. Toxicology. 198(2004): 249-254.

Reproductive and Developmental Toxicology

Andrews, J.E., H.P. Nichols, J.E. Schmid, L.M. Mole, E.S. Hunter, III and G.R. Klinefelter. 2004. Developmental toxicity of mixtures: the water disinfection by-products dichloro-,

dibromo- and bromochloro acetic acid in rat embryo culture. Reproductive Toxicology. 19(1):111-116.

Balchak, S.K., J.M. Hedge, A.S. Murr, M.L. Mole and J.M. Goldman. 2000. Influence of the drinking water disinfection by-product dibromoacetic acid on rat estrous cyclicity and ovarian follicular steroid release in vitro. Reproductive Toxicology. 14(2000):533-539.

Bielmeier, S.R., D.S. Best and M.G. Narotsky. 2004. Serum hormone characterization and exogenous hormone rescue of bromodichloromethane-induced pregnancy loss in the F344 rat. Toxicological Sciences. 77(1):101-108.

Bodensteiner, K.J., H.R. Sawyer, C.L. Moeller, C.M. Kane, K.-Y.F. Pau, G.R. Klinefelter and D.N.R. Veeramachaneni. 2004. Chronic exposure to dibromoacetic acid, a water disinfection byproduct, diminishes primordial follicle populations in the rabbit. Toxicological Sciences. 80(1):83-91.

Chen, J., G.C. Douglas, T.L. Thirkill, P.N. Lohstroh, S.R. Bielmeir, M.G. Narotsky, D.S. Best, R.A. Harrison, K. Natarajan, R.A. Pegram, J.W. Overstreet and B.L. Lasley. 2003. Effect of bromodichloromethane on chorionic gonadotropin secretion by human placental trophoblast cultures. Toxicological Sciences. 76(1):75-82.

Chen, J., T.L. Thirkill, P.N. Lohstroh, S.R. Bielmeir, M.G. Narotsky, D.S. Best, R.A. Harrison, K. Natarajan, R.A. Pegram, J.W. Overstreet, B. L. Lasley and G.C. Douglas. 2004. Bromodichloromethane inhibits human placental trophoblast differentiation. Toxicological Sciences. 78(1):166-174.

Goldman, J.M. and A.S. Murr. 2002. Alterations in ovarian follicular progesterone secretion by elevated exposures to the drinking water disinfection by-product dibromoacetic acid: examination of the potential site(s) of impact along the steroidogenic pathway. Toxicology. 171(2002):83-93.

Goldman, J.M. and A.S. Murr. 2003. Dibromoacetic acid-induced elevations in circulating estradiol: effects in both cycling and ovariectomized/steroid-primed female rats. Reproductive Toxicology. 17(5):585-592.

Kaydos, E.H., J.D. Suarez, N.L. Roberts, K. Bobseine, R. Zucker, J. Laskey and G.R. Klinefelter 2004. Haloacid induced alterations in fertility and the sperm Biomarker SP22 in the rat are additive: validation of an ELISA. Toxicological Sciences. 81(2):430–442.

Klinefelter, G.R., L.F. Strader, J.D. Suarez, N.L. Roberts, J.M. Goldman and A.S. Murr. 2004. Continuous exposure to dibromoacetic acid delays pubertal development and compromises sperm quality in the rat. Toxicological Sciences. 81(2):419–429.

Klinefelter, G.R., L.F. Strader, J.D. Suarez and N.L. Roberts. 2002. Bromochloroacetic acid exerts qualitative effects on rat sperm: implications for a novel biomarker. Toxicological Sciences. 68:164–173.

Tully, D.B., J.C. Luft, J.C. Rockett, H. Ren, J.E. Schmid, C.R. Wood and D.J. Dix. 2004.

Reproductive and genomic effects in testes from mice exposed to the water disinfectant byproduct bromochloroacetic acid. Reproductive Toxicology. In Press (Online 2 September 2004).

Health Effects Reviews

Graves, C.G., G.M. Matanoski and R.G. Tardiff. 2001. Weight of evidence for an association between adverse reproductive and developmental effects and exposure to disinfection by-products: a critical review. Regulatory Toxicology and Pharmacology. 34:103–124.

Komulainen, H. 2004. Experimental cancer studies of chlorinated by-products. Toxicology. 198(2004):239–248.

Villanueva, C.M., M. Kogevinas and J.O. Grimalt. 2001. Drinking water chlorination and adverse health effects: a review of epidemiological studies. Medicina Clinica 117(1): 27-35. [Spanish]

Cancer Epidemiology

Chevrier, C., B. Junod and S. Cordier. 2004. Does ozonation of drinking water reduce the risk of bladder cancer? Epidemiology. 15(5):605-614.

Goebell, P.J., C.M. Villanueva, A.W. Rettenmeier, et al. 2004. Environmental exposure, chlorinated drinking water, and bladder cancer. World Journal of Urology. 21(6):424-432.

Infante-Rivard, C., D. Amre and D. Sinnett. 2002. GSTT1 and CYP2E1 polymorphisms and trihalomethanes in drinking water: effect on childhood leukemia. Environmental Health Perspective. 110(6):591-593.

Ranmuthugala, G., L. Pilotto, W. Smith, T. Vimalasiri, K. Dear and R. Douglas. 2003. Chlorinated drinking water and micronuclei in urinary bladder epithelial cells. Epidemiology. 14(5):617–622.

Villanueva, C., M. Kogevinas and J. Grimalt. 2001. Chlorination of drinking water in Spain and bladder cancer. Gac Sanit. 15(1):48-53.

Villanueva, C.M., K.P. Cantor, S. Cordier, J.J.K. Jaakkola, W.D. King, C.F. Lynch, S. Porru and M. Kogevinas. 2004. Disinfection byproducts and bladder cancer a pooled analysis. Epidemiology. 15(3):357-367.

Vinceti, M., G. Fantuzzi, L. Monici, et al. 2004. A retrospective cohort study of trihalomethane exposure through drinking water and cancer mortality in northern Italy. Science of the Total Environment. 330(1-3):47-53.

Cancer and Other Toxicology

Ahmed, A.E., J. Aronson and S. Jacob. 2000. Induction of oxidative stress and TNF-a secretion by dichloroacetonitrile, a water disinfection byproduct, as mediators of apoptosis or necrosis in a murine macrophage cell line (RAW). Toxicology in Vitro. 14(3):199-210.

Allis, J.W., B.P. Anderson, G.Y. Zhao, et al. 2002. Evidence for the involvement of CYP1A2 in

the metabolism of bromodichloromethane in rat liver. Toxicology. 176(1-2):25-37.

Allis, J.W., B.L. Brown, G.Y. Zhao, et al. 2001. The effects of inhalation exposure to bromo-dichloromethane on specific rat CYP isoenzymes. Toxicology. 161(1-2):67-77.

Allis, J.W. and G.Y. Zhao. 2002. Quantitative evaluation of bromodichloromethane metabolism, by recombinant rat and human cytochrome P450s. Chemico-Biological Interactions. 140(2):137-153.

Coffin, J.C., R. Ge, S. Yang, P.M. Kramer, L. Tao and M.A. Pereira. 2000. Effect of trihalomethanes on cell proliferation and DNA methylation in female B6C3F1 mouse liver. Toxicological Sciences. 58:243-252.

Echigo, S., S. Itoh, T. Natsui, T. Araki and R. Ando. 2004. Contribution of brominated organic disinfection by-products to the mutagenicity of drinking water. Water Science and Technology. 50(5):321-328.

Fabrizi, L., G.W. Taylor, B. Canas, et al. 2003. Adduction of the chloroform metabolite phosgene to lysine residues of human histone H2B. Chemical Research in Toxicology. 16(3):266-275.

George, M.H., G.R. Olson, D. Doerfler, et al. 2002. Carcinogenicity of bromodichloromethane administered in drinking water to male F344/N rats and B6C3F(1) mice. International Journal of Toxicology. 21(3):219-230.

George, S.E., D.C. Wolf, L.R. Brooks, K.C. Bailey, M.J. Hooth and G.M. Nelson. 2004. Changes in cecal microbial metabolism of rats induced by individual and a mixture of drinking water disinfection by-products. Cancer Letters. 204(1):15-21.

Geter, D.R., L.W. Chang, N.M. Hanley, M.K. Ross, R.A. Pegram and A.B. DeAngelo. 2004. Analysis of in vivo and in vitro DNA strand breaks from trihalomethane exposure. Journal of Carcinogenesis. 3(1):2.

Geter, D.R., M.H. George, T.M. Moore, et al. 2004. The effects of a high animal fat diet on the induction of aberrant crypt foci in the colons of male F344/N rats exposed to trihalomethanes in the drinking water. Toxicology Letters. 147(3):245-252.

Geter, D.R., M.H. George, T.M. Moore, et al. 2004. Vehicle and mode of administration effects on the induction of aberrant crypt foci in the colons of male F344/N rats exposed to bromodichloromethane. Journal of Toxicology and Environmental Health-Part A. 67(1):23-29.

Hooth, M..J., K.S. McDorman, S.D. Hester, M.H. George, L.R. Brooks, A.E. Swank and D.C. Wolf. 2002. The carcinogenic response of Tsc2 mutant Long-Evans (Eker) rats to a mixture of drinking water disinfection by-products was less than additive. Toxicological Sciences. 69(2):322-331.

Kargalioglu, Y., B.J. McMillan, R.A. Minear and M.J. Plewa. A new assessment of the cytotoxicity and genotoxicity of drinking water disinfection by-products. <u>In</u> Natural Organic

Matter and Disinfection By-Products: Characterization and Control in Drinking Water. Eds. Barrett, S.E., S.W. Krasner and G.L. Amy. 2000. American Chemical Society.

Kargalioglu, Y., B.J. McMillan, R.A. Minear and M.J. Plewa. 2002. Analysis of the cytotoxicity and mutagenicity of drinking water disinfection by-products in *Salmonella typhimurium*. Teratogenesis, Carcinogenesis and Mutagenesis. 22(2):113-128.

Karrow, N.A., T.L. Guo, J.A. McCay, G.W. Johnson, R.D. Brown, D.L. Musgrove, D.R. Germolec, R.W. Luebke and K.L. White, Jr. 2001. Evaluation of the immunomodulatory effects of the disinfection by-product, sodium chlorite, in female B6C3F1 mice: a drinking water study. Drug and Chemical Toxicology. 24(3):239-258.

Kundu, B., S.D. Richardson, C.A. Granville, D.T. Shaughnessy, N.M. Hanley, P.D. Swartz, A.M. Richard and D.M. DeMarini. 2004. Comparative mutagenicity of halomethanes and halonitromethanes in *Salmonella* TA100: structure-activity analysis and mutation spectra. Mutation Research. 554(1-2):335-350.

Kundu, B., S.D. Richardson, P.D. Swartz, P.P. Matthews, A.M. Richard and D.M. DeMarini. 2004. Mutagenicity in *Salmonella* of halonitromethanes: a recently recognized class of disinfection by-products in drinking water. Mutation Research. 562(2004):39-65.

Landi, S., A. Naccarati, M.K. Ross, N.M. Hanley, L. Dailey, R.B. Devlin, M. Vasquez, R.A. Pegram and D.M. DeMarini. 2003. Induction of DNA strand breaks by trihalomethanes in primary human lung epithelial cells. Mutation Research/Genetic Toxicology and Environmental Mutagenesis. 538(1-2):41-50.

Lock, T., L. Cottrell, T. Soames, et al. 2004. Formic acid excretion in rats and mice exposed to bromodichloromethane: a possible link to renal tubule cell proliferation in long-term studies. Archives of Toxicology. 78(7):410-417.

McDorman, K.S., M.J. Hooth, T.B. Starr and D.C. Wolf. 2003. Analysis of preneoplastic and neoplastic renal lesions in Tsc2 mutant Long-Evans (Eker) rats following exposure to a mixture of drinking water disinfection byproducts. Toxicology. 187(1):1-12.

McDorman, K.S., S. Chandra, M.J. Hooth, S.D. Hester, R. Schoonhoven and D.C. Wolf. 2003. Induction of transitional cell hyperplasia in the urinary bladder and aberrant crypt foci in the colon of rats treated with individual and a mixture of drinking water disinfection by-products. Toxicologic Pathology. 31(2):235-242.

Merdink, J.L., R.J. Bull and I.R. Schultz. 2000. Trapping and identification of the dichloroacetate radical from the reductive dehalogenation of trichloroacetate by mouse and rat liver microsomes. Free Radical Biology and Medicine. 29(2):125-130.

Merdink, J.L., R.J. Bull and I.R. Schultz. 2001. Toxicokinetics of bromodichloroacetate in B6C3F1 mice. Journal of Applied Toxicology. 21(1):53-57.

Minear, R.A. and M.J. Plewa. 2003. Comparative Genotoxicity Assessment of DBPs in Drinking Water. Denver, Colo.: American Water Works Association Research Foundation.

Mohamadin, A.M. and A.B. Abdel-Naim. 2003. In vitro activation of dibromoacetonitrile to cyanide: role of xanthine oxidase. Archives of Toxicology. 77(2):86-93.

Mohamadin, A.M. 2001. Possible role of hydroxyl radicals in the oxidation of dichloroacetonitrile by Fenton-like reaction. Journal of Inorganic Biochemistry. 84(1-2):97-105.

Monarca, S., S.D. Richardson, D. Feretti, M. Grottolo, A.D. Thruston Jr, C. Zani, G. Navazio, P. Ragazzo, I. Zerbini and A. Alberti. 2002. Mutagenicity and disinfection by-products in surface drinking water disinfected with peracetic acid. Environmental Toxicology and Chemistry. 21(2):309-318.

Moser, V.C., P.M. Phillips, A.B. Levine, K.L. McDaniel, R.C. Sills, B.S. Jortner and M.T. Butt. 2004. Neurotoxicity produced by dibromoacetic acid in drinking water of rats. Toxicological Sciences. 79(1):112–122.

Muller-Pillet, V., M. Joyeux, D. Ambroise and P. Hartemann. 2000. Genotoxic activity of five haloacetonitriles: comparative investigations in the single cell gel electrophoresis (comet) assay and the ames-fluctuation test. Environmental and Molecular Mutagenesis. 36(1):52-58.

National Toxicology Program (NTP). 2004. Toxicology and carcinogenesis studies of bromodichloromethane (CAS No. 75-27-4) in male F344/N rats and female B6C3F1 mice (Drinking Water Studies). TR-532. http://ntp.niehs.nih.gov/INDEX.CFM?OBJECTID=00271EF5-F1F6-975E-73E6FE7AEE1A1A31

Pereira, M.A., W. Wang, P.M. Kramer and L. Tao. 2004. Prevention by Methionine of Dichloroacetic Acid Induced Liver Cancer and DNA Hypomethylation in Mice. Toxicological Sciences. 77(2):243-248.

Pereira, M.A., P.M. Kramer, P.B.Conran and L.H. Tao. 2001. Effect of chloroform on dichloroacetic acid and trichloroacetic acid-induced hypomethylation and expression of the c-myc gene and on their promotion of liver and kidney tumors in mice. Carcinogenesis. 22(9):1511-1519.

Plewa, M.J., E.D. Wagner, S.D. Richardson, A.D. Thruston Jr, Y.-T. Woo and A.B. McKague. 2004. Chemical and biological characterization of newly discovered iodo-acid drinking water disinfection by-products. Environmental Science and Technology. 38(18): 4713-4722.

Plewa, M.J., S.D. Richardson and P. Jazwierska. 2004. Halonitromethane drinking water disinfection byproducts: chemical characterization and mammalian cell cytotoxicity and genotoxicity. Environmental Science and Technology. 38(1): 62-68.

Plewa, M.J., Y. Kargalioglu, D. Vankerk, R.A. Minear and E.D. Wagner. 2002. Mammalian cell cytotoxicity and genotoxicity analysis of drinking water disinfection by-products. Environmental and Molecular Mutagenesis. 40(2):134-142.

Poon, R., I. Chu, G. LeBel, A. Yagminas and V.E. Valli. 2003. Effects of dibromoacetonitrile on rats following 13-week drinking water exposure. Food and Chemical Toxicology. 41(8):1051-1061.

Racz, G., L. Sujbert, J. Bocsi and B. Szende. 2004. Rapid communication: water disinfection by-products enhanced apoptotic activity in human lymphocytes. Journal of Toxicology and Environmental Health, Part A. 67(17):1315-1319.

Ross, M.K. and R.A. Pegram. 2004. In vitro biotransformation and genotoxicity of the drinking water disinfection byproduct bromodichloromethane: DNA binding mediated by glutathione transferase theta 1-1. Toxicology and Applied Pharmacology. 195(2):166-181.

Schultz, I.R., J.L. Merdink, A.G. Gonzalez-Leon and R.J. Bull. 2002. Dichloroacetate toxicokinetics and disruption of tyrosine catabolism in B6C3F1 mice: dose response relationships and age as a modifying factor. Toxicology. 173(3):229-247.

Sehata, S., T. Maejima, M. Watanabe, S. Ogata, T. Makino, K. Tanaka, S. Manabe and M. Takaoka. 2002. Twenty-six-week carcinogenicity study of chloroform in CB6F1 rasH2-transgenic mice. Toxicologic Pathology. 30(3):328-338.

Simmons, J.E., L.K. Teuschler, C. Gennings, T.F. Speth, S.D. Richardson, R.J. Miltner, M.G. Narotsky, K.M. Schenck, E.S. Hunter, III, R.C. Hertzbert, III. and G. Rice. 2004. Component-based and whole-mixture techniques for addressing the toxicity of drinking water disinfection byproducts mixtures. Journal of Toxicology and Environmental Health. 67:741-754.

St-Pierre, A., K. Krishnan and R. Tardif. 2003. Evaluation of the influence of chloroacetic acids on the pharmacokinetics of trihalomethanes in the rat. Journal of Toxicology and Environmental Health-Part A. 66(23):2267-2280.

Tan, Y.M., B.E. Butterworth, M.L. Gargas and R.B. Conolly. 2003. Biologically motivated computational modeling of chloroform cytolethality and regenerative cellular proliferation. Toxicological Sciences. 75(1):192-200.

Tao, L.,W. Wang, L. Li, P.M. Kramer and M.A. Pereira. 2004. Effect of dibromoacetic acid on DNA methylation, glycogen accumulation, and peroxisome proliferation in mouse and rat liver. Toxicological Sciences. 82(1):62-69.

Torti, V.R., A.J. Cobb, V.A. Wong, et al. 2002. Induction of micronuclei in wild-type and p53(+/-) transgenic mice by inhaled bromodichloromethane. Mutation Research-Genetic Toxicology and Environmental Mutagenesis. 520(1-2):171-178.

Torti, V.R., A.J. Cobb, J.I. Everitt, et al. 2001. Nephrotoxicity and hepatotoxicity induced by inhaled bromodichloromethane in wild-type and p53-heterozygous mice. Toxicological Sciences. 64(2):269-280.

Toussaint, M.W., A.B. Rosencrance, L.M. Brennan, et al. 2001. Chronic toxicity of bromodichloromethane to the Japanese medaka (*Oryzias latipes*). Toxicologic Pathology. 29(6):662-669.

Woo, Y.T., D. Lai, J.L. McLain, et al. 2002. Use of mechanism-based structure-activity relationships analysis in carcinogenic potential ranking for drinking water disinfection by-products. Environmental Health Perspectives. 110:75-87 Suppl.

Wright, J.M., J. Schwartz, T. Vartiainen, J. Mäki-Paakkanen, L. Altshul, J.J. Harrington and D.W. Dockery. 2002. 3-Chloro-4-(dichloromethyl)-5-hydroxy-2(5H)-furanone (MX) and mutagenic activity in Massachusetts drinking water. Environmental Health Perspectives. 110(2):157-164.

Xu, X., T. Mariano, J.D. Laskin and C.P. Weisel. 2002. Percutaneous absorption of trihalomethanes, haloacetic acids and haloketones. Toxicology and Applied Pharmacology. 184(1):19-26.

Risk Assessment

Ashbolt, N.J. 2004. Risk analysis of drinking water microbial contamination versus disinfection by-products (DBPs). Toxicology. 198(1-3):255-262.

Brennan, P., O. Bogillot, S. Cordier, E. Greiser, W. Schill, P. Vineis, G. Lopez-Abente, A. Tzonou, J. Chang-Claude, U. Bolm-Audorff, K.H. Jockel, F. Donato, C. Serra, J. Wahrendorf, M. Hours, A. T'Mannetje, M. Kogevinas and P. Boffetta. 2000. Cigarette smoking and bladder cancer in men: a pooled analysis of 11 case-control studies. International Journal of Cancer. 86(2):289-294.

Brennan, P., O. Bogillot, E. Greiser, J. Chang-Claude, J. Wahrendorf, S. Cordier, K.H. Jockel, G. Lopez-Abente, A. Tzonou, P. Vineis, F. Donato, M. Hours, C. Serra, U. Bolm-Audorff, W. Schill, M. Kogevinas and P. Boffetta. 2001. The contribution of cigarette smoking to bladder cancer in women (pooled European data). Cancer Causes and Control. 12(5):411-417.

Chen, C.W. and H. Gibb. 2003. Procedures for calculating cessation lag. Regulatory Toxicology and Pharmacology. 38:157-165.

Constan, A.A., B.A. Wong, J.I. Everitt and B.E. Butterworth. 2002. Chloroform inhalation exposure conditions necessary to initiate liver toxicity in female B6C3F1 mice. Toxicological Sciences. 66(2):201-208.

Da Silva, M.L., G. Charest-Tardif, K. Krishnan, et al. 2000. Evaluation of the pharmacokinetic interactions between orally administered trihalomethanes in the rat. Journal of Toxicology and Environmental Health, Part A. 60(5):343-353.

Griffiths, C.W., C. Dockins, N. Owens, N.B. Simon and D.A. Axelrad. 2002. What to do at low doses: a bounding approach for economic analysis. Risk Analysis. 22(4):679-688.

Hartge, P., D. Silverman, R. Hoove, C. Schairer, R. Altman, D. Austin, K. Cantor, M. Child, C. Key and L.D. Marrett. 1987. Changing cigarette habits and bladder cancer risk: a case-control study. Journal of the National Cancer Institute. 78(6):1119-1125.

Hsu, C.H., W.L. Jeng, R.M. Chang, L.C. Chien and B.C. Han. 2001. Estimation of potential lifetime cancer risks for trihalomethanes from consuming chlorinated drinking water in Taiwan. Environmental Research. 85(2):77-82.

Lee, S.C., H. Guo, S.M. Lam and S.L. Lau. 2004. Multipathway risk assessment on disinfection by-products of drinking water in Hong Kong. Environmental Research. 94(1):47-56.

Levesque, B., P. Ayotte, R. Tardif, et al. 2002. Cancer risk associated with household exposure to chloroform. Journal of Toxicology and Environmental Health-Part A. 65(7):489-502.

Lynberg, M., J.R. Nuckols, P. Langlois, et al. 2001. Assessing exposure to disinfection by-products in women of reproductive age living in Corpus Christi, Texas, and Cobb County, Georgia: Descriptive results and methods. Environmental Health Perspectives. 109(6):597-604.

Meek, M.E., R. Beauchamp, G. Long, D. Moir, L. Turner and M. Walker. 2002. Chloroform: exposure estimation, hazard characterization, and exposure-response analysis. Journal of Toxicology and Environmental Health, Part B. 5(3):283-334. Review.

Moudgal, C.J., J.C. Lipscomb and R.M. Bruce. 2000. Potential health effects of drinking water disinfection byproducts using quantitative structure toxicity relationship. Toxicology. 147:109-131.

Richardson, S.D., J.E. Simmons and G. Rice. 2002. Disinfection by-products: the next generation. Environmental Science and Technology. 36(9):198A-205A.

Sadiq, R. and M.J. Rodriguez. 2004. Fuzzy synthetic evaluation of disinfection by-products--a risk-based indexing system. Journal of Environmental Management. 73(1):1-13.

Saghir, S.A. and I.R. Schultz. 2002. Low dose oral bioavailability of dichloroacetate in naive and GST-zeta depleted F344 rats. Environmental Health Perspectives. 110(8):757-763.

Schultz, I.R. and S. Sylvestor. 2001. Stereospecific toxicokinetics of bromochloro- and chlorofluoroacetate: Effect of GST-zeta depletion. Toxicology and Applied Pharmacology. 175(2):104-113.

Teuschler, L.K. and J.E. Simmons. 2003. Approaching the toxicity of disinfection by-products in drinking water as a mixtures problem. Journal of the American Water Works Association. 95(6):131-138.

Teuschler, L.K., G.E. Rice, C.R. Wilkes, J.R. Lipscomb and F.W. Power. 2004. A feasibility study of cumulative risk assessment methods for drinking water disinfection by-product mixtures. Journal of Toxicology and Environmental Health, Part A. 67:755-777.

Tokmak, B., G. Capar, F.B. Dilek and U. Yetis. 2004. Trihalomethanes and associated potential cancer risks in the water supply in Ankara, Turkey. Environmental Research. 96(3):345-352.

U.S. EPA. 2003. The Feasibility of Performing Cumulative Risk Assessments for Mixtures of Disinfection By-Products in Drinking Water. EPA/600/R-03/051. ORD/NCEA Cincinnati, OH. http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=18494.

Zeegers, M.P., R.A. Goldbohm and P.A. van den Brandt. 2002. A prospective study on active and environmental tobacco smoking and bladder cancer risk (The Netherlands). Cancer Causes and Control. 13(1):83-90.

Exposure Routes

Arbuckle, T.E., S.E. Hrudey, S.W. Krasner, J.R. Nuckols, S.D. Richardson, P. Singer, P. Mendola, L. Dodds, C. Weisel, D.L. Ashley, K.L. Froese, R.A. Pegram, I.R. Schultz, J. Reif, A.M. Bachand, F.M. Benoit, M. Lynberg, C. Poole and K. Waller. 2002. Assessing exposure in epidemiologic studies to disinfection by-products in drinking water: report from an international workshop. Environmental Health Perspectives. 110(Suppl. 1):53-60.

Batterman, S., A.T. Huang, S.G. Wang, et al. 2000. Reduction of ingestion exposure to trihalomethanes due to volatilization. Environmental Science and Technology. 34(20):4418-4424.

Batterman, S., L. Zhang, S. Wang and A. Franzblau. 2002. Partition coefficients for the trihalomethanes among blood, urine, water, milk and air. Science of the Total Environment. 284:237-247.

Keegan, T., H. Whitaker, M.J. Nieuwenhuijsen, et al. 2001. Use of routinely collected data on trihalomethane in drinking water for epidemiological purposes. Occupational and Environmental Medicine. 58(7):447-452.

King, W.D., L. Dodds, B.A. Armson, A.C. Allen, D.B. Fell and C. Nimrod. 2004. Exposure assessment in epidemiologic studies of adverse pregnancy outcomes and disinfection byproducts. Journal of Exposure Analysis and Environmental Epidemiology. 14(6):466-472.

Miles, A.M., P.C. Singer, D.L. Ashley, M.C. Lynberg, P. Mendola, P.H. Langlois and J.R. Nuckols. 2002. Comparison of trihalomethanes in tap water and blood. Environmental Science and Technology. 36(8):1692-1698.

Nieuwenhuijsen, M.J., M.B. Toledano and P. Elliott. 2000. Uptake of chlorination disinfection by-products; a review and a discussion of its implications for exposure assessment in epidemiological studies. Journal of Exposure Analysis and Environmental Epidemiology. 10(6):586-599 Part 1.

Prah, J.D., B. Blount, F.L. Cardinali, et al. 2002. The development and testing of a dermal exposure system for pharmacokinetic studies of administered and ambient water contaminants. Journal of Pharmacological and Toxicological Methods. 47(3):189-195.

Whitaker, H.J., M.J. Nieuwenhuijsen and N.G. Best. 2003. The relationship between water concentrations and individual uptake of chloroform: A simulation study. Environmental Health Perspectives. 111(5):688-694.

Wright, J.M. and T.F. Bateson. 2004. A sensitivity analysis of bias in relative risk estimates due to disinfection by-product exposure misclassification (available online at Journal of Exposure Analysis and Environmental Epidemiology [30 June 2004]).

Xu, X. and C.P. Weisel. 2003. Inhalation exposure to haloacetic acids and haloketones during showering. Environmental Science and Technology. 37(3):569-576.

Xu, X. and C.P. Weisel. 2004. Dermal uptake of chloroform and haloketones during bathing. Journal of Exposure Analysis and Environmental Epidemiology. 1-8.

Xu, X. and C.P. Weisel. 2005. Human respiratory uptake of chloroform and haloketones during showering. Journal of Exposure Analysis and Environmental Epidemiology. 15:6-16.

Zender, R., A.M. Bachand and J.S. Reif. 2001. Exposure to tap water during pregnancy. Journal of Exposure Analysis and Environmental Epidemiology. 11(3):224-230.

Formation of Disinfection Byproducts and Occurrence Studies

Batterman, S., L.Z. Zhang and S.Q. Wang. 2000. Quenching of chlorination disinfection byproduct formation in drinking water by hydrogen peroxide. Water Research. 34(5):1652-1658.

Bichsel, Y. and D. von Gunten. 2000. Formation of iodo-trihalomethanes during disinfection and oxidation of iodide-containing waters. Environmental Science and Technology. 34:2784-2791.

Can, Z.S. and M. Gurol. 2003. Formaldehyde formation during ozonation of drinking water. Ozone-Science and Engineering. 25(1):41-51.

Cancho, B., F. Ventura, M. Galceran, A. Diaz and S. Ricart. 2000. Determination, synthesis and survey of iodinated trihalomethanes in water treatment processes. Water Research. 34(13):3380-3390.

Charrois, J., D. Graham, S. Hrudey and K. Froese. 2004. Disinfection by-products in small Alberta community drinking-water supplies. Journal of Toxicology and Environmental Health, Part A. 67(20-22):1797-803.

Chellam, S. and S.W. Krasner. 2001. Disinfection byproduct relationships and speciation in chlorinated nanofiltered waters. Environmental Science and Technology. 35(19):3988-3999.

Choi, J. and R.L. Valentine. 2002. A kinetic model of N-nitrosodimethylamine (NDMA) formation during water chlorination/chloramination. Journal of Water Science and Technology. 46(3):65-71.

Choi, J. and R.L. Valentine. 2002. Formation of N-nitrosodimethylamine (NDMA) from reaction of monochloramine: a new disinfection by-product. Water Research. 36(4):817-824.

Choi, J., S.E. Duirk and R.L. Valentine. 2002. Mechanistic studies of N-nitrosodimethylamine (NDMA) formation in chlorinated drinking water. Journal of Environmental Monitoring. 4(2):249-252.

Choi, J. and R.L. Valentine. 2003. N-nitrosodimethylamine formation by free-chlorineenhanced nitrosation of dimethylamine. Environmental Science and Technology. 37(21):4871-4876.

Chu, H. and M.J. Nieuwenhuijsen. 2002. Distribution and determinants of trihalomethane concentrations in indoor swimming pools. Occupational and Environmental Medicine. 59:243-247.

Clark, R.M., R.C. Thurnau, M. Sivaganesan, et al. 2001. Predicting the formation of chlorinated and brominated by-products. Journal of Environmental Engineering-ASCE. 127(6):493-501.

Dabrowska, A., J. Swietlik and J. Nawrocki. 2003. Formation of aldehydes upon ClO_2 disinfection. Water Research. 37(5):1161-1169.

Diehl, A.C., G.E. Speitel, J.M. Symons, S.W. Krasner, S.J. Hwang and S.E. Barrett. 2000. DBP formation during chloramination. Journal of the American Water Works Association. 92(6):76-90.

Duirk, S. and R.L. Valentine. 2002. Monochloramine loss in the presence of humic acid. Journal of Environmental Monitoring. 4(1):85-89.

Duong, H.A., M. Berg, M.H. Hoang, H.V. Pham, H. Gallard, W. Giger and U. von Gunten. 2003. Trihalomethane formation by chlorination of ammonium- and bromide-containing groundwater in water supplies of Hanoi, Vietnam. Water Research. 37(13):3242-52.

Espigares, N., P. Lardelli and P. Ortega. 2003. Evaluating trihalomethane content in drinking water on the basis of common monitoring parameters: Regression models. Journal of Environmental Health. 66(3):9-13.

Gang, D.C., T.E. Clevenger and S.K. Banerji. 2003. Relationship of chlorine decay and THMs formation to NOM size. Journal of Hazardous Materials. 96(1):1-12.

Gerecke, A.C. and D.L. Sedlak. 2003. Precursors of N-nitrosodimethylamine in natural waters. Environmental Science and Technology. 37(7):1331-1336.

Ivancev-Tumbas, I. and B. Dalmacija. 2001. Effects of coagulation processes on aldehydes formation in groundwater treated with common oxidative agents. Water Research. 35(16):3950-3958.

Kim, J., Y. Chung, D. Shin, M. Kim, Y. Lee, Y. Lim and D. Lee. 2003. Chlorination by-products in surface water treatment process. Desalination. 151(1):1-9.

Kitis, M., J.E. Kilduff and T. Karanfil. 2001. Isolation of dissolved organic matter (DOM) from surface waters using reverse osmosis and its impact on the reactivity of DOM to formation and speciation of disinfection by-products. Water Research. 35(9):2225-2234.

Kitis, M., T. Karanfil and J.E. Kilduff. 2004. The reactivity of dissolved organic matter for disinfection by-product formation. Turkish Journal of Engineering and Environmental Sciences. 28:167-179.

Kitis, M., T. Karanfil, J.E. Kilduff and A. Wigton. 2001. The reactivity of natural organic matter to disinfection by-product formation and its relation to specific ultraviolet absorbance. Water Science and Technology. 43(2)9-16.

Kitis, M., T. Karanfil, A. Wigton and J.E. Kilduff. 2002. Probing reactivity of dissolved organic matter for disinfection by-product formation using XAD-8 resin adsorption and ultrafiltration fractionation. Water Research. 36(15):3834-3848.

Korshin, G.V., W.W. Wu, M.M. Benjamin and O. Hemingway. 2002. Correlations between differential absorbance and the formation of individual DBPs. Water Research. 36(13):3273-3282.

Lekkas, T.D. and A.D. Nikolaou. 2004. Development of predictive models for the formation of trihalomethanes and haloacetic acids during chlorination of bromide-rich water. Water Quality Research Journal of Canada. 39(2):149-159.

Mitch, W.A., A.C. Gerecke and D.L. Sedlak. 2003. A N-nitrosodimethylamine (NDMA) precursor analysis for chlorination of water and wastewater. Water Research. 37(15):3733-3741.

Mitch, W.A. and D.L. Sedlak. 2004. Characterization and fate of N-nitrosodimethylamine precursors in municipal wastewater treatment plants. Environmental Science and Technology. 38(5):1445-1454.

Mitch, W.A. and D.L. Sedlak. 2002. Formation of N-nitrosodimethylamine (NDMA) from dimethylamine during chlorination. Environmental Science and Technology. 36(4):588-595.

Nikolaou, A.D., S.K. Golfinopoulos, M.N. Kostopoulou and T.D. Lekkas. 2000. Decomposition of dihaloacetonitriles in water solutions and fortified drinking water samples. Chemosphere. 41(8):1149-1154.

Nikolaou, A.D., T.D. Lekkas and S.K. Golfinopoulos. 2004. Kinetics of the formation and decomposition of chlorination by-products in surface waters. Chemical Engineering Journal. 100(1-3):139-148.

Nikolaou, A.D. and T.D. Lekkas. 2001. The role of natural organic matter during formation of chlorination by-products: A review. Acta Hydrochimica et Hydrobiologica. 29(2-3):63-77.

Plummer, J.D. and J.K. Edzwald. 2001. Effect of ozone on algae as precursors for trihalomethane and haloacetic acid production. Environmental Science and Technology. 35(18):3661-3668.

Qi, Y., C. Shang and I.M.C. Lo. 2004. Formation of haloacetic acids during monochloramination. Water Research. 38(9):2375-2383.

Richardson, S.D., A.D. Thruston, Jr., C. Rav-Acha, L. Groisman, I. Popilevsky, O. Juraev, V. Glezer, A.B. McKague, M.J. Plewa and E.D. Wagner. 2003. Tribrompyrrole, brominated acids, and other disinfection byproducts produced by disinfection of drinking water rich in bromide. Environmental Science and Technology. 37(17):3782-3793.

Sadiq, R. and M.J. Rodriguez. 2004. Disinfection by-products (DBPs) in drinking water and predictive models for their occurrence: a review. Science of the Total Environment. 321(1-3):21-46.

Sharpless, C.M., M.A. Page and K.G. Linden. 2003. Impact of hydrogen peroxide on nitrite formation during UV disinfection. Water Research. 37(19):4730-4736.

Singer, P.C., H.S. Weinberg, K. Brophy, L. Liang, M. Roberts, I. Grisstede, S. Krasner, H. Baribeau, H. Arora, and I. Najm. 2002. Relative Dominance of Haloacetic Acids and Trihalomethanes in Treated Drinking Water. Denver, Colo.: American Water Works Association Research Foundation.

Speitel, G.E., P.G. Pope, M.R. Collins, and M. Martin-Doole. 2004. Disinfection By-Product Formation and Control During Chloramination. Denver, Colo.: American Water Works Association Research Foundation.

Uyguner, C.S., C. Hellriegel, W. Otto, et al. 2004. Characterization of humic substances: Implications for trihalomethane formation. Analytical and Bioanalytical Chemistry. 378(6):1579-1586.

Von Gunten, U. 2003. Ozonation of drinkingwater: Part II. Disinfection and by-product formation in presence of bromide, iodide or chlorine. Water Research. 37:1469–1487.

Weinberg, H.S., S.W. Krasner, S.D. Richardson and A.D. Thruston, Jr. 2002. The Occurrence of Disinfection By-Products (DBPs) of Health Concern in Drinking Water: Results of a Nationwide DBP Occurrence Study, U.S. Environmental Protection Agency, National Exposure Research Laboratory, Athens, GA. EPA/600/R-02/068. http://www.epa.gov/athens/publications/ EPA600R02068.pdf.

Westerhoff, P. and H. Mash. 2002. Dissolved organic nitrogen in drinking water supplies: a review. Journal of Water Supply Research and Technology-Aqua. 51(8):415-448.

Westerhoff, P., P. Chao and H. Mash. 2004. Reactivity of natural organic matter with aqueous chlorine and bromine. Water Research. 38(6):1502-1513.

White, D.M., D.S. Garland, J. Narr, et al. 2003. Natural organic matter and DBP formation potential in Alaskan water supplies. Water Research. 37(4):939-947.

Wilczak, A., A. Assadi-rad, H.H. Lai, L.L. Hoover, J.F. Smith, R. Berger, F. Rodigari, J.W. Beland, L.J. Lazzelle, E.G. Kincannon, H. Baker and C.T. Heaney. 2003. Formation of NDMA in chloraminated water coagulated with DADMAC cationic polymer. Journal of the American Water Works Association. 95(9):94-106.

Vikesland, P.J., K. Ozekin and R.L. Valentine. 2001. Monochloramine decay in model and distribution system waters. Water Research. 35(7):1766-1776.

Villanueva, C.M., M. Kogevinas and J.O. Grimalt. 2003. Haloacetic acids and trihalomethanes in finished drinking waters from heterogeneous sources. Water Research. 37(4):953-958.

Yang, X. and C. Shang. 2004. Chlorination byproduct formation in the presence of humic acid, model nitrogenous organic compounds, ammonia, and bromide. Environmental Science and Technology. 38(19):4995-5001.

Yoon, J., Y. Choi, S. Cho and D. Lee. 2003. Low trihalomethane formation in Korean drinking water. Science of the Total Environment. 302(1-3):157-166.

Zhang, X.G. and R.A. Minear. 2002. Characterization of high molecular weight disinfection byproducts resulting from chlorination of aquatic humic substances. Environmental Science and Technology. 36(19):4033-4038.

Zhang, X.R. and R.A. Minear. 2002. Decomposition of trihaloacetic acids and formation of the corresponding trihalomethanes in drinking water. Water Research. 36(14):3665-3673.

Analytical Methods

Charrois, J.W.A., M.W. Arend, K.L. Froese and S.E. Hrudey. 2004. Detecting N-nitrosamines in drinking water at nanogram per liter levels using ammonia positive chemical ionization. Environmental Science and Technology. 38(18):4835-4841.

Delcomyn, C.A., H.S. Weinberg and P.C. Singer. 2001. Use of IC-PCR and measurement of tribromide to evaluate bromate levels in drinking water. Journal of Chromatography A. 920:213-219.

Ikeda, K., R. Arimura, S. Echigo, Y. Shimizu, R.A. Minear and S. Matsui. 2000. The fractionation/concentration of aquatic humic substances by the sequential membrane system and their characterization with mass spectrometry. Water Science and Technology. 42(7-8):383-390.

Munch, J.W. and M.V. Bassett. 2004. EPA Method 521. Determination of Nitrosamines in Drinking Water by Solid Phase Extraction and Capillary Column Gas Chromatography with Large Volume Injection and Chemical Ionization Tandem Mass Spectrometry (MS/MS).

Raymer, J.H., E. Pellizzari, B. Childs, K. Briggs and J.A. Shoemaker. 2000. Analytical methods for water disinfection byproducts in foods and beverages. Journal of Exposure Analysis and Environmental Epidemiology. 10(6 Pt 2):808-815.

Richardson, S.D. 2003. Disinfection by-products and other emerging contaminants in drinking water. Trends in Analytical Chemistry. 22(10):666-684.

Treatment Technologies

Jyoti, K.K. and A.B. Pandit. 2004. Ozone and cavitation for water disinfection. Biochemical Engineering Journal. 18(1):9-19.

Kim, B.R., J.E. Anderson, S.A. Mueller, W.A. Gaines and A.M. Kendall. 2002. Literature review—efficacy of various disinfectants against *Legionella* in water systems. Water Research. 36(18):4433–4444.

Kimbrough, D.E. and I.H. Suffet. 2002. Electrochemical removal of bromide and reduction of THM formation potential in drinking water. Water Research. 36(19):4902-4906.

Kilduff, J.E., S. Mattaraj, A. Wigton, M. Kitis and T. Karanfil. 2004. Effects of reverse osmosis isolation on reactivity of naturally occurring dissolved organic matter in physicochemical processes. Water Research. 38(4)1026-1036.

Yavich, A.A. and S.J. Masten. 2001. Modeling the kinetics of ozone reactions with NOM in Huron River water. Ozone: Science and Engineering. 23(2):105-119.

Yavich, A.A., K-H. Lee, K-C. Chen, L. Pape and S.J. Masten. 2004. Evaluation of biodegradability of NOM after ozonation. Water Research. 38:2839-2846.

Yavich, A.A. and S.J. Masten. 2003. The use of ozonation and FBT to control THM precursors. Journal of the American Water Works Association. 95(4):159-171.