5. List of References

Abdel-Mageed AB, Oehme FW. 1990. A review on biochemical roles, toxicity and interactions of zinc, copper and iron: IV. Interactions. Vet Hum Toxicol 32:456-458.

*Abdulla M, Svensson S, Haeger-Aronsen B. 1979. Antagonistic effects of zinc and aluminum on lead inhibition of δ-aminolevulinic acid dehydratase. Arch Environ Health 34(6):464-469.

Acuna-Castillo C, Morales B, Huidobro-Toro J. 1999. Zinc and copper modulate differentially the $P2X_4$ receptor. J Neurochem 74:1529-1537.

Alexander BH, Checkoway H, Costa-Mallen P, et al. 1998. Interaction of blood lead and δ-aminolevulinic acid dehydratase genotype on markers of heme synthesis and sperm production in lead smelter workers. Environ Health Perspect 106:213-216.

*Anderson LA, Hakojarvi SL, Boudreazu SK. 1998. Zinc acetate treatment in Wilson's disease. Ann Pharmacother 32:78-87.

*Antonowicz J, Andrzejak R, Smolik R. 1990. Influence of heavy metal mixtures on erythrocyte metabolism. Int Arch Occup Environ Health 62:195-198.

Anwer J, Ali S, Mehrotra NK. 1988. Antagonistic effect of zinc in lead treated developing chick embryos. Drug Chem Toxicol 11(1):85-95.

*Araki S, Murata K, Uchida E, et al. 1993a. Radial and median nerve conduction velocities in workers exposed to lead, copper, and zinc: A follow-up study for 2 years. Environ Res 61:308-316.

*Araki S, Murata K, Yokoyama K, et al. 1992. Auditory event-related potential (P300) in relation to peripheral nerve conduction in workers exposed to lead, zinc, and copper: Effects of lead on cognitive function and central nervous system. Am J Ind Med 21(4):539-547.

*Araki S, Yokoyama K, Murata K. 1993b. Assessment of the effects of occupational and environmental factors on all faster and slower large myelinated nerve fibers: A study of the distribution of nerve conduction velocities. Environ Res 62:325-332.

Ashraf MH, Fosmire GJ. 1985. Effects of marginal zinc deficiency on subclinical lead toxicity in the rat neonate. J Nutr 115:334-346.

*ATSDR. 1990. Toxicological profile for copper. Atlanta, GA: Agency for Toxic Substances and Disease Registry.

*ATSDR. 1992. Public health assessment guidance manual. Atlanta, GA: Agency for Toxic Substances and Disease Registry. U.S. Department of Health and Human Services.

*ATSDR. 1994. Toxicological profile for zinc. Atlanta, GA: Agency for Toxic Substances and Disease Registry

*Cited in text

*ATSDR. 1999. Toxicological profile for lead. Atlanta, GA: Agency for Toxic Substances and Disease Registry.

*ATSDR. 2000. Toxicological profile for manganese. Atlanta, GA: Agency for Toxic Substances and Disease Registry.

*ATSDR. 2001a. Guidance manual for the assessment of joint toxic action of chemical mixtures. Atlanta, GA: Agency for Toxic Substances and Disease Registry.

*ATSDR. 2001b. Guidance manual for the preparation of an interaction profile. Atlanta, GA: Agency for Toxic Substances and Disease Registry.

Axelson O, Wingren G. 1992. Epidemiological studies of occupational cancer as related to complex mixtures of trace elements. J Trace Elem Exp Med 5(2):86.

*Baldwin M, Mergler D, Larribe F, et al. 1999. Bioindicator and exposure data for a population based study of manganese. Neurotoxicology 20(2-3):343-354.

Baranowska-Dutkiewicz B, Dutkiewicz T. 1991. Evaluation of simultaneous industrial and environmental exposure to metals. Sci Total Environ 101:149-151.

*Barceloux DG. 1999. Copper. Clin Toxicol 37(2):217-230.

Basavaraju SR, Jones TD. 1998. Atherosclerotic risks from chemicals: Part I. Toxicological observations and mechanisms of atherosclerosis. Arch Environ Contam Toxicol 35:152-164.

*Batra N, Nehru B, Bansal MP. 1998. The effect of zinc supplementation on the effects of lead on the rat testis. Reprod Toxicol 12(5):535-540.

*Bebe FN, Panemangalore M. 1996. Modulation of tissue trace metal concentrations in weanling rats fed different levels of zinc and exposed to oral lead and cadmium. Nutr Res 16(8):1369-1380.

Beck BD. 1992. Symposium overview: An update on exposure and effects of lead. Fundam Appl Toxicol 18:1-16.

Bernstein IA, Vaughan FL. 1999. Cultured keratinocytes in in vitro dermatotoxicological investigation: A review. J Toxicol Environ Health 2(Part B):1-30.

Blumenthal S, Lewand D, Sochanik A, et al. 1994. Inhibition of Na^+-glucose cotransport in kidney cortical cells by cadmium and copper: Protection by zinc. Toxicol Appl Pharmacol 129:177-187.

*Border EA, Cantrell AC, Kilroe-Smith TA. 1976. The *in vitro* effect of zinc on the inhibition of human δ-aminolevulinic acid dehydratase by lead. Br J Ind Med 33:85-87.

Bremner I, Beattie JH. 1995. Copper and zinc metabolism in health and disease: Speciation and interactions. Proc Nutr Soc 54:489-499.

*Brewer GJ. 2000. Recognition, diagnosis, and management of Wilson's disease. Proc Soc Exp Biol Med 223:39-46.

*Brewer GJ, Dick RD, Schall W, et al. 1992. Use of zinc acetate to treat copper toxicosis in dogs. J Am Vet Med Assoc 201(4):564-568.

Brewer GJ, Hill GM, Dick RD, et al. 1985. Interactions of trace elements: Clinical significance. J Am Coll Nutr 4:33-38.

Bruinink A, Faller P, Sidler C, et al. 1998. Growth inhibitory factor and zinc affect neural cell culture in a tissue specific manner. Chem Biol Interact 115:167-174.

Bush AI, Pettingell WH, Multhaup G, et al. 1994. Rapid induction of alzheimer Aβ amyloid formation by zinc. Science 265:1464-1467.

*Bushnell PJ, Levin ED. 1983. Effects of zinc deficiency on lead toxicity in rats. Neurobehav Toxicol Teratol 5:283-288.

Camerino D, Cassitto MG, Gilioli R. 1993. Prevalence of abnormal neurobehavioral scores in populations exposed to different industrial chemicals. Environ Res 61:251-257.

Cantrell AC, Kilroe-Smith TA, Simoes MM, et al. 1977. The effect of zinc and pH on the behaviour of aminolevulinic acid dehydratase activity in baboons exposed to lead. Br J Ind Med 34:110-113.

Carfagna MA, Ponsler GD, Muhoberac BB. 1995. Inhibition of ATPase activity in rat synaptic plasma membranes by simultaneous exposure to metals. Chem Biol Interact 100:53-65.

Carpentieri U, Myers J, Daeschner CW, et al. 1988. Effects of iron, copper, zinc, calcium, and magnesium on human lymphocytes in culture. Biol Trace Elem Res 16:165-176.

*CDC. 1991. Preventing lead poisoning in young children. Atlanta, GA: U.S. Department of Health and Human Services. Public Health Service. Center for Disease Control and Prevention.

*Cerklewski FL. 1979. Influence of dietary zinc on lead toxicity during gestation and lactation in the female rat. J Nutr 109:1703-1709.

Cerklewski FL. 1984. Post-absorptive effect of increased dietary zinc on toxicity and removal of tissue lead in rats. J Nutr 114:550-554.

*Cerklewski FL, Forbes RM. 1976. Influence of dietary zinc on lead toxicity in the rat. J Nutr 106:689-696.

*Cerklewski FL, Forbes RM. 1977. Influence of dietary copper on lead toxicity in the young male rat. J Nutr 107:143-146.

Chan S, Gerson B, Subramaniam S. 1998. The role of copper, molybdenum, selenium, and zinc in nutrition and health. Toxicology 18(4):673-685.

*Chandra SV, Mohd M, Saxena DK, et al. 1981. Behavioral and neurochemical changes in rats simultaneously exposed to manganese and lead. Arch Toxicol 49:49-56.

*Chandra SV, Murthy RC, Saxena DK. 1983. Effects of pre- and postnatal combined exposure to Pb and Mn on brain development in rats. Ind Health 21:273-279.

Cheek DB, Smith RM, Spargo RM, et al. 1981. Zinc, copper and environmental factors in the aboriginal peoples of the North West. Aust N Z J Med 11:508-512.

*Chiba M, Kikuchi M. 1984a. The *in vitro* effects of zinc and manganese on δ-aminolevulinic acid dehydratase activity inhibited by lead or tin. Toxicol Appl Pharmacol 73:388-394.

*Chiba M, Kikuchi M. 1984b. The in vivo effects of manganese and zinc on δ-aminolevulinic acid dehydratase activity inhibited by lead. Toxicol Lett 20:143-147.

*Chisolm JJ Jr. 1981. Dose-effect relationships for lead in young children: Evidence in children for interactions among lead, zinc, and iron. In: Lynam DR, Piantanida LG, Cole JF, eds. Environmental Lead: Proceedings of the 2nd International Symposium on Environmental Lead Research. Ecotoxicology and environmental quality series. NY: Academic Press, 1-7.

*Chmielnicka J, Komsta-Szumska E, Zareba G. 1988. Effects of interaction between ^{65}Zn, cadmium, and copper in rats. Biol Trace Elem Res 17:285-292.

*Church HJ, Day JP, Braithwaite RA, et al. 1993a. Binding of lead to a metallothionein-like protein in human erythrocytes. J Inorg Biochem 49(1):55-68.

*Church HJ, Day JP, Braithwaite RA, et al. 1993b. The speciation of lead in erythrocytes in relation to lead toxicity. Case studies of two lead-exposed workers [Abstract]. Neurotoxicology 14(2-3):359-364.

Colt JS, Blair A. 1998. Parental occupational exposures and risk of childhood cancer. Environ Health Perspect 106(Suppl. 3):909-925.

Crow JP, Sampson JB, Zhuang Y, et al. 1997. Decreased zinc affinity of amyotrophic lateral sclerosis-associated superoxide dismutase mutants leads to enhanced catalysis of tyrosine nitration by peroxynitrite. J Neurochem 69:1936-1944.

Cuajungco MP, Goldstein LE, Nunomura A, et al. 2000. Evidence that the β-amyloid plaques of Alzheimer's disease represent the redox-silencing and entombment of Aβ by zinc. J Biol Chem 275(26):19439-19442.

Cunnane SC. 1981. Zinc and copper interact antagonistically in the regulation of linoleic acid metabolism. Prog Lipid Res 20:601-603.

Dameron CT, Harrison MD. 1998. Mechanisms for protection against copper toxicity. Am J Clin Nutr 67:1091S-1097S.

Davis CD, Feng Y. 1998. Dietary copper, manganese and iron affect the formation of aberrant crypts in colon of rats administered 3,2'-dimethyl-4-aminobiphenyl. J Nutr 129:1060-1067.

Davis JR, Avram MJ. 1977. A comparison of the stimulatory effects of cadmium and zinc on normal and lead-inhibited human erythrocytic δ-aminolevulinic acid dehydratase activity *in vitro*. Toxicol Appl Pharmacol 44:181-190.

*Davis JR, Avram MJ. 1978. A comparison of the stimulatory effects of cadmium and zinc on normal and lead-inhibited human erythrocytic δ-Aminolevulinic acid dehydratase activity in vitro. Toxicol Appl Pharmacol 44:181-190.

*Delves HT, Clayton BE, Bicknell J. 1973. Concentration of trace metals in the blood of children. Brit J Prev Soc Med 27:100-107.

Dieter MP. 1993. Fate, transport, and interactions of metals. Environ Health Perspect 101(4):344-345.

Domingo JL, Gomez M, Jones MM. 1998. Concurrent administration of D-penicillamine and zinc has no advantages over the use of either single agent on copper excretion in the rat. Toxicology 126:195-201.

Dorward A, Yagminas AP. 1994. Activity of erythrocyte δ-aminolevulinic acid dehydratase in the female cynomolgus monkey (*macaca fascicularis*): kinetic analysis in control and lead-exposed animals. Comp Biochem Physiol 108B(2):241-252.

Dutkiewicz B, Dutkiewicz T, Milkowska G. 1979. The effect of mixed exposure to lead and zinc on ALA level in urine. Int Arch Occup Environ Health 42:341-348.

DuVal GE, Fowler BA. 1989. Preliminary purification and characterization studies of a low molecular weight, high affinity cytosolic lead-binding protein in rat brain. Biochem Biophys Res Commun 159:177-184.

*El-Gazzar RM, Finelli VN, Boiano J, et al. 1978. Influence of dietary zinc on lead toxicity in rats. Toxicol Lett 1:227-234.

*Emsley CL, Gao S, Li Y, et al. 2000. Trace element levels in drinking water and cognitive function among elderly Chinese. Am J Epidemiol 151:913-920.

*EPA. 1986. Air quality criteria for lead. Vol. IV. Research Triangle Park, NC: U.S. Environmental Protection Agency, Office of Research and Development, Office of Health and Environmental Assessment, Environmental Criteria and Assessment Office. EPA 600/8-83-028dF, 12-34–12-37.

Farant JP, Wigfield DC. 1987. Interaction of divalent metal ions with normal and lead-inhibited human erythrocytic porphobilinogen synthase *in vitro*. Toxicol Appl Pharmacol 89:9-18.

Farant JP, Wigfield DC. 1990. The effects of copper, zinc, mercury, and cadmium on rabbit erythrocytic porphobilinogen synthase in vivo. J Anal Toxicol 14:222-226.

Ferm VH. 1972. The teratogenic effects of metals on mammalian embryos. Adv Teratol 5:51-75.

Finelli VN. 1977. Lead, zinc and δ-aminolevulinate dehydratase. In: Lee SD, ed. Biochemical effects of environmental pollutants. Ann Arbor, MI: Ann Arbor Science Publishers, Inc., 351-363.

Finelli VN, El-Gazzar RM. 1977. Interaction of lead and zinc on the prothrombin activity in rats. Toxicol Lett 1:33-39.

*Finelli VN, Klauder DS, Karaffa MA, et al. 1975. Interaction of zinc and lead and δ-aminolevulinate dehydratase. Biochem Biophys Res Commun 65(1):303-311.

Fischer PWF, Giroux A, L'Abbe MR. 1981. The effect of dietary zinc on intestinal copper absorption. Am J Clin Nutr 34:1670-1675.

Flanagan PR, Chamberlain MJ, Valberg LS. 1982. The relationship between iron and lead absorption in humans. Am J Clin Nutr 36:823-829.

Fleming DEB, Chettle DR, Wetmur JG, et al. 1998. Effect of the δ-aminolevulinate dehydratase polymorphism on the accumulation of lead in bone and blood in lead smelter workers. Environ Res 77:49-61.

Flora SJS, Bhatttacharya R, Sachan SRS. 1994. Dose-dependent effects of zinc supplementation during chelation of lead in rats. Pharmacol Toxicol 74:330-333.

*Flora SJS, Coulombe RA, Sharma RP, et al. 1989a. Influence of dietary protein deficiency on lead-copper interaction in rats. Ecotoxicol Environ Saf 18:75-82.

*Flora SJS, Jain VK, Behari JR, et al. 1982. Protective role of trace metals in lead intoxication. Toxicol Lett 13:51-56.

*Flora SJS, Kumar D, Gupta D. 1991. Interaction of zinc, methionine or their combination with lead at gastrointestinal or post-absorptive level in rats. Pharmacol Toxicol 68:3-7.

*Flora SJS, Singh S, Tandon SK. 1989b. Thiamine and zinc in prevention or therapy of lead intoxication. J Int Med Res 17:68-75.

*Fowler BA. 1998. Roles of lead-binding proteins in mediating lead bioavailability. Environ Health Perspect 106(Suppl. 6):1585-1587.

Fowler BA, Oskarsson A, Woods JS. 1987. Metal- and metalloid-induced porphyrinurias. Ann NY Acad Sci 514:172-182.

*Friberg L, Nordberg GF, Vouk VB. 1986. Handbook on the toxicology of metals. Vol. II: Specific Metals. 2nd ed. Amsterdam: Elsevier Science Publishers B.V., 242.

Fujita H, Yamamoto R, Sato K, et al. 1985. *In vivo* regulation of δ-aminolevulinate dehydratase activity. Toxicol Appl Pharmacol 77:66-75.

Gerhardsson L, Nordberg GF. 1993. Lung cancer in smelter workers -Interactions of metals as indicated by tissue levels. Scand J Work Environ Health 19(Suppl.1):90-94.

Gochfeld M. 1997. Factors influencing susceptibility to metals. Environ Health Perspect 105(Suppl.4):817-822.

Goering PL. 1993. Lead-protein interactions as a basis for lead toxicity. Neurotoxicology 14:45-60.

Goering PL, Fowler BA. 1985. Mechanisms of renal lead-binding protein protection against lead-inhibition of δ-aminolevulinic acid dehydratase. J Pharmacol Exp Ther 234:365-371.

Goering PL, Fowler BA. 1987a. Kidney zinc-thionein regulation of δ-aminolevulinic acid dehydratase inhibition by lead. Arch Biochem Biophys 253(1):48-55.

*Goering PL, Fowler BA. 1987b. Metal constitution of metallothionein influences inhibition of δ-aminolevulinic acid dehydratase (porphobiligen synthase) by lead. Biochem J 245:339-345.

Goering PL, Fowler BA. 1987c. Regulatory roles of high-affinity metal-binding proteins in mediating lead effects on δ-aminolevulinic acid dehydratase. Ann N Y Acad Sci 514:235-247.

*Gorell JM, Johnson CC, Rybicki BA, et al. 1997. Occupational exposure to metals as risk factors for Parkinson's disease. Neurology 48:650-658.

*Gorell JM, Johnson CC, Rybicki BA, et al. 1999. Occupational exposure to manganese, copper, lead, iron, mercury and zinc and the risk of Parkinson's disease. Neurotoxicology 20(2-3):239-248.

Goyer RA. 1995. Nutrition and metal toxicity. Am J Clin Nutr 61(Suppl.):646S-650S.

Goyer RA. 1997. Toxic and essential metal interactions. Annu Rev Nutr 17:37-50.

*Grant-Frost DR, Underwood EJ. 1958. Zinc toxicity in the rat and its interrelation with copper. Austral J Exp Biol 36:339-346.

Guilarte TR, Miceli RC. 1992. Age-dependent effects of lead on [^{3}H]MK-801 binding to the NMDA receptor-gated ionophore: In vitro and in vivo studies. Neurosci Lett 148:27-30.

Haeger-Aronsen B, Schutz A, Abdulla M. 1976. Antagonistic effect in vivo of zinc on inhibition of δ-aminolevulinic acid dehydratase by lead. Arch Environ Health 31(4):215-220.

Haghdoost NR, Newman LM, Johnson EM. 1997. Multiple chemical exposures: Synergism vs. individual exposure levels. Reprod Toxicol 11:9-27.

Hanas JS, Rodgers JS, Bantle JA, et al. 1999. Lead inhibition of DNA-binding mechanism of Cys_2His_2 zinc finger proteins. Pharm Exp Ther 56:982-988.

*Hardman JF, Limbird LE, eds. 1996. Goodman & Gilman's the pharmacological basis of therapeutics. New York, NY: McGraw-Hill, 120, 123-124, 252.

Hashemzadeh-Gargari H, Guilart TR. 1999. Divalent cations modulate *N*-methyl-D-aspartate receptor function at the glycine site. J Pharmacol Exp Ther 290:1356-1362.

*Hietanen E, Aitio A, Koivusaari U, et al. 1982. Tissue concentrations and interaction of zinc with lead toxicity in rabbits. Toxicology 25:113-127.

*Hsu FS, Krook L, Pond WG, et al. 1975. Interactions of dietary calcium with toxic levels of lead and zinc in pigs. J Nutr 105:112-118.

Hussain T, Ali MM, Chandra SV. 1987. The combined effect of Pb^{2+} and Mn^{2+} on monoamine uptake and Na^{+}, K^{+}-ATPase in striatal synaptosomes. J Appl Toxicol 7(4):277-280.

Hutton M. 1983. The effects of environmental lead exposure and *in vitro* zinc on tissue δ-aminolevulinic acid dehydratase in urban pigeons. Comp Biochem Physiol 74C(2):441-446.

*Institute of Medicine. 2001. Dietary reference intakes for vitamin A, vitamin K, arsenic, boron, chromium, copper, iodine, iron, manganese, molybdenum, nickel, silicon, vanadium, and zinc. Washington, DC: National Academy Press, 7-1–7-27. Http://www.nap.edu/books/0309072794/html/. December 19, 2001.

IRIS. 2001. Integrated Risk Information System. U.S. Environmental Protection Agency. Http://www.epa.gov/iris/subst/index.htm. April 17, 2001.

*Jehan ZS, Motlag DB. 1995. Metal induced changes in the erythrocyte membrane of rats. Toxicol Lett 78:127-133.

*Jenkins KF. 1989. Effect of copper loading of preruminant calves on intracellular distribution of hepatic copper, zinc, iron, and molybdenum. J Dairy Sci 72:2346-2350.

*Jenkins KJ, Hidiroglou M. 1989. Tolerance of the calf for excess copper in milk replacer. J Dairy Sci 72(1):150-156.

*Johnson MA, Flagg EW. 1986. Effects of sucrose and cornstarch on the development of copper deficiency in rats red high levels of zinc. Nutr Res 6:1307-1319.

*Johnson NE, Tenuta K. 1979. Diets and lead blood levels of children who practice pica. Environ Res 18:369-376.

*Joselow MM, Tobias E, Koehler R, et al. 1978. Manganese pollution in the city environment and its relationship to traffic density. Am J Public Health 68:557-560.

Kaiser J. 1994. Alzheimer's: Could there be a zinc link? Science 265:1365.

Kaji T, Takata M, Miyahara T, et al. 1990. Interaction of zinc with cadmium and copper on ossification of embryonic chick bone in tissue culture. Arch Environ Contam Toxicol 19:653-656.

Kalia K, Chandra SV, Viswanathan PN. 1984. Effect of ^{54}Mn and lead interaction on their binding with tissue proteins: In vitro* studies. Ind Health 22:207-218.

Kang YJ. 1999. The antioxidant function of metallothionein in the heart. Proc Soc Exp Biol Med 222:263-273.

Kasarskis EJ. 1990. Metal interactions of lead with zinc in the postnatally lead exposed rat. Neurotoxicol Teratol 12(5):562.

*Kies C, Ip SW. 1990. Lead bioavailability to humans from diets containing constant amounts of lead: Impact of supplemental copper, zinc and iron. Trace Subst Environ Health 24:177-184.

*Kies C, Umoren J. 1989. Inhibitors of copper bioutilization: Fiber, lead, phytate and tannins. Adv Exp Med Biol 258:81-93.

*Klauder DS, Petering HG. 1975. Protective value of dietary copper and iron against some toxic effects of lead in rats. Environ Health Perspect 12:77-80.

*Klauder DS, Petering HG. 1977. Anemia of lead intoxication. A role for copper. J Nutr 107:1779-1785.

*Klauder DS, Murthy L, Petering HG. 1972. Effect of dietary intake of lead acetate on copper metabolism in male rats. Trace Subst Environ Health 6:131-136.

Koizumi S, Yamada H, Suzuki K, et al. 1992. Zinc-specific activation of a HeLa cell nuclear protein which interacts with a metal responsive element of the human metallothionein-II_A gene. Eur J Biochem 210:555-560.

Kubena KS, Mcmurray DN. 1996. Nutrition and the immune system: A review of nutrient-nutrient interactions. J Am Diet Assoc 96:1156-1164.

*Lasley SM, Gilbert ME. 1999. Lead inhibits the rat *N*-methyl-D-aspartate receptor channel by binding to a site distinct from the zinc allosteric site. Toxicol Appl Pharmacol 159:224-233.

*Lauwerys R, Roels H, Buchet JP, et al. 1983. The influence of orally-administered vitamin C or zinc on the absorption of and the biological response to lead. J Occup Med 25(9):668-678.

Levander OA. 1979. Lead toxicity and nutritional deficiencies. Environ Health Perspect 29:115-125.

Lin JL, Tan DT, Hsu KH, et al. 2001. Environmental lead exposure and progressive renal insufficiency. Arch Intern Med 161:264-271.

*Liu J, Kershaw WC, Klaassen CD. 1991. The protective effect of metallothionein on the toxicity of various metals in rat primary hepatocyte culture. Toxicol Appl Pharmacol 197:27-34.

*Magee AC, Matrone G. 1960. Studies on growth, copper metabolism and iron metabolism of rats fed high levels of zinc. J Nutr 72:233-242.

*Mahaffey KR. 1985. Factors modifying susceptibility to lead toxicity. In: Mahaffey KR, ed. Dietary and environmental lead. Human health effects. Cincinnati, OH: Elsevier Science Publishers B.V., 373-419.

Mahaffey KR, Capar SG, Gladen BC, et al. 1981. Concurrent exposure to lead, cadmium, and arsenic: Effects on toxicity and tissue metal concentrations in the rat. J Lab Clin Med 98:463-481.

*Malhotra KM, Shukla GS, Chandra SV. 1982. Neurochemical changes in rats coexposed to lead and copper. Arch Toxicol 49:331-336.

*Markowitz ME, Rosen JF. 1981. Zinc (Zn) and copper (Cu) metabolism in $CaNa_2$EDTA-treated children with plumbism. Pediat Res 15:635.

Marshall EG, Gensburg LJ, Geary NS, et al. 1997. Maternal residential exposure to hazardous wastes and risk of central nervous system ane musculoskeletal birth defects. Arch Environ Health 52(6):416-425.

*Mauras Y, Allain P. 1979. Inhibition of delta-aminolevulinic acid dehydratase in humans by lead and activation by zinc or cysteine. Enzyme 24:181-187.

Milanino R, Deganello A, Marrella M, et al. 1992. Oral zinc as initial therapy in Wilson's disease: Two years of continuous treatment in a 10-year-old child. Acta Pediatr 81:163-166.

Miller GD, Massaro TF, Massaro EJ. 1990. Interactions between lead and essential elements: A review. Neurotoxicology 11:99-120.

*Miniuk K, Moniuszko-Jakoniuk JM, Kulikowska E, et al. 1989. The interactions of copper, lead and ethanol in rats: Effects on some biochemical parameters of blood. Pol J Pharmacol Pharm 41:273-280.

Mizutani T, Yamamoto K, Tajima K. 1983. Isotope effects on the metabolism and pulmonary toxicity of butylated hydroxytoluene in mice by deuteration of the 4-methyl group. Toxicol Appl Pharmacol 69:283-290.

Monteiro HP, Bechara EJH, Abdalla DSP. 1991. Free radicals involvement in neurological porphyrias and lead poisoning. Mol Cell Biochem 103:73-83.

*Murata K, Araki S. 1991. Autonomic nervous system dysfunction in workers exposed to lead, zinc, and copper in relation to peripheral nerve conduction: A study of R-R interval variability. Am J Ind Med 20(5):663-671.

*Murata K, Araki S, Yokoyama K, et al. 1993. Assessment of central, peripheral, and autonomic nervous system functions in lead workers: Neuroelectrophysiological studies. Environ Res 61:323-326.

Murgueytio AM, Evans RG, Sterling D, et al. 1998. Behaviors and blood lead levels of children in a lead-mining area and a comparison community. Environ Health:14-20.

Mylroie AA, Boseman A, Kyle J. 1986. Metabolic interactions between lead and copper in rats ingesting lead acetate. Biol Trace Elem Res 9:221-231.

*NRC. 1989. Recommended dietary allowances. 10th ed. Washington, DC: National Academy Press. National Research Council.

*NRC. 1995. Nutrient requirements of laboratory animals. 4th ed. Washington, DC: National Academy Press. National Research Council, 11-102.

*NRC. 1998. Nutrient requirements of laboratory animals. 4th ed. National Academy Press. National Research Council. 47-49, 110-111, 115-116, 121-122.

*Ogiso T, Moriyama K, Sasaki S, et al. 1974. Inhibitory effect of high dietary zinc on copper absorption in rats. Chem Pharm Bull 22:55-60.

Ogiso T, Ogawa N, Miura T. 1979. Inhibitory effect of high dietary zinc on copper absorption in rats. II. Binding of copper and zinc to cytosol proteins in the intestinal mucosa. Chem Pharm Bull 27(2):515-521.

*Ostreicher P, Cousins RJ. 1985. Copper and zinc absorption in the rat: Mechanism of mutual antagonism. J Nutr 115:159-166.

Panemangalore M. 1993. Interaction among zinc, copper and cadmium in rats: Effects of low zinc and copper diets and oral cadmium exposure. J Trace Elem Exp Med 6(3):125-139.

*Papaioannou R, Sohler A, Pfeiffer CC. 1978. Reduction of blood lead levels in battery workers by zinc and vitamin C. J Orthomol Psychiatr 7(2):94-106.

Platt B, Busselberg D. 1994. Combined actions of Pb2+, Zn2+, and Al3+ on voltage-activated calcium channel currents. Cell Mol Neurobiol 14(6):831-840.

*Pocino M, Malave I, Baute L. 1990. Zinc administration restores the impaired immune response observed in mice receiving excess copper by oral route. Immunopharmacol Immunotoxicol 12(4):697-713.

Pohl HR, Roney N, Fay M, et al. 1999. Site-specific consultation for a chemical mixture. Toxicol Ind Health 15:470-479.

Poirier J, Donaldson J, Barbeau A. 1985. The specific vulnerability of the substantia nigra to MPTP is related to the presence of transition metals. Biochem Biophys Res Commun 128(1):25-33.

*Prasad AS, Brewer GJ, Schoomaker EB, et al. 1978. Hypocupremia induced by zinc therapy in adults. JAMA 240:2166-2168.

Qian Y, Mikeska G, Harris ED, et al. 1999. Effect of lead exposure and accumulation on copper homeostasis in cultured C6 rat glioma cells. Toxicol Appl Pharmacol 158:41-49.

Quinn MR, Harris CL. 1995. Lead inhibits Ca^{2+} -stimulated nitric oxide xynthase activity from rat cerebellum. Neurosci Lett 196:65-68.

Quintanilla-Bega B, Smith DR, Kahng MW, et al. 1995. Lead-binding proteins in brain tissue of environmentally lead-exposed humans. Chem Biol Interact 98:193-209.

*Reinstein NH, Lonnerdal B, Keen CL, et al. 1984. Zinc-copper interactions in the pregnant rat: Fetal outcome and maternal and fetal zinc, copper and iron[1,2]. J Nutr 114:1266-1279.

Rifkin RJ. 1965. *In vitro* inhibition of Na+-K+ and Mg^2+ ATPases by mono, di and trivalent cations. Proc Soc Exp Biol Med 120:802-804.

Rodriguez RE, Kasprzak KS. 1989. Antagonists to metal carcinogens. J Am Coll Toxicol 8(7):1265-1269.

*Roels H, Lauwerys R, Buchet JP, et al. 1987. Epidemiological survey among workers exposed to manganese: Effects of lung, central nervous system, and some biological indices. Am J Emerg Med 11:307-327.

Rosen JF. 1981. Zinc (Zn) and copper (Cu) metabolism in $CaNa_2$EDTA-treated children with plumbism. Pediatr Res 15:635.

Rowles TK, Womac C, Bratton GR, et al. 1989. Interaction of lead and zinc in cultured astroglia. Metab Brain Dis 4(3):187-200.

Roughead ZK, Johnson LK, Hunt JR. 1999. Dietary copper primarily affects antioxidant capacity and dietary iron mainly affects iron status in a surface response study of female rats fed varying concentrations of iron, zinc and copper. J Nutr 129:1368-1376.

Sagripanti JL, Goering PL, Lamanna A. 1991. Interaction of copper with DNA and antagonism by other metals. Toxicol Appl Pharmacol 110:477-485.

*Sandstead HH, Frederickson CJ, Penland JG. 2000. History of zinc as related to brain function. J Nutr 130:496S-502S.

Sandstrom B. 1998. Toxicity considerations when revising the nordic nutrition recommendations. J Nutr 128:372-374.

Saxena DK, Murthy RC, Singh C, et al. 1989. Zinc protects testicular injury induced by concurrent exposure to cadmium and lead in rats. Res Commun Chem Pathol Pharmacol 64:317-329.

Schmitt N, Anderson TW, Philion JJ, et al. 1996. Could zinc help protect children from lead poisoning? Can Med Assoc J 154(1):13-14.

Schulte S, Muller WE, Priedberg KD. 1995. In vitro and in vivo effects of lead on specific ^{3}H-PN2---110 binding to dihydropyridine receptors in the frontal cortex of the mouse brain. Toxicology 97:113-121.

Shackelford ME, Collins TFX, Black TN, et al. 1994. Mineral interactions in rats fed ain-76A diets with excess calcium. Food Chem Toxicol 32(3):255-263.

Shafiq-ur-Rehman, Chandra O. 1984. Regional interrelationships of zinc, copper, and lead in the brain following lead intoxication. Bull Environ Contam Toxicol 32:157-165.

Sharonova IN, Vorobjev VS, Haas HL. 2000. Interaction between copper and zinc at $GABA_A$ receptors in acutely isolated cerebellar Purkinje cells of the rat. Br J Pharmacol 130:851-856.

Shaw WHR. 1961. Cation toxicity and the stability of transition-metal complexes. Nature 192:754-755.

*Shukla GS, Chandra SV. 1987. Concurrent exposure to lead, manganese, and cadmium and their distribution to various brain regions, liver, kidney, and testis of growing rats. Arch Environ Contam Toxicol 16:303-310.

*Simons TJB. 1997. Interactions between lead and metals in cellular toxicity. In: Yasui M, Strong MJ, Ota K et al., eds. Mineral and metal neurotoxicology. New York, NY. CRC Press, 243-251.

Skoczynska A, Smolik R. 1994. The effect of combined exposure to lead and cadmium on serum lipids and lipid peroxides level in rats. Int J Occup Med Environ Health 7(3):263-271.

Skoczynska A, Smolik R, Jelen M. 1993. Lipid abnormalities in rats given small doses of lead. Arch Toxicol 67:200-204.

Skoczynska A, Smolik R, Milian A. 1994. The effect of combined exposure to lead and cadmium on the concentration of zinc and copper in rat tissues. Int J Occup Med Environ Health 7(1):41-49.

Smith JW, Tokach MD, Goodband RD, et al. 1997. Effects of the interrelationship between zinc oxide and copper sulfate on growth performance of early-weaned pigs. J Anim Sci 75:1861-1866.

*Smith SE, Larson EJ. 1946. Zinc toxicity in rats: Antagonistic effects of copper and liver. J Biol Chem 103:29-38.

Snyder RD, Friedman MB. 1998. Enhancement of cytotoxicity and clastogenicity of L-DOPA and dopamine by manganese and copper. Mutat Res 405:1-8.

*Sohler A, Kruesi M, Pfeiffer CC. 1977. Blood lead levels in psychiatric outpatients reduced by zinc and vitamin C. J Orthomol Psychiatr 6:272-276.

Spencer JPE, Jenner A, Aruoma OI, et al. 1994. Intense oxidative DNA damage promoted by L-DOPA and its metabolites implications for neurodegenerative disease. FEBS Lett 353:246-250.

Srivastava AK, Gupta BN, Bihari V, et al. 1992. Clinical studies in workers engaged in maintenance of watermark moulds in a paper mill. Int Arch Occup Environ Health 64:141-145.

Srivastava L, Tandon, SK. 1984. Effect of zinc on lead-induced changes in brain lysosomal enzymes in the chick embryo. Toxicol Lett 20:11-114.

Steinbach OM, Wolterbeek HT. 1994. Role of cytosolic copper, metallothionein and glutathione in copper toxicity in rat hepatoma tissue culture cells. Toxicology 92:75-90.

Stohs SJ, Bagchi D. 1995. Oxidative mechanisms in the toxicity of metal ions. Free Radic Biol Med 18(2):321-336.

*Storm GL, Fosmire GJ, Bellis ED. 1994. Heavy metals in the environment: Persistence of metals in soil and selected vertebrates in the vicinity of the Palmerton zinc smelters. J Environ Qual 23:508-514.

Sukumar A, Subramanian R. 1992. Trace elements in scalp hair of manufacturers of fireworks from Sivakasi, Tamil Nadu. Sci Total Environ 114:161-168.

Summerfield AL, Steinberg FU, Gonzalez JG. 1992. Morphologic findings in bone marrow precursor cells in zinc-induced copper deficiency anemia. Am J Clin Pathol 97:665-668.

Sunderman PW. 1979. Carcinogenicity and anticarcinogenicity of metal compounds. In: Emmelot P, Kriek E, ed. Environmental Carcinogenesis. Amsterdam: Elsevier/North-Holland Biomedical Press, 165-225.

*Sziraki I, Sziraki I, Rauhala P, et al. 1999. Implications for atypical antioxidative properties of manganese in iron-induced brain lipid peroxidation and copper-dependent low density lipoprotein conjugation. Neurotoxicology 20(2-3):455-466.

Taves DR. 1974. Rapid assignment of patients by minimization in clinical trials. Pharmacologist 16(2):252.

*Thawley DG, Pratt SE, Selby LA. 1978. Antagonistic effect of zinc on increased urine δ-aminolevulinic acid excretion in lead-intoxicated rats. Environ Res 15:218-226.

*Thawley DG, Willoughby RA, McSherry BJ, et al. 1977. Toxic interactions among Pb, Zn, and Cd with varying levels of dietary Ca and vitamin D: Hematological system. Environ Res 14:463-475.

*Thomasino JA, Zuroweste E, Brooks SM, et al. 1977. Lead, zinc, and erythrocyte δ-aminolevulinic acid dehydratase: Relationships in lead toxicity. Arch Environ Health 32:244-247.

Tom K, Chen M, Goettlich-Riemann W, et al. 1977. Collagen and elastin metabolism in relation to dietary zinc and copper in the chick and rat. Nutr Rep Int 15(2):191-198.

*Tomokuni K. 1979. Interaction of zinc and other metal on the activity of erythrocyte δ-amino-levulinic acid dehydratase in vitro. J Toxicol Sci 4:11-18.

Van Campen DR. 1966. Effects of zinc, cadmium, silver and mercury on absorption and distribution of copper-64 in rats. J Nutr 88:125-130.

Van Campen DR. 1969. Copper interference with the intestinal absorption of zinc-65 by rats. J Nutr 97:104-108.

*Vassilev PP, Venkova K, Pencheva N, et al. 1994. Changes in the contractile responses to carbachol and in the inhibitory effects of verapamil and nitrendipine on isolated smooth muscle preparations form rats subchronically exposed to Pb^{2+} and Zn^{2+}. Pharmacol Toxicol 75:129-135.

*Velez-Pardo C, Rio MJD, Ebinger G, et al. 1995. Manganese and copper promote the binding of dopamine to "serotonin binding proteins" in bovine frontal cortex. Neurochem Int 26(6):615-622.

Vescovi A, Facheris L, Zaffaroni A, et al. 1991. Dopamine metabolism alterations in a manganese-treated pheochromocytoma cell line (PC12). Toxicology 67:129-142.

Victery W, Soifer NE, Weiss JS, et al. 1981. Acute effects of lead on the renal handling of zinc in dogs. Toxicol Appl Pharmacol 61:358-367.

Walsh CT, Sandstead HH, Prasad AS, et al. 1994. Zinc: Health effects and research priorities for the 1990s. Environ Health Perspect 102(Suppl. 2):5-46.

*Watanabe T, Iwami O, Nakatsuka H, et al. 1991. Correlation of cadmium, copper, manganese, and zinc levels in the urine of people in nonpolluted areas. J Toxicol Environ Health 33:263-272.

White AR, Bush AI, Beyreuther K, et al. 1999. Exacerbation of copper toxicity in primary neuronal cultures depleted of cellular glutathione. J Neurochem 72:2092-2098.

Wiegant FAC, Souren JEM, Van Wijk R. 1999. Stimulation of survival capacity in heat shocked cells by subsequent exposure to minute amounts of chemical stressors; role of similarity in hsp-inducing effects. Hum Exp Toxicol 18:460-470.

*Willoughby RA, MacDonald E, McSherry BJ, et al. 1972. Lead and zinc poisoning and the interaction between Pb and Zn poisoning in the foal. Can J Comp Med 36:348-359.

*Xu B, Chia S-E, Ong C-N. 1994. Concentrations of cadmium, lead, selenium, and zinc in human blood and seminal plasma. Biol Trace Elem Res 40:49-57.

*Yadrick MK, Kenney MA, Winterfeldt EA. 1989. Iron, copper, and zinc status: Response to supplementation with zinc or zinc and iron in adult females[1-3]. Am J Clin Nutr 49:145-150.

*Yoshikawa H, Ohta H. 1982. Interaction of metals and metallothioneien. In: Foulkes EC, ed. Biological roles of metallothionein. Amsterdam: Elsevier North Holland Inc., 11-23.

*Zawia NH, Crumpton T, Brydie M, et al. 2000. Disruption of the zinc finger domain. A common target that underlies many of the effects of lead. Neurotoxicology 21(6):1069-1080.

Zhang ZX, Anderson DW, Roman MN. 1996. Motor neuron disease on Guam: Geographic and familial occurrence, 1956-85. Acta Neurol Scand 94:51-59.

*Zielhuis RL, del Castilho PD, Herber RFM, et al. 1978. Levels of lead and other metals in human blood: Suggestive relationships, determining factors. Environ Health Perspect 25:103-109.