

## 7. BIBLIOGRAFÍA

1. Afrasiabi Z, Sinn E, Lin W, *et al.* 2005. Nickel (II) complexes of naphtaquinone thiosemicarbazone and semicarbazone: Synthesis, structure, spectroscopy, and biological activity. *J of Inorg Biochem* 99: 1526-1531.
2. Agren MS. 1991. Influence of 2 vehicles for zinc oxide on zinc absorption through intact skin and wounds. *Acta Derm Venereol (Stockh)* 71(2):153-156.
3. Ainscough EW, Brodie AM, Denny WA, *et al.* 1999. Citotoxicity of salicylaldehyde benzoylhydrazone analogs and their transition metal complexes: quantitative structure-activity relationships. *J of Inorg Biochem* 77: 125-133.
4. Albornoz AJC. 1997. Efecto Secundario de los AINEs: Revisión. *Rev de la Soc Med Quir del Hosp de Emerg Pérez de León.* 28(1):48-54.
5. Allen JG, Masters HG, Peet RL, *et al.* 1983. Zinc toxicity in ruminants. *J Comp Pathol* 93:363-377.
6. American Chrome and Chemicals. 1989. Chromic acid. Material safety data sheets. Corpus Christi, TX: American Chrome and Chemicals, Inc.
7. Anderson RA. 1981. Nutritional role of chromium. *Sci Total Environ* 17:13-29.
8. Armstrong, KA, Tidor B, Cheng AC. 2006. Optimal Charges in Lead Progression: A Structure-Based Neuraminidase Case Study. *J of Med Chem* 49:2470-2477
9. Arredondo M, Uauy R, González M. 2000. Regulation of copper uptake and transport in intestinal cell monolayers by acute and chronic copper exposure. *Biochim Biophys Acta* 1474(2):169-176.
10. Asmuß M, Mullenders LH, Hartwig A. 2000. Interference by toxic metal compounds with isolated zinc finger DNA repair proteins. *Toxicol Lett* 112-113:227-231.
11. ATSDR. 2000. Toxicological profile for chromium. U.S. Department of Health and Human Services. Agency for Toxic Substances and Disease Registry.
12. ATSDR. 2002. Toxicological profile for cadmium. U.S. Department of Health and Human Services. Agency for Toxic Substances and Disease Registry.

13. ATSDR. 2004. Toxicological profile for copper. U.S. Department of Health and Human Services. Agency for Toxic Substances and Disease Registry.
14. ATSDR. 2005a. Toxicological Profile for lead. U.S. Department of Health and Human Services. Agency for Toxic Substances and Disease Registry.
15. ATSDR. 2005b. Toxicological profile for zinc. U.S. Department of Health and Human Services. Agency for Toxic Substances and Disease Registry.
16. ATSDR. 2003. Toxicological profile for cobalt. U.S. Department of Health and Human Services. Agency for Toxic Substances and Disease Registry.
17. Baran EJ. 1995. Química Bioinorgánica. Mc Graw Hill. España.
18. Beers, MH, Bogin, RM, editores. 1999. El Manual Merck. Décima Edición. España: Harcourt.
19. Behrooz A, Ismail-Beigi F. 1997. Dual control of glut1 glucose transporter gene expression by hypoxia and by inhibition of oxidative phosphorylation. *J Biol Chem* 272(9):5555-5562.
20. Bentley PJ, Grubb BR. 1991. Experimental dietary hyperzincemia tissue disposition of excess zinc in rabbits. *Trace Elements in Medicine* 8:202-207.
21. Bertini I, Rigel A, Rigel H. 2001. Handbook on metalloproteins. Marcel Dekker. New York.
22. Bhandari P, Andrews PLR. 1991. Erratum: Preliminary evidence for the involvement of the putative 5-HT<sub>4</sub> receptor in zacopride-and copper sulphate-induced vomiting in the ferret. *Eur J Pharmacol* 211(3):430.
23. Blanc P, Wong H, Bernstein MS, et al. 1991. An experimental human model of metal fume fever. *Ann Intern Med* 114:930-936. Mueller EJ, Seger DL. 1985. Metal fume fever: A review. *J Emerg Med* 2:271-274.
24. Boctor AM, Eickholt M, Pugsley TA. 1986. Meclofenamate sodium is an inhibitor of both the 5 lipooxygenase and cyclooxygenase pathways of the arachidonic acid cascade in vitro. *Prostaglandins, Leukotrienes. Med* 23: 229.
25. Boscolo P, Carmignani M. 1988. Neurohumoral blood pressure regulation in lead exposure. *Environ Health Perspect* 78:101-106.

26. Boveris A, La evolución del concepto de radicales libres en biología y medicina. España; 2005-[actualizada el 17 de abril de 2005; acceso 25 de marzo de 2006]. Disponible en <http://farmacia.ugr.es/ars/pdf/311.pdf>.
27. Colonna S, Gaggero N, Richelmi C, et al. 1999. Recent biotechnological developments in the use of peroxidases. Elsevier Science. New York.
28. Brown DH, Smith WE, Teape JW. 1980. Antiinflammatory Effects of Some Copper Complexes. *Am Chem Soc* 23: 729-734.
29. Bury A, Underhill AE. 1988. Metal complexes of anti-inflammatory drugs. Part V. Meclofenamic acid complexes of manganese(II), Iron(III), cobalt(II), nickel(II), copper(II) and zinc(II). *Inorg Chim Acta* 152: 171-175.
30. Calderón-Morales L. Estudio de la capacidad coordinante del fármaco antiinflamatorio ácido (S)-6-metoxi- $\alpha$ -metil-2-naftaleneacético (naproxeno) hacia iones metálicos contaminates [Cd(II), Pb(II), Al(III), Mn(II), Cr(II), Hg(II), Fe(III), Cu(II)] [Tesis de licenciatura]. México. Universidad Autónoma de Tlaxcala. 2006.
31. Camakaris J, Voskoboinik I, Mercer JF. 1999. Molecular mechanisms of copper homeostasis. *Biochem Biophys Res Commun* 261(2):225-232.
32. Carcelli M, Mazza P, Pellizi C, et al. 1995. Antimicrobial and genotoxic activity of 2,6-diacetylpyridine bis(acylhidrazones) and their complexes with some first transition series metal ions. X-ray crystal structure of a dinuclear copper (II) complex. *J of Inorg Biochem* 57: 43-62.
33. Cardenas A, Bernard A, Lauwerys R. 1992. Incorporation of [35S] sulfate into glomerular membranes of rats chronically exposed to cadmium and its relation with urinary glycosaminoglycans and proteinuria. *Toxicol* 76:219-231.
34. Carranza-Téllez V. Síntesis y caracterización del ligante tipo "clip" piridinadicarbonil-bishistidina y su complejo con Fe (III)-protoporfirina IX como compuesto modelo de peroxidasa [Tesis de Maestría]. México. Benemérita Universidad Autónoma de Puebla; 2005.
35. Chang R. 2001. Química. Tercera Edición. McGraw-Hill. México.
36. Chikaraishi KN, Sekino K, Ishikawa M, et al. 2003. Synthesis, structural characterization and antimicrobial activities of 12 zinc(II) complexes with four

- thiosemicarbazone and two semicarbazone ligands. *J of Inorg Biochem.* 96: 298-310.
37. Cotran RS, Kumar V, Robbins SL. 1989. Robbins pathologic basis of disease. 4th ed. Philadelphia, PA: W.B. Saunders Company, 461.
  38. Cotton FA, Wilkinson G. 2005. Química Inorgánica Avanzada. 4a ed. Limusa Noriega Editores. México.
  39. Dameron CT, Harrison MD. 1998. Mechanisms for protection against copper toxicity. *Am J Clin Nutr* 67(5):1091S-1097S.
  40. Davies NT. 1980. Studies on the absorption of zinc by rat intestine. *Br J Nutr* 43:189-203.
  41. De Boeck M, Lison D, Kirsh Volders M. 1998. Evaluation of the in vitro direct and indirect genotoxic effects of cobalt compounds using the alkaline comet assay. Influence of interdonor and interexperimental variability. *Carcinogenesis* 19:2021-2129.
  42. De Celis R, Bravo CA, Preciado MV, et al. 2007. La contaminación ambiental y nuestra salud. *Ciencia* 58(1): 15-21.
  43. De Matteis F, Gibbs AH. 1977. Inhibition of haem synthesis caused by cobalt in rat liver. *Biochem J* 162:213-216.
  44. De Vizcaya-Ruiz A, Rivero-Müller A, Ruiz-Ramirez L, et al. 2003. Hematotoxicity response in rats by the novel copper-based anticancer agent: casiopeina II. *Toxicol* 194: 103-113.
  45. DeRwitter J, Principles of drug action 2. England; 2002-[actualizada el 26 de mayo de 2005; acceso 18 de enero de 2006]. Disponible en [www.auburn.edu/~deruija/nsaids\\_2002.pdf](http://www.auburn.edu/~deruija/nsaids_2002.pdf).
  46. Dillon CT, Hambley TW, Kennedy BJ, et al. 2003. Gastrointestinal toxicity, antiinflammatory activity and superoxide dismutase activity of copper and zinc complexes of the antiinflammatory drug Indomethacin. *Chem Res Toxicol.* 16: 28-37.
  47. Ding Y, Gonick HC, Vaziri ND, et al. 2001. Lead-induced hypertension. Increased hydroxyl radical production. *Am J Hypertens* 14:169-173.

48. Donkin SG, Ohlson DL, Teaf CM. 2000. Properties and Effects of Metals. In: Williams PL, James RC, Roberts SM. Principles of Toxicology: Environmental and Industrial Applications. Second Edition. John Wiley & Sons Inc. New York.
49. Dorian C, Gattone VH II, Klaasen CD. 1992a. Renal cadmium deposition and injury as a result of accumulation of cadmium-metallothionein (CdMT) by the proximal convoluted tubules - a light microscopic autoradiography study with <sup>109</sup>CdMT. Toxicology and Applied Pharmacology 114:173-181.
50. Dorian C, Gattone VH II, Klaasen CD. 1992. Accumulation and degradation of the protein moiety of cadmium - metallothionein (CdMT) in the mouse kidney. Toxicol and Appl Pharm 117:242-248.
51. Dorian C, Gattone VH II, Klaasen CD. 1995a. Discrepancy between the nephrotoxic potencies of cadmium - metallothionein and cadmium chloride and the renal concentration of cadmium in the proximal convoluted tubules. Toxicology and Applied Pharmacology 130:161-168.
52. Dorian C, Klaassen CD. 1995b. Protection by zinc-metallothionein (znmt) against cadmiummetalothionein- induced nephrotoxicity. Fundam Appl Toxicol 26(1):99-106.
53. Dudley RE, Gammal LM, Klaassen CD. 1985. Cadmium-induced hepatic and renal injury in chronically exposed rats: Likely role of hepatic cadmium-metallothionein in nephrotoxicity. Toxicol Appl Pharmacol 77:414-426.
54. Ellis KJ, Cohn SH, Smith TJ. 1985. Cadmium inhalation exposure estimates: Their significance with respect to kidney and liver cadmium burden. J Tox Environ Health 15:173-187.
55. English MA. 1995. Iron: Heme proteins, peroxidases and catalases. Encyclopedia of Inorganic Chemistry. 1682-1697.
56. EPA. 1984. Health assessment document for chromium. Research Triangle Park, NC: Environmental Assessment and Criteria Office, U.S. Environmental Protection Agency. EPA 600/8-83-014F.
57. EPA. 1986. Air quality criteria for lead. 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. EPA600883028F.

58. Evering WE, Haywood S, Bremner I, *et al.* 1991. The protective role of metallothionein in copper overload: I. Differential distribution of immunoreactive metallothionein in copper-loaded rat liver and kidney. *Chem Biol Interact* 78(3):283-295.
59. Franson RC, Eisen D, Jesse R, *et al.* 1980. Inhibition of highly purified mammalian phospholipases A<sub>2</sub> by non-steroidal anti-inflammatory agents. *Biochem J.* 186: 633-636.
60. Ferrans VJ, Hibbs RG, Weilbaecher DG. 1964. Alcoholic cardiomyopathy: a histochemical and electron microscopic study. *Am J Cardiol* 13:106-107.
61. Flood-Garibay JA. Síntesis y Evaluación biológica *in vitro* de compuestos de coordinación [Cu(4,7-dimetil-1,10-fenantrolina)(N-O)]NO<sub>3</sub> (Casiopinas<sup>®</sup>) en diferentes líneas tumorales humanas. [Tesis de Licenciatura]. México: Universidad de las Américas, Puebla; 2006.
62. Forssen A. 1972. Inorganic elements in the human body: I. Occurrence of Ba, Br, Ca, Cd, Cs, Cu, K, Mn, Ni, Sn, Sr, Y, and Zn in the human body. *Ann Med Exp Biol Fenn* 50:99-162.
63. Foulkes EC, McMullen DM. 1987. Kinetics of transepithelial movement of heavy metals in rat jejunum. *Am J Physiol* 253:G134-G138.
64. Fox, M.A., Whittessel, JK. 2000. Química orgánica. Segunda edición. Pearson Educación. México.
65. Fuentealba IC, Haywood S, Foster J. 1989. Cellular mechanisms of toxicity and tolerance in the copper-loaded rat. III. Ultrastructural changes and copper localization in the kidney. *Br J Exp Pathol* 70(5):543-556.
66. Fukui H, Yamamoto M, Sasaki S, *et al.* 1993. Involvement of 5-HT<sub>3</sub> receptors and vagal afferents in copper sulfate- and cisplatin-induced emesis in monkeys. *Eur J Pharmacol* 249(1):13-18.
67. Fukui H, Yamamoto M, Sasaki S, *et al.* 1994. Possible involvement of peripheral 5-HT<sub>4</sub> receptors in copper sulfate-induced vomiting in dogs. *Eur J Pharmacol* 257(1-2):47-52.

68. Gad SC, Powers WJ, Dunn BJ, *et al.* 1986. Acute toxicity of four chromate salts. In: Serrone DM, ed. Chromium symposium 1986: An update. Pittsburgh, PA.: Industrial Health Foundation inc., 43-58.
69. Gill KD, Pal R, Sandhir R, *et al.* 1989. Effect of chronic cadmium exposure on lipid composition and peroxidation in liver and kidneys in rats. *Med Sci Res* 17:921-924.
70. Giroux EL, Durieux M, Schechter PJ. 1976. A study of zinc distribution in human serum. *Bioinorg Chem* 5:211-218.
71. Goering PL. 1993. Lead-protein interactions as a basis for lead toxicity. *Neurotoxicology* 14:45-60.
72. Goyer RA, Miller CR, Zhu SY, *et al.* 1989. Non-metallothionein-bound cadmium in the pathogenesis of cadmium nephrotoxicity in the rat. *Toxicol Appl. Pharmacol* 101:232-244.
73. Hamdi EA. 1969. Chronic exposure to zinc of furnace operators in a brass foundry. *Br J Ind Med* 26:126-134.
74. Hempe JM, Cousins RJ. 1992. Cysteine-rich intestinal protein and intestinal metallothionein: An inverse relationship as a conceptual model for zinc absorption in rats. *J Nutr* 122(1):89-95.
75. Hernán-Hernández E. Estudio de la capacidad coordinante del diclofenaco sódico {[2-[(2,6-Diclorofenil)Amino]Fenilato] de Sodio} y los iones contaminantes Pb(II), Cd(II), Zn(II) y Mn(II) [Tesis de Licenciatura]. México: Universidad de las Américas, Puebla; 2004.
76. Hoet PMH, Roesems G, Demedts MG, *et al.* 2002. Activation of the hexose monophosphate shunt in rat type II pneumocytes as an early marker of oxidative stress caused by cobalt particles. *Arch Toxicol* 76(1):1-7.
77. Horn, J. 1970. Isolation and examination of inclusion bodies of the rat kidney after chronic lead poisoning. *Virchows Arch [Zellpathol]* 6:313.
78. Howes DB, Schiodt BC, Welinder KG, *et al.* 1999. The quantum mixed-spin heme state of Barley Peroxidase: a paradigm for class III peroxidases. *Biophys J.* 77(1): 478-492.

79. ICN Farmacéutica, Geles de aluminio y magnesio. Argentina: ICN farmacéutica; [1990-actualizada el 1 de enero de 2006; acceso 28 de marzo de 2006]. Disponible en [http://www.obgmanagement.com/redir.asp?filename=obg\\_0702\\_00071.xml](http://www.obgmanagement.com/redir.asp?filename=obg_0702_00071.xml)
80. IOM. 2002. Dietary reference intakes for vitamin A, vitamin K, arsenic, boron, chromium, copper, iodine, iron, manganese, molybdenum, nickel, silicon, vanadium, and zinc. Institute of Medicine. Food and Nutrition Board, NRC. Washington, DC: National Academy Press, 442-501.
81. Jamall IS, Naik M, Sprowls JJ, *et al.* 1989. A comparison of the effects of dietary cadmium on heart and kidney oxidant enzymes: Evidence for the greater vulnerability of the heart to cadmium toxicity. *J Appl Toxicol* 9:339-345.
82. Jamall IS, Smith JC. 1985. Effects of cadmium on glutathione peroxidase, superoxide dismutase and lipid peroxidation in the rat heart: A possible mechanism of cadmium cardiotoxicity. *Toxicol Appl Pharmacol* 80:33-42.
83. Johnson PE, Hunt JR, Ralston NV. 1988. The effect of past and current dietary Zn intake on Zn absorption and endogenous excretion in the rat. *J Nutr* 118:1205-1209.
84. Kapoor SC, Van Rossum GDV, O'Neill KJ *et al.* 1985. Uptake of inorganic lead in vitro by isolated mitochondria and tissue slices of rat renal cortex. *Biochem Pharmacol* 34:1439-1448.
85. Kasprzak KS, Zastawny TH, North SL, *et al.* 1994. Oxidative DNA base damage in renal, hepatic, and pulmonary chromatin of rats after intraperitoneal injection of cobalt(II) acetate. *Chem Res Toxicol* 7:329-335.
86. Kasuga NC, Sekino K, Ishikawa M, Honda A, Yokoyama M, Nakano S, Shimada N, Koumo C, Nomiya K. Synthesis, structural characterization and antimicrobial activities of 12 zinc (II) complexes with four thisemicarbazone and two semicarbazone ligands. *Journal of Inorganic Biochemistry (Japan)* 2003; 96: 298-310.
87. Katya-Katya M, Ensminger A, Mèjean L, *et al.* 1984. The effect of zinc supplementation on plasma cholesterol levels. *Nutr Res* 4:633-638.
88. Kawanishi S, Inoue S, Yamamoto K. 1994. Active oxygen species in DNA damage induced by carcinogenic metal compounds. *Environ Health Perspect Suppl* 102(3):17-20.



89. Khalil-Manesh F, Gonick HC, Cohen A, *et al.* 1992. Experimental model of lead nephropathy. II. Effect of removal from lead exposure and chelation treatment with dimercaptosuccinic acid (DMSA). *Environ Res* 58:35-54.
90. Koneman WE, Janda MW, Allen DS, *et al.* 1999. Diagnóstico microbiológico. Médica Panamericana. México.
91. Kreyling WG, Godleski JJ, Kariya ST, *et al.* 1990. *In vitro* dissolution of uniform cobalt oxide particles by human and canine alveolar macrophages. *Am J Resp Cell Mol Biol* 2:413-422.
92. Lasfargues G, Lardot C, Delos M, *et al.* 1995. The delayed lung responses to single and repeated intratracheal administration of pure cobalt and hard metal powder in the rat. *Environ Res* 69:108-121.
93. Lehninger AL. 1982. Principles of Biochemistry. New York: Worth Publishers, Inc., 361-466.
94. Lewis CPL, Demedts M, Nemery B. 1991. Indices of oxidative stress in hamster lung following exposure to cobalt(II) ions: *In vivo* and *in vitro* studies. *Am J Resp Cell Mol Biol* 5:163-169.
95. Lison D, Lauwerys R, Demedts M, *et al.* 1996. Experimental research into the pathogenesis of cobalt/hard metal lung disease. *European Respiratory Journal* 9:1024-1028.
96. Liu J, Liu Y, Habecbu SS, *et al.* 1998. Susceptibility of MT-null mice to chronic CdCl<sub>2</sub>-induced nephrotoxicity indicates that renal injury is not mediated by the CdMT complex. *Toxicological Sciences* 46(1):197-203.
97. Loomis TA. 1984. Fundamentos de toxicología. Acribia. España.
98. Lloyd DR, Phillips DH, Carmichael PL. 1997. Generation of putative intrastrand cross-links and strand breaks in DNA by transition metal ion-mediated oxygen radical attack. *Chem Res Toxicol* 10:393-400.
99. Mahmood S, Ali S, Bhatti MH, *et al.* 2004. Synthesis, spectral characterization and biological applications of tri- and diorganotin(IV) derivatives of 2-[N-(2,6-dichloro-3-methylphenyl)amino]benzoic acid. *Turk J Chem.* 28: 17-26.

100. Marín-Hernández A, Gracia-Mora I, Ruiz-Ramírez L, *et al.* 2003. Toxic effects of copper-based antineoplastic drugs (Casiopeinas ®) on mitochondrial functions. *Biochem Pharm* 65: 1979-1989.
101. Mason RM, Barnardo DE, Fox WR, *et al.* 1967. Assessment of drugs in out patients with rheumatoid arthritis. Evaluation of methods and a comparison of mefenamic and flufenamic acids with phenylbutazone and aspirin. *Ann Rheum Dis.* 26: 373-388.
102. Galati G, Tafazoli S, Sabzevari O, *et al.* 2002. Idiosyncratic NSAID drug induced oxidative stress. *Chem Biol Interact.* 142(1-2): 25-41.
103. Ministerio de Medio Ambiente, Artritis Reumatoide. España; 2000-[acceso 11 de abril de 2006]. Disponible en <http://www.buenosdiasplaneta.org/rm2000/indigen.htm>.
104. Mohamed G. 2006. Synthesis, characterization and biological activity of bis(phenylimine) Schiff base ligands and their metal complexes. *Spectroc Acta Part A* 64: 188-195.
105. Myers BM, Prendergast FG, Holman R, *et al.* 1993. Alterations in hepatocyte lysosomes in experimental hepatic copper overload in rats. *Gastroenterology* 105(6):1814-1823.
106. Nielson KB, Atkin CL, Winge DR. 1985. Distinct metal-binding configurations in metallothionein. *J Biol Chem* 260:5342-5350.
107. Nomiya K, Yoshizawa A, Tsukagoshi K, *et al.* 2004. Synthesis and structural characterization of silver (I), aluminium (III) and cobalt (II) complexes with 4-isopropyltropolone (hinokitiol) showing noteworthy biological activities. Action of silver (I)-oxygen bonding complexes on the antimicrobial activities. *J of Inorg Biochem* 2004; 98: 46-60.
108. Oskarsson A, Fowler BA. 1985. Effects of lead inclusion bodies on subcellular distribution of lead in rat kidney: The relationship to mitochondrial function. *Exp Mol Pathol* 43:397-408.
109. Osterode W, Barnas U, Geissler K. 1999. Dose dependent reduction of erythroid progenitor cells and inappropriate erythropoietin response in exposure to lead: New aspects of anaemia induced by lead. *Occup Environ Med* 56:106-109.

110. Pons PJ, Estudiem el comportament de lligands en front de diferents metalls. España; 2005-[acceso el 27 de abril de 2006]. Disponible en ([www.uab.es/uabdivulga/avencos/2005/lligands0205.htm](http://www.uab.es/uabdivulga/avencos/2005/lligands0205.htm)).
111. Palacios-Hernández T. Acción farmacológica de complejos metal-antiinflamatorio en conejos con artritis inducida por micoplasmas [Tesis de Licenciatura] México: Universidad Autónoma de Tlaxcala; 2005.
112. Pena MMO, Lee J, Thiele DJ. 1999. A delicate balance: Homeostatic control of copper uptake and distribution. *J Nutr* 129(7):1251-1260.
113. Petrilli FL, Rossi GA, Camoirano A, *et al.* 1986b. Metabolic reduction of chromium by alveolar macrophages and its relationships to cigarette smoke. *J Clin Invest* 77:1917-1924.
114. Reels H, Bernard AM, Cardenas A, *et al.* 1993. Markers of early renal changes induced by industrial pollutants. III. Application to workers exposed to cadmium. *Brit J Ind Med* 50:37-48.
115. Rengasamy A, Kommineni C, Jones JA, *et al.* 1999. Effects of hard metal on nitric oxide pathways and airway reactivity to methacholine in rat lungs. *Toxicol Appl Pharmacol* 157:178-191.
116. Rodríguez-Arnaiz R. 2003. Las toxinas ambientales y sus efectos genéticos. Fondo de Cultura Económica. México.
117. Romero-Zarazúa MF. 2004. Evaluación de contaminantes metálicos dispersos en empresas metal-mecánicas de Puebla y su posible relación con efectos toxicológicos [Tesis de licenciatura]. México. Universidad de las Américas, Puebla.
118. Sánchez-Gaytán BL. 2005. Síntesis y caracterización del ligante biomimético tipo pinza glutamicobishistidina y su complejo con hierro(III)-protoporfirina IX [Tesis de maestría]. México. Benemérita Universidad Autónoma de Puebla.
119. Sarkar B. 1995. Metal replacement in DNA-binding zinc finger proteins and its relevance to mutagenicity and carcinogenicity through free radical generation. *Nutrition* 11(5):646-649.
120. Sendelbach LE, Klaassen CD. 1988. Kidney synthesizes less metallothionein than liver in response to cadmium chloride and cadmium-metallothionein. *Toxicol Appl Pharmacol* 92:95-102.

121. Shelton KR, Egle PM. 1982. The proteins of lead-induced intranuclear inclusion bodies. *J Biol Chem* 257(19):11802-11807.
122. Sinclair P, Gibbs AH, Sinclair JF, *et al.* 1979. Formation of cobalt protoporphyrin in the liver of rats. *Biochem J* 178:529-538.
123. Sokol RJ, Devereaux M, Mierau GW, *et al.* 1990. Oxidant injury to hepatic mitochondrial lipids in rats with dietary copper overload. *Gastroenterology* 99(4):1061-1071.
124. Song MK, Kim YY, Heng MCY, *et al.* 1992. Prostaglandin interacts with steroid sex hormones in the regulation of intestinal zinc transport. *Comp Biochem Physiol* 101A(3):477-481.
125. Squibb KS, Pritchard JB, Fowler BA. 1984. Cadmium-metallothionein nephropathy: Relationships between ultrastructural/biochemical alterations and intracellular cadmium binding. *J Pharmacol Exp Therap* 229:311-321.
126. Sunderman WF. 1987. Metal induction of heme oxygenase. *Ann N Y Acad Sci* 514:65-80.
127. Tao TY, Liu F, Klomp L, *et al.* 2003. The copper toxicosis gene product murr1 directly interacts with the Wilson disease protein. *J Biol Chem* 278(43):41593-41596.
128. Tsao D-A, Yu H-S, Cheng J-T, *et al.* 2000. The change of  $\beta$ -adrenergic system in lead-induced hypertension. *Toxicol Appl Pharmacol* 163:127-133
129. Turnlund JR. 1989. Stable isotope studies of the effect of dietary copper on copper absorption and excretion. *Adv Exp Med Biol* 258:21-28.
130. Vásquez-Árciga H. Estudio de la capacidad coordinante de iones metálicos contaminantes ( $\text{Cd}^{+2}$ ,  $\text{Pb}^{+2}$ ,  $\text{Al}^{+3}$ ) y el fármaco antiinflamatorio ácido acetilsalicílico [Tesis de Licenciatura]. México: Universidad de las Américas, Puebla; 2004.
131. Valdés-Perezgasga F, Cabrera-Morelos VM. 1999. La contaminación por metales pesados en Torreón, Coahuila, México. Texas Center for Policy Studies. En Defensa del Ambiente, A.C. México.
132. Vaziri ND, Sica DA. 2004. Lead-induced hypertension: Role of oxidative stress. *Curr Hypertens Rep* 6:314-320.

133. Vinodu MV, Padmanabhan M. 2001. Peroxidase-like catalytic activities of ionic metalloporohyrins supported on functionalized polystyrene surface. *Proc Indian Acad Sci* 113(1):1-9.
134. Waalkes MP, Klaassen CD. 1985. Concentration of metallothionein in major organs of rats after administration of various metals. *Fund Appl Toxicol* 5:473-477.
135. Watts SW, Chai S, Webb RC. 1995. Lead acetate-induced contraction in rabbit mesenteric artery: Interaction with calcium and protein kinase C. *Toxicology* 99:55-65.
136. Weakly JN. 1973. The action of cobalt ions on neuromuscular transmission in the frog. *J Physiol* 234:597-612.
137. Weder JE, Dillon CT, Hambley TW, *et al.* 2002. Copper complexes of non-steroidal anti-inflammatory drugs: an opportunity yet to be realized. *Coord Chem Rev* 232: 95-126.
138. WHO. 1996. Zinc. Trace elements in human nutrition and health. World Health Organization,72-104.
139. Xiang-Guang M, Guo Y, Chang Wei H, *et al.* 2004. Mimic models of peroxidase-kinetic studies of the catalytic oxidation of hydroquinone by H<sub>2</sub>O<sub>2</sub>. *J of Inorg Biochem.* 98: 2107-2113.
140. Xu C, Holscher MA, Jones MM, *et al.* 1995. Effect of monoisoamyl meso-2,3-dimercaptosuccinate on the pathology of acute cadmium intoxication. *J Toxicol Environ Health* 45:261-277.
141. Yamatani K, Saito K, Ikezawa Y, *et al.* 1998. Relative contribution of Ca<sup>2+</sup>-dependent mechanism in glucagon-induced glucose output from the liver. *Arch Biochem Biophys* 355(2):175-180.
142. Ybarra J, Behrooz A, Gabriel A, *et al.* 1997. Glycemia-lowering effect of cobalt chloride in the diabetic rat: increased GLUT1 mRNA expression. *Mol Cell Endocrinol* 133:151-160.
143. Yoshida M, Fumukmoto M, Kishimoto T, *et al.* 1993. Effects of zinc, selenium, and calcium on the nephrotoxicity of cadmium in primary cultures of rat renal proximal epithelial cells. *Biol Trace Elem Res* 36(3):219-227.

144. Zamudio-Rivera LS, George-Tellez R, López-Mendoza G, *et al.* 2005. Synthesis, characterization, biocide and toxicological activities of di-n-butyl- and diphenyl-tin<sup>IV</sup>-salicylidene-β-amino alcohol derivatives. *Inorg Chem* 44: 5370-5378.
145. Zhou Q, Hambley TW, Kennedy BJ, *et al.* 2000. Synthesis and characterization of anti-inflammatory dinuclear and mononuclear zinc Indomethacin complexes. Crystal structures of  $[Zn_2(Indomethacin)_4(L)_2]$  (L= N,N-dimethylacetamide, pyridine, 1-methyl-2-pyrrolidinone) and  $[Zn(Indomethacin)_2(L_1)_2]$  (L<sub>1</sub>= ethanol, methanol). *Inorg. Chem.* 39: 3742-3748.